MR 509
Permit No. 11-2024-0128D

Office Use Only

State of Ohio
Department of Transportation
Permit

County or Jurisdiction BEL
Rte SR149
Log Pt 23.71
Acc Cat

[1] Subject to all terms, conditions, and restrictions printed, written below and on the reverse side hereof, or attached,

Name: Love's Travel Stops & Country Stores, Inc.
Address: 10601 N. Pennsylvania Ave Oklahoma City OK 73120
Company Phone: 405-203-5900

is hereby granted a permit under Section 5515.01 and 5515.02 of Ohio Revised Code, and permission to perform work necessary in the manner described and at the location indicated in the following or attached to this permit.

Drive - Commercial - (see attached sheets)

Description of Work: Love's will construct a public access drive off of SR 149 for access to the proposed Love's Travel Stop development. In conjunction with the construction of the proposed access drive, a southbound right turn lane along SR 149 will be constructed for access onto existing Reco Rd. A dedicated right turn lane from SR 149 to the I-70 EB Entrance ramp will also be striped. A dedicated left turn lane SR 149 northbound for access to Reco Drive will be added. A two way left turn lane will be striped between Reco Drive and the proposed Love's driveway. A dedicated southbound right turn lane will be added for access to the proposed Love's driveway on SR 149. A dedicated left turn lane will be striped for access from SR 149 northbound to the proposed Love's driveway. It is anticipated that this construction will be started in June 2024 in conjunction with the Love's Travel Stop development and completed by May 2025.

[2] This permit shall be in the possession of employees /agents of permittee on site at all times who are in charge of the work and shall be shown, upon request, to any employee of the Department of Transportation.

Contact ODOT Representative 3 days before work begins, also contact ODOT Representative when work is completed for final inspection.
Failure to notify the ODOT Representative could result in work stoppage!

[3] No work authorized by this permit shall begin until the permittee has contacted and received instructions from

ODOT Representative	Dave Schafer
Phone	330-308-6510
Email Address:	David.Schafer@dot.ohio.gov
(Authorized ODOT Employee)	

NOTE: Any work performed by the permittee may be stopped if this requirement is not met.

[4] Prior to any excavation in the highway right-of-way, the Ohio811, https://www.oups.org/excavators, must be contacted in accordance with ORC Section 3781.25 to 3781.32. Ohio811 can be reached at 1-800-362-2764 or 811.

[5] If your utility is above ground in any way, you must mark your utility with a fluorescent colored marker that corresponds with the universal OUPS color code. The marker must be no shorter than six feet in height and you must maintain the marker. Guide wires must be marked a fluorescent yellow. Failure to mark as described, will result in the Department of Transportation being held harmless and no reimbursement for damage to your property.

[6] All work requiring persons or vehicles within ODOT right of way shall comply with all applicable requirements of the Ohio Manual of Uniform Traffic Control Devices and Item 614 (Maintaining Traffic) of the Construction and Material Specifications, latest editions. Failure to comply with these requirements will be cause for immediate revocation or suspension of the permit until the proper traffic control devices have been provided.

[7] The permittee accepts the conditions, terms, and requirements printed, written on, or attached to this permit and understands that failure to comply fully with those conditions, terms, and requirements or any change in the use of the permit inconsistent with its terms and conditions will be considered a violation and cause for suspension, revocation, or annulment of the permit thereby rendering the permit illegal and subject to appropriate Department action, up to an including removal of the installation at the permittee's expense.

[8] Performance Bond Required? _____ Yes ___X___ No Company_____
Effective Date _____ Expiration Date _____Amount $ _____

[9] This permit shall be void if the work described herein does not comply with the conditions, terms, and requirements applicable to this permit, and if the work is not completed by 08/11/2025

Dated 08/08/2024

Rev 5/6/2021

(the remainder of this page is left blank intentionally)

General Provisions Applicable to All Permits
(Sections 5515.01 and 5515.02 of O.R.C.)

[1] This permit is not a substitute for satisfying the rights or obligations of any other party who may have an interest in the underlying fee interest.

[2] The granting of this permit does not convey to the permittee or to the property served any rights, title, or interest in state highway rights of way or in the design or operation of the state highway; or in any way abridge the right of the Director of the Department of Transportation in his jurisdiction over state highways. If, in the process of any future work or for the benefit of the traveling public, it becomes necessary, in the opinion of the Director of Transportation to order the removal, reconstruction, relocation, or repair of any of the fixtures, or work performed under this permit, said removal, reconstruction, relocation, or repair shall be wholly at the expense of the owners thereof or the permittee and be made as directed by the Director of Transportation and within the time determined by the Director. Such changes in the state highway design or operation, necessary for improved safety and operation or for the benefit of the traveling public, shall not require a permit modification since the permit confers no private rights to the permittee over the control of t he state highway.

[3] The District Deputy Director acts for and on behalf of the Director in issuing and carrying out the provisions of all permits. The District Deputy Director has full authority to ensure that all provisions of the permit are met and to reject any materials, design, and workmanship that do not meet applicable Department standards. The District Deputy Director, at his/her discretion, may require a performance bond or certified check as a prerequisite to the issuance of a permit.

[4] Failure on the part of the permittee to comply fully with the provisions and conditions of the permit will be cause for suspension, revocation, or annulment of the permit thereby rendering the permit illegal and subject to appropriate Departmental action. By accepting the permit, the permittee agrees to comply with all conditions, terms, and restrictions printed or written on or attached to the permit. If the permittee or its agent performs any work contrary to the conditions of the permit or to the instructions of the District Deputy Director and, after due notice, fails to correct the problem, the Department of Transportation may, with or without notice, correct or remove such work and the permittee shall reimburse the Department for the costs and shall hold the Department harmless for all results of such work.

[5] The permittee shall indemnify and hold harmless the State of Ohio, Department of Transportation, its officers, representatives and assigns, from any and all loss, liability, damages, litigation costs, and claims for injury or death to any person, property, or business caused by or resulting from any act, omission, event, consequence, or occurrence, negligent or otherwise of the permittee, its employees, agents, or assigns as a result of the issuance of this permit.

[6] All work authorized under the permit shall be performed to the Department's satisfaction, and the entire expense shall be borne by the permittee. No work shall be performed until the permittee has contacted the Department's appointed representative named on the permit and received instructions. The Department's representative may inspect all work covered by the permit, or the Department reserves the right, during the time any or all of the work is being performed, to appoint an inspector over the work who shall represent the interest of the State on the work and any compensation arranged for shall be paid wholly by the permit holder. Work not in compliance shall be halted and the District Deputy Director shall be notified of the cause. The permittee shall be notified of the Department's determination and given an opportunity to correct the problem. If the problem is not corrected timely or to the satisfaction of the Department, this permit will be revoked.

[7] Failure to complete all work within the time specified on the permit shall void the permit, thereby making the permit illegal and subject to appropriate Departmental action. The permittee may request an extension in writing from the District Office, explaining why the extension is necessary and when the work is expected to be completed.

[8] All work infringing on the pavement or shoulders shall comply with applicable standards and requirements regarding traffic control devices. Failure to comply will be cause for revocation or suspension of the permit. Any closure of lanes or shoulders shall be described in terms of location, duration, time of day, etc. Such work shall not begin until all traffic control devices are in place.

[9] If any grading, sidewalk, or other work allowed by a permit interferes with the drainage of the highway in any way, such catch basins and outlets as necessary shall be constructed to take proper care of said drainage and any materials such as pipes and tiles damaged during any installation or repair by the permittee or its employees or agents shall be repaired immediately at the sole cost of the permittee . Permittee shall timely notify the Department of any such damage and repairs thereto. Failure of the permittee to immediately repair the damage after it is discovered shall result in the Department performing the repair and the permittee shall reimburse the Department for the costs and shall hold the Department harmless for all the results of such work which may include removal of the permittee's facilities.

[10] Any damage to ODOT or another's property caused by the work shall be repaired by the permittee or permittee's agent or contractor in a timely manner and at the sole cost of permittee. If any emergency repairs to ODOT property are needed that cannot be performed by the permittee or permittee's agent or contractor, ODOT shall cause the repairs to be performed at the sole cost of permittee.

[11] Upon completion of the work, the permittee shall leave the highway clean of all rubbish, excess materials, temporary structures and equipment, and all parts of the highway shall be left in a condition acceptable to the Department. Upon satisfactory completion of the work authorized by the permit, the Department's appointed representative shall complete the Permit Inspection Certificate, Form No. MR 678 certifying that the permittee has complied with the terms of the permit.

[12] Except as herein authorized, no excavation shall be made or obstacle placed within the limits of the highway so as to interfere with the travel over the road.

[13] All pole lines are to be built in accordance with Rule 4901:3-1-08 of Ohio Administrative Code promulgated and enforced by the Public Utilities Commission of Ohio.

[14] All underground utilities shall be installed at a depth and horizontal distance from the road surface and any appurtenances in accordance with state and national safety standards and as pre-approved by the Department. After installation, the exact location of the utility shall be provided to the Department. The Department shall be held harmless for any damage to utilities due to insufficient or inaccurate installation or identification and all repairs shall be at the sole cost of the permittee.

[15] The permittee shall comply with the Air Pollution requirements of Rule 3745-17-08 of the Ohio Administrative Code promulgated and enforced by the Ohio Environmental Protection Agency.

[16] The permittee certifies that he or she is fully authorized to sign this permit. This permit shall apply to and be binding upon the permittee and any successors in interest. No change in ownership of the underlying property or of the facility owned by permittee shall in any way alter the permittee's obligations under this permit.

[17] The permittee(s) for herself/himself/themselves/itself, her/his/their/its personal representatives, and her/his/their/its successors in interest and assigns, as a part of the consideration hereof, do/does hereby covenant and agree that:

(1) No person on the grounds of race, color, or national origin, shall be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination in the use of the utility/facilities/ services of the permittee.

(2) In the construction of any improvements on, over, or under the above described property and the furnishing of services thereon, no person on the grounds of race, color, national origin, sex, age, or disability shall be excluded from the participation in, be denied the benefits of, or be otherwise subjected to discrimination.

(3) The above described property shall be used in a manner that at all times is in compliance with all other requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. DOT, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. DOT — Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations may be amended.

(4) In the event that this instrument grants a lease, license, or permit and any of the above non-discrimination covenants is breached, then the State of Ohio, Department of Transportation, shall have the unfettered right to terminate the lease, license or permit and to re-enter and repossess the above-described property and hold the same as if said lease, license or permit had never been made or issued.

This permit is granted subject to the following attached conditions:

Permittee shall widen State Route 149 to accommodate a right and left turn lane and construct a commercial drive for access on behalf of Love's Travel Stops & Country Stores, Inc on the West side of State Route 149 in Belmont County. The drive is approximately 645 feet South of Reco Drive. The work shall include the signals being upgraded at both of the ramps of I70 and SR 149, In addition temporary wood pole signals will be installed at the intersection with Reco Drive. The permittee is to make minor widening improvements to Reco Drive. The drive opening shall be constructed as per ODOT standard roadway drawing BP-4.1. The apron profile & pavement build up shall be constructed as per ODOT L&D Manual, volume 1, section 803.1, section 803.2 and section 805.1 & 805.2 and Figure 401-2E. All work shall comply with State & Federal guidelines & in no way should the work adversely affect the travelling public. "See Additional Requirements."

This permit is valid only within the limits of right-of-way of this state route. Permits for that portion of your facilities located along county or township right-of-way must be obtained from the appropriate authorities. **A copy of your permit is to be on-site at all times while working.**

All work required for this improvement shall be subject to inspection by the State of Ohio or their designated representative.

All work to be performed at no cost to the State or Federal Highway Administration.

The permittee and the State of Ohio Department of Transportation are to enter into an agreement for the completion of this work.

The Permittee agrees that the State of Ohio, Department of Transportation, and Federal Highway Administration shall be saved harmless from any and all claims or damages, public or private, arising from or growing out of the issuance of this permit.

Highway Lighting and/or traffic signals: even though ODOT is listed as a member of the Ohio utilities protection service (OUPS), the contractor is required to contact ODOT directly so that the ODOT utilities located within this project are marked. The contractor shall notify ODOT project engineer/project supervisor, Jacob Petry at 330-204-6780, fourteen (14) calendar days in advance of any work, for the need to mark ODOT owned utilities.

ODOT's District 11 Public Information Officer (PIO) must be notified 72 hours prior to any work for the purpose of issuing a press release through the local media. Please fill out the form on D11 Permit PIO Notification - Formstack https://odot.formstack.com/forms/d11_permit_pio_notification

The Permittee is responsible for maintaining the integrity of the Edge of Pavement at all times during and after work is complete. If there is any damage to this State Route it will be the permittees responsibility to repair.

The updated maintenance of traffic sheets dated 8/8/24 shall govern.

C-01 To assure the proper installation, the Ohio Department of Transportation County Manager or his representative must be notified a minimum of 24 hours prior to any work being started and must be present to approve grades, location and material used. All cost associated with having a construction inspector on a site will be paid by the permittee.

C-02 There will be no parking, loading/unloading of equipment, service vehicles, erection of lights or placing advertising devices within the state highway right-of-way. Similarly, no equipment, service vehicles, devices or structures are permitted to overhang the state highway.

C-03 The Advertising Device Control Section in Columbus, Ohio must be notified and must give their authorization prior to erecting any advertising device. All requests should be mailed to the Ohio Department of Transportation Advertising Device Control, 1980 W. Broad St., P.O. Box 899, Columbus, Ohio, 43223. All on premise devices must be in accordance with Section 5501:2-2-02 part (C) of the Ohio Administrative Code. An on-premise device visible to an interstate system must additionally conform to Section 5501:2-2-03 Part (A) of the Ohio Administrative Code.

C-04 The drainage and/or driveway pipe if required shall be supplied by the Permittee, at the Permittee's cost, in the size and to the specifications indicated by the Ohio Department of Transportation, and installed subject to inspection and approval by the Ohio Department of Transportation.

C-05 The approach will slope down and away from the through pavement edge at a minimum of 1.6% as per Location and Design Manual Vol. 1, Section 400, Figure 401-2E. No surface water will be allowed to drain onto the highway pavement.

C-06 The drive is to be paved at least 50' back from the Edge of Pavement, see Location and Design Manual Vol. 1 Section 805.3.

C-07 Permittee to furnish all labor, material and equipment necessary to complete and maintain the project.

C-08 The contractor must give property owners a minimum of 24-hour notice before cutting any driveways. Also, the permit holder shall give ample notice to all property owners before trenching or cable plowing operations begin.

C-09 The use of traveled lanes stabilized or un-stabilized berms for the storage of construction materials or depositing of excavated material is NOT permitted. All excess and discarded material to be removed from State Right of Way.

C-10 The portion of the earthwork on State right of way shall be seeded and mulched to prevent erosion, as per Item 659 of the Ohio Department of Transportation Construction and Material Specifications Manual.

C-11 Private drainage outlets, such as field tiles, disturbed by this operation shall be restored to working order to the satisfaction of the owner.

C-12 The permittee shall take any and all appropriate measures to limit soil erosion during and after construction authorized herein. As such, he shall be fully accountable to the Ohio EPA, the Soil Conservation Service and other appropriate agencies for any violation or disregard of the applicable governing standards and regulations related to the protection and conservation of soils that are affected by this permitted work - Ref. SS877.

C-13 All public and private property, including highway fence, that is disturbed by the contractor will be repaired to a condition equal to or better than the original condition, including sidewalks and driveways.

C-14 This work will be performed at no cost to the State or the Federal Highway Administration.

C-15 Any mud, snow or debris that accumulates on the highway as a result of this project (i.e., from tire tracks, equipment, etc.) is to be removed immediately at the Permittee's expense.

C-16 The Permittee is responsible for complying with any/all applicable state and/or federal environmental laws including, but not limited to, obtaining any necessary Section 404 & 401 waterway permits prior to performing any work within the state right-of-way.

C-17 Backfill is to be compacted to ODOT specifications.

C-18 All work on State Right of Way to be performed in a manner satisfactory to the Ohio Department of Transportation.

C-19 The Permittee agrees that the State of Ohio, Department of Transportation, and Federal Highway Administration shall be saved harmless from any and all claims or damages, public or private, arising from or growing out of the issuance of this permit.

C-20 Work is not to be performed during inclement weather conditions (i.e., ice, snow, fog, heavy rainstorms, etc.). Additionally, work is not to start until one (1) hour after sunrise and is to cease one (1) hour before sunset.

C-21 It is to be understood that should the location and/or design (construction) of the new access and turn lanes interfere with the safety of the traveling public, or drainage issues develop undermining the highway's foundation or cause neighboring properties to flood, ODOT District 11 reserves the right to require modification and/or realignment of these newly installed facilities.

C-22 All work requiring men or vehicles on the pavement or shoulders shall comply fully with the Ohio Manual of Uniform Traffic Control Devices (see highlighted link below) for Construction and Maintenance Operations and Item 614 (Maintaining Traffic) in the State of Ohio Department of Transportation Construction and Material Specifications Manual. Failure to comply with this requirement will be just cause for immediate suspension of this permit until such time the proper traffic control is in place.

http://www.dot.state.oh.us/Divisions/Engineering/Roadway/DesignStandards/traffic/OhioMUTCD/Pages/OMUTCD2012_current_default.aspx

C-23 Traffic to be maintained as per the Ohio Manual of Uniform Traffic Control Devices. All traffic to be maintained by above requirements and applicable sections of the OMUTCD and Item 614 of the Construction and Material Specifications Manual.

C-24 All areas where the vegetative growth has been disturbed or destroyed by the contractor/utility company shall be fertilized, seeded and mulched as per the 2019 ODOT Construction and Material Specifications Item 659 Seeding and Mulching. The contractor shall maintain the Temporary Sediment and Erosion Control as per the ODOT Construction and Material Specifications. All berm, shoulder or roadside slopes disturbed or destroyed shall be restored to the original or better conditions.

C-25 All excess and discarded material to be removed from the State Right of Way.

C-26 The Permittee is held responsible for all public and private utility coordination and relocation required in the performance of the work

C-27 NOTICE: Failure to notify the Ohio Department of Transportation County Manager or his representative a minimum of 24 hours prior to any work being started and again upon completion of the project will void this permit.

Failure to comply with these terms will result in the revocation of the permit and subsequent removal of the driveway.

IF, WITHIN SEVEN (7) DAYS OF COMPLETION OF WORK AND INSPECTION OF THE PROJECT BY AN O.D.O.T. REPRESENTATIVE, THE PERMIT REQUIREMENTS HAVE NOT BEEN FULFILLED BY THE PERMITTEE, O.D.O.T. MAY REMOVE OR REPAIR THE WORK AT THE PROPERTY OWNER'S EXPENSE AND NO FUTURE PERMITS FOR THIS TYPE OF WORK WILL BE ISSUED TO YOU.

THE FUTURE MAINTENANCE OF ANY WORK PERMITTED HEREIN SHALL BE THE RESPONSIBILITY AND AT THE EXPENSE OF THE PERMITTEE.

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M&R 720
rev. 02-17

Bond No. LM9454153

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

BOND

Know all persons by these presents, that we, Love's Travel Stops & Country Stores, Inc. of 10601 N. Pennsylvania Ave., Oklahoma City, OK 73120 as Principal, and Fidelity and Deposit Company of Maryland as Surety, are held and firmly bound unto the Ohio Department of Transportation in the sum of One Million Five Hundred Ninety Five Thousand and No/100 Dollars ($ 1,595,000.00) lawful money of the United States, for which payment will and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the above bound Principal has been granted or is about to be granted a permit for the below listed work within the Ohio Department of Transportation Right of Way, to wit:
St. Clairsville, Ohio Roadway and Signal Plan Work.

Now, therefore, the Conditions of this Obligation are such that in addition to complying with all applicable laws, rules, regulations, policies and ordinances related to the issuance and coverage of the permit, the above Principal shall indemnify and hold harmless the Ohio Department of Transportation against all loss, costs, expense or damage caused by Principal resulting from the issuance of the above described permit.

The term of this bond is for a period beginning on the 17th day of June, 20 24 and ending* on the 21st day of January, 20 25.

Signed, sealed and dated this 21st day of June 20 24

Notary Seal

Principal, Love's Travel Stops & Country Stores, Inc.

By _____

Surety, Fidelity and Deposit Company of Maryland

By _____
Tonie Petranek, Attorney-in-Fact

***Notice to the Permittee and Bonding Agencies:** The initial time frame of this bond is a projection to when all the work within the State's right-of-way is to be completed, final inspection completed and work approved. Should the permittee fail to complete all work within the projected time frame, the permittee shall be responsible to insure this bond remains active. This bond shall be released only by formal written notice by the Ohio Department of Transportation.

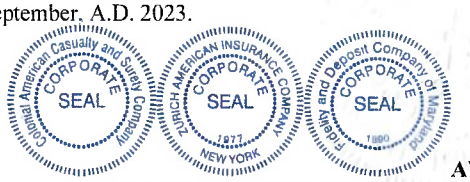
DOT-2083

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Illinois, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Illinois (herein collectively called the "Companies"), by Robert D. Murray, Vice President, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint Ricardo J. REYNA, Tina MCEWAN, Don E. CORNELL, Joshua SAUNDERS, Robbi MORALES, Sophinie HUNTER, Kelly A. WESTBROOK, Tonie PETRANEK, Mikaela PEPPERS of Dallas, Texas, its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings,** and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 14th day of September, A.D. 2023.



ATTEST:
ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND

By: Robert D. Murray
Vice President

By: Dawn E. Brown
Secretary

State of Maryland
County of Baltimore

On this 14th day of September, A.D. 2023, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **Robert D. Murray, Vice President and Dawn E. Brown, Secretary** of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Genevieve M. Maison

GENEVIEVE M. MAISON
NOTARY PUBLIC
BALTIMORE COUNTY, MD
My Commission Expires JANUARY 27, 2025

Authenticity of this bond can be confirmed at bondvalidator.zurichna.com or 410-559-8790

EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify of revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this 21st day of June, 2024.

Colonial American Casualty and Surety Company CORPORATE SEAL

ZURICH AMERICAN INSURANCE COMPANY CORPORATE SEAL 1977 NEW YORK

Fidelity and Deposit Company of Maryland CORPORATE SEAL 1890

Thomas O. McClellan
Vice President

TO REPORT A CLAIM WITH REGARD TO A SURETY BOND, PLEASE SUBMIT A COMPLETE DESCRIPTION OF THE CLAIM INCLUDING THE PRINCIPAL ON THE BOND, THE BOND NUMBER, AND YOUR CONTACT INFORMATION TO:

Zurich Surety Claims
1299 Zurich Way
Schaumburg, IL 60196-1056
reportsfclaims@zurichna.com
800-626-4577

Authenticity of this bond can be confirmed at bondvalidator.zurichna.com or 410-559-8790

Parcel Number
39-00338.000

Legal Description
R5 T8 S14 HWY EASE .09 67.9601 AC NEW SURVEY

Location
66320 BELMONT MORRISTOWN

Owner
LOVE'S TRAVEL STOPS & COUNTRY STORES INC.

Acres
67.9601

Property

Tax District
39-UNION TWP - UNION LSD

School District
UNION LSD

Neighborhood
20000-UNION LOCAL & HARRISON LOCAL SCHOOL DIST

Subdivision

Map Number
14.00

Routing Number
39-01400-007000

CD Year

Owner

Contact
LOVE'S TRAVEL STOPS & COUNTRY STORES INC.
PO BOX 26210
OKLAHOMA CITY OK 73126-0210

Owner Name
LOVE'S TRAVEL STOPS & COUNTRY STORES INC.

Deed

Legal Description
R5 T8 S14 HWY EASE .09 67.9601 AC NEW SURVEY

Acres
67.9601

Date Sold
05/23/2023

Sales Amount
3,450,000.00

Volume / Page
912 / 944

Taxpayer

Contact
LOVE'S TRAVEL STOPS & COUNTRY STORES INC.
PO BOX 26210
OKLAHOMA CITY OK 73126-0210

Values

Land Use
499-OTHER COMMERCIAL STRUCTURES

	Appraised
Land	298,610
Improvement	481,760
Total	780,370
CAUV (N)	0
Homestead (N)	0
Owner Occupancy (N)	0
Taxable	780,370

Current Charges

Full Rate
52.950000

Effective Rate
39.451213

Qualifying Rate
36.390872

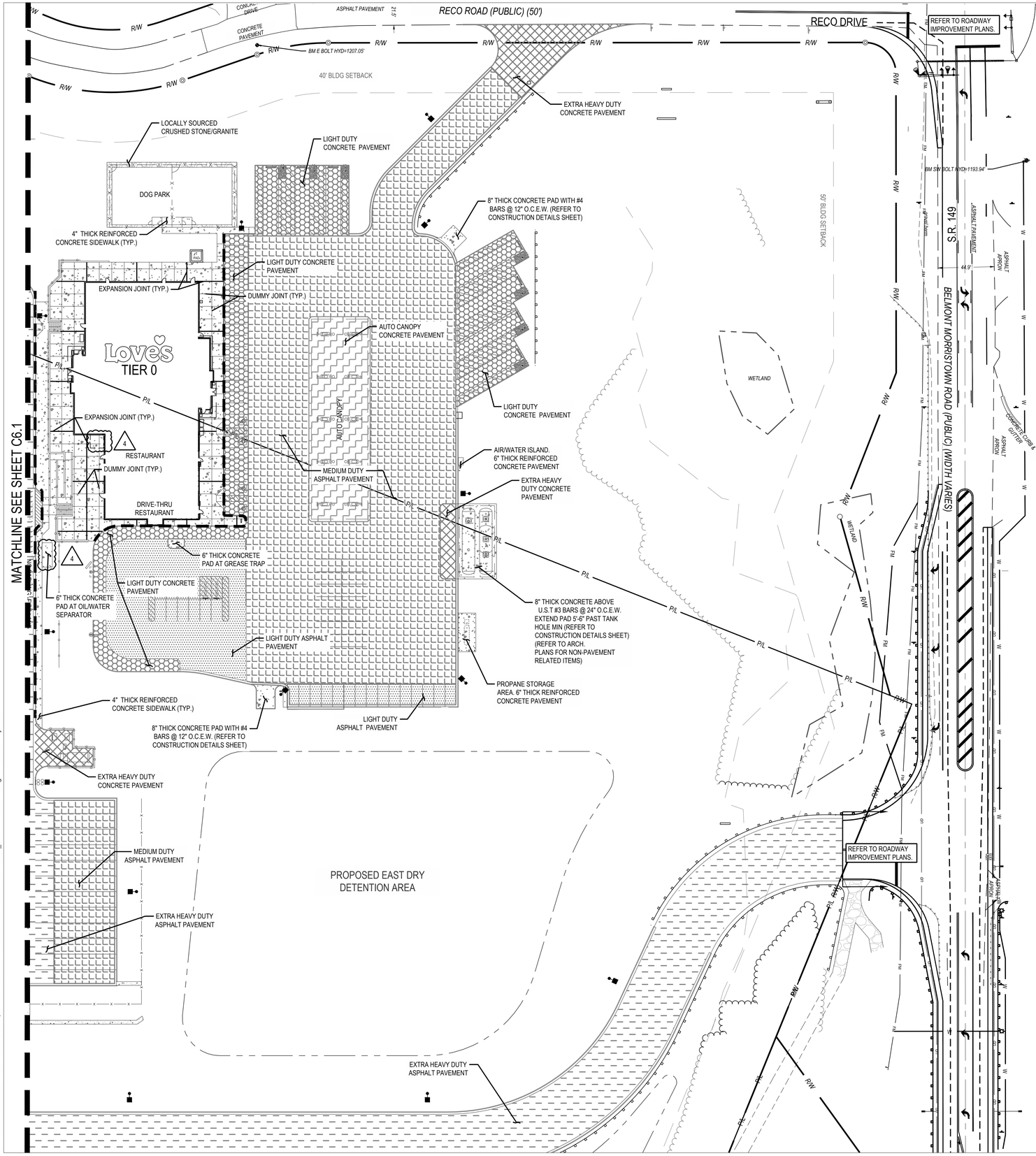
	Prior	First	Second
Tax	0.00	5,387.70	5,387.70
Special	0.00	2.06	0.00
Total	0.00	5,389.76	5,387.70
Paid	0.00	5,389.76	5,387.70
Due	0.00	0.00	0.00

Adding on? Try our tax estimator.

Future Charges

Type	Description	A
Special Assessments	C9700 JEFFERSON BELMONT SOLID WASTE	2

Loves - St. Clairsville, OH - Access Vicinity Map



LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

ASPHALT		CONCRETE	
	PROPOSED EXTRA HEAVY DUTY ASPHALT PAVEMENT		PROPOSED EXTRA HEAVY DUTY CONCRETE PAVEMENT
	PROPOSED HEAVY DUTY ASPHALT PAVEMENT		PROPOSED HEAVY DUTY CONCRETE PAVEMENT
	PROPOSED MEDIUM DUTY ASPHALT PAVEMENT		PROPOSED MEDIUM DUTY CONCRETE PAVEMENT
	PROPOSED LIGHT DUTY ASPHALT PAVEMENT		PROPOSED LIGHT DUTY CONCRETE PAVEMENT
	GRAVEL		PROPOSED SIDEWALK/ CONCRETE PAVEMENT
			PROPOSED AUTO CANOPY CONCRETE PAVEMENT
			PROPOSED TRUCK CANOPY CONCRETE PAVEMENT
			COLORED CONCRETE CURB

NOTE: REFER TO CONSTRUCTION DETAILS

PAVING NOTES

1. PAVEMENT SECTION DESIGNS ARE TAKEN FROM THE GEOTECHNICAL INVESTIGATION REPORT PREPARED BY TERRACON DATED JULY 21, 2023. REFERENCE THIS REPORT FOR COMPLETE DESIGN SPECIFICATIONS.
2. WITHIN 24 HOURS PRIOR TO ANY PAVING OPERATION, THE CONTRACTOR SHALL PERFORM SUBGRADE COMPACTION AND PROOF ROLL TESTS ON PREPARED SUBGRADE TO VERIFY SUBGRADE HAS NOT DETERIORATED DURING PROJECT CONSTRUCTION.
3. ALL CONCRETE SHALL HAVE LIGHT BROOM FINISH EXCEPT TRUCK FUELING BAYS WHICH SHALL HAVE HEAVY BROOM FINISH.
4. THE FOLLOWING AREAS ARE TO BE SEALED 30 DAYS AFTER CONCRETE IS POURED. REFERENCE ARCHITECTURAL SPECIFICATIONS:
   - ALL SIDEWALKS
   - AUTO CANOPY PAD
   - TRUCK CANOPY PAD
   - FUEL DISPENSER ISLANDS AND BUMPERS
   - BUILDING PARKING SPACES AT FRONT OF BUILDING
   - EXTERIOR CONCRETE AT TIRE SHOP
   - TIRE SHOP PAD
   - DUMPSTER PAD AREA
   - OIL-WATER SEPARATOR PAD
   - U.S.T. SLAB
   - DRIVE THRU LANE
5. ALL ASPHALT THAT ABUTS CONCRETE IS TO BE FINISHED AT 1/2 INCH ABOVE FINISHED CONCRETE ELEVATION.
6. ALL PAVING SHALL CONFORM TO ODOT STANDARDS AND SPECIFICATIONS.
7. AFTER COMPLETING THE PAVING OPERATION THE CONTRACTOR IS RESPONSIBLE FOR HAVING THE PAVEMENT CORED UNDER THE SUPERVISION OF A MATERIALS INSPECTOR AND SUBMITTING CORE RESULTS TO ENGINEER AND OWNER. FOR ASPHALT PAVEMENT, CONTRACTOR SHALL CORE BASE AND INTERMEDIATE COURSES ONLY. SURFACE COURSE SHOULD NOT BE CORED.
8. REFERENCE GRADING AND DRAINAGE SHEETS FOR PAVEMENT ELEVATION DETAILS.
9. CONCRETE-TO-ASPHALT STANDARD PAVEMENT HEADER TO BE USED FOR ALL CONCRETE-TO-ASPHALT INTERFACES.
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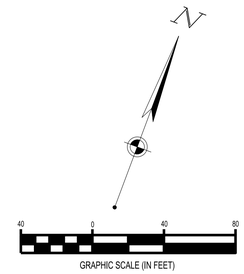
12. REFER TO ARCHITECTURAL PLANS FOR CANOPY JOINTING PLAN FOR BOTH AUTO AND DIESEL CANOPIES.



OHIO811.org Before You Dig

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Love's

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

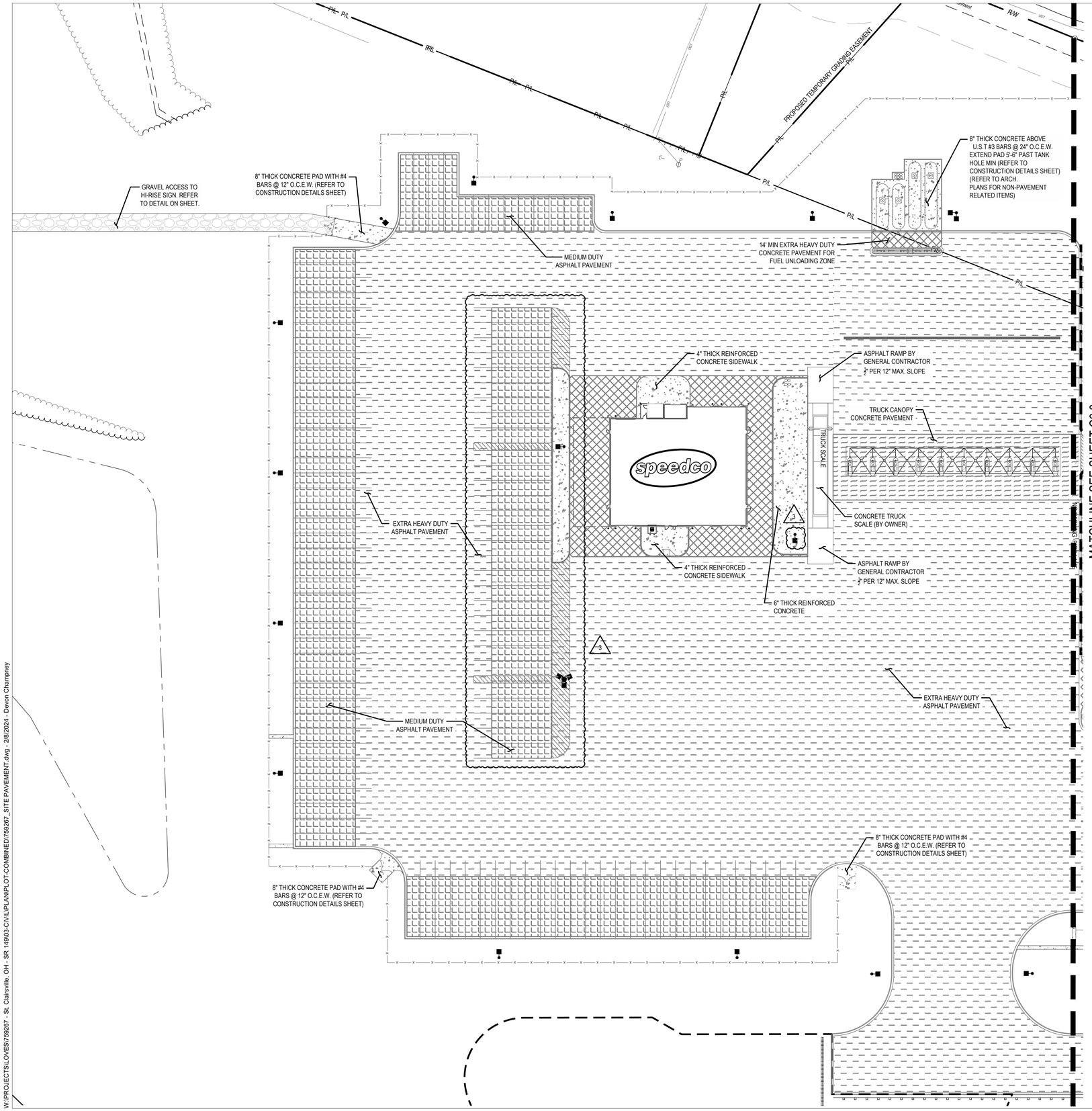
ID	Description	Date
3	ADDENDUM 3	02/09/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

PAVEMENT PLAN - EAST

C6.0



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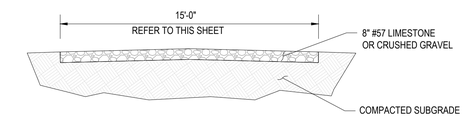
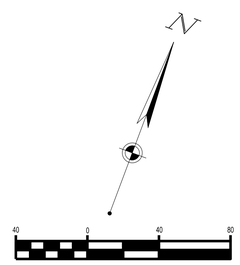


GRAVEL ACCESS DRIVE DETAIL
NOT TO SCALE



GRAPHIC SCALE (IN FEET)

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Revisions / Submissions

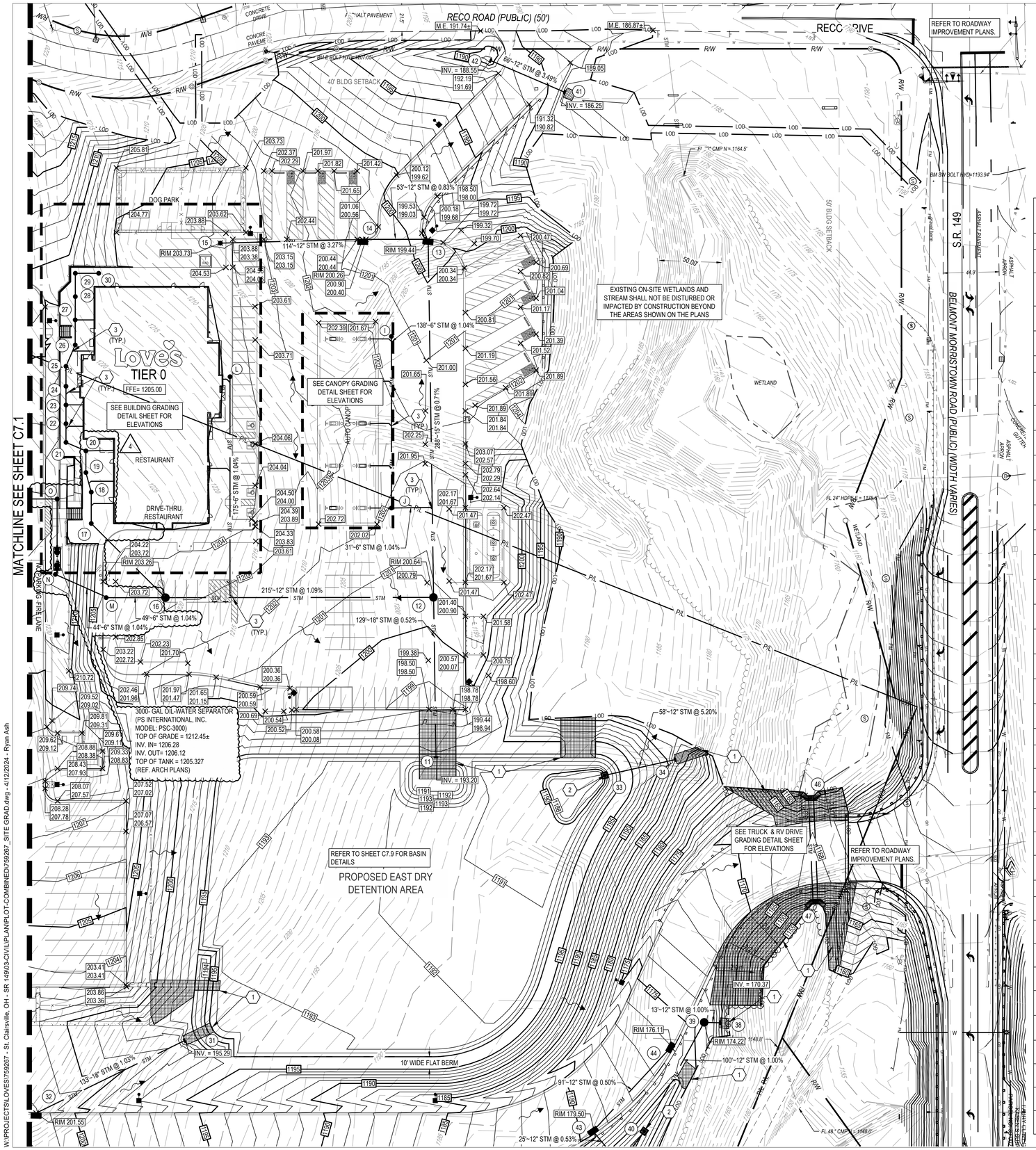
ID	Description	Date
3	ADDENDUM 3	02/09/2024

Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

PAVEMENT PLAN - WEST

C6.1



LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- 080 — MAJOR CONTOUR
- 079 — MINOR CONTOUR
- RIDGE LINE
- STM — STORM SEWER
- UD — STORM SEWER UNDERDRAIN
- STORM CURB INLET PER CONSTRUCTION DETAILS
- STORM HALF HEIGHT HEADWALL PER ODOT HW-2.1 DETAIL
- STORM CLEANOUT
- YARD DRAIN
- SANITARY STANDARD MANHOLE PER CONSTRUCTION DETAILS
- SANITARY CLEANOUT
- XXX.XX — SPOT ELEVATION
- XXX.XX / XXX.XX — TOP OF CURB / BOTTOM OF CURB
- RIM — TOP OF CASTING ELEVATION
- RIP RAP
- FLOW ARROW

STORM SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	RIM	INVERT
11	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1		1193.20 (18") N
12	48" STORM MANHOLE	1200.64	1194.12 (15") N 1194.37 (12") W 1193.87 (18") S
13	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1199.44	1196.44 (12") W 1196.15 (15") S
14	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1200.26	1196.88 (12") W 1196.88 (12") E
15	NYLOPAST 15" INLINE DRAIN	1203.72	1200.62 (12") E
16	48" STORM MANHOLE	1203.26	1196.72 (12") NW 1205.11 (6") W 1196.72 (12") E
17	NYLOPAST 15" INLINE DRAIN	1204.62	1200.40 (12") N 1200.40 (12") SE
18	NYLOPAST 15" INLINE DRAIN	1204.73	1200.52 (12") NW 1200.52 (12") S
19	NYLOPAST 15" INLINE DRAIN	1204.81	1200.60 (12") N 1200.60 (12") SE
20	NYLOPAST 15" INLINE DRAIN	1204.81	1200.69 (12") W 1200.69 (12") S
21	NYLOPAST 15" INLINE DRAIN	1204.78	1200.78 (12") N 1200.78 (12") E
22	NYLOPAST 15" INLINE DRAIN	1204.78	1200.85 (12") N 1200.85 (12") S
23	NYLOPAST 15" INLINE DRAIN	1204.78	1200.93 (12") N 1200.93 (12") S
24	NYLOPAST 15" INLINE DRAIN	1204.84	1201.17 (8") N 1201.00 (12") S
25	NYLOPLAST 10" INLINE DRAIN	1204.81	1201.34 (8") N 1201.34 (8") S
26	NYLOPLAST 10" INLINE DRAIN	1204.77	1201.53 (8") N 1201.53 (8") S
27	NYLOPLAST 10" INLINE DRAIN	1204.77	1201.74 (8") N 1201.74 (8") S
28	NYLOPLAST 10" INLINE DRAIN	1204.77	1202.02 (6") N 1201.94 (8") S
29	NYLOPLAST 10" INLINE DRAIN	1204.79	1202.22 (6") E 1202.22 (6") S
30	NYLOPLAST 10" INLINE DRAIN	1205.76	1202.41 (6") W
31	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1	1197.33	1195.29 (18") SW
32	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1201.55	1196.66 (18") NE
33	OUTLET CONTROL STRUCTURE	1192.50	1190.00 (12") NE
34	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1	1188.55	1187.00 (12") SW
38	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1	1171.92	1170.37 (12") W
39	48" STORM MANHOLE	1174.21	1170.50 (12") S 1170.50 (12") E
40	OUTLET CONTROL STRUCTURE	1174.00	1171.50 (12") N
41	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1	1187.80	1186.25 (12") W
42	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1	1190.10	1188.55 (12") E
42	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1	1174.00	1172.45 (12") NW
43	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1	1174.00	1172.45 (12") NW
43	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1179.54	1172.58 (12") N 1172.58 (12") SE
44	48" INLET MANHOLE	1179.54	1172.58 (12") N 1172.58 (12") SE
44	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1176.04	1173.04 (12") S
45	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1176.04	1173.04 (12") S
46	ODOT FULL-HEIGHT HEADWALL PER STD. DWG. HW-1.1	1158.92	1154.00 (48") SE
47	ODOT FULL-HEIGHT HEADWALL PER STD. DWG. HW-1.1	1157.52	1152.60 (48") NW

STORM SEWER CLEANOUT SCHEDULE

NO.	STRUCTURE	RIM	INVERT
I	6" CLEANOUT	1201.50	1198.50 (6") S
J	6" CLEANOUT	1201.88	1197.07 (6") N 1197.07 (6") E
L	6" CLEANOUT	1204.80	1197.95 (6") S
M	6"CLEANOUT	1207.51	1205.62 (6") W 1205.62 (6") E
N	6" CLEANOUT	1212.21	1206.08 (6") N 1206.08 (6") E
O	6" CLEANOUT	1212.68	1206.69 (6") W 1206.69 (6") S

4

REFER TO CONSTRUCTION DETAILS SHEET

REFER TO UTILITY PLAN FOR ADDITIONAL UTILITY WORK

REFER TO SHEETS C7.13 TO C7.15 FOR STORM SEWER PROFILES

CODED NOTES

1. CONTRACTOR TO INSTALL EROSION CONTROL FLEXAMAT STANDARD OR APPROVED EQUAL.
2. OUTLET STRUCTURE. REFER TO SHEETS C7.9 TO C7.12.
3. WYE CONNECTION
4. (2) 1-1/2" CONDUITS FOR 4" SUMP. COORDINATE WITH CAT SCALE REPRESENTATIVE AND GENERAL CONTRACTOR.

A DETAILED GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS SITE AND SHOULD BE ADHERED TO THE FULL EXTENT OF THOSE RECOMMENDATIONS AND FIELD TESTING. REFER TO GEOTECHNICAL ENGINEERING REPORT PREPARED BY TERRACON PROJECT NO.4225529

GRAPHIC SCALE (IN FEET)
40 0 40 80

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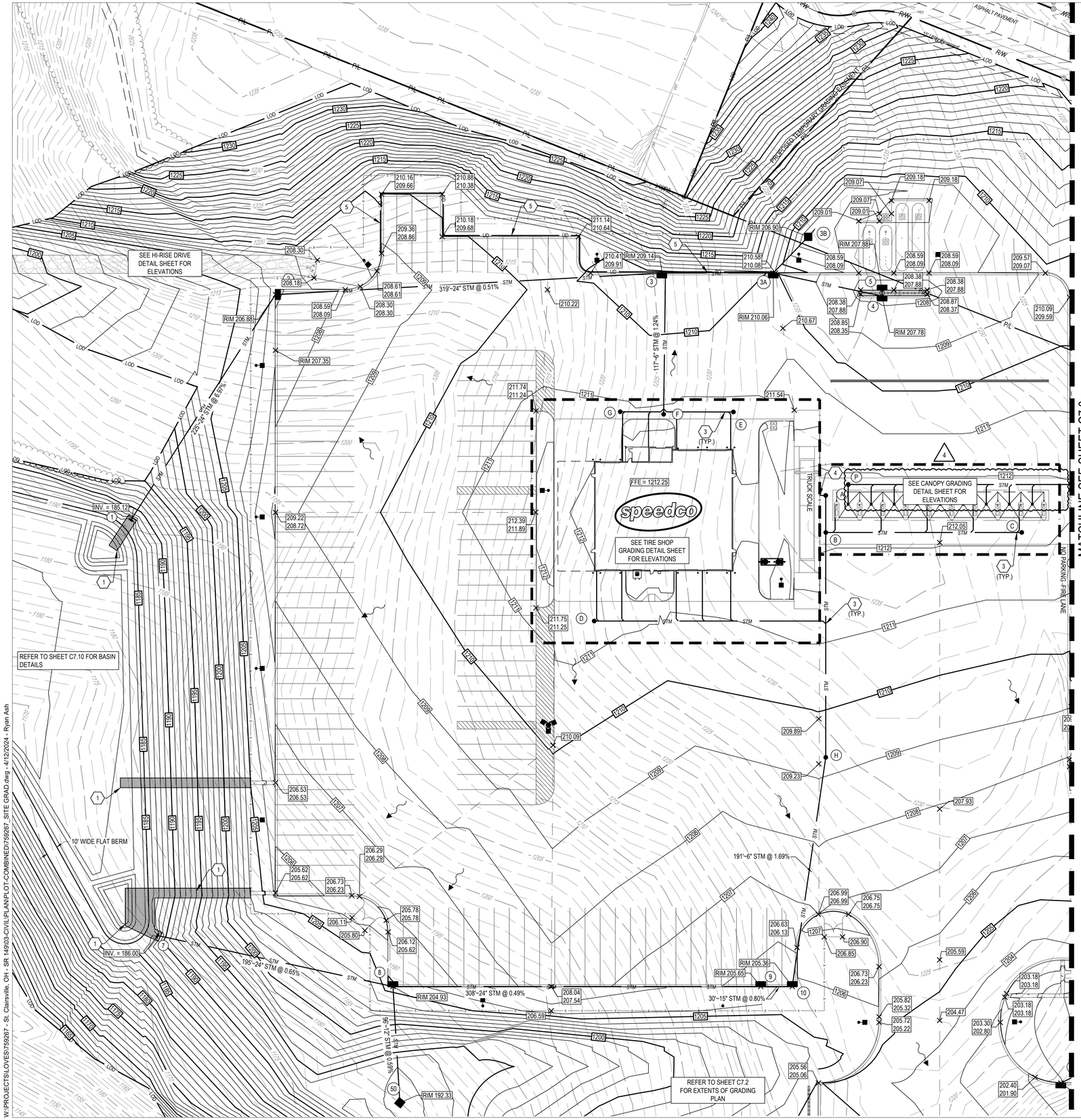
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
GRADING & DRAINAGE PLAN - EAST

C7.0



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- RIM — TOP OF CASTING ELEVATION
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GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL ODOT REGULATIONS AND CODES, AND O.S.H.A. STANDARDS. THE CONTRACTOR SHALL OBTAIN FINAL PERMITTING AND APPROVAL/INSPECTIONS AS REQUIRED FROM THE LOCALITY.
2. THE CONTRACTOR SHALL VERIFY ELEVATIONS AT CONNECTION POINTS OR ANY EXISTING UTILITY CROSSING PRIOR TO ORDERING STRUCTURES. REPORT ANY CONFLICTS TO THE ENGINEER.
3. LINES UNDERGROUND SHALL BE INSTALLED, INSPECTED, AND APPROVED PRIOR TO BACKFILLING.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE REPAIRS TO UTILITIES DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
5. STORM SEWER CATCH BASINS, CURB INLETS, MANHOLES, AND ENDWALLS SHALL CONFORM TO ODOT STANDARD CONSTRUCTION DRAWINGS.
6. ALL SPOT ELEVATIONS REFER TO FINISHED PAVEMENT ELEVATION UNLESS OTHERWISE NOTED.
7. PROVIDE 2% MAXIMUM CROSS SLOPE ON SIDEWALKS AND ADA PARKING AREA.
8. ALL CURB AND WALL UNDERDRAINS SHALL OUTLET TO STORM SEWER SYSTEM. PROVIDE POSITIVE DRAINAGE TO CONNECTION POINT.
9. CONTRACTOR SHALL APPLY EROSION CONTROL BLANKET AND LOW MAINTENANCE GRASS SEED MIX TO ALL SLOPES 3H:1V OR STEEPER. REFER TO SWPPP DETAILS FOR LOW MAINTENANCE GRASS SEED MIXTURE SPECIFICATIONS.

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5. PROPOSED UNDERDRAIN.

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10. ADD 1000.00 TO ALL SPOT ELEVATIONS SHOWN ON PLAN TO OBTAIN U.S.G.S. ELEVATIONS.
11. REFER TO GEOTECHNICAL REPORT FOR SUBGRADE PREPARATION.
12. PROVIDE STORM SEWER MINIMUM 2'-0" COVER UNLESS OTHERWISE NOTED.
13. PROVIDE FINGER DRAINS AND CONCRETE COLLARS ON ALL PROPOSED STORM SEWER STRUCTURES IN PAVEMENT PER CONSTRUCTION DETAILS SHEET.
14. CONTRACTOR SHALL NOT ALLOW WATER TO POND AT SUBGRADE OR BASE MATERIAL ADJACENT TO CURB INLETS AND CATCH BASINS PRIOR TO PAVEMENT PLACEMENT. TEMPORARY PROVISIONS SUCH AS DEWATERING AND INSTALLATION OF SUBDRAINS SHALL BE TAKEN TO KEEP THE SUBGRADE DRY DURING CONSTRUCTION.
15. ENSURE POSITIVE DRAINAGE AWAY FROM BUILDING(S) AT ALL TIMES. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL DETAILS.

STORM SEWER CLEANOUT SCHEDULE

NO.	STRUCTURE	RIM	INVERT
A	6" CLEANOUT	1212.24	1207.78 (6") S
B	6" CLEANOUT	1212.16	1207.46 (6") N 1207.46 (6") E 1207.46 (6") S
C	6" CLEANOUT	1212.15	1209.15 (6") W
D	6" CLEANOUT	1211.43	1208.64 (6") E
E	6" CLEANOUT	1211.27	1208.19 (6") W
F	6" CLEANOUT	1211.15	1207.59 (6") W 1207.59 (6") E 1207.59 (6") N
G	6" CLEANOUT	1211.11	1207.96 (6") E
H	6" CLEANOUT	1209.29	1205.53 (6") N 1205.53 (6") S
P	6" CLEANOUT	1212.16	1208.69 (6") E

STORM SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	RIM	INVERT
1	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1		1185.12 (24") N
2	48" INLET MANHOLE	1206.84	1200.79 (24") NE 1200.79 (24") S
3	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1209.14	1202.41 (24") E 1206.14 (6") S 1202.41 (24") SW
3A	48" INLET MANHOLE	1210.06	1202.87 (24") E 1204.35 (12") NE 1202.87 (24") W
3B	2X2 CATCH BASIN	1206.90	1204.56 (12") SW
4	48" INLET MANHOLE	1207.78	1203.83 (18") N 1203.33 (24") W
5	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1207.88	1203.85 (18") S
7	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1		1186.00 (24") E
8	48" INLET MANHOLE	1204.85	1199.06 (24") E 1188.27 (12") SE 1187.27 (24") W
9	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1205.65	1201.32 (15") E 1200.57 (24") W
10	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1205.31	1202.31 (6") N 1201.56 (15") W
48	OUTLET CONTROL STRUCTURE		1180.00 (12") SW
49	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1		1179.50 (12") NE
50	2X2 CATCH BASIN	1192.33	1188.83 (12") NW

GRAPHIC SCALE (IN FEET)

40 0 40 80

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

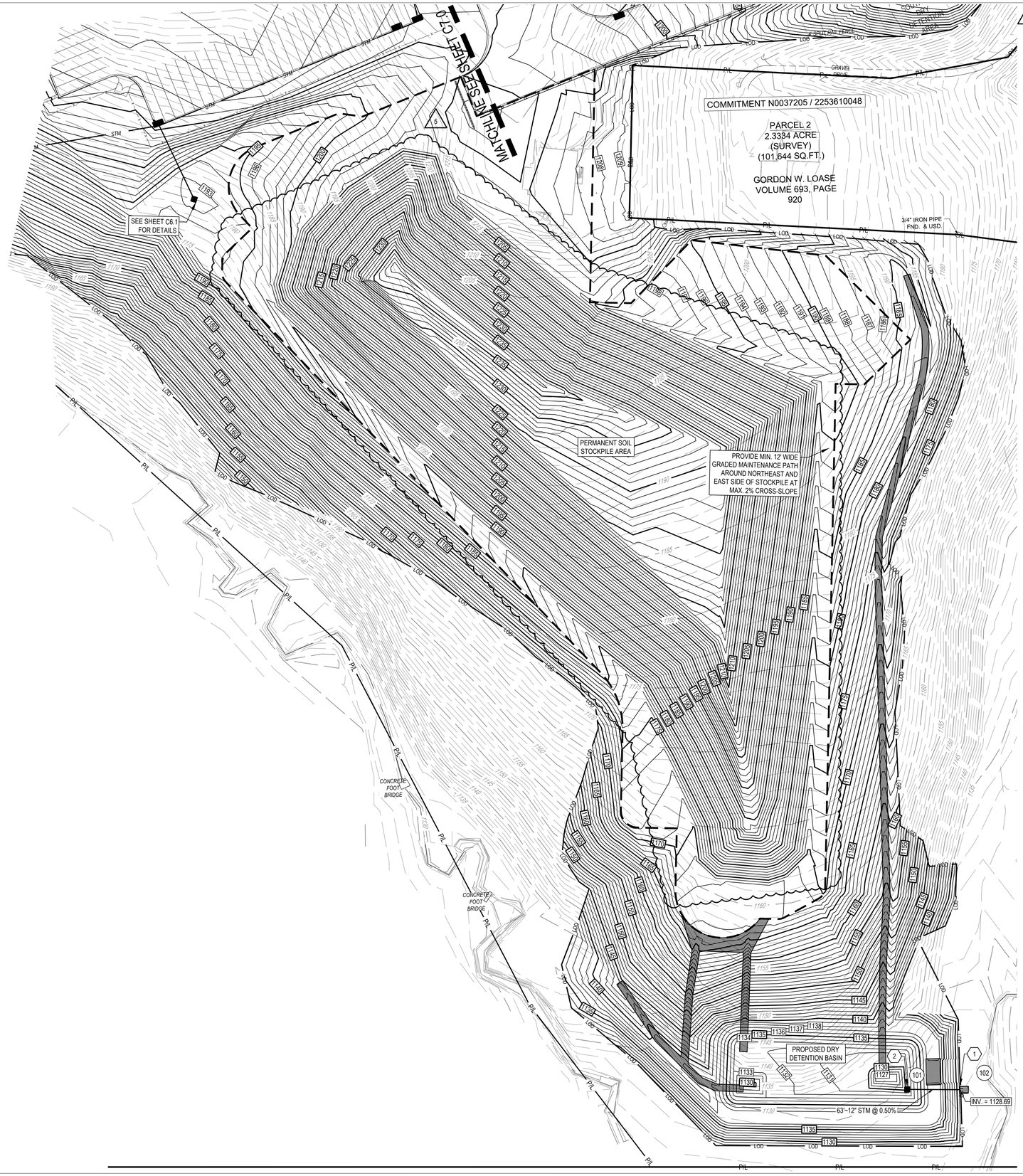
ID	Description	Date
1	REV 1	01/03/2024
3	ADDENDUM 3	02/09/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1"=40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

GRADING & DRAINAGE PLAN - WEST

C7.1



5

PERMANENT STOCKPILE NOTES:

CONTRACTOR SHALL PLACE FILL IN SHOWN STOCKPILE AREA AS NEEDED FOR EXCAVATION IN TRUCK STOP AND TRAVEL CENTER AREA. FILL SHALL BE PLACED IN LIFTS AND COMPACTED PER GUIDANCE FROM GEOTECHNICAL ENGINEER. SLOPE OF STOCKPILE SHALL NOT EXCEED 3:1. CONTRACTOR SHALL PLACE A DOUBLE ROW OF SILT FENCE AROUND ENTIRE STOCKPILE AND FULLY STABILIZE STOCKPILE WITH PERMANENT SEEDING UPON FINAL GRADING. CONTRACTOR SHALL GRADE PERIMETER SWALES TO PROPOSED DETENTION FACILITY, AS SHOWN.

LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- 1200 — MAJOR CONTOUR
- 1199 — MINOR CONTOUR
- RIDGE LINE
- STM — STORM SEWER
- STORM CATCH BASIN [TYPE]
- STORM ENDWALL
- STORM CLEANOUT
- XXXX.XX — SPOT ELEVATION
- XX.XX — TRUNCATED SPOT ELEVATION
- FLEXMAT OR APPROVED EQUAL

CODED NOTES

1. RIP RAP. SEE SWPPP FOR DIMENSIONS
2. OUTLET STRUCTURE PER DETAIL ON SHEET C7.12

REFER TO CONSTRUCTION DETAILS SHEET

REFER TO DETAIL GRADING SHEETS C7.0 TO C7.2

REFER TO UTILITY PLAN FOR ADDITIONAL UTILITY WORK

REFER TO SHEETS C7.13 TO C7.15 FOR STORM SEWER PROFILE

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL ODOT REGULATIONS AND CODES, AND O.S.H.A. STANDARDS. THE CONTRACTOR SHALL OBTAIN FINAL PERMITTING AND APPROVAL/INSPECTIONS AS REQUIRED FROM THE LOCALITY.
2. THE CONTRACTOR SHALL VERIFY ELEVATIONS AT CONNECTION POINTS OR ANY EXISTING UTILITY CROSSING PRIOR TO ORDERING STRUCTURES. REPORT ANY CONFLICTS TO THE ENGINEER.
3. LINES UNDERGROUND SHALL BE INSTALLED, INSPECTED, AND APPROVED PRIOR TO BACKFILLING.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE REPAIRS TO UTILITIES DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
5. STORM SEWER CATCH BASINS, CURB INLETS, MANHOLES, AND ENDWALLS SHALL CONFORM TO ODOT STANDARD CONSTRUCTION DRAWINGS.
6. ALL SPOT ELEVATIONS REFER TO FINISHED PAVEMENT ELEVATION UNLESS OTHERWISE NOTED.
7. PROVIDE 2% MAXIMUM CROSS SLOPE ON SIDEWALKS AND ADA PARKING AREA.
8. ALL CURB AND WALL UNDERDRAINS SHALL OUTLET TO STORM SEWER SYSTEM. PROVIDE POSITIVE DRAINAGE TO CONNECTION POINT.
9. CONTRACTOR SHALL APPLY EROSION CONTROL BLANKET AND LOW MAINTENANCE GRASS SEED MIX TO ALL SLOPES 3H:1V OR STEEPER. REFER TO SWPPP DETAILS FOR LOW MAINTENANCE GRASS SEED MIXTURE SPECIFICATIONS.
10. ADD 1100.00 TO ALL SPOT ELEVATIONS SHOWN ON PLAN TO OBTAIN U.S.G.S. ELEVATIONS.
11. REFER TO GEOTECHNICAL REPORT FOR SUBGRADE PREPARATION.
12. PROVIDE STORM SEWER MINIMUM 1'-5" COVER UNLESS OTHERWISE NOTED.
13. PROVIDE FINGER DRAINS AND CONCRETE COLLARS ON ALL PROPOSED STORM SEWER STRUCTURES IN PAVEMENT PER CONSTRUCTION DETAILS SHEET.
14. CONTRACTOR SHALL NOT ALLOW WATER TO POND AT SUBGRADE OR BASE MATERIAL ADJACENT TO CURB INLETS AND CATCH BASINS PRIOR TO PAVEMENT PLACEMENT. TEMPORARY PROVISIONS SUCH AS DEWATERING AND INSTALLATION OF SUBDRAINS SHALL BE TAKEN TO KEEP THE SUBGRADE DRY DURING CONSTRUCTION.
15. ENSURE POSITIVE DRAINAGE AWAY FROM BUILDING(S) AT ALL TIMES. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL DETAILS.

N

60 0 60 120

GRAPHIC SCALE (IN FEET)

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66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

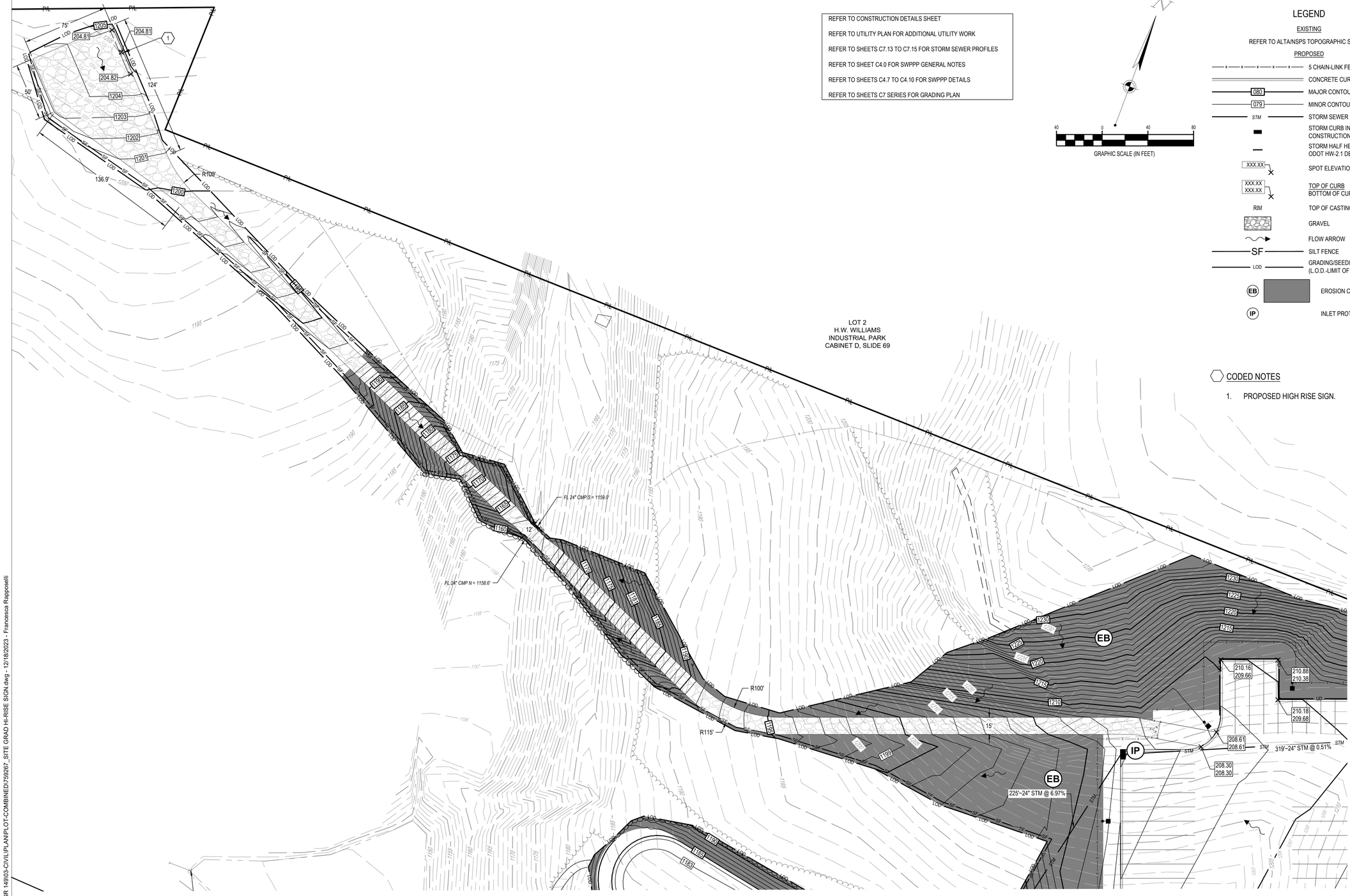
Revisions / Submissions

ID	Description	Date
5	ADDENDUM 5	04/18/2024

Project Number:	759267
Scale:	1"=60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
GRADING & DRAINAGE PLAN - PREPARED PAD

C7.2



LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- 5 CHAIN-LINK FENCE
- CONCRETE CURB AND GUTTER
- MAJOR CONTOUR
- MINOR CONTOUR
- STORM SEWER
- STORM CURB INLET PER CONSTRUCTION DETAILS
- STORM HALF HEIGHT HEADWALL PER ODOT HW-2.1 DETAIL
- SPOT ELEVATION
- TOP OF CURB / BOTTOM OF CURB
- RIM — TOP OF CASTING ELEVATION
- GRAVEL
- FLOW ARROW
- SF — SILT FENCE
- LOD — GRADING/SEEDING LIMITS (L.O.D.-LIMIT OF DISTURBANCE)
- EB — EROSION CONTROL BLANKET
- IP — INLET PROTECTION

CODED NOTES

1. PROPOSED HIGH RISE SIGN.

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER

12/18/2023

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

ID	Description	Date

Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

HIGH RISE DRIVE SITE & SWPPP PLAN

C7.3

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL ODOT REGULATIONS AND CODES, AND O.S.H.A. STANDARDS. THE CONTRACTOR SHALL OBTAIN FINAL PERMITTING AND APPROVAL/INSPECTIONS AS REQUIRED FROM THE LOCALITY.
2. THE CONTRACTOR SHALL VERIFY ELEVATIONS AT CONNECTION POINTS OR ANY EXISTING UTILITY CROSSING PRIOR TO ORDERING STRUCTURES. REPORT ANY CONFLICTS TO THE ENGINEER.
3. LINES UNDERGROUND SHALL BE INSTALLED, INSPECTED, AND APPROVED PRIOR TO BACKFILLING.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE REPAIRS TO UTILITIES DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
5. STORM SEWER CATCH BASINS, CURB INLETS, MANHOLES, AND ENDWALLS SHALL CONFORM TO ODOT STANDARD CONSTRUCTION DRAWINGS.
6. ALL SPOT ELEVATIONS REFER TO FINISHED PAVEMENT ELEVATION UNLESS OTHERWISE NOTED.
7. PROVIDE 2% MAXIMUM CROSS SLOPE ON SIDEWALKS AND ADA PARKING AREA.
8. ALL CURB AND WALL UNDERDRAINS SHALL OUTLET TO STORM SEWER SYSTEM. PROVIDE POSITIVE DRAINAGE TO CONNECTION POINT.
9. CONTRACTOR SHALL APPLY EROSION CONTROL BLANKET AND LOW MAINTENANCE GRASS SEED MIX TO ALL SLOPES 3H:1V OR STEEPER. REFER TO SWPPP DETAILS FOR LOW MAINTENANCE GRASS SEED MIXTURE SPECIFICATIONS.
10. ADD 1000.00 TO ALL SPOT ELEVATIONS SHOWN ON PLAN TO OBTAIN U.S.G.S. ELEVATIONS.
11. REFER TO GEOTECHNICAL REPORT FOR SUBGRADE PREPARATION.
12. PROVIDE STORM SEWER MINIMUM 2'-0" COVER UNLESS OTHERWISE NOTED.
13. PROVIDE FINGER DRAINS AND CONCRETE COLLARS ON ALL PROPOSED STORM SEWER STRUCTURES IN PAVEMENT PER CONSTRUCTION DETAILS SHEET.
14. CONTRACTOR SHALL NOT ALLOW WATER TO POND AT SUBGRADE OR BASE MATERIAL ADJACENT TO CURB INLETS AND CATCH BASINS PRIOR TO PAVEMENT PLACEMENT. TEMPORARY PROVISIONS SUCH AS DEWATERING AND INSTALLATION OF SUBDRAINS SHALL BE TAKEN TO KEEP THE SUBGRADE DRY DURING CONSTRUCTION.
15. ENSURE POSITIVE DRAINAGE AWAY FROM BUILDING(S) AT ALL TIMES. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL DETAILS.

REFER TO CONSTRUCTION DETAILS SHEET

REFER TO UTILITY PLAN FOR ADDITIONAL UTILITY WORK

REFER TO SHEETS C7.13 TO C7.12 FOR STORM SEWER PROFILES

REFER TO SHEETS C7 SERIES FOR GRADING PLAN

CODED NOTES

1. CONTRACTOR TO INSTALL EROSION CONTROL FLEXAMAT STANDARD OR APPROVED EQUAL
2. OUTLET STRUCTURE. REFER TO SHEETS C7.7 TO C7.9.

LEGEND

EXISTING

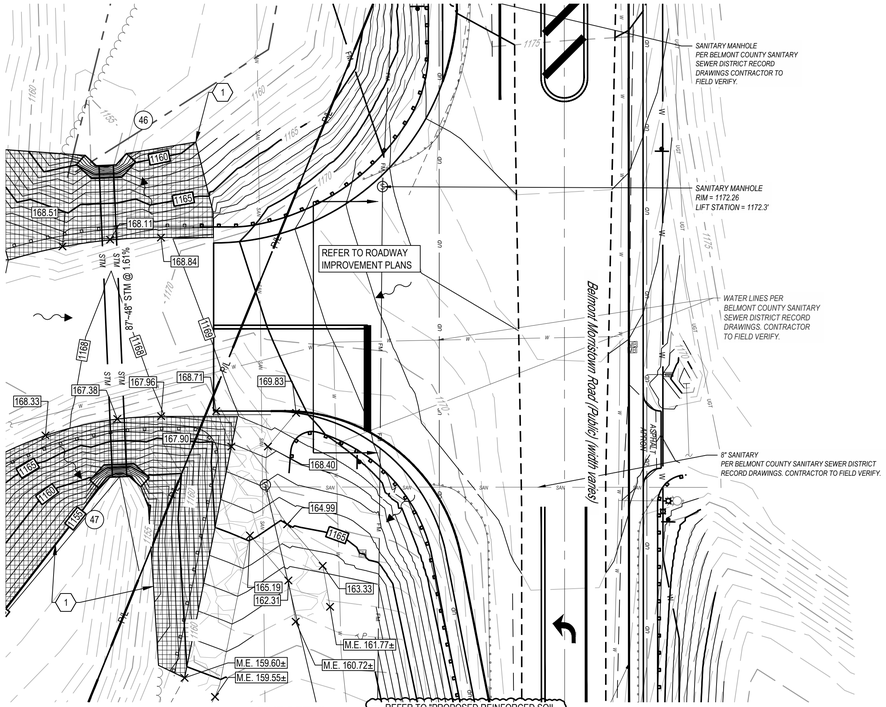
REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- 5 CHAIN-LINK FENCE
- CONCRETE CURB AND GUTTER
- MAJOR CONTOUR (080)
- MINOR CONTOUR (079)
- STORM SEWER (STM)
- STORM CURB INLET PER CONSTRUCTION DETAILS
- STORM HALF HEIGHT HEADWALL PER ODOT HW-2.1 DETAIL
- SPOT ELEVATION (XXX.XX)
- TOP OF CURB / BOTTOM OF CURB (XXX.XX / XXX.XX)
- RIM — TOP OF CASTING ELEVATION
- GRAVEL
- FLOW ARROW

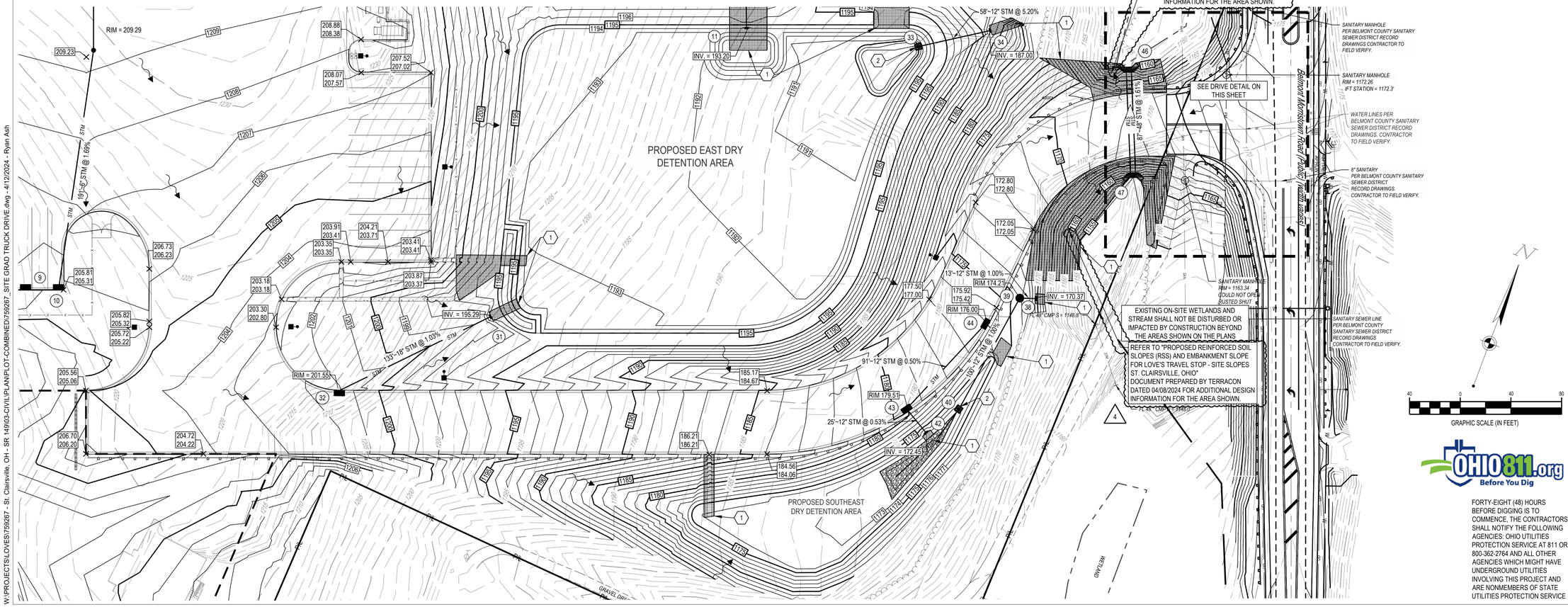
STORM SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	RIM	INVERT
11	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1		1193.20 (18") N
31	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1		1195.29 (18") SW
32	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1201.55	1196.66 (18") NE
33	OUTLET CONTROL STRUCTURE		1190.00 (12") NE
34	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1		1187.00 (12") SW
38	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1		1170.37 (12") W
39	48" STORM MANHOLE	1174.21	1170.50 (12") S 1170.50 (12") E
40	OUTLET CONTROL STRUCTURE		1171.50 (12") N
42	ODOT HALF-HEIGHT HEADWALL PER STD. DWG. HW-2.1		1172.45 (12") NW
43	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1179.54	1172.58 (12") N 1172.58 (12") SE
44	3' X 3' PRECAST CURB INLET PER CONSTRUCTION DETAILS	1176.04	1173.04 (12") S
46	ODOT FULL-HEIGHT HEADWALL PER STD. DWG. HW-1.1		1154.00 (48") SE
47	ODOT FULL-HEIGHT HEADWALL PER STD. DWG. HW-1.1		1152.60 (48") NW



DRIVE DETAIL
SCALE: 1" = 20'

REFER TO "PROPOSED REINFORCED SOIL SLOPES (RSS) AND EMBANKMENT SLOPE FOR LOVE'S TRAVEL STOP - SITE SLOPES ST. CLAIRSVILLE, OHIO" DOCUMENT PREPARED BY TERRACON DATED 04/08/2024 FOR ADDITIONAL DESIGN INFORMATION FOR THE AREA SHOWN.



GRAPHIC SCALE (IN FEET)
40 0 40 80

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Love's

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66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

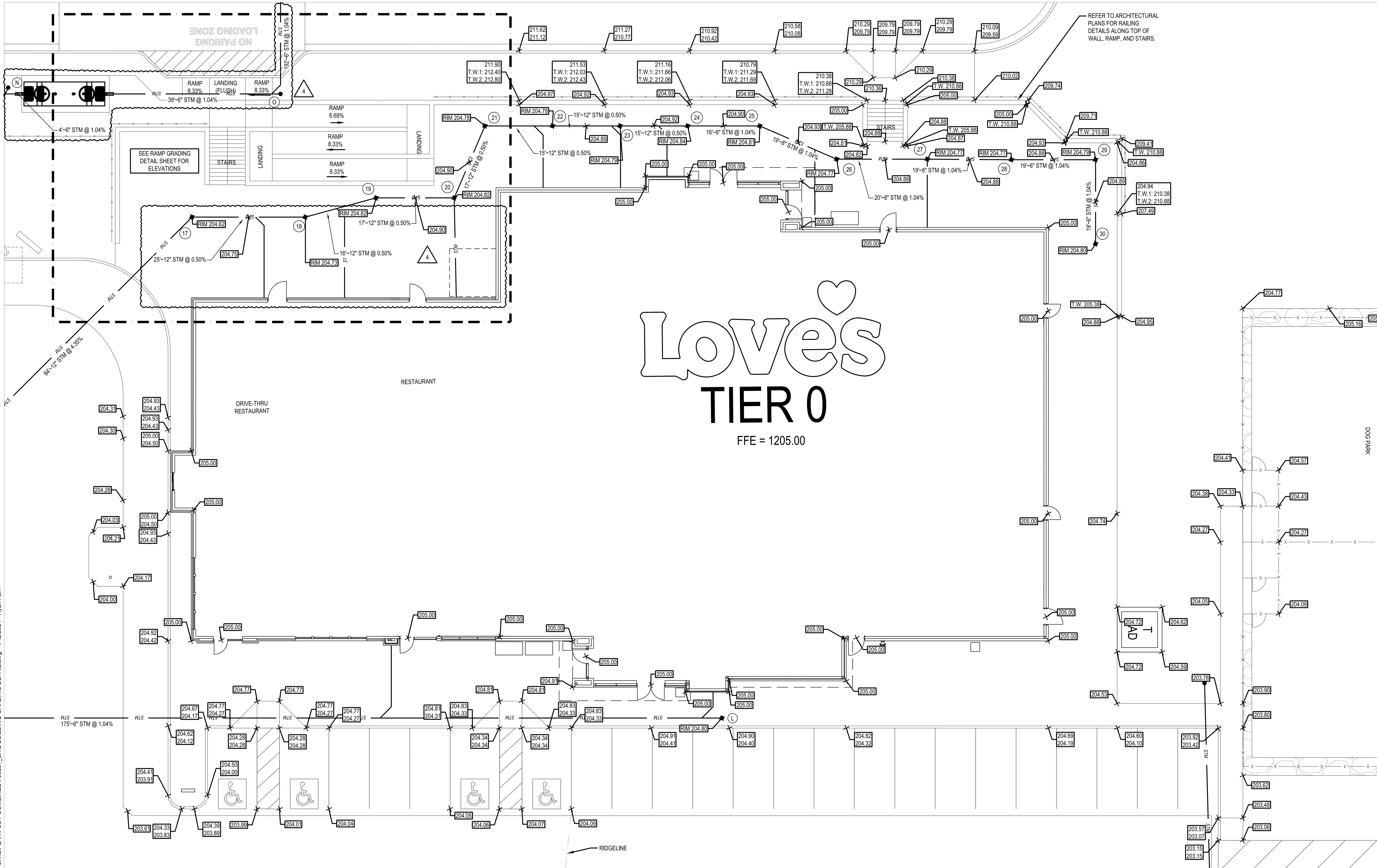
Revisions / Submissions

ID	Description	Date
1	REV 1	01/03/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SOUTH DRIVE DETAIL

C7.4

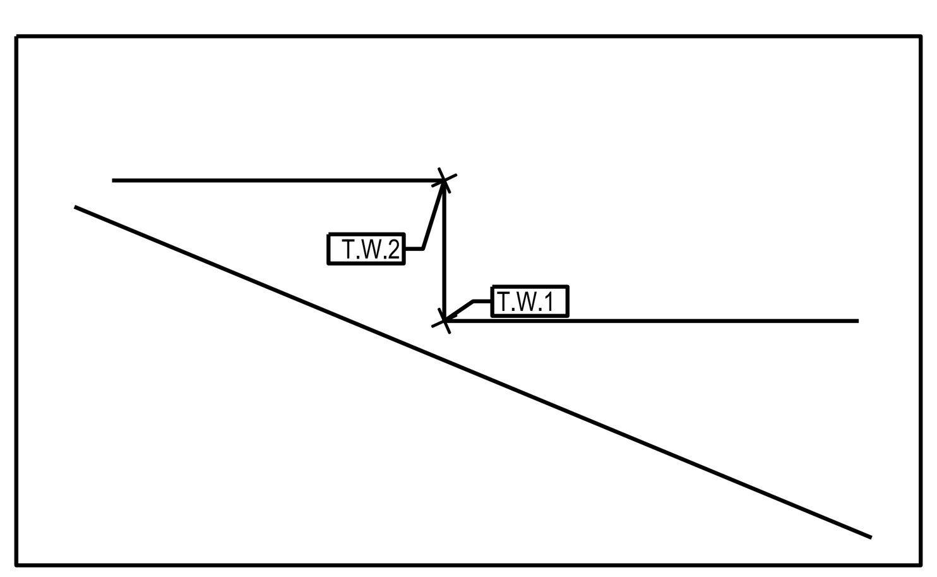


SPOT ELEVATIONS FOR BUILDING

SCALE: 1" = 10'

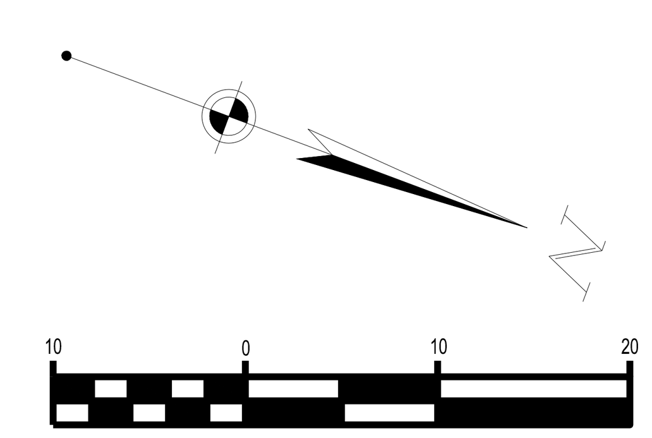
NOTES

1. ALL SPOT GRADES REFER TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
2. SEE GRADING PLAN FOR ADDITIONAL GRADES ON SITE.
3. ALL DISCREPANCIES BETWEEN SPOT ELEVATIONS ON THIS SHEET AND THE GRADING PLAN SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND THE DESIGN ENGINEER.
4. SLOPES IN ADA PARKING AREA AND ACCESSIBLE AISLE WAY SHALL NOT EXCEED 2.0% IN ANY DIRECTION.
5. ADD 1000.00 TO ALL SPOT ELEVATIONS SHOWN ON PLAN TO OBTAIN U.S.G.S. ELEVATIONS.



T.W.1 & T.W.2 DIAGRAM

SCALE: NTS



FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

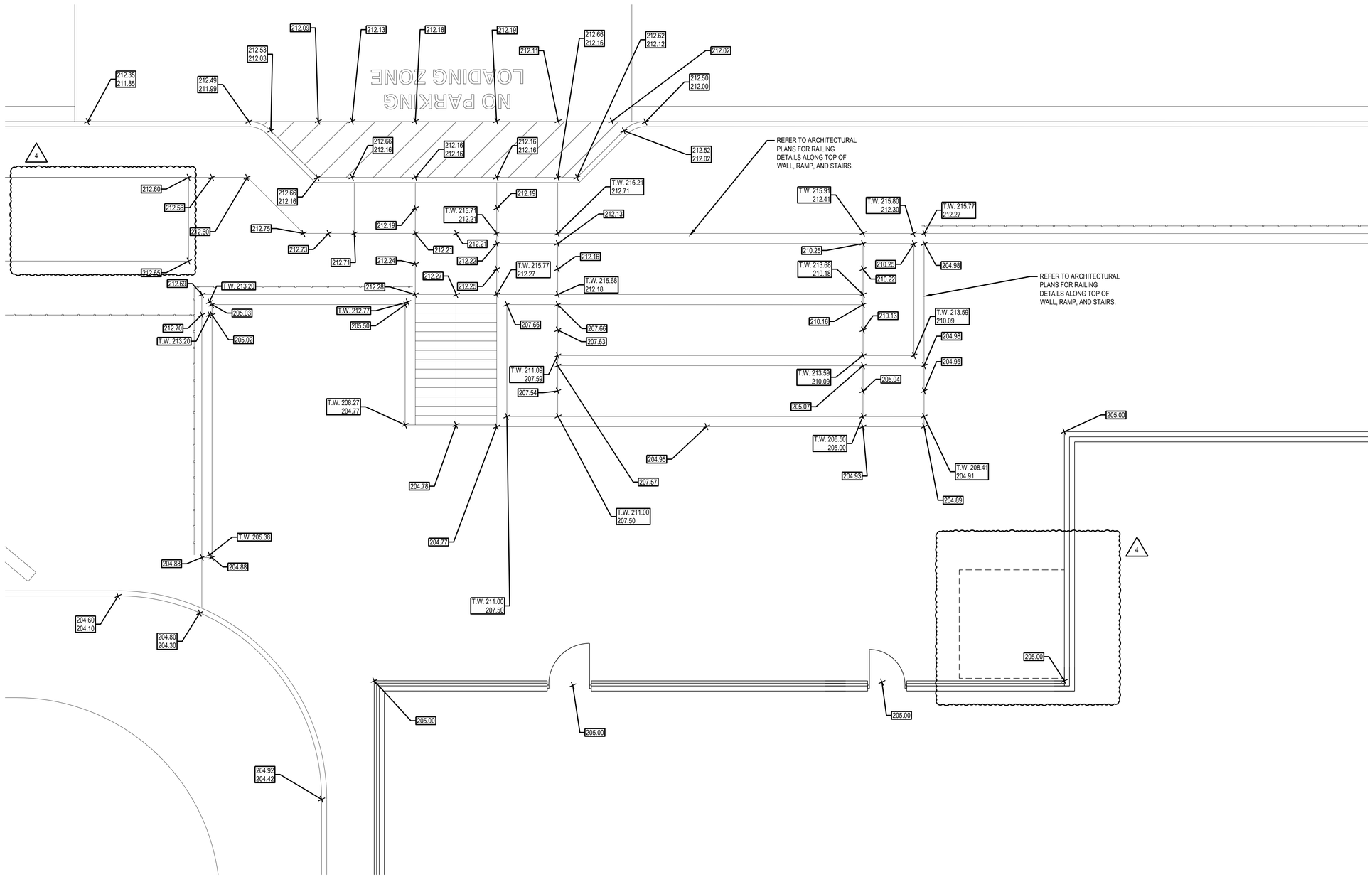
ID	Description	Date
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1" = 10'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

BUILDING GRADING DETAIL

W:\PROJECTS\LOVES\759267 - St. Clairsville, OH - SR 149\03-CIVIL\PLANPLOT-COMBINED\759267_SITE BUILDING GRADING DETAIL.dwg - 4/12/2024 - Ryan Ash



NOTES

1. ALL SPOT GRADES REFER TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
2. SEE GRADING PLAN FOR ADDITIONAL GRADES ON SITE.
3. ALL DISCREPANCIES BETWEEN SPOT ELEVATIONS ON THIS SHEET AND THE GRADING PLAN SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND THE DESIGN ENGINEER.
4. SLOPES IN ADA PARKING AREA AND ACCESSIBLE AISLE WAY SHALL NOT EXCEED 2.0% IN ANY DIRECTION.
5. ADD 1000.00 TO ALL SPOT ELEVATIONS SHOWN ON PLAN TO OBTAIN U.S.G.S. ELEVATIONS.

SPOT ELEVATIONS FOR RAMP

SCALE: 1" = 5'

5 0 5 10

GRAPHIC SCALE (IN FEET)

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FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

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ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

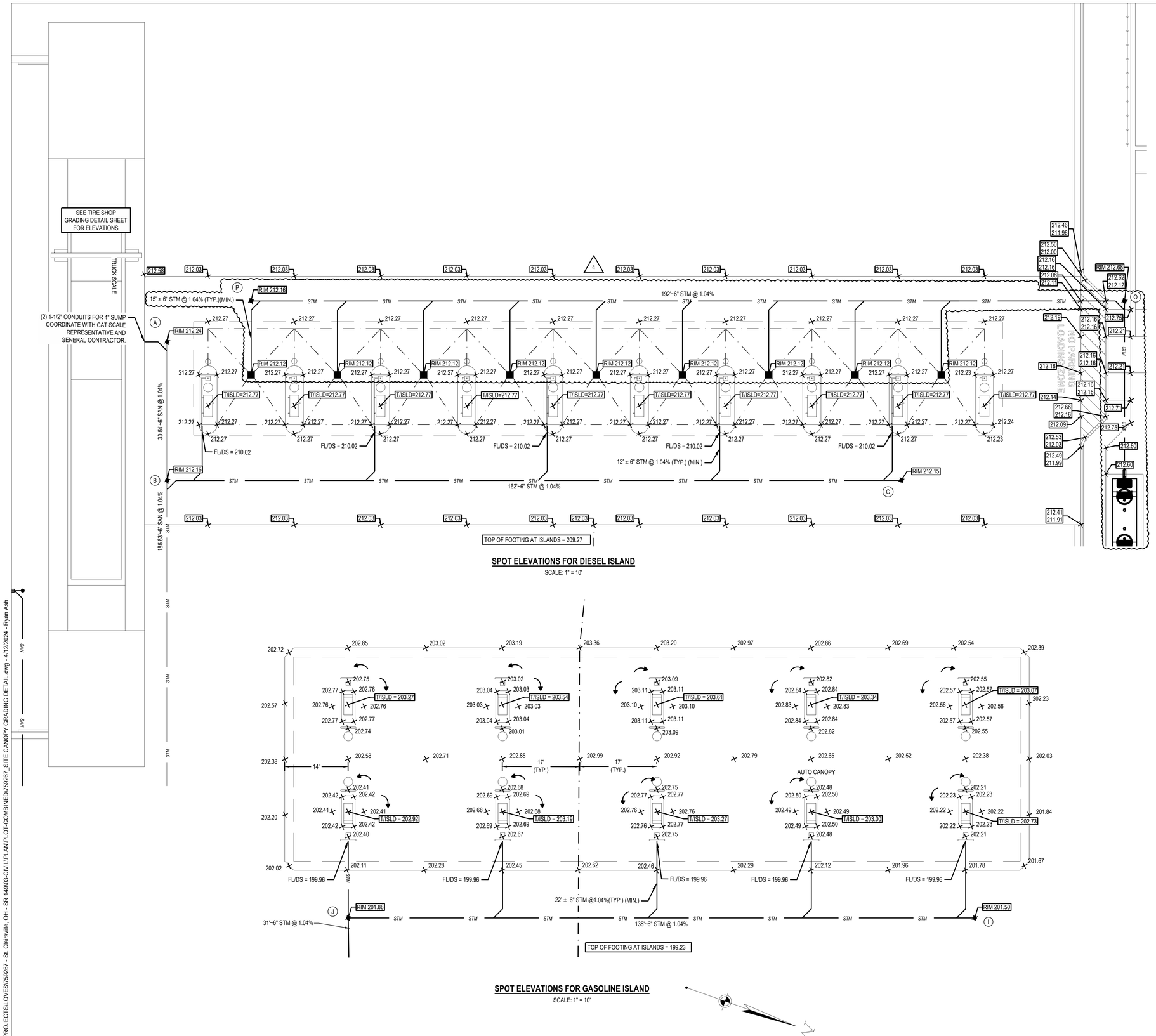
Revisions / Submissions

ID	Description	Date
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1"=5'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
RAMP GRADING DETAIL

C7.6



NOTES

1. GRADING DESIGN FOR FINISHED PAVEMENT GRADES IS SHOWN HEREIN.
2. STRUCTURAL SUPPORT FOR THE CANOPIES AND DESIGN FOR CANOPY FOOTINGS ARE DESIGNED BY OTHERS AND SHOWN HERE FOR INFORMATIONAL PURPOSES ONLY.
3. FUEL SYSTEM IS DESIGNED BY OTHERS. THE FUEL SYSTEM PLAN LAYOUT IS SHOWN FOR INFORMATIONAL PURPOSES ONLY.
4. CONTRACTOR SHALL ENSURE THAT THE CURB HEIGHT AT THE FUEL DISPENSER ISLAND IS 6 INCHES MINIMUM AND 8 INCHES MAXIMUM.
5. REFERENCE PAVEMENT DESIGNS ARE SHOWN ON CONSTRUCTION DETAILS SHEET.
6. REFER TO UTILITY PLAN FOR SANITARY SEWER STRUCTURE SCHEDULE.
7. ALL SPOT GRADES REFER TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
8. SEE GRADING PLAN FOR ADDITIONAL GRADES ON SITE.
9. ALL DISCREPANCIES BETWEEN SPOT ELEVATIONS ON THIS SHEET AND THE GRADING PLAN SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND THE DESIGN ENGINEER.
5. ADD 1000.00 TO ALL SPOT ELEVATIONS SHOWN ON PLAN TO OBTAIN U.S.G.S. ELEVATIONS.

LEGEND OF ABBREVIATIONS

T/ISLD	- TOP OF PUMP ISLAND
RIM	- TOP OF CASTING
FL/DS	- FLOW LINE OF PIPE AT COLUMN

REFER TO CONSTRUCTION DETAILS SHEET

REFER TO UTILITY PLAN FOR ADDITIONAL UTILITY WORK

REFER TO SHEETS C7.13 TO C7.15 FOR STORM SEWER PROFILES

GRAPHIC SCALE (IN FEET)

10 0 10 20

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Love's

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

ID	Description	Date
4	ADDENDUM 4	02/23/2024

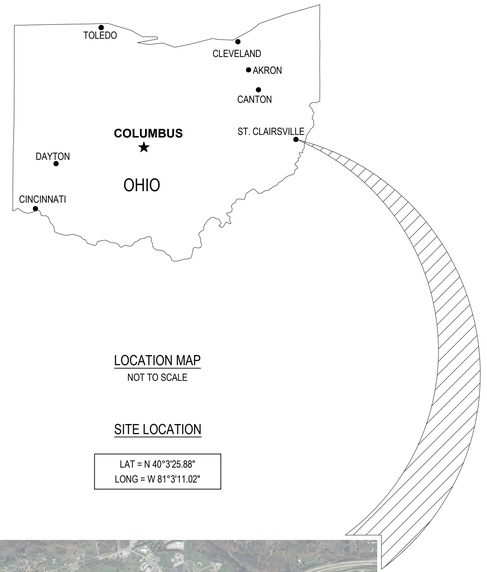
Project Number:	759267
Scale:	1" = 10'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

CANOPY GRADING DETAIL

C7.7

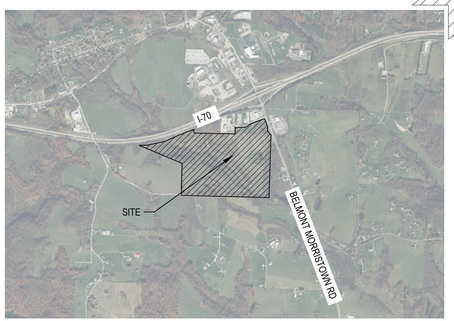
PROPOSED LOVE'S TRAVEL STOP
66320 BELMONT-MORRISTOWN ROAD
UNION TOWNSHIP
BELMONT COUNTY, OHIO, 43718



LOCATION MAP
NOT TO SCALE

SITE LOCATION

LAT = N 40°3'25.88"
LONG = W 81°3'11.02"



VICINITY MAP
NOT TO SCALE

	BENCHMARKS
TBM "A"	"X" CHISELED IN SOUTH SIDE OF RIM OF SANITARY MANHOLE ON NORTH SIDE OF RECO DRIVE, EAST OF ADDRESS 41245 RECO DRIVE = 1239.44'
TBM "B"	EAST BOLT ON HYDRANT ON SOUTH SIDE OF RECO DRIVE, ACROSS FROM ADDRESS 41371 RECO DRIVE = 120.05'
TBM "C"	SOUTHWEST BOLT ON HYDRANT ON EAST SIDE OF BELMONT MORRISTOWN ROAD AT ADDRESS 66377 BELMONT MORRISTOWN ROAD = 1193.84'

VERTICAL DATUM: NAVD88

PROPERTY DATA:

PARCEL OWNER:
1 MGD PROPERTY HOLDINGS, LLC.
2 LOASE COAL INC.

PARCEL:	PARCEL ID:	PARCEL AREA:
1	39-01234.000-3	7.24 ACRES
2	39-00338.000-31	128.94 ACRES

ADDRESS: 66320 BELMONT-MORRISTOWN ROAD
ST. CLAIRSVILLE, OHIO 43718

PROPOSED USE: TRUCK STOP

FLOODPLAIN DESIGNATION: THE SUBJECT PARCEL IS LOCATED WITHIN "ZONE X" (AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS INDICATED BY THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER 39013C0175E, EFFECTIVE DATE: APRIL 5, 2006; PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

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FOR ROADWAY IMPROVEMENTS, REFER TO OH-149 ROADWAY IMPROVEMENT AND SIGNAL PLANS BY CESO, INC.

Belmont County Water & Sewer District approves the design of the improvements shown on these drawings

APPROVAL STAMP AND SIGNATURE

A DETAILED GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS SITE AND SHOULD BE ADHERED TO THE FULL EXTENT OF THOSE RECOMMENDATIONS AND FIELD TESTING. REFER TO GEOTECHNICAL ENGINEERING REPORT PREPARED BY TERRACON PROJECT NO.4225529

OWNER/DEVELOPER
LOVE'S TRAVEL STOPS & COUNTRY STORES, INC.
10601 N. PENNSYLVANIA AVE.
OKLAHOMA CITY, OK 73120

CONTACT: CHAD BRUNER
PH: (405) 463-8801
EMAIL: CHAD.BRUNER@LOVES.COM

STORM SEWER
ODOT
2201 REISER AVENUE SE
NEW PHILADELPHIA, OH 44663
PH: (330) 308-7861
CONTACT: JEREMY CESSNA

SANITARY SEWER
BELMONT COUNTY WATER & SEWER DISTRICT
67711 OAK VIEW DRIVE
ST. CLAIRSVILLE, OH 43950
PH: (740) 695-3144
CONTACT: JEANNE KINNEY

WATER
BELMONT COUNTY WATER & SEWER DISTRICT
67711 OAK VIEW DRIVE
ST. CLAIRSVILLE, OH 43950
PH: (740) 695-3144
CONTACT: JEANNE KINNEY

ROADWAY
STATE DOT:
ODOT - DISTRICT 11
2201 REISER AVE.
NEW PHILADELPHIA, OH 44663
PH: (330) 308-7861
CONTACT: JEREMY CESSNA

LOCAL DOT:
UNION TWP.
PH: (740) 782-1337
CONTACT: JUSTIN DEMARCHI

HEALTH DEPARTMENT
BELMONT COUNTY HEALTH DEPARTMENT
68501 BANNOCK ROAD
ST.CLAIRSVILLE, OH 43950
PH: (740) 695-1202

ENGINEER
CESO, INC.
175 MONTROSE WEST AVE. SUITE 400
AKRON, OHIO 44321

CONTACT: KIMBERLY COOPER, P.E.
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EROSION CONTROL
OEPA - SEDO
2195 EAST FRONT STREET
LOGAN, OH 43138
PH: (740) 385-8501

GAS
COLUMBIA GAS OF OHIO
300 LURAY DRIVE
WINTERSVILLE, OH 43953
PH: (419) 575-2763
CONTACT: ADAM STUPAK

FIRE
LAFFERTY VOLUNTEER FIRE DEPARTMENT
70191 IRWIN ROAD
LAFFERTY, OH 43951
PH: (740) 310-0901
CONTACT: DUSTIN HUDAK

ELECTRIC
AMERICAN ELECTRIC POWER (AEP)
47687 NATIONAL RD. W
ST. CLAIRSVILLE, OH 43950
PH: (740) 238-3630
CONTACT: BRENT PANEPUCCI

COMMUNICATIONS
COMCAST
PH: (412) 337-1049
CONTACT: ANGELA MEYERS

NOTE: TELEPHONE AND COMMUNICATIONS CONTACT INFORMATION IS PROVIDED FOR UTILITY CONFLICT COORDINATION PURPOSES ONLY. FOR ANY NECESSARY SERVICE OR ACCOUNT SETUPS, CONTACT KRYSTAL TURNER WITH LOVE'S AT (405) 463-8959 OR BY EMAIL AT KRYSTAL.TURNER@LOVES.COM TO COORDINATE.

STANDARD DRAWINGS

THE STANDARD SPECIFICATIONS OF OHIO DEPARTMENT OF TRANSPORTATION (ODOT), CURRENT EDITION, INCLUDING STANDARD DRAWINGS SHALL GOVERN THIS IMPROVEMENT.

PROTOTYPICAL SITE EQUIPMENT LIST

DESCRIPTION	QTY	MANUFACTURE/MODEL	PROCURED BY	INSTALLED BY	VENDOR CONTACT	REMARKS
FIRE PUMP HOUSE & STORAGE TANKS						
PUMP HOUSE PACKAGE	1	HOUSE PACKAGE 2 (1000-1250 GPM) CITY FED	VENDOR	GC	FLUID SOLUTIONS: DAVID GONZALEZ DGONZALEZ@FLUIDSLLC.COM 1-205-730-7116	

OHIO DEPARTMENT OF TRANSPORTATION STANDARD CONSTRUCTION DETAILS

DWG NUMBER	DESCRIPTION	DWG NUMBER	DESCRIPTION	DWG NUMBER	DESCRIPTION
H.W.-2.1	HALF-HEIGHT HEADWALLS				
MGS 1.1	MIDWEST GUARDRAIL SYSTEM - RAIL COMPONENTS				
MGS 2.1	MIDWEST GUARDRAIL SYSTEM				
H.W. -1.1	FULL-HEIGHT HEADWALLS				

OHIO811.org Before You Dig

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM
175 Montrose West Ave., Suite 400
Akron, OH 44321
Phone: 330.665.0660 Fax: 888.208.4826

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH
66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

ID	Description	Date
1	REV 1	01/03/2024
3	ADDENDUM 3	02/09/2024
4	ADDENDUM 4	02/23/2024
5	ADDENDUM 5	04/18/2024

Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
COVER SHEET

C1.0

GENERAL NOTES

DEMOLITION NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL. THE DEMOLITION, REMOVAL, AND DISPOSAL IS TO BE APPROVED BY ALL GOVERNING AUTHORITIES, OF ALL STRUCTURES, PADS, WALLS, FLUMES, FOUNDATIONS, PARKING, DRIVES, DRAINAGE, STRUCTURES, UTILITIES, ETC., SUCH THAT THE IMPROVEMENTS SHOWN ON THE REMAINING PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE SPECIFICATIONS.
2. THE CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANY'S FORCES AND ANY FEES WHICH ARE TO BE PAID TO THE UTILITY COMPANY FOR THEIR SERVICES. THE CONTRACTOR IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES. CONTRACTOR SHALL MAINTAIN ALL UTILITY SERVICES TO INHABITED BUILDINGS ON SITE AND ADJACENT PROPERTIES AT ALL TIMES. INTERRUPTIONS SHALL BE APPROVED BY THE OWNERS OF THE BUILDINGS/PROPERTIES.
3. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES FOR ONSITE LOCATIONS OF EXISTING UTILITIES.
4. CONTRACTOR IS RESPONSIBLE FOR REPAIRING THE DAMAGE DONE TO ANY EXISTING ITEM DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, CURB, ETC. REPAIRS SHALL BE EQUAL TO, OR BETTER THAN, EXISTING CONDITIONS. CONTRACTOR IS RESPONSIBLE TO DOCUMENT ALL EXISTING DAMAGE AND NOTIFY THE CITY/COUNTY PRIOR TO CONSTRUCTION START.
5. CONTINUOUS ACCESS SHALL BE MAINTAINED TO THE SURROUNDING PROPERTIES AT ALL TIMES DURING DEMOLITION OF THE EXISTING FACILITIES.
6. PRIOR TO DEMOLITION, ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED PER THE GOVERNING AGENCIES GUIDELINES AND STANDARDS.
7. CONTRACTOR MAY LIMIT SAW-CUT & PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THESE CONSTRUCTION PLANS, BUT IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR. SAWCUT SHOWN IS FOR REFERENCE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING THAT WHICH IS NECESSARY TO COMPLETE THE INTENT OF THE PROPOSED IMPROVEMENTS.
8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO STUDY THE PLANS AND VISIT THE SITE TO DETERMINE THE ITEMS THAT MUST BE REMOVED TO COMPLY WITH THE SITE DEVELOPMENT PLANS. NO EXTRA FEE WILL BE PAID FOR THE REMOVAL OF ANY ITEM NOT LISTED THAT IS VISIBLE UPON A SITE VISIT. THE DEMOLITION PLAN IS INTENDED TO PRESENT THE SCOPE OF THE DEMOLITION, AND DOES NOT GUARANTEE THAT ALL ITEMS ARE ADDRESSED.
9. CONTRACTOR SHALL MAINTAIN ALL EXISTING PARKING, SIDEWALKS, DRIVES, ETC. CLEAR AND FREE FROM ANY CONSTRUCTION ACTIVITY AND/OR MATERIAL TO THE BEST OF THEIR ABILITIES. TO ENSURE EASY AND SAFE PEDESTRIAN AND VEHICULAR TRAFFIC TO AND FROM THE SITE.
10. BURNING OF CLEARED MATERIALS IS PROHIBITED.

SITE NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL CITY/COUNTY REGULATIONS AND CODES AND O.S.H.A. STANDARDS.
2. ALL MATERIAL NOTED ON DRAWINGS WILL BE SUPPLIED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL AND MECHANICAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF FUEL CANOPY, FUEL ISLANDS AND EQUIPMENT PAD.
4. ALL DISTURBED AREAS ARE TO RECEIVE 6" OF TOPSOIL, SEED, MULCH AND WATER UNTIL A HEALTHY STAND OF GRASS IS ESTABLISHED.
5. ALL DIMENSIONS AND RADII ARE TO THE FACE OF THE CURB OR EDGE OF PAVEMENT, AS APPLICABLE, UNLESS OTHERWISE NOTED.
6. PROVIDE STRIPING AS SHOWN. PARKING STALLS SHALL BE PAINTED WITH 4" WHITE, WIDE LINES.
7. REFER TO ARCHITECTURAL PLANS FOR PROPOSED SIGNAGE.
8. REFER TO MECHANICAL PLANS FOR EQUIPMENT LAYOUT.
9. REFER TO ELECTRICAL PLANS FOR ELECTRICAL WORK.
10. REFER TO GEOTECHNICAL ENGINEERING REPORT PREPARED BY TERRACON CONSULTANTS, INC. AND PROPOSED FLEXIBLE PAVEMENT SECTIONS REPORT FOR SITE WORK PREPARATION/RECOMMENDATIONS AND PAVEMENT SECTIONS.
11. SURVEY PROVIDED BY CESO INC. DATED: 8/30/2022 REFER TO ALTA/NSPS SURVEY FOR ADDITIONAL INFORMATION.
12. REFER TO ALTA/NSPS SURVEY FOR BENCHMARK LOCATIONS AND ELEVATIONS.

ENVIRONMENTAL NOTES

1. THERE ARE (1) [INDIANA BAT] SPECIES AND (1) STATE THREATENED [NORTHERN LONG EARED BAT] SPECIES NEAR OR WITHIN THE PROJECT LIMITS, BUT THERE ARE NO CRITICAL AREAS WITHIN THE PROJECT LIMITS.
2. NOTICE: BAT ADVISORY
   PERMIT APPLICANT IS ADVISED:
   HABITAT FOR PROTECTED/ENDANGERED NORTHERN LONG EARED BAT AND INDIANA BAT ARE POTENTIALLY IN THE AREA OF THIS PROJECT. PROJECTS THAT INVOLVE REMOVAL OF TREES GREATER THAN 3 INCHES IN DIAMETER AT BREAST HEIGHT (DBH) MAY REQUIRE COORDINATION WITH THE UNITED STATE FISH AND WILDLIFE SERVICE (USFWS) AND [STATE] DEPARTMENT OF NATURAL RESOURCES (ODNR). IT IS THE RESPONSIBILITY OF THE APPLICANT TO COMPLY WITH ALL FEDERAL AND STATE GUIDANCE AND REQUIREMENTS PERTAINING TO THE NORTHERN LON EARED BAT AND THE INDIANA BAT. THIS MAY INCLUDE BUT IS NOT LIMITED TO AN ENDANGERED SPECIES SURVEY AND OTHER DOCUMENTATION. TREE REMOVALS SHOULD BE COMPLETED BETWEEN THE DATES OF OCTOBER 1 AND MARCH 31 TO AVOID PERIODS WHEN THE NORTHERN LONG EARED BAT AND THE INDIANA BAT ARE TYPICALLY PRESENT.

A DETAILED GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS SITE AND SHOULD BE ADHERED TO THE FULL EXTENT OF THOSE RECOMMENDATIONS AND FIELD TESTING. REFER TO GEOTECHNICAL ENGINEERING REPORT PREPARED BY TERRACON PROJECT NO.4225529

GRADING AND DRAINAGE NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. THE TOPOGRAPHIC SURVEY WAS PERFORMED BY A REGISTERED LAND SURVEYOR. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, HE SHALL HAVE MADE, AT HIS EXPENSE, A TOPOGRAPHIC SURVEY PREPARED ON THE SAME DATUM AS THE ORIGINAL SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW.
3. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
4. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE EPA OR APPLICABLE STATE GENERAL N.P.D.E.S. PERMIT FOR STORM WATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES.
5. EXISTING AND PROPOSED GRADE CONTOUR INTERVALS ARE SHOWN AT 1 FOOT INTERVALS.
6. EXISTING DRAINAGE STRUCTURES SHALL BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES ARE TO BE CLEANED TO REMOVE ALL SILT AND DEBRIS AFTER CONSTRUCTION IS COMPLETE.
7. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
8. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM FUEL ISLANDS AND EQUIPMENT PAD FOR ALL NATURAL AND PAVED AREAS.
9. ALL TOPSOIL MUST BE REMOVED BEFORE FILL IS PLACED.
10. ALL WET, OR OTHERWISE UNSUITABLE, SOILS MUST BE STABILIZED. THIS MAY BE ACCOMPLISHED BY DRYING, REMOVAL & REPLACEMENT, REMOVAL & DRYING & RECOMPACTION, OR SOIL TREATMENT (LIME/CEMENT).
11. ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 6" OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER AND SEED WITH LOW MAINTENANCE GRASS SEED MIX. CONTRACTOR SHALL SEED DISTURBED AREAS IN ACCORDANCE WITH SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED. ALL EXPOSED SURFACE AREAS SHALL BE STABILIZED PER THE SWPPP AND LANDSCAPE REQUIREMENTS AS PART OF THIS SET.
12. ALL STORM PIPE ENTERING STRUCTURES SHALL BE GROUTED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT.
13. ALL STORM STRUCTURES SHALL HAVE A SMOOTH UNIFORM POURED MORTAR INVERT FROM INVERT IN TO INVERT OUT UNLESS OTHERWISE NOTED ON THE PLANS.
14. PRECAST STRUCTURES MAY BE USED AT CONTRACTOR'S OPTION. IF PRECAST STRUCTURES ARE UTILIZED, THE CONTRACTOR SHALL VERIFY ELEVATIONS AT CONNECTION POINTS OR ANY EXISTING UTILITY CROSSING PRIOR TO ORDERING STRUCTURES. REPORT ANY CONFLICTS TO THE ENGINEER.
15. STORM PIPE SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:

MATERIAL	TYPE	PIPE SPEC	JOINT SPEC	INSTALLATION	ACCEPTABLE AREAS OF USE
REINFORCED CONCRETE PIPE (RCP)	CLASS IV	ASTM C-76	ASTM C443	ASTM C1479	WITHIN R/W, ALL SEWERS < 2' OF COVER
HIGH DENSITY POLY-ETHYLENE (HDPE)	SMOOTH-WALLED CORRUGATED ADS-N12 WT IB PIPE OR EQUAL	ASTM F2306 AASHTO M294 (TYPE S)	ASTM D3212	ASTM D2321	ON SITE, 12" TO 60" DIA.
POLY VINYL CHLORIDE (PVC)	SDR 35	ASTM D3034	ASTM D3212	ASTM D2321	ON SITE, 4" TO 10" DIA.

16. SAWCUT LINE PROVIDED IS FOR REFERENCE ONLY. CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING THE EXTENT OF THE SAWCUT THAT WILL BE REQUIRED.
17. ALL STORM SEWER STRUCTURE GRATES AND FRAMES WITHIN PAVEMENT SHALL BE HEAVY DUTY.
18. ALL STORM DRAINAGE SHALL BE PERFORMED IN ACCORDANCE WITH BELMONT COUNTY AND ODOT STANDARDS.
19. GRADING BEHIND CURB AT TRUCK PARKING SPACES NOT TO EXCEED 2% (UPHILL) FOR 15'-0" DUE TO TRUCK OVERHANG.
20. PROVIDE CONCRETE APRONS AROUND ALL PARKING LOT STORM SEWER STRUCTURES.
21. ALL DOWNSPOUT DRAINS ARE TO HAVE A 1.04% MINIMUM SLOPE UNLESS OTHERWISE NOTED. CONNECT DOWNSPOUTS TO THE PROPOSED STORM SEWER SYSTEM. REFER TO ARCHITECTURAL PLANS FOR DOWNSPOUT LOCATIONS.
22. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED.
23. THE STORM SEWER GRADE WILL BE SUCH THAT A MINIMUM COVER IS MAINTAINED TO WITHSTAND AASHTO HS-25 LOADING ON THE PIPE. PROVIDE MINIMUM 2 FEET OF COVER FOR ALL STORM SEWERS UNLESS OTHERWISE NOTED.
24. WHEN A SANITARY SEWER MAIN LIES ABOVE A STORM SEWER, OR WITHIN 18 INCHES BELOW, THE SANITARY SEWER WILL HAVE AN IMPERVIOUS ENCASEMENT OR BE CONSTRUCTED OF STRUCTURAL SEWER PIPE FOR A MINIMUM OF 10 FEET ON EACH SIDE OF WHERE THE STORM SEWER CROSSES.
25. IF EXISTING FIELD TILES ARE ENCOUNTERED DURING CONSTRUCTION THEY SHALL BE REPAIRED AND/OR TIED INTO A STORM SEWER SYSTEM AS NEEDED TO MAINTAIN POSITIVE DRAINAGE.

UTILITY NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, FIELD SURVEY INFORMATION. THE UTILITIES LOCATED ARE NOT GUARANTEED TO COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. FURTHERMORE, THE UTILITIES ARE NOT WARRANTED TO BE IN THE EXACT LOCATION INDICATED ON THE PLANS, ALTHOUGH THEY HAVE BEEN LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS OF O.S.H.A. DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL USE SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION. THIS TO INCLUDE BUT NOT LIMITED FOR ACCESS AND EGRESS FROM ALL EXCAVATION AND TRENCHING. CONTRACTOR IS RESPONSIBLE TO COMPLY WITH PERFORMANCE CRITERIA FOR O.S.H.A.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING UTILITY DURING CONSTRUCTION AT NO COST TO THE OWNER.
4. COMPACTED FILLS ARE TO BE MADE A MINIMUM OF THREE FEET ABOVE THE CROWN OF ANY PROPOSED UTILITY PRIOR TO CUTTING OF TRENCHES FOR PLACEMENT OF SAID UTILITY. ALL FILLS SHALL BE CONTROLLED, COMPACTED, AND INSPECTED BY AN APPROVED TESTING AGENCY OR THE APPROPRIATE UTILITY DEPARTMENT.
5. CONTRACTOR SHALL NOTIFY THE UTILITY AUTHORITY'S INSPECTORS 72 HOURS BEFORE CONNECTING TO ANY EXISTING LINE.
6. WATER AND SANITARY UTILITIES SHALL HAVE TEN (10') FEET OF CLEARANCE (PARALLEL) OR WHEN CROSSING 18" VERTICAL CLEARANCE (OUTSIDE EDGE OF PIPE TO OUTSIDE EDGE OF PIPE.) THE CROSSING SHALL BE ARRANGED SO THAT THE SANITARY SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER LINE JOINTS.
7. IF A WATER LINE PASSES UNDER THE SANITARY SEWER LINE, THE SEWER LINE SHOULD BE CONSTRUCTED OF A WATERTIGHT MATERIAL APPROVED BY THE REGULATORY AGENCY FOR USE IN WATER MAIN CONSTRUCTION AND SHALL EXTEND TEN (10') FEET ON BOTH SIDES OF THE CROSSING, AS MEASURED PERPENDICULAR TO THE MAIN. ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO MAINTAIN LINE AND GRADE.
8. LINES UNDERGROUND SHALL BE INSTALLED, INSPECTED AND APPROVED BEFORE BACKFILLING.
9. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR EQUIPMENT TIE-IN OF ALL BUILDING UTILITIES.
10. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS. THE CONTRACTOR SHALL CONDUCT ALL REQUIRED TESTS TO THE SATISFACTION OF THE RESPECTIVE UTILITY REGULATIONS AND THE OWNER'S INSPECTION AUTHORITIES.
11. REFER TO MECHANICAL AND ELECTRICAL PLANS FOR PIPING AND GAS/ELECTRICAL SERVICES.
12. PROVIDE FIRE EXTINGUISHER TO BE MOUNTED ON EACH COLUMN OF THE FUEL CANOPY. FIRE EXTINGUISHER TO BE MOUNTED IN AN EXTERIOR METAL FIRE EXTINGUISHER CABINET.
13. UTILITY TRENCHES WITHIN PAVED AREAS TO BE BACKFILLED PER TRENCH BACKFILL DETAIL ON CONSTRUCTION DETAILS SHEET AND GEOTECHNICAL REPORT.
14. REFER TO LOVE'S SITE-SPECIFIC PROJECT MANUAL FOR CONSTRUCTION SPECIFICATIONS.
15. ALL SANITARY SEWER WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE BELMONT COUNTY WATER & SEWER DISTRICT REGULATIONS.
16. ALL WATER LINE WORK SHALL BE PERFORMED IN ACCORDANCE WITH BELMONT COUNTY WATER & SEWER DISTRICT REGULATIONS.
17. PROVIDE WATER LINE A MINIMUM OF 4'-0" OF COVER.
18. PROVIDE SANITARY SEWER LINE A MINIMUM OF 3'-0" OF COVER.
19. WATER LINE MATERIAL FOR DOMESTIC WATER SERVICE SHALL BE AS FOLLOWS:

MATERIAL	PRESSURE RATING	PIPE SPEC	FITTINGS	INSTALLATION	ACCEPTABLE AREAS OF USE
HIGH-DENSITY POLY-ETHYLENE (HPDE TUBING)	SDR 11 P.C. = 200 PSI	ASTM D2239 AWWA C901 NSF STANDARD #14	ASTM D3350 ASTM D3261	ASTM D2774	ON SITE, < 2" DIA.
PE 4710 POLY-ETHYLENE PLASTIC (IPS)	SDR 11 P.C. = 200 PSI	ASTM D3035 AWWA C901	ASTM D3350 ASTM D3261	ASTM D2774	ON SITE, 2" TO 3" DIA.
PE 4710 POLY-ETHYLENE PLASTIC (DIPS)	SDR 11 P.C. = 200 PSI	ASTM F714 AWWA C906	ASTM D3350 ASTM D3261	ASTM D2774	ON SITE, 4" DIA. AND LARGER

20. SANITARY SEWER MATERIAL FOR ON-SITE SANITARY SEWER LINES SHALL BE AS FOLLOWS:

MATERIAL	PRESSURE RATING	PIPE SPEC	FITTINGS	INSTALLATION	ACCEPTABLE AREAS OF USE
POLY VINYL CHLORIDE (PVC)	SDR 35	ASTM D3034 (GASKET)	ASTM D3212 (GASKET)	ASTM D2321 WITH TYPE 1 BEDDING	ON SITE, 6" TO 8" DIA., LESS THAN 8.5' OF COVER
POLY VINYL CHLORIDE (PVC)	SDR 26	ASTM 3034 (GASKET)	ASTM D3212 (GASKET)	ASTM 2321 WITH TYPE 1 BEDDING	ON SITE, 6" TO 8" DIA., GREATER THAN OR EQUAL TO 8.5' OF COVER

21. CONTRACTOR TO CONFIRM ALL CLEARANCE HEIGHTS OF OVERHEAD UTILITIES. IF FINISHED ELEVATION OF GRADING REDUCES THE CLEARANCE OF THE LOWEST LINE TO LESS THAN 16'-0", CONTRACTOR SHALL CONTACT UTILITY PROVIDER, OWNER AND ENGINEER.

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FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Phone: 330.665.0660 Fax: 888.208.4826

Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER
12/18/2023

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH
66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

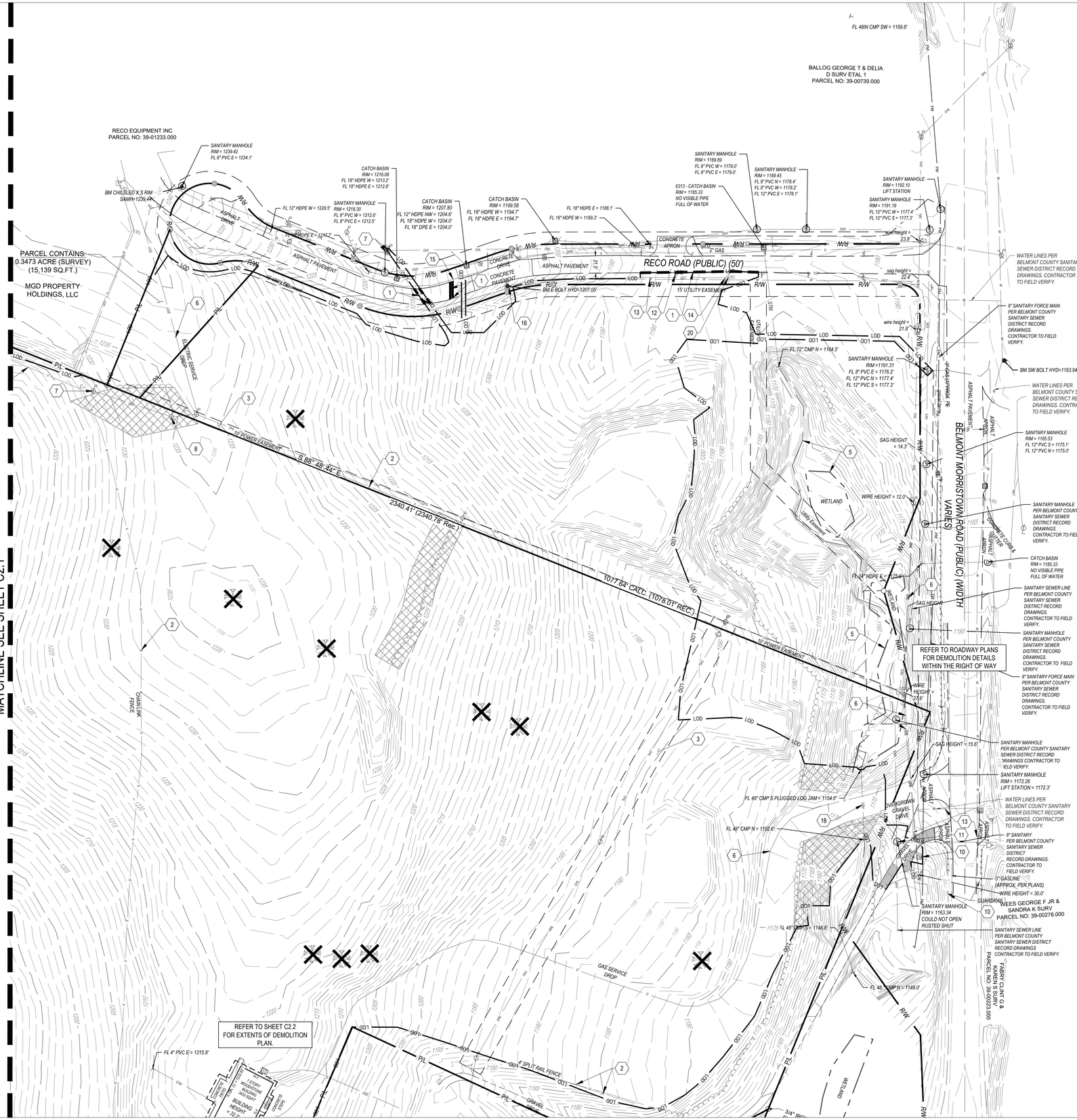
Revisions / Submissions

ID	Description	Date

Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
GENERAL NOTES

C1.1



LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- LOD — LIMITS OF DISTURBANCE (L.O.D.)
- REMOVE PAVEMENT, ASPHALT AND CONCRETE MATERIAL
- REMOVE EXISTING GRAVEL
- REMOVE EXISTING TREES AND BRUSH
- SAWCUT LINE
- REMOVE EXISTING TREE

GENERAL NOTES:

1. REMOVE ALL SITE FEATURES AS SHOWN ON THE PLAN AND LEGALLY DISPOSE OF OFF SITE.
2. SAWCUT EXISTING PAVEMENT TO FULL DEPTH, USING CARE TO CUT NEAT, STRAIGHT LINES. CUT AT EXISTING JOINTS WHERE POSSIBLE.
3. PROTECT EXISTING SITE FEATURES TO REMAIN OUTSIDE CONSTRUCTION LIMITS. REPAIR ANY DAMAGE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
4. USE ANY MEANS NECESSARY TO CONTROL DUST AT THE SITE. PROVIDE STREET CLEANING WHEN NECESSARY OR AS DIRECTED.
5. REFER TO ROADWAY PLANS FOR LIMITS OF PROPOSED WORK OUTSIDE THE SITE SCOPE.
6. FIELD VERIFY EXISTING LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES. IF EXISTING SYSTEM'S LOCATION OR ELEVATION IS FOUND TO BE DIFFERENT FROM THE PLANS, CONTRACTOR IS TO CONTACT THE ENGINEER.
7. IF FIELD TILES ARE ENCOUNTERED DURING CONSTRUCTION THEY SHALL BE REPAIRED AND/OR TIED INTO A STORM SEWER SYSTEM AS NEEDED TO MAINTAIN POSITIVE DRAINAGE.

CODED NOTES:

1. SAWCUT PAVEMENT TO FULL DEPTH IN NEAT, STRAIGHT LINES
2. REMOVE EXISTING FENCE TO EDGE OF LIMITS OF DISTURBANCE.
3. EASEMENT TO BE VACATED. REMOVE OVERHEAD POWER LINES AND POLES. CONTRACTOR TO COORDINATE WITH POWER COMPANY.
4. ABANDONED EXISTING WELL. CONTRACTOR TO COORDINATE WITH BELMONT COUNTY HEALTH DEPARTMENT.
5. EXISTING WETLAND, DITCH, AND STREAM TO REMAIN. CONTRACTOR TO USE ANY MEANS NECESSARY TO NOT DISTURB STREAMS AND WETLANDS.
6. REMOVE EXISTING UTILITY.
7. PROTECT EXISTING UTILITY POLE TO REMAIN.
8. REMOVE EXISTING UTILITY POLE.
9. REMOVE EXISTING ELECTRICAL BOX.
10. PROTECT EXISTING GAS METER.
11. PROTECT EXISTING SANITARY MANHOLE. ADJUST RIM TO MATCH PROPOSED FINISHED GRADE.
12. REMOVE EXISTING SIGN.
13. PROTECT EXISTING WATER MAIN TO REMAIN.
14. PROTECT EXISTING UNDERGROUND UTILITY TO REMAIN.
15. PROTECT EXISTING GAS MAIN TO REMAIN.
16. PROTECT EXISTING WATER STRUCTURE TO REMAIN.
17. NOT USED.
18. REPLACE EXISTING CULVERT AND HEADWALLS. REFER TO SHEET C7.4 FOR ADDITIONAL INFORMATION.
19. REMOVE ASPHALT PAVEMENT WALK TO EDGE OF LIMIT OF DISTURBANCE.
20. ADJUST TELEPHONE MARKER. CONTRACTOR TO COORDINATE WITH TELEPHONE COMPANY.

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

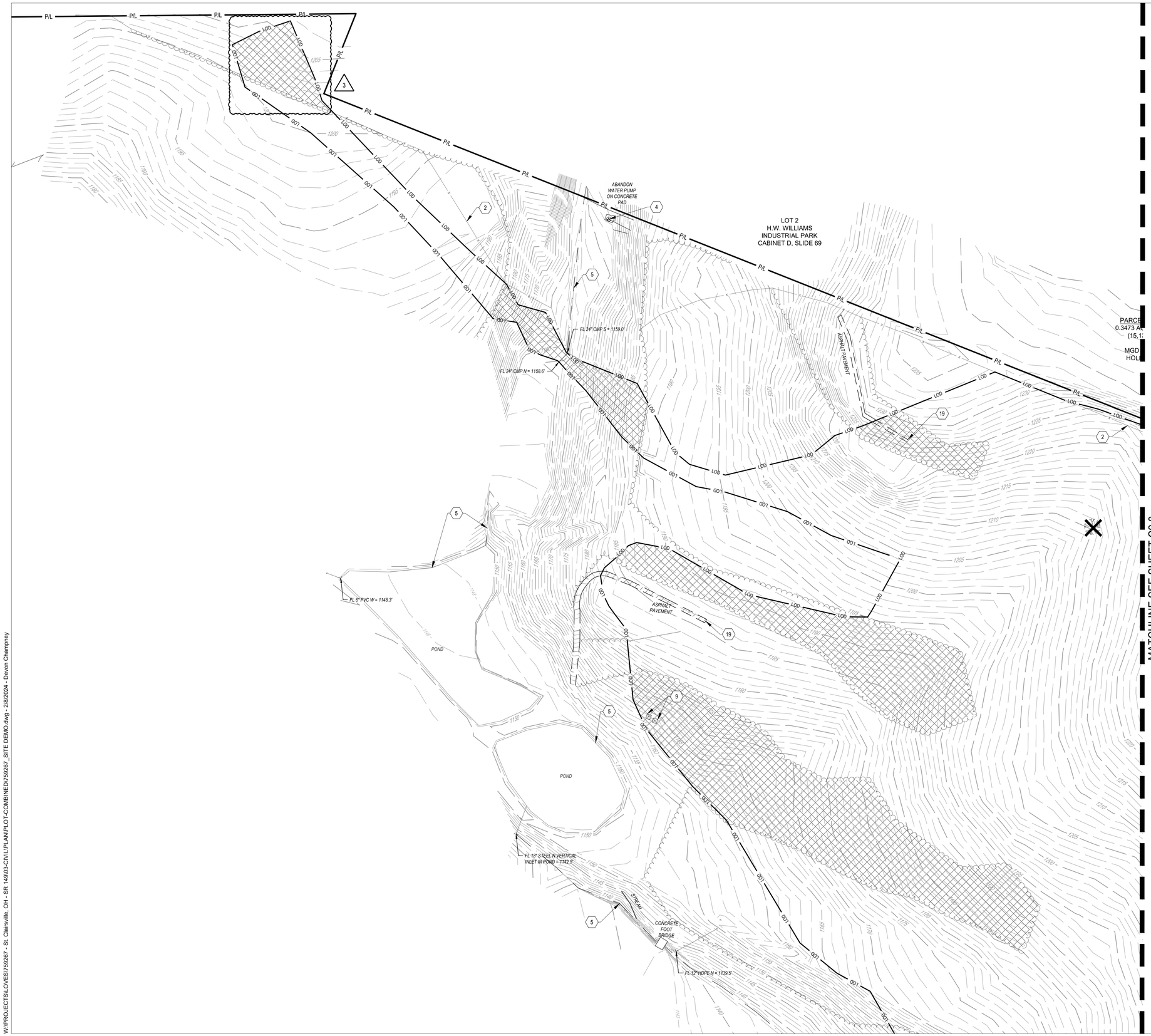
ID	Description	Date
1	REV 1	01/03/2024
3	ADDENDUM 3	02/09/2024

Project Number:	759267
Scale:	1" = 60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

DEMOLITION PLAN - EAST

C2.0



LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- LOD — LIMITS OF DISTURBANCE (L.O.D.)
- REMOVE PAVEMENT, ASPHALT AND CONCRETE MATERIAL
- REMOVE EXISTING GRAVEL
- REMOVE EXISTING TREES AND BRUSH
- SAWCUT LINE
- REMOVE EXISTING TREE

GENERAL NOTES:

1. REMOVE ALL SITE FEATURES AS SHOWN ON THE PLAN AND LEGALLY DISPOSE OF OFF SITE.
2. SAWCUT EXISTING PAVEMENT TO FULL DEPTH, USING CARE TO CUT NEAT, STRAIGHT LINES. CUT AT EXISTING JOINTS WHERE POSSIBLE.
3. PROTECT EXISTING SITE FEATURES TO REMAIN OUTSIDE CONSTRUCTION LIMITS. REPAIR ANY DAMAGE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
4. USE ANY MEANS NECESSARY TO CONTROL DUST AT THE SITE. PROVIDE STREET CLEANING WHEN NECESSARY OR AS DIRECTED.
5. REFER TO ROADWAY PLANS FOR LIMITS OF PROPOSED WORK OUTSIDE THE SITE SCOPE.
6. FIELD VERIFY EXISTING LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES. IF EXISTING SYSTEMS LOCATION OR ELEVATION IS FOUND TO BE DIFFERENT FROM THE PLANS, CONTRACTOR IS TO CONTACT THE ENGINEER.
7. IF FIELD TILES ARE ENCOUNTERED DURING CONSTRUCTION THEY SHALL BE REPAIRED AND/OR TIED INTO A STORM SEWER SYSTEM AS NEEDED TO MAINTAIN POSITIVE DRAINAGE.

CODED NOTES:

1. SAWCUT PAVEMENT TO FULL DEPTH IN NEAT, STRAIGHT LINES
2. REMOVE EXISTING FENCE TO EDGE OF LIMITS OF DISTURBANCE.
3. EASEMENT TO BE VACATED. REMOVE OVERHEAD POWER LINES AND POLES. CONTRACTOR TO COORDINATE WITH POWER COMPANY.
4. ABANDONED EXISTING WELL. CONTRACTOR TO COORDINATE WITH BELMONT COUNTY HEALTH DEPARTMENT.
5. EXISTING WETLAND, DITCH, AND STREAM TO REMAIN. CONTRACTOR TO USE ANY MEANS NECESSARY TO NOT DISTURB STREAMS AND WETLANDS.
6. REMOVE EXISTING UTILITY.
7. PROTECT EXISTING UTILITY POLE TO REMAIN.
8. REMOVE EXISTING UTILITY POLE.
9. REMOVE EXISTING ELECTRICAL BOX.
10. PROTECT EXISTING GAS METER.
11. PROTECT EXISTING SANITARY MANHOLE. ADJUST RIM TO MATCH PROPOSED FINISHED GRADE.
12. REMOVE EXISTING SIGN.
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16. PROTECT EXISTING WATER STRUCTURE TO REMAIN.
17. NOT USED.
18. REPLACE EXISTING CULVERT AND HEADWALLS. REFER TO SHEET C7.4 FOR ADDITIONAL INFORMATION.
19. REMOVE ASPHALT PAVEMENT WALK TO EDGE OF LIMIT OF DISTURBANCE.
20. ADJUST TELEPHONE MARKER. CONTRACTOR TO COORDINATE WITH TELEPHONE COMPANY.

60 0 60 120

GRAPHIC SCALE (IN FEET)

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FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

ID	Description	Date
3	ADDENDUM 3	02/09/2024

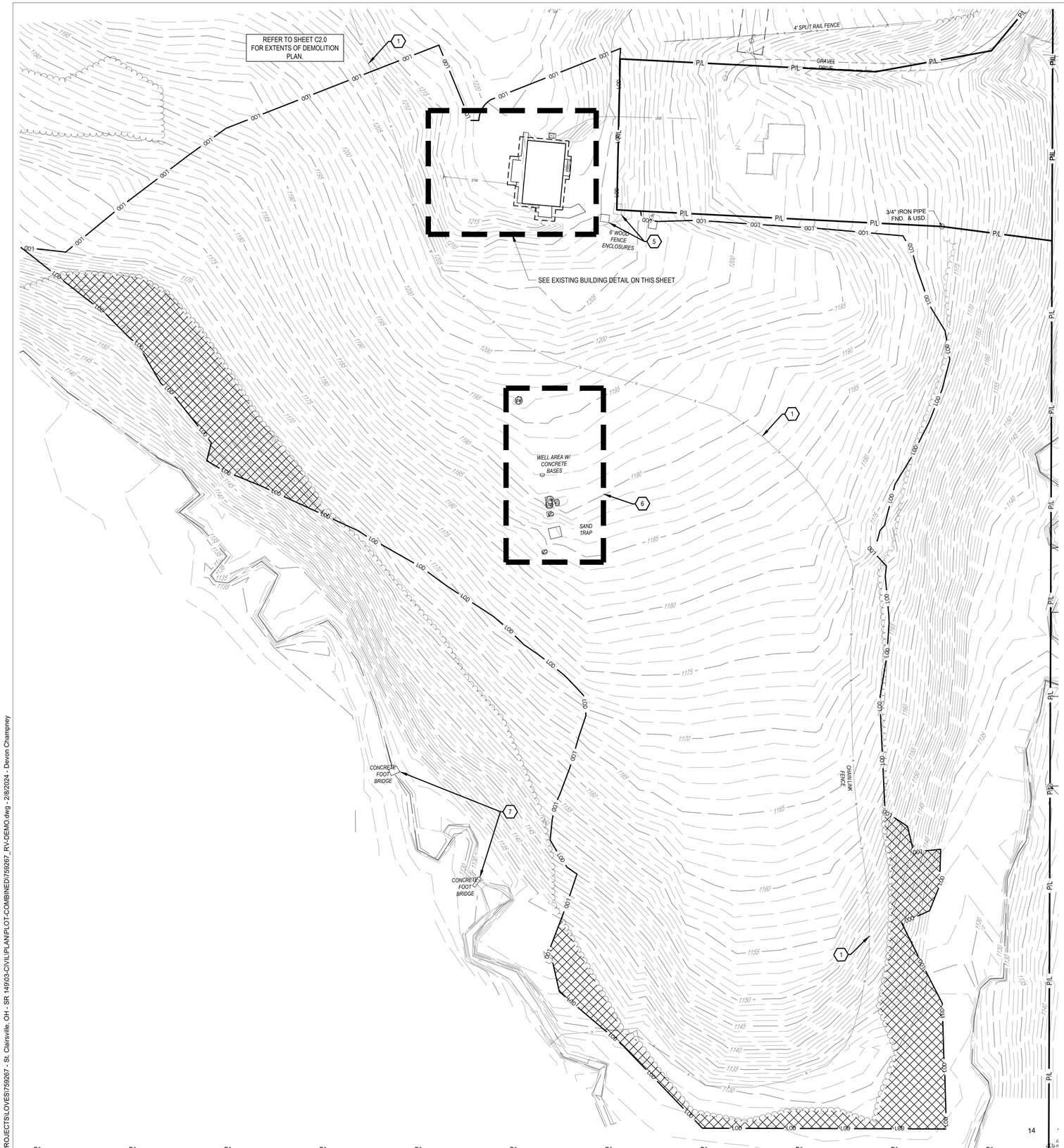
Project Number:	759267
Scale:	1" = 60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

DEMOLITION PLAN - WEST

C2.1

W:\PROJECTS\LOVES\759267 - St. Clairsville, OH - SR 149\03-CIVIL\PLAN\PLOT-COMBINED\759267_SITE DEMO.dwg - 2/8/2024 - Devon Champney



LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

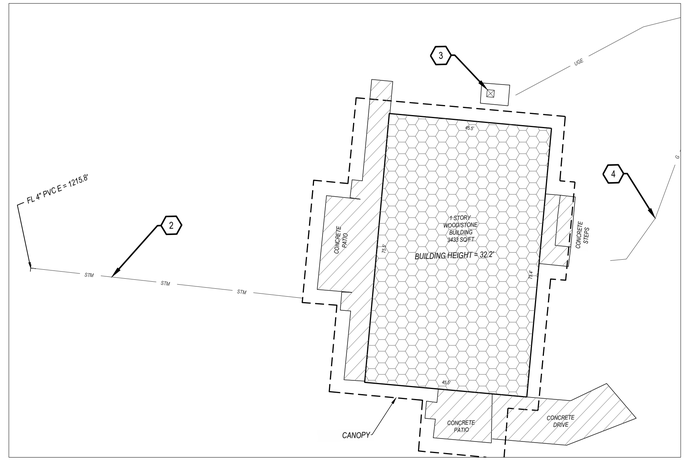
- LOD — LIMITS OF DISTURBANCE (L.O.D.)
- REMOVE EXISTING STRUCTURE, INCLUDING FOOTERS
- REMOVE PAVEMENT AND CONCRETE MATERIAL
- REMOVE EXISTING TREES AND BRUSH

GENERAL NOTES:

1. REMOVE ALL SITE FEATURES AS SHOWN ON THE PLAN AND LEGALLY DISPOSE OF OFF SITE.
2. SAWCUT EXISTING PAVEMENT TO FULL DEPTH, USING CARE TO CUT NEAT, STRAIGHT LINES. CUT AT EXISTING JOINTS WHERE POSSIBLE.
3. PROTECT EXISTING SITE FEATURES TO REMAIN OUTSIDE CONSTRUCTION LIMITS. REPAIR ANY DAMAGE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
4. USE ANY MEANS NECESSARY TO CONTROL DUST AT THE SITE. PROVIDE STREET CLEANING WHEN NECESSARY OR AS DIRECTED.
5. REFER TO ROADWAY PLANS FOR LIMITS OF PROPOSED WORK OUTSIDE THE SITE SCOPE.
6. FIELD VERIFY EXISTING LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES. IF EXISTING SYSTEM'S LOCATION OR ELEVATION IS FOUND TO BE DIFFERENT FROM THE PLANS, CONTRACTOR IS TO CONTACT THE ENGINEER.
7. IF FIELD TILES ARE ENCOUNTERED DURING CONSTRUCTION THEY SHALL BE REPAIRED AND/OR TIED INTO A STORM SEWER SYSTEM AS NEEDED TO MAINTAIN POSITIVE DRAINAGE.

CODED NOTES:

1. REMOVE EXISTING FENCE
2. REMOVE EXISTING STORM SEWER
3. REMOVE EXISTING ELECTRICAL STRUCTURE. COORDINATE WITH ELECTRIC COMPANY
4. REMOVE EXISTING GAS CONNECTION. COORDINATE WITH GAS COMPANY
5. REMOVE WOODEN FENCE ENCLOSURES
6. REMOVE EXISTING STRUCTURES AND PIPES.
7. EXISTING STRUCTURE TO REMAIN



EXISTING BUILDING DETAIL

SCALE: 1" = 20'

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

N

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GRAPHIC SCALE (IN FEET)

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Loves

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

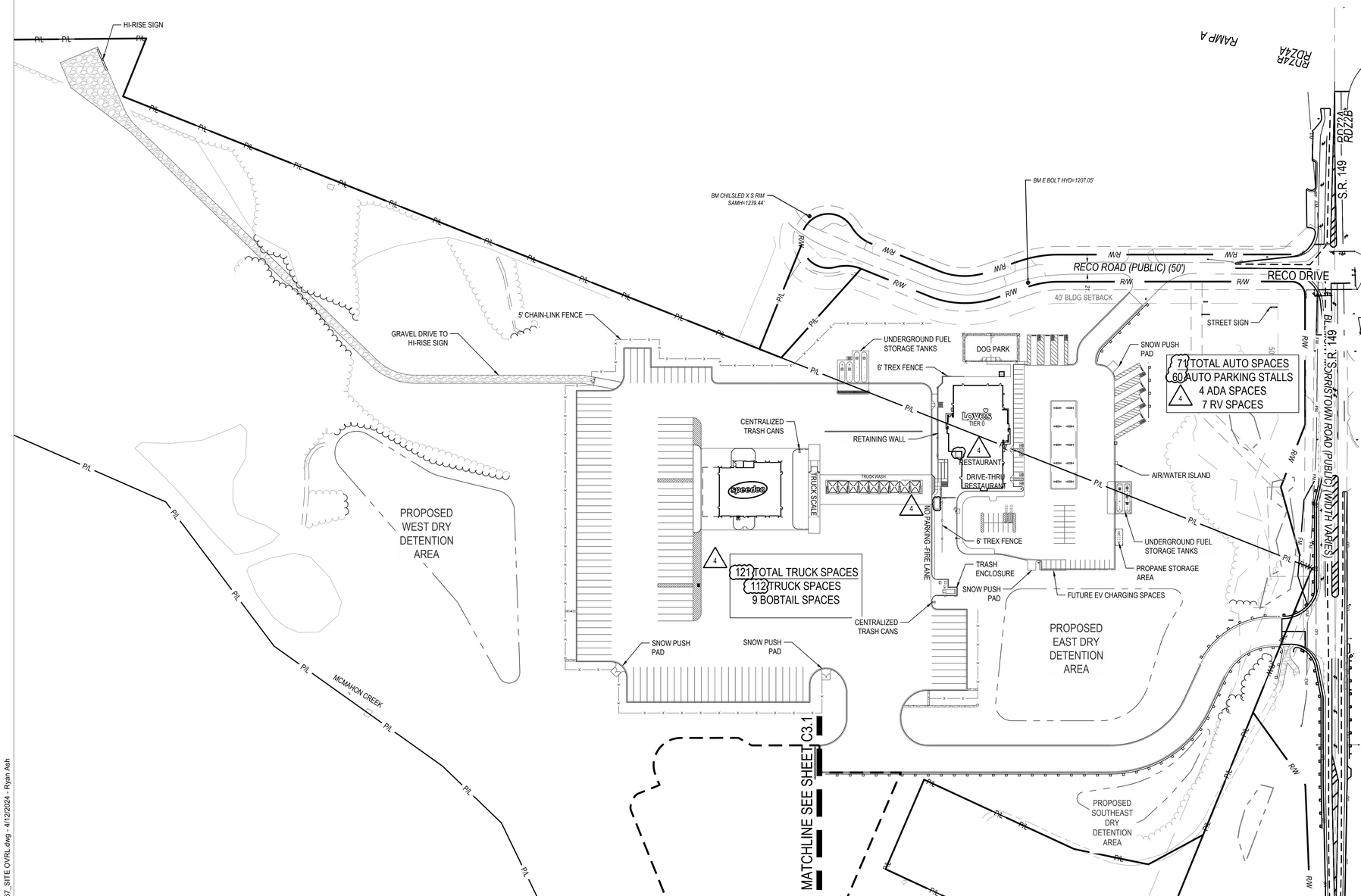
ID	Description	Date
3	ADDENDUM 3	02/09/2024

Project Number:	759267
Scale:	1" = 60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

DEMOLITION PLAN - PREPARED PAD AREA

C2.2



LEGEND

EXISTING

REFER TO ALTA/NSPS FOR EXISTING FEATURES LEGEND

PROPOSED

- CONCRETE CURB AND GUTTER
- PAVEMENT
- 6' TREX FENCE (REF. ARCH. PLANS)
- 5' CHAIN-LINK FENCE (REF. ARCH. PLANS)
- 4' BLACK CHAIN-LINK FENCE (REF. ARCH. PLANS)
- UTILITY EASEMENT
- LIGHT POLE SHOWN FOR REFERENCE ONLY. REFER TO ARCH. PLANS FOR ADDITIONAL INFORMATION AND EXACT LOCATION

SITE REQUIREMENTS:

BUILDING SETBACKS:	FRONT YARD - 40', REAR YARD - 0' RIGHT YARD - 50', LEFT YARD - 0'
PARKING SETBACKS:	NONE
STANDARD PARKING DIMENSIONS:	CAR: 9'Wx18'L (PERIMETER) 10'Wx20'L (INTERIOR) TRUCK: 12'6"Wx65'L (PERIMETER) 12'6"Wx75'L (INTERIOR) RV: 10'Wx40'L
MINIMUM DRIVE AISLE:	NONE

SITE ANALYSIS:

PROPOSED BUILDING AREA	LOVE'S COUNTRY STORE:	12,393 ± S.F.
	ATTACHED RESTAURANT:	2,998 ± S.F.
	DRIVE-THRU RESTAURANT:	3,221 ± S.F.
	TIRE SHOP:	11,135 ± S.F.
TOTAL:		29,747 ± S.F.

PARKING PROVIDED:

PARKING DIMENSIONS: VARIES
(9) ADA CAR PARKING SPACES
(60) STANDARD CAR PARKING SPACES
(7) RV PARKING SPACES
(9) BOBTAIL PARKING SPACES
(112) TRUCK PARKING SPACES
192 TOTAL PARKING SPACES

GRAPHIC SCALE (IN FEET): 100 0 100 200

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Love's

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

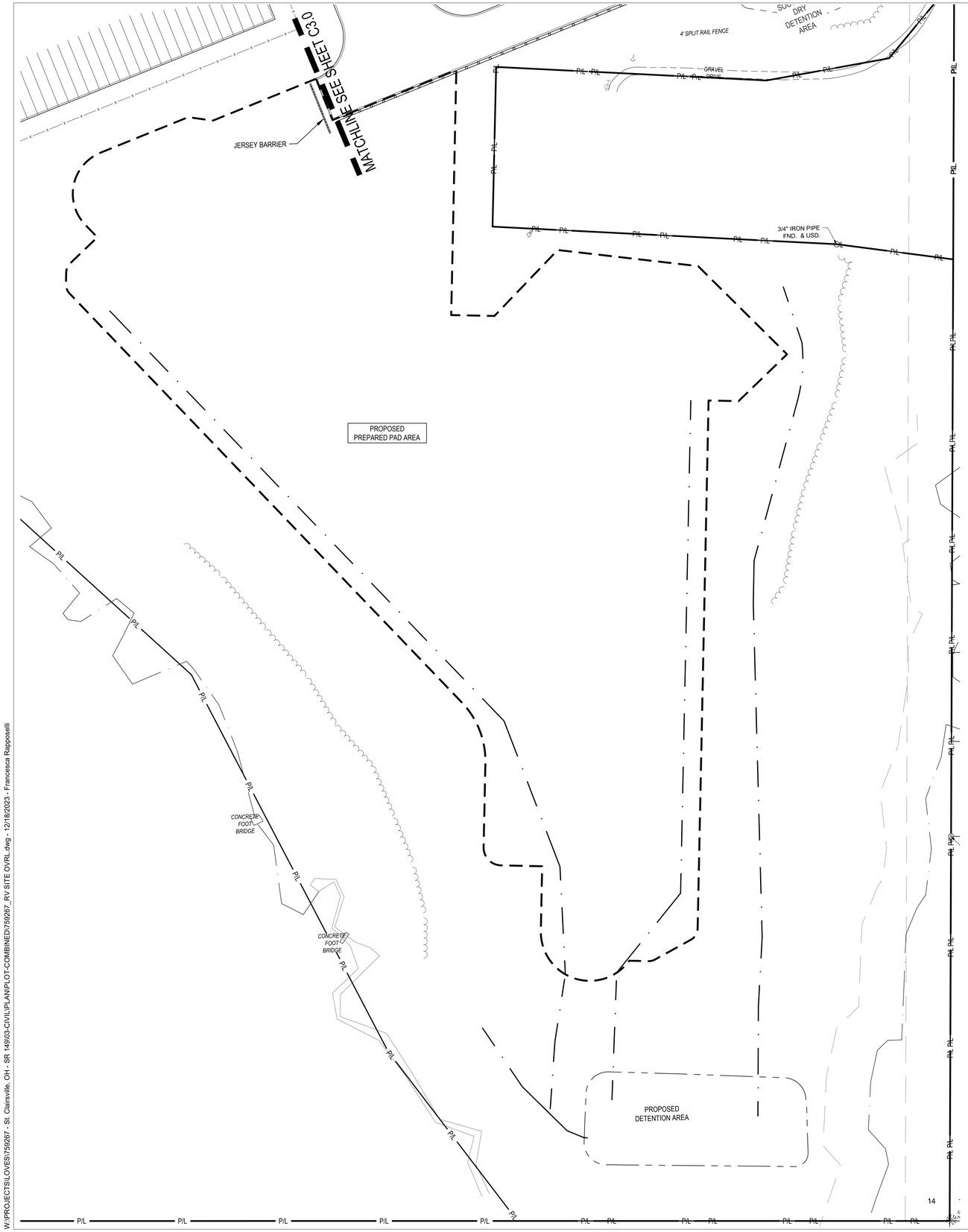
ID	Description	Date
3	ADDENDUM 3	02/09/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1" = 100'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

OVERALL SITE PLAN

C3.0



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LEGEND

EXISTING

REFER TO ALTA/NSPS FOR EXISTING FEATURES LEGEND

SWALE

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER

12/18/2023

OHIO811.org Before You Dig

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

N

60 0 60 120
GRAPHIC SCALE (IN FEET)

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

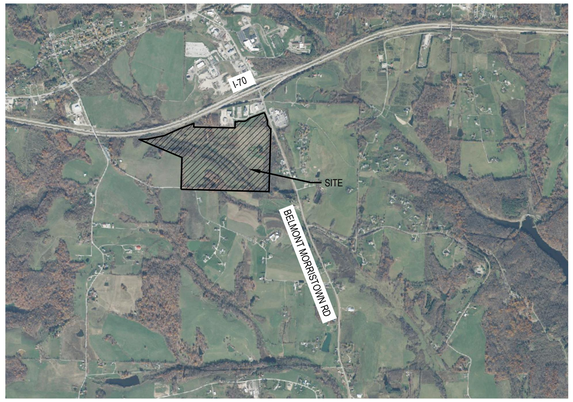
Revisions / Submissions

ID	Description	Date

Project Number:	759267
Scale:	1" = 60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
OVERALL SITE PLAN - PREPARED PAD AREA

C3.1



EROSION AND SEDIMENT CONTROL NARRATIVE

SITE ADDRESS: 66320 BELMONT-MORRISTOWN ROAD
ST. CLAIRSVILLE, OHIO 43718

EXISTING SITE CONDITIONS: THE EXISTING SITE CONSISTS OF WOODED AREAS, GRASS LAND HILLS, AND AN EXISTING BUILDING WITH AN UNPAVED DRIVE LEADING TO THE BUILDING.

THE SUBJECT PARCEL IS LOCATED WITHIN "ZONE X" (AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS INDICATED BY THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER 39013C0175E, EFFECTIVE DATE: APRIL 5, 2006; PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

PROJECT DESCRIPTION: THE PROJECT CONSISTS OF BUILDINGS, CANOPIES, FUEL TANKS, PIPING AND DISPENSERS AND PARKING LOT CONSTRUCTION FOR A LOVE'S TRAVEL STOP.

TOTAL SITE AREA: 260.23 ACRES
PRE-CONSTRUCTION IMPERVIOUS ACREAGE = 0.11 ACRES

DISTURBED AREA TRAVEL STOP: 28.32 ACRES
POST-CONSTRUCTION IMPERVIOUS ACREAGE FOR THE EAST DRAINAGE AREA = 5.30 ACRES
POST-CONSTRUCTION IMPERVIOUS ACREAGE FOR THE WEST DRAINAGE AREA = 7.64 ACRES
POST-CONSTRUCTION IMPERVIOUS ACREAGE FOR THE SOUTHEAST DRAINAGE AREA = 0.52 ACRES

DISTURBED AREA PREPARED PAD: 14.61 ACRES
POST-CONSTRUCTION IMPERVIOUS ACREAGE FOR THE SOUTH DRAINAGE AREA= 3.42 ACRES

RUNOFF FOR TRAVEL STOP: THE PRE-CONSTRUCTION RUNOFF CURVE NUMBER FOR THE EAST DRAINAGE AREA IS 62.
THE PRE-CONSTRUCTION RUNOFF CURVE NUMBER FOR THE WEST DRAINAGE AREA IS 64.
THE PRE-CONSTRUCTION RUNOFF CURVE NUMBER FOR THE SOUTHEAST DRAINAGE AREA IS 69.
THE POST-CONSTRUCTION RUNOFF CURVE NUMBER FOR THE EAST DRAINAGE AREA IS 89.
THE POST-CONSTRUCTION RUNOFF CURVE NUMBER FOR THE WEST DRAINAGE AREA IS 86.
THE POST-CONSTRUCTION RUNOFF CURVE NUMBER FOR THE SOUTHEAST DRAINAGE AREA IS 83.

RUNOFF FOR PREPARED PAD: THE PRE-CONSTRUCTION RUNOFF CURVE NUMBER FOR THE SOUTH DRAINAGE AREA IS 74.
THE POST-CONSTRUCTION RUNOFF CURVE NUMBER FOR THE SOUTH DRAINAGE AREA IS 82.

SITE DRAINS TO: MCMAHON CREEK TO THE WEST AND AN UNAMED TRIBUTARY OF OF MCMAHON CREEK TO THE EAST.

RECEIVING BODY: UPPER MCMAHON CREEK

SITE BMP'S: FINAL LOCATIONS OF ALL SITE BMP'S INCLUDE DUMPSTER, VEHICLE FUELING AREAS, CONCRETE TRUCK WASH, MATERIAL STORAGE, AND TOPSOIL STOCKPILES SHALL BE DETERMINED BY CONTRACTOR. IF FINAL LOCATION OF BMP'S DIFFER FROM THE LOCATIONS SHOWN, CONTRACTOR SHALL MODIFY SWPPP AND INFORM OHIO EPA OF NEW LOCATION OF BMP'S.

ADJACENT AREAS FOR TRAVEL STOP:
NORTH: NO ZONING
SOUTH: NO ZONING
EAST: NO ZONING
WEST: NO ZONING

ADJACENT AREAS FOR PREPARED PAD:
NORTH: NO ZONING
SOUTH: NO ZONING
EAST: NO ZONING
WEST: NO ZONING

SOILS ON SITE: REFER TO SHEET THIS SHEET FOR SOILS MAP BOUNDARIES.

EROSION AND SEDIMENT CONTROL MEASURES: PROVIDE INLET PROTECTION OF ALL NEW AND EXISTING DRAINAGE STRUCTURES INDICATED ON THIS PLAN.

ANY OFF-SITE BORROW OR SPOIL AREAS SHALL BE SUBJECT TO THE REQUIREMENTS SET FORTH BY THE OHIO EPA. ALL EROSION AND SEDIMENT CONTROL MEASURES FOR OFF-SITE AREAS NOT COVERED BY A SEPARATE NPDES PERMIT OR SWPPP SHALL BE COORDINATED WITH THE OHIO EPA.

ALL TRENCH OR EXCAVATION GROUNDWATER CONTAINING SEDIMENT MUST BE EFFECTIVELY TREATED PRIOR TO DISCHARGE INTO THE STORM SEWER SYSTEM.

USE ANY MEANS NECESSARY AND ACCEPTABLE TO THE JURISDICTION TO CONTROL DUST ON THE SITE AND PREVENT TRACKING SOIL OFF SITE.

CRITICAL AREAS: WETLANDS, STREAMS, AND RIVERS LOCATED ON SITE AND ARE NOT TO BE DISTURBED.

JURISDICTION: ALL EROSION AND SEDIMENT CONTROL PRACTICES ARE SUBJECT TO FIELD MODIFICATION AT THE DISCRETION OF OHIO EPA.

INSPECTIONS: INSPECTIONS OF OUTFALLS/EPSC MEASURES SHALL BE PERFORMED AT LEAST TWICE WEEKLY AND AT LEAST 72 HOURS APART. COORDINATION OF THESE INSPECTIONS IS THE RESPONSIBILITY OF THE OWNER'S REPRESENTATIVE.

DOCUMENT INSPECTIONS WEEKLY AND SUBMIT INSPECTION REPORT MONTHLY. A COPY OF THIS SWPPP AND INSPECTION REPORT IS TO BE MADE AVAILABLE ON SITE AT ALL TIMES. ON-SITE SWPPP IS TO BE LOCATED IN THE JOB TRAILER.

OUTFALLS/EPSC AND OTHER PROTECTIVE MEASURES SHALL BE REPAIRED, REPLACED OR MODIFIED WITHIN 7 DAYS ACCORDING TO THE NEEDS IDENTIFIED IN THE INSPECTION REPORT.

SCHEDULE: CONSTRUCTION ESTIMATED START DATE: JANUARY 2024
CONSTRUCTION ESTIMATED COMPLETION DATE: APRIL 2025

STORMWATER POLLUTION PREVENTION PLAN GENERAL NOTES

OWNER/DEVELOPER
LOVE'S TRAVEL STOPS & COUNTRY STORES, INC.
10601 N. PENNSYLVANIA AVE.
OKLAHOMA CITY, OK 73120

CONTACT: CHAD BRUNER
PH: (405) 463-8801
CHAD.BRUNER@LOVES.COM

ENGINEER/PLAN DESIGNER
CESO, INC.
175 MONTROSE WEST AVE. SUITE 400
AKRON, OHIO 44321

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STORMWATER POLLUTION PREVENTION PLAN NOTES

SITE EPSC SHALL BE CHECKED AND IF NECESSARY, REPAIRED WEEKLY AND WITHIN 24 HOURS AFTER EACH RAINFALL GREATER THAN ½". IN THE EVENT OF CONTINUOUS RAINFALL, EROSION CONTROLS SHALL BE CHECKED DAILY.

REMOVE TRAPPED SEDIMENT FROM SEDIMENT CONTROLS AT OR BEFORE 50% OF DESIGN CAPACITY.

ALL AREAS TO REMAIN BARE GREATER THAN 7 DAYS MUST BE TEMPORARILY STABILIZED.

THERE SHALL BE NO DIRT, DEBRIS, OR STORAGE OF MATERIALS IN THE STREET.

GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STONE LAYER OF THE CONSTRUCTION ENTRANCE.

STRAW BALES SHALL NOT BE USED AS A FORM OF EROSION CONTROL.

ALL EPSC PROPOSED MUST BE INSTALLED TO CONTROL RAINFALL AND RUNOFF FOR THE 2-YR, 24-HOUR STORM EVENT.

QUALITY ASSURANCE INSPECTION OF EROSION AND SEDIMENT CONTROLS SHALL BE PERFORMED WITHIN ONE MONTH OF CONSTRUCTION COMMENCING PER THE STATE OF OHIO NPDES PERMIT GUIDELINES.

1. ALL EROSION AND SEDIMENTATION CONTROL SHALL BE PERFORMED ACCORDING TO: SWPPP AND DETAIL PLANS; ACCORDING TO THE LATEST OHIO EPA AUTHORIZATION FOR CONSTRUCTION ACTIVITY UNDER THE "NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM" (NPDES); ANY AND ALL REQUIRED PERMITS, REPORTS, AND RELATED DOCUMENTS. SEE OHIO EPA FOR SWPPP RULES AND REGULATIONS. ALL CONTRACTORS AND SUBCONTRACTORS MUST BECOME FAMILIAR WITH ALL OF THE ABOVE. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED IN THE FIELD BY THE INSPECTOR.
2. CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES AS REQUIRED BY THE SWPPP. ADDITIONAL BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED AS DICTATED BY CONDITIONS AND GRADE CHANGES TO THE SITE AT NO ADDITIONAL COST TO OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION.
3. CONTRACTOR SHALL MINIMIZE CLEARING AND DISTURBANCE TO THE ENVIRONMENT TO THE MAXIMUM EXTENT POSSIBLE OR AS REQUIRED BY THE GENERAL PERMIT. DO NOT DISTURB AREA OUTSIDE OF THE LIMITS OF DISTURBANCE (L.O.D).
4. SEDIMENT STRUCTURE AND PERIMETER SEDIMENT BARRIERS SHALL BE IMPLEMENTED AS THE FIRST STEP OF GRADING WITHIN SEVEN (7) DAYS FROM THE START OF CLEARING AND GRUBBING, AND SHALL CONTINUE TO FUNCTION UNTIL THE SLOPE DEVELOPMENT AREA IS RESTABILIZED.
5. SOIL STABILIZATION:

- PERMANENT SOIL STABILIZATION OF DISTURBED AREAS BY MEANS OF VEGETATION, LANDSCAPE TYPE, MULCHING, MATTING, SOD, RIP RAP, AND OTHER APPROVED LANDSCAPING TECHNIQUES TO BE APPLIED AS FOLLOWS:
  WITHIN SEVEN (7) DAYS OF ANY AREA THAT WILL BE DORMANT FOR ONE (1) YEAR OR MORE.
  WITHIN TWO (2) DAYS OF ANY AREA WITHIN 50 FEET OF A STREAM AT FINAL GRADE.
  WITHIN SEVEN (7) DAYS FOR ANY OTHER AREA AT FINAL GRADE.
- TEMPORARY SOIL STABILIZATION OF DISTURBED AREAS BY MEANS OF TEMPORARY VEGETATION, MULCHING, GEOTEXTILES, SOD, PRESERVATION OF EXISTING VEGETATION, AND OTHER APPROVED TECHNIQUES TO BE APPLIED AS FOLLOWS:
  WITHIN TWO (2) DAYS OF ANY AREA WITHIN 50 FEET OF A STREAM NOT AT FINAL GRADE. WITHIN SEVEN (7) DAYS OF ANY AREA THAT WILL BE DORMANT FOR MORE THAN FOURTEEN (14) DAYS, BUT LESS THAN ONE (1) YEAR. PRIOR TO THE ONSET OF WINTER WEATHER FOR AREAS THAT WILL BE IDLE OVER WINTER.
- TEMPORARY SEEDING, MULCHING, AND FERTILIZER SPECIFICATIONS:
  SEEDING: ANNUAL RYEGRASS AT 2.02 #/1,000 S.F.
  MULCHING: STRAW MATERIAL SHALL BE UNROTTED SMALL GRAIN STRAW APPLIED AT A RATE OF TWO (2)TON/ACRE, OR 80-100 POUNDS PER 1,000 S.F. MULCH MATERIALS SHALL BE RELATIVELY FREE OF ALL KINDS OF WEEDS AND SHALL BE FREE OF PROHIBITIVE NOXIOUS WEEDS. MULCH SHALL BE SPREAD UNIFORMLY BY HAND OR MECHANICAL MEANS. FROM NOVEMBER 01 THRU MARCH 15 INCREASE THE RATE OF STRAW MULCH TO THREE (3) TON/ACRE.
  FERTILIZER: APPLY FERTILIZER AT HALF THE RATE OF PERMANENT APPLICATION AND AS PER STATE DOT SPECIFICATIONS. IF PROJECT CONDITIONS PREVENT FERTILIZING THE SOIL, THEN THIS ITEM MAY BE WAIVED.
- PERMANENT SEEDING SHALL BE IN ACCORDANCE WITH OHIO EPA STANDARD SPECIFICATIONS.
- SLOPES SHALL BE LEFT IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION. ALL SLOPES 3:1 OR GREATER THAN 3:1 SHALL BE FERTILIZED, SEEDED, PROFILE PROMATRIX EROSION MULCHING OR EROSION CONTROL BLANKETS INSTALLED, AND LOW MAINTENANCE GRASS SEED MIX APPLIED ON THE SLOPES, AS SPECIFIED IN THE PLANS.

6. NO SOLID (OTHER THAN SEDIMENT) OR LIQUID WASTE, INCLUDING BUILDING MATERIALS, SHALL BE DISCHARGED IN STORM WATER RUNOFF. ALL NON-SEDIMENT POLLUTANTS MUST BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL GUIDELINES. WASH OUT OF CEMENT TRUCKS SHOULD OCCUR IN DESIGNATED PIT OR DIKED AREAS, WHERE WASHINGS CAN BE REMOVED AND PROPERLY DISPOSED OF OFF-SITE WHEN THEY HARDEN. STORAGE TANKS SHOULD ALSO BE LOCATED IN PIT OR DIKED AREAS. IN ADDITION, SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS TO CLEAN AND CONTAIN FUEL AND CHEMICAL SPILLS MUST BE KEPT ON SITE.
7. IF THE ACTION OF VEHICLES TRAVELING OVER THE STABILIZED CONSTRUCTION EXIT DOES NOT SUFFICIENTLY REMOVE MOST OF THE DIRT AND MUD, THEN THE TIRES MUST BE WASHED BEFORE VEHICLES ENTER A PUBLIC ROAD. PROVISIONS MUST BE MADE TO INTERCEPT THE WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFF THE SITE.
8. RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DISPOSED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE SITE THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.
9. DUST CONTROL USING APPROVED MATERIALS MUST BE PERFORMED AT ALL TIMES. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION IS PROHIBITED.
10. ON-SITE AND OFF-SITE STOCKPILE AND BORROW AREAS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION BY THE USE OF BEST MANAGEMENT PRACTICES. THESE AREAS MUST BE SHOWN IN THE SITE MAP AND PERMITTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS. AT A MINIMUM, A SILT FENCE IS TO BE PLACED AT PERIMETER OF STOCKPILE AREA TO PREVENT SOIL FROM LEAVING THE STOCKPILE AREA.
11. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED ONTO THE ROADWAYS OR INTO THE STORM SEWERS MUST BE REMOVED IMMEDIATELY.
12. ALL CONSTRUCTION SHALL BE STABILIZED AT THE END OF EACH DAY; THIS INCLUDES BACKFILLING OF TRENCHES FOR UTILITY CONSTRUCTION AND PLACEMENT OF GRAVEL OR ASPHALT FOR ROAD CONSTRUCTION.
13. THE LAST LAYER OF SOIL, INCLUDING TOP SOIL, SHALL BE COMPACTED TO 80% - 85% OF THE MAXIMUM STANDARD PROCTOR DENSITY, IN AREAS OUTSIDE THE PARKING LOT THAT WILL RECEIVE VEGETATION. THIS IS PARTICULARLY IMPORTANT IN CUT SLOPE AND EMBANKMENT AREAS. IN PAVEMENT AND ISLAND AREAS, IT IS RECOMMENDED THAT THE SOIL BE COMPACTED TO 98% AND 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY RESPECTIVELY; THE LAST COMPACTED LAYER MAY BE SCARIFIED TO IMPROVE THE SOIL GROWTH CHARACTERISTICS.
14. IN THE EVENT THAT HIGH GROUND WATER IS ENCOUNTERED, CONTRACTOR IS RESPONSIBLE FOR DESIGNING AND IMPLEMENTING A PLAN TO CONTROL BOTH SURFACE AND GROUND WATER DURING THE COURSE OF CONSTRUCTION. ALL DEWATERING ACTIVITIES SHALL PASS THROUGH A BMP PRIOR TO LEAVING THE SITE.

INSPECTION/MAINTENANCE NOTES

FILTER BARRIERS, INCLUDING BUT NOT LIMITED TO SILT FENCE AND INLET PROTECTION, SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY HALF THE HEIGHT OF THE BARRIER.

IF THE FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE, AND THE BARRIER IS STILL REQUIRED, THE FABRIC SHALL BE REPLACED PROMPTLY.

ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED, AND SEEDED.

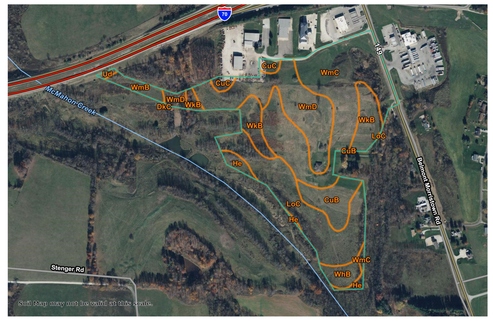
1. ALL CONTROL MEASURES STATED IN THE SWPPP SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL TEMPORARY OR PERMANENT STABILIZATION OF THE SITE IS ACHIEVED. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED BY A QUALIFIED PERSON IN ACCORDANCE TO THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED ACCORDING TO THE FOLLOWING:
   A. INLET PROTECTION DEVICES AND CONTROLS SHALL BE REPAIRED OR REPLACED WHEN THEY SHOW SIGNS OF UNDERMINING AND OR DETERIORATION.
   B. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STANDING OF GRASS IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDED AS NEEDED.
   C. SILT FENCES AND CHECK DAMS SHALL BE REPAIRED TO THEIR ORIGINAL CONDITION IF DAMAGED. SEDIMENT ACCUMULATION MUST BE REMOVED WHEN SEDIMENT HEIGHT REACHES ONE-HALF THE HEIGHT OF THE SILT FENCE OR CHECK DAM.
   D. OUTLET STRUCTURES IN SEDIMENTATION BASINS SHALL BE MAINTAINED IN OPERATIONAL CONDITIONS AT ALL TIMES. SEDIMENT MUST BE REMOVED FROM BASINS AND OR TRAPS WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY 40%.
   E. MINIMIZE OFF-SITE SEDIMENT TRACKING OF VEHICLES BY THE USE OF STONE MATERIAL IN ALL CONSTRUCTION ENTRANCES, ALONG WITH REGULARLY SCHEDULED SWEEPING/GOOD HOUSEKEEPING. STABILIZED CONSTRUCTION ENTRANCES TO BE PROPERLY MAINTAINED BY GENERAL CONTRACTOR AND IN GOOD WORKING ORDER AT ALL TIMES; THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE STONE AS CONDITIONS DEMAND.
   F. THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE) BY GENERAL CONTRACTOR. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE TEMPORARY PARKING AS CONDITIONS DEMAND.
2. CONTRACTORS AND SUBCONTRACTORS WILL BE RESPONSIBLE FOR REMOVING ALL SEDIMENT FROM THE SITE, INCLUDING DETENTION BASINS AND STORM SEWER SYSTEMS. SEDIMENT DEPOSITION DURING SITE STABILIZATION MUST ALSO BE REMOVED.
3. ALL RIP RAP MUST BE PLACED OVER GEOTEXTILE FILTER.
4. STONE CONSTRUCTION EXIT TO BE MAINTAINED BY GENERAL CONTRACTOR UNTIL SITE HAS BEEN PAVED OR IS NO LONGER REQUIRED.

SOLID/SANITARY/TOXIC WASTES NOTES

1. CONTAINERS SHALL BE AVAILABLE FOR DISPOSAL OF DEBRIS, TRASH, HAZARDOUS OR PETROLEUM WASTES. ALL CONTAINERS MUST BE COVERED AND LEAK-PROOF. ALL WASTE MATERIAL SHALL BE DISPOSED OF AT FACILITIES APPROVED FOR THE PERTINENT MATERIAL.
2. BRICKS, HARDENING CONCRETE AND SOIL WASTE SHALL BE FREE FROM CONTAMINATION WHICH MAY LEACH CONSTITUENTS TO WATERS OF THE STATE.
3. CLEAN CONSTRUCTION WASTES THAT WILL BE DISPOSED INTO THE PROPERTY SHALL BE SUBJECT TO ANY LOCAL PROHIBITIONS FROM THIS TYPE OF DISPOSAL.
4. ALL CONSTRUCTION AND DEMOLITION DEBRIS (C&DD) WASTE SHALL BE DISPOSED OF IN AN APPROVED C&DD LANDFILL. CONSTRUCTION DEBRIS MAY BE DISPOSED OF ON-SITE, BUT DEMOLITION DEBRIS MUST BE DISPOSED OF IN AN APPROVED LANDFILL. ALSO, MATERIALS WHICH CONTAIN ASBESTOS MUST COMPLY WITH AIR POLLUTION REGULATIONS.
5. AREA SHALL BE DESIGNATED BY CONTRACTOR AND SHOWN ON SWPPP MAP FOR MIXING OR STORAGE OF COMPOUNDS SUCH AS FERTILIZERS, LIME ASPHALT, OR CONCRETE, THESE DESIGNATED AREAS SHALL BE LOCATED AWAY FROM WATERCOURSES, DRAINAGE DITCHES, FIELD DRAINS, OR OTHER STORMWATER DRAINAGE AREA.
6. EQUIPMENT FUELING & MAINTENANCE SHALL BE IN DESIGNATED AREAS ONLY.
7. A SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN MUST BE DEVELOPED FOR SITES WITH ONE ABOVE-GROUND STORAGE TANK OF 660 GALLONS OR MORE, TOTAL ABOVE-GROUND STORAGE OF 1,330 GALLONS OR BELOW-GROUND STORAGE OF 4,200 GALLONS OF FUEL.
8. ALL DESIGNATED CONCRETE WASHOUT AREAS SHALL BE LOCATED AWAY FROM WATERCOURSES, DRAINAGE DITCHES, FIELD DRAINS OR OTHER STORMWATER DRAINAGE AREAS.
9. ALL CONTAMINATED SOIL MUST BE TREATED AND/OR DISPOSED OF IN AN APPROVED SOLID WASTE MANAGEMENT FACILITY OR HAZARDOUS WASTE TREATMENT, STORAGE OR DISPOSAL FACILITIES.
10. THE CONTRACTOR SHALL CONTACT OHIO EPA, THE LOCAL FIRE DEPARTMENT AND THE LOCAL EMERGENCY PLANNING COMMITTEE IN THE EVENT OF A PETROLEUM SPILL (>25 GALLONS) OR THE PRESENCE OF SHEEN.
11. OPEN BURNING IS NOT PERMITTED ON THE SITE.

GENERAL NOTES

1. ADDITIONAL EROSION AND SEDIMENT CONTROLS MAY BE REQUIRED AS IDENTIFIED WITH OHIO EPA AND LOCAL JURISDICTION INSPECTOR.
2. CONTRACTOR SHALL REVIEW THE COMPLETE DRAWING SET AND NOTIFY THE DESIGN PROFESSIONAL IN WRITING PRIOR TO CONSTRUCTION IF ANY DISCREPANCIES ARE FOUND WITHIN THE DRAWINGS OR WITH ACTUAL FIELD CONDITIONS.
3. ALL STORMWATER POLLUTION PREVENTION PLANS, NOTES AND DETAILS SHALL COMPLY WITH THE OHIO ENVIRONMENTAL PROTECTION AGENCY (OHIO EPA).
4. CONTRACTOR IS RESPONSIBLE TO MAINTAIN EROSION CONTROL MEASURES UNTIL ADEQUATE RE-VEGETATION AND STABILIZATION ARE ACHIEVED.
5. CONTRACTOR SHALL PROVIDE AND POST NOTICE OF INTENT (NOI) WITH PROJECT DESCRIPTION AND CONTACT NUMBERS.
6. CONTRACTOR SHALL MODIFY THE SEQUENCE OF CONSTRUCTION BASED ON MEANS AND METHODS. ALL EROSION AND SEDIMENT CONTROL MEASURES FROM THE BEGINNING OF EARTH DISTURBING ACTIVITIES TO THE FINAL COMPLETION OF THE PROJECT ARE THE RESPONSIBILITY OF THE SITE WORK CONTRACTOR.



SOILS ON SITE:				
WESTMORELAND SILT LOAM	-	WmC	-	8 TO 15% SLOPES
WESTMORELAND SILT LOAM	-	WmD	-	15 TO 25% SLOPES
WESTMORELAND SILT LOAM	-	WmB	-	3 TO 8% SLOPES
WESTMORELAND SILT LOAM	-	WkB	-	3 TO 8% SLOPES
WELLSTON SILT LOAM	-	WhB	-	3 TO 8% SLOPES
UDORTHENTS-URBAN LAND COMPLEX	-	Ud	-	N/A
LOWELL-WESTMORELAND SILT LOAM	-	LoC	-	8 TO 15% SLOPES
HARTSHORN SILT LOAM	-	He	-	OCCASIONALLY FLOODED
DEKALB LOAM	-	DkC	-	8 TO 15% SLOPES
CULLEOKASILT LOAM	-	CuC	-	8 TO 15% SLOPES
CULLEOKASILT LOAM	-	CuB	-	3 TO 8% SLOPES

SOILS MAP
NOT TO SCALE

REFER TO SHEETS C4.7 TO C4.10 FOR SWPPP DETAILS

REFER TO SHEETS C7 SERIES FOR GRADING PLAN

OHIO811.org Before You Dig

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER
12/18/2023

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH
66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

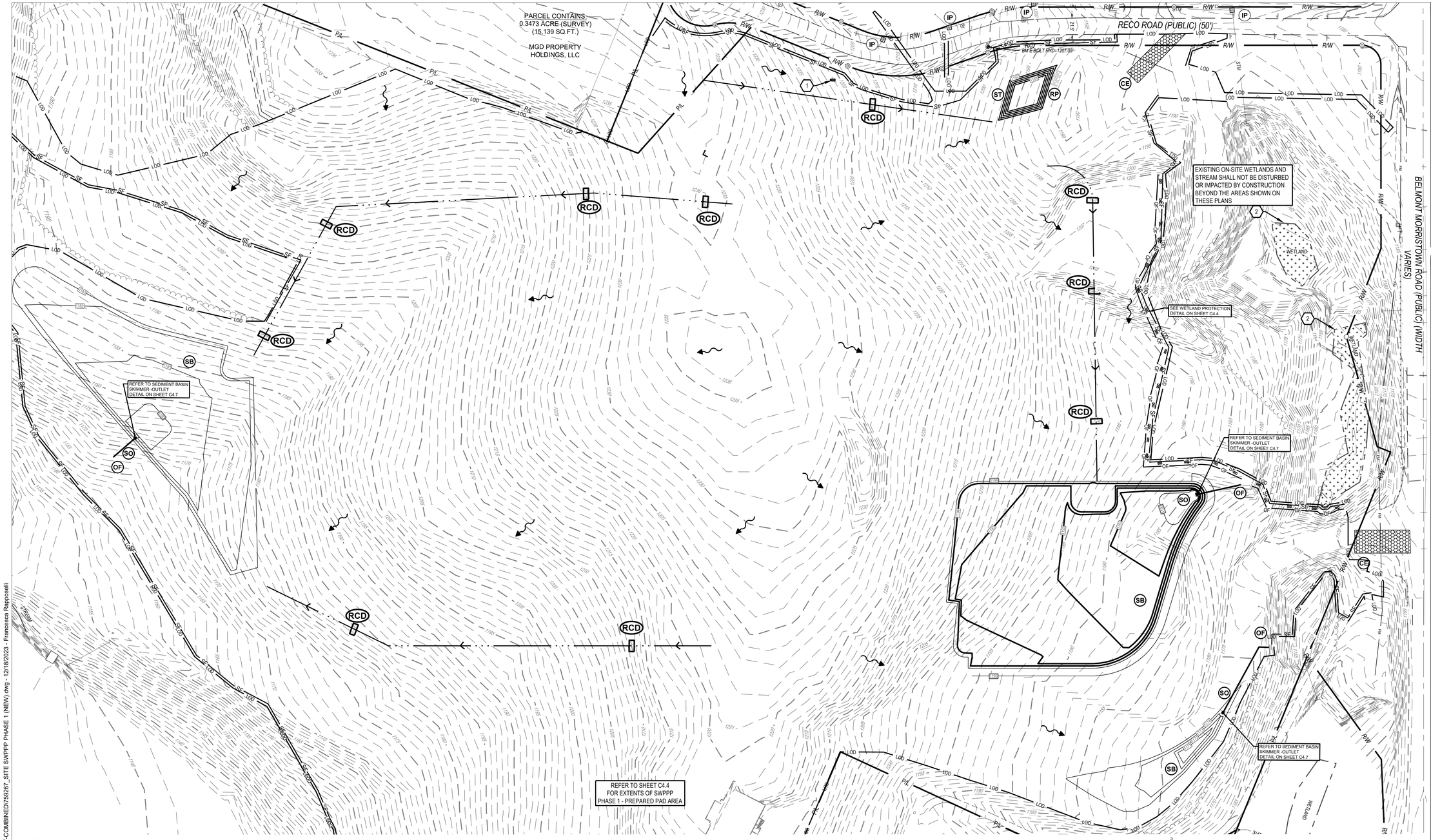
Revisions / Submissions

ID	Description	Date

Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SWPPP NOTES

C4.0



GENERAL NOTES

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2. CONTRACTOR SHALL REVIEW THE COMPLETE DRAWING SET AND NOTIFY THE DESIGN PROFESSIONAL IN WRITING PRIOR TO CONSTRUCTION, IF ANY DISCREPANCIES ARE FOUND WITHIN THE DRAWINGS OR WITH ACTUAL FIELD CONDITIONS.
3. ALL STORMWATER POLLUTION PREVENTION PLANS, NOTES AND DETAILS SHALL COMPLY WITH THE OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA).
4. CONTRACTOR IS RESPONSIBLE TO MAINTAIN POST-CONSTRUCTION PERMANENT EROSION CONTROL MEASURES UNTIL ADEQUATE RE-VEGETATION AND STABILIZATION ARE ACHIEVED.
5. REMOVE ALL ON SITE FEATURES AS SHOWN ON THE PLAN AND LEGALLY DISPOSE OF OFF SITE.
6. PROTECT EXISTING SITE FEATURES TO REMAIN OUTSIDE CONSTRUCTION LIMITS. REPAIR ANY DAMAGE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
7. USE ANY MEANS NECESSARY AND ACCEPTABLE TO THE JURISDICTION TO CONTROL DUST AT THE SITE. PROVIDE STREET CLEANING WHEN NECESSARY OR AS DIRECTED.
8. SILT FENCE SHOWN OFF OF LIMITS OF DISTURBANCE FOR CLARITY PURPOSES ONLY. CONTRACTOR TO ENSURE SILT FENCE IS PLACED AT LIMITS OF DISTURBANCE. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ENGINEER PRIOR TO PLACEMENT OF ANY EROSION CONTROL MEASURES.
9. TRUELOOK SITE CAMERA AND COMPONENTS SHALL BE PROVIDED BY OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION, MAINTENANCE, AND REMOVAL AS PER THE TRUELOOK CAMERA INSTALLATION GUIDE. CAMERA TO BE POLE MOUNTED APPROXIMATELY 35' IN THE AIR WITH 6' BURIED, AND SHALL BE PLACED AS SHOWN ON THE PLANS, OR IN A LOCATION THAT OFFERS MAXIMUM SITE VISIBILITY, AND WHICH WILL NOT BE DISTURBED OR MOVED DURING CONSTRUCTION.

SEQUENCE OF CONSTRUCTION - (PHASE ONE)

UNLESS NOTED OTHERWISE, THE GENERAL CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES IN STRICT ACCORDANCE WITH THE SWPPP THROUGHOUT THE DURATION OF THE PROJECT.

1. ENSURE NOTICE OF INTENT (N.O.I.) IS FILED. KEEP A COPY OF THE PERMIT AND SWPPP ON SITE.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THE SWPPP INCLUDING CULVERT UNDER ACCESS DRIVE FROM RECO ROAD.
3. INSPECTION OF EROSION CONTROL MEASURES AS OUTLINED IN NOTES. REPAIRS AND/OR REPLACEMENTS SHALL BE MADE AS NECESSARY.
4. SITE DEMOLITION AND CLEARING.

NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL SOIL EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED DURING CONSTRUCTION.

LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- PAVEMENT
- SF — SF — SILT FENCE
- RIDGE LINE
- LOD — GRADING/SEEDING LIMITS (L.O.D. - LIMITS OF DISTURBANCE)
- TEMPORARY DIVERSION CHANNEL
- FLOW ARROW
- TREULOOK CAMERA
- RCD — ROCK CHECK DAM
- ST — TEMPORARY SEDIMENT TRAP
- SB — TEMPORARY SEDIMENT BASIN
- OF — STORMWATER OUTFALL POINT
- SO — SKIMMER OUTLET STRUCTURE
- CE — STABILIZED CONSTRUCTION ENTRANCE
- CW — CONCRETE WASHOUT
- RP — RIP RAP STORM SEWER OUTLET/SLOPE PROTECTION
- EXISTING WETLAND

REFER TO SHEET C4.0 FOR SWPPP GENERAL NOTES

REFER TO SHEETS C4.7 TO C4.10 FOR SWPPP DETAILS

REFER TO SHEETS C7 SERIES FOR GRADING PLAN

CODED NOTES

1. TRUELOOK CAMERA.
2. WETLAND STREAM AREAS TO BE PROTECTED THROUGHOUT CONSTRUCTION.

60 0 60 120

GRAPHIC SCALE (IN FEET)

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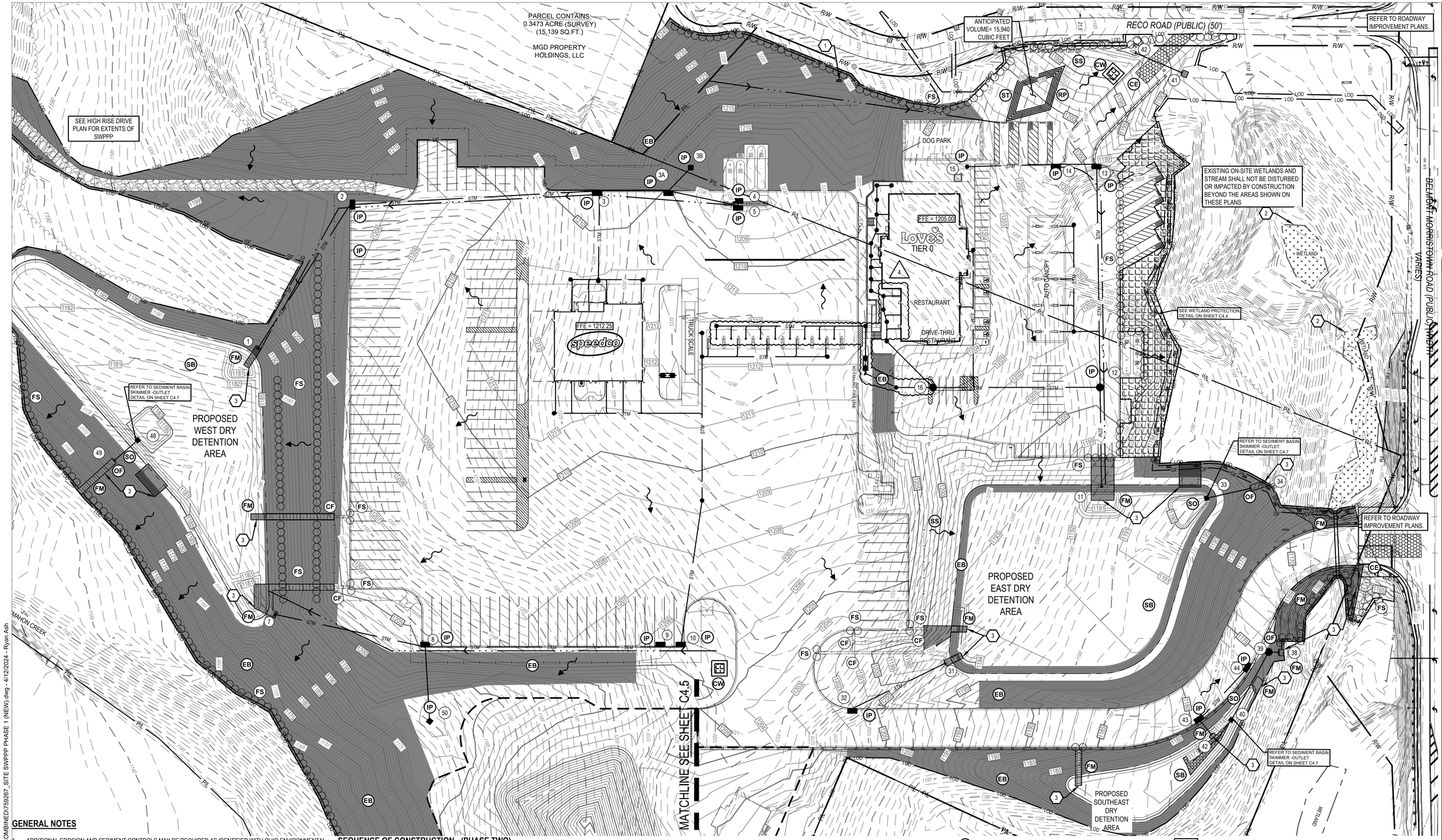
Scale:	1" = 60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SWPPP PHASE 1

C4.1



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SEQUENCE OF CONSTRUCTION - (PHASE TWO)

UNLESS NOTED OTHERWISE, THE GENERAL CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES IN STRICT ACCORDANCE WITH THE SWPPP THROUGHOUT THE DURATION OF THE PROJECT.

1. INSPECTION OF EROSION CONTROL MEASURES INSTALLED UNDER PHASE ONE AS OUTLINED IN NOTES. REPAIRS AND/OR REPLACEMENTS SHALL BE MADE AS NECESSARY.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THE SOIL EROSION PLAN FOR PHASE TWO.
3. ENSURE POSITIVE DRAINAGE FROM SITE TO BASIN DURING ALL PHASES OF CONSTRUCTION. STORM DITCHES OR BERMS MAY BE NECESSARY PRIOR TO STORM STRUCTURE CONSTRUCTION.
4. ROUGH GRADING. PROVIDE SOIL STABILIZATION OF DISTURBED AREAS WHICH ARE INACTIVE. REFER TO NPDES PERMIT REQUIREMENTS AND SWPPP DETAILS FOR ADDITIONAL INFORMATION.
5. STORM SEWER SYSTEM AND UNDERGROUND UTILITY CONSTRUCTION. INSTALL INLET PROTECTION CONCURRENT WITH CONSTRUCTION OF PROPOSED STORM SEWER STRUCTURES.
6. BUILDING PAD CONSTRUCTION.
7. SEDIMENT TRAP REMOVAL.
8. CURB CONSTRUCTION.
9. FINE GRADING AND PAVEMENT SUBGRADE PREPARATION.
10. ASPHALT PAVING AND REMAINING CONCRETE FLATWORK.
11. PREPARATION OF LANDSCAPED AREAS TO FINISHED GRADE.

CODED NOTES

1. TRUELOOK CAMERA.
2. WETLAND STREAM AREAS TO BE PROTECTED THROUGHOUT CONSTRUCTION.
3. CONTRACTOR TO INSTALL EROSION CONTROL MEASURE FLEXAMAT OR APPROVED EQUAL.

LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- 080 — MAJOR CONTOUR
- 081 — MINOR CONTOUR
- BUILDING
- CONCRETE CURB AND GUTTERR
- PAVEMENT
- STM — STORM SEWER
- SF — SF — SILT FENCE
- RIDGE LINE
- TEMPORARY DIVERSION CHANNEL
- LOD — GRADING/SEEDING LIMITS (L.O.D. - LIMITS OF DISTURBANCE)
- FLOW ARROW
- TRUELOOK CAMERA

- IP — INLET PROTECTION
- RP — RIP RAP STORM SEWER OUTLET/SLOPE PROTECTION
- SO — SKIMMER OUTLET STRUCTURE
- RCD — ROCK CHECK DAM
- SS — SOIL STABILIZATION
- FS — FILTER SOCK
- ST — TEMPORARY SEDIMENT TRAP
- SB — TEMPORARY SEDIMENT BASIN
- OF — STORMWATER OUTFALL POINT
- CF — CONCRETE FLUME
- CE — STABILIZED CONSTRUCTION ENTRANCE
- FM — STANDARD FLEXAMAT
- CW — CONCRETE WASHOUT
- EB — EROSION CONTROL BLANKET
- EXISTING WETLAND
- CONTRACTOR TO PROVIDE TEMPORARY SOIL STABILIZATION UNTIL SOD IS PLACED

REFER TO SHEET C4.0 FOR SWPPP GENERAL NOTES

REFER TO SHEETS C4.7 TO C4.10 FOR SWPPP DETAILS

REFER TO SHEETS C7 SERIES FOR GRADING PLAN

NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL SOIL EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED DURING CONSTRUCTION.

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60 0 60 120

GRAPHIC SCALE (IN FEET)

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

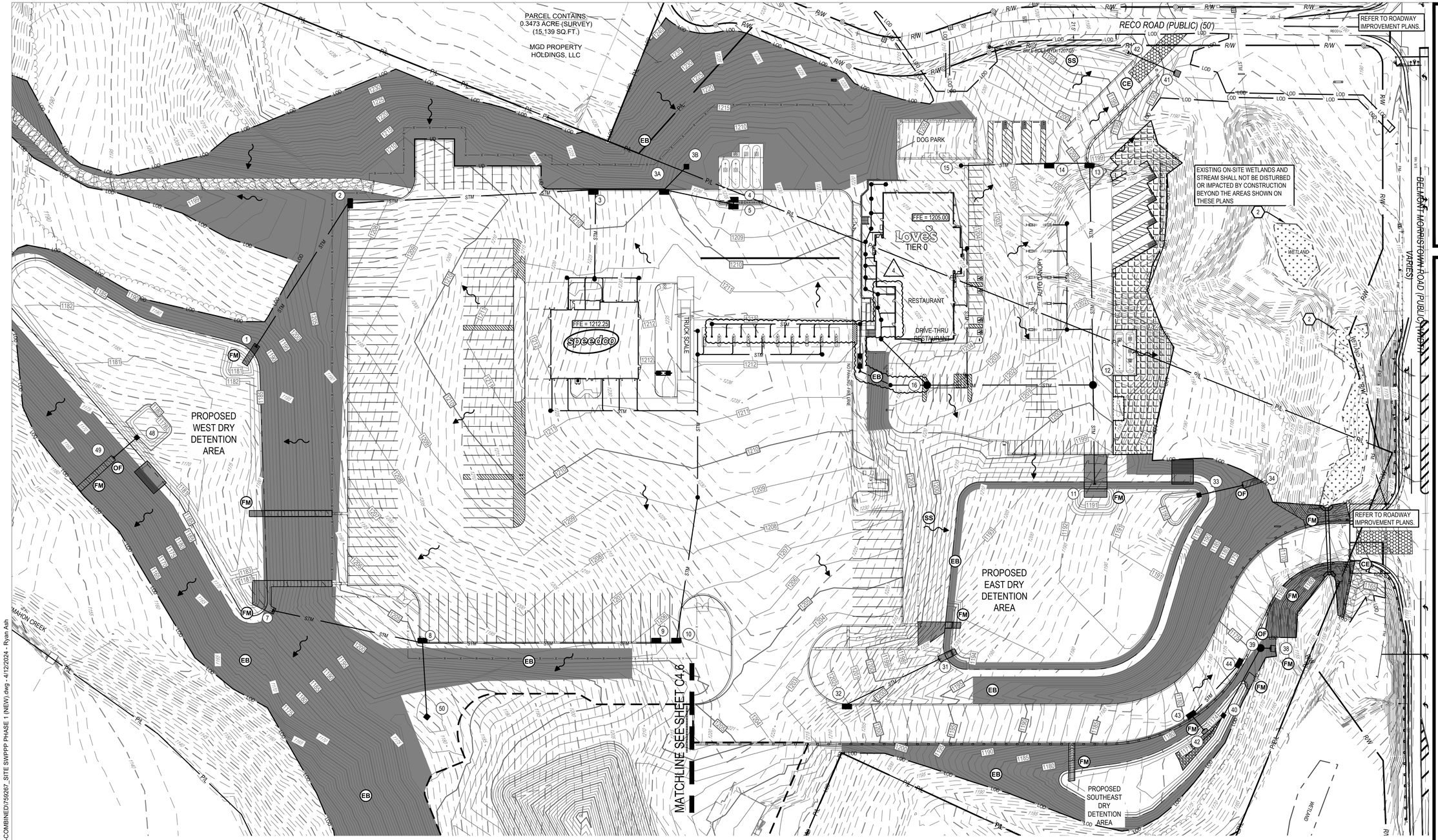
Revisions / Submissions

ID	Description	Date
1	REV 1	01/03/2024
3	ADDENDUM 3	02/09/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1" = 60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SWPPP PHASE 2

C4.2



GENERAL NOTES

1. ADDITIONAL EROSION AND SEDIMENT CONTROLS MAY BE REQUIRED AS IDENTIFIED WITH OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA) AND LOCAL JURISDICTION INSPECTOR.
2. CONTRACTOR SHALL REVIEW THE COMPLETE DRAWING SET AND NOTIFY THE DESIGN PROFESSIONAL IN WRITING PRIOR TO CONSTRUCTION, IF ANY DISCREPANCIES ARE FOUND WITHIN THE DRAWINGS OR WITH ACTUAL FIELD CONDITIONS.
3. ALL STORMWATER POLLUTION PREVENTION PLANS, NOTES AND DETAILS SHALL COMPLY WITH OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA).
4. CONTRACTOR IS RESPONSIBLE TO MAINTAIN POST-CONSTRUCTION PERMANENT EROSION CONTROL MEASURES UNTIL ADEQUATE RE-VEGETATION AND STABILIZATION ARE ACHIEVED.
5. TRUELOOK SITE CAMERA AND COMPONENTS SHALL BE PROVIDED BY OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION, MAINTENANCE, AND REMOVAL AS PER THE TRUELOOK CAMERA INSTALLATION GUIDE. CAMERA TO BE POLE MOUNTED APPROXIMATELY 35' IN THE AIR WITH 6' BURIED, AND SHALL BE PLACED AS SHOWN ON THE PLANS, OR IN A LOCATION THAT OFFERS MAXIMUM SITE VISIBILITY, AND WHICH WILL NOT BE DISTURBED OR MOVED DURING CONSTRUCTION.

SEQUENCE OF CONSTRUCTION - (PHASE THREE)

UNLESS NOTED OTHERWISE, THE GENERAL CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES IN STRICT ACCORDANCE WITH THE SWPPP THROUGHOUT THE DURATION OF THE PROJECT.

1. INSPECTION OF EROSION CONTROL MEASURES INSTALLED UNDER PHASE ONE AND TWO AS OUTLINED IN NOTES. REPAIRS AND/OR REPLACEMENTS SHALL BE MADE AS NECESSARY.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THE SOIL EROSION PLAN FOR PHASE TWO.
3. REMOVE TEMPORARY RISER AND SKIMMER IN ALL SEDIMENT BASINS, AND REMOVE ACCUMULATED SEDIMENT FROM BASINS, INLET INSERTS AND STORM STRUCTURE SUMPS FOR FINAL CONVERSION TO DRY BASINS.
4. COMPLETE FINE GRADING AND PREPARATION OF LANDSCAPED AREAS TO FINISHED GRADE.
5. PERMANENT BMP's.
6. FINAL STABILIZATION AND PERMANENT SEEDING. REFER TO THE NPDES REQUIREMENTS FOR ADDITIONAL INFORMATION. REFER TO LANDSCAPE PLAN FOR SOD LIMITS AND PLANTING AREAS.
7. REMOVE SOIL EROSION CONTROL MEASURES AFTER PERMANENT VEGETATION HAS BEEN ESTABLISHED. ENSURE NOTICE OF COMPLETION (N.O.C.) IS FILED.

NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL SOIL EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED DURING CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR REMOVAL OF ALL TEMPORARY EROSION CONTROL MEASURES AFTER PERMANENT VEGETATION HAS BEEN ESTABLISHED.

LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- 080 — MAJOR CONTOUR
- 081 — MINOR CONTOUR
- BUILDING
- CONCRETE CURB AND GUTTER
- PAVEMENT
- STM — STORM SEWER
- RIDGE LINE
- LOD — GRADING/SEEDING LIMITS (L.O.D. - LIMITS OF DISTURBANCE)
- FLOW ARROW
- TRUELOOK CAMERA

- SS — SOIL STABILIZATION
- OF — STORMWATER OUTFALL POINT
- EB — EROSION CONTROL BLANKET
- EXISTING WETLAND
- FM — STANDARD FLEXAMAT
- CE — STABILIZED CONSTRUCTION ENTRANCE
- CONTRACTOR TO PROVIDE TEMPORARY SOIL STABILIZATION UNTIL SOD IS PLACED

REFER TO SHEET C4.0 FOR SWPPP GENERAL NOTES

REFER TO SHEETS C4.7 TO C4.10 FOR SWPPP DETAILS

REFER TO SHEETS C7 SERIES FOR GRADING PLAN

CODED NOTES

1. TRUELOOK CAMERA.
2. WETLAND STREAM AREAS TO BE PROTECTED THROUGHOUT CONSTRUCTION.

GRAPHIC SCALE (IN FEET)

60 0 60 120

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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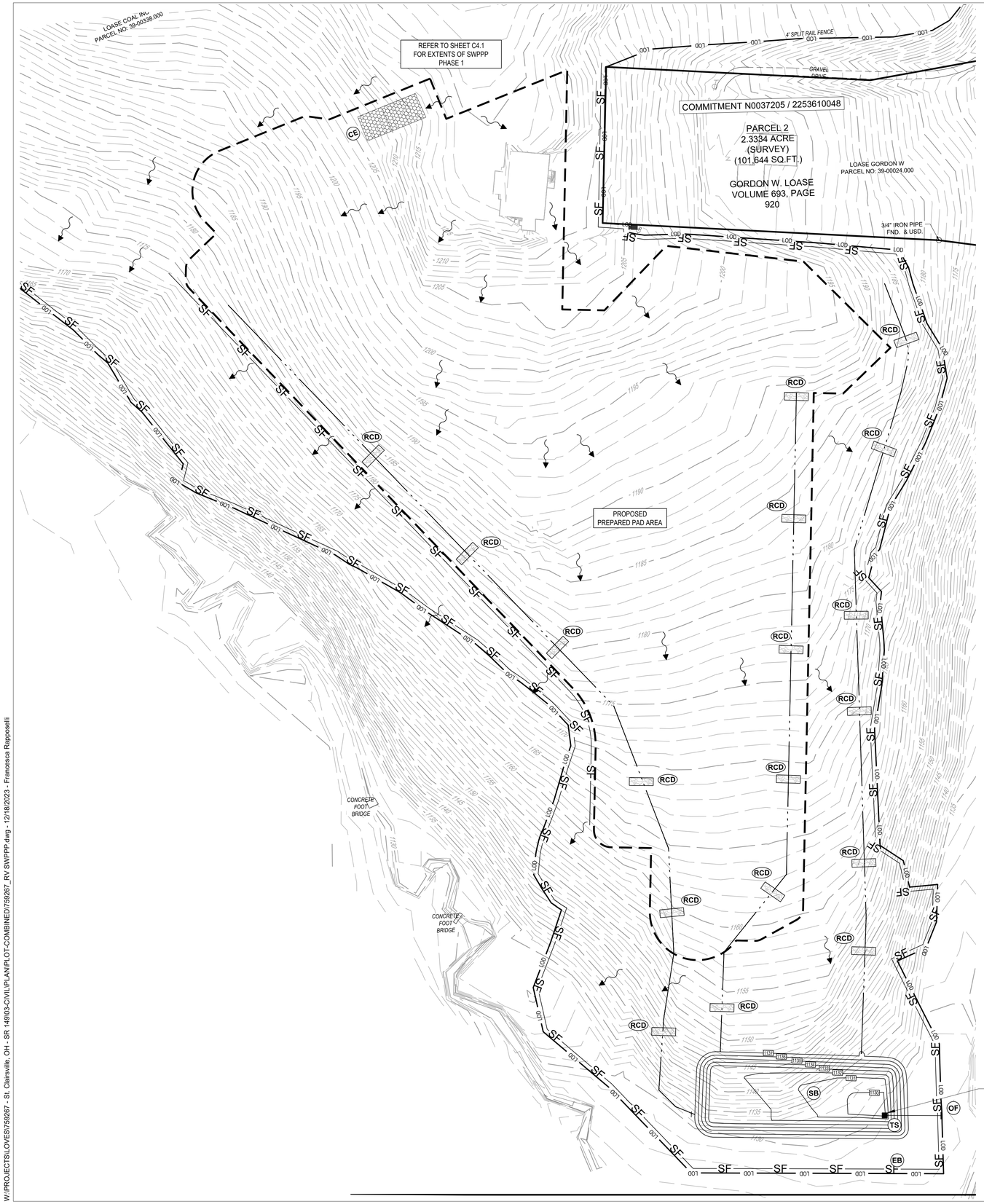
Revisions / Submissions

ID	Description	Date
1	REV 1	01/03/2024
3	ADDENDUM 3	02/09/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1"=60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SWPPP PHASE 3

C4.3



GENERAL NOTES

1. ADDITIONAL EROSION AND SEDIMENT CONTROLS MAY BE REQUIRED AS IDENTIFIED WITH THE OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA) AND LOCAL JURISDICTION INSPECTOR.
2. CONTRACTOR SHALL REVIEW THE COMPLETE DRAWING SET AND NOTIFY THE DESIGN PROFESSIONAL IN WRITING PRIOR TO CONSTRUCTION, IF ANY DISCREPANCIES ARE FOUND WITHIN THE DRAWINGS OR WITH ACTUAL FIELD CONDITIONS.
3. ALL STORMWATER POLLUTION PREVENTION PLANS, NOTES AND DETAILS SHALL COMPLY WITH THE OEPA.
4. CONTRACTOR IS RESPONSIBLE TO MAINTAIN POST-CONSTRUCTION PERMANENT EROSION CONTROL MEASURES UNTIL ADEQUATE RE-VEGETATION AND STABILIZATION ARE ACHIEVED.
5. REMOVE ALL ON SITE FEATURES AS SHOWN ON THE PLAN AND LEGALLY DISPOSE OF OFF SITE.
6. PROTECT EXISTING SITE FEATURES TO REMAIN OUTSIDE CONSTRUCTION LIMITS. REPAIR ANY DAMAGE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
7. USE ANY MEANS NECESSARY AND ACCEPTABLE TO THE JURISDICTION TO CONTROL DUST AT THE SITE. PROVIDE STREET CLEANING WHEN NECESSARY OR AS DIRECTED.
8. SILT FENCE SHOWN OFF OF LIMITS OF DISTURBANCE FOR CLARITY PURPOSES ONLY. CONTRACTOR TO ENSURE SILT FENCE IS PLACED AT LIMITS OF DISTURBANCE. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ENGINEER PRIOR TO PLACEMENT OF ANY EROSION CONTROL MEASURES.
9. TRUELOOK SITE CAMERA AND COMPONENTS SHALL BE PROVIDED BY OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION, MAINTENANCE, AND REMOVAL AS PER THE TRUELOOK CAMERA INSTALLATION GUIDE. CAMERA TO BE POLE MOUNTED APPROXIMATELY 35' IN THE AIR WITH 6' BURIED, AND SHALL BE PLACED AS SHOWN ON THE PLANS, OR IN A LOCATION THAT OFFERS MAXIMUM SITE VISIBILITY, AND WHICH WILL NOT BE DISTURBED OR MOVED DURING CONSTRUCTION.

LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- PAVEMENT
- SF — SILT FENCE
- RIDGE LINE
- TEMPORARY DIVERSION SWALE
- LOD — GRADING/SEEDING LIMITS (L.O.D. - LIMITS OF DISTURBANCE)
- FLOW ARROW
- TRUELOOK CAMERA
- RP — RIPRAP STORM SEWER OUTLET/SLOPE PROTECTION
- TS — TEMPORARY SKIMMER
- SB — TEMPORARY SEDIMENT BASIN
- OF — STORMWATER OUTFALL POINT
- RCD — ROCK CHECK DAM

REFER TO SHEET C4.0 FOR SWPPP GENERAL NOTES

REFER TO SHEETS C4.7 TO C4.10 FOR SWPPP DETAILS

REFER TO SHEETS C7 SERIES FOR GRADING PLAN

SEQUENCE OF CONSTRUCTION - (PHASE ONE)

UNLESS NOTED OTHERWISE, THE GENERAL CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES IN STRICT ACCORDANCE WITH THE SWPPP THROUGHOUT THE DURATION OF THE PROJECT.

1. ENSURE NOTICE OF INTENT (N.O.I.) IS FILED. KEEP A COPY OF THE PERMIT AND SWPPP ON SITE.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THE SWPPP.
3. INSPECTION OF EROSION CONTROL MEASURES AS OUTLINED IN NOTES. REPAIRS AND/OR REPLACEMENTS SHALL BE MADE AS NECESSARY.
4. SITE DEMOLITION AND CLEARING.

NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL SOIL EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED DURING CONSTRUCTION.

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N

60 0 60 120

GRAPHIC SCALE (IN FEET)

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER

12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

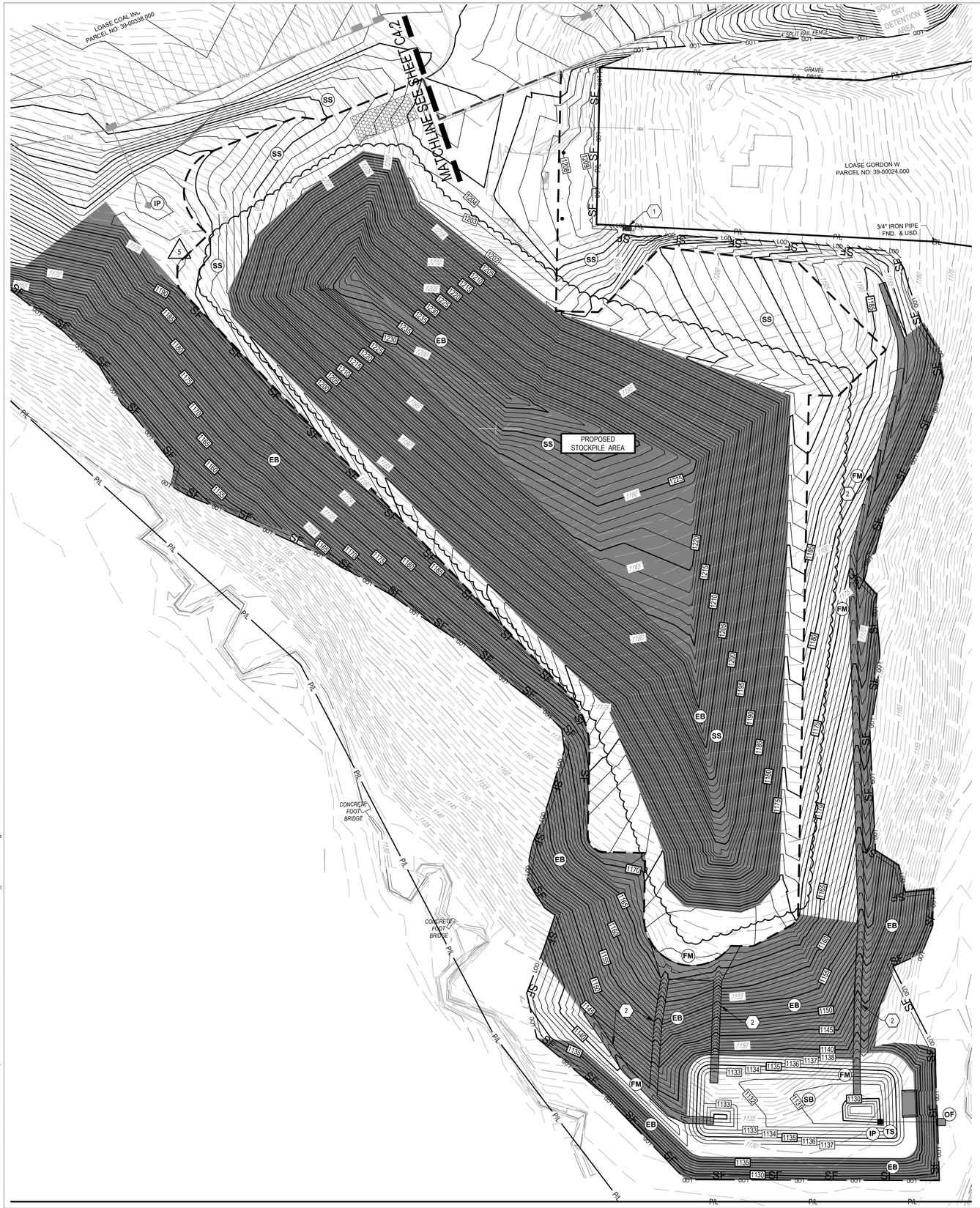
ID	Description	Date

Project Number:	759267
Scale:	1"=60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

SWPPP PHASE 1 - PREPARED PAD AREA

C4.4



GENERAL NOTES

1. ADDITIONAL EROSION AND SEDIMENT CONTROLS MAY BE REQUIRED AS IDENTIFIED WITH THE OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA) AND LOCAL JURISDICTION INSPECTOR.
2. CONTRACTOR SHALL REVIEW THE COMPLETE DRAWING SET AND NOTIFY THE DESIGN PROFESSIONAL IN WRITING PRIOR TO CONSTRUCTION, IF ANY DISCREPANCIES ARE FOUND WITHIN THE DRAWINGS OR WITH ACTUAL FIELD CONDITIONS.
3. ALL STORMWATER POLLUTION PREVENTION PLANS, NOTES AND DETAILS SHALL COMPLY WITH THE OHIO DEPARTMENT OF NATURAL RESOURCES' RAINWATER AND LAND DEVELOPMENT MANUAL.
4. CONTRACTOR IS RESPONSIBLE TO MAINTAIN POST-CONSTRUCTION PERMANENT EROSION CONTROL MEASURES UNTIL ADEQUATE RE-VEGETATION AND STABILIZATION ARE ACHIEVED.
5. REMOVE ALL ON SITE FEATURES AS SHOWN ON THE PLAN AND LEGALLY DISPOSE OF OFF SITE.
6. PROTECT EXISTING SITE FEATURES TO REMAIN OUTSIDE CONSTRUCTION LIMITS. REPAIR ANY DAMAGE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
7. USE ANY MEANS NECESSARY AND ACCEPTABLE TO THE JURISDICTION TO CONTROL DUST AT THE SITE. PROVIDE STREET CLEANING WHEN NECESSARY OR AS DIRECTED.
8. SILT FENCE SHOWN OFF OF LIMITS OF DISTURBANCE FOR CLARITY PURPOSES ONLY. CONTRACTOR TO ENSURE SILT FENCE IS PLACED AT LIMITS OF DISTURBANCE. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ENGINEER PRIOR TO PLACEMENT OF ANY EROSION CONTROL MEASURES.
9. TRUELOOK SITE CAMERA AND COMPONENTS SHALL BE PROVIDED BY OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION, MAINTENANCE, AND REMOVAL AS PER THE TRUELOOK CAMERA INSTALLATION GUIDE. CAMERA TO BE POLE MOUNTED APPROXIMATELY 35' IN THE AIR WITH 6' BURIED, AND SHALL BE PLACED AS SHOWN ON THE PLANS, OR IN A LOCATION THAT OFFERS MAXIMUM SITE VISIBILITY, AND WHICH WILL NOT BE DISTURBED OR MOVED DURING CONSTRUCTION.

LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- 1200 — MAJOR CONTOUR
- 1199 — MINOR CONTOUR
- BUILDING
- PAVEMENT
- STM — STORM SEWER
- SF — SILT FENCE
- RIDGE LINE
- LOD — GRADING/SEEDING LIMITS (L.O.D. - LIMITS OF DISTURBANCE)
- FLOW ARROW
- TRUELOOK CAMERA
- IP — INLET PROTECTION
- SS — SOIL STABILIZATION
- RP — RIPRAP STORM SEWER OUTLET/SLOPE PROTECTION
- SB — TEMPORARY SEDIMENT BASIN
- OF — STORMWATER OUTFALL POINT
- EB — EROSION CONTROL BLANKET
- FM — STANDARD FLEXMAT

REFER TO SHEET C4.0 FOR SWPPP GENERAL NOTES

REFER TO SHEETS C4.7 TO C4.10 FOR SWPPP DETAILS

REFER TO SHEETS C7 SERIES FOR GRADING PLAN

SEQUENCE OF CONSTRUCTION - (PHASE TWO)

UNLESS NOTED OTHERWISE, THE GENERAL CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES IN STRICT ACCORDANCE WITH THE SWPPP THROUGHOUT THE DURATION OF THE PROJECT.

1. INSPECTION OF EROSION CONTROL MEASURES INSTALLED UNDER PHASE ONE AS OUTLINED IN NOTES. REPAIRS AND/OR REPLACEMENTS SHALL BE MADE AS NECESSARY.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THE SOIL EROSION PLAN FOR PHASE TWO.
3. ROUGH GRADING. PROVIDE SOIL STABILIZATION OF DISTURBED AREAS WHICH ARE INACTIVE. REFER TO NPDES PERMIT REQUIREMENTS AND SWPPP DETAILS FOR ADDITIONAL INFORMATION.

NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL SOIL EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED DURING CONSTRUCTION.

CODED NOTES

1. TRUELOOK CAMERA.
2. CONTRACTOR TO INSTALL EROSION CONTROL MEASURE FLEXAMAT OR APPROVED EQUAL.

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GRAPHIC SCALE (IN FEET)

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Revisions / Submissions

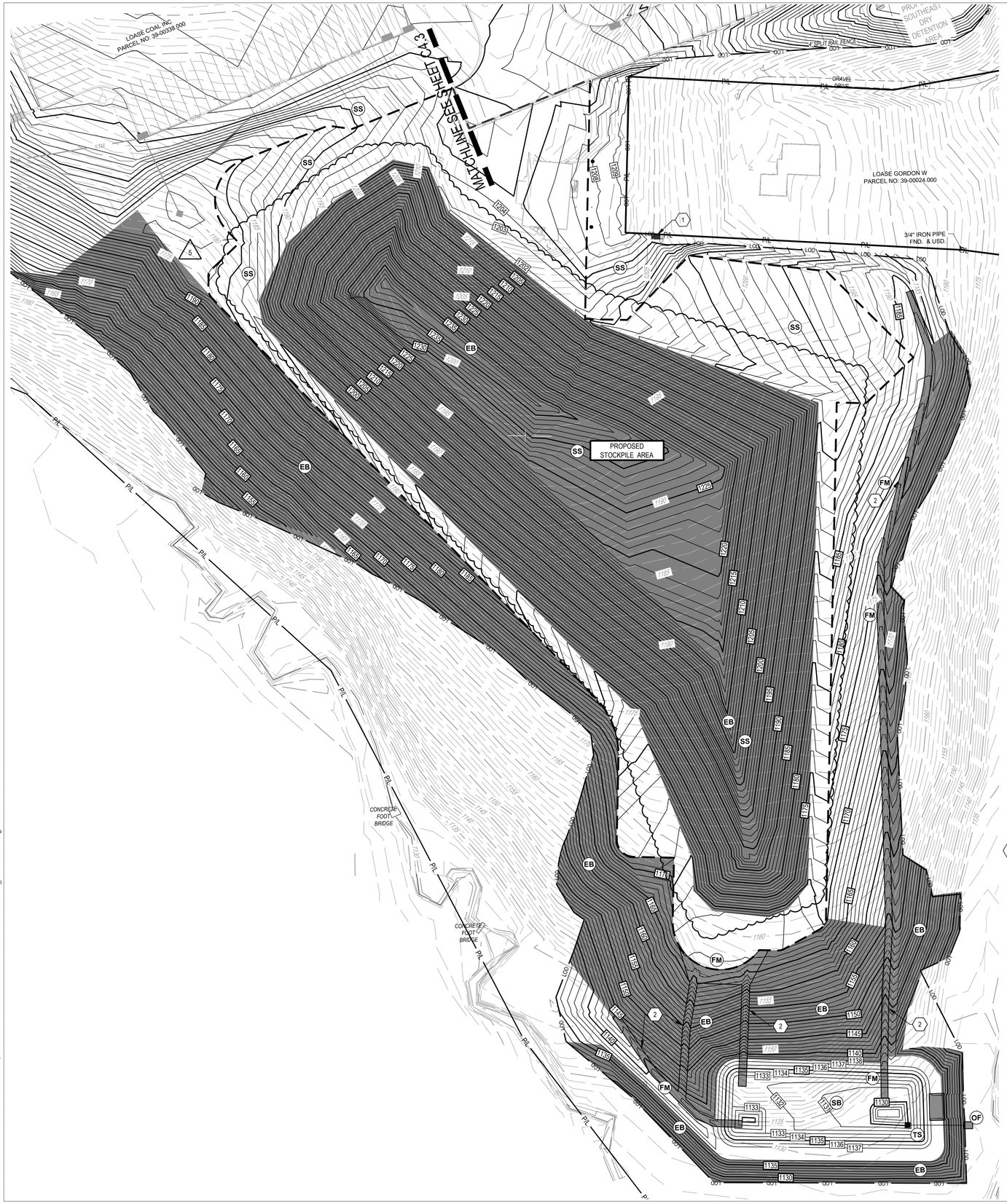
ID	Description	Date
5	ADDENDUM 5	04/18/2024

Project Number:	759267
Scale:	1"=60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

SWPPP PHASE 2 - PREPARED PAD AREA

C4.5



CODED NOTES

1. TRUELOOK CAMERA.
2. CONTRACTOR TO INSTALL EROSION CONTROL MEASURE FLEXAMAT OR APPROVED EQUAL.

LEGEND

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SEQUENCE OF CONSTRUCTION - (PHASE THREE)

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1. INSPECTION OF EROSION CONTROL MEASURES INSTALLED UNDER PHASE ONE AND TWO AS OUTLINED IN NOTES. REPAIRS AND/OR REPLACEMENTS SHALL BE MADE AS NECESSARY.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THE SOIL EROSION PLAN FOR PHASE TWO.
3. REMOVE TEMPORARY RISER AND SKIMMER IN SEDIMENT BASIN, AND REMOVE ACCUMULATED SEDIMENT FROM BASIN, INLET INSERTS AND STORM STRUCTURE SUMPS FOR FINAL CONVERSION TO DRY BASIN.
4. PERMANENT BMP's.
5. FINAL STABILIZATION AND PERMANENT SEEDING. REFER TO THE NPDES REQUIREMENTS FOR ADDITIONAL INFORMATION. REFER TO LANDSCAPE PLAN FOR SOD LIMITS AND PLANTING AREAS.
6. REMOVE SOIL EROSION CONTROL MEASURES AFTER PERMANENT VEGETATION HAS BEEN ESTABLISHED. ENSURE NOTICE OF COMPLETION (N.O.C.) IS FILED.

NOTE: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL SOIL EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED DURING CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR REMOVAL OF ALL TEMPORARY EROSION CONTROL MEASURES AFTER PERMANENT VEGETATION HAS BEEN ESTABLISHED.

GENERAL NOTES

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2. CONTRACTOR SHALL REVIEW THE COMPLETE DRAWING SET AND NOTIFY THE DESIGN PROFESSIONAL IN WRITING PRIOR TO CONSTRUCTION, IF ANY DISCREPANCIES ARE FOUND WITHIN THE DRAWINGS OR WITH ACTUAL FIELD CONDITIONS.
3. ALL STORMWATER POLLUTION PREVENTION PLANS, NOTES AND DETAILS SHALL COMPLY WITH THE OHIO DEPARTMENT OF NATURAL RESOURCES' RAINWATER AND LAND DEVELOPMENT MANUAL.
4. CONTRACTOR IS RESPONSIBLE TO MAINTAIN POST-CONSTRUCTION PERMANENT EROSION CONTROL MEASURES UNTIL ADEQUATE RE-VEGETATION AND STABILIZATION ARE ACHIEVED.
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GRAPHIC SCALE (IN FEET)

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Revisions / Submissions

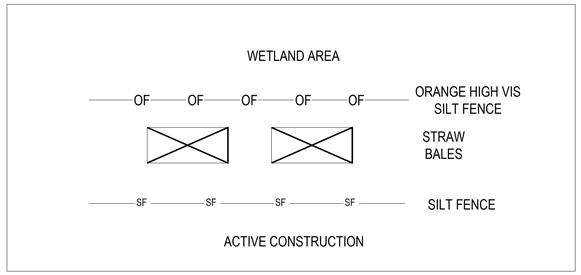
ID	Description	Date
5	ADDENDUM 5	04/18/2024

Project Number:	759267
Scale:	1"=60'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

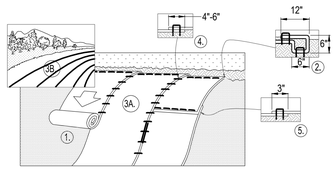
Drawing Title:

SWPPP PHASE 3 - PREPARED PAD AREA

C4.6



WETLAND PROTECTION DETAIL
NTS

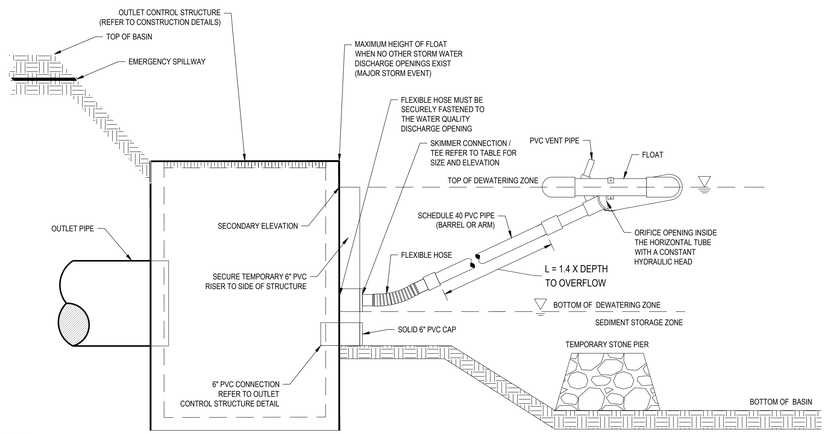


NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH AS SHOWN IN DETAIL 2. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS PER MANUFACTURES RECOMMENDATION.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH MINIMUM 6" OVERLAP. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
6. PLACE STAPLES/STAKES PER MANUFACTURER'S RECOMMENDATION FOR THE APPROPRIATE SLOPE BEING APPLIED.

EROSION CONTROL BLANKET
NTS

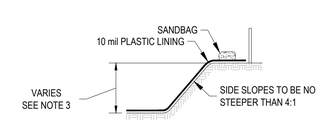
NOTE: CONTRACTOR MAY USE PRO MATRIX ENGINEERED FIBER MATRIX, OR APPROVED EQUAL, PER THE MANUFACTURER'S RECOMMENDED APPLICATION RATES. AS AN ALTERNATIVE TO EROSION CONTROL BLANKET IN AREAS OF 4:1 SLOPES OR GREATER. CONTRACTOR SHALL SUBMIT ALL NECESSARY SOIL SAMPLES AS REQUIRED BY THE MANUFACTURER IN ORDER TO DETERMINE THE CORRECT PRODUCT MIXTURE, AND A LOW MAINTENANCE SEED MIXTURE SHALL BE UTILIZED.



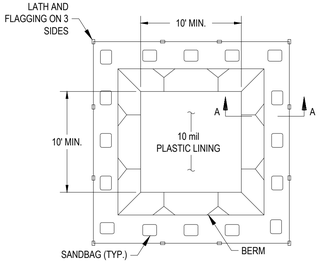
NOTES:
1. DIMENSIONS - REFER TO LIMITS OF EXCAVATION, SLOPES, PIPE INFORMATION , AND ADDITIONAL EROSION CONTROL MEASURES ON THE CONSTRUCTION DRAWINGS.
2. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT.
3. INSPECT SYSTEM REGULARLY TO ENSURE IT IS FUNCTIONING IN A CORRECT MANNER.
4. USE FAIRCLOTH SKIMMER OR APPROVED EQUAL.
5. REMOVE SKIMMER UPON ACHIEVING FINAL STABILIZATION. INSTALL PERMANENT OUTLET PROTECTION / RIP RAP.
6. REFER TO OUTLET STRUCTURE DETAIL FOR PERMANENT WATER QUALITY OR RUNOFF CONTROL MEASURES.
7. AFTER SITE IS STABILIZED, REMOVE ACCUMULATED SEDIMENT FROM OUTLET STRUCTURE AND BASIN. REMOVE TEMPORARY RISER.
8. INSTALL CONNECTION IN THE OUTLET STRUCTURE PER DETAIL FOR PERMANENT CONTROLS.

SEDIMENT BASIN
SKIMMER-OUTLET STRUCTURE
FOR PROPOSED TRAVEL STOP
NTS

	BASIN LOCATION			
	EAST	WEST	SOUTH EAST	SOUTH (PREPARED PAD)
DRAINAGE AREA (AC)	8.58	14.75	1.38	10.91
	ELEVATION			
TOP OF BASIN	1195.00	1185.00	1175.00	1137.75
EMERGENCY SPILLWAY	1194.00	1184.00	1174.00	1136.75
SECONDARY ELEVATION	RIM =1192.25	WND=1182.08	RIM=1174.00	RIM=1134.00
SKIMMER OUTLET	1191.50	1181.25	1172.75	1132.30
BOTTOM OF BASIN	1190.00	1180.00	1171.00	1130.00
	VOLUME (CF)			
SEDIMENT STORAGE REQUIRED	8,580	14,750	1,380	10,910
SEDIMENT STORAGE PROVIDED	9,700	16,334	2,028	11,149
DEWATERING - REQUIRED	15,444	26,550	2,484	19,638
DEWATERING - PROVIDED	16,193	27,561	6,565	22,861
	SKIMMER SIZING			
DAYS TO DRAIN - REQUIRED	2	2	2	2
DAYS TO DRAIN - PROVIDED	2	2	2	2
FAIRCLOTH SKIMMER SIZE (IN)	4.00	5.00	2.00	4.00
FAIRCLOTH SKIMMER ORIFICE DIAMETER (IN)	3.10	4.00	1.50	3.70



SECTION "A-A"



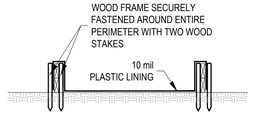
NOTE:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.

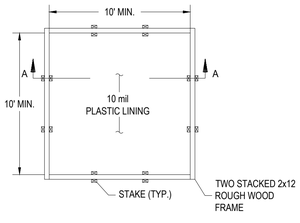
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

3. THE WASHOUT MUST HAVE SUFFICIENT VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS INCLUDING, BUT NOT LIMITED TO, OPERATIONS ASSOCIATED WITH GROUT AND MORTAR.

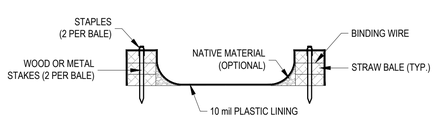
"BELOW GRADE"



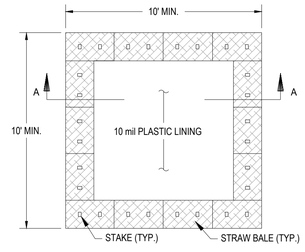
SECTION "A-A"



"ABOVE GRADE" w / WOOD PLANKS



SECTION "A-A"

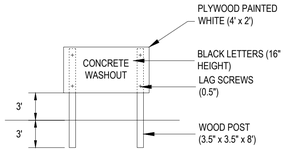


NOTES:

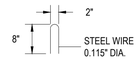
1. ACTUAL LAYOUT DETERMINED IN THE FIELD.

2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

PLAN VIEW



CONCRETE WASHOUT SIGN DETAIL



STAPLE DETAIL

CONCRETE WASHOUT CW
NOT TO SCALE

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER
12/18/2023

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH
66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

ID	Description	Date

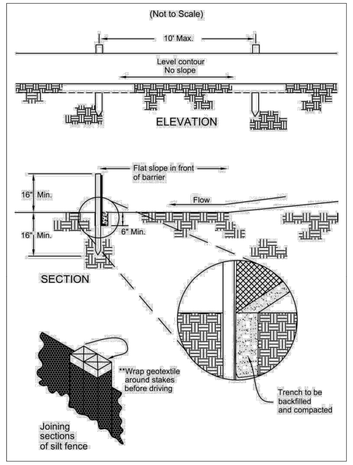
Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SWPPP DETAILS

C4.7

Specifications
for

Silt Fence



Specifications
for

Silt Fence

1. Silt fence shall be constructed before upslope land disturbance begins.
2. All silt fence shall be placed as close to the contour as possible so that water will not concentrate at low points in the fence and so that small swales or depressions that may carry small concentrated flows to the silt fence are dissipated along its length.
3. Ends of the silt fences shall be brought upslope slightly so that water ponded by the silt fence will be prevented from flowing around the ends.
4. Silt fence shall be placed on the flattest area available.
5. Where possible, vegetation shall be preserved for 5 feet (or as much as possible) upslope from the silt fence. If vegetation is removed, it shall be reestablished within 7 days from the installation of the silt fence.
6. The height of the silt fence shall be a minimum of 16 inches above the original ground surface.
7. The silt fence shall be placed in an excavated or sliced trench cut a minimum of 6 inches deep. The trench shall be made with a trencher, cable laying machine, slicing machine, or other suitable device that will ensure an adequately uniform trench depth.
8. The silt fence shall be placed with the stakes on the downslope side of the geotextile. A minimum of 8 inches of geotextile must be below the ground surface. Excess material shall lay on the bottom of the 6-inch deep trench. The trench shall be backfilled and compacted on both sides of the fabric.
9. Seams between sections of silt fence shall be spliced together only at a support post with a minimum 6-in. overlap prior to driving into the ground, (see details).
10. Maintenance—Silt fence shall allow runoff to pass only as diffuse flow through the geotextile. If runoff overtops the silt fence, flows under the fabric or around the fence ends, or in any other way allows a concentrated flow discharge, one of the following shall be performed, as appropriate: 1) the layout of the silt fence shall be changed, 2) accumulated sediment shall be removed, or 3) other practices shall be installed.

    Sediment deposits shall be routinely removed when the deposit reaches approximately one-half of the height of the silt fence.

    Silt fences shall be inspected after each rainfall and at least daily during a prolonged rainfall. The location of existing silt fence shall be reviewed daily to ensure its proper location and effectiveness. If damaged, the silt fence shall be repaired immediately.

Criteria for silt fence materials

1. Fence post – The length shall be a minimum of 32 inches. Wood posts will be 2-by-2-in. nominal dimensioned hardwood of sound quality. They shall be free of knots, splits and other visible imperfections, that will weaken the posts. The maximum spacing between posts shall be 10 ft. Posts shall be driven a minimum 16 inches into the ground, where possible. If not possible, the posts shall be adequately secured to prevent overturning of the fence due to sediment/water loading.
2. Silt fence fabric – See chart below.

Table 6.3.2 Minimum criteria for Silt Fence Fabric (ODOT, 2002)

FABRIC PROPERTIES	VALUES	TEST METHOD
Minimum Tensile Strength	120 lbs. (535 N)	ASTM D 4632
Maximum Elongation at 60 lbs	50%	ASTM D 4632
Minimum Puncture Strength	50 lbs (220 N)	ASTM D 4833
Minimum Tear Strength	40 lbs (180 N)	ASTM D 4533
Apparent Opening Size	≤ 0.84 mm	ASTM D 4751
Minimum Permittivity	1X10-2 sec.-1	ASTM D 4491
UV Exposure Strength Retention	70%	ASTM G 4355

Specifications
for

Temporary Seeding

Table 7.8.1 Temporary Seeding Species Selection

Seeding Dates	Species	Lb./1000 ft2	Lb/Acre
March 1 to August 15	Oats Tall Fescue Annual Ryegrass	3 1 1	128 (4 Bushel) 40 40
	Perennial Ryegrass Tall Fescue Annual Ryegrass	1 1 1	40 40 40
	Annual Ryegrass Perennial Ryegrass Creeping Red Fescue Kentucky Bluegrass	1.25 3.25 0.4 0.4	55 142 17 17
	Oats Tall Fescue Annual Ryegrass	3 1 1	128 (3 bushel) 40 40
August 16th to November	Rye Tall Fescue Annual Ryegrass	3 1 1	112 (2 bushel) 40 40
	Wheat Tall Fescue Annual Ryegrass	3 1 1	120 (2 bushel) 40 40
	Perennial Rye Tall Fescue Annual Ryegrass	1 1 1	40 40 40
	Annual Ryegrass Perennial Ryegrass Creeping Red Fescue Kentucky Bluegrass	1.25 3.25 0.4 0.4	40 40 40
November 1 to Feb. 29	Use mulch only or dormant seeding		

Note: Other approved species may be substituted.

1. Structural erosion and sediment control practices such as diversions and sediment traps shall be installed and stabilized with temporary seeding prior to grading the rest of the construction site.
2. Temporary seed shall be applied between construction operations on soil that will not be graded or reworked for 21 days or greater. These idle areas shall be seeded within 7 days after grading.
3. The seedbed should be pulverized and loose to ensure the success of establishing vegetation. Temporary seeding should not be postponed if ideal seedbed preparation is not possible.
4. Soil Amendments—Temporary vegetation seeding rates shall establish adequate stands of vegetation, which may require the use of soil amendments. Base rates for lime and fertilizer shall be used.
5. Seeding Method—Seed shall be applied uniformly with a cyclone spreader, drill, cultipacker seeder, or hydroseeder. When feasible, seed that has been broadcast shall be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used, the seed and fertilizer will be mixed on-site and the seeding shall be done immediately and without interruption.

Specifications
for

Temporary Seeding

Mulching Temporary Seeding

1. Applications of temporary seeding shall include mulch, which shall be applied during or immediately after seeding. Seedings made during optimum seeding dates on favorable, very flat soil conditions may not need mulch to achieve adequate stabilization.

2. Materials:

- Straw—If straw is used, it shall be unrotted small-grain straw applied at a rate of 2 tons per acre or 90 lbs./ 1,000 sq. ft. (2-3 bales)
- Hydroseeders—If wood cellulose fiber is used, it shall be used at 2000 lbs./ ac. or 46 lb./ 1,000-sq.-ft.
- Other—Other acceptable mulches include mulch mattings applied according to manufacturer's recommendations or wood chips applied at 6 ton/ ac.

3. Straw Mulch shall be anchored immediately to minimize loss by wind or water. Anchoring methods:

- Mechanical—A disk, crimper, or similar type tool shall be set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but left to a length of approximately 6 inches.
- Mulch Netting—Netting shall be used according to the manufacturers recommendations. Netting may be necessary to hold mulch in place in areas of concentrated runoff and on critical slopes.
- Synthetic Binders—Synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petroset, Terra Track or equivalent may be used at rates specified by the manufacturer.
- Wood-Cellulose Fiber—Wood-cellulose fiber binder shall be applied at a net dry wt. of 750 lb./ac. The wood-cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 lb. / 100 gal.

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Loves

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12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

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Revisions / Submissions

ID	Description	Date

Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SWPPP DETAILS

C4.8

Specifications
for

Permanent Seeding

Site Preparation

1. Subsoiler, plow, or other implement shall be used to reduce soil compaction and allow maximum infiltration. (Maximizing infiltration will help control both runoff rate and water quality.) Subsoiling should be done when the soil moisture is low enough to allow the soil to crack or fracture. Subsoiling shall not be done on slip-prone areas where soil preparation should be limited to what is necessary for establishing vegetation.
2. The site shall be graded as needed to permit the use of conventional equipment for seedbed preparation and seeding.
3. Topsoil shall be applied where needed to establish vegetation.

Seedbed Preparation

1. Lime—Agricultural ground limestone shall be applied to acid soil as recommended by a soil test. In lieu of a soil test, lime shall be applied at the rate of 100 pounds per 1,000-sq. ft. or 2 tons per acre.
2. Fertilizer—Fertilizer shall be applied as recommended by a soil test. In place of a soil test, fertilizer shall be applied at a rate of 25 pounds per 1,000-sq. ft. or 1000 pounds per acre of a 10-10-10 or 12-12-12 analyses.
3. The lime and fertilizer shall be worked into the soil with a disk harrow, spring-tooth harrow, or other suitable field implement to a depth of 3 inches. On sloping land, the soil shall be worked on the contour.

Seeding Dates and Soil Conditions

Seeding should be done March 1 to May 31 or August 1 to September 30. If seeding occurs outside of the above-specified dates, additional mulch and irrigation may be required to ensure a minimum of 80% germination. Tillage for seedbed preparation should be done when the soil is dry enough to crumble and not form ribbons when compressed by hand. For winter seeding, see the following section on dormant seeding.

Dormant Seedings

1. Seedings should not be made from October 1 through November 20. During this period, the seeds are likely to germinate but probably will not be able to survive the winter.
2. The following methods may be used for "Dormant Seeding":

- From October 1 through November 20, prepare the seedbed, add the required amounts of lime and fertilizer, then mulch and anchor. After November 20, and before March 15, broadcast the selected seed mixture. Increase the seeding rates by 50% for this type of seeding.
- From November 20 through March 15, when soil conditions permit, prepare the seedbed, lime and fertilize, apply the selected seed mixture, mulch and anchor. Increase the seeding rates by 50% for this type of seeding.
- Apply seed uniformly with a cyclone seeder, drill, cultipacker seeder, or hydro-seeder (slurry may include seed and fertilizer) on a firm, moist seedbed.
- Where feasible, except when a cultipacker type seeder is used, the seedbed should be firmed following seeding operations with a cultipacker, roller, or light drag. On sloping land, seeding operations should be on the contour where feasible.

Mulching

1. Mulch material shall be applied immediately after seeding. Dormant seeding shall be mulched. 100% of the ground surface shall be covered with an approved material.
2. Materials

- Straw—If straw is used it shall be unrotted small-grain straw applied at the rate of 2 tons per acre or 90 pounds (two to three bales) per 1,000-sq. ft. The mulch shall be spread uniformly by hand or mechanically applied so the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000-sq.-ft. sections and spread two 45-lb. bales of straw in each section.
- Hydroseeders—If wood cellulose fiber is used, it shall be applied at 2,000 lb./ac. or 46 lb./1,000 sq. ft.
- Other—Other acceptable mulches include rolled erosion control mattings or blankets applied according to manufacturer's recommendations or wood chips applied at 6 tons per acre.

3. Straw and Mulch Anchoring Methods

Straw mulch shall be anchored immediately to minimize loss by wind or water.

- Mechanical—A disk, crimper, or similar type tool shall be set straight to punch or anchor the mulch material into the soil. Straw mechanically anchored shall not be finely chopped but, generally, be left longer than 6 inches.
- Mulch Netting—Netting shall be used according to the manufacturer's recommendations. Netting may be necessary to hold mulch in place in areas of concentrated runoff and on critical slopes.
- Asphalt Emulsion—Asphalt shall be applied as recommended by the manufacture or at the rate of 160 gallons per acre.
- Synthetic Binders—Synthetic binders such as Acrylic DLR (Agri-Tac), DCA-70, Petroset, Terra Tack or equivalent may be used at rates specified by the manufacturer.
- Wood Cellulose Fiber—Wood cellulose fiber shall be applied at a net dry weight of 750 pounds per acre. The wood cellulose fiber shall be mixed with water with the mixture containing a maximum of 50 pounds cellulose per 100 gallons of water.

Irrigation

Permanent seeding shall include irrigation to establish vegetation during dry weather or on adverse site conditions, which require adequate moisture for seed germination and plant growth.

Irrigation rates shall be monitored to prevent erosion and damage to seeded areas from excessive runoff.

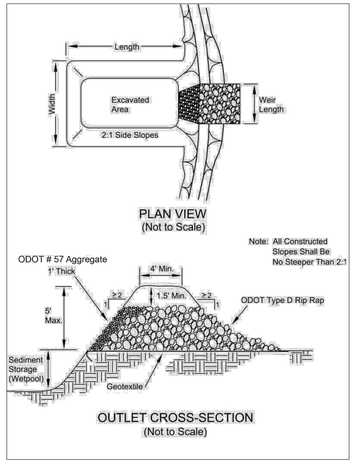
Table 7.10.2 Permanent Seeding

Seed Mix	Seeding Rate		Notes:
	Lbs./acre	Lbs./1,000 Sq. Feet	
General Use			
Creeping Red Fescue Domestic Ryegrass Kentucky Bluegrass	20-40 10-20 20-40	1/2-1 1/4-1/2 1/2-1	For close mowing & for waterways with <2.0 ft/sec velocity
Tall Fescue	40-50	1-1 1/4	
Turf-type (dwarf) Fescue	90	2 1/4	
Steep Banks or Cut Slopes			
Tall Fescue	40-50	1-1 1/4	
Crown Vetch Tall Fescue	10-20 20-30	1/4-1/2 1/2-3/4	Do not seed later than August
Flat Pea Tall Fescue	20-25 20-30	1/2-3/4 1/2-3/4	Do not seed later than August
Road Ditches and Swales			
Tall Fescue	40-50	1-11/4	
Turf-type (Dwarf) Fescue Kentucky Bluegrass	90 5	2 1/4 0.1	
Lawns			
Kentucky Bluegrass Perennial Ryegrass	100-120	2 2	
Kentucky Bluegrass Creeping Red Fescue	100-120	2 1-1/2	For shaded areas

Note: Other approved seed species may be substituted.

Specifications
for

Sediment Trap



Specifications
for

Sediment Traps

1. Work shall consist of the installation, maintenance and removal of all sediment traps at the locations designated on the drawings.
2. Sediment traps shall be constructed to the dimensions specified on the drawings and operational prior to upslope land disturbance.
3. The area beneath the embankment shall be cleared, grubbed and stripped of vegetation to a minimum depth of six (6) inches. The pool shall be cleared as needed to facilitate sediment cleanout.
4. Fill used for the embankment shall be evaluated to assure its suitability and it must be free of roots or other woody vegetation, large rocks, organics or other objectionable materials. Fill material shall be placed in six (6) inch lifts and shall be compacted by traversing with a sheepsfoot or other approved compaction equipment. Fill height shall be increased five (5) percent to allow for structure/foundation settlement. Construction shall not be permitted if either the earthfill or compaction surface is frozen.
5. The maximum height of embankment shall be five (5) feet. All cut and fill slopes shall be 2:1 (H:V) or flatter.
6. A minimum storage volume below the crest of the outlet of 67 yd^3. for every acre of contributing drainage area shall be achieved at each location noted on the drawings with additional sediment storage volume provided below this elevation.
7. Temporary seeding shall be established and maintained over the useful life of the practice.
8. The outlet for the sediment trap structure shall be constructed to the dimensions shown on the drawings.
9. The outlet shall be constructed using the materials specified on the drawings. Where geotextile is used, all overlaps shall be a minimum of two (2) feet or as specified by the manufacturer, whichever is greater. All overlaps shall be made with the upper most layer placed last. Geotextile shall be keyed in at least 6" on the upstream side of the outlet.
10. Warning signs and safety fence shall be placed around the traps and maintained over the life of the practice.
11. After all sediment-producing areas have been permanently stabilized, the structure and all associated sediment shall be removed. Stabile earth materials shall be placed in the sediment trap area and compacted. The area shall be graded to blend in with adjoining land surfaces and have positive drainage. The area shall be immediately seeded.

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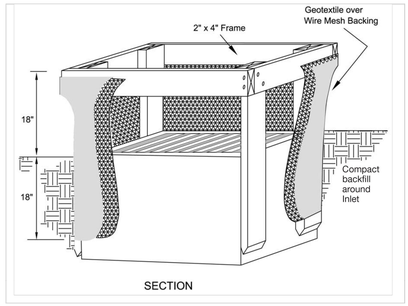
Specifications
for

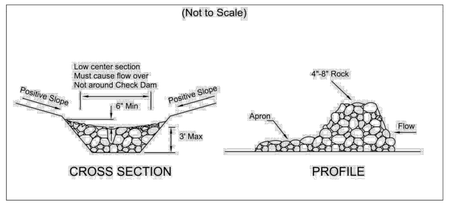
Geotextile Inlet Protection (IP)



1. Inlet protection shall be constructed either before upslope land disturbance begins or before the inlet becomes functional.
2. The earth around the inlet shall be excavated completely to a depth at least 18 inches.
3. The wooden frame shall be constructed of 2-inch by 4-inch construction grade lumber. The 2-inch by 4-inch posts shall be driven one (1) ft. into the ground at four corners of the inlet and the top portion of 2-inch by 4-inch frame assembled using the overlap joint shown. The top of the frame shall be at least 6 inches below adjacent roads if ponded water will pose a safety hazard to traffic.
4. Wire mesh shall be of sufficient strength to support fabric with water fully impounded against it. It shall be stretched tightly around the frame and fastened securely to the frame.
5. Geotextile material shall have an equivalent opening size of 20-40 sieve and be resistant to sunlight. It shall be stretched tightly around the frame and fastened securely. It shall extend from the top of the frame to 18 inches below the inlet notch elevation. The geotextile shall overlap across one side of the inlet so the ends of the cloth are not fastened to the same post.
6. Backfill shall be placed around the inlet in compacted 6-inch layers until the earth is even with notch elevation on ends and top elevation on sides.
7. A compacted earth dike or check dam shall be constructed in the ditch line below the inlet if the inlet is not in a depression. The top of the dike shall be at least 6 inches higher than the top of the frame.

Specifications
for

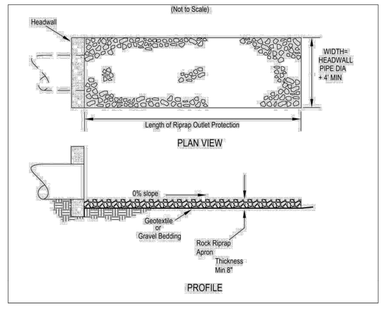
Rock Check Dam



1. The check dam shall be constructed of 4-8 inch diameter stone, placed so that it completely covers the width of the channel. ODOT Type D stone is acceptable, but should be underlain with a gravel filter consisting of ODOT No. 3 or 4 or suitable filter fabric.
2. Maximum height of check dam shall not exceed 3.0 feet.
3. The midpoint of the rock check dam shall be a minimum of 6 inches lower than the sides in order to direct across the center and away from the channel sides.
4. The base of the check dam shall be entrenched approximately 6 inches.
5. Spacing of check dams shall be in a manner such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
6. A Splash Apron shall be constructed where check dams are expected to be in use for an extended period of time, a stone apron shall be constructed immediately downstream of the check dam to prevent flows from undercutting the structure. The apron should be 6 in. thick and its length two times the height of the dam.
7. Stone placement shall be performed either by hand or mechanically as long as the center of check dam is lower than the sides and extends across entire channel.
8. Side slopes shall be a minimum of 2:1.

Specifications
for

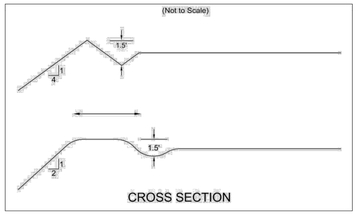
Rock Outlet Protection (RP)



1. Subgrade for the filter or bedding and riprap shall be prepared to the required lines and grades as shown on the plan. The subgrade shall be cleared of all trees, stumps, roots, sod, loose rock, or other material.
2. Riprap shall conform to the grading limits as shown on the plan.
3. Geotextile shall be securely anchored according to manufacturers' recommendations.
4. Geotextile shall be laid with the long dimension parallel to the direction of flow and shall be laid loosely but without wrinkles and creases. Where joints are necessary, strips shall be placed to provide a 12-in. minimum overlap, with the upstream strip overlapping the downstream strip.
5. Gravel bedding shall be ODOT No. 67's or 57's unless shown differently on the drawings.
6. Riprap may be placed by equipment but shall be placed in a manner to prevent slippage or damage to the geotextile.
7. Riprap shall be placed by a method that does not cause segregation of sizes. Extensive pushing with a dozer causes segregation and shall be avoided by delivering riprap near its final location within the channel.
8. Construction shall be sequenced so that outlet protection is placed and functional when the storm drain, culvert, or open channel above it becomes operational.
9. All disturbed areas will be vegetated as soon as practical.

Specifications
for

Temporary Diversion



1. Drainage area should not exceed 10 acres. Larger areas require a more extensive design.
2. The channel cross section may be parabolic or trapezoidal. Disk the base of the dike before placing fill. Build the dike 10% higher than designed for settlement. The dike shall be compacted by traversing with tracked earth-moving equipment.
3. The minimum cross section of the levee or dike will be as follows: (Minimum design freeboard shall be 0.3 foot.) Where construction traffic will cross, the top width may be made wider and the side slopes flatter than specified above.

Table 5.3.2

Dike Top Width (ft.)	Height (ft.)	Side Slopes	Shape
0	1.5	4:1	Trapezoidal
4	1.5	2:1	Parabolic

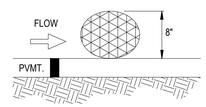
4. The grade may be variable depending upon the topography, but must have a positive drainage to the outlet and be stabilized to be non-erosive.

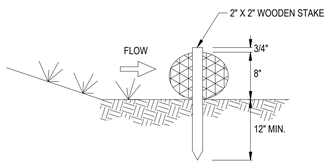
Table 5.3.3

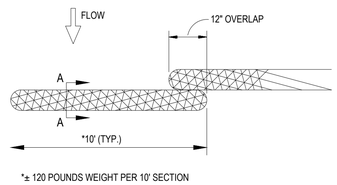
Temporary Diversion Stabilization Treatment			
Diversion Slope	< 2 ac.	2 - 5 ac.	5 - 10 ac.
0 - 3%	Seed and Straw	Seed and Straw	Seed and Straw
3 - 5%	Seed and Straw	Seed and Straw	Matting
5 - 8%	Seed and Straw	Matting	Matting
8 - 20%	Seed and Straw	Matting	Engineered

Note: Diversions with steeper slopes or greater drainage areas are beyond the scope of this standard and must be designed for stability. Seed, straw and matting used shall meet the Specifications for Temporary Seeding, Mulching and Matting.

5. Outlet runoff onto a stabilized area, into a properly designed waterway, grade stabilization structure, or sediment trapping facility.
6. Diversions shall be seeded and mulched in accordance with the requirements in practice standards TEMPORARY SEEDING (or PERMANENT SEEDING) and MULCHING as soon as they are constructed or other suitable stabilization in order to preserve dike height and reduce maintenance.



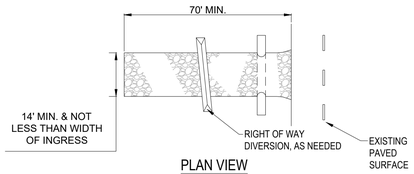


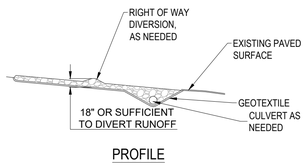


NOTES:

1. STONE SIZE - (1.5-2.5 INCH) STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 70 FT. (EXCEPTION: APPLY 30 FT. MINIMUM TO SINGLE RESIDENCE LOTS.
3. THICKNESS - THE STONE LAYER SHALL BE AT LEAST 6 INCHES THICK FOR LIGHT DUTY ENTRANCES OR AT LEAST 10 INCHES FOR HEAVY DUTY USE.
4. WIDTH - THE ENTRANCE SHALL E AT LEAST 14 FEET WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. GEOTEXTILE - A GEOTEXTILE SHALL BE LAID OVER THE ENTIRE AREA PRIOR TO PLACING STONE, IT SHALL BE COMPOSED OF STRONG ROT-PROOF POLYMERIC FIBERS AND MEET THE FOLLOWING SPECIFICATIONS:
6. TIMING - THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SOON AS IS PRACTICAL BEFORE MAJOR GRADING ACTIVITIES.
7. CULVERT - A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OR TO PREVENT RUNOFF FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
8. WATER BAR - A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
9. MAINTENANCE - TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, ORA ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY, REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION-SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
10. REMOVAL - THE ENTRANCE SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY OR ENTRANCE.

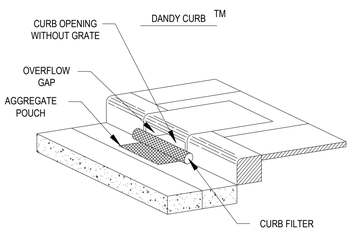
GEOTEXTILE SPECIFICATION FOR CONSTRUCTION ENTRANCE	
MINIMUM TENSILE STRENGTH	200 lbs.
MINIMUM PUNCTURE STRENGTH	80 psi.
MINIMUM TEAR STRENGTH	50 lbs.
MINIMUM BURST STRENGTH	320 psi.
MINIMUM ELONGATION	20%
EQUIVALENT OPENING SIZE	EOS < 0.6 mm.
PERMITTIVITY	1x10-3 cm/sec.





STABILIZED CONSTRUCTION ENTRANCE (CE)

NTS



DANDY CURB™
SPECIFICATIONS

NOTE: THE DANDY CURB™ WILL BE MANUFACTURED IN THE U.S.A. FROM A WOVEN MONOFILAMENT FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS:

DANDY CURB™ (SAFETY ORANGE)

Mechanical Properties	Test Method	Units	MARV
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.62 (365) X 0.89 (200)
Grab Tensile Elongation	ASTM D 4632	%%%	24 X 10
Puncture Strength	ASTM D 4833	kN (lbs)	0.40 (90)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	3097 (450)
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.51 (115) X 0.33 (75)
UV Resistence	ASTM D 4355	%%%	90
Apparent Opening Size	ASTM D 4751	Mm (US Std Sieve)	0.425 (40)
Flow Rate	ASTM D 4491	l/min/m (gal/min/ft)	5907 (145)
Permittivity	ASTM D 4491	Sec -1	2.1

*Note: All Dandy Curbs™ can be ordered with our optional oil absorbents

CURB INLET DANDY BAG (IP)

NTS

- MATERIALS - COMPOST USED FOR FILTER SOCKS SHALL BE WEED, PATHOGEN AND INSECT FREE AND FREE OF ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH. THEY SHALL BE DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER AND CONSIST OF A PARTICLES RANGING FROM 3/8" TO 2".
- FILTER SOCKS SHALL BE 3 OR 5 MIL CONTINUOUS, TUBULAR, HDPE 3/8" KNITTED MESH NETTING MATERIAL, FILLED WITH COMPOST PASSING THE ABOVE SPECIFICATIONS FOR COMPOST PRODUCTS.

INSTALLATION:

- FILTER SOCKS WILL BE PLACED ON A LEVEL LINE ACROSS SLOPES, GENERALLY PARALLEL TO THE BASE OF THE SLOPE OR OTHER AFFECTED AREA. ON SLOPES APPROACHING 2:1, ADDITIONAL SOCKS SHALL BE PROVIDED AT THE TOP AND AS NEEDED MIDSLOPE.
- FILTER SOCKS ARE NOT TO BE USED IN CONCENTRATED FLOW SITUATIONS OR IN RUNOFF CHANNELS.

MAINTENANCE:

- ROUTINELY INSPECT FILTER SOCKS AFTER EACH SIGNIFICANT RAIN, MAINTAINING FILTER SOCKS IN A FUNCTIONAL CONDITION AT ALL TIMES.
- REMOVE SEDIMENTS COLLECTED AT THE BASE OF THE FILTER SOCKS WHEN THEY REACH 1/3 OF THE EXPOSED HEIGHT OF THE PRACTICE.
- WHERE THE FILTER SOCK DETERIORATES OR FAILS, IT WILL BE REPAIRED OR REPLACED WITH A MORE EFFECTIVE ALTERNATIVE.
- REMOVAL - FILTER SOCKS WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED IN SUCH AS WAY AS TO FACILITATE AND NOT OBSTRUCT SEEDINGS.

FILTER SOCK (FS)

NTS

CESO
WWW.CESOINC.COM
175 Montrose West Ave., Suite 400
Akron, OH 44321
Phone: 330.665.0660 Fax: 888.208.4826

Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER
12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

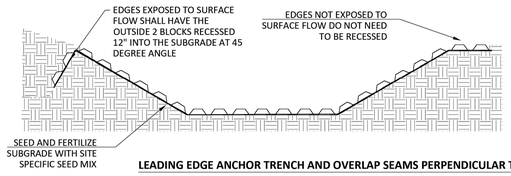
ID	Description	Date

Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

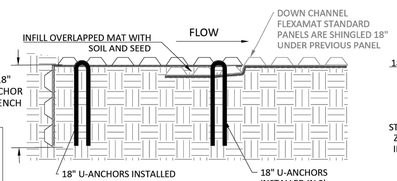
Drawing Title:
SWPPP DETAILS

C4.9

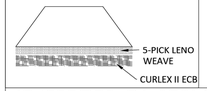
METHOD FOR TREATING EDGES EXPOSED TO SURFACE SHEET FLOW



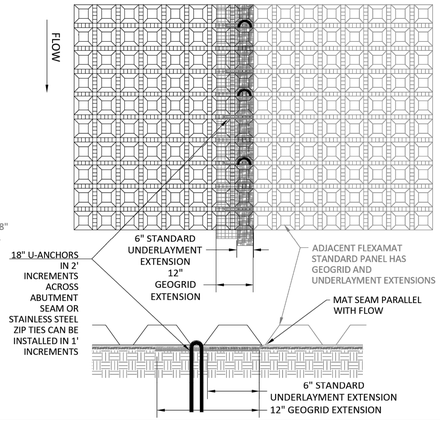
LEADING EDGE ANCHOR TRENCH AND OVERLAP SEAMS PERPENDICULAR TO FLOW



FLEXAMAT STANDARD UNDERLAYMENT



ABUTMENT METHOD FOR WIDER THAN 16'



FLEXAMAT STANDARD CHANNEL - LAYOUT PARALLEL TO FLOW

CONSTRUCTION NOTES:

1. AN ENGINEER OR MANUFACTURERS REPRESENTATIVE SHALL BE ONSITE FOR THE START OF THE INSTALLATION.
2. GRADE CHANNEL SO THAT WATER WILL FLOW DOWN CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND.
3. PRIOR TO FLEXAMAT STANDARD INSTALLATION SEED AND FERTILIZE THE PREPARED SUBGRADE WITH SITE SPECIFIC SEED MIX AND IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
4. INSTALL FLEXAMAT STANDARD ROLLS, USING THE WIDEST ROLLS POSSIBLE TO AVOID SEAMS.
   - 4.1. FOR CHANNELS THAT ARE WIDER THAN 16', INSTALL 15.5' WIDE FLEXAMAT STANDARD ROLLS THAT INCLUDE 12" GEOGRID EXTENSIONS WITH A 6" STANDARD UNDERLAYMENT EXTENSIONS. THESE SEAMS ARE PARALLEL WITH FLOW, THE ADJACENT MAT INSTALLED OVER THE EXTENSIONS. ENSURE GEOGRID AND STANDARD UNDERLAYMENT EXTENSIONS ARE LAYING FLAT ON SUBGRADE PRIOR TO INSTALLING ADJACENT MAT.
   - 4.2. SECURE THE ABUTMENT PARALLEL WITH FLOW BY INSTALLING 18" U-ANCHORS IN 2' INCREMENTS OR 20" STAINLESS STEEL ZIP TIES IN 1' INCREMENTS THROUGH THE EXTENSION OVERLAP. U ANCHORS OR ZIP TIES TO BE INSTALLED PERPENDICULAR TO FLOW. ZIP TIES SHALL ENCOMPASS 3 CORDS OF GEOGRID FROM EACH MAT.
5. FOR ADDITIONAL SECTIONS OF MAT, SECURE SEAM PERPENDICULAR WITH FLOW BY OVERLAPPING THE DOWNSTREAM SECTION 18" WITH UPSTREAM SECTION OF MAT. PRIOR TO INSTALLING OVERLAP, FLIP UPSTREAM MAT BACK 24". EXCAVATE 2.25"" OF SOIL 18" FROM END OF UPSTREAM MAT. DOWNSTREAM SECTION IS LAID IN THE SHALLOW TRENCH. RETURN AND TAMP SOIL OVER INITIAL EDGE AND SEED. FLIP END OF UPSTREAM MAT OVER THE SOIL COVERED AND SEEDED INITIAL LEADING EDGE OF DOWNSTREAM MAT.
   - 5.1. SECURE OVERLAPS PERPENDICULAR TO FLOW BY INSTALLING 18" U-ANCHORS IN 2' INCREMENTS OR 20" STAINLESS STEEL ZIP TIES IN 1' INCREMENTS THROUGH THE OVERLAP. ZIP TIES SHALL ENCOMPASS 3 CORDS OF GEOGRID FROM EACH MAT.
6. AT THE INITIAL LEADING EDGE OF THE FLEXAMAT STANDARD ARMORED CHANNEL, EMBED THE MAT 18" IN A VERTICAL ANCHOR TRENCH. FILL AND COMPACT ANCHOR TRENCH WITH SUITABLE FILL. AT

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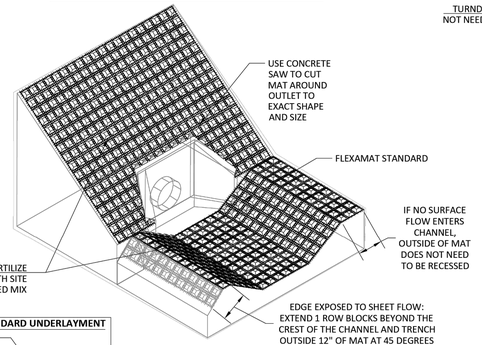
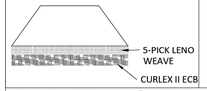
REV - 1

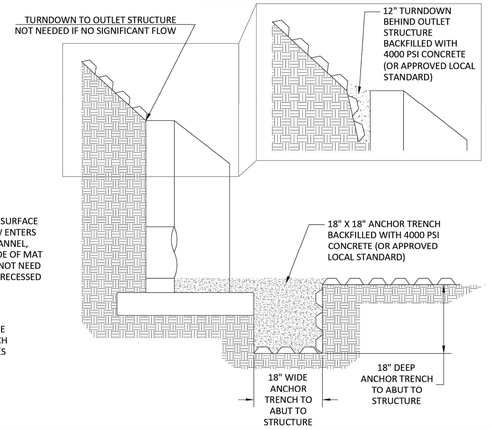
ISOMETRIC VIEW OF OUTLET AND SLOPE PROTECTION



FLEXAMAT STANDARD UNDERLAYMENT



PROFILE VIEW OF ANCHOR TRENCHES



FLEXAMAT STANDARD - OUTLET ARMORING

CONSTRUCTION NOTES:

1. GRADE CHANNEL SO THAT WATER WILL FLOW DOWN CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING FOUNDATION FOR THE MATS.
2. PRIOR TO FLEXAMAT STANDARD INSTALLATION, SEED AND FERTILIZER SUBGRADE WITH SITE SPECIFIC SEED MIX IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
3. INSTALL FLEXAMAT ROLLS. AVAILABLE WIDTHS ARE 4', 5.5', 8', 10', 12', AND 16' AVAILABLE IN CUSTOM LENGTHS. FOR WIDTHS WIDER THAN 16', INSTALL 15.5' WIDE MAT WITH 12" GEOGRID EXTENSION AND 6" UNDERLAYMENT EXTENSION.
   - 3.1. WHERE POSSIBLE AVOID LONGITUDINAL ABUTMENT SEAMS IN CHANNEL BOTTOM.
   - 3.2. FOR OUTLET PROTECTION WIDER THAN 16' SEE CHANNEL PARALLEL TO FLOW INSTALLATION DETAIL.
   - 3.3. FOR OUTLET PROTECTION THAT REQUIRES MORE THAN 1 MAT IN LENGTH TO COVER CHANNEL SEE CHANNEL PARALLEL TO FLOW INSTALLATION DETAIL.
4. AT THE BEGINNING OF CHANNEL, THE INITIAL LEADING EDGE OF FLEXAMAT EXPOSED TO CONCENTRATED FLOW SHALL BE EMBEDDED 18" VERTICALLY INTO ANCHOR TRENCH. THE TRENCH SHALL BE FILLED WITH 4,000 PSI CONCRETE.
5. AT THE END OF THE ARMORED CHANNEL, EMBED THE MAT 18" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH A COHESIVE FILL.

GUIDANCE TABLE FOR STORMWATER OUTFALL PROTECTION

PIPE DIAMETER		FLEXAMAT WIDTH	FLEXAMAT LENGTH (*MIN)
12"	8 CFS	5.5'	5'
18"	20 CFS	8'	8'
24"	30 CFS	8'	10'
36"	75 CFS	12'	16'
48"	100 CFS	16'	20'
60"	150 CFS	20'	25'

*CONSULT MANUFACTURER FOR GUIDANCE IF DESIGN DISCHARGE VARIES SIGNIFICANTLY FROM VALUES LISTED IN TABLE.
*LENGTH OF PROTECTION WILL VARY ON THE LENGTH OF THE SLOPE, DEGREE OF SLOPE, OR IF IT IS DISCHARGING ONTO A FLAT AREA. OUTFALLS DISCHARGING ONTO SLOPES, IT IS RECOMMENDED TO EXTEND FLEXAMAT PLUS THE LENGTH OF THE SLOPE AND 3' PAST THE TOE.

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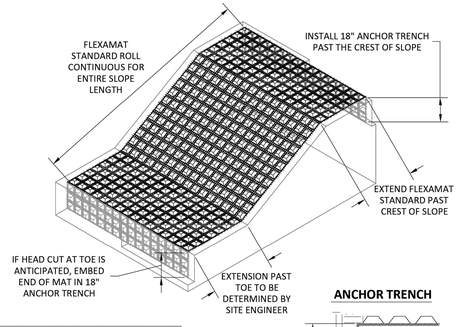
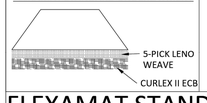
REV - 1

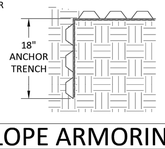
ISOMETRIC VIEW OF SLOPE AND ANCHOR TRENCHES



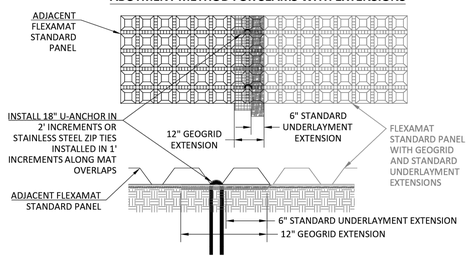
FLEXAMAT STANDARD UNDERLAYMENT



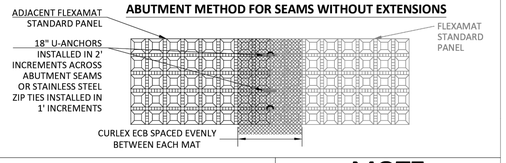
ANCHOR TRENCH



ABUTMENT METHOD FOR SEAMS WITH EXTENSIONS



ABUTMENT METHOD FOR SEAMS WITHOUT EXTENSIONS



FLEXAMAT STANDARD - SLOPE ARMORING

CONSTRUCTION NOTES:

1. AN ENGINEER OR MANUFACTURERS REPRESENTATIVE SHALL BE ONSITE FOR THE START OF THE INSTALLATION.
2. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND.
3. PRIOR TO FLEXAMAT STANDARD INSTALLATION SEED AND FERTILIZE SUBGRADE WITH SITE SPECIFIC SEED MIX IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
4. INSTALL FLEXAMAT STANDARD ROLLS THAT ARE CONTINUOUS FOR ENTIRE SLOPE LENGTH. FOR SLOPES LONGER THAN 16', USE MATS WITH EXTENSIONS CUT TO THE LENGTH OF THE SLOPE. INSTALL MATS TO THAT THE MATTING EXTENDS PAST THE CREST OF SLOPE AND INTO AN 18" ANCHOR TRENCH.
   - 4.1. FOR ARMORED SLOPE LENGTHS 16' OR LESS, INSTALL CURLEX ECB EQUALLY UNDER ADJACENT MATS. SECURE SEAM WITH #3 REBAR 18" U-ANCHORS IN 2' INCREMENTS THE LENGTH OF THE ABUTMENT.
   - 4.2. ARMORED SLOPE LENGTHS LONGER THAN 16', INSTALL NEXT MAT OVER EXTENSIONS.
5. INSTALL SUBSEQUENT MATS OVER THE GEOGRID EXTENSION AND STANDARD UNDERLAYMENT EXTENSION OF THE PREVIOUSLY INSTALLED MAT. ENSURE THE GEOGRID AND STANDARD UNDERLAYMENT EXTENSIONS ARE LAYING FLAT ON THE SUBGRADE BEFORE INSTALLING ADJACENT MAT OVER THE EXTENSIONS.
6. INSTALL #3 REBAR 18" U-ANCHORS IN 2' INCREMENTS ACROSS THE GEOGRID AND STANDARD EXTENSION ABUTMENT. INSTALL ANCHORS PERPENDICULAR TO THE SLOPE DIRECTLY BEHIND FIRST ROW OF BLOCKS ON THE ADJACENT MAT.
7. AT THE END OF THE ARMORED SLOPE, IF HEAD CUT IS ANTICIPATED, EMBED THE MAT 18" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH SUITABLE FILL.

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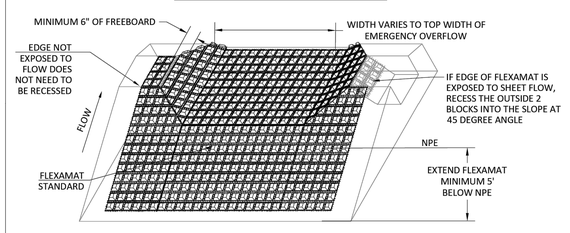
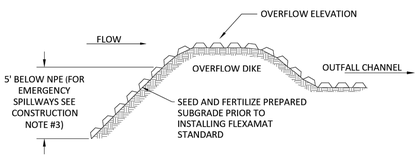
REV - 1

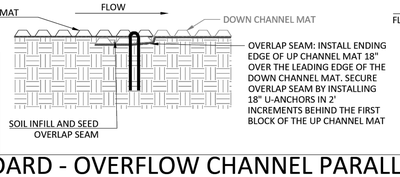
EMERGENCY SPILLWAY - ISOMETRIC VIEW



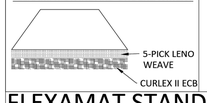
OVERFLOW DIKE - PROFILE VIEW



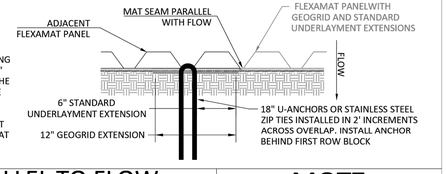
1. OVERLAP METHOD FOR SEAMS PERPENDICULAR TO FLOW



FLEXAMAT STANDARD UNDERLAYMENT



2. OVERLAP METHOD FOR SEAMS PARALLEL TO FLOW



FLEXAMAT STANDARD - OVERFLOW CHANNEL PARALLEL TO FLOW

CONSTRUCTION NOTES:

1. AN ENGINEER OR MANUFACTURERS REPRESENTATIVE SHALL BE ONSITE FOR THE START OF THE INSTALLATION.
2. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING SUBGRADE FOR THE MATS.
3. PRIOR TO THE FLEXAMAT STANDARD INSTALLATION SEED AND FERTILIZE SUBGRADE WITH SITE SPECIFIC SEED MIX IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
4. MAT SHALL EXTEND 5' BELOW NORMAL POND ELEVATION. (FOR EMERGENCY OVERFLOW INSTALLATIONS EXTEND THE MAT 3' DOWN THE INSIDE FACE OF THE OVERFLOW DIKE.)
5. INSTALL FLEXAMAT STANDARD ROLLS. MANUFACTURER RECOMMENDS INSTALLING THE WIDEST MAT POSSIBLE FOR SPILLWAY APPLICATIONS.
   - 5.1. FOR WIDTHS WIDER THAN 16', INSTALL 15.5' WIDE MATS WITH GEOGRID AND STANDARD UNDERLAYMENT EXTENSIONS. INSTALL ADJACENT MAT OVER THE 12" GEOGRID AND 6" STANDARD UNDERLAYMENT EXTENSIONS OF THE ADJACENT MATS. ENSURE THE GEOGRID AND STANDARD UNDERLAYMENT EXTENSIONS ARE LAYING FLAT ON THE SUBGRADE BEFORE INSTALLING ADJACENT MAT OVER THE EXTENSIONS. INSTALL #3 REBAR 18" U-ANCHORS IN 2' INCREMENTS ACROSS THE GEOGRID AND STANDARD EXTENSION ABUTMENT. INSTALL ANCHORS PERPENDICULAR TO THE FLOW DIRECTLY BEHIND FIRST ROW OF BLOCKS ON THE ADJACENT MAT.
   - 5.2. FOR ADDITIONAL SECTIONS OF MAT, OVERLAP THE DOWNSTREAM SECTION 18" WITH UPSTREAM SECTION OF MAT. PRIOR TO INSTALLING OVERLAP, FLIP UPSTREAM MAT BACK 24". EXCAVATE 2.25" OF SOIL 18" FROM THE END OF THE UPSTREAM MAT. DOWNSTREAM SECTION IS THEN LAID IN THE SHALLOW TRENCH. RETURN AND TAMP SOIL OVER INITIAL EDGE AND SEED AREA. FLIP END OF UPSTREAM MAT OVER THE SOIL COVERED INITIAL LEADING EDGE. SEED AND FERTILIZE SOIL INFILL PRIOR TO FLIPPING END OF UPSTREAM MAT OVER THE SOIL COVERED INITIAL LEADING EDGE OF DOWNSTREAM MAT. SECURE PERPENDICULAR OVERLAP SEAMS BY INSTALLING #3 REBAR - 18" U ANCHORS PERPENDICULAR TO FLOW IN 2' INCREMENTS.
6. AT THE END OF THE ARMORED SPILLWAY, EMBED THE MAT 18" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH SUITABLE FILL. (AS SPECIFIED BY EOR.)

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REV - 1

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER
12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

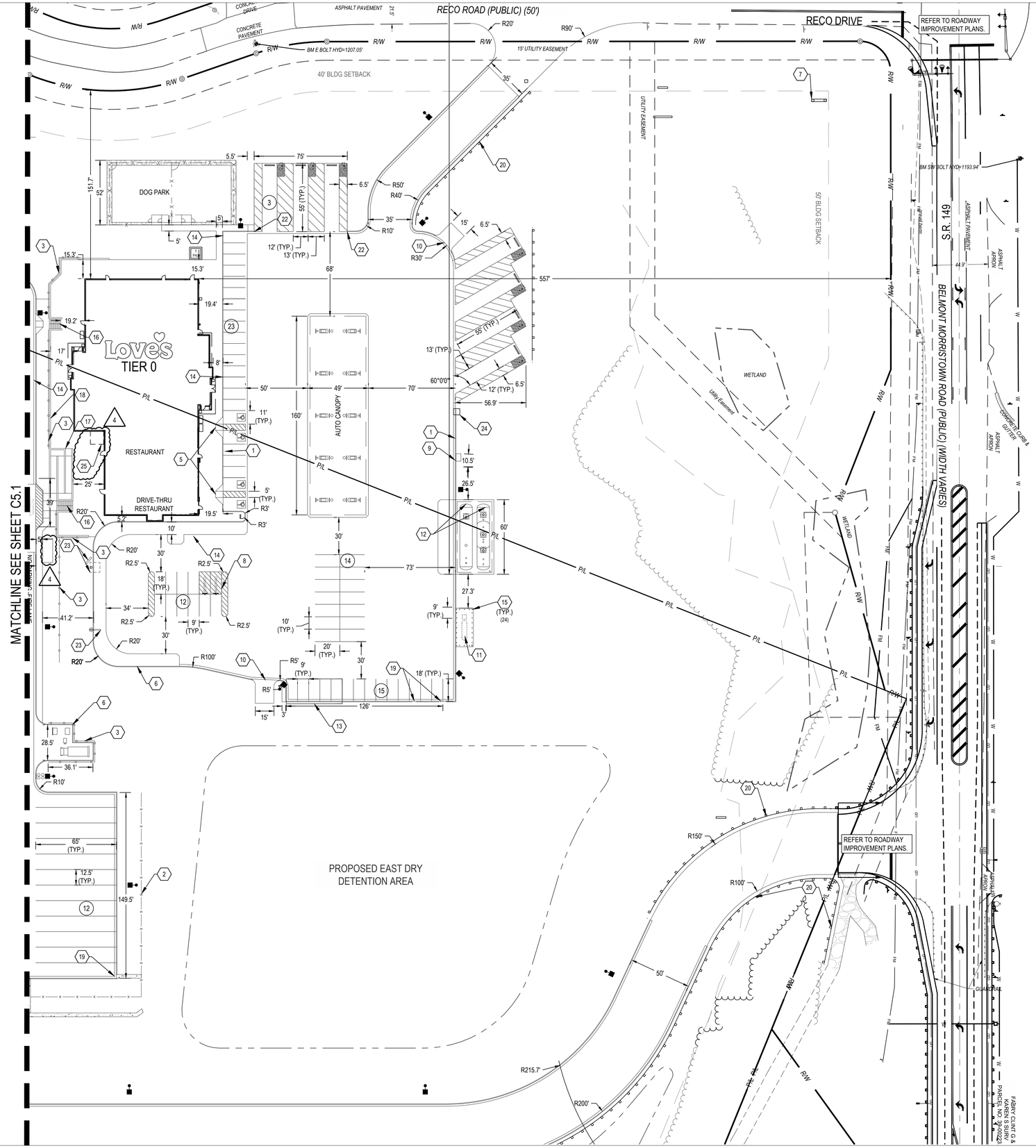
Revisions / Submissions

ID	Description	Date

Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SWPPP DETAILS

C4.10



LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- CONCRETE CURB AND GUTTER
- PAVEMENT
- BOLLARD
- 6 TREX FENCE
- 5 CHAIN-LINK FENCE
- 4 BLACK CHAIN-LINK-FENCE
- XX' SBL — SETBACK
- (X) — NUMBER OF PARKING STALLS
- GRAVEL
- PROPOSED TEMPORARY GRADING EASEMENT AREA

NOTE: REFER TO CONSTRUCTION DETAILS SHEETS

GENERAL NOTES:

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL ODOT STANDARDS. THE CONTRACTOR SHALL OBTAIN FINAL APPROVALS/PERMITTING AND INSPECTION AS NECESSARY PRIOR TO CONSTRUCTION.
2. ALL WET OR OTHERWISE UNSUITABLE SOILS MUST BE STABILIZED PRIOR TO PAVEMENT CONSTRUCTION. REFER TO GEOTECHNICAL REPORT.
3. ALL DIMENSIONS AND COORDINATES REFER TO EDGE OF PAVEMENT AND/OR FACE OF CURB WHERE APPLICABLE.
4. ALL RADII TO BE 5'-0" UNLESS OTHERWISE NOTED.
5. REFER TO CONSTRUCTION DETAILS SHEET/GEOTECHNICAL REPORT FOR PAVEMENT SECTION RECOMMENDATIONS.
6. REFER TO PAVEMENT PLAN FOR PAVEMENT DELINEATION.
7. REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING LAYOUT AND DIMENSIONS AND PROPOSED SIGNS.
8. REFER TO ELECTRICAL DRAWINGS FOR LIGHT POLE LOCATIONS AND VERIFY BOLLARD PROTECTION WITH ARCHITECTURAL PLANS.

CODED NOTES:

1. PROPOSED CURB AND GUTTER
2. PROPOSED 5' CHAIN-LINK FENCE. REFER TO ARCHITECTURAL PLANS
3. PROPOSED 6' TREX FENCE. REFER TO ARCHITECTURAL PLANS
4. STOP BAR
5. ADA RAMP
6. PROPOSED MONOLITHIC CURB
7. LOVE'S STREET SIGN. REFER TO ARCHITECTURAL PLANS.
8. RESERVED PARKING SPACE FOR DRIVE-THRU CUSTOMERS. REFER TO ARCHITECTURAL PLANS FOR SIGNAGE AND STRIPING.
9. AIR/ WATER ISLAND/ RV DUMP. REFER TO ARCHITECTURAL PLANS.
10. SNOW PLOT PUSH PAD, REFER TO DETAIL ON CONSTRUCTION DETAIL SHEET.
11. PROPANE STORAGE AREA. REFER TO ARCHITECTURAL PLANS.
12. FUEL STORAGE TANKS. REFER TO ARCHITECTURAL PLANS.
13. FUTURE EV CHARGING STALLS.
14. PROPOSED COLORED CONCRETE CURB. REFER TO PAVEMENT PLAN FOR LIMITS.
15. PROPOSED BOLLARD.
16. STAIRS.
17. SWITCH BACK RAMP. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.
18. RETAINING WALL. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.
19. PROPOSED CURB CUT.
20. PROPOSED GUARDRAIL.
21. PROPOSED JERSEY BARRIER.
22. TAPER CURB FROM 6" TO 0" OVER 1 FOOT.
23. PROPOSED DRIVE THRU EQUIPMENT. REFER TO ARCHITECTURAL PLANS FOR DETAILS FOR ADDITIONAL INFORMATION.
24. PROPOSED RV SIGNAGE. REFER TO ARCHITECTURAL PLANS.
25. PROPOSED SMOKERS LOUNGE CANOPY. REFER TO ARCHITECTURAL PLANS. (4)

GRAPHIC SCALE (IN FEET): 40 0 40 80

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FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
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Loves

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

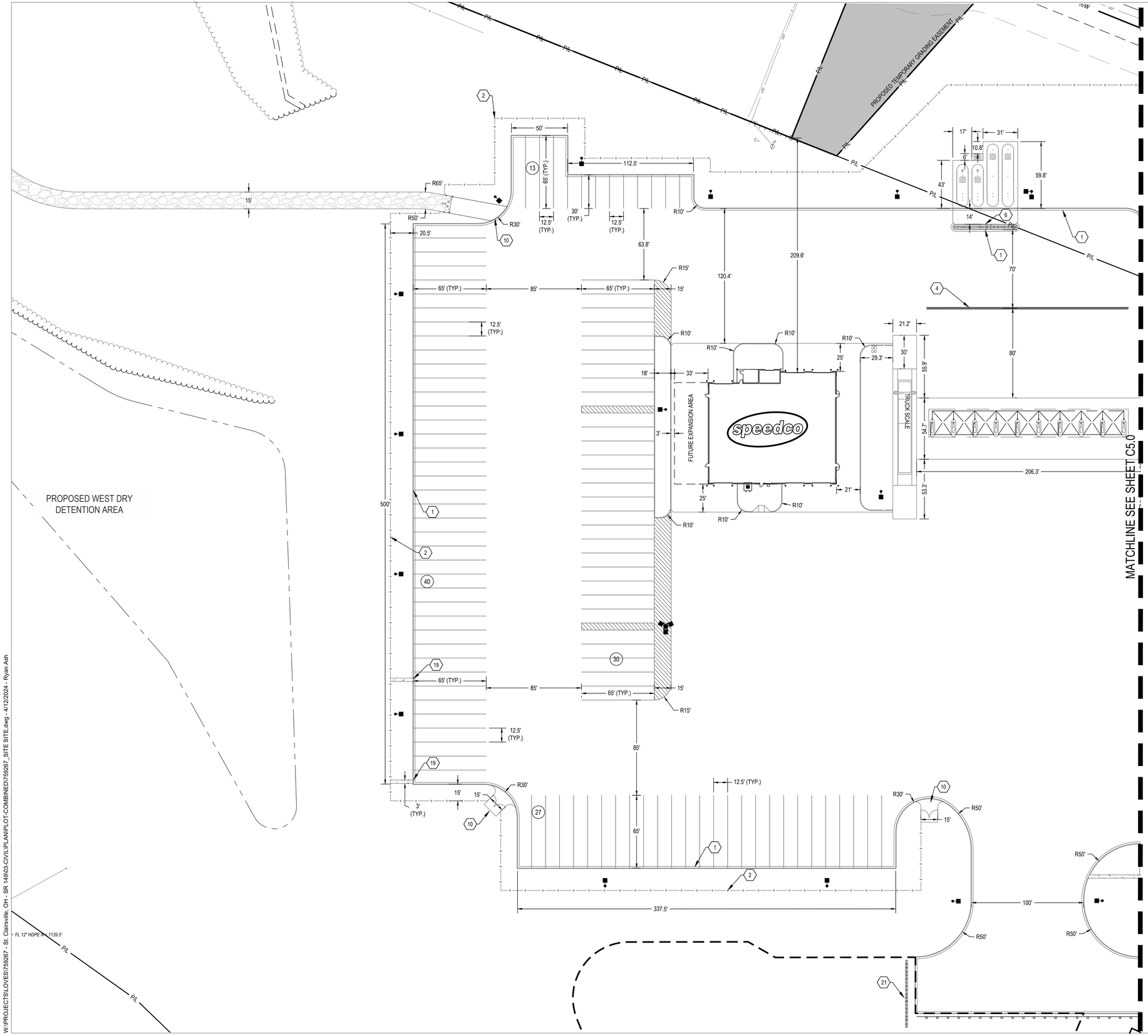
Revisions / Submissions

ID	Description	Date
3	ADDENDUM 3	02/09/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SITE PLAN - EAST

C5.0



LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- CONCRETE CURB AND GUTTER
- PAVEMENT
- BOLLARD
- 6 TREX FENCE
- 5 CHAIN-LINK FENCE
- 4 BLACK CHAIN-LINK-FENCE
- XX' SBL — SETBACK
- (X) — NUMBER OF PARKING STALLS
- GRAVEL
- PROPOSED TEMPORARY GRADING EASEMENT AREA

NOTE: REFER TO CONSTRUCTION DETAILS SHEETS

GENERAL NOTES:

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL ODOT STANDARDS. THE CONTRACTOR SHALL OBTAIN FINAL APPROVALS/PERMITTING AND INSPECTION AS NECESSARY PRIOR TO CONSTRUCTION.
2. ALL WET OR OTHERWISE UNSUITABLE SOILS MUST BE STABILIZED PRIOR TO PAVEMENT CONSTRUCTION. REFER TO GEOTECHNICAL REPORT.
3. ALL DIMENSIONS AND COORDINATES REFER TO EDGE OF PAVEMENT AND/OR FACE OF CURB WHERE APPLICABLE.
4. ALL RADII TO BE 5'-0" UNLESS OTHERWISE NOTED.
5. REFER TO CONSTRUCTION DETAILS SHEET/GEOTECHNICAL REPORT FOR PAVEMENT SECTION RECOMMENDATIONS.
6. REFER TO PAVEMENT PLAN FOR PAVEMENT DELINEATION.
7. REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING LAYOUT AND DIMENSIONS AND PROPOSED SIGNS.
8. REFER TO ELECTRICAL DRAWINGS FOR LIGHT POLE LOCATIONS AND VERIFY BOLLARD PROTECTION WITH ARCHITECTURAL PLANS.

CODED NOTES:

1. PROPOSED CURB AND GUTTER
2. PROPOSED 5' CHAIN-LINK FENCE. REFER TO ARCHITECTURAL PLANS
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25. PROPOSED SMOKERS LOUNGE CANOPY. REFER TO ARCHITECTURAL PLANS.

GRAPHIC SCALE (IN FEET)

40 0 40 80

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

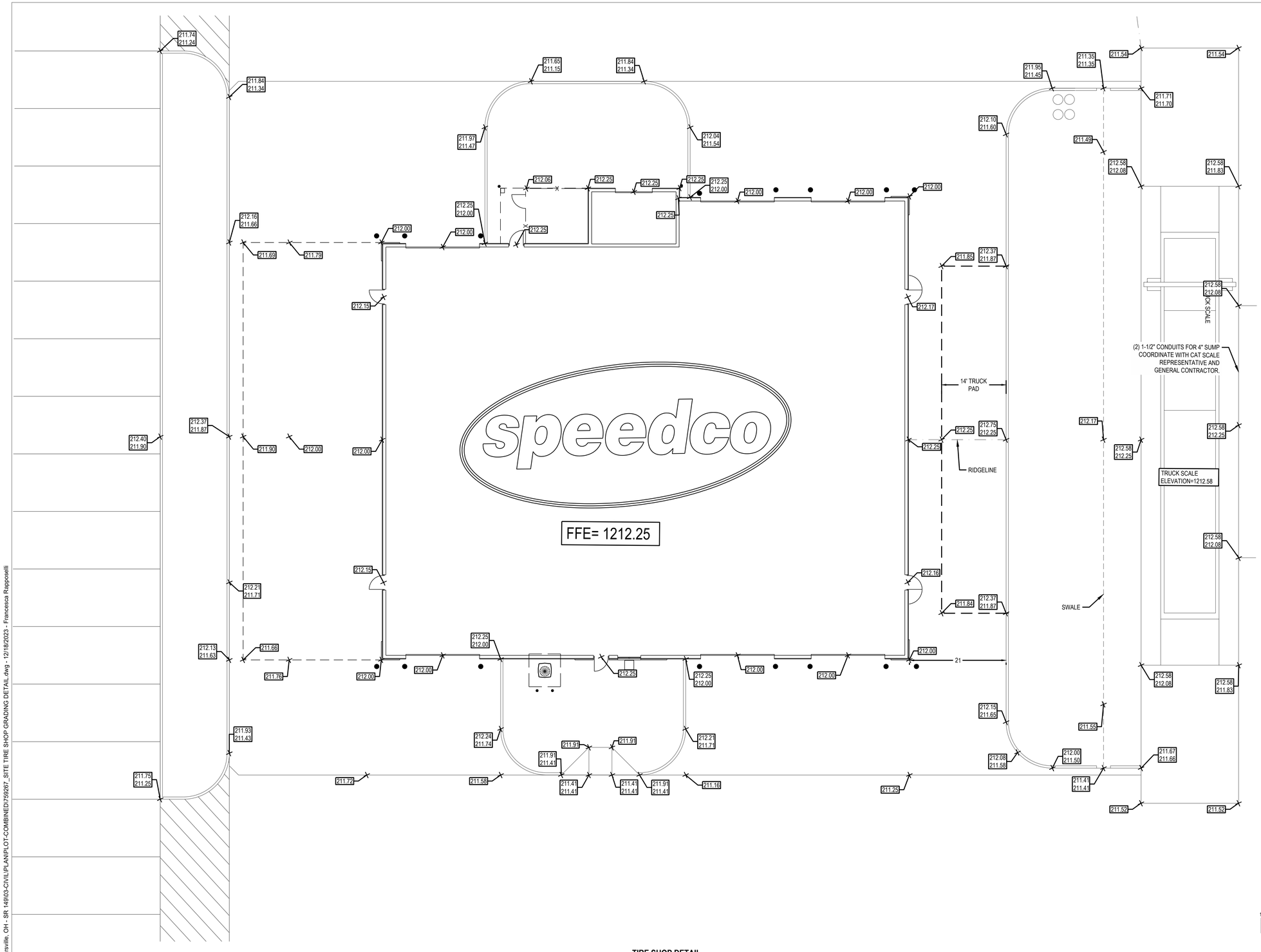
ID	Description	Date
3	ADDENDUM 3	02/09/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

SITE PLAN - WEST

C5.1



TIRE SHOP DETAIL

SCALE: 1" = 10'

NOTES

1. ALL SPOT GRADES REFER TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
2. SEE GRADING PLAN FOR ADDITIONAL GRADES ON SITE.
3. ALL DISCREPANCIES BETWEEN SPOT ELEVATIONS ON THIS SHEET AND THE GRADING PLAN SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND THE DESIGN ENGINEER.
4. ELEVATIONS SHOWN AT TIRE SHOP DOORS SHOULD BE VERIFIED WITH ARCHITECTURAL PLANS. ANY DISCREPANCIES BETWEEN THIS SHEET AND THE ARCHITECTURAL PLANS SHOULD BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND THE DESIGN ENGINEER.
5. THE TIRE SHOP FINISHED FLOOR ELEVATION (1212.25) IS EQUAL TO THE ARCHITECTURAL FINISHED FLOOR ELEVATION 100.00 NOTED ON THE FOUNDATION PLANS.
5. ADD 1000.00 TO ALL SPOT ELEVATIONS SHOWN ON PLAN TO OBTAIN U.S.G.S. ELEVATIONS.

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Loves

STATE OF OHIO
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REGISTERED PROFESSIONAL ENGINEER

12/18/2023

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Revisions / Submissions

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Project Number:	759267
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Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:

TIRE SHOP GRADING DETAIL

C7.8

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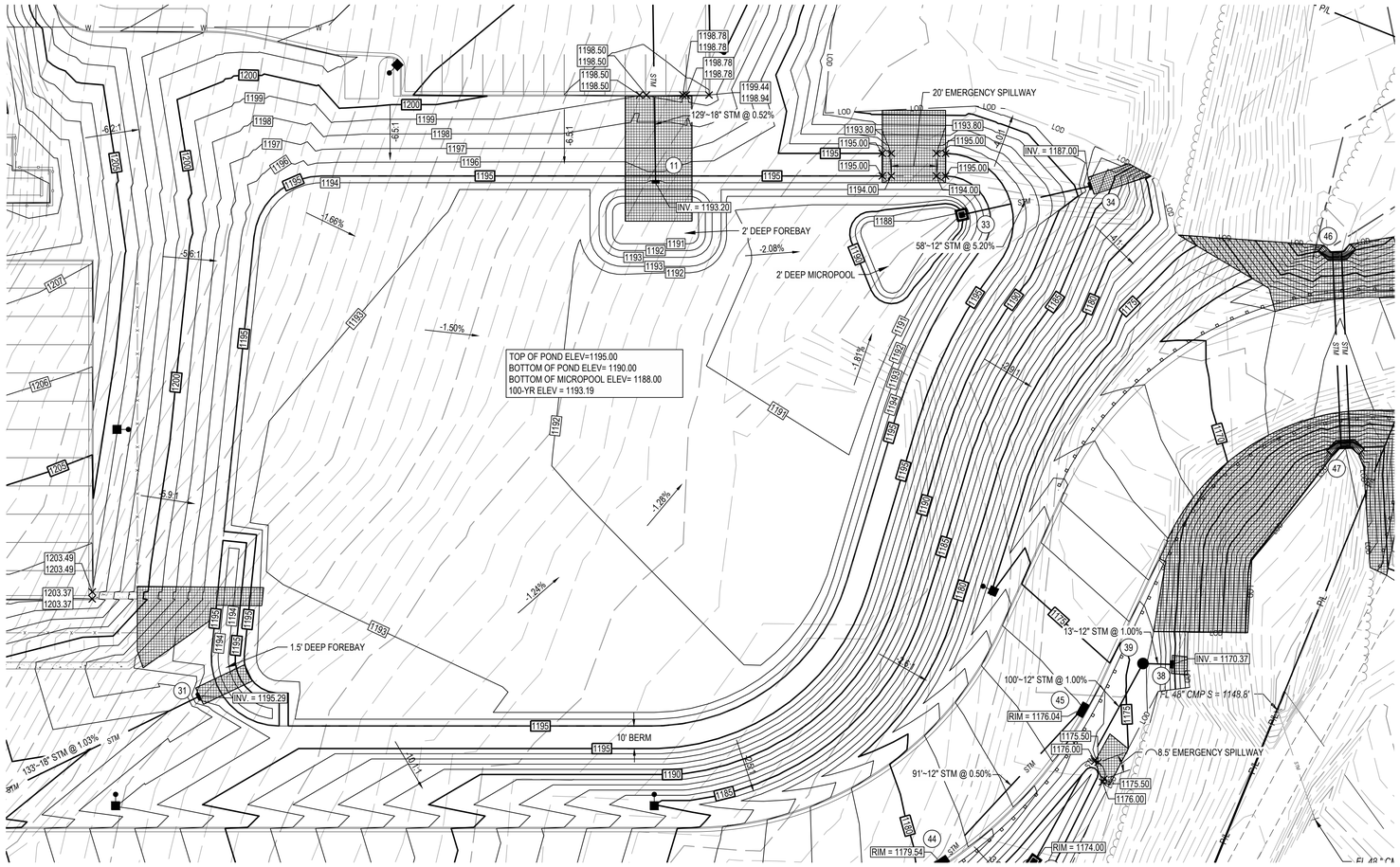


GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL BELMONT COUNTY AND ODOT REGULATIONS AND CODES, AND O.S.H.A. STANDARDS. THE CONTRACTOR SHALL OBTAIN FINAL PERMITTING AND APPROVAL/INSPECTIONS AS REQUIRED FROM THE LOCALITY.
2. STORM SEWER CATCH BASINS, CURB INLETS, MANHOLES AND ENDWALLS SHALL CONFORM TO ODOT STANDARD CONSTRUCTION DRAWINGS.
3. REFER TO SWPPP PLANS FOR RIPRAP / FLEXAMAT LOCATIONS AND DIMENSIONS AND ALL OTHER PERMANENT EROSION CONTROL MEASURES.

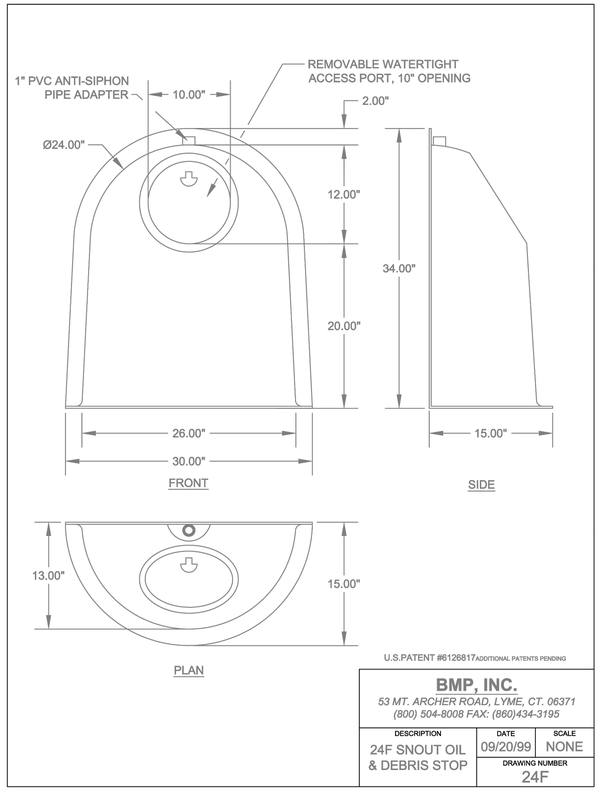
LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

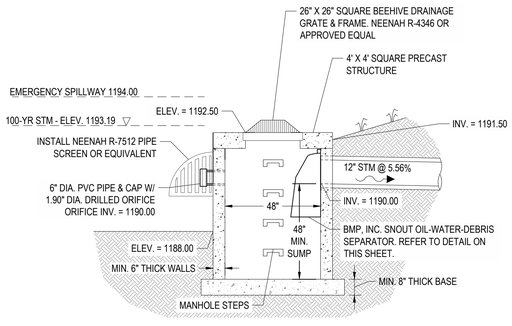
- 080 — MAJOR CONTOUR
- 079 — MINOR CONTOUR
- RIDGE LINE
- STM — STORM SEWER
- STORM CURB INLET
- STORM HALF-HEIGHT HEADWALL
- XXX.XX — SPOT ELEVATION
- XXX.XX / XXX.XX — TOP OF CURB / BOTTOM OF CURB
- RIM — TOP OF CASTING ELEVATION
- STANDARD FLEXAMAT



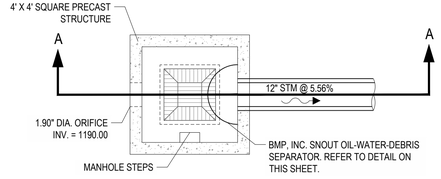
U.S.PATENT #6126817ADDITIONAL PATENTS PENDING

BMP, INC.
53 MT. ARCHER ROAD, LYME, CT. 06371
(800) 504-8008 FAX: (860)434-3195

DESCRIPTION	DATE	SCALE
24F SNOUT OIL & DEBRIS STOP	09/20/99	NONE
	DRAWING NUMBER	
	24F	



SECTION A-A
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

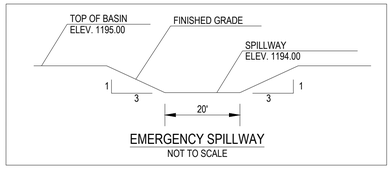
OUTLET STRUCTURE (#36)
NOT TO SCALE

East Basin Spillway Calculations

(Q100) Estimated 100-yr Flow = 50.9 cfs

(Qs) Spillway Capacity = $C_w * L * (h^{3/2})$

Spillway Coeffient, C_w = 2.90
Bottom Width, L = 20.00 ft
Height, h = 1.00 ft
Qs = 58.00 cfs



NOT TO SCALE

STORMWATER CALCULATIONS BASED ON ODOT REGULATIONS. THE POST-DEVELOPED PEAK RUNOFF RATE FOR THE 2-YR. THROUGH 100-YR RETURN PERIOD STORM MUST NOT EXCEED THE PRE-DEVLOPED PEAK RUNOFF RATE FOR THE EQUIVALENT STORM RETURN PERIOD.

East Dry Detention Pond Volume

Elevation	Contour Area (SF)	Incremental Volume (CF)	Total Volume (CF)
1188	774	0	0
1189	1,046	907	907
1190	1,352	1,196	2,103
1191	7,520	4,020	6,123
1192	23,109	14,604	20,727
1193	51,812	36,508	57,235
1194	65,232	58,393	115,628
1195	68,466	66,842	182,470

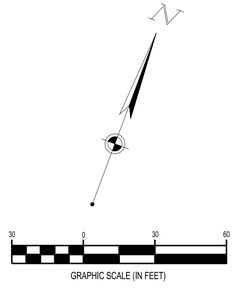
East Drainage Area Stormwater Release Rate Summary

Storm Frequency	Pre-Developed Peak Flow (CFS)	Dry Detenion Basin Peak Elevation	Dry Detention Basin Peak Flow (CFS)	Total Post-Developed Peak Flow (CFS)
2	1.76	1192.52	0.27	1.47
5	5.37	1192.61	1.05	2.62
10	8.99	1192.70	2.29	3.64
25	14.98	1192.86	4.70	8.32
50	20.28	1193.02	5.60	11.26
100	26.31	1193.19	6.21	13.57

BMP WATER QUALITY STRUCTURE NOTICE

THE OUTLET STRUCTURE IS AN INTEGRAL PART OF THE PRIVATE STORM SEWER SYSTEM DEPICTED IN THESE DRAWINGS. RESPONSIBILITY AND ASSURANCE OF PERIODIC MAINTENANCE AND THE CONTINUOUS FUNCTIONALITY OF THESE STORMWATER QUALITY DEVICES IS PERPETUAL: BEGINNING WITH THE OWNER AT THE TIME OF INSTALLATION AND CONTINUING TO ALL FUTURE OWNERS OF SAID PRIVATE STORM SEWER SYSTEM.

CONTRACTOR TO ENSURE THAT THE DETENTION SYSTEM (INCLUDING ALL DETENTION STRUCTURES AND WATER QUALITY STRUCTURES) IS CLEAN AND FUNCTIONS PROPERLY BEFORE SYSTEM IS TURNED OVER TO THE OWNER.



FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM
175 Montrose West Ave., Suite 400
Akron, OH 44321
Phone: 330.665.0660 Fax: 888.208.4826

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER
12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

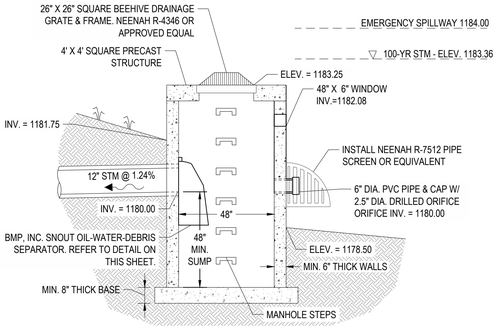
Revisions / Submissions

ID	Description	Date

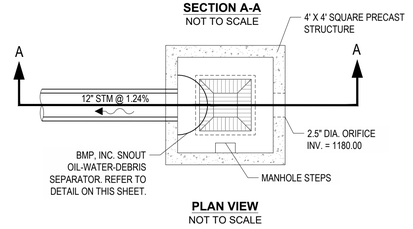
Project Number:	759267
Scale:	1" = 30'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
DETENTION DETAILS EAST

C7.9



SECTION A-A
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

OUTLET STRUCTURE (#9)
NOT TO SCALE

LEGEND

EXISTING

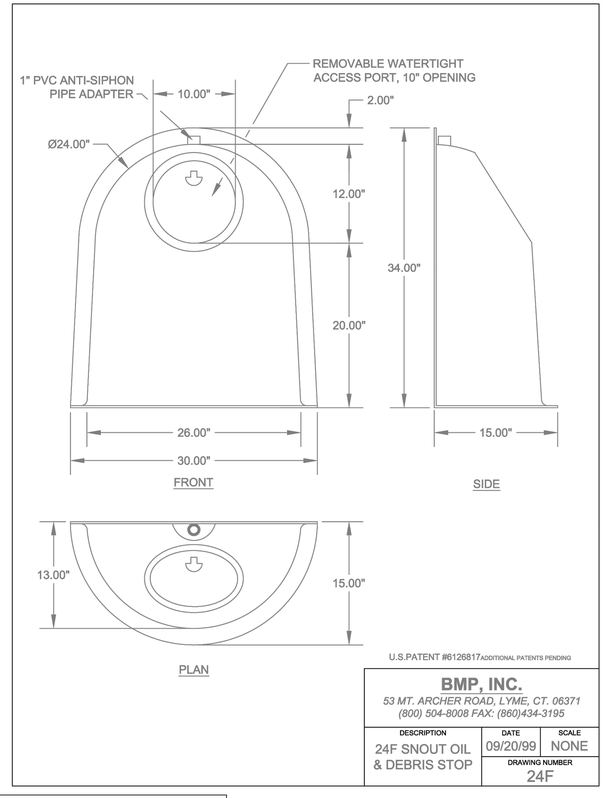
REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- 080 — MAJOR CONTOUR
- 079 — MINOR CONTOUR
- RIDGE LINE
- STM — STORM SEWER
- STORM CURB INLET
- STORM HALF-HEIGHT HEADWALL
- XXX.XX — SPOT ELEVATION
- XXX.XX / XXX.XX — TOP OF CURB / BOTTOM OF CURB
- RIM — TOP OF CASTING ELEVATION
- STANDARD FLEXAMAT

GENERAL NOTES

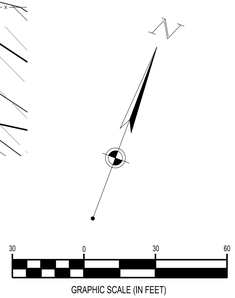
1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL BELMONT COUNTY AND ODOT REGULATIONS AND CODES, AND O.S.H.A. STANDARDS. THE CONTRACTOR SHALL OBTAIN FINAL PERMITTING AND APPROVAL/INSPECTIONS AS REQUIRED FROM THE LOCALITY.
2. STORM SEWER CATCH BASINS, CURB INLETS, MANHOLES AND ENDWALLS SHALL CONFORM TO ODOT STANDARD CONSTRUCTION DRAWINGS.
3. REFER TO SWPPP PLANS FOR RIPRAP / FLEXAMAT LOCATIONS AND DIMENSIONS AND ALL OTHER PERMANENT EROSION CONTROL MEASURES.



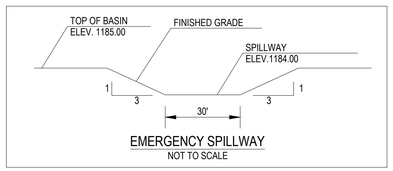
U.S.PATENT #6126817ADDITIONAL PATENTS PENDING

BMP, INC.
53 MT. ARCHER ROAD, LYME, CT. 06371
(800) 504-8008 FAX: (860)434-3195

DESCRIPTION	DATE	SCALE
24F SNOUT OIL & DEBRIS STOP	09/20/99	NONE
	DRAWING NUMBER	24F



GRAPHIC SCALE (IN FEET)



EMERGENCY SPILLWAY
NOT TO SCALE

West Basin Spillway Calculations

(Q100) Estimated 100-yr Flow = 77.47 cfs

(Qs) Spillway Capacity = $C_w * L * (h^{3/2})$

Spillway Coeffient, C_w = 2.90
Bottom Width, L = 30.00 ft
Height, h = 1.00 ft
Qs = 87.00 cfs

West Dry Detention Pond Volume

Elevation	Contour Area (SF)	Incremental Volume (CF)	Total Volume (CF)
1178	1,088	0	0
1180	2,005	3,047	3,047
1181	17,394	8,435	11,482
1182	43,937	29,659	41,141
1183	55,013	49,371	90,512
1184	61,743	58,346	148,858
1185	65,522	63,623	212,481

STORMWATER CALCULATIONS BASED ON ODOT REGULATIONS. THE POST-DEVELOPED PEAK RUNOFF RATE FOR THE 2-YR. THROUGH 100-YR RETURN PERIOD STORM MUST NOT EXCEED THE PRE-DEVLOPED PEAK RUNOFF RATE FOR THE EQUIVALENT STORM RETURN PERIOD.

West Drainage Area Stormwater Release Rate Summary

Storm Frequency	Pre-Developed Peak Flow (CFS)	Dry Detenion Basin Peak Elevation	Dry Detention Basin Peak Flow (CFS)	Total Post-Developed Peak Flow (CFS)
2	2.98	1182.17	0.59	1.19
5	8.15	1182.33	1.83	2.42
10	13.28	1182.49	3.57	4.02
25	21.68	1182.77	5.70	8.72
50	29.08	1183.06	6.05	12.04
100	37.45	1183.36	6.39	14.19

BMP WATER QUALITY STRUCTURE NOTICE

THE OUTLET STRUCTURE IS AN INTEGRAL PART OF THE PRIVATE STORM SEWER SYSTEM DEPICTED IN THESE DRAWINGS. RESPONSIBILITY AND ASSURANCE OF PERIODIC MAINTENANCE AND THE CONTINUOUS FUNCTIONALITY OF THESE STORMWATER QUALITY DEVICES IS PERPETUAL; BEGINNING WITH THE OWNER AT THE TIME OF INSTALLATION AND CONTINUING TO ALL FUTURE OWNERS OF SAID PRIVATE STORM SEWER SYSTEM.

CONTRACTOR TO ENSURE THAT THE DETENTION SYSTEM (INCLUDING ALL DETENTION STRUCTURES AND WATER QUALITY STRUCTURES) IS CLEAN AND FUNCTIONS PROPERLY BEFORE SYSTEM IS TURNED OVER TO THE OWNER.

OHIO811.org Before You Dig

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Loves

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12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

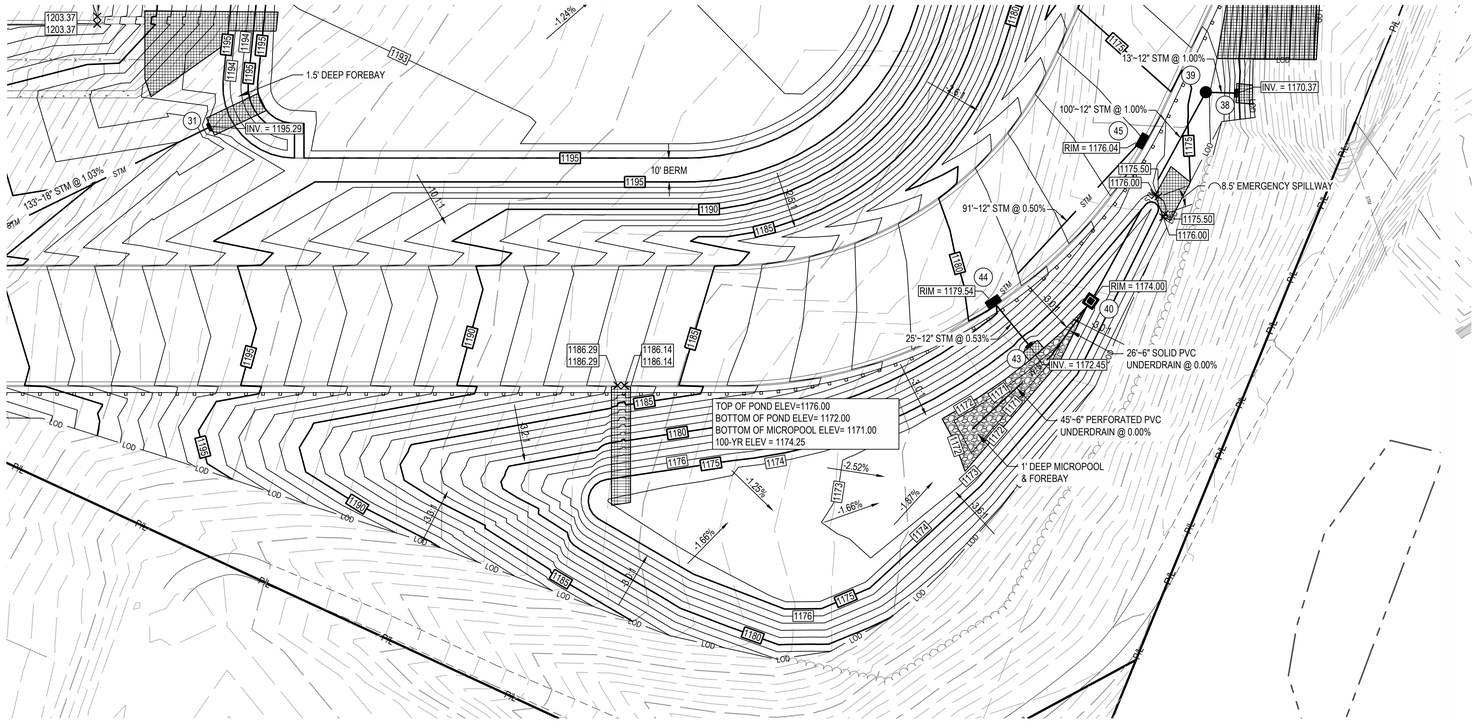
Revisions / Submissions

ID	Description	Date

Project Number:	759267
Scale:	1" = 30'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
DETENTION DETAILS WEST

C7.10



GENERAL NOTES

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LEGEND

EXISTING

REFER TO ALTA/NSPS TOPOGRAPHIC SURVEY

PROPOSED

- 080 — MAJOR CONTOUR
- 079 — MINOR CONTOUR
- RIDGE LINE
- STM — STORM SEWER
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- STORM HALF-HEIGHT HEADWALL
- XXX.XX — SPOT ELEVATION
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- RIM — TOP OF CASTING ELEVATION
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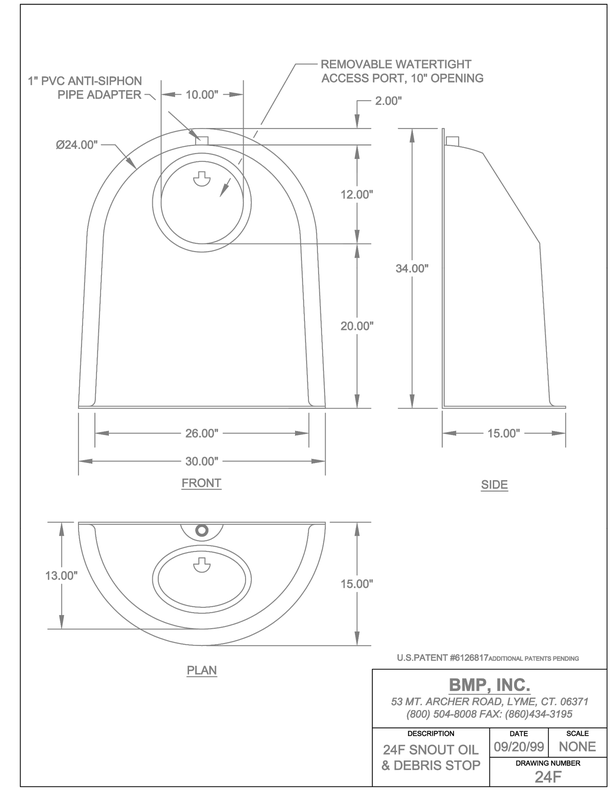


U.S.PATENT #6126817ADDITIONAL PATENTS PENDING

BMP, INC.
53 MT. ARCHER ROAD, LYME, CT. 06371
(800) 504-8008 FAX: (860)434-3195

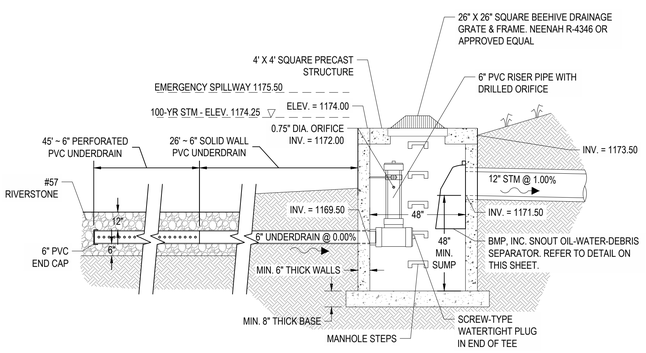
DESCRIPTION	DATE	SCALE
24F SNOUT OIL & DEBRIS STOP	09/20/99	NONE
	DRAWING NUMBER	
	24F	

Southeast Dry Detention Pond Volume

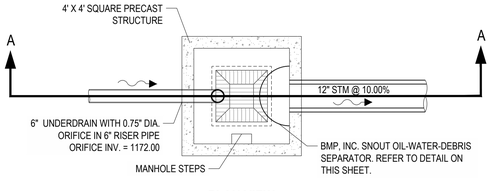
Elevation	Contour Area (SF)	Incremental Volume (CF)	Total Volume (CF)
1171	417	0	0
1172	921	653	653
1173	3,458	2,055	2,708
1174	8,518	5,801	8,509
1175	10,886	9,678	18,187
1176	12,770	11,815	30,002

Southeast Drainage Area Stormwater Release Rate Summary

Storm Frequency	Pre-Developed Peak Flow (CFS)	Dry Detenion Basin Peak Elevation	Dry Detention Basin Peak Flow (CFS)	Total Post-Developed Peak Flow (CFS)
2	0.95	1173.84	0.02	0.02
5	1.74	1174.01	0.07	0.07
10	2.46	1174.03	0.20	0.20
25	3.57	1174.08	0.71	0.71
50	4.52	1174.17	1.93	1.93
100	5.57	1174.25	3.59	3.59

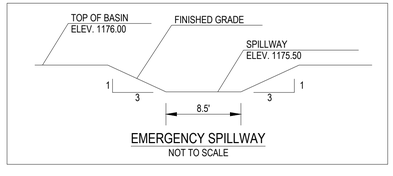


SECTION A-A
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

OUTLET STRUCTURE (#39)
NOT TO SCALE



EMERGENCY SPILLWAY
NOT TO SCALE

Southeast Basin Spillway Calculations

(Q100) Estimated 100-yr Flow = 8.45 cfs

(Qs) Spillway Capacity = $C_w * L * (h^{3/2})$

Spillway Coeffient, C_w = 2.90
Bottom Width, L = 8.50 ft
Height, h = 0.50 ft
Qs = 8.72 cfs

STORMWATER CALCULATIONS BASED ON ODOT REGULATIONS. THE POST-DEVELOPED PEAK RUNOFF RATE FOR THE 2-YR. THROUGH 100-YR RETURN PERIOD STORM MUST NOT EXCEED THE PRE-DEVLOPED PEAK RUNOFF RATE FOR THE EQUIVALENT STORM RETURN PERIOD.

BMP WATER QUALITY STRUCTURE NOTICE

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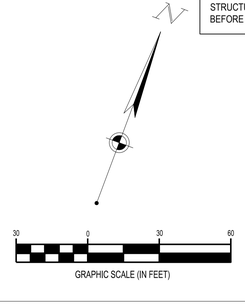

GRAPHIC SCALE (IN FEET)

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Loves

STATE OF OHIO
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REGISTERED PROFESSIONAL ENGINEER

12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

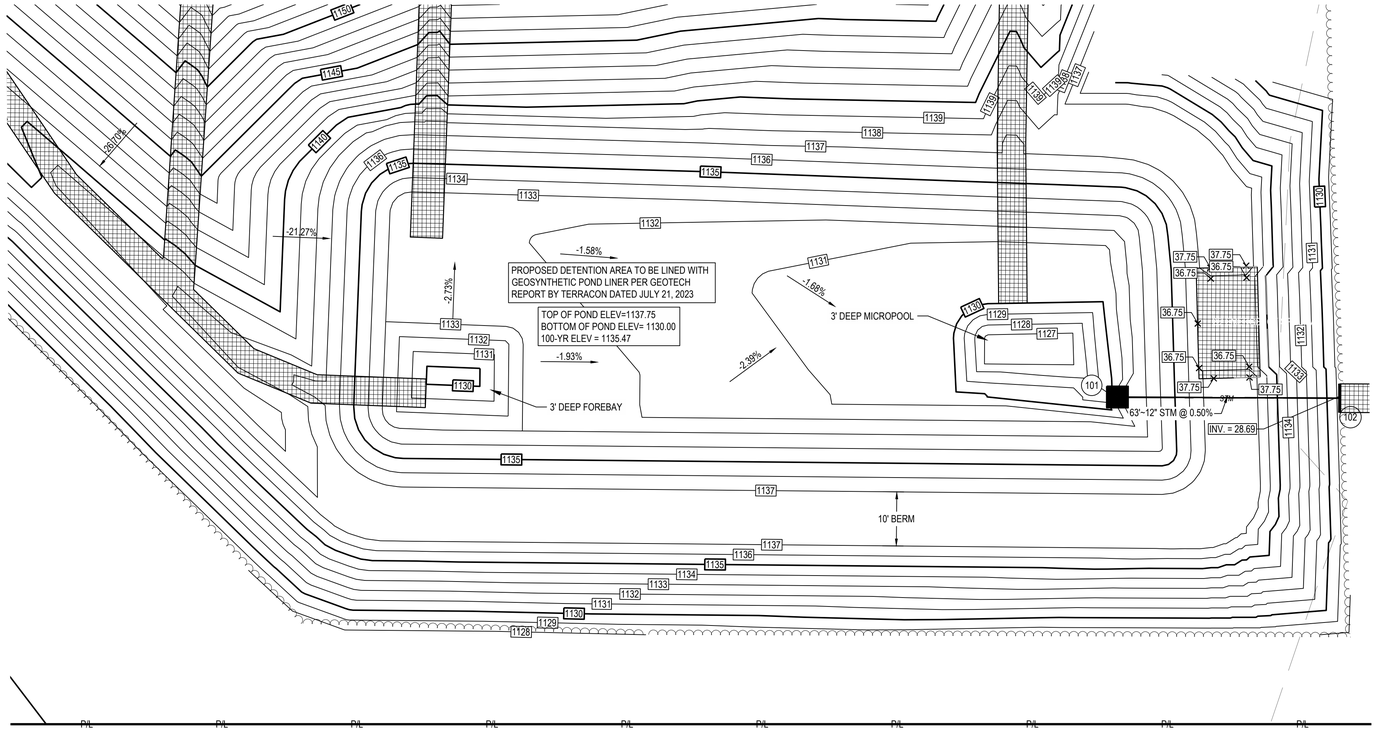
Revisions / Submissions

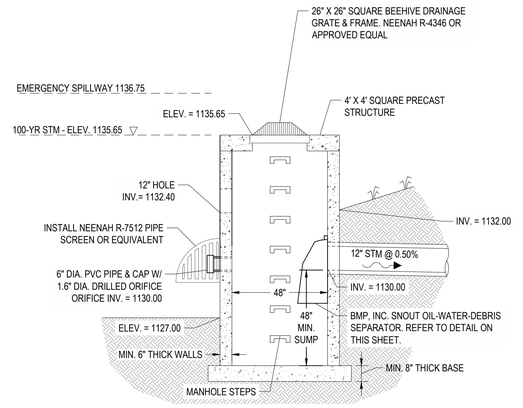
ID	Description	Date

Project Number:	759267
Scale:	1" = 30'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

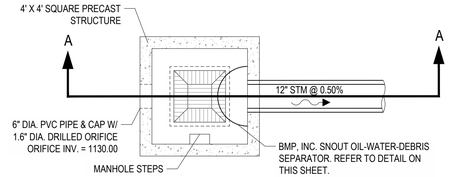
Drawing Title:
DETENTION DETAILS SOUTHEAST

C7.11



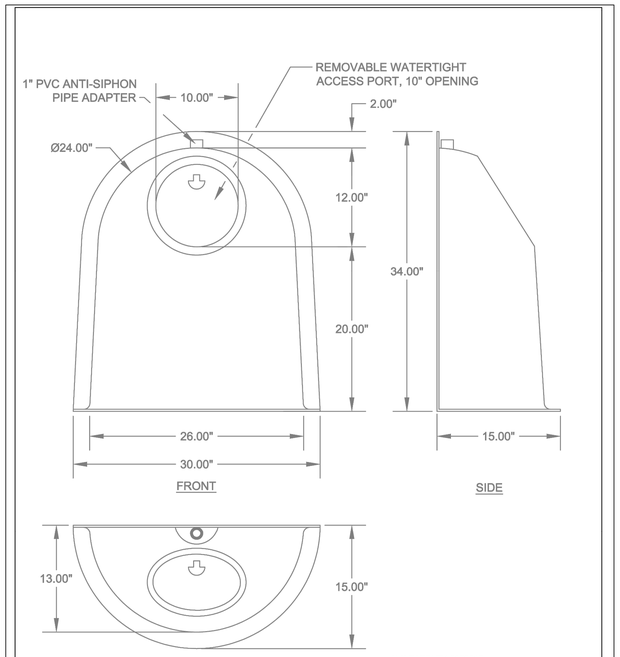


SECTION A-A
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

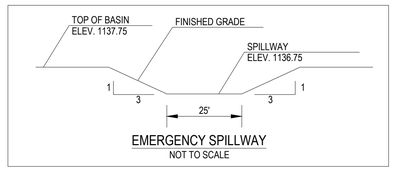
OUTLET STRUCTURE (#101)
NOT TO SCALE



U.S.PATENT #6126817ADDITIONAL PATENTS PENDING

BMP, INC.
53 MT. ARCHER ROAD, LYME, CT. 06371
(800) 504-8008 FAX: (860)434-3195

DESCRIPTION	DATE	SCALE
24F SNOUT OIL & DEBRIS STOP	09/20/99	NONE
	DRAWING NUMBER	24F



EMERGENCY SPILLWAY
NOT TO SCALE

South Basin Spillway Calculations

(Q100) Estimated 100-yr Flow = 62.68 cfs

(Qs) Spillway Capacity = $C_w*L*(h^{3/2})$

Spillway Coeffient, C_w = 2.90
Bottom Width, L = 25.00 ft
Height, h = 1.00 ft
Qs = 72.50 cfs

STORMWATER CALCULATIONS BASED ON ODOT REGULATIONS. THE POST-DEVELOPED PEAK RUNOFF RATE FOR THE 2-YR. THROUGH 100-YR RETURN PERIOD STORM MUST NOT EXCEED THE PRE-DEVLOPED PEAK RUNOFF RATE FOR THE EQUIVALENT STORM RETURN PERIOD.

PRE-DEVELOPMENT 2-YR PEAK RUNOFF RATE: 6.62 CFS

POST-DEVELOPMENT 2-YR PEAK RUNOFF RATE: 3.92 CFS

PRE-DEVELOPMENT 100-YR PEAK RUNOFF RATE: 43.57 CFS

POST-DEVELOPMENT 100-YR PEAK RUNOFF RATE: 22.02 CFS

STORAGE VOLUME PROVIDED: 87,507 CF FROM ELEVATION 1130.00 TO 1136.75

GENERAL NOTES

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South Drainage Area Stormwater Release Rate Summary

Storm Frequency	Pre Developed Release Rates (CFS)	Post Developed Release Rates (CFS)	Dry Detention Basin Peak Flow (CFS)	Water Elevation in Dry Detention Basin	Total Post-Developed Peak Flow (CFS)
2	6.62	3.92	1.23	1132.95	4.05
5	12.91	7.26	2.86	1133.42	6.65
10	18.59	10.63	3.91	1133.90	9.68
25	27.49	15.13	5.02	1134.57	14.38
50	35.10	18.51	5.77	1135.11	17.85
100	43.57	22.02	6.44	1135.65	21.31

DISCLAIMER: PROPOSED BASIN HAS BEEN DESIGNED TO HANDLE 3.42 ACRES (148,975.20 S.F.) OF IMPERVIOUS AREA.

BMP WATER QUALITY STRUCTURE NOTICE

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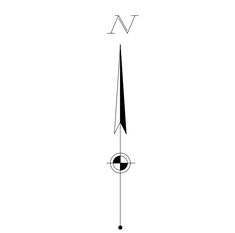

GRAPHIC SCALE (IN FEET)

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Loves

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12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

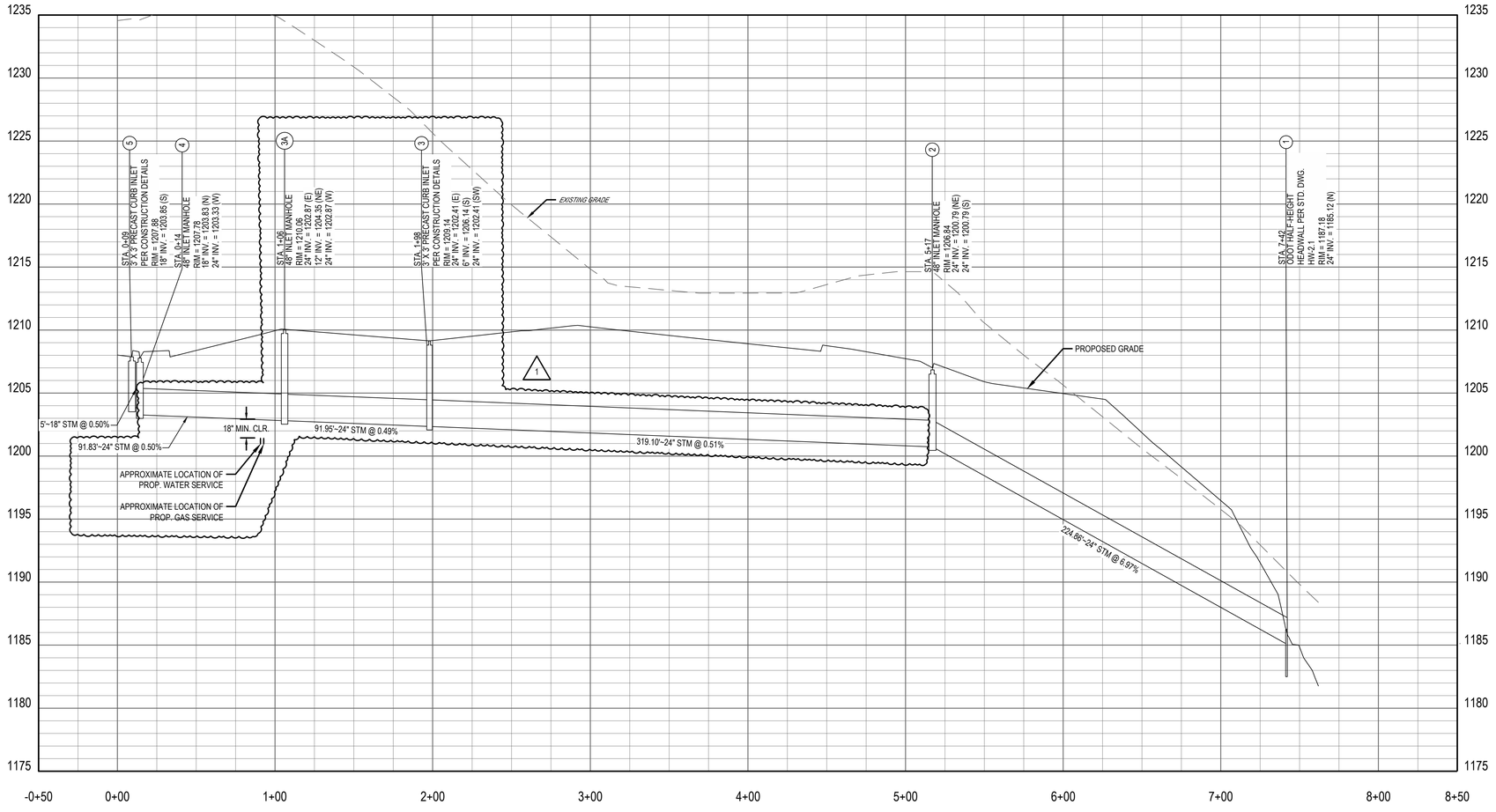
Revisions / Submissions

ID	Description	Date

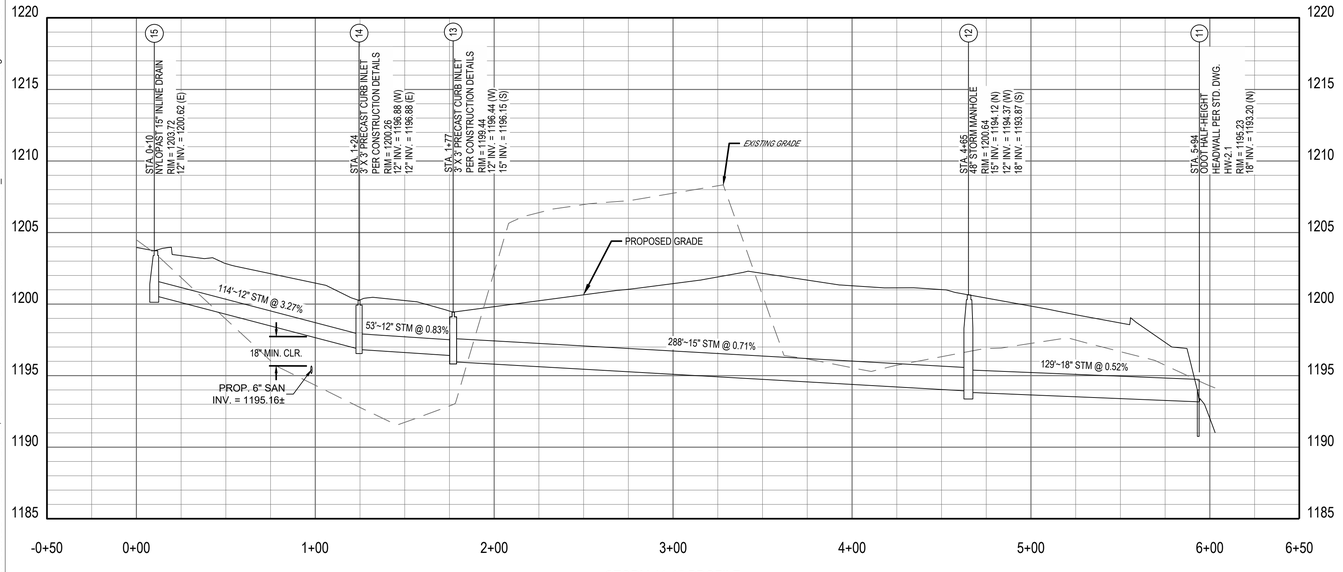
Project Number:	759267
Scale:	1" = 20'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
DETENTION DETAILS PREPARED PAD

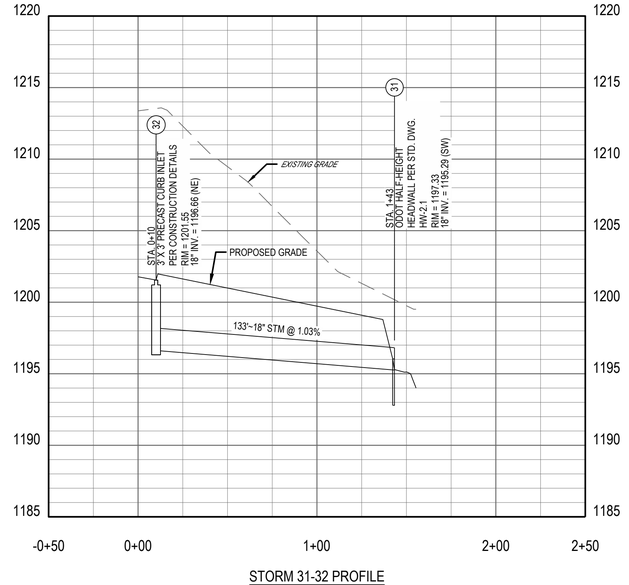
C7.12



STORM 5-1 PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.



STORM 11-15 PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.



STORM 31-32 PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.

LEGEND

EXISTING GRADE

PROPOSED GRADE

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Loves

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01/15/2024

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH
66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

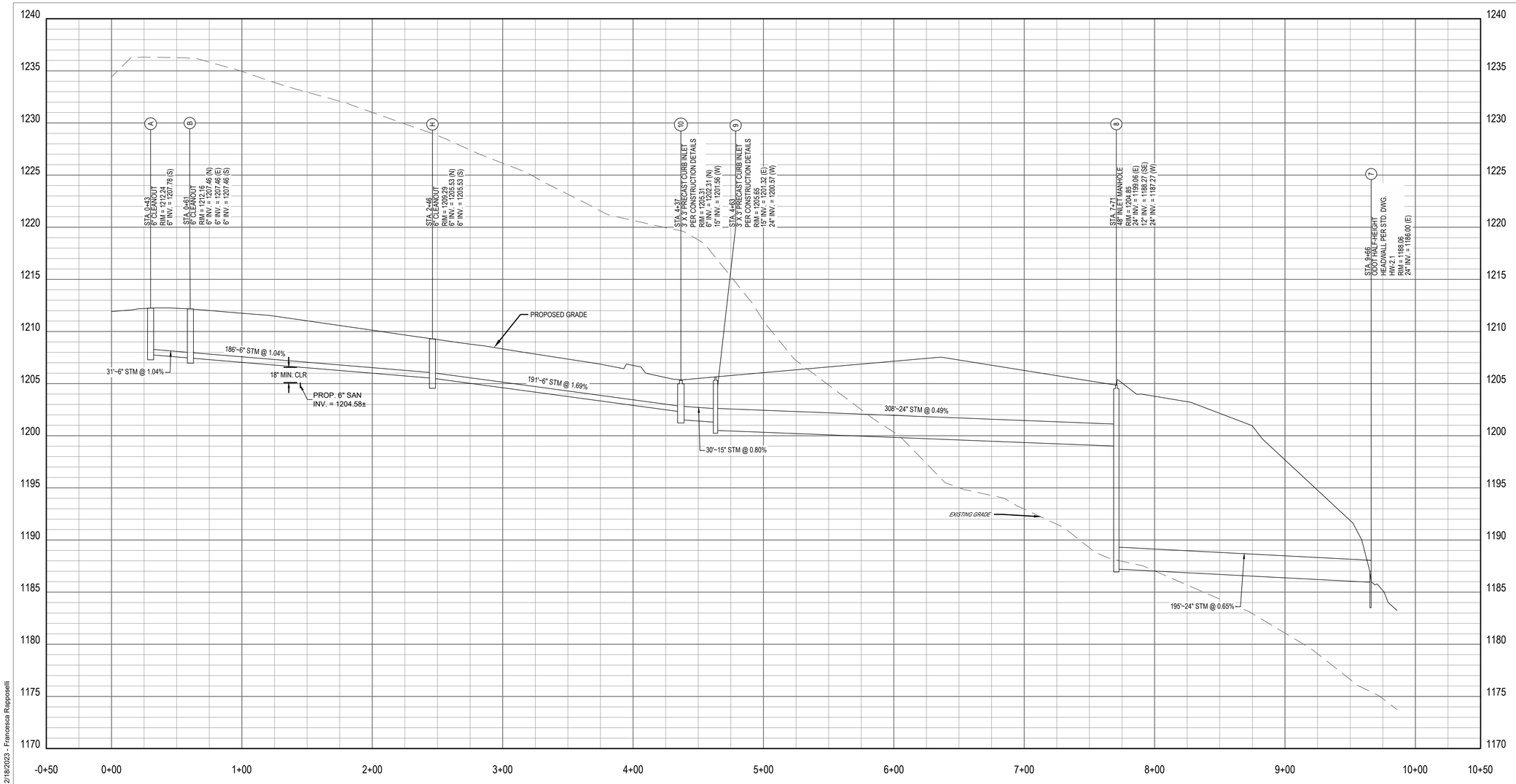
Revisions / Submissions

ID	Description	Date
1	REV 1	01/03/2024

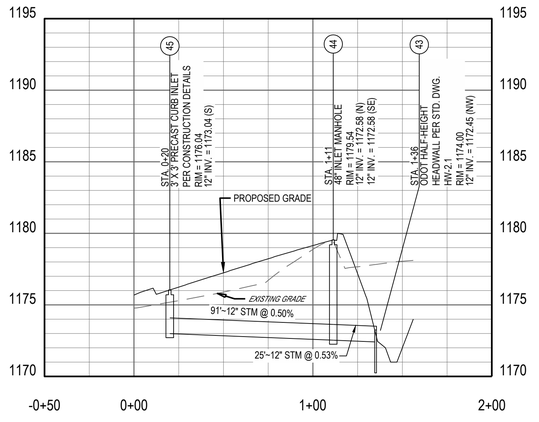
Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
STORM PROFILE

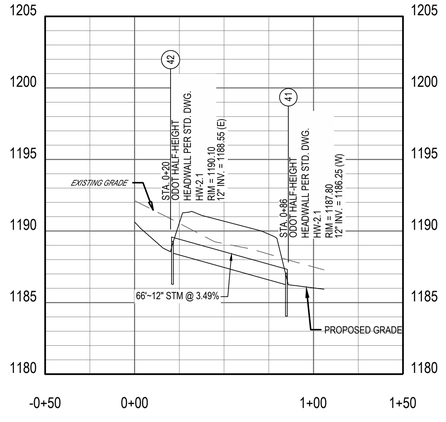
C7.13



STORM 7-A PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.



STORM 43-45 PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.



STORM 41-42 PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.

LEGEND

EXISTING GRADE

PROPOSED GRADE

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER

12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

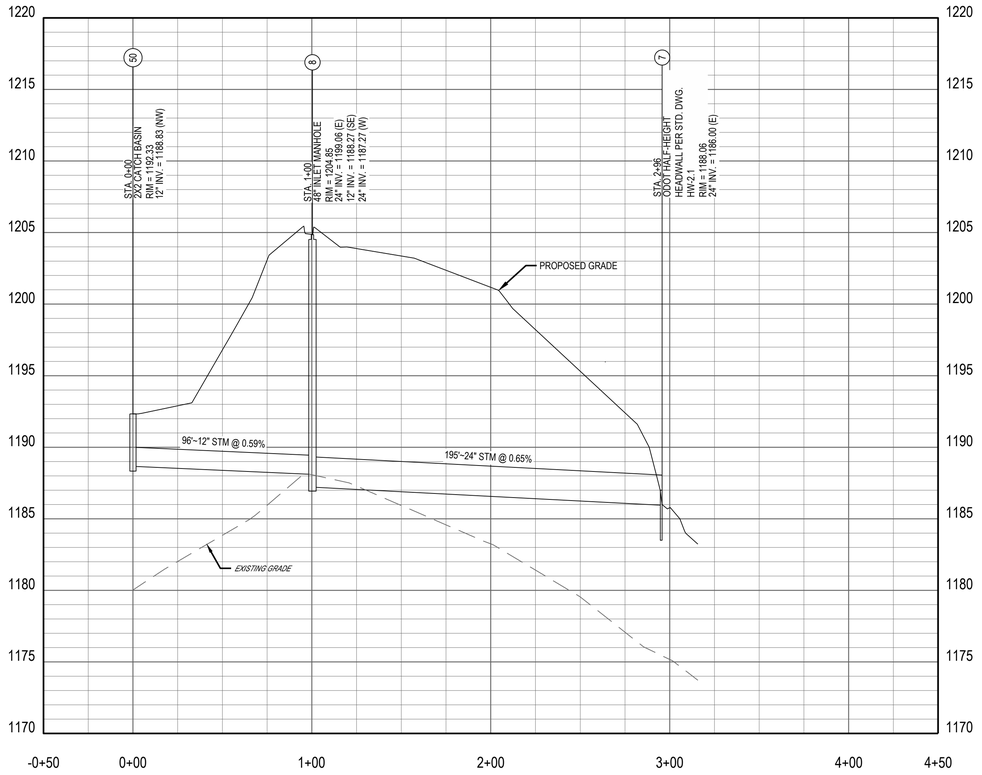
ID	Description	Date

Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

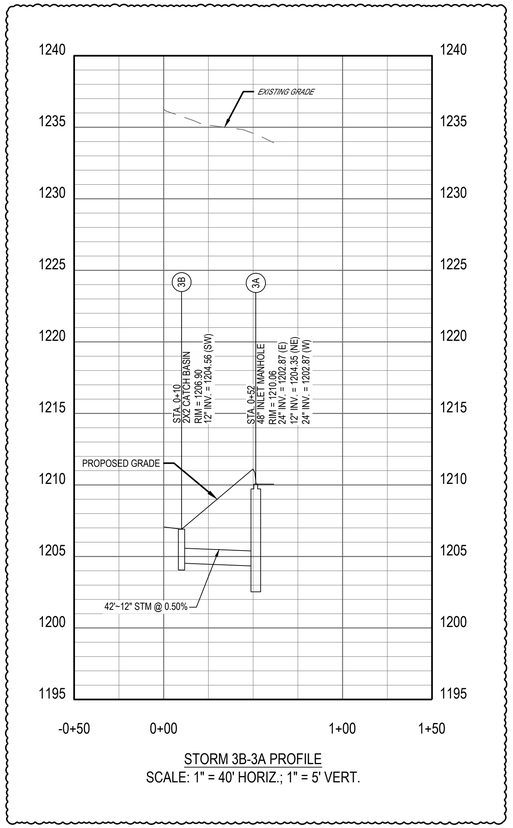
Drawing Title:

STORM PROFILE

C7.14



STORM 111-8-7 PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.



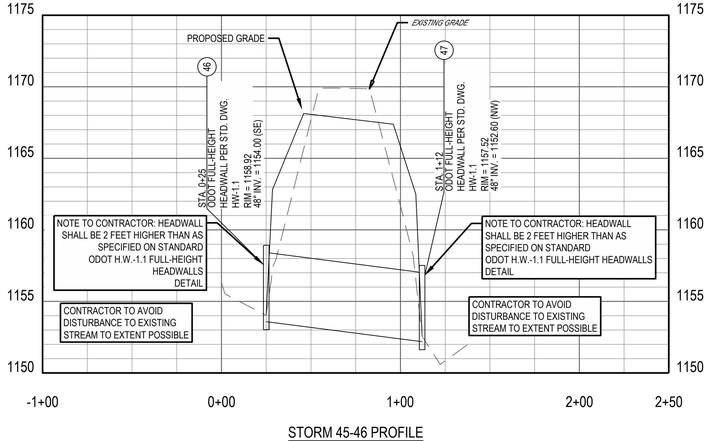
STORM 3B-3A PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.

1

LEGEND

EXISTING GRADE

PROPOSED GRADE



STORM 45-46 PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.

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Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
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Drawing Title:
STORM PROFILE

C7.15

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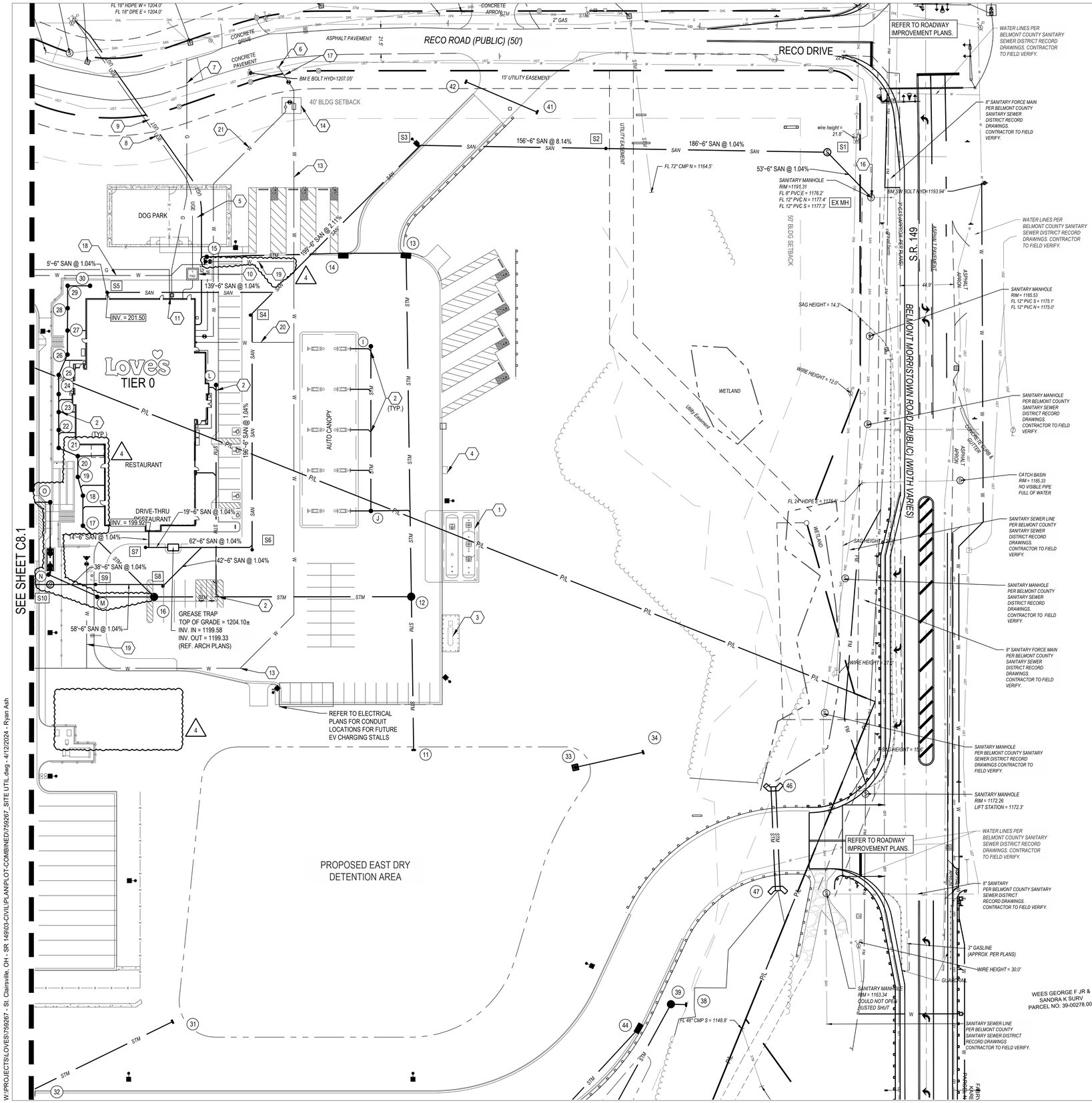

LEGEND

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- STORM CURB INLET
- STORM ENDWALL
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- STORM CLEANOUT
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- WATER VALVE
- WATER METER
- REDUCER
- BACKFLOW PREVENTER
- FIRE HYDRDANT
- GAS METER
- LIGHT POLE
- TRUELOOK CAMERA

CODED NOTES:

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SANITARY SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	RIM	INVERT
EX MH	EXISTING MANHOLE	1190.08	1177.30 (6") NW 1177.40 (12") N 1175.90 (12") S 1176.20 (8") E
S1	MANHOLE	1189.15	1177.85 (6") W 1177.85 (6") SE
S2	CLEANOUT	1185.57	1179.78 (6") W 1179.78 (6") E
S3	CLEANOUT	1196.44	1192.44 (6") SW 1192.44 (6") E
S4	CLEANOUT	1203.25	1196.65 (6") S 1196.65 (6") NE
S5	CLEANOUT	1204.96	1201.45 (6") SE 1197.57 (6") E
S6	CLEANOUT	1203.29	1198.69 (6") W 1198.69 (6") N
S7	CLEANOUT	1204.22	1199.78 (6") N 1199.78 (6") E
S8	CLEANOUT	1203.38	1199.57 (6") W 1199.57 (6") NE
S9	CLEANOUT	1203.67	1200.17 (6") W 1200.17 (6") E
S10	SANITARY DROP MANHOLE	1212.05	1202.15 (6") W 1200.56 (6") E

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3	ADDENDUM 3	02/09/2024
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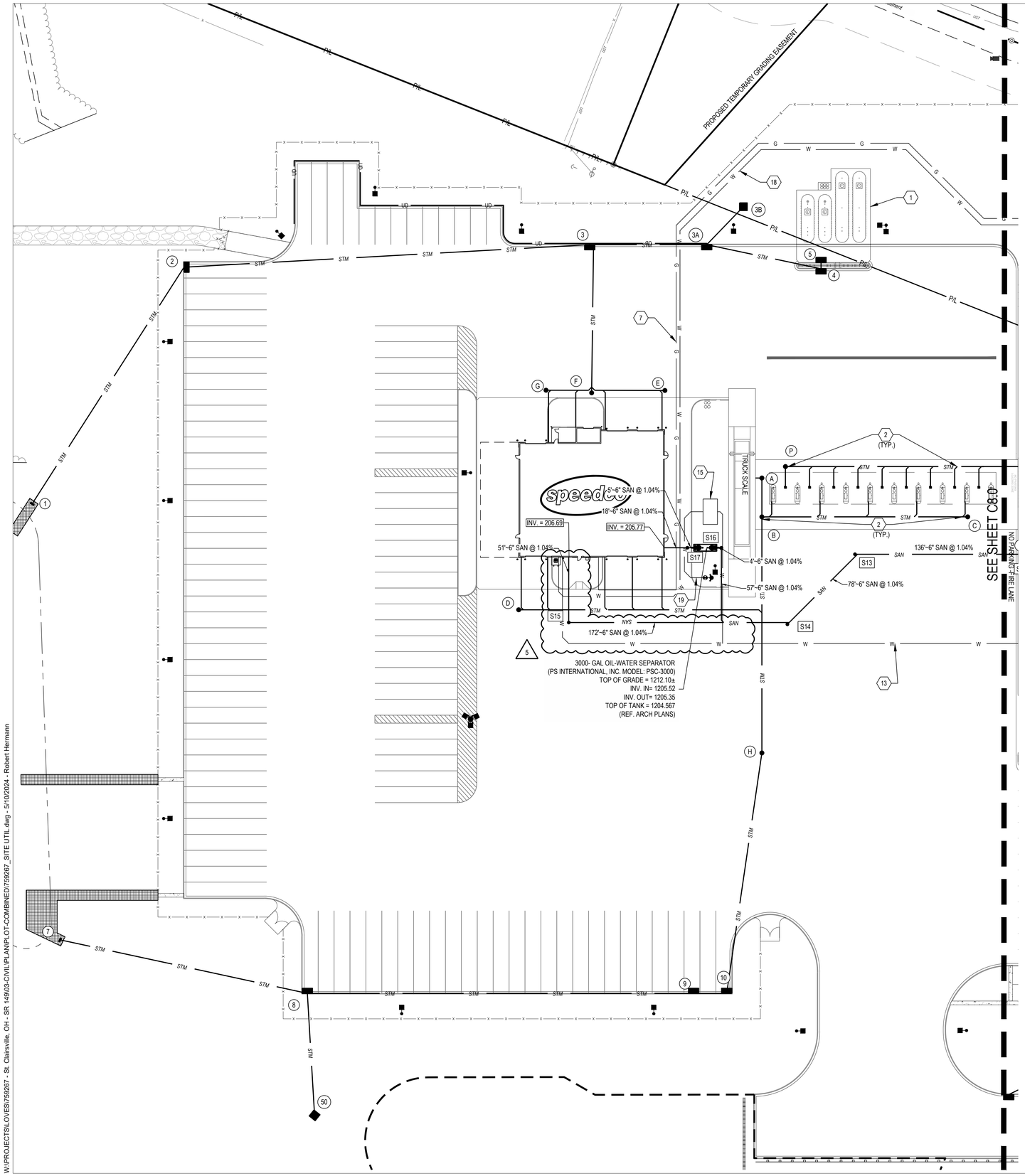
UTILITY PLAN - EAST

C8.0



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GRAPHIC SCALE (IN FEET)

NO.	STR
S13	CLEANO

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Checked By:	JTK
Date:	12/19/2023
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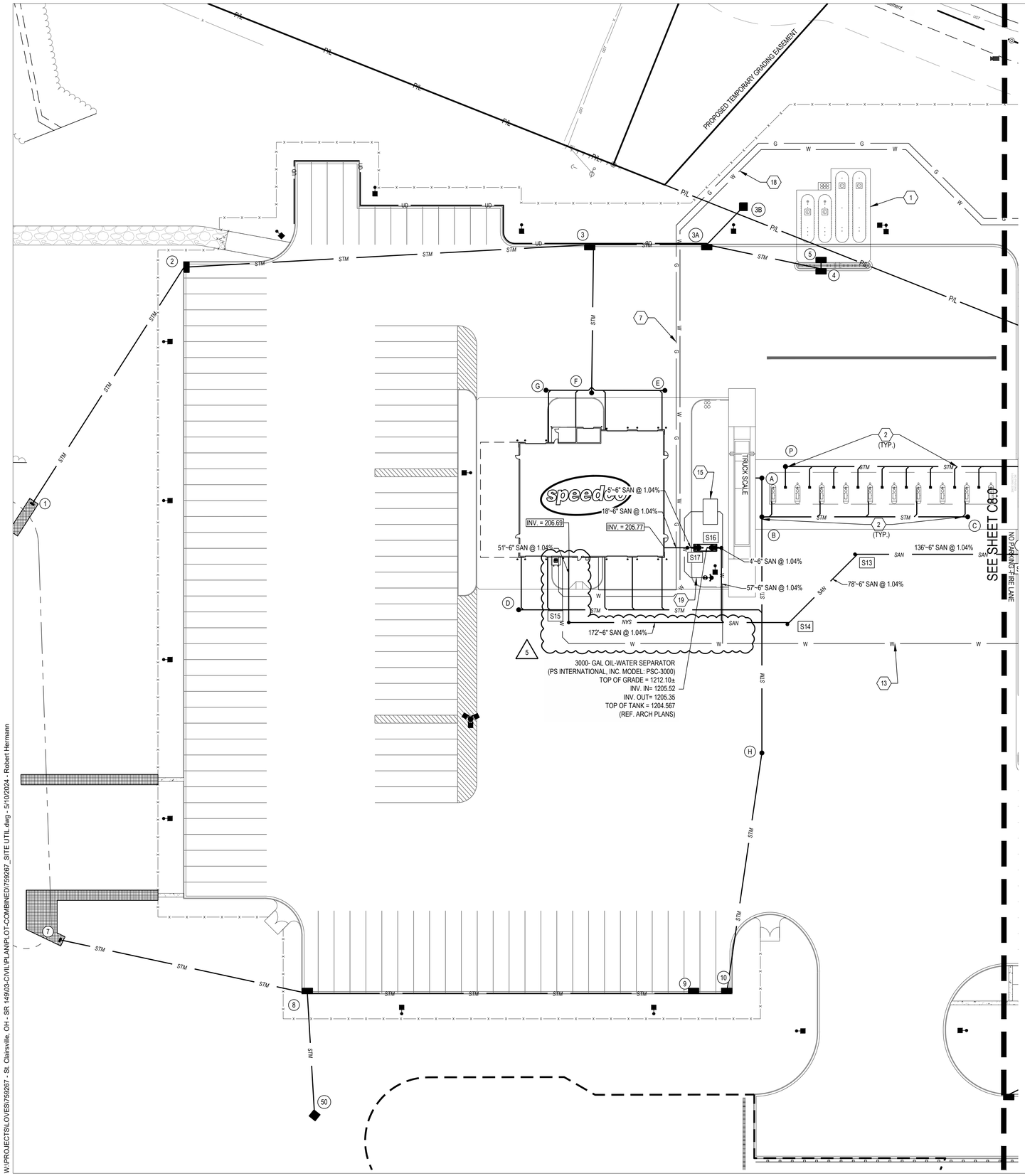
Drawing Title:

UTILITY PLAN - WEST

C8.1



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GRAPHIC SCALE (IN FEET)

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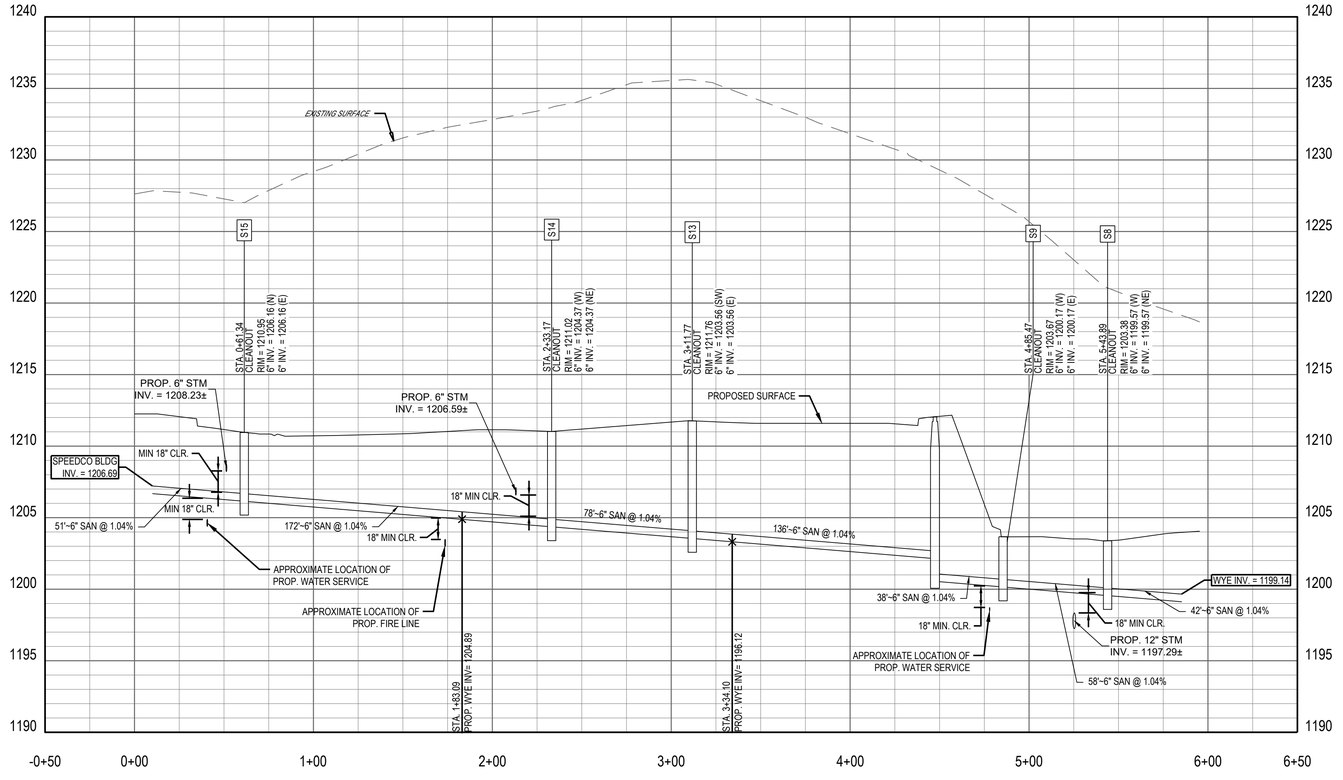
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

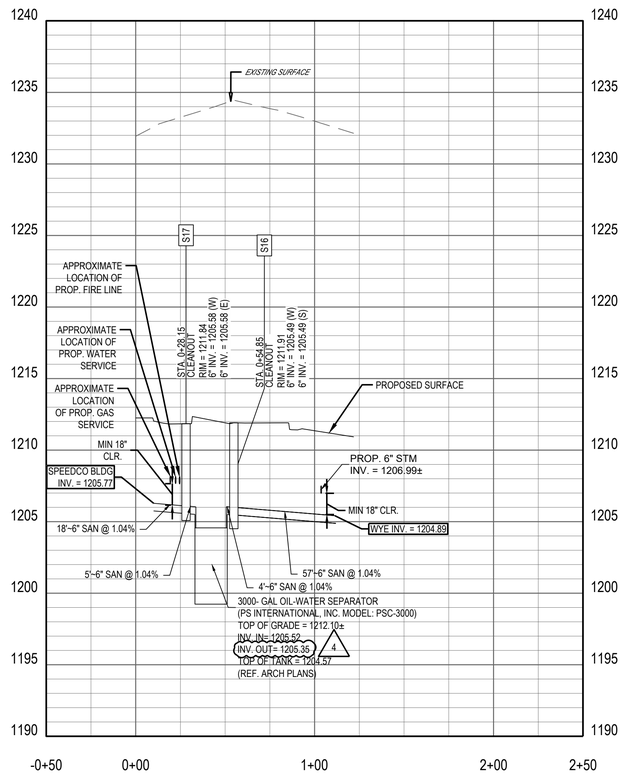
Drawing Title:

UTILITY PLAN - WEST

C8.1



SANITARY STRC 15-8 PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.



SANITARY STRC 17-16 PROFILE
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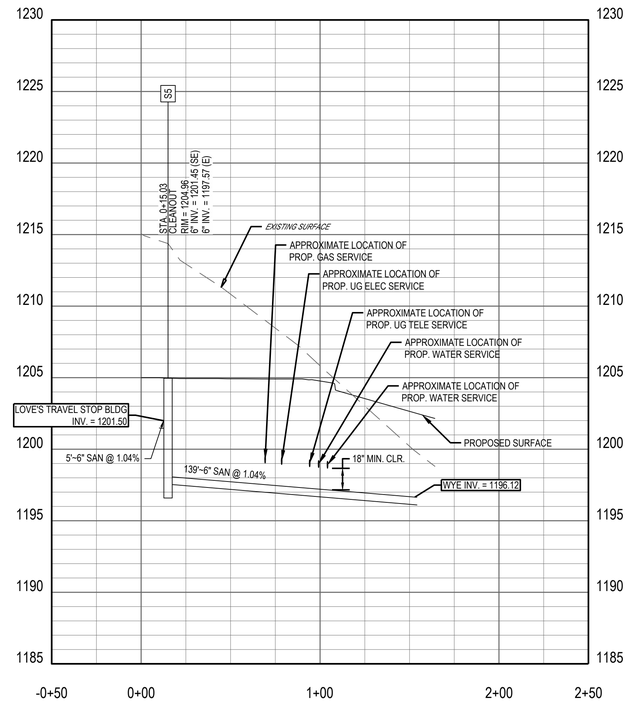

SANITARY STRC S5 PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.

4

LEGEND

EXISTING GRADE

PROPOSED GRADE

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

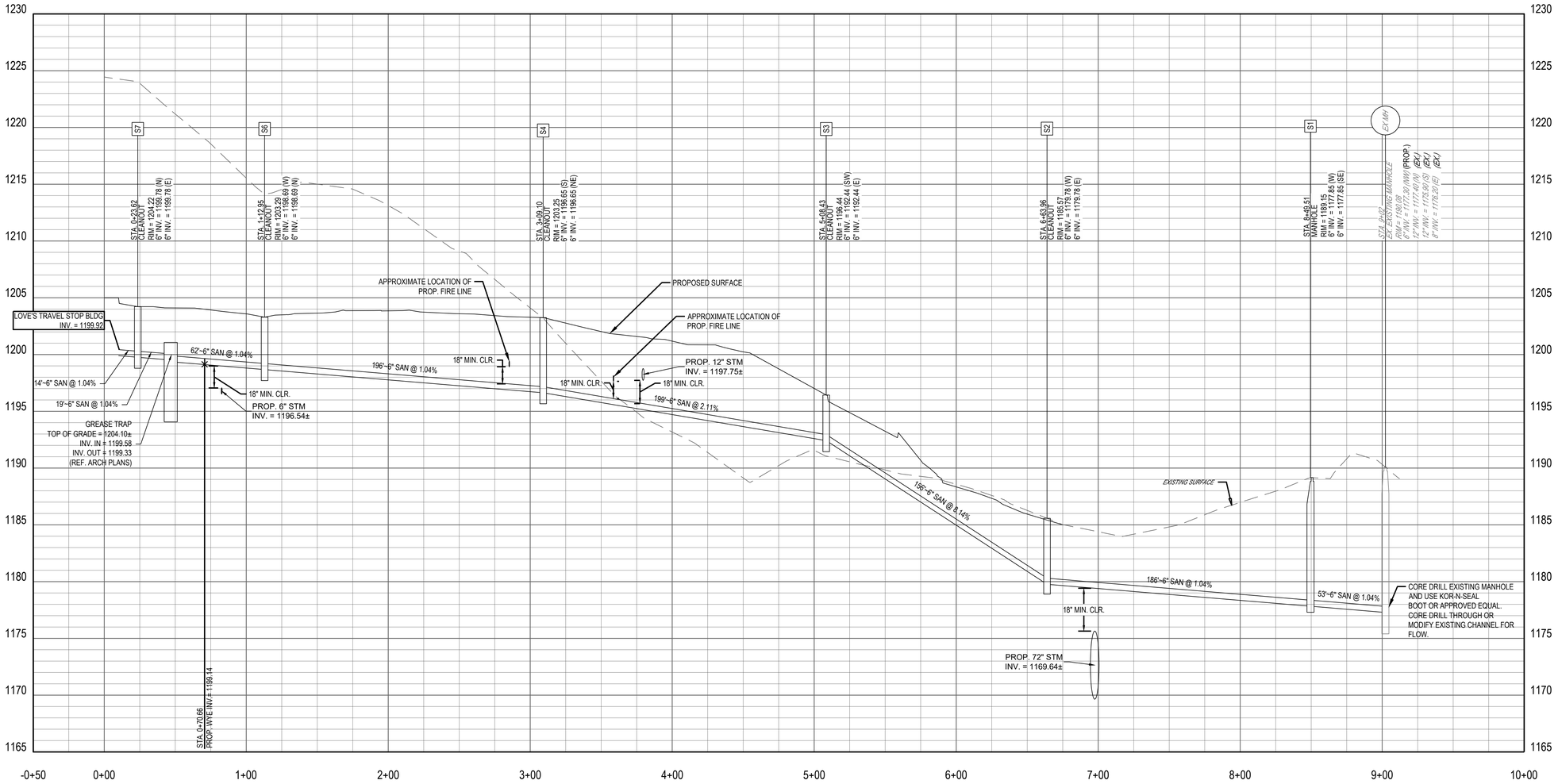
Revisions / Submissions

ID	Description	Date
1	REV 1	01/03/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SANITARY PROFILE

C8.2



SANITARY STRC 7 - EX. MH PROFILE
SCALE: 1" = 40' HORIZ.; 1" = 5' VERT.

LEGEND

EXISTING GRADE

PROPOSED GRADE

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER
01/15/2024

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

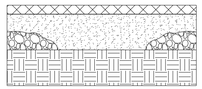
ID	Description	Date
1	REV 1	01/03/2024

Project Number:	759267
Scale:	1" = 40'
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
SANITARY PROFILE

C8.3

ASPHALTIC PAVEMENT

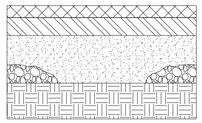


LIGHT DUTY

A. 4" ASPHALTIC CONCRETE SURFACE, ODOT SECTION 442 ASPHALT BINDER, PG70-22

B. 8" AGGREGATE BASE, ODOT SECTION 304, MINERAL AGGREGATE BASE, TYPE A

C. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION AND PER PROPOSED FLEXIBLE PAVEMENT SECTIONS REPORT SECTION 3 SUBGRADE PRETREATMENT



MEDIUM DUTY

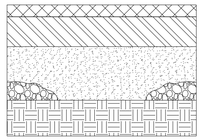
A. 2.5" ASPHALTIC CONCRETE SURFACE, ODOT SECTION 442, ASPHALT BINDER, PG64-22

B. 2.5" ASPHALTIC CONCRETE BINDER, ODOT SECTION 442, 12.5MM ASPHALT BINDER, PG64-22

C. 8" AGGREGATE BASE

D. LEGEO BX-2525 GEOGRID OR EQUIVALENT, ODOT SECTION 304, MINERAL AGGREGATE BASE, TYPE A

E. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION AND PER PROPOSED FLEXIBLE PAVEMENT SECTIONS REPORT SECTION 3 SUBGRADE PRETREATMENT



HEAVY DUTY

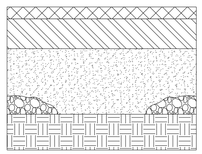
A. 2.5" ASPHALTIC CONCRETE SURFACE, ODOT SECTION 442, ASPHALT BINDER, PG70-22

B. 3" ASPHALTIC CONCRETE BINDER, ODOT SECTION 442, 12.5 MM ASPHALT BINDER, PG64-22

C. 8" AGGREGATE BASE, ODOT SECTION 304, MINERAL AGGREGATE BASE, TYPE A

D. LEGEO BX-2525 GEOGRID OR EQUIVALENT

E. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION AND PER PROPOSED FLEXIBLE PAVEMENT SECTIONS REPORT SECTION 3 SUBGRADE PRETREATMENT



EXTRA HEAVY DUTY

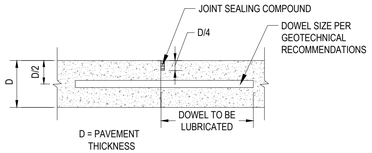
A. 2.5" ASPHALTIC CONCRETE SURFACE, ODOT SECTION 422, ASPHALT BINDER, PG70-22

B. 3" ASPHALTIC CONCRETE BINDER, ODOT SECTION 422, 12.5 MM ASPHALT BINDER, PG-64-22

C. 9" AGGREGATE BASE, ODOT SECTION 304, MINERAL AGGREGATE BASE, TYPE A

D. LEGEO BX-2525 GEOGRID OR EQUIVALENT

E. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION AND PER PROPOSED FLEXIBLE PAVEMENT SECTIONS REPORT SECTION 3 SUBGRADE PRETREATMENT

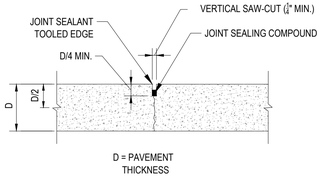


NOTES:

1. DOWELS SHALL BE SUPPORTED BY AN APPROVED DEVICE.
2. ALL BARS AND BASKETS SHALL BE EPOXY COATED.
3. DOWELED CONTRACTION JOINTS ARE REQUIRED WHERE PAVEMENT DEPTH IS 7" OR GREATER.
4. DOWELS SHALL BE SMOOTH BARS AND FREE MOVEMENT SHALL BE PROVIDED BY APPLYING A COATING OF GREASE AS A BOND-BREAKING MATERIAL JUST PRIOR TO PLACING THE CONCRETE.

DOWELED CONTRACTION JOINT DETAIL

NOT TO SCALE

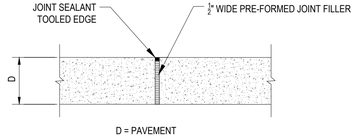


NOTES:

1. MAXIMUM CONTRACTION JOINT SPACING IS DEPENDENT UPON THE PAVEMENT THICKNESS. REFER TO TABLE BELOW FOR SPACING REQUIREMENTS.
2. ENSURE CONTRACTION JOINT PATTERNS DIVIDE PAVEMENT INTO PANELS AS CLOSE TO SQUARE AS POSSIBLE.

CONTRACTION JOINT DETAIL

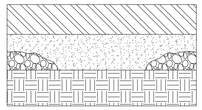
NOT TO SCALE



EXPANSION JOINT

NOT TO SCALE

CONCRETE PAVEMENT

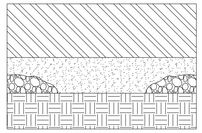


LIGHT DUTY

A. 6" PORTLAND CEMENT CONCRETE PAVEMENT, 4000 P.S.I.

B. 6" AGGREGATE BASE MATERIAL

C. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION

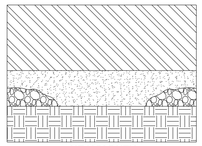


MEDIUM DUTY

A. 8" PORTLAND CEMENT CONCRETE PAVEMENT, 4000 P.S.I.

B. 6" AGGREGATE BASE MATERIAL

C. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION

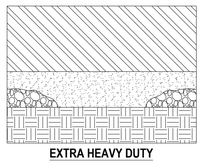


HEAVY DUTY

A. 10" PORTLAND CEMENT CONCRETE PAVEMENT, 4000 P.S.I.

B. 6" AGGREGATE BASE MATERIAL

C. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION ON PAGE 14

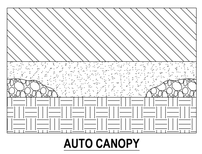


EXTRA HEAVY DUTY

A. 11" PORTLAND CEMENT CONCRETE PAVEMENT, 4000 P.S.I.

B. 6" AGGREGATE BASE MATERIAL

C. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION

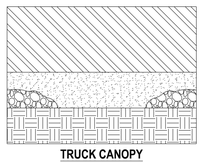


AUTO CANOPY

A. 8" PORTLAND CEMENT CONCRETE PAVEMENT, 4000 P.S.I., #4 BARS @ 24" O.C.E.W.
(MINIMUM THICKNESS OF 8", SHOULD STILL FOLLOW GEOTECH RECOMMENDATIONS FOR MEDIUM DUTY CONCRETE)

B. 6" AGGREGATE BASE MATERIAL

C. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION



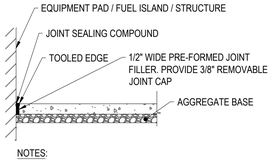
TRUCK CANOPY

A. 11" PORTLAND CEMENT CONCRETE PAVEMENT, 4000 P.S.I., #5 BARS @ 24" O.C.E.W.
(MINIMUM THICKNESS OF 12", SHOULD STILL FOLLOW GEOTECH RECOMMENDATIONS FOR EXTRA HEAVY DUTY CONCRETE)

B. 6" AGGREGATE BASE MATERIAL

C. SUBGRADE-COMPACT PER GEOTECHNICAL REPORT PREPARED SUBGRADE SECTION

JOINT SPACING FOR UNREINFORCED CONCRETE (FROM ACI 330.2R-17 TABLE 4.4.4 & ACI 330.R-8 TABLE 3.5)	
PAVEMENT THICKNESS (IN)	MAXIMUM SPACING (FT)
4 - 4.5	10
5 - 5.5	12.50
6 OR GREATER	15

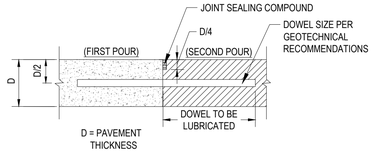


NOTES:

1. PLACE ISOLATION JOINTS WHERE CONCRETE PAVEMENT ABUTS SLABS, FUEL ISLANDS, CANOPY COLUMNS, BOLLARDS AND STRUCTURES OR FIXED OBJECTS.
2. PRE-FORMED JOINT FILLER - NON-IMPREGNATED TYPE, CLOSED CELL RESILIENT POLYETHYLENE FOAM, 1/2" THICK UNLESS OTHERWISE NOTED.
3. WHERE SLABS OF DIFFERENT THICKNESSES COME TOGETHER AT ISOLATION JOINTS, THE SUBGRADE/SUBBASE UNDER THE THINNER PAVEMENT SECTIONS SHOULD BE SHAPED TO PROVIDE GRADUAL THICKNESS TRANSITION OVER A DISTANCE OF 4 FT OR MORE.

ISOLATION JOINT DETAIL

NOT TO SCALE



NOTES:

1. DOWELS SHALL BE SUPPORTED BY AN APPROVED DEVICE.
2. ALL BARS AND BASKETS SHALL BE EPOXY COATED.
3. PLACE CONSTRUCTION JOINTS AT END OF PLACEMENTS AND AT LOCATIONS WHERE PLACEMENT OPERATIONS ARE STOPPED FOR A PERIOD OF MORE THAN ½ HOUR.
4. DOWELS SHALL BE SMOOTH BARS AND FREE MOVEMENT SHALL BE PROVIDED BY APPLYING A COATING OF GREASE AS A BOND-BREAKING MATERIAL JUST PRIOR TO PLACING THE CONCRETE.
5. IN EMERGENCY SITUATIONS SUCH AS LACK OF MATERIALS, SUDDEN CHANGES IN WEATHER, OR EQUIPMENT BREAKDOWN, A CONSTRUCTION JOINT SHOULD BE INSTALLED IN PLACE OF THE NEAREST CONTRACTION JOINT LOCATION.
6. CONSTRUCTION JOINTS ARE NOT TO BE LOCATED CLOSER THAN 10'-0" TO ANOTHER PARALLEL JOINT.
7. WHERE SLABS OF DIFFERENT THICKNESSES COME TOGETHER AT JOINTS, THE SUBGRADE/SUBBASE UNDER THE THINNER PAVEMENT SECTIONS SHOULD BE SHAPED TO PROVIDE GRADUAL THICKNESS TRANSITION OVER A DISTANCE OF 4 FT OR MORE.

CONSTRUCTION JOINT DETAIL

NOT TO SCALE

ON-SITE PAVEMENT NOTES

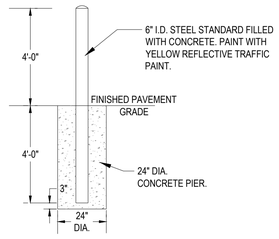
1. ALL CONSTRUCTION METHODS AND MATERIALS SHALL BE IN ACCORDANCE WITH THE ODOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES".
2. PAVEMENT DESIGN IS BASED ON A 20 YEAR DESIGN LIFE. (REFER TO GEOTECHNICAL ENGINEERING REPORT.)
3. CONCRETE SHALL BE AIR ENTRAINED AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 P.S.I. AFTER 28 DAYS OF LABORATORY CURING. REFER TO GEOTECHNICAL REPORT FOR CONCRETE JOINT RECOMMENDATIONS.
4. REFER TO GEOTECHNICAL REPORT FOR SUBGRADE PREPARATION.
5. ALL PROPOSED AGGREGATE BASE FOR CONCRETE PAVEMENT SHALL CONFORM TO ODOT MATERIAL SPECIFICATION SECTION 815 PER THE GEOTECHNICAL REPORT.

GENERAL JOINTING NOTES:

1. NOTES AND DETAILS BASED ON ACI 330.2R-17 AND 330.R-8 GUIDELINES. ALL RECOMMENDATIONS SHOULD BE CONFIRMED ON A PROJECT BY PROJECT BASIS WITH THE CIVIL AND/OR GEOTECHNICAL ENGINEER. IF THE DETAILS AND RECOMMENDATIONS PROVIDED DO NOT COMPLY WITH THE STANDARDS OF THE LATEST INDUSTRY STANDARDS, OR THE STANDARDS ESTABLISHED BY THE AUTHORITY HAVING JURISDICTION, THIS SHOULD BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE OWNER'S REPRESENTATIVE.
2. CONSTRUCTION AND TRANSVERSE JOINTS SHALL BE RE-SAWN AND ALL SAW LAITANCE VACCUMED FROM THE JOINT ONCE BOTH SIDES ARE POURED.
3. PAVEMENT JOINTS OF ANY TYPE SHOULD EXTEND THROUGH ANY CURB AND GUTTER.
4. CONCRETE CONTRACTOR SHALL SUBMIT THE CONCRETE MIX TO THE OWNER'S REPRESENTATIVE FOR REVIEW AND APPROVAL.
5. A SCALED DRAWING OF THE JOINTING PLAN FOR THE PAVEMENTS AND CURBS SHOULD BE SUBMITTED BY THE CONTRACTOR FOR REVIEW BY THE CIVIL AND GEOTECHNICAL ENGINEERS.

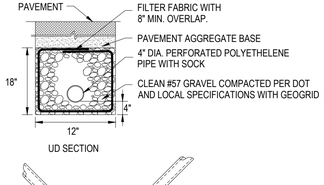
SIDEWALK JOINT NOTES

1. ALL JOINTS TO BE SEALED TO BE THOROUGHLY CLEANED BY HYDROBLASTING AND/OR SAND BLASTING METHODS. THE JOINTS ARE TO BE FREE FROM ALL DUST COATINGS, ANY CONTAMINATES, AND FREE FROM ALL MOISTURE THAT MIGHT INTERFERE WITH THE PROPER AND SATISFACTORY BONDING OF THE JOINT SEALANT MATERIAL. THE JOINT WILL BE BLOWN OUT WITH DRY COMPRESSED AIR IMMEDIATELY PRIOR TO APPLYING SEALANT.
2. CONSTRUCTION EQUIPMENT AND OTHER VEHICLES AND PEDESTRIANS WHICH MAY CAUSE DAMAGE TO THE JOINTS SHALL NOT BE ALLOWED ON THE PAVEMENT AND SIDEWALKS BEFORE THE JOINT SEALANT BECOMES TACK FREE.
3. USE 1/2" x 4" EXPANSION JOINT MATERIAL ALONG SIDEWALK CURB AND ALONG BUILDING.
4. USE 1/2" x 4" EXPANSION JOINT MATERIAL AROUND POLES OR OTHER OBSTRUCTIONS IN WALK.
5. SAW CUT JOINTS WITHIN 24 HOURS.

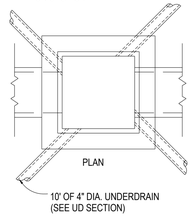


BOLLARD DETAIL

NOT TO SCALE



UD SECTION



FINGER DRAIN

NOT TO SCALE

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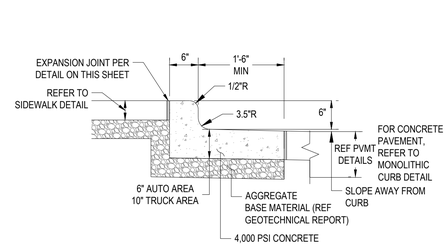
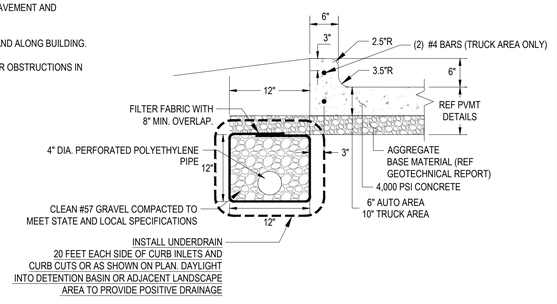


NOTE: COLORED CONCRETE SHALL BE USED FOR CURB PER OWNER SPECIFICATIONS

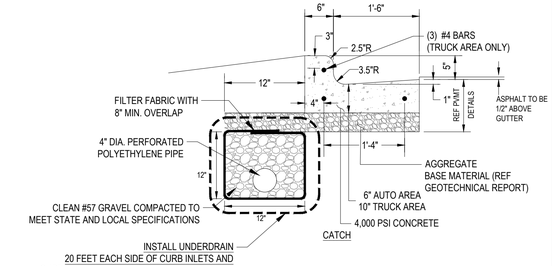
COLORED CONCRETE CURB DETAIL

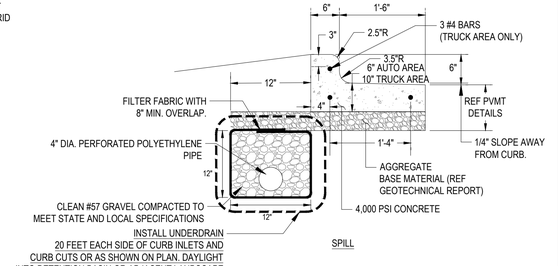
NOT TO SCALE



6" MONOLITHIC CONCRETE CURB DETAIL

NOT TO SCALE





CONCRETE CURB AND GUTTER DETAIL

NOT TO SCALE

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Akron, OH 44321
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STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER

12/18/2023

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

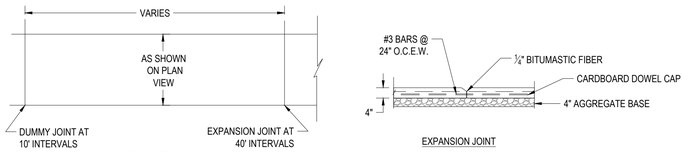
Revisions / Submissions

ID	Description	Date

Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

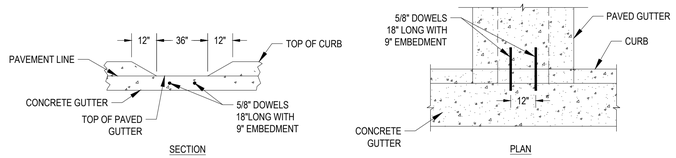
Drawing Title:
CONSTRUCTION DETAILS

C9.0



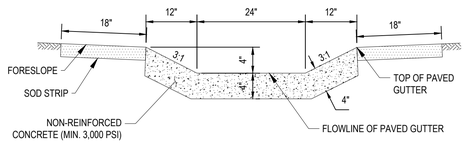
NOTE: REFERENCE GEOTECHNICAL REPORT FOR JOINT AND DOWEL SPECIFICATIONS

SIDEWALK DETAIL
NOT TO SCALE



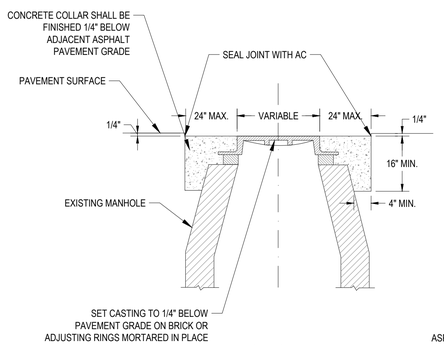
NOTE: CONTRACTOR TO MATCH TOP OF PAVED GUTTER TO TOP OF CURB AND THEN TRANSITION GUTTER DEPTH DOWN TO 4" OVER 6'.

CURB CUT DETAIL
NOT TO SCALE

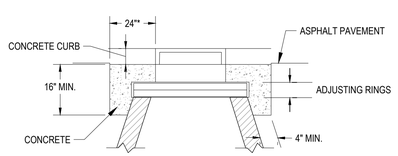


NOTE: FLOWLINE OF PAVED GUTTER TO MATCH CURB CUT WIDTH OF 36" AT OPENING, THEN TRANSITION TO 24" WITHIN 6'

PAVED GUTTER
NOT TO SCALE

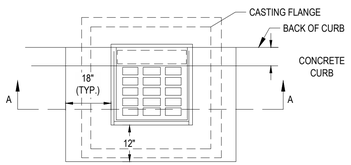


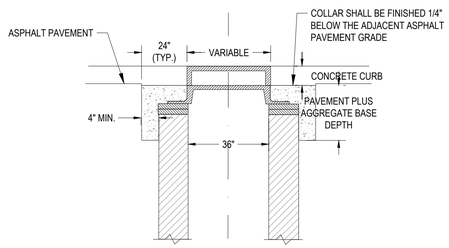
MANHOLE COLLAR DETAIL
NOT TO SCALE



*CONCRETE COLLAR SHALL EXTEND NO MORE THAN 12" INTO ROADWAY OFF FRONT EDGE OF CASTING.

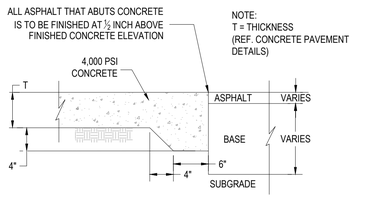
CONCRETE COLLAR DETAIL FOR 48" DIA. STRUCTURES (FOR USE ON CONE SECTION WITH 24" OR 36" OPENINGS)
NOT TO SCALE



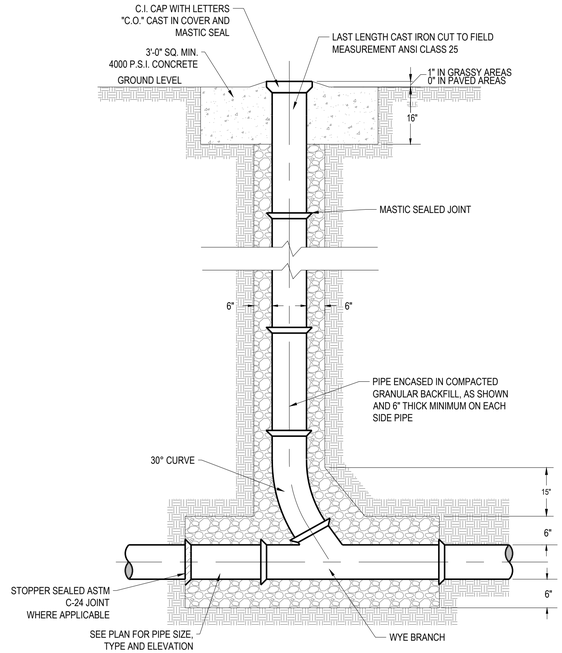


NOTE:
FOR CONCRETE COLLARS ON FLAT TOP STRUCTURES, COLLARS SHALL BE PINNED TO THE TOP WITH TWO #4 BARS (ONE ON EACH SIDE) IN THE DIRECTION OF TRAFFIC.

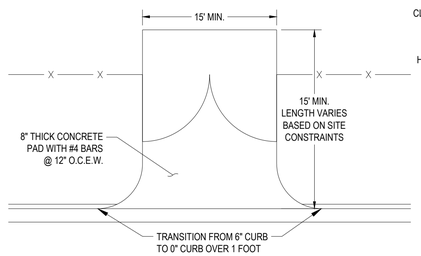
CATCH BASIN COLLAR FOR RECTANGULAR STRUCTURES - SECTION A-A
NOT TO SCALE



CONCRETE TO ASPHALT STANDARD PAVING HEADER
NOT TO SCALE

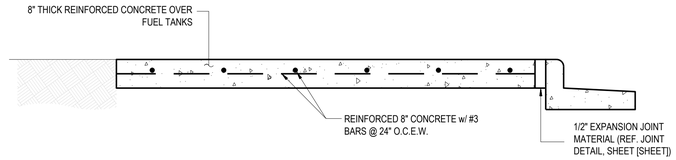


CLEAN OUT
NOT TO SCALE



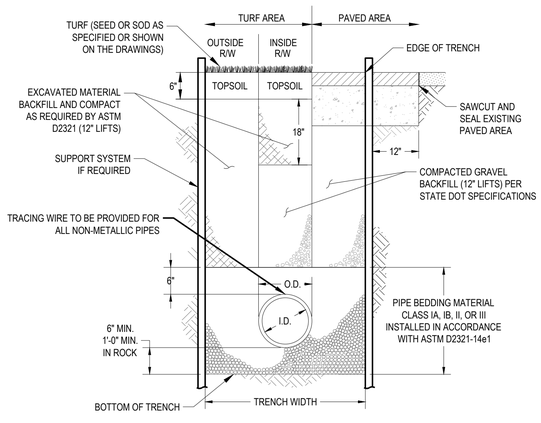
SNOW PLOW PUSH PAD
NOT TO SCALE

NOTE:
1. MAXIMUM PAD SLOPE NOT TO EXCEED 4:1 IN THE LONGITUDINAL DIRECTION OR 4% CROSS-SLOPE.
2. PROVIDE GATE IN CHAIN-LINK FENCE AS NEEDED. GATE SHALL SWING OPEN TOWARDS THE PARKING LOT.
3. PROVIDE ROLLED DROP CURB AT PUSH PAD SO AS TO PROVIDE A SMOOTH TRANSITION FROM THE PARKING LOT TO THE PAD FOR THE SNOW PLOW.
4. REFER TO ARCHITECTURAL PLANS FOR FENCE/GATE DETAILS.



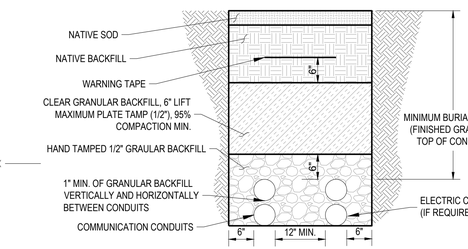
NOTE: MANHOLE LIDS TO BE SET 1" ABOVE SURROUNDING CONCRETE. GRADE CONCRETE TO MEET MANHOLE LIDS. SEE FUELING PLANS FOR FINALIZED GRADING OF THE TANK SLAB.

TYPICAL SECTION THROUGH PAVING OVER FUEL TANKS
NOT TO SCALE



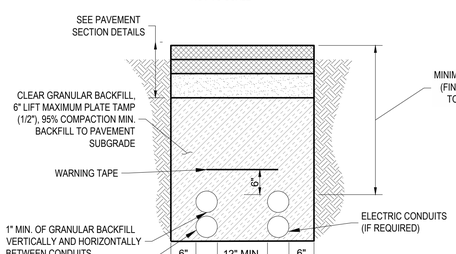
PIPE OUTSIDE DIAMETER	TRENCH WIDTH
LESS THAN OR EQUAL TO 15"	O.D. + 16"
GREATER THAN 15"	(O.D. X 1.25) + 12"
TRENCH WIDTH MAY BE LESS IF APPROVED BY THE ENGINEER. TRENCH WIDTH TO BE GREATER IN POOR OR UNSTABLE SOILS AS DETERMINED BY THE ENGINEER (REF. ASTM 2321).	

TRENCH BACKFILL
NOT TO SCALE



NOTE:
1. BURIAL DEPTHS ARE REQUIRED TO BE 2'-0" MIN. OR 6" BELOW FROST DEPTH PER LOCAL JURISDICTION.
2. EXACT NUMBER OF CONDUIT SHALL BE DETERMINED BY THE ELECTRICAL PLANS.
3. REFER TO ELECTRICAL PLANS FOR CONDUIT ROUTES.
4. IF NO ELECTRICAL CONDUIT IS REQUIRED, CENTER COMMUNICATIONS CONDUIT IN TRENCH.

EV CONDUIT TRENCH DETAIL IN LANDSCAPE
NOT TO SCALE



NOTE:
1. PAVEMENT SECTION DETAILS TO COMPLY WITH GEOTECH REPORT SPECIFICATIONS .
2. BURIAL DEPTHS ARE REQUIRED TO BE 2'-0" MIN. OR 6" BELOW FROST DEPTH PER LOCAL JURISDICTION.
3. EXACT NUMBER OF CONDUIT SHALL BE DETERMINED BY THE ELECTRICAL PLANS.
4. REFER TO ELECTRICAL PLANS FOR CONDUIT ROUTES.
5. IF NO ELECTRICAL CONDUIT IS REQUIRED, CENTER COMMUNICATIONS CONDUIT IN TRENCH.

EV CONDUIT TRENCH DETAIL IN PAVEMENT
NOT TO SCALE

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER

12/18/2023

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH
66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

ID	Description	Date

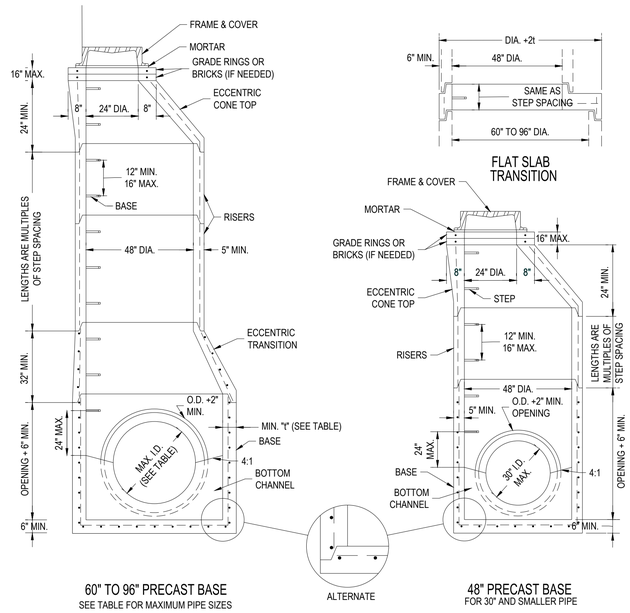
Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
CONSTRUCTION DETAILS

C9.1

NOTES:

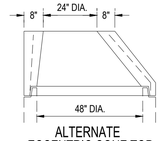
1. SECTIONS OF THE PRECAST MANHOLE SHALL BE CAST AND ASSEMBLED WITH EITHER ALL TONGUE OR ALL GROOVE ENDS UP. LIFT HOLES MAY BE PROVIDED IN EACH SECTION FOR HANDLING.
2. TOP AND TRANSITION (OR REDUCER) SECTIONS MAY BE EITHER ECCENTRIC CONE, CONCENTRIC CONE, OR FLAT SLAB.
3. BASES FOR MANHOLES ARE SHOWN WITH MONOLITHIC FLOOR AND RISER WHICH MAY BE CAST IN ONE OR TWO OPERATIONS. A PERMISSIBLE ALTERNATE IS TO CAST AND SHIP THE FLOOR AND BARREL SEPARATELY. OPENINGS FOR INLET AND OUTLET PIPE SHALL BE PROVIDED EITHER WHEN THE UNIT IS CAST OR LATER, TO MEET PROJECT REQUIREMENTS. BOTTOM CHANNELS MAY BE FORMED OF CONCRETE PRECAST IN THE BASE OR BY FIELD CONSTRUCTION. BASES MAY ALSO BE POURED IN PLACE. ALL INLETS AND OUTLETS ARE TO BE IDENTIFIED.
4. OPENINGS IN RISER SECTIONS FOR 18" AND SMALLER INLET PIPES SHALL BE PREFABRICATED. FLEXIBLE CONNECTIONS SHALL BE PROVIDED FOR SANITARY AND COMBINED SEWERS.
5. JOINT SEAL BETWEEN PRECAST MANHOLE SECTIONS AND PIPES SHALL BE RESILIENT AND FLEXIBLE GASKET JOINTS PER ASTM C-923 OR LATEST EDITION.
6. 0-RING JOINT, BETWEEN MANHOLE SECTIONS SHALL BE FLEXIBLE BUTYL RUBBER SEAL PER ASTM C-990.
7. PRECAST MANHOLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478. CONCRETE SHALL BE 4000 PSI.
8. SEAL LIFT HOLES WITH NON-SHRINK GROUT.
9. FRAME AND COVER:
   - 9.1. FRAME WITH SOLID COVER USE EAST JORDAN 1710A, WITH APPROPRIATE LETTERING OR APPROVED OTHER
   - 9.2. FRAME WITH GRATE USE EAST JORDAN 1710M OR APPROVED OTHER.



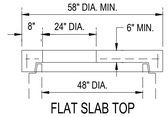
60" TO 96" PRECAST BASE
SEE TABLE FOR MAXIMUM PIPE SIZES

48" PRECAST BASE
FOR 30" AND SMALLER PIPE

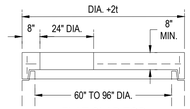
FLAT SLAB TRANSITION



ALTERNATE
ECCENTRIC CONE TOP



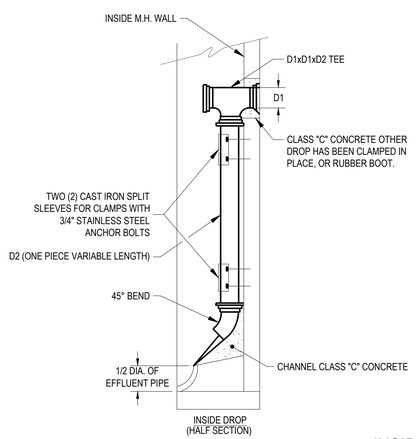
FLAT SLAB TOP



FLAT SLAB TOP

BASE I.D.	MIN. "t"	MAX. PIPE SIZE
60"	5"	36"
72"	6"	48"
84"	7"	54"
90"	7½"	60"
96"	8"	66"

PRECAST CONCRETE MANHOLE
NTS

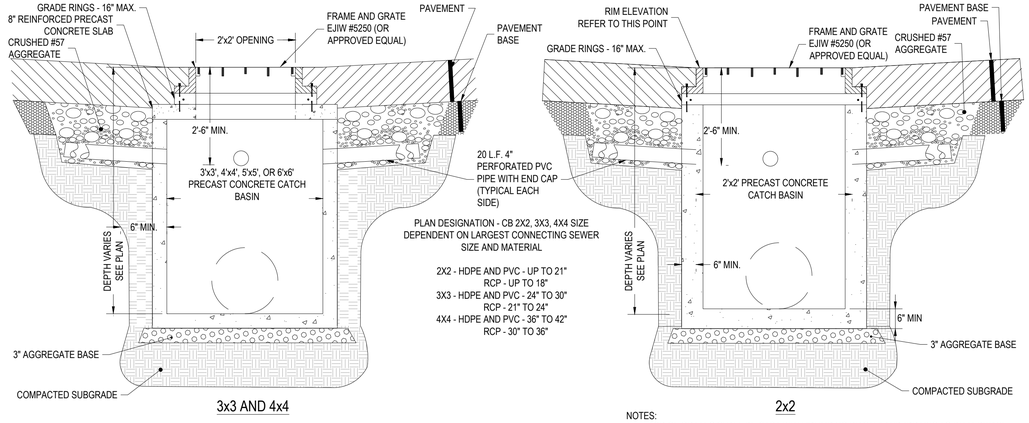


INSIDE / OUTSIDE SANITARY DROP
NTS

NOTES:

1. HEIGHT OF DROP IS TO BE AS SHOWN ON THE PLANS OR WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
2. WHERE CALLED FOR, AND UNLESS OTHERWISE REQUIRED BY THE PLANS, THE OUTSIDE DROP WILL BE CONSTRUCTED WITH NEW MANHOLES.
3. MATERIALS FOR THE TEE, DROP PIPE AND BEND SHALL BE OF THE SAME MATERIAL AS THE UPSTREAM PIPE, UNLESS OTHERWISE DIRECTED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
4. OUTSIDE DROP PIPES REQUIRE A 5" THICK (MINIMUM) CLASS "C" CONCRETE ENCASEMENT ON THREE SIDES OF PIPE

PIPE DIAMETER	
D1	D2
4"	4"
6"	6"
8"	6"
10"	8"
12"	8"
15"	10"
18"	10"
21"	12"
24"	12"



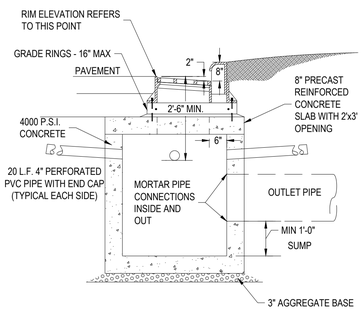
PLAN DESIGNATION - CB 2X2, 3X3, 4X4 SIZE DEPENDENT ON LARGEST CONNECTING SEWER SIZE AND MATERIAL

2X2 - HDPE AND PVC - UP TO 21"
RCP - UP TO 18"
3X3 - HDPE AND PVC - 24" TO 30"
RCP - 21" TO 24"
4X4 - HDPE AND PVC - 36" TO 42"
RCP - 30" TO 36"

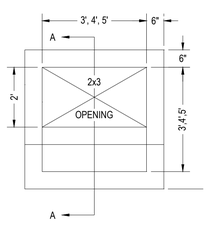
PRECAST CATCH BASIN
NTS

NOTES:

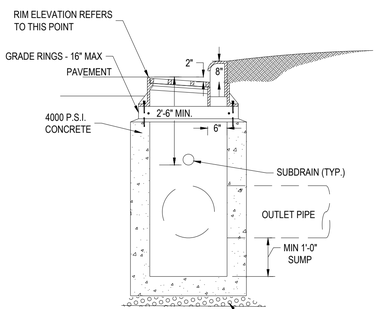
1. TOP OF GRATES SHALL BE CAST WITH "DUMP NO WASTE" AND "DRAINS TO WATERWAY". JOINTS BETWEEN SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-990 OR LATEST EDITION. PRECAST SECTIONS SHALL CONFORM TO THE REQUIREMENTS TO ASTM C-478. CONCRETE SHALL BE 4000 PSI.
2. ADJUSTMENT TO GRADES TO BE PRECAST GRADE RINGS. CASTINGS TO BE MORTARED WITH TYPE "M" MASONRY MORTAR.



3x3 AND 4x4 - SECTION A-A
TOP VIEW - CASTING REMOVED



TOP VIEW
CASTING REMOVED



2x3 - SECTION A-A
TOP VIEW - CASTING REMOVED

NOTES:

1. FRAME AND GRATE ASSEMBLY SHALL BE EAST JORDAN 5352M, 7080Z, 7080T OR APPROVED EQUAL. CURB PIECE SHALL BE CAST WITH "DUMP NO WASTE" AND "DRAINS TO WATERWAY".
2. JOINT SEALS BETWEEN PRECAST SECTIONS SHALL BE RESILIENT AND FLEXIBLE GASKET JOINTS PER ASTM C-990.
3. PRECAST SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478. CONCRETE SHALL BE 4000 PSI.
4. ADJUSTMENTS TO GRADES TO BE PRECAST GRADE RINGS. CASTINGS TO BE MORTARED WITH TYPE "M" MASONRY MORTAR.

PRECAST CURB INLET
NTS

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Loves

STATE OF OHIO
ZACHARY D. FRESHNER
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REGISTERED PROFESSIONAL ENGINEER

12/18/2023

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

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Revisions / Submissions

ID	Description	Date

Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
CONSTRUCTION DETAILS

C9.2

GENERAL CONSTRUCTION REQUIREMENTS

1. DETAIL PLANS OF PLANNED WATER LINE CONSTRUCTION WILL BE SUBMITTED TO THE BELMONT COUNTY WATER AND SEWER DISTRICT, FOR APPROVAL BY THE ENGINEER ASSOCIATE, PRIOR TO CONSTRUCTION. A PRECONSTRUCTION MEETING WILL BE REQUIRED BEFORE START OF CONST.
2. SIGNED WATER APPLICATIONS & APPLICABLE FEES MUST BE RECIEVED PRIOR TO CONSTRUCTION.
3. ALL WATERLINE'S SHALL BE C900 (DR-14) IN HIGH PRESSURE AREAS DUCTILE IRON CLASS 50 OR 52 WILL BE REQUIRED BY THE DISTRICT. (ALL DUCTILE IRON PIPE TO BE POLYETHYLENE WRAPPED AS PER AWWA C105/A21.5) PIPE SIZES TO BE 3/4"CTS, 1"CTS, 2"I.P., 4", 6", 8", 10", 12" C-900 (DR 14) (3/4" OR 1" TO BE TYPE-K SOFT COPPER IF LINE PRESSURE IS GREATER THAN 200 PSI) NO PIPE LENGTHS UNDER 4'.
4. 2" AND LARGER PRIVATE SERVICE LINES THAT CROSS UNDER A ROADWAY WILL REQUIRE AN ADDITIONAL VALVE AT THE RIGHT-OF-WAY ON THE OPPOSITE SIDE OF MAINLINE.
5. RESIDENTIAL PVC SEWER LINE WILL BE A MINIMUM OF 4 INCH SDR-35. ALL SEWER PIPE TO BE GASKETED.
6. SEWER FORCE MAIN WILL BE A MINIMUM OF 1 1/2", OR 2", POLYETHYLENE CLASS 200, OR 2", 4", 6", OR 8" SDR-21 CL-200 PVC PIPE, AND GREEN IN COLOR. GRAVITY SEWER LINES SHALL BE AIR AND DEFLECTION TESTED IN ACCORDANCE WITH TABLE 1 PAGE 29 OF THIS BOOKLET.
7. ALL PIPE THAT IS INSTALLED SHALL BE BEDDED WITH A MINIMUM OF 6" ABOVE AND BELOW THE PIPE WITH GOOD TOP SOIL FREE OF STONE AND OTHER FOREIGN OBJECTS, OR CRUSH AND RUN STONE.
8. WATERLINE SHALL BE INSTALLED WITH 4 FOOT MINIMUM COVER UNLESS OTHERWISE APPROVED.
9. A MINIMUM VERTICAL CLEARANCE OF 18 INCHES SHALL BE PROVIDED BETWEEN THE PROPOSED WATER MAIN AND OTHER UTILITIES OR STRUCTURES, UNLESS OTHERWISE NOTED.
10. A MINIMUM HORIZONTAL CLEARANCE OF 4 FEET SHALL BE PROVIDED BETWEEN THE PROPOSED WATER LINE AND OTHER UTILITIES OR STRUCTURES UNLESS OTHERWISE APPROVED.
11. THE WATERLINE SHALL BE PLACED WITH A MINIMUM OF 10 FOOT HORIZONTAL SEPARATION FROM ANY SANITARY SEWERS OR WHEN THE THE WATER LINE CROSSES A SANITARY SEWER, THE WATER LINE SHALL BE A MINIMUM OF 18 INCHES ABOVE THE SEWER.
12. SEWER LINES MUST CROSS UNDER ALL WATERLINES WITH A MINIMUM OF 18" OF CLEARANCE. IF NOT POSSIBLE THE BCSSD WILL PERMIT CROSSING OVER WITH STEEL CASING OR PLASTIC CASING AND CONCRETE. MINIMUM CASING LENGTH IS 10FT. AS PER NOTE ON SHT.- #16
13. ALL FITTINGS SHALL BE MECHANICAL JOINT (MJ), FUSION EPOXY COATED, DUCTILE IRON, RESTRAINED BY THE USE OF RESTRAINERS AND/OR MEGALUGS AND THRUST BLOCKED WITH CONCRETE AS REQUIRED. SEE SHT# 25 FOR THRUST BLOCKING DETAIL

CONTINUES ON NEXT PAGE

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

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02/15/24 2

GENERAL CONSTRUCTION REQUIREMENTS

14. A 16FT. MIN. LENGTH OF WATERLINE SHALL BE PROVIDED ON EACH SIDE OF ANY MAINLINE FITTING, OR THE JOINT SHALL BE RESTRAINED WITH BELL RESTRAINT FITTINGS.
15. ALL SERVICE CONNECTIONS MADE TO EXISTING LINES WILL BE MADE BY THE DISTRICT. THE CONNECTION SHALL BE MADE WET USING A TAPPING TEE AND VALVE. IF A LINE TO BE CONNECTED IS THE SAME AS THE EXISTING LINE, 2" CONNECTED TO 2" OR 6" CONNECTED TO 6", THE CONNECTION WILL BE MADE DRY. EXCEPTIONS MAY BE MADE DUE TO UNFORESEEN FIELD CIRCUMSTANCES.
16. MAGNETIC DETECTABLE TRACER TAPE SHALL BE INSTALLED AT 18 INCHES DEEP WITH ALL PVC PIPE.
17. TRACE WIRE TO BE INSTALLED ON ALL WATER & SEWER LINES.
    A.) OPEN-TRENCH INSTALLATION: DIRECT BURIAL #12 AWG SOLID (0.0808" DIA.),STEEL CORE SOFT DRAWN TRACER WIRE, 250# AVERAGE TENSILE BREAK LOAD, 30 MIL HIGH MOLECULAR-HIGH DENSITY POLYETHYLENE JACKET COMPLYING WITH ASTM-D-1248,30 VOLT RATING, 45 MIL JACKET WHEN DIRECTIONAL BORED.

    B.) CONNECTORS
    SPLICES ALONG THE CONTINUOUS RUN OF TRACE WIRE FOR REPAIR OF A WIRE BREAK OR REPLACEMENT OF FAILED SEGMENT OF WIRE SHALL USE 3M BRAND DBR DIRECT BURY SPLICE KIT OR APPROVED EQUAL.

    C.) INSTALLATION
    TRACE WIRE ACCESS POINT SHALL BE ACCESSIBLE AT ALL NEW WATER VALVE BOXES, WATER METER BOXES, BLOWOFFS, ARVS, FIRE HYDRANTS AND MANHOLES.

    D.) TESTING REQUIREMENTS
    CONTRACTOR SHALL PERFORM A CONTINUITY TEST ON ALL TRACE WIRE IN THE PRESENCE OF BCWSD. IF THE TRACE WIRE IS FOUND TO BE NOT CONTINUOUS AFTER TESTING, CONTRACTOR SHALL REPAIR OR REPLACE THE FAILED SEGMENT OF WIRE.
18. THE CONTRACTOR WILL SCHEDULE WITH THE DISTRICT APPROXIMATE TIMES FOR THE INSPECTION OF LINES, FITTINGS & ETC., PRIOR TO BACKFILLING. **THE COUNTY SHALL BE GIVEN A MINIMUM 48 HOURS OF NOTICE WHEN A INSPECTION IS REQUIRED**
19. EXISTING MAINLINE VALVES WILL ONLY BE OPERATED BY DISTRICT PERSONNEL.
20. A MINIMUM OF 24 HOURS NOTICE FOR ANY INSTALLATIONS BY CONTRACTORS THAT MAY DISRUPT WATER SERVICE TO EXISTING WATER CUSTOMERS. THE NOTICE SHALL BE MADE THROUGH THE DISTRICTS OFFICE.
21. ALL SERVICE CONNECTIONS INSTALLED WILL BE STAKED AT THE TIME OF CONSTRUCTION WITH IRON "TEE BAR STAKES" PER DISTRICT REQUIREMENTS.
22. CHANGES IN GRADE AND ALIGNMENT TO BE OBTAINED BY DEFLECTIONS AT PIPE JOINTS SHALL BE NO GREATER THAN RECOMMENDED BY THE MANUFACTURER OF THE WATER LINE.

CONTINUES ON NEXT PAGE

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

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02/15/24 3

GENERAL CONSTRUCTION REQUIREMENTS

23. PRESSURE TESTING OF WATER LINES AND SEWER FORCE MAINS SHALL BE IN ACCORDANCE WITH AWWA C600-87. TESTING AT 1-1/2 TIMES EXISTING PRESSURE AND/OR WORKING PRESSURE OR MINIMUM OF 100PSI/MAX. OF THE PRESSURE RATING OF OF THE PIPE. PRESSURE TESTING MUST BE DONE WITHIN 2 WORKING WEEKS ONCE LINE IS IN PLACE.
24. THE CONTRACTOR WILL CHLORINATE THE INSTALLED WATER LINE AT RECOMMENDED AWWA 651 STANDARDS, FOR A MINIMUM OF 24 HOURS, AT 50 P.P.M.
25. THE DISTRICT WILL TAKE REPRESENTATIVE SAMPLES OF THE WATER IN THE LINES, AND HAVE AN APPROVED LABORATORY MAKE THE BACTERIOLOGICAL EXAMINATIONS OF THE SAMPLE TO ESTABLISH THE ACCEPTABILITY OF THAT PORTION OF THE SYSTEM PRIOR TO ANY TURN ON OF SERVICE TO ANY FACILITY. THERE WILL BE NO EXCEPTION TO THIS STANDARD.
26. ALL MAIN LINE VALVES & FLUSH-OUT ASSEMBLIES SHALL BE MARKED BY A WHITE FIBERGLASS MARKER AS PER THE WATER DISTRICTS REQUIREMENTS.
27. LOCATION OF THE PROPOSED SERVICE TAPS SHALL BE FIELD LOCATED BY THE OWNER PRIOR TO CONSTRUCTION OR AT TIME OF CONSTRUCTION.
28. ALL MATERIAL AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BELMONT COUNTY SPECIFICATIONS AS OUTLINED IN STANDARD DETAILS MANUAL.
29. ALL PARTS, LABOR, EQUIPMENT, AND MISC. EXPENSES BY THE BELMONT COUNTY SANITARY SEWER DISTRICT WILL BE INVOICED TO THE DEVELOPER.
30. CONTRACTOR IS RESPONSIBLE FOR ALL WORK PERFORMED FOR THE FIRST YEAR OF CUSTOMER SERVICE.
31. ALL PRESSURE TESTING STARTS BEFORE NOON.
32. AS-BUILTS DRAWINGS (MAPS) MUST BE PROVIDED TO BCWSD WITHIN 3 MONTHS OF THE BACTERIA TEST, WHICH MARKS THE WATER LINE COMPLETION DATE. FOR 6" AND LARGER LINES/ AND WITHIN ONE MONTH FOR 2"&4" LINES
33. AS-BUILTS FOR 6" & LARGER LINES ARE REQUIRED TO HAVE GPS POINT WHEN SUBMITTED FOR APPROVAL THEY ARE TO POINT OUT THE FOLLOWING;HYDRANTS,FITTINGS **CURB BOXES, METER WELLS, MAN HOLES, CLEAN OUTS, VALVES, AND WATER OR SEWER LINES** IN 100FT. INCREMENTS.

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

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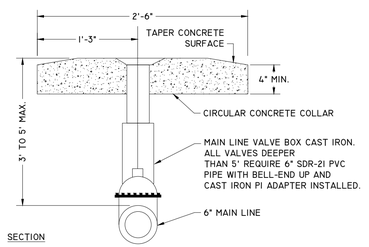
02/15/24 3A

NOT TO SCALE



BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS
VALVE BOX SETTING

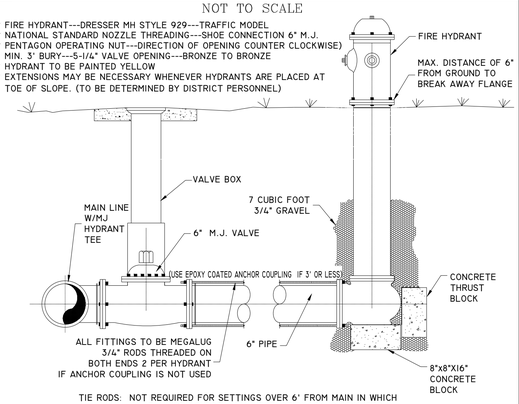
DWG. NO. 5

10/31/17

10

NOT TO SCALE

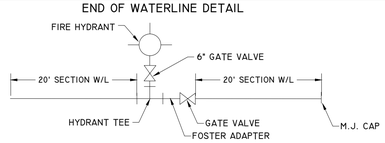
* FIRE HYDRANT---DRESSER MH STYLE 929---TRAFFIC MODEL
* NATIONAL STANDARD NOZZLE THREADING---SHOE CONNECTION 6" M.J.
* PENTAGON OPERATING NUT---DIRECTION OF OPENING COUNTER CLOCKWISE)
* MIN. 3' BURY---5-1/4" VALVE OPENING---BRONZE TO BRONZE
* HYDRANT TO BE PAINTED YELLOW
* EXTENSIONS MAY BE NECESSARY WHENEVER HYDRANTS ARE PLACED AT TOE OF SLOPE. (TO BE DETERMINED BY DISTRICT PERSONNEL)



TIE RODS: NOT REQUIRED FOR SETTINGS OVER 6' FROM MAIN IN WHICH CASE A MORE SUBSTANTIAL THRUST BLOCK IS REQUIRED.

NOTE: KEEP FLANGES AND WEEP HOLES CLEAR OF CONCRETE.

END OF WATERLINE DETAIL



BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS
FIRE HYDRANT ASSEMBLY
ARRANGMENT AT END OF WATERLINE EXTENSION

DWG. NO. 7

10/31/17

14

CESO
WWW.CESOINC.COM
175 Montrose West Ave., Suite 400
Akron, OH 44321
Phone: 330.665.0660 Fax: 888.208.4826

Loves

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

ID	Description	Date
1	REV 1	01/03/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	N/A
Drawn By:	CDR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
CONSTRUCTION DETAILS

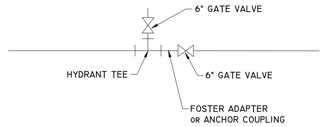
C9.3

OHIO811.org Before You Dig

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

W:\PROJECTS\LOVES\759267 - St. Clairsville, OH - SR 149\03-CIVIL\PLAN\PLOT-COMBINED\759267_SITE CONSTRUCTION DETAILS.dwg - 4/12/2024 - Ryan Ash

6" x 6" VALVE ARRANGMENT & HYDRANT TEE ON W/L



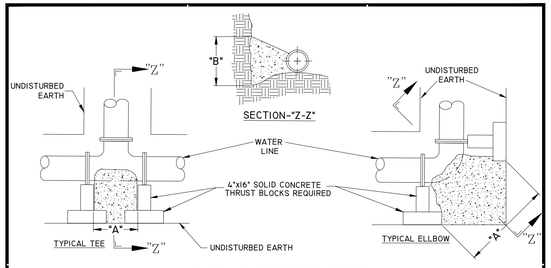
BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS
6" X 6" VALVE ARRANGMENT

DWG. NO. 7A

9/25/17

14A



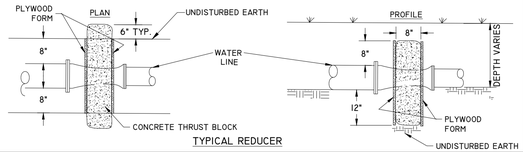
MINIMUM THRUST BLOCKING REQUIREMENTS

PIPE SIZE	90° BENDS AREA SQ. FT.	"A"	"B"	45° BENDS AREA SQ. FT.	"A"	"B"	22-1/2° BENDS AREA SQ. FT.	"A"	"B"	11-1/4° BENDS AREA SQ. FT.	"A"	"B"	TEES AND PLUGS AREA SQ. FT.	"A"	"B"
4 INCH OR LESS	2.3	22"	15"	1.5	12"	18"	1.0	12"	12"	0.75	12"	9"	2.25	18"	18"
6 INCH	4.0	32"	18"	3.75	30"	18"	1.5	18"	12"	1.0	12"	12"	4.0	32"	18"
8 INCH	7.0	42"	24"	6.0	36"	24"	3.0	24"	12"	1.5	18"	12"	6.0	36"	24"
10 INCH	11.0	53"	30"	9.0	36"	36"	5.0	30"	24"	2.25	18"	18"	8.33	40"	30"
12 INCH	16.1	64"	36"	13.5	54"	36"	7.5	36"	30"	3.0	9"	36"	11.0	44"	36"
14 INCH	21.6	74"	42"	17.5	60"	42"	10.5	42"	36"	5.0	30"	24"	14.0	48"	42"
16 INCH	28.3	85"	48"	24.75	66"	54"	14.0	48"	42"	6.0	36"	24"	17.3	52"	48"

NOTE'S:

1.) SOLID BLOCKS MAY BE USED UNDER FITTINGS AND ALONG SIDES OF THRUST BLOCKING TO HOLD CONCRETE IN PLACE. ALL CONCRETE MUST BE MIXED 4000# MINIMUM

2.) ALL FITTINGS TO BE WRAPPED WITH 8-MIL PLASTIC, LEAVING NO CONCRETE ON BOLTS



TYPICAL REDUCER

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS
THRUST BLOCKING

DWG. NO. 8

12/6/17

15

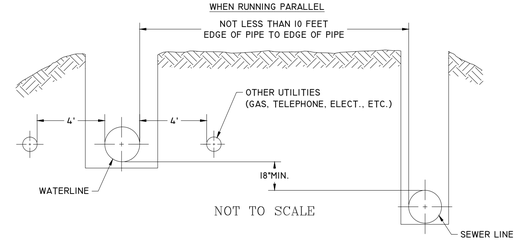
CROSSINGS

SEWERS CROSSING WATER MAINS SHALL BE LAID TO PROVIDE A MIN. VERTICAL DISTANCE OF 18" BELOW THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER. THIS SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SEWER. THE CROSSING SHALL BE ARRANGED SO THAT THE SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS. WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO MAINTAIN LINE AND GRADE.

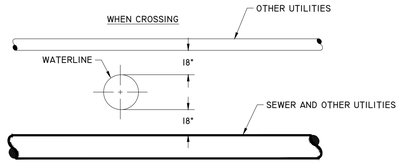
EITHER THE WATER MAIN OR THE SEWER LINE MUST BE ENCASED IN A WATERTIGHT CARRIER PIPE WHICH EXTENDS 10' ON BOTH SIDES OF THE CROSSING, MEASURED PERPENDICULAR TO THE MAIN. THE CARRIER PIPE SHALL BE MIN. 3/8" THICK STEEL OR ODOT ITEM 603 CONDUIT TYPE B, 707.42 WITH CONCRETE AS PER CONCRETE ENCASEMENT DETAIL ON DWG#10.

IF SEWER LINE IS A 4"SERVICE LINE CROSSING OVER OR UNDER A MAIN WATER LINE, THE CARRIER PIPE LENGTH MAY BE REDUCED TO 5' ON BOTH SIDES OF THE CROSSING.

WHEN RUNNING PARALLEL



WHEN CROSSING



BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS
UTILITIES RELATIONSHIP DETAIL

DWG. NO. 9

1/29/18

16

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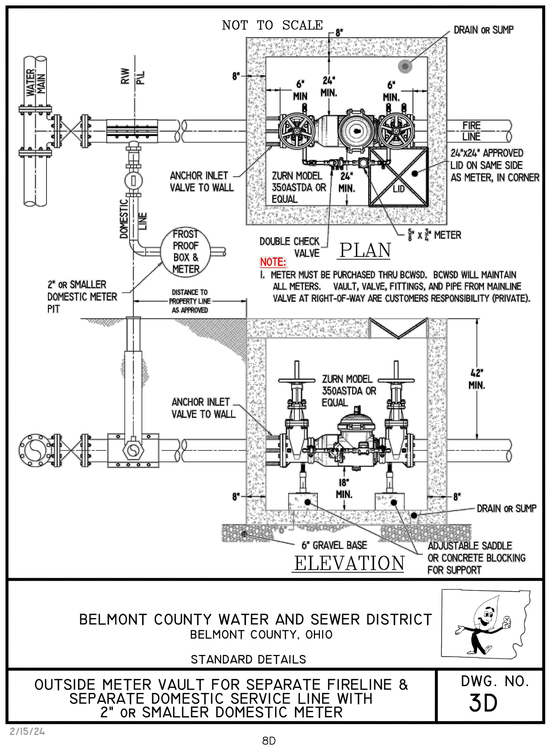
FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM
175 Montrose West Ave., Suite 400
Akron, OH 44321
Phone: 330.665.0660 Fax: 888.208.4826

Loves

4



BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS

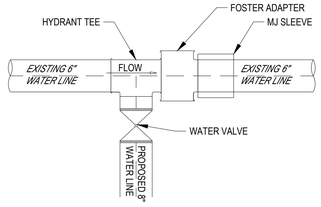
OUTSIDE METER VAULT FOR SEPARATE FIRELINE & SEPARATE DOMESTIC SERVICE LINE WITH 2" OR SMALLER DOMESTIC METER

DWG. NO. 3D

2/15/24

C:\ATLAS-WATER\STANDARD DETAILS\PAGES\#3D_OUTSIDE METER VAULT FOR SEPARATE FIRELINE & SEPARATE DOMESTIC SERVICE LINE WITH 2IN OR SMALLER DOMESTIC METER.DWG, 2/15/2024 1:29:20 PM

8D



TIE-IN TO EXISTING WATER LINE
ON RECO ROAD

NOTE: FITTING TO BE A MINIMUM OF 5 FEET FROM ANY BELL OR OTHER FITTINGS OR TAPS

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

ID	Description	Date
1	REV 1	01/03/2024
3	ADDENDUM 3	02/09/2024
4	ADDENDUM 4	02/23/2024

Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
CONSTRUCTION DETAILS

C9.4

W:\PROJECTS\LOVES\759267 - St. Clairsville, OH - SR 149\03-CIVIL\PLAN\PLOT-COMBINED\759267_SITE CONSTRUCTION DETAILS.dwg - 4/12/2024 - Ryan Ash

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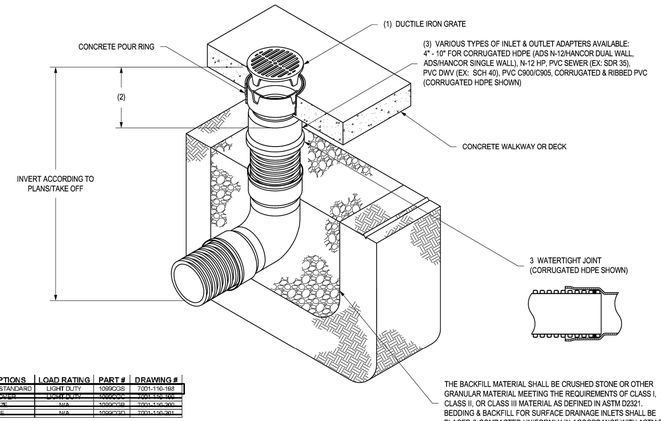
OHIO811.org Before You Dig

NYLOPLAST 10" INLINE DRAIN: 2710AG _ _ X



GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN(STANDARD)	LIGHT DUTY	1099CGS	7001-110-197
SOLID COVER	LIGHT DUTY	1099CGC	7001-110-199
BRONZE	N/A	1099CGB	7001-110-200
DOME	N/A	1099CGD	7001-110-201

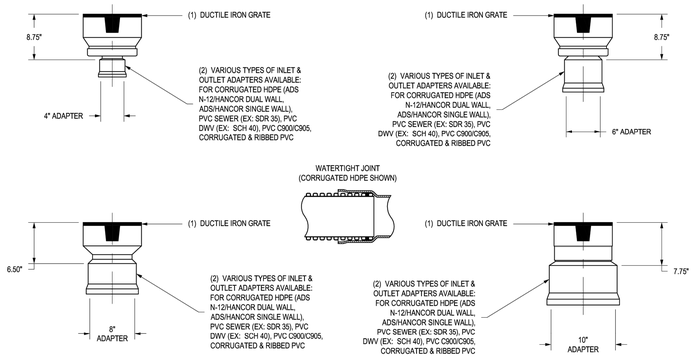
1 - GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05 WITH THE EXCEPTION OF THE BRONZE GRATE.
2 - FOR COMPLETE DESIGN DETAILS SEE DRAWING NO. 7003-110-001.
3 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), & PVC SEWER.

DRAWN BY	EBC
DATE	11-15-06
REVISED BY	NMH
DATE	03-15-16
DWG SIZE	A
MATERIAL	
PROJECT NO./NAME	
SCALE	1:16
SHEET	1 OF 1
DWG NO.	7003-110-034
REV	F

ADS Nyloplast
3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

TITLE
10 IN INLINE DRAIN QUICK SPEC INSTALLATION DETAIL

NYLOPLAST 10" INLINE DRAIN: 2710AG _ _ X



GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
STANDARD	LIGHT DUTY	1099CGS	7001-110-198
SOLID COVER	LIGHT DUTY	1099CGC	7001-110-199
BRONZE	N/A	1099CGB	7001-110-200
DOME	N/A	1099CGD	7001-110-201

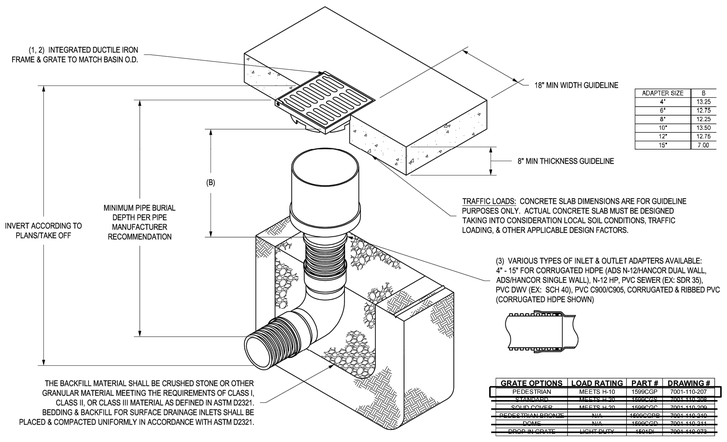
1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05, WITH THE EXCEPTION OF THE BRONZE GRATE.
2 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC.
3 - DIMENSIONS ARE FOR REFERENCE ONLY.
4 - ACTUAL DIMENSIONS MAY VARY.

DRAWN BY	CJA
DATE	06-25-99
REVISED BY	CCA
DATE	07-19-13
DWG SIZE	A
MATERIAL	
PROJECT NO./NAME	
SCALE	NTS
SHEET	1 OF 1
DWG NO.	7003-110-001
REV	G

ADS Nyloplast
3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

TITLE
10 IN DESIGN DETAILS

NYLOPLAST 15" INLINE DRAIN: 2715AG _ _ X



ADAPTER SIZE	B
4"	13.25
6"	12.75
8"	12.25
10"	13.50
12"	12.75
15"	7.00

GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-10	1599CGP	7001-110-207
STANDARD	MEETS H-10	1599CGS	7001-110-196
SOLID COVER	MEETS H-20	1599CGC	7001-110-209
PEDESTRIAN BRONZE	N/A	1599CGPB	7001-110-210
DOME	N/A	1599CGD	7001-110-211
DROP IN GRATE	LIGHT DUTY	1501H	7001-110-073

1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05. WITH THE EXCEPTION OF THE BRONZE GRATE.
2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER.
4 - DIMENSIONS ARE FOR REFERENCE ONLY. ACTUAL DIMENSIONS MAY VARY.
5 - DIMENSIONS ARE IN INCHES
6 - SEE DRAWING NO. 7001-110-275 FOR ADS N-12 & HANCOR DUAL WALL BELL INFORMATION & DRAWING NO. 7001-110-364 FOR N-12 HP BELL INFORMATION.

DRAWN BY	EBC
DATE	04-03-06
REVISED BY	NMH
DATE	03-15-16
DWG SIZE	A
MATERIAL	
PROJECT NO./NAME	
SCALE	1:20
SHEET	1 OF 1
DWG NO.	7003-110-026
REV	E

ADS Nyloplast
3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

TITLE
15 IN INLINE DRAIN QUICK SPEC INSTALLATION DETAIL

CESO
WWW.CESOINC.COM
175 Montrose West Ave., Suite 400
Akron, OH 44321
Phone: 330.665.0660 Fax: 888.208.4826

Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER
12/18/2023

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH
66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

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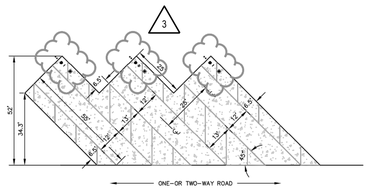
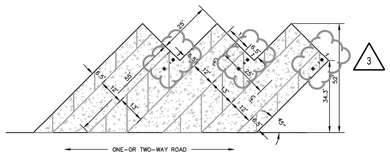
Project Number:	759267
Scale:	N/A
Drawn By:	FAR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
CONSTRUCTION DETAILS

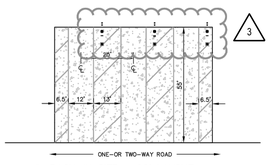
C9.5



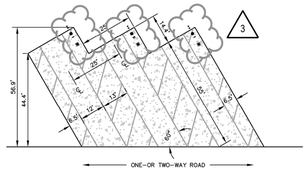
1 45° BACK-IN SITE – DRIVER SIDE
(FOR MODEL 3 SITES)



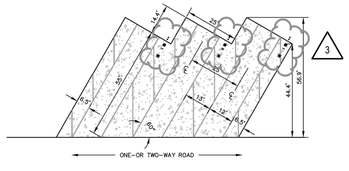
2 45° BACK-IN SITE – PASSENGER SIDE
(FOR MODEL 3 SITES)



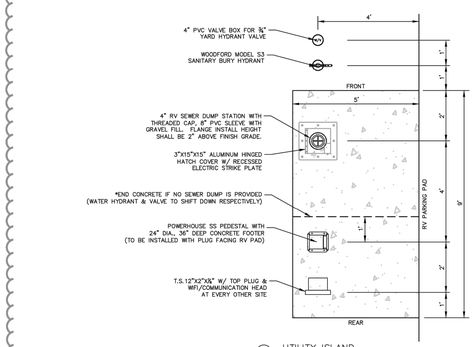
3 BACK-IN SITE – 90° LAYOUT
(FOR MODEL 3 SITES)



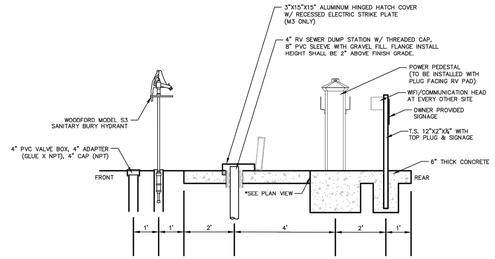
4 60° BACK-IN SITE – DRIVER SIDE
(FOR MODEL 3 SITES)



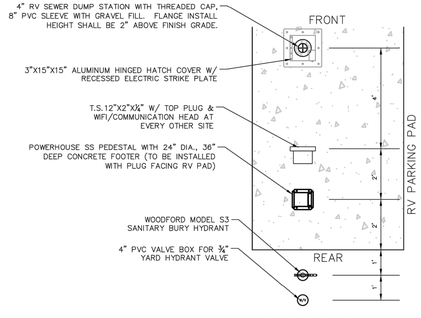
5 60° BACK-IN SITE – PASSENGER SIDE
(FOR MODEL 3 SITES)



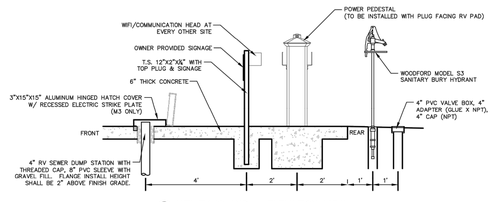
6 UTILITY ISLAND
(M3 PULL-THRU)



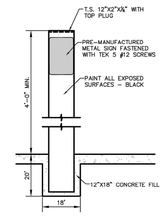
7 UTILITY ISLAND – ELEVATION VIEW
(OFFSITE M3 PULL-THRU SUITE)



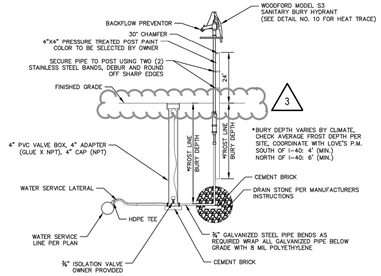
8 UTILITY ISLAND
(M3 BACK-IN)



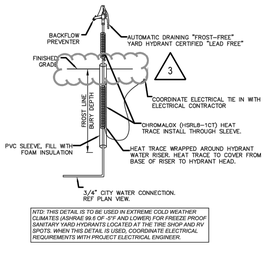
9 UTILITY ISLAND – ELEVATION VIEW
(M3 BACK-IN SUITE)



10 SIGNAGE POST DETAIL



11 SANITARY BURY HYDRANT DETAIL



NTD: THIS DETAIL IS TO BE USED IN EXTREME COLD WEATHER CLIMATES (ASHRAE 99.6 OF -3°F AND LOWER) FOR FREEZE PROOF SANITARY YARD HYDRANTS LOCATED AT THE TIRE SHOP AND RV SPOTS. WHEN THIS DETAIL IS USED, COORDINATE ELECTRICAL REQUIREMENTS WITH PROJECT ELECTRICAL ENGINEER.

12 HYDRANT HEAT TRACE DETAIL

FOR PERMITTING ONLY

Chipola Engineering Group, Inc.
CIVIL ENGINEERING, DESIGN, PLANNING, ENVIRONMENTAL PERMITTING, & CONSTRUCTION SERVICES
4420 JACKSON STREET, MARIANNA, FL 32448
PHONE (850) 372-4045
FIRM LICENSE NO. : XXXXXX

DRAWN BY : JDK	DATE : 1/29/24
CHECKED BY : HDW	DATE : 1/29/24
DESIGNED BY : JDK	CAD NAME : RV-PROTO
SCALE : N.T.S.	PLOT DATE : 1/29/24

REVISIONS

DESCRIPTION	INT.	DATE

CLIENT : RVSTOP Loves

PROJECT : JOB LOCATION, JOB STATE

SHEET TITLE : CONSTRUCTION DETAILS (M3 SITES)

PROJ. NO. : RV-PROTO

SHEET NO. : C9.0

OHIO811.org Before You Dig

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM
175 Montrose West Ave., Suite 400
Akron, OH 44321
Phone: 330.665.0660 Fax: 888.208.4826

Loves

LOVE'S TRAVEL STOP

ST. CLAIRSVILLE, OH

66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

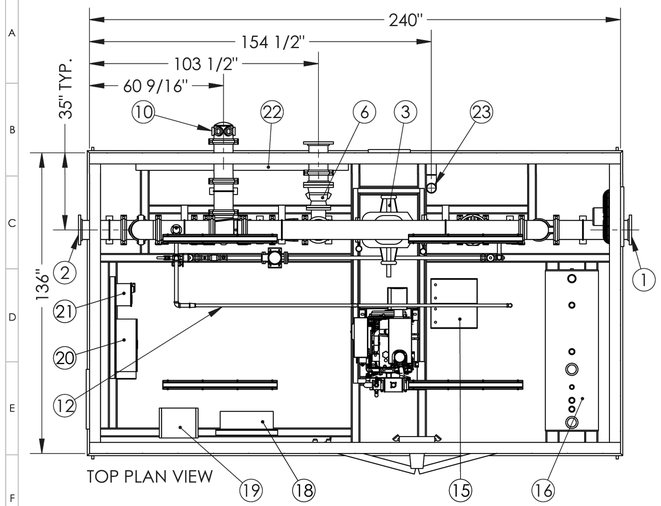
Revisions / Submissions

ID	Description	Date
3	ADDENDUM 3	02/09/2024

Project Number:	759267
Scale:	40
Drawn By:	CDR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
CONSTRUCTION DETAILS

C9.6

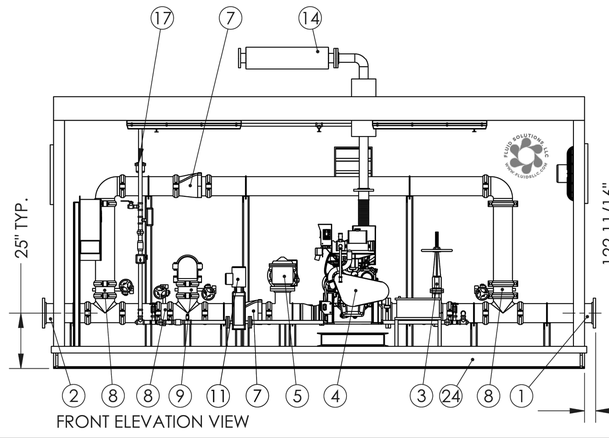


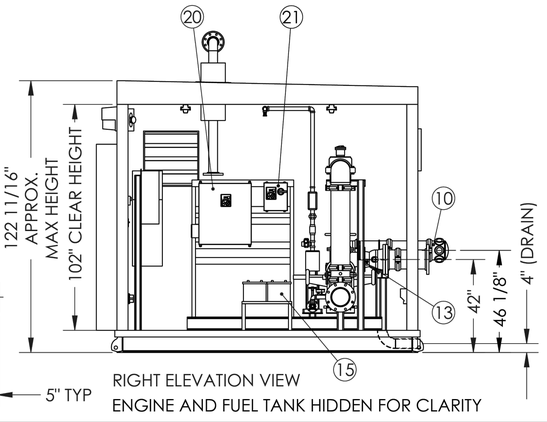
NOTES:
1) ANCHOR BOLT HOLES AVAILABLE ONLY UPON CUSTOMER REQUEST.
2) ONLY MAIN STRUCTURAL SUPPORTS ARE SHOWN ON DRAWING. ADDITIONAL CROSS MEMBERS ARE REQUIRED TO SUPPORT PIPING, PUMP CONTROLLER, OR ANY OTHER APPLICABLE COMPONENTS. IF THERE IS A DRAIN OR ANY OTHER OBSTRUCTION IN THE FLOOR THAT SHOULD BE CONSIDERED, PLEASE LOCATE ON THIS DRAWING.
3) THIS SKID IS DESIGNED TO BE FILLED WITH CONCRETE AT INSTALLATION.
4) TAMPER SWITCHES ARE PROVIDED ON ALL GATE VALVES AND BUTTERFLY VALVES.
5) BUILDING HVAC, EMERGENCY LIGHT, LIGHTS, JOCKEY PUMP CONTROL PANEL, JOCKEY PUMP, AND OTHER ITEMS ARE SHOWN IN THEIR GENERAL LOCATIONS AND MAY VARY FROM THE LOCATION SHOWN ON THE DRAWING.
6) ELECTRICAL SERVICE TO BE LANDED IN DISTRIBUTION PANEL BY OTHERS.
7) SPRINKLER LINE LAYOUT TO BE FINALIZED BY AN NFPA 13 CERTIFIED VENDOR AT TIME OF PROJECT RELEASE.

ITEM NO.	DESCRIPTION	QTY.
1	8" SYSTEM SUCTION CONNECTION, 150# FF	1
2	6"/8" SYSTEM DISCHARGE CONNECTION, 150# FF	1
3	8" OS&Y GATE VALVE ANSI 150#	1
4	1000/1250 GPM DIESEL DRIVEN PUMP	1
5	MAIN RELIEF VALVE 6"	1
6	WASTECONE 6" X 8"	1
7	8" GROOVED CHECK VALVE	2
8	8" GROOVED BUTTERFLY VALVE (N.O.)	3
9	8" GROOVED BUTTERFLY VALVE (N.C.)	1
10	8"X6 GROOVED HOSE HEADER (SHIP LOOSE)	1
11	JOCKEY PUMP	1
12	SPRINKLER SYSTEM	1
13	1/2" DRIP VALVE	1
14	4" 150# FLG RESIDENTIAL MUFFLER (SHIP LOOSE)	1
15	12V BATTERY WITH RACK (SHIP LOOSE)	2
16	DOUBLE WALL FUEL TANK 140 GALLON	1
17	1/2" AIR RELEASE VALVE	1
18	SINGLE POINT POWER CONNECTION	1
19	MINI POWER ZONE	1
20	MAIN PUMP CONTROLLER	1
21	JOCKEY PUMP CONTROLLER	1
22	BASEBOARD HEATER	1
23	4" SYSTEM DRAIN	1
24	10" SYSTEM SKID	1

APPROVED	
SIGN:	
DATE:	

APPROXIMATE DRY SYSTEM WEIGHT: 24,000 LBS





REV	DESCRIPTION	BY DATE
B	INCLUDED SUCTION AND DISCHARGE LABELS IN BOM	JRD 8/17/2021
A	UPDATED TO STANDARD SIZE	JRD 8/5/2021

ALL DIMENSIONS +/- TOLERANCE OF 1/2"

LOVES 1000 / 1250 GPM
CITY FED SYSTEM
HOUSE PACKAGE 2

DRAWN BY: JRD | ENG. BY: JRD | CHECKED BY: MDT

DATE: 7/28/2021

FLUID SOLUTIONS,LLC
a THG International Company
101 Lyon Lane Birmingham, AL 35211
205 705 1497 ph || www.fluidsllc.com

SCALE: 1:42 | DWG: A1-1

OHIO811.org Before You Dig

FORTY-EIGHT (48) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: OHIO UTILITIES PROTECTION SERVICE AT 811 OR 800-362-2764 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM
175 Montrose West Ave., Suite 400
Akron, OH 44321
Phone: 330.665.0660 Fax: 888.208.4826

Loves

STATE OF OHIO
ZACHARY D. FRESHNER
E-73224
REGISTERED PROFESSIONAL ENGINEER
01/15/2024

LOVE'S TRAVEL STOP
ST. CLAIRSVILLE, OH
66320 BELMONT-MORRISTOWN ROAD, UNION TOWNSHIP, OH 43718

Revisions / Submissions

ID	Description	Date
1	REV 1	01/03/2024

Project Number:	759267
Scale:	1" = 40'
Drawn By:	CDR
Checked By:	JTK
Date:	12/19/2023
Issue:	OUT TO BID

Drawing Title:
CONSTRUCTION DETAILS

C9.7

ROADWAY IMPROVEMENTS
LOVE'S TRAVEL STOPS
BEL-149-23.44

UNION TOWNSHIP
BELMONT COUNTY, OH

INDEX OF SHEETS

PROJECT DESCRIPTION

CONSTRUCTION TO WIDEN EAST AND WEST SIDE OF S.R. 149 TO PROVIDE 175' NB LEFT TURN LANE INTO LOVE'S DRIVEWAY, 175' SB RIGHT-TURN LANE INTO LOVE'S DRIVEWAY, 164' TWLTL BETWEEN SOUTH PILOT DRIVEWAY & NORTH PILOT DRIVEWAY, 125' NB LEFT TURN LANE INTO RECO DRIVE, 200' SB RIGHT TURN LANE INTO RECO DRIVE AND ASSOCIATED LANE RECONFIGURATION TO ACCOMMODATE AFOREMENTIONED IMPROVEMENTS. CONSTRUCTION TO WIDEN RECO DRIVE AND INSTALLATION OF TRAFFIC SIGNAL AT S.R. 149 & RECO DRIVE INTERSECTION. DITCH AND SLOPE GRADING AND INSTALLATION OF NECESSARY TRAFFIC CONTROL DEVICES. STORMWATER STRUCTURE AND CONDUIT MODIFICATIONS BETWEEN SOUTH MARATHON DRIVEWAY AND NORTH MARATHON DRIVEWAY.

EARTH DISTURBED AREAS AND TOTAL AREA OF PROJECT

TOTAL AREA OF PROJECT: 1.95 ACRES.
PROJECT EARTH DISTURBING ACTIVITIES AREA: 1.65 ACRES
CONTRACTOR EARTH DISTURBING ACTIVITIES AREA: 0.30 ACRES
NOI EARTH DISTURBING ACTIVITIES AREA: 1.95 ACRES

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

APPROVED _____

DATE _____ DISTRICT DEPUTY DIRECTOR

APPROVED _____

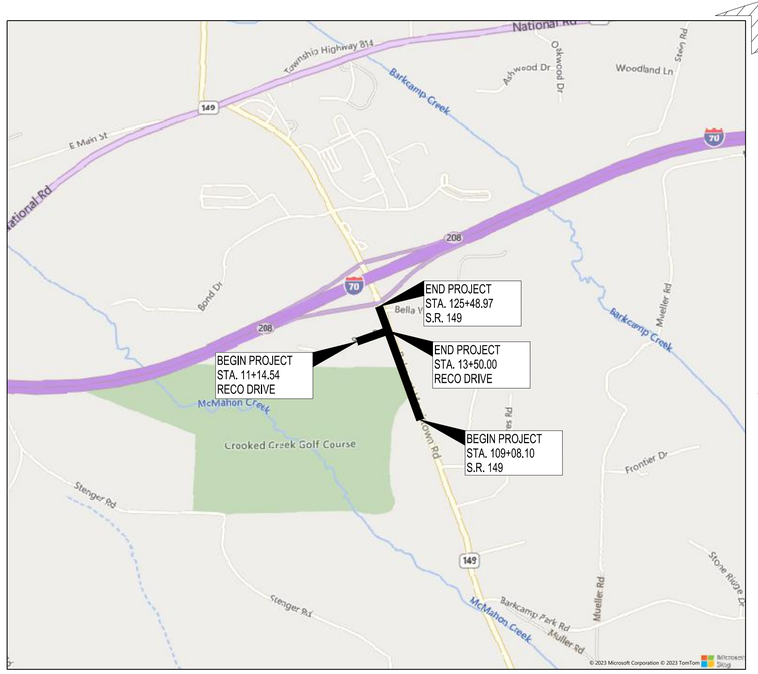
DATE _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

RAILROAD INVOLVEMENT

NONE

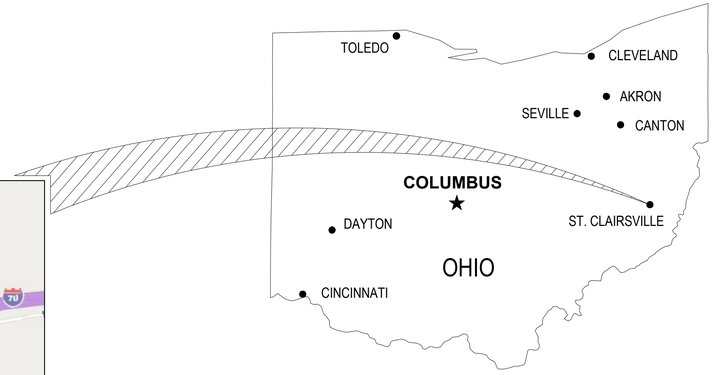
FEDERAL PROJECT NUMBER

NON-FEDERAL



LOCATION MAP
NOT TO SCALE

PROJECT LOCATED ALONG S.R. 149 - BELMONT MORRISTOWN ROAD, 1.29 MILES SOUTHEAST OF MORRISTOWN, OHIO AND SOUTH OF THE THE S.R. 149 AND I-70 INTERCHANGE. APPROXIMATELY 8.00 MILES WEST OF CLAIRSVILLE, OHIO



STATE LOCATION MAP
NOT TO SCALE

SITE LOCATION

LAT = N 40° 03' 27"
LONG = W 81° 03' 09"

DESIGN DESIGNATION - STATE ROUTE 149 (BELMONT MORRISTOWN ROAD):

AADT (2024)	10,000
DESIGN YEAR AADT (2044)	14,500
DESIGN HOURLY VOLUME (2044)	1,300
DIRECTIONAL DISTRIBUTION	55%
TRUCKS (24 HOUR B&C)	21%
DESIGN SPEED	50 MPH
LEGAL SPEED	45 MPH
DESIGN FUNCTIONAL CLASSIFICATION	5 - RURAL MAJOR COLLECTOR
NHS PROJECT	NO

2023 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN PLANS AND CHANGES LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

SCALES

PLAN _____ 20 0 20

PROFILE _____ HORIZONTAL 20 0 20 VERTICAL 5 0 5

CROSS SECTION _____ HORIZONTAL 5 0 5 VERTICAL 5 0 5

PRELIMINARY NOT FOR CONSTRUCTION

PLAN PREPARED BY:

CESO
WWW.CESOINC.COM
3601 RIGBY ROAD, SUITE 300
MIAMISBURG, OHIO 45342
PH (937) 435-8584 | FAX (937) 435-3307

ENGINEER'S STAMP

SIGNED: _____

DATE: _____

STANDARD CONSTRUCTION DRAWINGS

ODOT HW-2.2	7/20/2018	ODOT DM-1.1	7/17/2020	ODOT MT-95.31	7/19/2019	ODOT TC-41.41	7/19/2019	ODOT TC-81.22	7/21/2023		
		ODOT DM-1.2	7/16/2021	ODOT MT-97.11	1/20/2017	ODOT TC-42.20	10/18/2013	ODOT TC-83.10	1/17/2020		
ODOT CB-3A	7/16/2021	ODOT DM-4.3	1/15/2016	ODOT MT-99.20	7/19/2019	ODOT TC-52.10	10/18/2013	ODOT TC-83.20	1/19/2024		
		ODOT DM-4.4	1/15/2016	ODOT MT-101.90	7/17/2020	ODOT TC-52.20	1/15/2021	ODOT TC-85.20	4/1/2023		
ODOT BP-3.1	1/21/2022			ODOT MT-120.00	1/19/2024	ODOT TC-61.30	7/19/2019				
ODOT BP-4.1	7/19/2013	ODOT MGS-1.1	7/16/2021								
ODOT BP-5.1	7/15/2022	ODOT MGS-2.1	1/19/2018	ODOT TC-21.21	1/20/2023	ODOT TC-65.10	1/17/2014				
		ODOT MGS-4.2	7/19/2013	ODOT TC-41.20	10/18/2013	ODOT TC-65.11	7/15/2022				
				ODOT TC-41.30	4/21/2023	ODOT TC-71.10	4/21/2023				

SUPPLEMENTAL SPECIFICATIONS

SS 800	1/19/2024
SS 832	7/21/2023
SS 863	7/21/2023
SS 809	1/19/2024
SS 825	4/21/2023
SS 909	1/19/2024

REVISIONS

BY	DATE	DESCRIPTION
PD	11/8/2023	ODOT COMMENTS #1
PD	1/2/2024	ODOT COMMENTS #2
PD	1/3/2024	REV 1
PD	2/9/2024	ADDENDUM #3
PD	2/23/2024	ODOT COMMENTS #3
PD	2/23/2024	ADDENDUM #4
PD	4/29/2024	ODOT COMMENTS #4

UNDERGROUND UTILITIES
Contact Two Working Days Before You Dig
OHIO811.org Before You Dig
OHIO811, 8-1-1, or 1-800-362-2764
(Non-members must be called directly)

DATE 4-29-2024
ISSUE AGENCY REVIEW
CALCULATED PJD
CHECKED TDH

TITLE SHEET
S.R. 149

BEL-149-23.44

R1
R31

BENCHMARKS	
BM #A	"X" CHISELED IN THE SOUTH SIDE OF RIM OF SANITARY MANHOLE ON NORTH SIDE OF RECO DRIVE, EAST OF ADDRESS 41245 RECO DRIVE
	ELEV=1239.44'
BM #B	EAST BOLT ON HYDRANT ON SOUTH SIDE OF RECO DRIVE, ACROSS FROM ADDRESS 41371 RECO DRIVE
	ELEV=1207.05'
BM #C	SOUTHWEST BOLT ON HYDRANT ON EAST SIDE OF BELMONT MORRISTOWN ROAD AT ADDRESS 66377 BELMONT MORRISTOWN ROAD
	ELEV=1193.84'

BENCHMARK NOTES:
BM "A" AND BM "B" LOCATED OUTSIDE OF PROJECT VIEWPORT LIMITS. REFER TO ORIGINAL SURVEY CONDUCTED BY CESO, INC. DATED APRIL 12, 2023 FOR MARKED LOCATION OF BENCHMARKS.

DATUM NOTES:

HORIZONTAL DATUM:
OHIO STATE PLANE COORDINATE SYSTEM, OHIO SOUTH ZONE, NAD83 (2011) AS DETERMINED BY OPUS POST PROCESSED STATIC SESSION.

VERTICAL DATUM:
NAVD 88 AS DETERMINED BY OPUS POST PROCESSED STATIC SESSIONS USING GEOID 18 (CONUS)

UTILITY DISCLAIMER:
THE UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION OUPS #A218001060 AND/OR EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES LOCATED HERE ON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES LOCATED ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

DATE OF FIELD SURVEY: AUGUST 9, 2022

DATE OF SURVEY MAP: APRIL 12, 2023

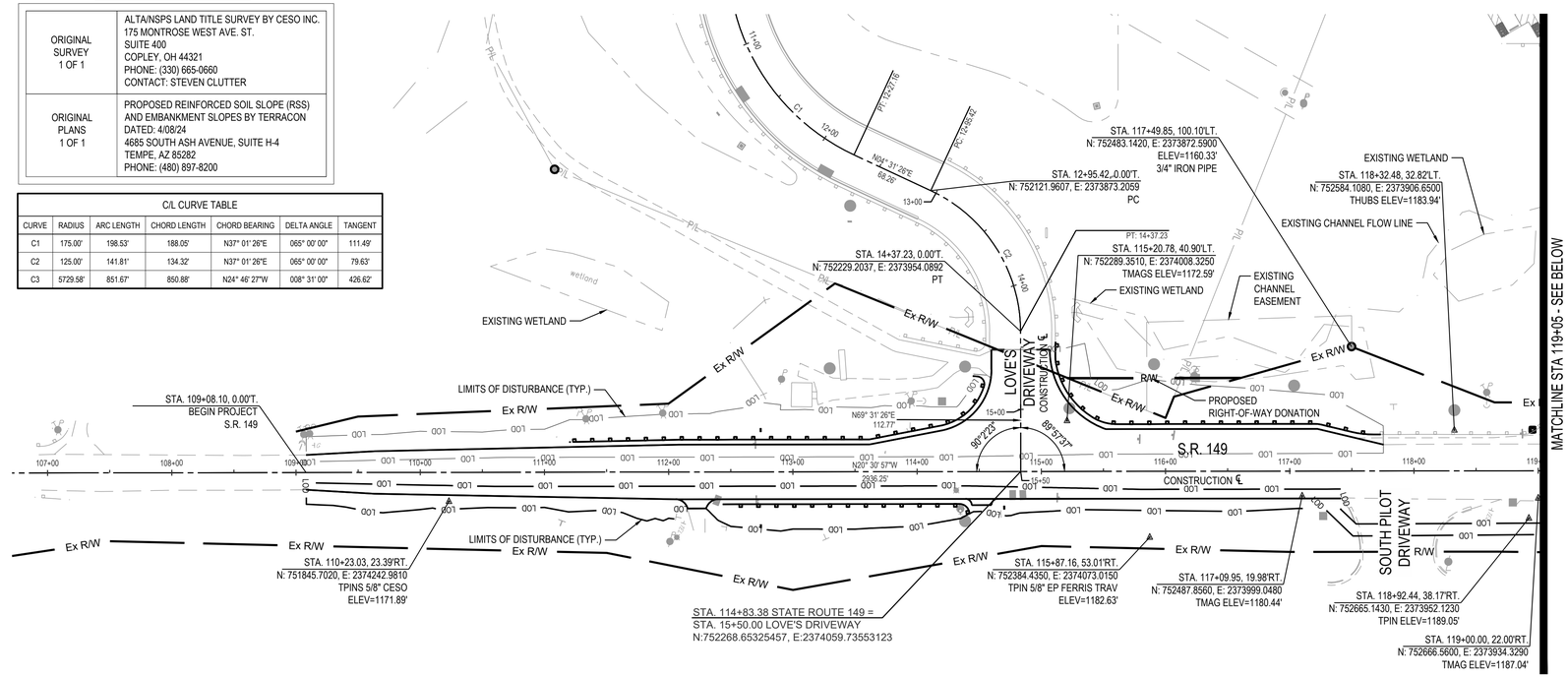
LANDSCAPE NOTE:
THERE ARE NO EXISTING LANDSCAPED AREAS WITHIN THE WORK LIMITS.

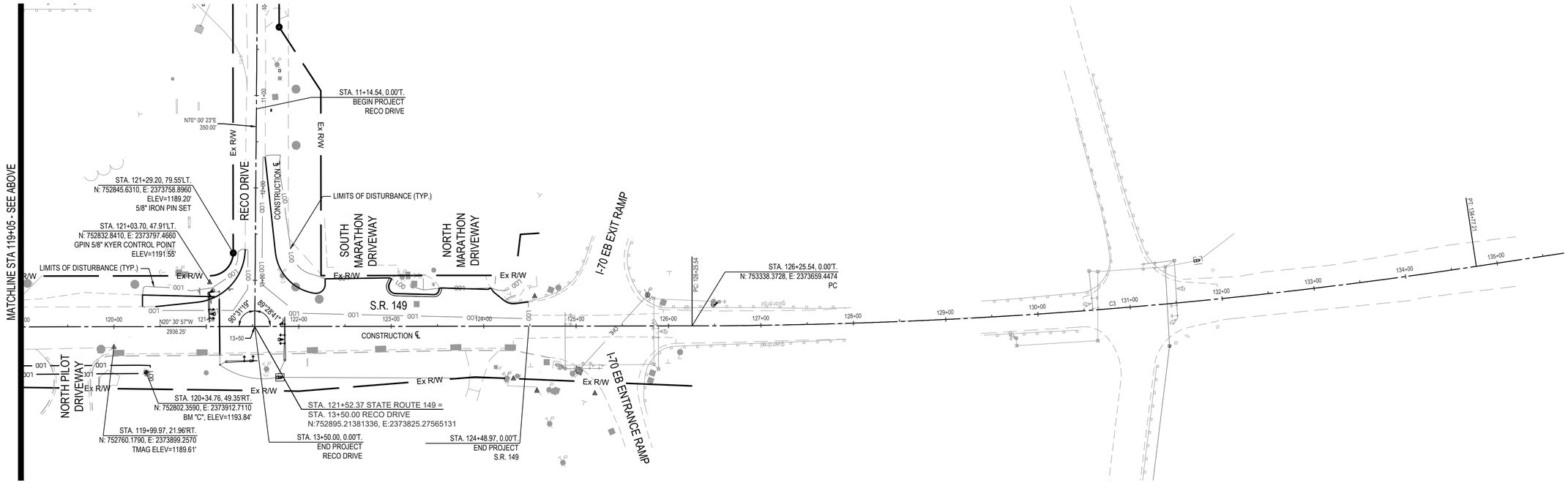
REFERENCE DRAWINGS:

ORIGINAL SURVEY 1 OF 1	ALTA/NSPS LAND TITLE SURVEY BY CESO INC. 175 MONTROSE WEST AVE. ST. SUITE 400 COPLEY, OH 44321 PHONE: (330) 665-0660 CONTACT: STEVEN CLUTTER
ORIGINAL PLANS 1 OF 1	PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES BY TERRACON DATED: 4/08/24 4685 SOUTH ASH AVENUE, SUITE H-4 TEMPE, AZ 85282 PHONE: (480) 897-8200

C/L CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE	TANGENT
C1	175.00'	198.53'	188.05'	N37° 01' 26"E	065° 00' 00"	111.49'
C2	125.00'	141.81'	134.32'	N37° 01' 26"E	065° 00' 00"	79.63'
C3	5729.58'	851.67'	850.88'	N24° 46' 27"W	008° 31' 00"	426.62'





GRAPHIC SCALE (IN FEET)
120 60 30 0 60

CALCULATED PJD
CHECKED TDH

SCHEMATIC PLAN
S.R. 149

BEL-149-23.44

R2
R31

SPECIFICATIONS AND STANDARD CONSTRUCTION DRAWINGS
THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION, 2023 CONSTRUCTION AND MATERIALS SPECIFICATIONS, AND THE NOTED STANDARD CONSTRUCTION DRAWINGS SHALL GOVERN THIS IMPROVEMENT. WHEREVER THE WORD "STATE" OCCURS, IT IS TO MEAN THE OHIO DEPARTMENT OF TRANSPORTATION (ODOT).

WHENEVER THE WORD "ENGINEER" OR "DEPARTMENT" IS USED HEREIN, IT SHALL BE HELD TO MEAN THE ODOT PROJECT ENGINEER, OR DULY AUTHORIZED AUTHORITY.

EXISTING SURVEY MONUMENTS
EXISTING SURVEY MONUMENTS, INCLUDING BUT NOT LIMITED TO PROPERTY CORNERS, CENTERLINE MONUMENTS, RIGHT-OF-WAY MONUMENTS, ETC., MAY POTENTIALLY BE DISTURBED OR DESTROYED BY CONSTRUCTION OF THESE ROADWAY IMPROVEMENTS. THE CONTRACTOR SHALL RETAIN A PROFESSIONAL SURVEYOR, LICENSED IN THE STATE OF OHIO, TO IDENTIFY MONUMENTS THAT MAY BE DISTURBED AND TO PROPERLY REPLACE DISTURBED MONUMENTS IN-KIND AFTER CONSTRUCTION IS COMPLETE.

PERMITS FEES AND NOTICES
THE CONTRACTOR SHALL OBTAIN, AT HIS EXPENSE, ANY AND ALL PERMITS AND INSPECTIONS REQUIRED FOR THE PROSECUTION OF THE WORK BY LOCAL LAWS, ORDINANCES, RULES AND REGULATIONS.

MATERIALS AND WORKMANSHIP
UNLESS OTHERWISE SPECIFIED, ALL MATERIALS SHALL BE NEW AND BOTH WORKMANSHIP AND MATERIALS SHALL BE OF THE FIRST QUALITY, PROPER AND SUFFICIENT FOR THE PURPOSE CONTEMPLATED. THE CONTRACTOR SHALL FURNISH, IF SO REQUIRED, SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND WORKMANSHIP. ALL ITEMS OF EQUIPMENT AND/OR MATERIALS PROPOSED FOR SUBSTITUTION MUST BE APPROVED BY THE ENGINEER IN WRITING AND SHALL BE EQUAL OR BE SUPERIOR TO THE ITEMS SPECIFIED IN THE CONTRACT DOCUMENTS. IF SAID SUBSTITUTION PROPOSED BY THE CONTRACTOR FOR A SPECIFIED ITEM REQUIRED ENGINEERING REVISIONS, THE EXPENSE OF SUCH REVISIONS SHALL BE PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

EXISTING FACILITIES
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM HIS WORK IN SUCH A MANNER AS NOT TO DAMAGE OR DESTROY ANY EXISTING FACILITY. IF ANY SUCH DAMAGE DOES OCCUR DUE TO THE CONTRACTOR'S OPERATIONS, HE SHALL REPLACE THE DAMAGED PORTION AT HIS EXPENSE AND TO THE SATISFACTION OF THE ENGINEER.

EXAMINATION OF THE SITE
THE CONTRACTOR SHALL CAREFULLY EXAMINE THE SITE OF THE PROPOSED WORK, THE PLANS AND SPECIFICATIONS. THE SUBMISSION OF A BID SHALL BE CONSIDERED EVIDENCE THAT THE CONTRACTOR HAS MADE SUCH EXAMINATION AND IS SATISFIED AS TO THE CONDITIONS TO BE ENCOUNTERED IN PERFORMING THE WORK IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

WORK LIMITS
THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATION OF ALL TEMPORARY TRAFFIC CONTROL AND TEMPORARY TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

RELOCATION OF UTILITIES
ALL UTILITIES WHICH ARE SHOWN OR LOCATED DURING THE COURSE OF CONSTRUCTION THAT ARE FOUND TO BE IN CONFLICT WITH THESE PLANS ARE TO BE RELOCATED OR ADJUSTED BY THE OWNER OF THE UTILITY.

UNDERGROUND UTILITIES
THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLAN AREAS OBTAINED FROM THE OWNERS OF THE UTILITIES. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES LOCATED HEREON COMPROMISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES LOCATED ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE/SHE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

SEEDING AND MULCHING

THE FOLLOWING QUANTITIES ARE PROVIDED TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDING AREAS:

ITEM 659, TOPSOIL	661 CU.YD
ITEM 659, SEEDING AND MULCHING	3,965 SQ. YD.
ITEM 659, COMMERCIAL FERTILIZER	0.54 TON
ITEM 659, LIME	0.82 ACRES
ITEM 659, WATER	10.7 M.GAL

APPLY SEEDING AND MULCHING TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

ITEM 659 SEEDING AND MULCHING
SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR ITEM 659, SEEDING AND MULCHING, ARE BASED ON THESE LIMITS.

WEATHER CONDITIONS
NO CONSTRUCTION SHALL BE DONE DURING STORMY, FREEZING OR INCLEMENT WEATHER UNLESS PERMISSION IS GIVEN BY THE ENGINEER WHENEVER WORK PROCEEDS DURING SUCH WEATHER, THE CONTRACTOR SHALL PROVIDE APPROVED FACILITIES, INCLUDING HEAT (IF REQUIRED), FOR THE PROTECTION OF ALL MATERIALS AND FINISHED WORK.

AGENCY NOTIFICATIONS
CONTRACTOR TO NOTIFY LOCAL EMERGENCY SERVICE PROVIDERS, UNITED STATES POSTAL SERVICE, LOCAL SCHOOL DISTRICTS PRIOR TO START OF CONSTRUCTION.

REVIEW OF DRAINAGE FACILITIES
PRIOR TO THE START OF WORK AND AGAIN BEFORE FINAL ACCEPTANCE, PERFORM AN INSPECTION WITH REPRESENTATIVES OF THE DEPARTMENT, CONTRACTOR AND LOCALS OF ALL EXISTING DRAINAGE FACILITIES THAT ARE TO REMAIN IN SERVICE WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCES IS DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTION ARE MAINTAINED BY THE DEPARTMENT. CONFIRM ALL EXISTING SEWERS INSPECTED INITIALLY BY THE ABOVE-MENTIONED PARTIES ARE MAINTAINED AND LEFT IN A CONDITION COMPARABLE TO THAT DETERMINED BY THE ORIGINAL INSPECTION. THE CONTRACTOR IS RESPONSIBLE TO CORRECT ANY CHANGE IN THE CONDITION RESULTING FROM THEIR OPERATIONS AS DIRECTED AND APPROVED BY THE ENGINEER. PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE IS INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 611 CONDUIT ITEMS.

ROUNDING
THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLIES TO ALL CROSS SECTIONS, EVEN THOUGH OTHERWISE SHOWN.

COOPERATION WITH UTILITY COMPANIES
WHILE THE WORK OF THIS CONTRACT IS BEING PERFORMED, THE UTILITY COMPANIES MAY BE WORKING IN THE AREA ADJUSTING AND RESETTING EXISTING FACILITIES. THE CONTRACTOR SHALL FULLY COOPERATE WITH UTILITY COMPANIES SO THAT THE ENTIRE WORK IS COMPLETED IN A MANNER CONSISTENT WITH GOOD CONSTRUCTION PRACTICES. THE CONTRACTOR, UTILITIES, AND ENGINEER SHALL DISCUSS THE NECESSARY CONSTRUCTION SCHEDULES TO COMPLETE THE PROJECT.

CROSSINGS TO EXISTING PIPES AND UTILITIES
WHERE PLANS PROVIDE FOR A PROPOSED CONDUIT TO CROSS OVER OR UNDER AN EXISTING SEWER OR UNDERGROUND UTILITY, THE CONTRACTOR SHALL LOCATE THE EXISTING PIPES OR UTILITIES BOTH AS TO LINE AND GRADE BEFORE STARTING THE PROPOSED CONDUIT.

UTILITY COORDINATION
THE FOLLOWING IS A LIST OF THE KNOWN EXISTING UTILITIES IN THE PROJECT AREA ALONG WITH THE RESPECTIVE OWNERS. THE LIST IS INCLUDED FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITY OWNERS IN THE PROJECT AREA PRIOR TO START OF CONSTRUCTION WHETHER LISTED ON THIS PAGE OR NOT.

SANITARY SEWER
BELMONT COUNTY
WATER & SEWER DISTRICT
67711 OAK VIEW DRIVE
ST. CLAIRSVILLE, OH 43950
PH: (740) 695-3144
CONTACT: JEANNE KINNEY

FIRE
LAFFERTY VOLUNTEER
FIRE DEPARTMENT
70191 IRWIN ROAD
LAFFERTY, OH 43951
PH: (740) 310-0901
CONTACT: DUSTIN HUDAK

WATER
BELMONT COUNTY
WATER & SEWER DISTRICT
67711 OAK VIEW DRIVE
ST. CLAIRSVILLE, OH 43950
PH: (740) 695-3144
CONTACT: JEANNE KINNEY

EROSION CONTROL
OEPA - SEDO
2195 EAST FRONT STREET
LOGAN, OH 43138
PH: (740) 385-8501

ROADWAY
STATE DOT: ODOT DISTRICT 11
41061 BOND DR.
BELMONT, OH 43718
PH: (330) 308-6510
CONTACT: DAVID SCHAFER

LOCAL DOT: UNION TOWNSHIP
PH: (740) 782-1337
CONTACT: JUSTIN DEMARCHI

COMMUNICATION
COMCAST
PH: (412) 337-1049
CONTACT: ANGELA MEYERS

ELECTRIC
AMERICAN ELECTRIC POWER (AEP)
47687 NATIONAL RD. W
ST. CLAIRSVILLE, OH 43950
PH: (740) 238-3630
CONTACT: BRENT PANEPUCCI

GAS
COLUMBIA GAS
290 W NATIONWIDE BLVD
COLUMBUS, OH 43215
PH: (614) 460-8928
CONTACT: DAVID BASSITT

STORM SEWER
STATE DOT: ODOT DISTRICT 11
41061 BOND DR.
BELMONT, OH 43718
PH: (330) 308-6510
CONTACT: DAVID SCHAFER

OWNER/DEVELOPER
LOVE'S TRAVEL STOPS & COUNTRY STORES, INC.
10601 N. PENNSYLVANIA AVE.
OKLAHOMA CITY, OK 73120
CONTACT: RICK SHUFFIELD
PH: (405) 302-6646
EMAIL: RICK.SHUFFIELD@LOVES.COM

ENGINEER
CESO, INC.
175 MONTROSE WEST AVE. SUITE 400
AKRON, OH 44321
CONTACT: KIMBERLY COOPER, P.E.
PH: (330) 396-5682
EMAIL: COOPER@CESOINC.COM

UTILITIES NOTIFICATION
AT LEAST TWO WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION OPERATIONS IN AN AREA WHICH MAY INVOLVE UNDERGROUND UTILITY FACILITIES, THE CONTRACTOR SHALL CONTACT OHIO811 OUPS AT 8-1-1 OR 1-800-362-2764 (OHIO811.ORG), THE ENGINEER, THE REGISTERED UTILITY PROTECTION SERVICE AND THE OWNERS OF EACH UNDERGROUND UTILITY FACILITY SHOWN ON THE PLAN. THE OWNER OF THE UNDERGROUND FACILITY SHALL, WITHIN 48 HOURS (EXCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS), MARK THE LOCATION OF THE UNDERGROUND UTILITY FACILITIES IN THE CONSTRUCTION AREA IN SUCH A MANNER AS TO INDICATE THEIR COURSE AND THE APPROXIMATE DEPTH AT WHICH THEY WERE INSTALLED. THE MARKING OR LOCATING SHALL BE COORDINATED TO STAY APPROXIMATELY TWO DAYS AHEAD OF THE PLANNED CONSTRUCTION.

TEMPORARY TRAFFIC CONTROL
IT IS ESSENTIAL THAT THE ENGINEER HAVE THE AUTHORITY TO CONTROL THE PROGRESS OF THE WORK ON THE PROJECT IN ITS RELATION TO OBTAINING SAFE CONDITIONS. THIS INCLUDES THE AUTHORITY TO MODIFY CONDITIONS OR HALT WORK UNTIL APPLICABLE OR REMEDIAL SAFETY MEASURES ARE TAKEN. THE CONTRACTOR IS TO SUPPLY ALL TRAFFIC CONTROL, AS THE ENGINEER DEEMS NECESSARY. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH SECTION 614 OF THE ODOT STANDARD SPECIFICATIONS AND OTHER APPLICABLE PORTIONS OF THE ODOT SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

CLEARING AND GRUBBING
ALTHOUGH THERE ARE NO TREES OR STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE LIMITS OF THE PROJECT, A LUMP SUM QUANTITY IS INCLUDED IN THE GENERAL SUMMARY FOR ITEM 201, CLEARING AND GRUBBING. ALL PROVISIONS AS SET FORTH IN THE SPECIFICATIONS UNDER THIS ITEM ARE INCLUDED IN THE LUMP SUM PRICE BIG FOR ITEM 201, CLEARING AND GRUBBING.

SURVEY DATA
PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE SHEET R2 OF THE PLANS FOR A TABLE CONTAINING PROJECT CONTROL INFORMATION. USE THE FOLLOWING PROJECT CONTROL, VERTICAL POSITIONING, AND HORIZONTAL POSITIONING PARAMETERS FOR ALL SURVEYING:

BASIS OF BEARINGS: BEARINGS ARE BASED UPON OHIO STATE PLANE SOUTH ZONE

PROJECT CONTROL
POSITIONING METHOD: ODOT REAL TIME NETWORK
MONUMENT TYPE: TYPE 'B'

VERTICAL POSITIONING
ORTHOMETRIC HEIGHT DATUM: NAVD88
GEOID: 18B

HORIZONTAL POSITIONING
REFERENCE FRAME: NAD83 (2011)
ELLIPSOID: GRS 80
COORDINATE SYSTEM: OHIO STATE PLANE SOUTH ZONE
PROJECTION: LAMBERT CONFORMAL CONIC
CENTRAL LATITUDE: N 40° 03' 28"
CENTRAL LONGITUDE: W 81° 03' 06"
PROJECTION SCALE FACTOR: 1.00000000

USE THE POSITIONING METHODS AND PRIMARY MONUMENT TYPE USED IN THE ORIGINAL SURVEY TO RESTORE ALL MONUMENTS RELATED TO PRIMARY PROJECT CONTROL THAT ARE DAMAGED OR DESTROYED BY CONSTRUCTION ACTIVITIES. RESTORE THE DAMAGED OR DESTROYED MONUMENTS IN ACCORDANCE WITH CMS 623.

UNITS ARE IN U.S. SURVEY FEET. USE THE FOLLOWING CONVERSION FACTOR: 1 METER=3.2808333333 U.S. SURVEY FEET

ITEM SPECIAL - MAILBOX SUPPORT
THIS WORK SHALL CONSIST OF FURNISHING AND ERECTING MAILBOX SUPPORTS AND ANY ASSOCIATED MOUNTING HARDWARE IN ACCORDANCE WITH PLAN DETAILS, AND ATTACHING AN OWNER-SUPPLIED MAILBOX AT LOCATIONS SPECIFIED IN THE PLAN, OR OTHERWISE ESTABLISED BY THE ENGINEER. WOOD POSTS SHALL BE NOMINAL 4 INCHES BY 4 INCHES SQUARE OR 4.5 INCHES DIAMETER ROUND, AND CONFORM TO 710.14. STEEL POSTS SHAL BE NOMINAL PIPE SIZE 2 INCHES I.D., AND CONFORM TO AASHTO M 181. ALL HARDWARE INCLUDING BUT NOT LIMITED TO PLATES, SCREWS, BOLTS, AND ETC. SHALL BE COMMERCIAL-GRADE GALVANIZED STEEL. POSTS SHALL BE SET PER THE FIRST PARAGRAPH OF 606.03, AND SHALL IN NO INSTANCE BE ENCASED IN CONCRETE. SUPPORT HARDWARE SHALL ACCOMMODATE EITHER A SINGLE OR A DOUBLE MAILBOX INSTALLATION, AND NO MORE THAN TWO BOXES MAY BE MOUNTED ON A SINGLE POST. THE MAILBOX SHALL BE SECURELY AND NEATLY ATTACHED BY THE CONTRACTOR TO THE NEW SUPPORT. THE CONTRACTOR SHALL FURNISH ALL NECESSARY ATTACHMENT HARDWARE (NUTS, BOLTS, PLATES, SPACERS, AND WASHERS) AS NECESSARY TO ACCOMMODATE THE COMPLETE INSTALLATION. IN THE ABSENCE OF A NEW BOX SUPPLIED BY THE OWNER, THE CONTRACTOR SHALL SALVAGE THE EXISTING BOX AND PLACE IT ON THE NEW SUPPORT. DUE CARE SHALL BE EXERCISED IN SUCH AN OPERATION, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY BOX DAMAGED BY IMPROPER HANDLING ON HIS PART, AS JUDGED AND DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL POST MASTER REGARDING THE TIMING OF THE MOVEMENT OF ANY MAILBOX TO A NEW LOCATION. PAYMENT UNDER THIS ITEM SHALL BE LIMITED TO FINAL PERMANENT INSTALLATIONS, TEMPORARY INSTALLATIONS SHALL BE IN ACCORDANCE WITH 107.10. HOWEVER, THE SAME MATERIAL AND SIZE LIMITATIONS AS FOR PERMANENT INSTALLATIONS SHALL APPLY. MAILBOX SUPPORTS, COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH, FOR ITEM SPECIAL MAILBOX SUPPORT SYSTEM, (SINGLE) (DOUBLE).

RESTORATION
THE CONTRACTOR SHALL PROVIDE FOR PROTECTION OF THE FOLLOWING:

EXISTING STREETS, DRIVEWAYS, SIDEWALKS, CURBS, GUTTERS, RE-SEEDING/RE-SODDING, REMOVAL OF TREES, RESTORATION OF AGRICULTURAL LAND, THE MAINTENANCE OF THE CONSTRUCTION AREA DURING PROGRESS OF THE WORK AND THE COMPLETE RESTORATION OF THE CONSTRUCTION AREA TO ITS ORIGINAL CONDITION AT THE COMPLETION OF THE WORK. THE CONTRACTOR SHALL CONTINUOUSLY CARRY ON WITH THE FINAL RESTORATION OF THE CONSTRUCTION AREA AFTER THE BACKFILLING IS COMPLETED, AND HE SHALL PROCEED TO RESTORE TO ITS ORIGINAL CONDITION ALL STREETS, DRIVEWAYS, SIDEWALKS, CURBS, GUTTERS, STRUCTURES, AND ALL AREAS THAT WERE DAMAGED, DISTURBED, OR OCCUPIED BY THE CONTRACTOR IN CONNECTION WITH ANY PHASE OF THE WORK.

PAVEMENTS, PAVEMENT MARKINGS, TREES, SHRUBS, FENCES, POLES. OR OTHER PROPERTY AND SURFACE STRUCTURES WHICH HAVE BEEN DAMAGED, REMOVED, OR DISTURBED BY THE CONTRACTOR, WHETHER DELIBERATELY OR THROUGH FAILURE TO CARRY OUT THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, STATE LAWS, MUNICIPAL ORDINANCES, THE SPECIFIC DIRECTION OF THE ENGINEER, OR THROUGH FAILURE TO EMPLOY USUAL AND REASONABLE SAFEGUARDS SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR.

ALL TEMPORARY SIGNS, SPRINKLER SYSTEMS, LANDSCAPING, ORNAMENTAL FENCING, ETC., LOCATED WITHIN THE PROJECT LIMITS MUST BE REPLACED OR RELOCATED UPON COMPLETION OF THE CONSTRUCTION.

ITEM 832: EROSION CONTROL
ALL EROSION AND SEDIMENTATION CONTROL SHALL BE PERFORMED ACCORDING TO: DETAIL PLANS; ACCORDING TO THE LATEST OHIO EPA AUTHORIZATION FOR CONSTRUCTION ACTIVITY UNDER THE "NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM" (NPDES); ANY AND ALL REQUIRED PERMITS, REPORTS, AND RELATED DOCUMENTS. SEE OHIO EPA PERMIT NO. OHR000006 FOR REGULATIONS. ALL CONTRACTORS AND SUBCONTRACTORS MUST BECOME FAMILIAR WITH ALL OF THE ABOVE. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED IN THE FIELD BY THE INSPECTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL EROSION CONTROL MEASURES THAT ARE USED FOR WATER QUALITY. THE EROSION AND SEDIMENTATION CONTROL FACILITIES SHOWN ON THESE PLANS ARE TO BE CONSIDERED ADEQUATE BASIC REQUIREMENTS FOR THE ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION, DEVIATIONS FROM THIS PLAN MAY BE NECESSARY IN ORDER TO MAINTAIN WATER QUALITY. THE CONTRACTOR SHALL ADHERE TO ODOT'S SUPPLEMENTAL SPECIFICATION 832 FOR EROSION AND SEDIMENTATION CONTROL.

ASPHALT CONCRETE JOINT SEALER
THE CONTRACTOR SHALL APPLY LIQUID ASPHALT CONCRETE (PG64-22) TO THE VERTICAL FACE OF ALL EXISTING ASPHALT PRIOR TO THE PLACEMENT OF THE ADJOINING ASPHALT CONCRETE LIFT. PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO EACH RESPECTIVE ASPHALT CONCRETE COURSE OR BASE BEING PLACED.

BENCHING OF FOUNDATION SLOPES
ALTHOUGH CROSS-SECTIONS INDICATE SPECIFIC DIMENSIONS FOR PROPOSED BENCHING OF THE EMBANKMENT FOUNDATIONS IN CERTAIN AREAS, NO WAIVER OF THE SPECIFICATIONS IS INTENDED. BENCH ALL OTHER SLOPED EMBANKMENT AREAS AS SET FORTH IN SECTION 203.05 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (C&MS). NO ADDITIONAL PAYMENT WILL BE MADE FOR BENCHING REQUIRED UNDER THE PROVISIONS OF SECTION 203.05.

PART-WIDTH CONSTRUCTION
BECAUSE OF THE NECESSITY TO BUILD THIS PROJECT UNDER TRAFFIC AND TO CONSTRUCT THE FULL PAVEMENT WIDTH IN STAGES, EXERCISE CARE TO PREVENT THE CONSTRUCTION OF A BUTT JOINT IN THE BASE COURSES. LAP LONGITUDINAL JOINTS AS SHOWN ON STANDARD CONSTRUCTION DRAWING BP-3.1.

CONNECTION BETWEEN EXISTING AND PROPOSED GUARDRAIL
WHEN IT IS NECESSARY TO SPLICE PROPOSED GUARDRAIL TO EXISTING GUARDRAIL, ONLY THE EXISTING GUARDRAIL SHALL BE CUT, DRILLED, OR PUNCHED. THE CONNECTION SHALL BE MADE USING A W-BEAM, BEAM SPLICE AS SHOWN IN AASHTO M 180-12, EXCEPT THE BEAM WASHERS ARE NOT TO BE USED. PAYMENT SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE RESPECTIVE GUARDRAIL ITEMS.

ITEM 606 - ANCHOR ASSEMBLY, MGS TYPE E
THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING ANY OF THE GUARDRAIL END TERMINALS FOR TYPE MGS GUARDRAIL AS LISTED ON ROADWAY ENGINEERING'S WEB PAGE UNDER ROADSIDE SAFETY DEVICES FOR APPROVED GUARDRAIL END TREATMENTS. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. THE FACE OF THE TYPE E IMPACT HEAD SHALL BE COVERED WITH REBOUNDABLE RETROREFLECTIVE SHEETING, PER CMS 730.191. REFER TO THE MANUFACTURER'S INSTRUCTIONS REGARDING THE INSTALLATION OF, AND THE GRADING AROUND THE FOUNDATION TUBES AND GROUND STRUT. THE TOP OF ANY FOUNDATION TUBE SHOULD BE LESS THAN 4 INCHES ABOVE THE GROUND. THE PLACEMENT OF THE FOUNDATION TUBES SHOULD BE AN APPROPRIATE DEPTH BELOW THE LEVEL LINE IN ORDER TO MAINTAIN THE FINISHED GUARDRAIL HEIGHT OF 31 INCHES FROM THE EDGE OF THE SHOULDER. ON-SITE GRADING IS REQUIRED IF THE TOP OF THE FOUNDATION TUBES OR TOP OF THE GROUND STRUT DOES PROJECT MORE THAN 4 INCHES ABOVE THE GROUND LINE. PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT PRICE BID FOR ITEM 606, ANCHOR ASSEMBLY, MGS TYPE E, EACH, AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT A COMPLETE AND FUNCTIONAL ANCHOR ASSEMBLY SYSTEM, INCLUDING ALL RELATED TRANSITIONS, REFLECTIVE SHEETING, HARDWARE, GRADING, EMBANKMENT AND EXCAVATION NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

DATUM NOTES:

HORIZONTAL DATUM:
OHIO STATE PLANE COORDINATE SYSTEM, OHIO SOUTH ZONE, NAD83 (2011) AS DETERMINED BY OPUS POST PROCESSED STATIC SESSION.

VERTICAL DATUM:
NAVD 88 AS DETERMINED BY OPUS POST PROCESSED STATIC SESSIONS USING GEOID 18 (CONUS)

UTILITY DISCLAIMER:
THE UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION OUPS #A218001060 AND/OR EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES LOCATED HERE ON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES LOCATED ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

DATE OF FIELD SURVEY: AUGUST 9, 2022
DATE OF SURVEY MAP: APRIL 12, 2023

REFERENCE DRAWINGS:

ORIGINAL SURVEY 1 OF 1	ALTA/NSPS LAND TITLE SURVEY BY CESO INC. 175 MONTROSE WEST AVE. ST. SUITE 400 COPLEY, OH 44321 PHONE: (330) 665-0660 CONTACT: STEVEN CLUTTER
ORIGINAL PLANS 1 OF 1	PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES BY TERRACON DATED: 4/08/24 4685 SOUTH ASH AVENUE, SUITE H-4 TEMPE, AZ 85282 PHONE: (480) 897-8200

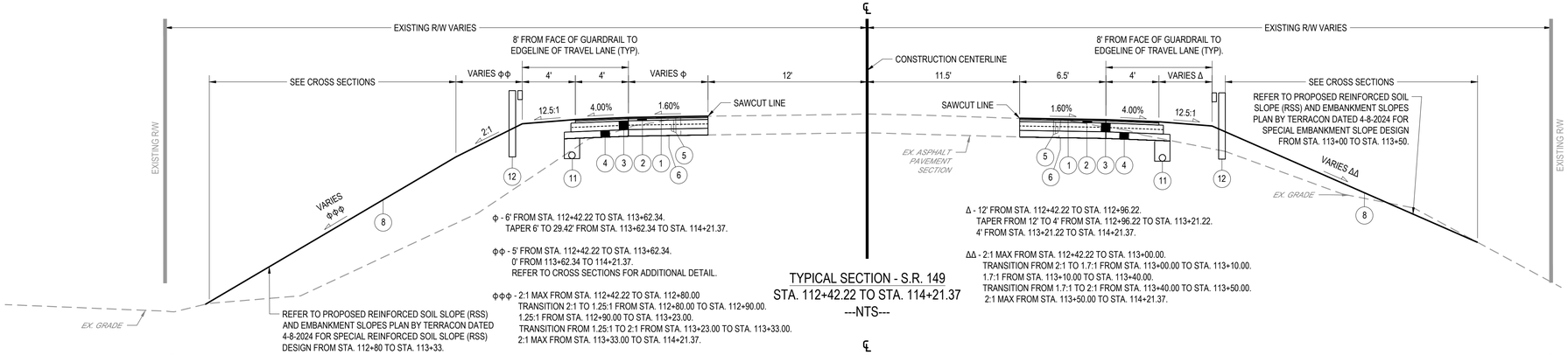
ODOT ITEM 408 - PRIME COAT, AS PER PLAN
THE CONTRACTOR SHALL APPLY ONE COAT OF MC-70 (AS PER SECTION 702) AT A RATE OF 0.40 GAL/SY TO THE COMPLETED AGGREGATE SHOULDER AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE A SHIELD TO PREVENT THE SPRAYING OR DRIFTING OF LIQUID BITUMINOUS MATERIAL ONTO THE EDGE OF PAVEMENT OR EDGE LINE. THE ATTENTION OF THE CONTRACTOR IS DIRECTED TO 107.10 OF THE SPECIFICATIONS.

CALCULATED P.D
CHECKED TDH

GENERAL NOTES
S.R. 149

BEL-149-23.44

R3
R31

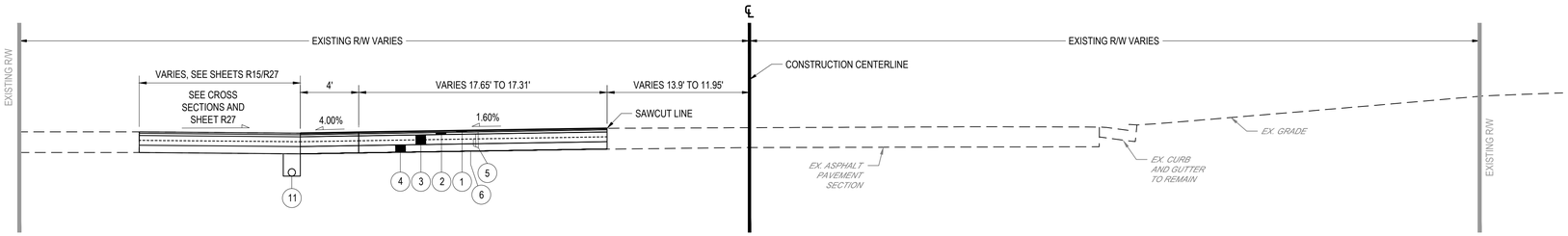


CALCULATED PJD
CHECKED TDH

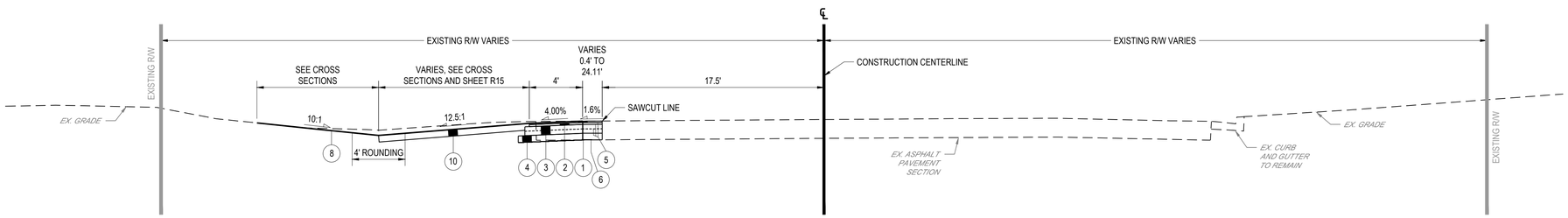
TYPICAL SECTIONS
S.R. 149

BEL-149-23.44

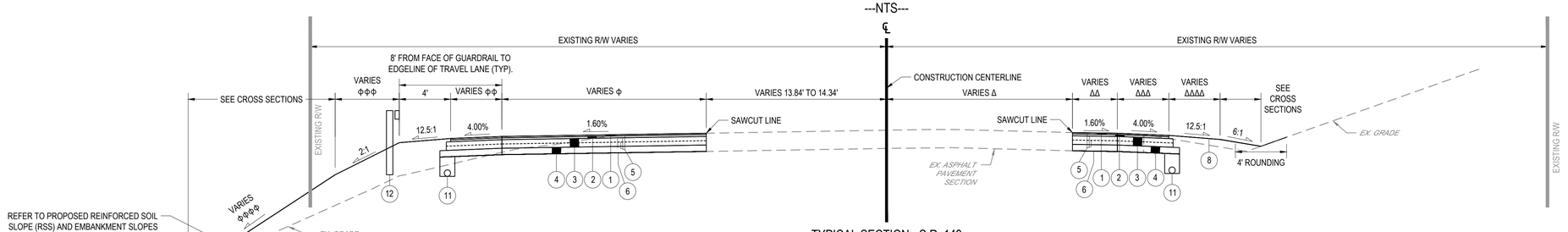
R4
R31



TYPICAL SECTION - S.R. 149
STA. 122+17.06 TO STA. 122+95.92
---NTS---



TYPICAL SECTION - S.R. 149
STA. 120+30.95 TO STA. 121+29.23
---NTS---



REFER TO PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES PLAN BY TERRACON DATED 4-8-2024 FOR SPECIAL EMBANKMENT SLOPE DESIGN FROM STA. 115+73 TO STA. 117+35.

ΦΦΦ - 5' FROM STA. 115+51.97 TO 117+35.
TAPER 5' TO 0' FROM STA. 117+35 TO STA. 117+50.
0' FROM STA. 117+50 TO STA. 117+75.65.

Φ - VARIES 20.16' TO 16.11' FROM STA. 115+51.97 TO STA. 115+71.95.
VARIES 16.11' TO 15.78' FROM STA. 115+71.95 TO STA. 117+21.93.
VARIES 15.78' TO 3.67' FROM STA. 117+21.93 TO STA. 117+81.88.
VARIES 3.67' TO 3.63' FROM STA. 117+81.88 TO 117+75.65.

ΦΦ - VARIES 0' TO 4' FROM STA. 115+51.97 TO STA. 115+71.95.
4' FROM 115+71.95 TO 117+75.65.

ΦΦΦΦ - 2:1 FROM STA. 115+51.97 TO 115+73.00.
TRANSITION FROM 2:1 TO 1.7: FROM STA. 115+73.00 TO STA. 115+83.00.
1.7:1 FROM STA. 115+83.00 TO STA. 117+00.00.
TRANSITION 1.7:1 TO 2.3:1 FROM STA. 117+00.00 TO STA. 117+35.00.
2.3:1 FROM STA. 117+35.00 TO STA. 117+75.65.

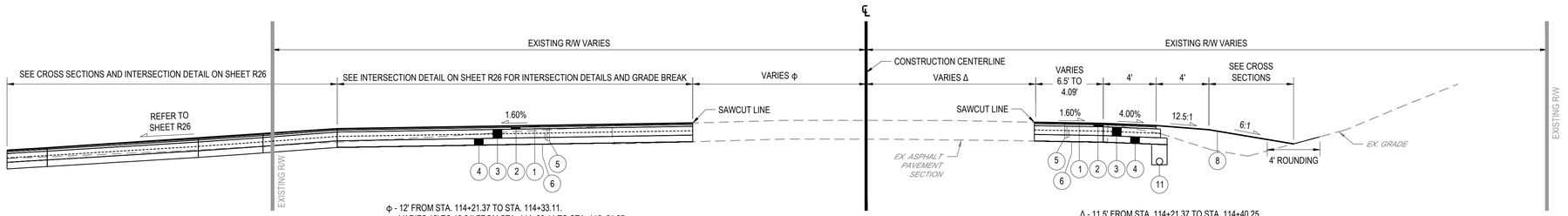
TYPICAL SECTION - S.R. 149
STA. 115+51.97 TO STA. 117+75.65
---NTS---

Δ - VARIES 13.91' TO 14.5' FROM STA. 115+51.97 TO STA. 115+79.47.
14.5' FROM STA. 115+79.47 TO STA. 117+71.27.
0' FROM STA. 117+71.27 TO STA. 117+75.65.

ΔΔ - VARIES 4.03' TO 3.50' FROM STA. 115+51.97 TO STA. 117+41.29.
0' FROM STA. 117+41.29 TO STA. 117+75.65.

ΔΔΔ - 4' FROM STA. 115+51.97 TO STA. 117+41.29.
0' FROM STA. 117+41.29 TO STA. 117+75.65.

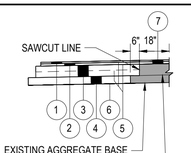
ΔΔΔΔ - 4' FROM STA. 115+51.97 TO STA. 117+41.29.
0' FROM STA. 117+41.29 TO STA. 117+75.65.



Φ - 12' FROM STA. 114+21.37 TO STA. 114+33.11.
VARIES 12' TO 13.84' FROM STA. 114+33.11 TO STA. 115+51.97.

TYPICAL SECTION - S.R. 149
STA. 114+21.37 TO STA. 115+51.97
---NTS---

Δ - 11.5' FROM STA. 114+21.37 TO STA. 114+40.25.
VARIES 11.5' TO 13.91' FROM STA. 114+40.25 TO STA. 115+51.97.



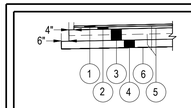
STEPPED CONSTRUCTION AT SAWCUT JOINT DETAIL (TYP.)

NOTE: WHERE PHASING FOR MAINTENANCE OF TRAFFIC WILL NOT ALLOW LAPPING COLD LONGITUDINAL JOINTS PER SCD BP3.1, PROVIDE A MINIMUM OF 6 INCHES OFFSET BETWEEN COLD JOINTS FOR EACH COURSE PLACED.

LEGEND

1. ODOT ITEM 441 - 1-1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), AS PER PLAN (PG70-22M)
2. ODOT ITEM 441 - 1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)
3. ODOT ITEM 301 - 8" ASPHALT CONCRETE BASE, PG64-22 (TWO 4" LIFTS, ITEM 407 BETWEEN LIFT)
4. ODOT ITEM 304 - 6" AGGREGATE BASE
5. ODOT ITEM 407 - TACK COAT
6. ODOT ITEM 204 - SUBGRADE COMPACTION
7. ODOT ITEM 254 - 3" PAVEMENT PLANING (MILL OF EX. SURFACE AND INTERMEDIATE COURSE)
8. ODOT ITEM 659 - SEEDING AND MULCHING
9. ODOT ITEM 609 - ODOT TYPE 2 COMBINATION CURB AND GUTTER PER BP-5.1
10. ODOT ITEM 411 - 6" STABILIZED CRUSHED AGGREGATE WITH ODOT ITEM 408 - PRIME COAT, AS PER PLAN - SEE ITEM 408 NOTE
11. ODOT ITEM 605 - 6" BASE PIPE UNDERDRAIN WITH GEOTEXTILE FABRIC, TYPE A, 18" DEPTH TO PIPE BOTTOM FROM SUBGRADE (TYP). DEPTH VARIES AT SELECTED LOCATIONS. SEE CROSS SECTIONS FOR UNDERDRAIN ELEVATIONS/OFFSET.
12. ITEM 606 - GUARDRAIL, TYPE MGS WITH LONG POSTS

EXISTING GRADE/PAVEMENT SECTION



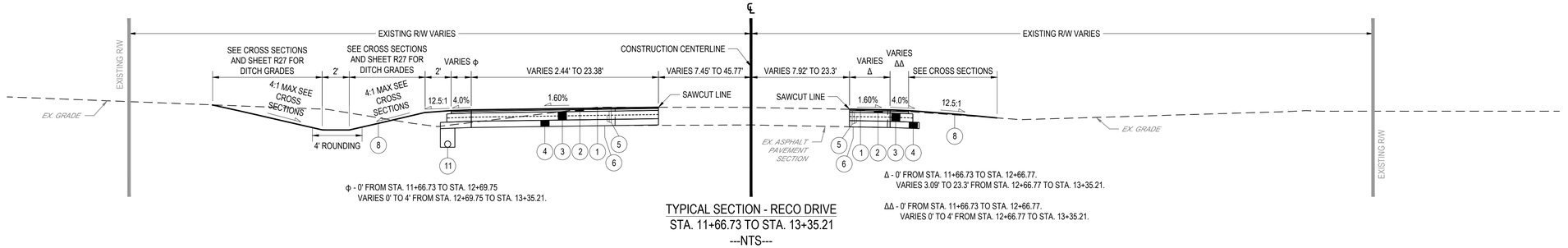
ASPHALT PAVEMENT STEP-OUT DETAIL (TYP.)

CALCULATED PJD
CHECKED TDH

TYPICAL SECTIONS
S.R. 149

BEL-149-23.44

R5
R31

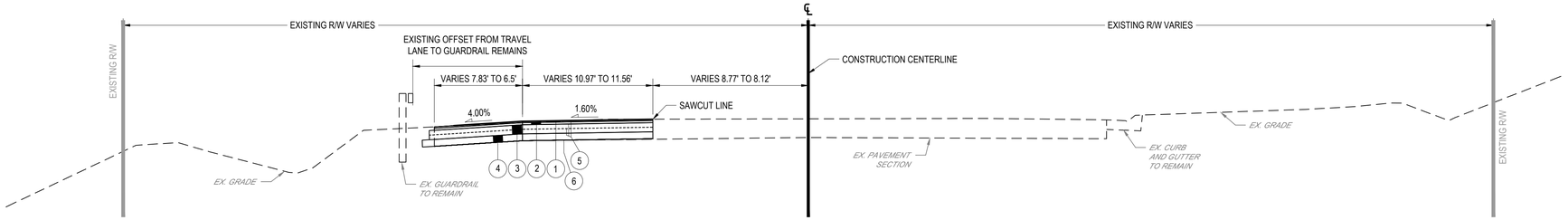


Φ - 0' FROM STA. 11+66.73 TO STA. 12+69.75
VARIES 0' TO 4' FROM STA. 12+69.75 TO STA. 13+35.21.

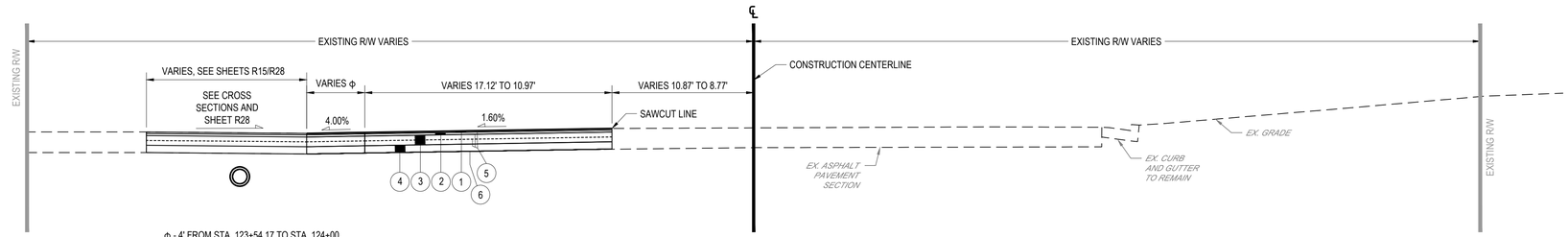
Δ - 0' FROM STA. 11+66.73 TO STA. 12+66.77.
VARIES 3.09' TO 23.3' FROM STA. 12+66.77 TO STA. 13+35.21.

ΔΔ - 0' FROM STA. 11+66.73 TO STA. 12+66.77.
VARIES 0' TO 4' FROM STA. 12+66.77 TO STA. 13+35.21.

TYPICAL SECTION - RECO DRIVE
STA. 11+66.73 TO STA. 13+35.21
---NTS---

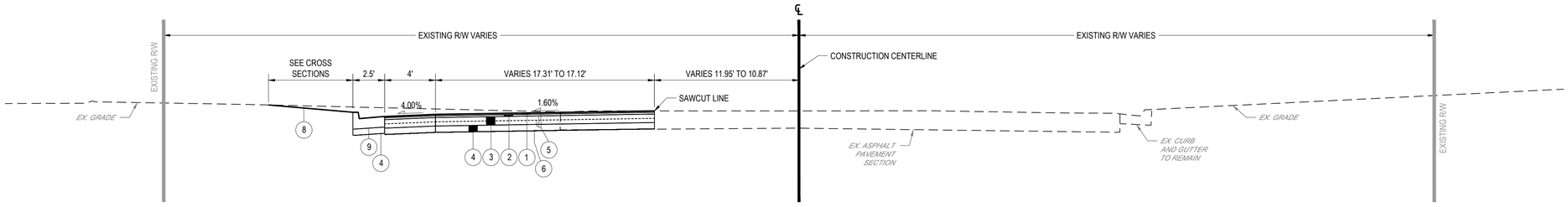


TYPICAL SECTION - S.R. 149
STA. 124+22.46 TO STA. 124+48.45
---NTS---

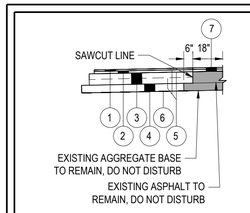


Φ - 4' FROM STA. 123+54.17 TO STA. 124+00.
VARIES 4' TO 7.83' FROM STA. 124+00 TO STA. 124+22.46.

TYPICAL SECTION - S.R. 149
STA. 123+54.17 TO STA. 124+22.46
---NTS---



TYPICAL SECTION - S.R. 149
STA. 122+95.92 TO STA. 123+54.17
---NTS---



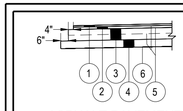
STEPPED CONSTRUCTION AT SAWCUT JOINT DETAIL (TYP.)

NOTE: WHERE PHASING FOR MAINTENANCE OF TRAFFIC WILL NOT ALLOW LAPPING COLD LONGITUDINAL JOINTS PER SCD BP3.1, PROVIDE A MINIMUM OF 6 INCHES OFFSET BETWEEN COLD JOINTS FOR EACH COURSE PLACED.

LEGEND

1. ODOT ITEM 441 - 1-1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), AS PER PLAN (PG70-22M)
2. ODOT ITEM 441 - 1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)
3. ODOT ITEM 301 - 8" ASPHALT CONCRETE BASE, PG64-22 (TWO 4" LIFTS, ITEM 407 BETWEEN LIFT)
4. ODOT ITEM 304 - 6" AGGREGATE BASE
5. ODOT ITEM 407 - TACK COAT
6. ODOT ITEM 204 - SUBGRADE COMPACTION
7. ODOT ITEM 254 - 3" PAVEMENT PLANING (MILL OF EX. SURFACE AND INTERMEDIATE COURSE)
8. ODOT ITEM 659 - SEEDING AND MULCHING
9. ODOT ITEM 609 - ODOT TYPE 2 COMBINATION CURB AND GUTTER PER BP-5.1
10. ODOT ITEM 411 - 6" STABILIZED CRUSHED AGGREGATE WITH ODOT ITEM 408 - PRIME COAT, AS PER PLAN - SEE ITEM 408 NOTE
11. ODOT ITEM 605 - 6" BASE PIPE UNDERDRAIN WITH GEOTEXTILE FABRIC, TYPE A, 18" DEPTH TO PIPE BOTTOM FROM SUBGRADE (TYP). DEPTH VARIES AT SELECTED LOCATIONS. SEE CROSS SECTIONS FOR UNDERDRAIN ELEVATIONS/OFFSET.
12. ITEM 606 - GUARDRAIL, TYPE MGS WITH LONG POSTS

– – – EXISTING GRADE/PAVEMENT SECTION



ASPHALT PAVEMENT STEP-OUT DETAIL (TYP.)

CALCULATED P.JD
CHECKED TDH

TYPICAL SECTIONS
S.R. 149

BEL-149-23.44

R6
R31

MAINTAINING TRAFFIC
THE CONTRACTOR SHALL PROVIDE, ERECT, AND MAINTAIN SIGNS (IN PROPER POSITION, CLEAN AND LEGIBLE, AND IN GOOD WORKING CONDITION) AND REMOVE ALL LIGHTS, SIGNS, CONES, DRUMS, AND ANY OTHER TRAFFIC CONTROL DEVICES NECESSARY FOR THE MAINTENANCE OF TRAFFIC ACCORDING TO THESE PLAN NOTES AND DETAILS.

NO CHANGES IN TRAFFIC CONTROL PATTERNS SHALL BE MADE BETWEEN THE HOURS OF 6:00 AM TO 9:00 PM MONDAY THROUGH FRIDAY, 8:00 AM-8:00 PM SATURDAY, AND 8:00 AM-8:00 PM SUNDAY; IN ADDITION, LANE CLOSURES ARE NOT PERMITTED 6:00 AM TO 9:00 PM MONDAY THROUGH FRIDAY, 8:00 AM-8:00 PM SATURDAY, AND 8:00 AM-8:00 PM SUNDAY. REFER TO LANE VALUE CONTRACT TABLE.

LANES OPEN DURING HOLIDAYS AND SPECIAL EVENTS
NO WORK SHALL BE PERFORMED AND THE SAME NUMBER OF LANES AS WERE AVAILABLE AT THE START OF THE PROJECT SHALL BE OPEN TO TRAFFIC DURING THE FOLLOWING DESIGNATED HOLIDAYS OR SPECIAL EVENTS:

HOLIDAYS:
NEW YEAR'S (OBSERVED), TOTAL SOLAR ECLIPSE (4/8/24), MEMORIAL DAY, FOURTH OF JULY (OBSERVED), LABOR DAY, GENERAL/REGULAR ELECTION DAY (NOV), THANKSGIVING, CHRISTMAS (OBSERVED).

THE PERIOD OF TIME THAT THE LANES ARE TO BE OPEN DEPENDS ON THE DAY OF THE WEEK ON WHICH THE HOLIDAY OR SPECIAL EVENT FALLS. THE FOLLOWING SCHEDULE SHALL BE USED TO DETERMINE THIS PERIOD:

DAY OF HOLIDAY OR SPECIAL EVENT	TIME ALL LANES MUST BE OPEN TO TRAFFIC
SUNDAY	12:00 NOON FRIDAY THROUGH 6:00 AM MONDAY
MONDAY	12:00 NOON FRIDAY THROUGH 6:00 AM TUESDAY
MONDAY (TOTAL SOLAR ECLIPSE)	12:00 NOON FRIDAY THROUGH 6:00 AM WEDNESDAY
TUESDAY	12:00 NOON MONDAY THROUGH 6:00 AM WEDNESDAY
TUESDAY (GEN./REG. ELECTION)	5:00 AM TUESDAY THROUGH 12:00 AM WEDNESDAY
WEDNESDAY	12:00 NOON TUESDAY THROUGH 6:00 AM THURSDAY
THURSDAY	12:00 NOON WEDNESDAY THROUGH 6:00 AM FRIDAY
THANKSGIVING	6:00 AM WEDNESDAY THROUGH 6:00 AM MONDAY
FRIDAY	12:00 NOON THURSDAY THROUGH 6:00 AM MONDAY
SATURDAY	12:00 NOON FRIDAY THROUGH 6:00 AM MONDAY

DURING THE SAME PERIODS, MAINTAIN PEDESTRIAN ACCESS IF PEDESTRIAN ACCESS WAS PRESENT PRIOR TO CONSTRUCTION.

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY-WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED A DISINCENTIVE IN THE AMOUNT OF $6,000/HR THE ABOVE DESCRIBED LANE CLOSURE RESTRICTIONS ARE VIOLATED.

LENGTH AND DURATION OF LANE CLOSURES AND RESTRICTIONS SHALL BE AT THE APPROVAL OF THE ENGINEER. IT IS THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME, AS DETERMINED BY THE ENGINEER, SHALL NOT BE PERMITTED. THE LEVEL OF UTILIZATION OF MAINTENANCE OF TRAFFIC DEVICES SHALL BE COMMENSURATE WITH THE WORK IN PROGRESS.

BEFORE THE WORK BEGINS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE NAMES AND TELEPHONE NUMBERS OF PERSONS WHO CAN BE CONTACTED TWENTY-FOUR (24) HOURS PER DAY BY ODOT AND ALL INTERESTED POLICE AGENCIES. THIS PERSON OR PERSONS SHALL BE RESPONSIBLE FOR PLACING OR REPLACING NECESSARY TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN TRAFFIC AT ALL TIMES. IT IS THE INTENTION TO PERFORM THE REQUIRED WORK WITH THE LEAST INCONVENIENCE TO AND THE MAXIMUM SAFETY OF THE WORKERS AND THE TRAVELING PUBLIC OCCASIONALLY, MODIFICATIONS IN TRAFFIC CONTROLS OR WORKING CONDITIONS MAY BE REQUIRED IN ORDER TO EXPEDITE SAFE TRAFFIC MOVEMENT AND TO PROMOTE WORKER SAFETY.

NOTIFICATION OF TRAFFIC RESTRICTIONS
THROUGHOUT THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN WRITING OF ALL TRAFFIC RESTRICTIONS AND UPCOMING MAINTENANCE OF TRAFFIC CHANGES. THE CONTRACTOR SHALL ENSURE THE WRITTEN NOTIFICATION IS SUBMITTED IN A TIMELY MANNER TO ALLOW THE PROJECT ENGINEER TO MEET THE REQUIRED TIME FRAMES SET FORTH IN THE TABLE BELOW TO INFORM THE SPECIAL HAULING PERMITS SECTION (HAULING.PERMITS@DOT.OHIO.GOV) AND THE DISTRICT PUBLIC INFORMATION OFFICE (PIO). THIS NOTIFICATION SHALL BE RECEIVED BY THE PROJECT ENGINEER PRIOR TO THE PHYSICAL SETUP OF ANY APPLICABLE SIGNS OR MESSAGE BOARDS. INFORMATION SHOULD INCLUDE, BUT IS NOT LIMITED TO, ALL CONSTRUCTION ACTIVITIES THAT IMPACT OR INTERFERE WITH TRAFFIC AND SHALL LIST THE SPECIFIC LOCATION, TYPE OF WORK, ROAD STATUS, DATE AND TIME OF RESTRICTION, DURATION OF RESTRICTION, NUMBER OF LANES MAINTAINED, NUMBER OF LANES CLOSED, MINIMUM VERTICAL CLEARANCE, MINIMUM WIDTH OF DRIVABLE PAVEMENT, DETOUR ROUTES, IF APPLICABLE, AND ANY OTHER INFORMATION REQUESTED BY THE PROJECT ENGINEER.

NOTIFICATION OF TRAFFIC RESTRICTIONS TIME TABLE

ITEM	DURATION OF CLOSURE	NOTICE DUE TO PERMITS & PIO
RAMP &	> 2 WEEKS	21 CALENDAR DAYS PRIOR TO CLOSURE
ROAD	> 12 HOURS & < 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
CLOSURES	< 12 HOURS	4 BUSINESS DAYS PRIOR TO CLOSURE
LANE	> 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
CLOSURES &		
RESTRICTIONS	< 2 WEEKS	5 BUSINESS DAYS PRIOR TO CLOSURE
START OF CONSTRUCTION &		
TRAFFIC PATTERN CHANGES	N/A	14 CALENDAR DAYS PRIOR TO IMPLEMENTATION

ANY UNFORESEEN CONDITIONS NOT SPECIFIED IN THE PLANS REQUIRING TRAFFIC RESTRICTIONS SHALL ALSO BE REPORTED TO THE PROJECT ENGINEER USING THE NOTIFICATION TIME TABLE.

WORK SITE LIGHTING
FLOODLIGHTING OF THE WORK SITE FOR OPERATIONS CONDUCTED DURING NIGHTTIME PERIODS SHALL BE ACCOMPLISHED SO THAT THE LIGHTS DO NOT CAUSE GLARE TO THE DRIVERS ON THE ROADWAY. TO ENSURE THE ADEQUACY OF FLOODLIGHT PLACEMENT, THE CONTRACTOR, AND THE ENGINEER SHALL DRIVE THROUGH THE WORK SITE EACH NIGHT WHEN THE LIGHTING IS IN PLACE AND OPERATIVE PRIOR TO COMMENCING ANY WORK. IF GLARE IS DETECTED, THE LIGHT PLACEMENT AND SHIELDING SHALL BE ADJUSTED TO THE SATISFACTION OF THE ENGINEER BEFORE WORK PROCEEDS. PAVEMENT FOR ALL LABOR, EQUIPMENT, AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACTOR PRICE FOR ITEM 614, MAINTAINING TRAFFIC.

MUD, DIRT AND DEBRIS
THE TRACKING OR SPILLAGE OF MUD, DIRT OR DEBRIS UPON STATE HIGHWAYS IS PROHIBITED AND ANY SUCH OCCURRENCE SHALL BE CLEANED UP IMMEDIATELY BY THE CONTRACTOR.

PERSONAL PROTECTIVE EQUIPMENT
ODOT REQUIRES ALL CONTRACTORS' PERSONNEL TO WEAR THE CORRECT PPE WHILE WITHIN ODOT RIGHT-OF-WAY. ALL VEHICLES SHALL HAVE THE CORRECT SAFETY EQUIPMENT ALSO.

THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN SIGNS AND SIGN
SUPPORTS, AS DETAILED IN THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

ALL VEHICLES, EQUIPMENT AND WORKERS AND THEIR ACTIVITIES ARE RESTRICTED TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE APPROVED BY THE ENGINEER. CONSTRUCTION VEHICLES SHALL ALWAYS MOVE WITH AND NOT AGAINST THE FLOW OF TRAFFIC. CONSTRUCTION VEHICLES AND EQUIPMENT SHALL ENTER AND LEAVE WORK AREAS IN A MANNER WHICH WILL NOT BE HAZARDOUS TO, OR INTERFERE WITH THE NORMAL FLOW OF TRAFFIC. PERSONAL VEHICLES ARE NOT PERMITTED IN THE RIGHT-OF-WAY EXCEPT IN SPECIFIC AREAS DESIGNATED BY THE ENGINEER.

MAINTAINING TRAFFIC (SIGNS AND BARRICADES)
THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN SIGNS AND SIGN SUPPORTS, AS DETAILED IN THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND TYPE III BARRICADES AS DIRECTED IN CONSTRUCTION SEQUENCE.

TEMPORARY PAVEMENT WEDGE
TEMPORARY PAVEMENT WEDGES SHALL BE PROVIDED AT ALL TIMES WHERE TRAFFIC IS REQUIRED TO TRAVEL FROM OR ONTO A PAVEMENT SURFACE OF A DIFFERENT ELEVATION. THE MINIMUM SLOPE OF THE TEMPORARY PAVEMENT WEDGE SHALL BE 3:1 ALONG LONGITUDINAL JOINTS AND 120:1 AT TRANSVERSE JOINTS. THESE WEDGES SHALL BE REMOVED PRIOR TO PLACING THE SPECIFIED PAVEMENT COURSE.

PLACEMENT OF ASPHALT CONCRETE
TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES EXCEPT THAT ONE WAY TRAFFIC WILL BE PERMITTED FOR MINIMUM PERIODS OF TIME CONSISTENT WITH THE REQUIREMENTS OF THE SPECIFICATIONS FOR PROTECTION OF COMPLETED ASPHALT COURSES.

TRENCH FOR WIDENING
TRENCH FOR EXCAVATION FOR BASE WIDENING SHALL BE FOR ONLY ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH DRUMS OR BARRICADES AT ALL TIMES. PLACEMENT OF PROPOSED SUBBASE AND BASE MATERIAL SHALL FOLLOW CLOSELY AS POSSIBLE BEHIND EXCAVATION OPERATIONS. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT ALL TIMES BE SUBJECT TO APPROVAL BY THE ENGINEER.

THE CONTRACTOR SHALL ENSURE THAT THE TRENCH FOR WIDENING HAS A VERTICAL DROP OF NO MORE THAN 5 INCHES. THE TRENCH CAN BE BACKFILLED BY A COMPACTED AGGREGATE WEDGE. THE MINIMUM SLOPE OF THE TEMPORARY COMPACTED AGGREGATE WEDGE SHALL BE 3:1 ALONG THE EXISTING PAVEMENT AND PROTECTED WITH DRUMS AT ALL TIMES.

OVERNIGHT TRENCH CLOSING
THE BASE WIDENING SHALL BE COMPLETED TO A DEPTH OF NO MORE THAN 5 INCHES BELOW THE EXISTING PAVEMENT BY THE END OF EACH WORK DAY. NO TRENCH SHALL BE LEFT OPEN OVERNIGHT EXCEPT FOR A SHORT LENGTH (25 FEET OR LESS) OF A WORK SECTION AT THE END OF THE DAY. IN CASE WORK MUST BE SUSPENDED BECAUSE OF INCLEMENT WEATHER OR OTHER REASONS, THE TRENCH FOR THE UNCOMPLETED BASE WIDENING SHALL BE BACKFILLED AT THE DIRECTION OF THE ENGINEER.

DROPOFFS IN WORK ZONE
THE DROPOFF ADJACENT TO THE TRAVELED LANE SHALL MEET THE CRITERIA OUTLINED ODOT STANDARD DRAWING MT-101.90. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR MATERIALS, LABOR OR EQUIPMENT NECESSARY TO MEET THE REQUIREMENTS OF MT-101.90.

ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS
USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED.

IN ADDITION TO THE REQUIREMENTS OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

- DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.
- DURING A TRAFFIC SIGNAL INSTALLATION WHEN IMPACTING THE NORMAL FUNCTION OF THE SIGNAL OR THE FLOW OF TRAFFIC, OR WHEN TRAFFIC NEEDS TO BE DIRECTED THROUGH AN ENERGIZED TRAFFIC SIGNAL CONTRARY TO THE SIGNAL DISPLAY (E.G., DIRECTING MOTORISTS THROUGH A RED LIGHT).

IN ADDITION TO THE REQUIREMENT OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHOULD BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS AS APPROVED BY THE ENGINEER:

- FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP).
- FOR OPERATIONS WITHOUT POSITIVE PROTECTION OCCURRING WITHIN 10 FEET OF AN OPEN TRAVELED LANE THAT MEET ALL OF THE FOLLOWING CRITERIA:
  - ON A MULTI-LANE DIVIDED INTERSTATE, OTHER FREEWAY OR EXPRESSWAY; AND
  - AN AUTHORIZED SPEED LIMIT OF 45 MPH OR GREATER THAT IS IN EFFECT AT THE TIME OF OPERATION; AND,
  - AADT OF 50,000 (OR AADT OF 30,000 WITH 25% OR HIGHER PERCENT TRUCKS)

"WITHOUT POSITIVE PROTECTION" MEANS USE OF DRUMS, CONES, SHADOW VEHICLE, ETC, WITHOUT
PROTECTION FROM PORTABLE BARRIER OR OTHER RIGID BARRIER ALONG THE WORK AREA. THIS PHRASE DOES NOT APPLY TO CASES WHERE POSITIVE PROTECTION IS REQUIRED. MOBILE OPERATIONS ARE REGARDED AS "WITHOUT POSITIVE PROTECTION". FOR WORK ZONES USING A COMBINATION OF BARRIER AND TEMPORARY TRAFFIC CONTROL DEVICES (CONES, DRUMS, ETC), THE DESIGNATION SHALL BE BASED UPON THE TYPE OF DEVICES USED IN THE AREA THAT WORKERS ARE LOCATED.

IF MULTIPLE ACTIVE LOCALIZED QUALIFYING WORK AREAS OCCUR WITHOUT POSITIVE PROTECTION, PER
MAINLINE TRAFFIC DIRECTION, PROVIDE A UNIFORMED LEO AND OFFICIAL PATROL CAR IN ADVANCE OF:
THE FIRST ACTIVE WORK AREA THAT DRIVERS WILL ENCOUNTER; OR
THE ACTIVE WORK AREA LATERALLY CLOSEST TO THE OPEN TRAVELED LANE; OR
OTHER LOCATION AS APPROVED BY THE ENGINEER.

THE UNIFORMED LEO AND OFFICIAL PATROL CAR MAY RELOCATE AMONG THE LISTED LOCATIONS AS
APPROPRIATE AS THE OPERATIONS PROCEED IN THE LOCALIZED QUALIFYING WORK AREAS.

IN GENERAL, LEOS SHOULD BE POSITIONED IN ADVANCE OF AND ON THE SAME SIDE AS THE LANE RESTRICTION OR AT THE POINT OF ROAD CLOSURE, AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH SIGNALIZED INTERSECTIONS IN WORK ZONES.

LEOS SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORISTS FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST'S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE. THE LEOS WORK AT THE DIRECTION OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS' DUTIES AND PLACEMENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES. ENSURE PROVIDED LEOS HAVE BEEN TRAINED APPROPRIATE TO THE JOB DECISIONS THEY ARE REQUIRED TO MAKE WHILE ON THE PROJECT, IN ACCORDANCE WITH C&MS 614.03. THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO-WAY COMMUNICATION DEVICE THAT SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. LEOS (WITH PATROL CAR) REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY.

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 100 HOURS. THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED. ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

ACCESS TO PRIVATE PROPERTY
ACCESS TO DRIVES SHALL BE MAINTAINED VIA EXISTING PAVEMENT, TEMPORARY PAVEMENT IN THE EVENT THAT A DRIVE CANNOT BE MAINTAINED AND A CLOSURE IS NEEDED THE CONTRACTOR WILL COORDINATE WITH THE PROPERTY OWNER TO MINIMIZE THE IMPACT TO THE OWNER. COMMERCIAL PROPERTY WITH MULTIPLE DRIVES MAY HAVE ONE DRIVE CLOSED WHEN WORKING IN THE AREA OF THE DRIVE. COMMERCIAL PROPERTY WITH ONLY ONE DRIVEWAY OR DRIVEWAYS WITH ONE DIRECTION TRAFFIC USE WILL BE CONSTRUCTED PART WIDTH. THE CONTRACTOR WILL COORDINATE WITH THE PROPERTY OWNER TO MINIMIZE THE IMPACT TO THE OWNER. MAINTAIN ACCESS TO RESIDENTIAL PROPERTIES AT ALL TIMES. WHEN A RESIDENTIAL DRIVE IS CLOSED FOR CONSTRUCTION, MAINTAIN ALTERNATE ACCESS TO THE PROPERTY. IT MAY BE REQUIRED FOR THE CONTRACTOR TO MAINTAIN ONE PASSABLE LANE WITHIN A CLOSURE IN ORDER FOR VEHICLES TO ACCESS RESIDENCY WITH A VEHICLE. UNLESS CALLED OUT IN THE PLANS THE CONTRACTOR WILL COORDINATED ANY CLOSURES WITH PROPERTY OWNERS AND BE RESPONSIBLE FOR ANY AND ALL PROPERTY USE AGREEMENTS FOR ALTERNATIVE ACCESS. SUCCESSFULLY NOTIFY THE OCCUPANTS/OWNERS OF COMMERCIAL OR RESIDENTIAL DRIVES TO BE CLOSED AND COORDINATE THE CLOSURE AT LEAST 48 HOURS BEFORE THE CLOSURE BEGINS (SIMPLY LEAVING A WRITTEN NOTICE OR PHONE MESSAGE IS NOT SUFFICIENT). COORDINATE ALTERNATE ACCESS TO RESIDENTIAL PROPERTIES WITH THE OWNER/OCCUPANT. PAYMENT FOR ALL LABOR, EQUIPMENT, LAW ENFORCEMENT OFFICERS AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC UNLESS ITEMIZED SEPARATELY.

ITEM 615 - ROADS FOR MAINTAINING TRAFFIC, AS PER PLAN
IN ADDITION TO THE REQUIREMENTS OF ODOT C&MS 615, THIS ITEM SHALL INCLUDE TEMPORARY DRAINAGE ITEMS, RESTORATION OF ALL SURFACES AND SIGNS DISTURBED BY THE PLACEMENT OF PAVEMENT FOR MAINTAINING TRAFFIC OUTSIDE OF THE PROJECT LIMITS.

TEMPORARY PAVEMENT SECTION
TEMPORARY PAVEMENT SECTION TO BE INSTALLED PER ODOT ITEM 615 FOR S.R. 149/RECO DRIVE. TEMPORARY PAVEMENT SECTION MAY BE SUBSTITUTED AT DIRECTION OF ENGINEER.

ITEM 614 - WORK ZONE IMPACT ATTENUATOR FOR 24" WIDE HAZARDS (UNIDIRECTIONAL OR BIDIRECTIONAL)
THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING A NON-GATING IMPACT ATTENUATOR. FURNISH AN IMPACT ATTENUATOR FROM THE OFFICE OF ROADWAY ENGINEERING'S APPROVED LIST FOR WORK ZONE IMPACT ATTENUATORS, FROM THE ROADWAY STANDARDS APPROVED PRODUCTS WEB PAGE. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. THE CONTRACTOR SHALL REPAIR OR REPLACE A DAMAGED UNIT WITHIN 24 HOURS OF A DAMAGING IMPACT. WHEN BIDIRECTIONAL DESIGNS ARE SPECIFIED, THE CONTRACTOR SHALL SUPPLY APPROPRIATE TRANSITIONS. WHEN GATING IMPACT ATTENUATORS ARE DESIRED, THE CONTRACTOR SHALL SUBMIT DOCUMENTATION TO THE ENGINEER FOR ACCEPTANCE. THE COST FOR THE ADDITIONAL BARRIER REQUIRED FOR A GATING IMPACT ATTENUATOR SHALL BE INCLUDED IN THE COST OF THE GATING IMPACT ATTENUATOR. PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT PRICE BID AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT AND MAINTAIN A COMPLETE AND FUNCTIONAL IMPACT ATTENUATOR SYSTEM, INCLUDING ALL RELATED BACKUPS, TRANSITIONS, LEVELING PADS, HARDWARE AND GRADING, NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

DUST CONTROL
THE CONTRACTOR SHALL FURNISH AND APPLY WATER FOR DUST CONTROL AS DIRECTED BY THE ENGINEER. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED FOR DUST CONTROL PURPOSES:

ITEM 616 WATER 9.0 M.GAL.

CONSTRUCTION SEQUENCE FOR MAINTENANCE OF TRAFFIC (MOT)

PRE-ROADWAY TRAFFIC SIGNAL INSTALLATION:
INSTALL THE PROPOSED TRAFFIC SIGNAL AND ASSOCIATED UNDERGROUND SIGNAL COMPONENTS AT S.R. 149 AND RECO DRIVE. SIGNAL AND SIGNAL COMPONENTS CAN BE INSTALLED CONCURRENTLY WITH ANY OF THE PHASES PRIOR TO FINAL PAVEMENT MARKING OPERATIONS. TRAFFIC SIGNAL HEADS TO REMAIN COVERED AND TRAFFIC SIGNAL REMAIN INOPERABLE UNTIL FINAL PAVEMENT MARKINGS ARE COMPLETE FOR ALL ROADWAY WORK AND ROADWAY IS READY FOR FINAL OPENING.

PRE-PHASE 1A/1B:
INSTALL TEMPORARY PAVEMENT AS SHOWN ON SOUTH SIDE OF RECO DRIVE. TEMPORARY PAVEMENT TO BE INSTALLED IN EXPEDITED FASHION DURING OFF PEAK TRAFFIC HOURS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS/GUIDELINES AND ODOT SCD MT-97.11. EXISTING CONDITION TO BE RESTORED WHEN NO LONGER NEEDED FOR MOT OPERATIONS.

PHASE 1A:
COMPLETE WORK IN NORTHWEST QUADRANT OF BELMONT MORRISTOWN ROAD (S.R. 149) AND RECO DRIVE. SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AND RECO DRIVE AS SHOWN IN PLAN. COMPLETE SOUTH MARATHON DRIVEWAY WORK. NORTH MARATHON DRIVEWAY TO REMAIN OPEN.

PHASE 1B:
RECONFIGURE MOT PHASE 1A AS SHOWN ON PHASE 1B TO REOPEN MARATHON SOUTH DRIVEWAY AND CLOSE NORTH MARATHON DRIVEWAY TO COMPLETE WORK. COMPLETE WORK IN EXPEDITED FASHION DURING OFF PEAK HOURS TO LIMIT DISRUPTION TO TRUCK TRAFFIC AND ADJACENT BUSINESSES.

PRE-PHASE 2:
INSTALL TEMPORARY PAVEMENT AS SHOWN ON EAST SIDE OF S.R. 149. TEMPORARY PAVEMENT TO BE INSTALLED IN EXPEDITED FASHION DURING OFF PEAK TRAFFIC HOURS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS/GUIDELINES AND ODOT SCD MT-97.11. EXISTING CONDITION TO BE RESTORED WHEN NO LONGER NEEDED FOR MOT OPERATIONS.

PHASE 2:
COMPLETE WORK ON WEST SIDE OF BELMONT MORRISTOWN ROAD (S.R. 149) AND SOUTH WEST QUADRANT OF RECO DRIVE. SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AND RECO DRIVE AS SHOWN IN PLAN.

PRE-PHASE 3:
INSTALL TEMPORARY PAVEMENT AS SHOWN ON WEST SIDE OF S.R. 149. TEMPORARY PAVEMENT TO BE INSTALLED IN EXPEDITED FASHION DURING OFF PEAK TRAFFIC HOURS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS/GUIDELINES AND ODOT SCD MT-97.11. EXISTING CONDITION TO BE RESTORED WHEN NO LONGER NEEDED FOR MOT OPERATIONS. CONTRACTOR TO COORDINATE TEMPORARY GUY-WIRES/STABILIZATION FOR UTILITY POLES ADJACENT TO TEMPORARY PAVEMENT PRIOR TO ANY CONSTRUCTION.

PHASE 3:
COMPLETE WORK ON EAST SIDE OF BELMONT MORRISTOWN ROAD (S.R. 149). SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AS SHOWN IN PLAN.

CALCULATED P.JD
CHECKED TDH

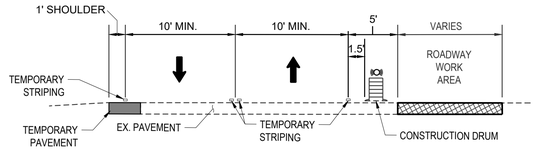
MAINTENANCE OF TRAFFIC NOTES
S.R. 149

BEL-149-23.44

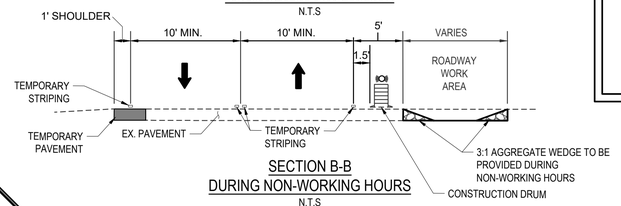
R7
R31

NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
2. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE. IF WORK IS EXPECTED IN WINTER WEATHER CONDITIONS, CONTACT ENGINEER FOR SUITABLE REPLACEMENT.
3. EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL MARKINGS OR ARE LABELED TO BE REMOVED SHALL BE COVERED WITH REMOVABLE BLACKOUT TAPE (CMS 740.06, TYPE I).
4. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE (CMS 740.06, TYPE I)
5. TEMPORARILY BAG/COVER EXISTING SIGNS IN WORK ZONE WHEN THEY CONFLICT WITH INTENDED MAINTENANCE OF TRAFFIC PLAN.
6. STEADY BURNING TYPE A WARNING LIGHTS SHOWN ON THE ADVANCE WARNING SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
7. PROVISIONS SHALL BE MADE TO STABILIZE THE DRUMS TO PREVENT THEM FROM BLOWING OVER.
8. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.
9. ALL TAPERS AND WORK ZONE TRAFFIC CONTROL SHALL COMPLY WITH REQUIREMENTS OUTLINED IN THE OMUTCD.



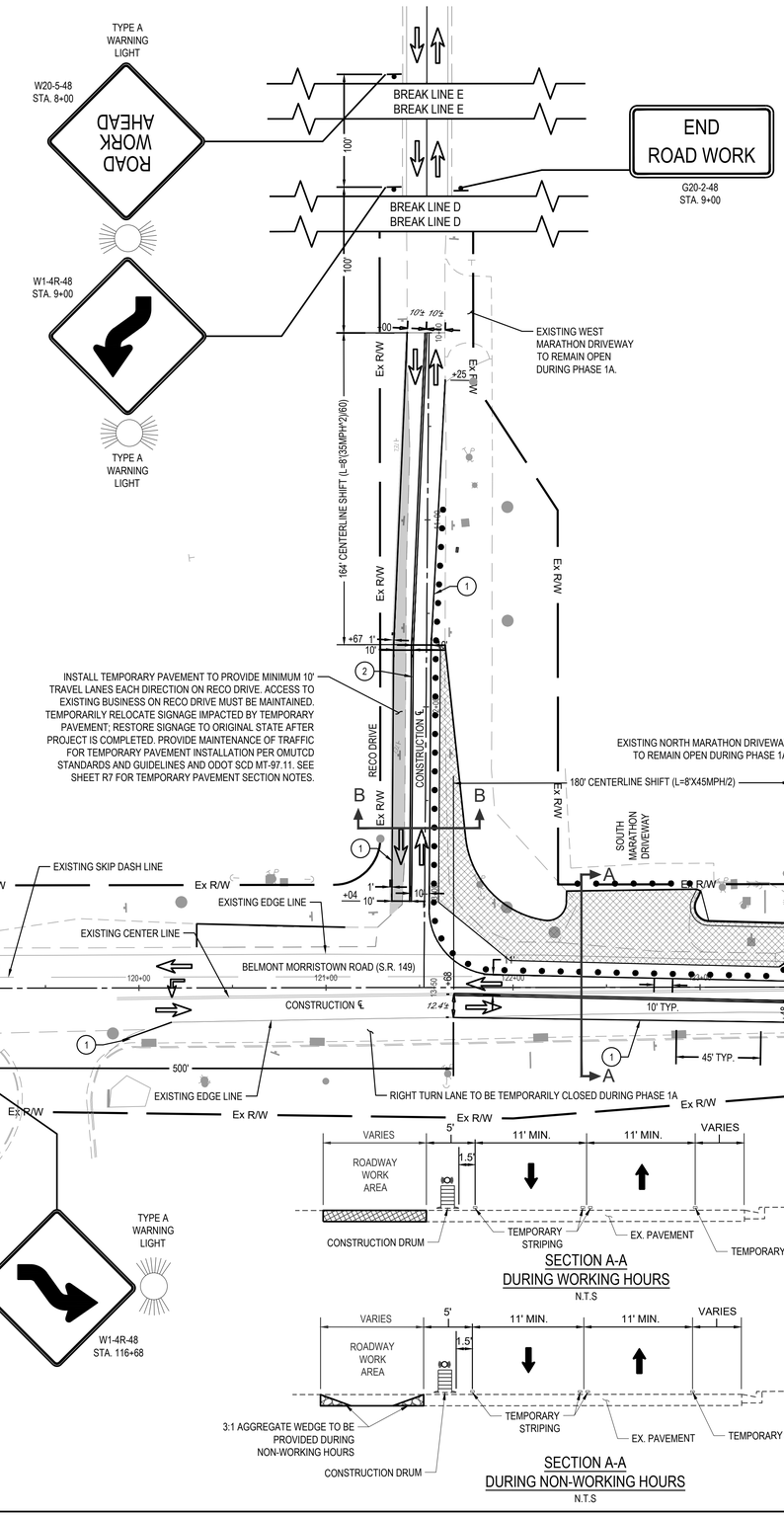
SECTION B-B
DURING WORKING HOURS
N.T.S

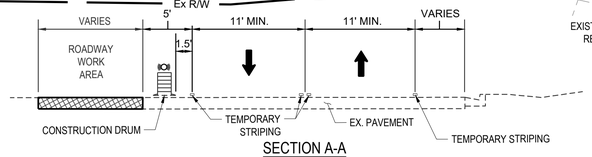


SECTION B-B
DURING NON-WORKING HOURS
N.T.S

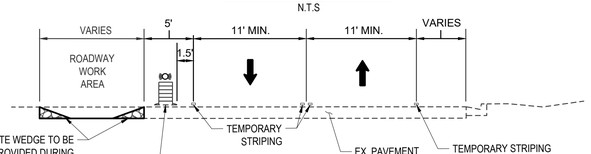
LEGEND

- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)





SECTION A-A
DURING WORKING HOURS
N.T.S



SECTION A-A
DURING NON-WORKING HOURS
N.T.S

GRAPHIC SCALE (IN FEET)
80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH

MAINTENANCE OF TRAFFIC - PHASE 1A
S.R. 149

BEL-149-23.44

R8
R31

NOTES:

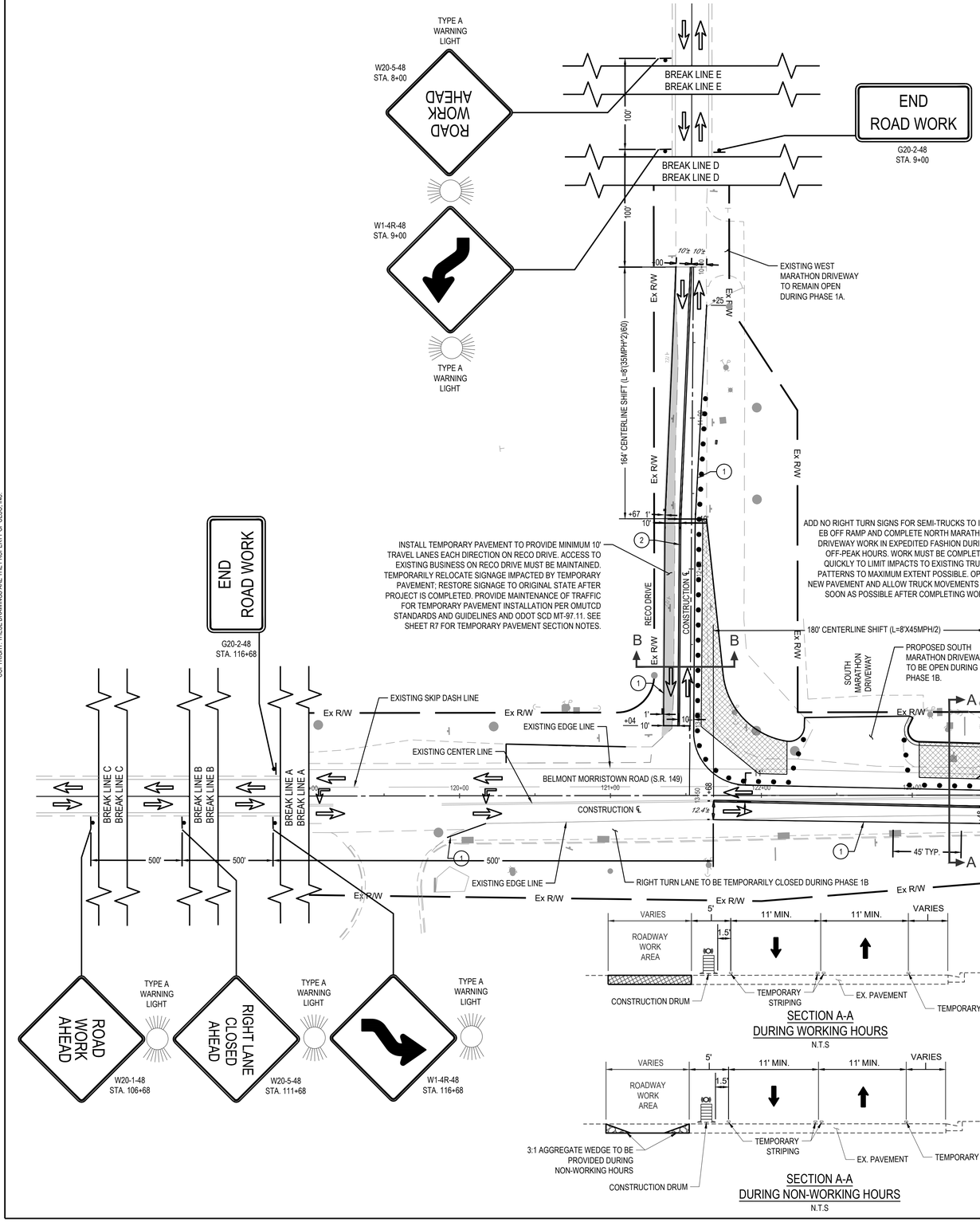
1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
2. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE. IF WORK IS EXPECTED IN WINTER WEATHER CONDITIONS, CONTACT ENGINEER FOR SUITABLE REPLACEMENT.
3. EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL MARKINGS OR ARE LABELED TO BE REMOVED SHALL BE COVERED WITH REMOVABLE BLACKOUT TAPE (CMS 740.06, TYPE I).
4. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE (CMS 740.06, TYPE I)
5. TEMPORARILY BAG/COVER EXISTING SIGNS IN WORK ZONE WHEN THEY CONFLICT WITH INTENDED MAINTENANCE OF TRAFFIC PLAN.
6. STEADY BURNING TYPE A WARNING LIGHTS SHOWN ON THE ADVANCE WARNING SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
7. PROVISIONS SHALL BE MADE TO STABILIZE THE DRUMS TO PREVENT THEM FROM BLOWING OVER.
8. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.
9. ALL TAPERS AND WORK ZONE TRAFFIC CONTROL SHALL COMPLY WITH REQUIREMENTS OUTLINED IN THE OMUTCD.

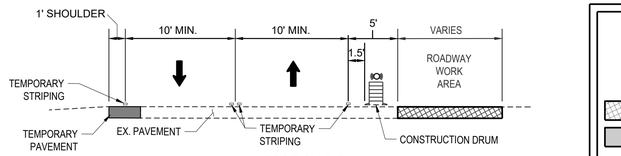
LEGEND

- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)

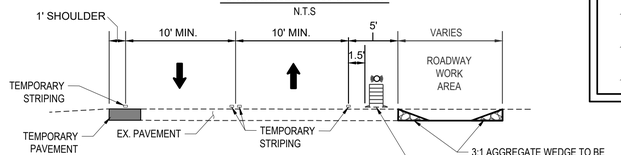
GRAPHIC SCALE (IN FEET): 80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH

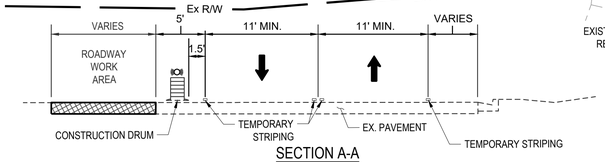




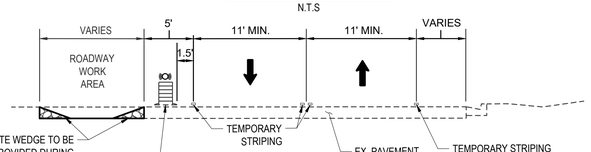
SECTION B-B
DURING WORKING HOURS
N.T.S



SECTION B-B
DURING NON-WORKING HOURS
N.T.S



SECTION A-A
DURING WORKING HOURS
N.T.S

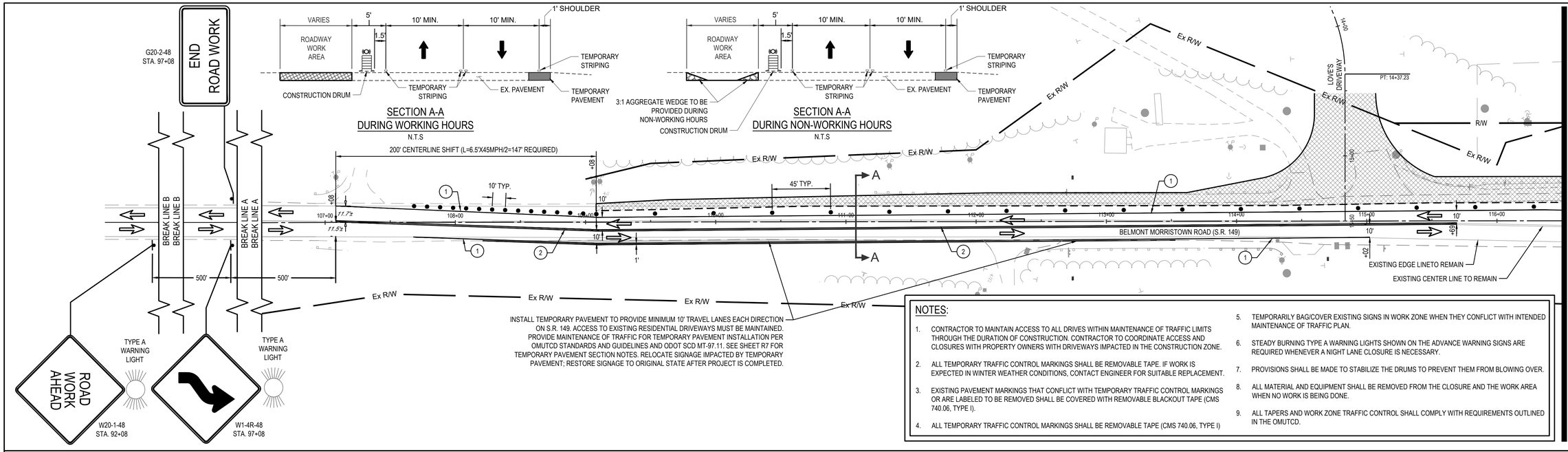


SECTION A-A
DURING NON-WORKING HOURS
N.T.S

MAINTENANCE OF TRAFFIC - PHASE 1B
S.R. 149

BEL-149-23.44

R9
R31


G20-2-48
STA. 97+08
END
ROAD WORK
VARIES
5'
1.5'
10' MIN.
10' MIN.
1' SHOULDER
ROADWAY WORK AREA
TEMPORARY STRIPING
CONSTRUCTION DRUM
EX. PAVEMENT
TEMPORARY PAVEMENT
SECTION A-A
DURING WORKING HOURS
N.T.S
3:1 AGGREGATE WEDGE TO BE PROVIDED DURING NON-WORKING HOURS
SECTION A-A
DURING NON-WORKING HOURS
N.T.S
200' CENTERLINE SHIFT (L=6.5'X45MPH/2=147' REQUIRED)
10' TYP.
45' TYP.
BREAK LINE B
BREAK LINE A
500'
Ex R/W
BELMONT MORRISTOWN ROAD (S.R. 149)
LOVE'S DRIVEWAY
PT: 14+37.23
EXISTING EDGE LINETO REMAIN
EXISTING CENTER LINE TO REMAIN
MATCHLINE STA 116+50 - SEE BELOW
INSTALL TEMPORARY PAVEMENT TO PROVIDE MINIMUM 10' TRAVEL LANES EACH DIRECTION ON S.R. 149. ACCESS TO EXISTING RESIDENTIAL DRIVEWAYS MUST BE MAINTAINED. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS AND GUIDELINES AND ODOT SCD MT-97.11. SEE SHEET R7 FOR TEMPORARY PAVEMENT SECTION NOTES. RELOCATE SIGNAGE IMPACTED BY TEMPORARY PAVEMENT; RESTORE SIGNAGE TO ORIGINAL STATE AFTER PROJECT IS COMPLETED.
ROAD WORK AHEAD
W20-1-48
STA. 92+08
TYPE A WARNING LIGHT
W1-4R-48
STA. 97+08
NOTES:
1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
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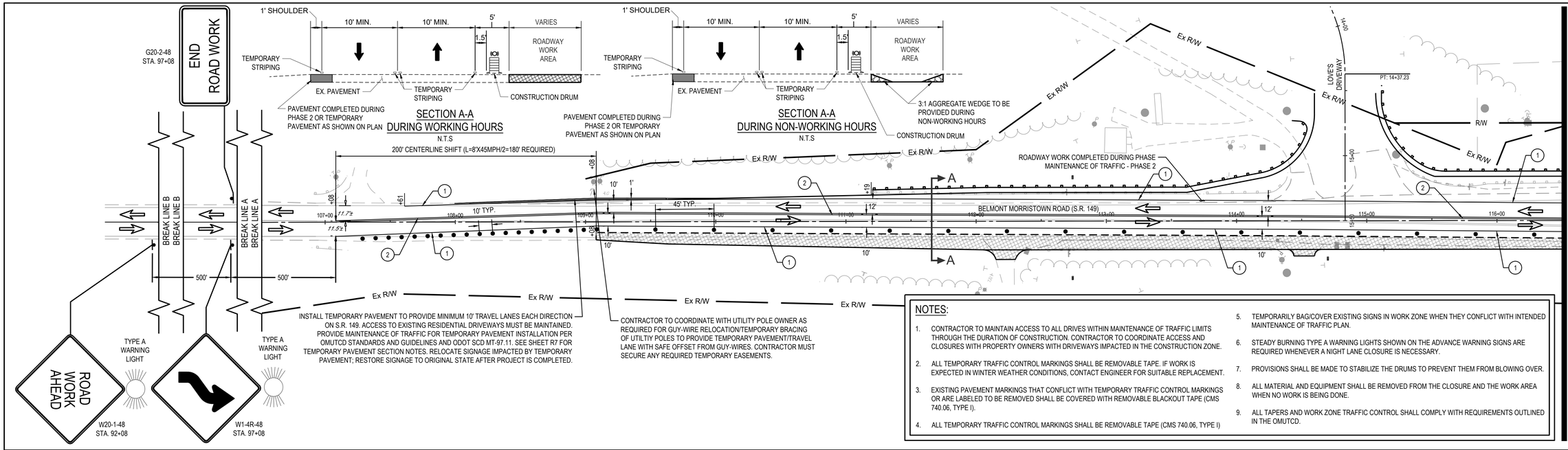
9. ALL TAPERS AND WORK ZONE TRAFFIC CONTROL SHALL COMPLY WITH REQUIREMENTS OUTLINED IN THE OMUTCD.
LEGEND
CONSTRUCTION DRUM
TEMPORARY CONSTRUCTION SIGN
ROADWAY WORK AREA
TEMPORARY PAVEMENT
DIRECTION OF TRAVEL
1 TEMPORARY EDGE LINE (6" WHITE)
2 TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
3 TEMPORARY STOP BAR (24", WHITE)
W20-5-48
STA. 9+81
ROAD WORK AHEAD
TYPE A WARNING LIGHT
W1-4L-48
STA. 10+81
RECO DRIVE
CONSTRUCTION ℄
END
ROAD WORK
G20-2-48
STA. 10+81
PROVIDE TEMPORARY STOP SIGN R1-1 FOR OUTBOUND TRAFFIC
275' CENTERLINE SHIFT (L=8'X45MPH/2=180' REQUIRED)
EXISTING SKIP DASH LINE TO BE COVERED WITH BLACKOUT TAPE; PASSING BLISTER (LEFT TURN LANE) TO BE CLOSED TEMPORARILY DURING PHASE 2
SOUTH MARATHON DRIVEWAY
NORTH MARATHON DRIVEWAY
EXISTING CENTER LINE TO REMAIN
EXISTING EDGE LINETO REMAIN
EXISTING NORTHBOUND THROUGH LANE AND RIGHT TURN LANE TO REMAIN OPEN
MATCHLINE STA 116+50 - SEE ABOVE
VARIES
5' MIN.
1.5' MIN.
12' MIN.
EXISTING LANE WIDTH
EXISTING LANE MARKING
SECTION B-B
DURING WORKING HOURS
N.T.S
3:1 AGGREGATE WEDGE TO BE PROVIDED DURING NON-WORKING HOURS
SECTION B-B
DURING NON-WORKING HOURS
N.T.S
ROAD WORK AHEAD
W20-1-48
W1-4R-48
STA. 132+11
W20-1-48
STA. 137+11
BREAK LINE C
BREAK LINE C
1000'
L-70 EB EXIT RAMP
L-70 EB ENTRANCE RAMP
BELMONT MORRISTOWN ROAD (S.R. 149)
CONSTRUCTION ℄
BREAK LINE F
BREAK LINE G
BREAK LINE I
END
ROAD WORK
G20-2-48
STA. 132+11
G20-2-48
END
ROAD WORK
GRAPHIC SCALE (IN FEET)
CALCULATED
PJD
CHECKED
TDH
MAINTENANCE OF TRAFFIC - PHASE 2
S.R. 149
BEL-149-23.44
R10
R31
COPYRIGHT: THESE DRAWINGS ARE THE PROPERTY OF CESO, INC.
W:\PROJECTS\LOVES\759267 - ST. CLAIRSVILLE, OH - SR 149\03-CIVIL\PLAN\ROADWAY\PLOT\759267_MP002.DWG - 4/30/2024 8:30:00 AM



NOTES:

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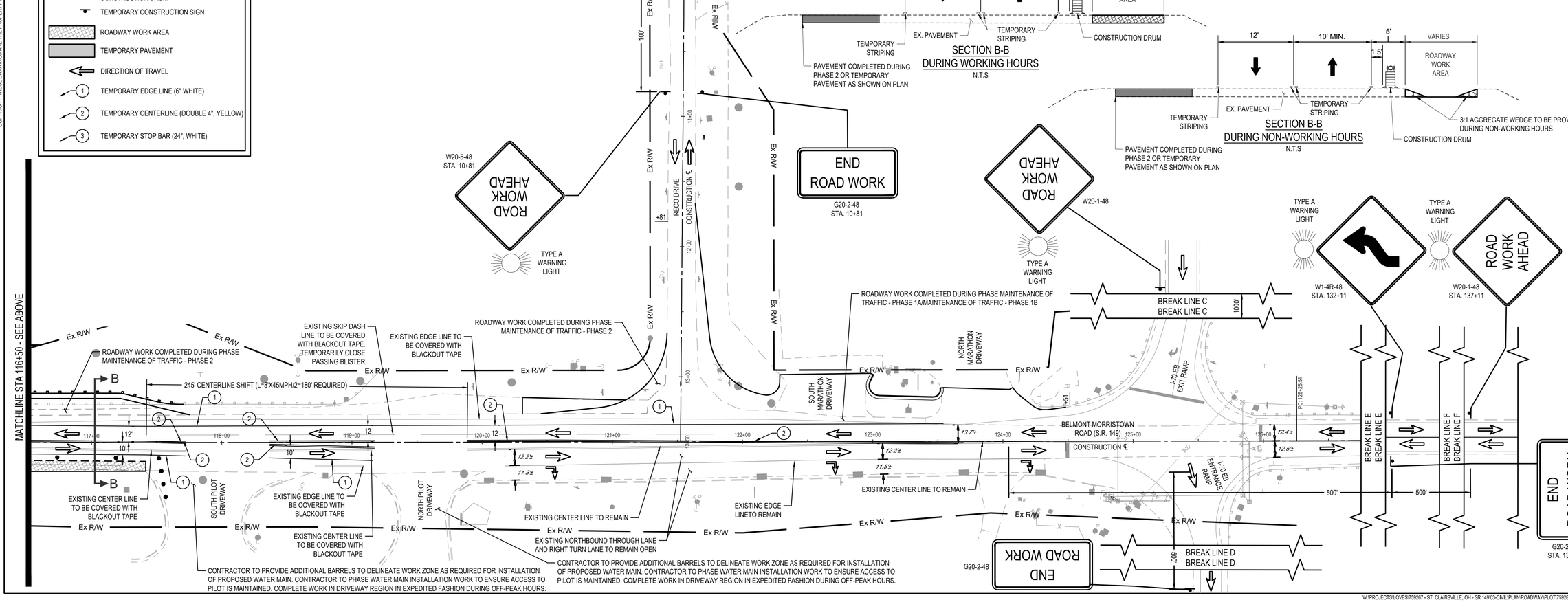
LEGEND

- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)



GRAPHIC SCALE (IN FEET)
80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH

MAINTENANCE OF TRAFFIC - PHASE 3
S.R. 149

BEL-149-23.44

R11
R31

SITE DESCRIPTION

CONSTRUCTION TO WIDEN EAST AND WEST SIDE OF S.R. 149 TO PROVIDE 175' NB LEFT TURN LANE INTO LOVE'S DRIVEWAY, 175' SB RIGHT-TURN LANE INTO LOVE'S DRIVEWAY, 164' TWLTL BETWEEN SOUTH PILOT DRIVEWAY & NORTH PILOT DRIVEWAY, 125' NB LEFT TURN LANE INTO RECO DRIVE, 200' SB RIGHT TURN LANE INTO RECO DRIVE AND ASSOCIATED LANE RECONFIGURATION TO ACCOMMODATE AFOREMENTIONED IMPROVEMENTS. CONSTRUCTION TO WIDEN RECO DRIVE AND INSTALLATION OF TRAFFIC SIGNAL AT S.R. 149 & RECO DRIVE INTERSECTION. DITCH AND SLOPE GRADING AND INSTALLATION OF NECESSARY TRAFFIC CONTROL DEVICES. STORMWATER STRUCTURE AND CONDUIT MODIFICATIONS BETWEEN SOUTH MARATHON DRIVEWAY AND NORTH MARATHON DRIVEWAY.

NOI AND BMP NOTE

NOI AND BMP'S FOR ROADWAY WORK ARE INCLUDED WITH OVERALL SITE SUBMISSION FOR LOVE'S TRAVEL STOP DEVELOPMENT.

EARTH DISTURBED AREAS AND TOTAL AREA OF PROJECT

TOTAL AREA OF PROJECT: 1.95 ACRES
PROJECT EARTH DISTURBING ACTIVITIES AREA: 1.65 ACRES
CONTRACTOR EARTH DISTURBING ACTIVITIES AREA: 0.30 ACRES
NOI EARTH DISTURBING ACTIVITIES AREA: 1.95 ACRES

SITE LOCATION

LAT = N 40° 03' 27"
LONG = W 81° 03' 09"

REFER TO PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES PLAN BY TERRACON DATED 4-8-2024 FOR SPECIAL REINFORCED SOIL SLOPE (RSS) DESIGN FROM STA. 112+80 TO STA. 113+33.

SEED AND MULCHING, CLASS 2 PER ODOT ITEM 659. CONTRACTOR TO ESTABLISH PERMANENT VEGEATATIVE COVER FOR ALL DISTURBED EARTH AREAS (TYP.)

REFER TO SITE PLANS FOR SITE GRADING. ROADWAY CONTRACTOR TO COORDINATE GRADING TIE IN AND ON SITE SWPPP MEASURES WITH SITE CONTRACTOR

REFER TO SITE PLANS FOR SITE GRADING. ROADWAY CONTRACTOR TO COORDINATE GRADING TIE IN AND ON SITE SWPPP MEASURES WITH SITE CONTRACTOR

BELMONT MORRISTOWN ROAD (S.R. 149)
CONSTRUCTION ℄

LOVE'S DRIVEWAY
15+50
CONSTRUCTION ℄

SEED AND MULCHING, CLASS 2 PER ODOT ITEM 659. CONTRACTOR TO ESTABLISH PERMANENT VEGEATATIVE COVER FOR ALL DISTURBED EARTH AREAS (TYP.)

REFER TO PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES PLAN BY TERRACON DATED 4-8-2024 FOR SPECIAL EMBANKMENT SLOPE DESIGN FROM STA. 113+00 TO STA. 113+50.

REFER TO PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES PLAN BY TERRACON DATED 4-8-2024 FOR SPECIAL EMBANKMENT SLOPE DESIGN FROM STA. 115+73 TO STA. 117+35.

MATCHLINE STA 117+00 - SEE BELOW

MATCHLINE STA 117+00 - SEE ABOVE

RECO DRIVE
CONSTRUCTION ℄
13+00

SOUTH PILOT DRIVEWAY

NORTH PILOT DRIVEWAY

EXISTING LAND USE
452-AUTOMOTIVE
SERVICE STATION

SOUTH MARATHON DRIVEWAY

NORTH MARATHON DRIVEWAY

EXISTING LAND USE
452-AUTOMOTIVE
SERVICE STATION

SEED AND MULCHING, CLASS 2 PER ODOT ITEM 659. CONTRACTOR TO ESTABLISH PERMANENT VEGEATATIVE COVER FOR ALL DISTURBED EARTH AREAS (TYP.)

REPLACE EXISTING ROCK CHANNEL PROTECTION IMPACTED BY GRADING ACTIVITY IN TYPE AND KIND

I-70 EB EXIT RAMP

I-70 EB ENTRANCE RAMP

KEY

- 962 — EXISTING CONTOUR
- 962 — PROPOSED CONTOUR, COORDINATE WITH SITE GRADING PLANS
- LOD — GRADING/SEEDING LIMITS (L.O.D. - LIMITS OF DISTURBANCE)
- SF — SF — SILT FENCE
- DC — DITCH CHECK (ODOT SCD DM-4.4)
- IP — INLET PROTECTION (ODOT SCD DM-4.4)
- RC — ROCK CHANNEL PROTECTION
- WL — EXISTING WETLAND - DO NOT DISTURB
- SM — SEEDING AND MULCHING
- FLOW ARROW
- EM — TEMPORARY EROSION CONTROL MAT, TYPE B

SWPPP NOTES:

1. CONTRACTOR IS RESPONSIBLE TO MAINTAIN POST-CONSTRUCTION PERMANENT EROSION CONTROL MEASURES UNTIL ADEQUATE RE-VEGETATION AND STABILIZATION ARE ACHIEVED.
2. CONTRACTOR TO PLACE SILT FENCE (PER ODOT SCD DM-4.4) AS SHOWN AND AS NEEDED IN THE FIELD TO RETAIN ALL SOILS ON THE DISTURBED LAND AND PREVENT RUNOFF INTO THE SURROUNDING STORMWATER SYSTEM.
3. ALL ITEMS SHALL BE LOCATED, FURNISHED AND INSTALLED PER ODOT REQUIREMENTS/STANDARDS AND SPECIFICATIONS.
4. TOTAL DISTURBED AREA FOR ENTIRE ROADWAY PROJECT: 1.77 ACRES

RATIONAL METHOD RUNOFF COEFFICIENT

PRECONSTRUCTION = 0.70
POST CONSTRUCTION = 0.72
(0.9 USED FOR PAVEMENT, 0.6 USED FOR LAWN)

ESTIMATE OF IMPERVIOUS AREA

PRE-CONSTRUCTION = 0.3829 ACRES
POST-CONSTRUCTION = 0.7850 ACRES
AREAS OBTAINED FROM REGION WITHIN SAWCUT LIMITS

IMMEDIATE RECEIVING STREAM OR SURFACE WATER:

IMMEDIATE RECEIVING STREAM: UPPER MCMAHON CREEK
SUBSEQUENT RECEIVING WATERS: OHIO RIVER

USGS 7.5-MINUTE QUADRANGLE MAP:

NAME: BETHESDA QUADRANGLE
NUMBER: 466004

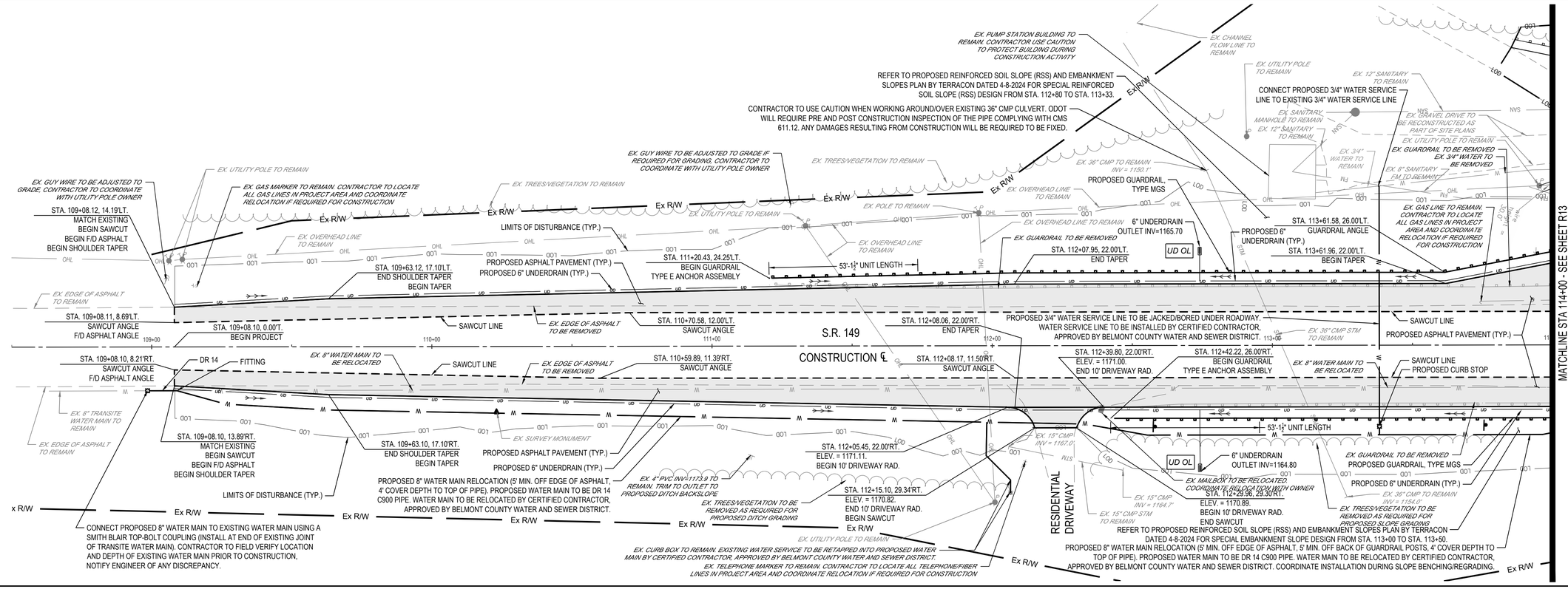
GRAPHIC SCALE (IN FEET)
60 30 0 15 30

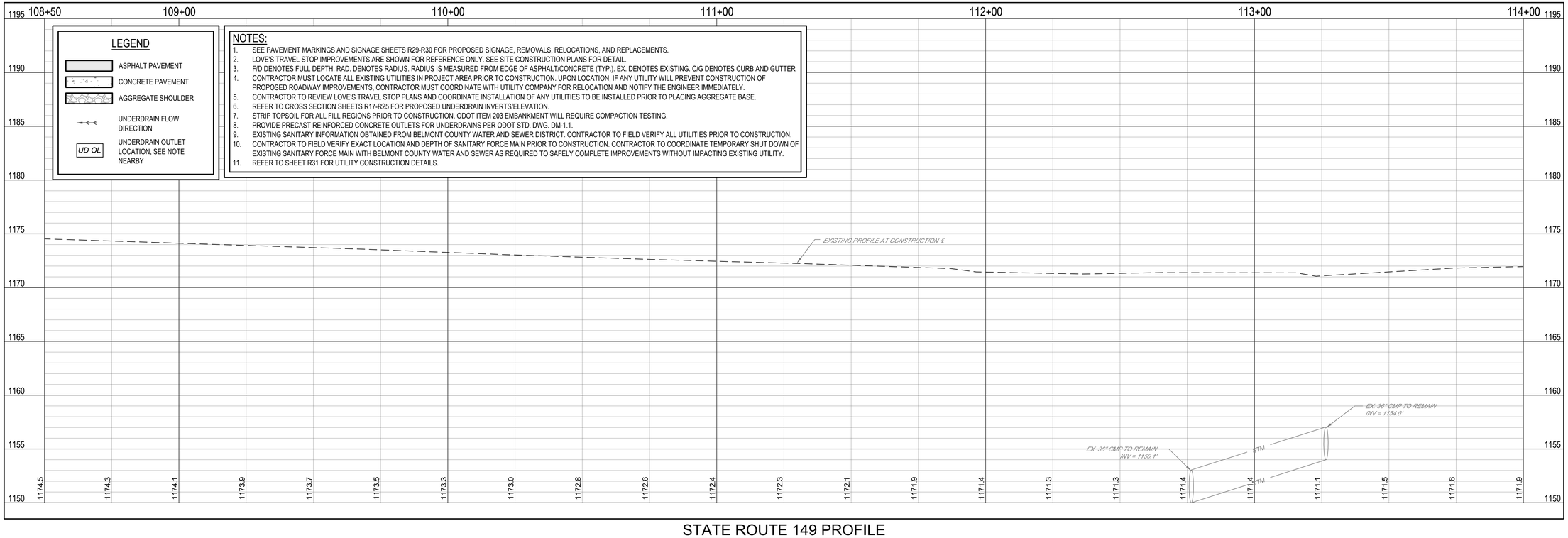
CALCULATED PJD
CHECKED TDH

SITE PLAN
S.R. 149

BEL-149-23.44

R12
R31





STATE ROUTE 149 PROFILE

Scale: 1" = 20' Horiz.; 1" = 5' Vert.

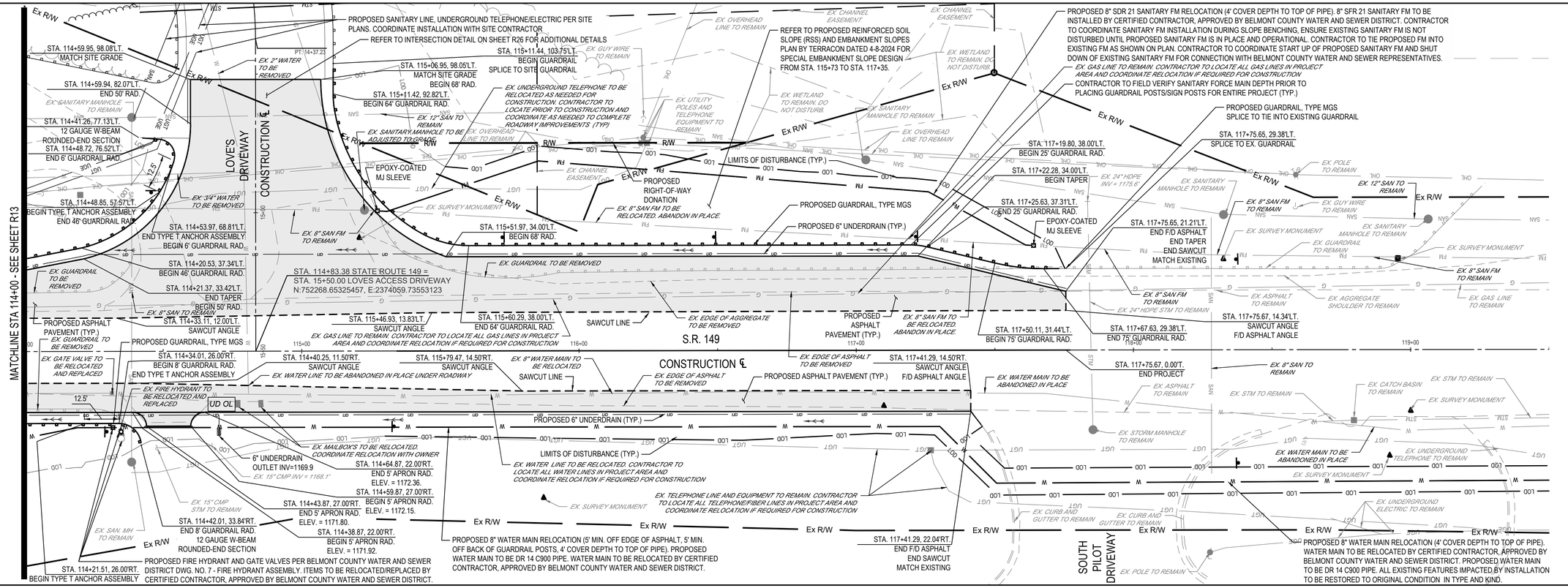
GRAPHIC SCALE (IN FEET)
40 20 0 10 20

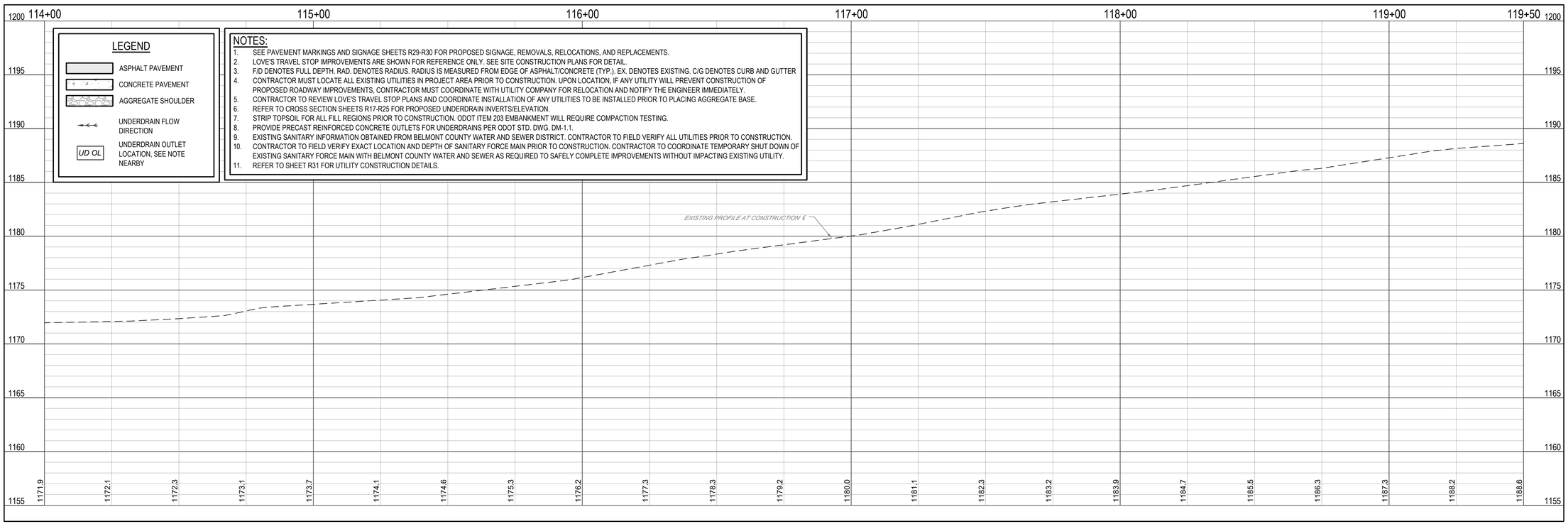
CALCULATED PJD
CHECKED TDH

PLAN & PROFILE - STA. 108+50 TO STA. 114+00
S.R. 149

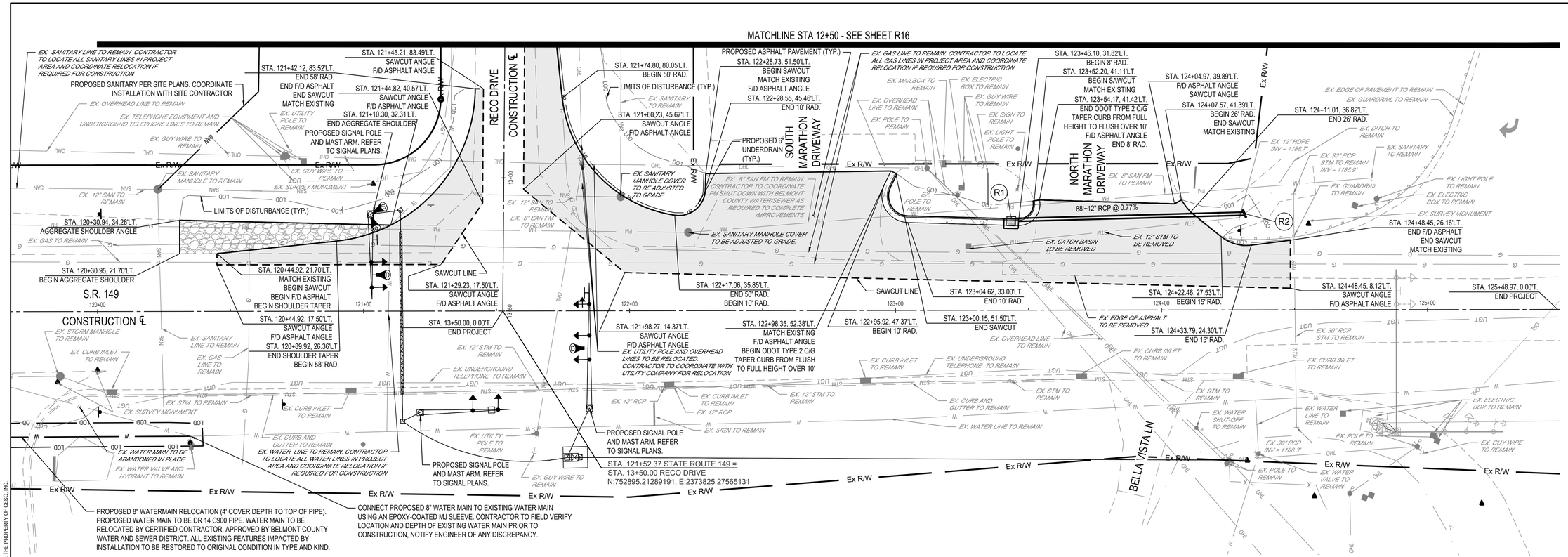
BEL-149-23.44

R13
R31





STATE ROUTE 149 PROFILE
Scale: 1" = 20' Horiz.; 1" = 5' Vert.



LEGEND

- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- AGGREGATE SHOULDER
- UNDERDRAIN FLOW DIRECTION
- UD OL — UNDERDRAIN OUTLET LOCATION, SEE NOTE NEARBY

NOTES:

1. SEE PAVEMENT MARKINGS AND SIGNAGE SHEETS R29-R30 FOR PROPOSED SIGNAGE, REMOVALS, RELOCATIONS, AND REPLACEMENTS.
2. LOVE'S TRAVEL STOP IMPROVEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE SITE CONSTRUCTION PLANS FOR DETAIL.
3. F/D DENOTES FULL DEPTH. RAD. DENOTES RADIUS. RADIUS IS MEASURED FROM EDGE OF ASPHALT/CONCRETE (TYP.). EX. DENOTES EXISTING. C/G DENOTES CURB AND GUTTER
4. CONTRACTOR MUST LOCATE ALL EXISTING UTILITIES IN PROJECT AREA PRIOR TO CONSTRUCTION. UPON LOCATION, IF ANY UTILITY WILL PREVENT CONSTRUCTION OF PROPOSED ROADWAY IMPROVEMENTS, CONTRACTOR MUST COORDINATE WITH UTILITY COMPANY FOR RELOCATION AND NOTIFY THE ENGINEER IMMEDIATELY.
5. CONTRACTOR TO REVIEW LOVE'S TRAVEL STOP PLANS AND COORDINATE INSTALLATION OF ANY UTILITIES TO BE INSTALLED PRIOR TO PLACING AGGREGATE BASE.
6. REFER TO CROSS SECTION SHEETS R17-R25 FOR PROPOSED UNDERDRAIN INVERTS/ELEVATION.
7. STRIP TOPSOIL FOR ALL FILL REGIONS PRIOR TO CONSTRUCTION. ODOT ITEM 203 EMBANKMENT WILL REQUIRE COMPACTION TESTING.
8. PROVIDE PRECAST REINFORCED CONCRETE OUTLETS FOR UNDERDRAINS PER ODOT STD. DWG. DM-1.1.
9. EXISTING SANITARY INFORMATION OBTAINED FROM BELMONT COUNTY WATER AND SEWER DISTRICT. CONTRACTOR TO FIELD VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION.
10. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND DEPTH OF SANITARY FORCE MAIN PRIOR TO CONSTRUCTION. CONTRACTOR TO COORDINATE TEMPORARY SHUT DOWN OF EXISTING SANITARY FORCE MAIN WITH BELMONT COUNTY WATER AND SEWER AS REQUIRED TO SAFELY COMPLETE IMPROVEMENTS WITHOUT IMPACTING EXISTING UTILITY.
11. REFER TO SHEET R31 FOR UTILITY CONSTRUCTION DETAILS.

STORM SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	GRATE	INVERT	STATION/OFFSET
R1	CATCH BASIN NO.3A PER ODOT SCD CB-3A	1192.01	1189.28 (12") N	STA. 123+43.57, 33.89'LT.
R2	HALF-HEIGHT HEADWALL PER ODOT SCD HW-2.2		1188.60 (12") S	STA. 124+31.25, 36.15'LT.

STATE ROUTE 149 PROFILE

Scale: 1" = 20' Horiz.; 1" = 5' Vert.

GRAPHIC SCALE (IN FEET) 40 20 0 10 20

CALCULATED P.JD

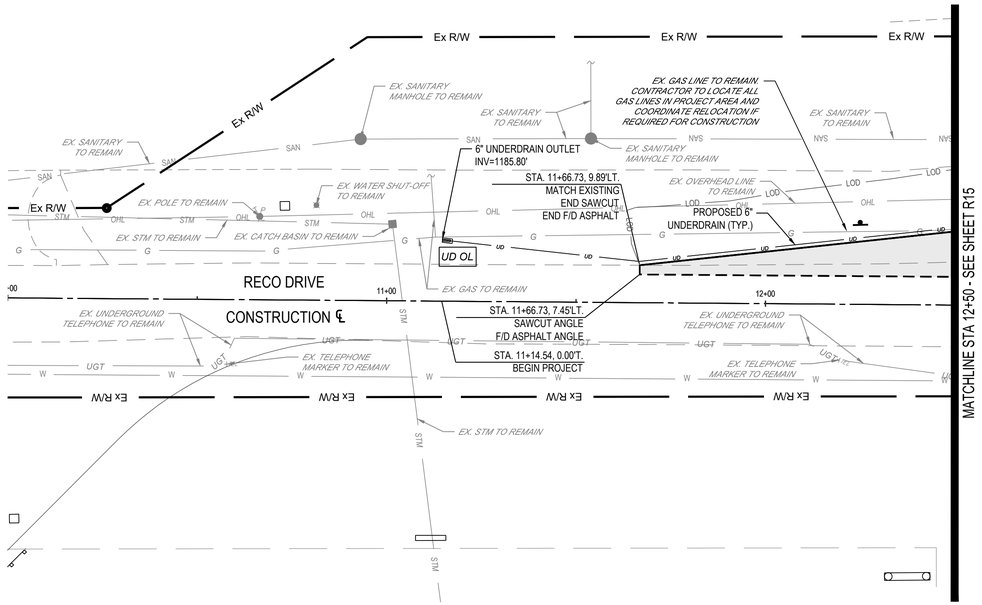
CHECKED TDH

PLAN & PROFILE - STA. 120+00 TO STA. 125+50

S.R. 149

BEL-149-23.44

R15
R31



NOTES:

1. SEE PAVEMENT MARKINGS AND SIGNAGE SHEETS R29-R30 FOR PROPOSED SIGNAGE, REMOVALS, RELOCATIONS, AND REPLACEMENTS.
2. LOVE'S TRAVEL STOP IMPROVEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE SITE CONSTRUCTION PLANS FOR DETAIL.
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6. REFER TO CROSS SECTION SHEETS R17-R25 FOR PROPOSED UNDERDRAIN INVERTS/ELEVATION.
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8. PROVIDE PRECAST REINFORCED CONCRETE OUTLETS FOR UNDERDRAINS PER ODOT STD. DWG. DM-1.1.
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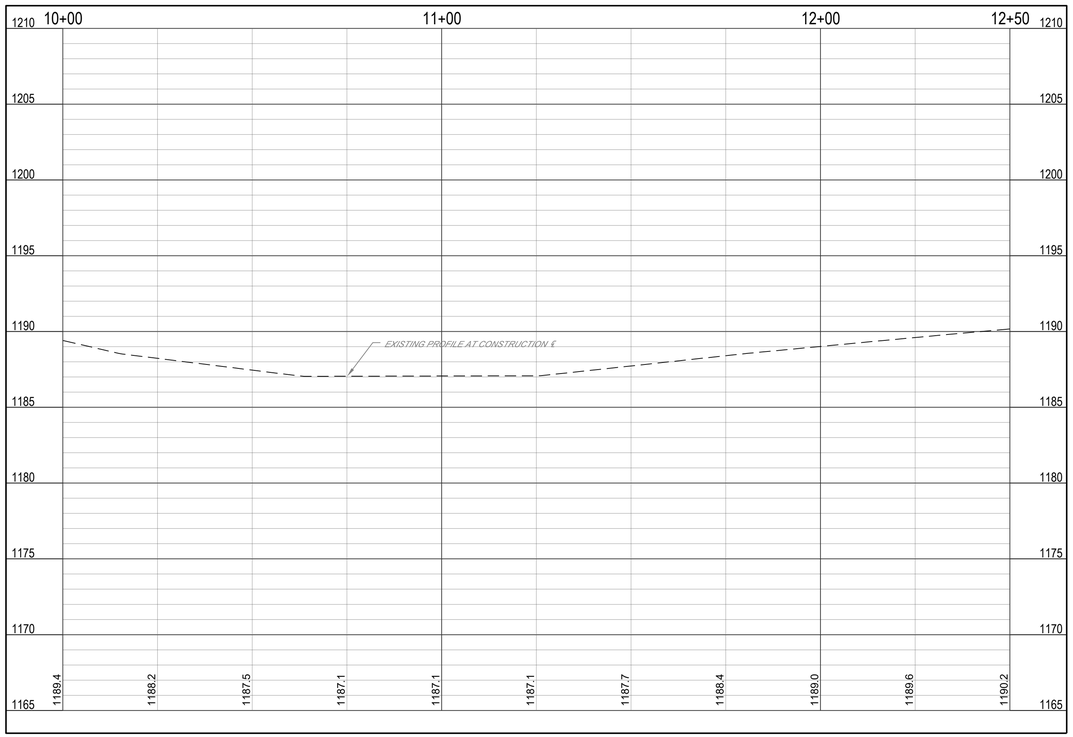
11. REFER TO SHEET R31 FOR UTILITY CONSTRUCTION DETAILS.

LEGEND

- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- AGGREGATE SHOULDER
- UNDERDRAIN FLOW DIRECTION
- UD OL — UNDERDRAIN OUTLET LOCATION, SEE NOTE NEARBY



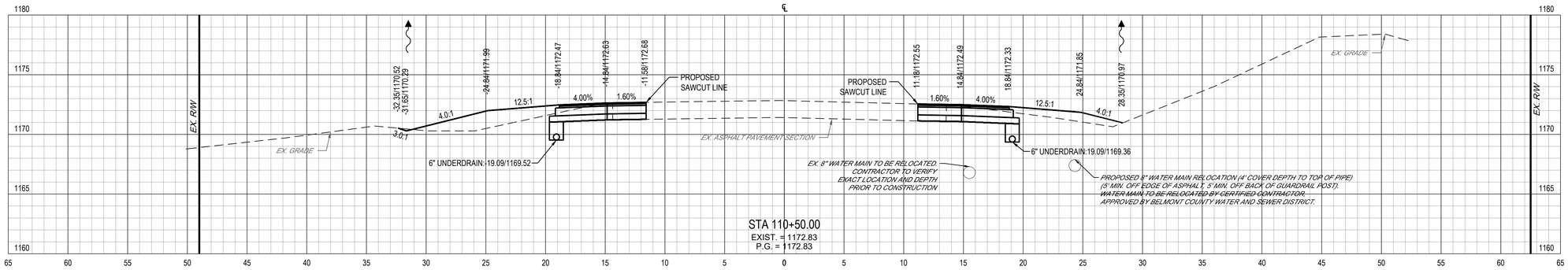
GRAPHIC SCALE (IN FEET)
40 20 0 10 20

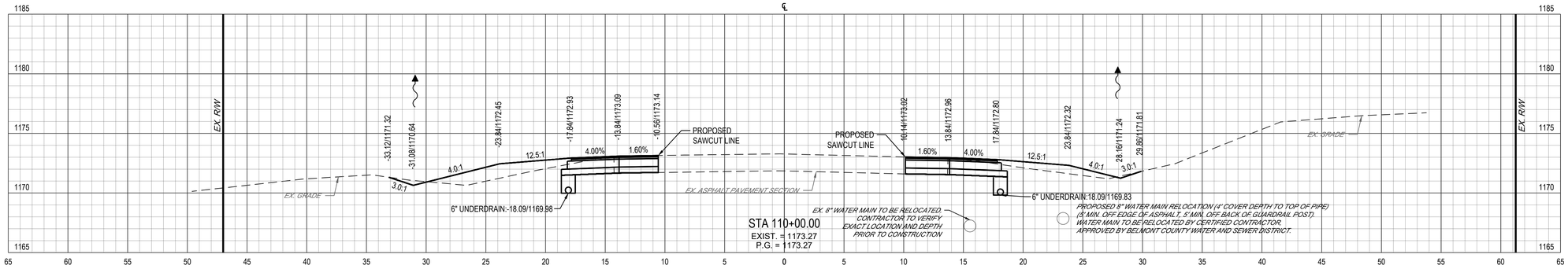
CALCULATED PJD
CHECKED TDH

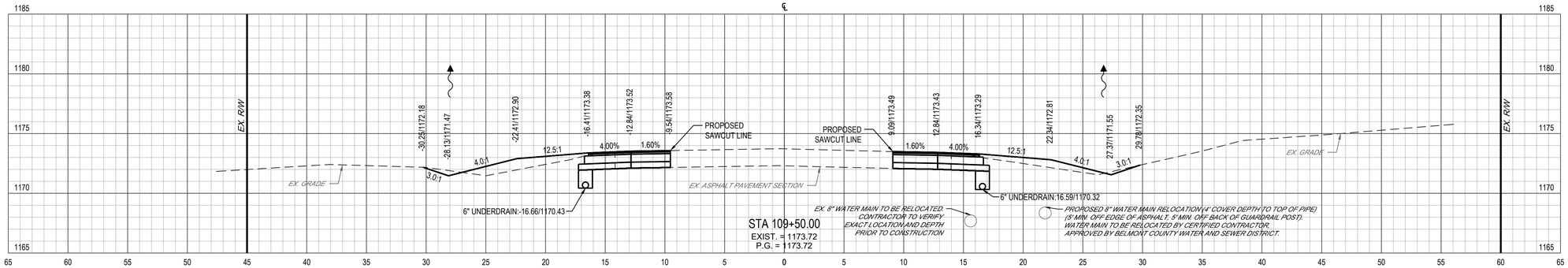
PLAN & PROFILE - RECO DRIVE
S.R. 149

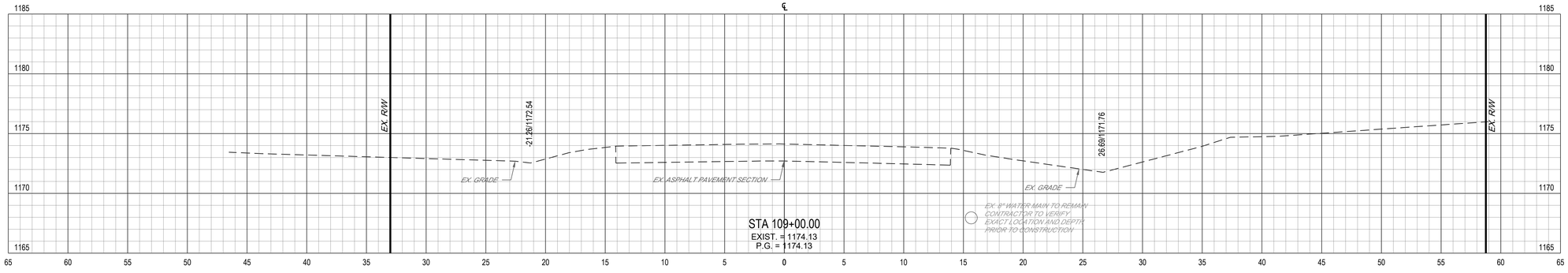
BEL-149-23.44

R16
R31









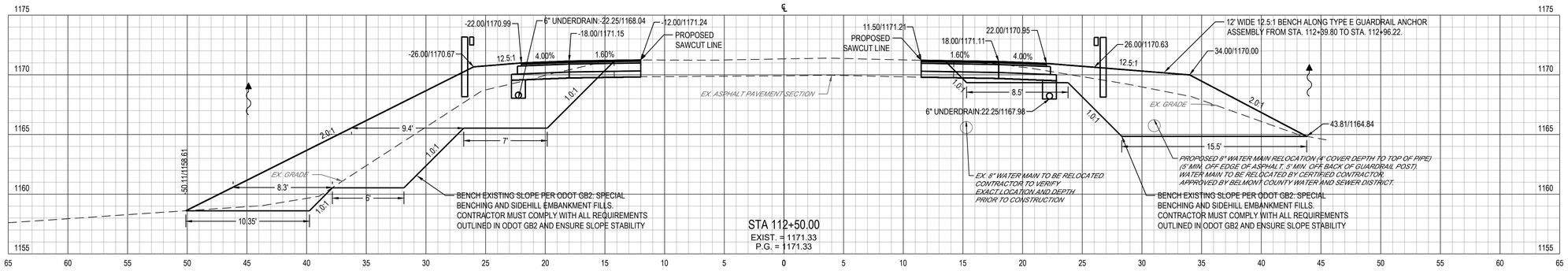
GRAPHIC SCALE (IN FEET)
10 5 0 2.5 5

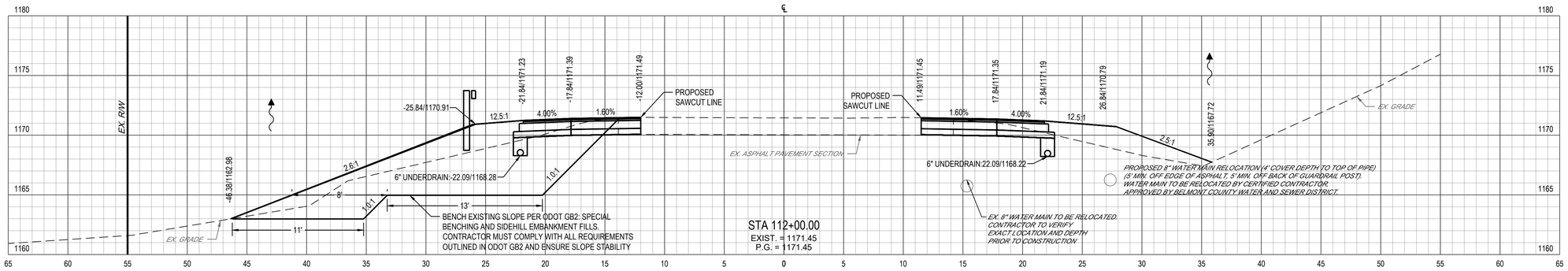
CALCULATED P.JD
CHECKED TDH

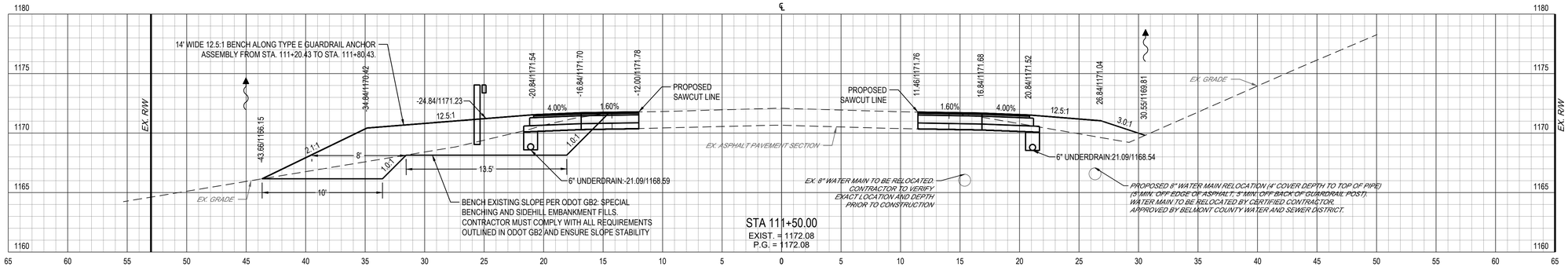
CROSS SECTIONS - STA. 109+00 TO STA. 110+50
S.R. 149

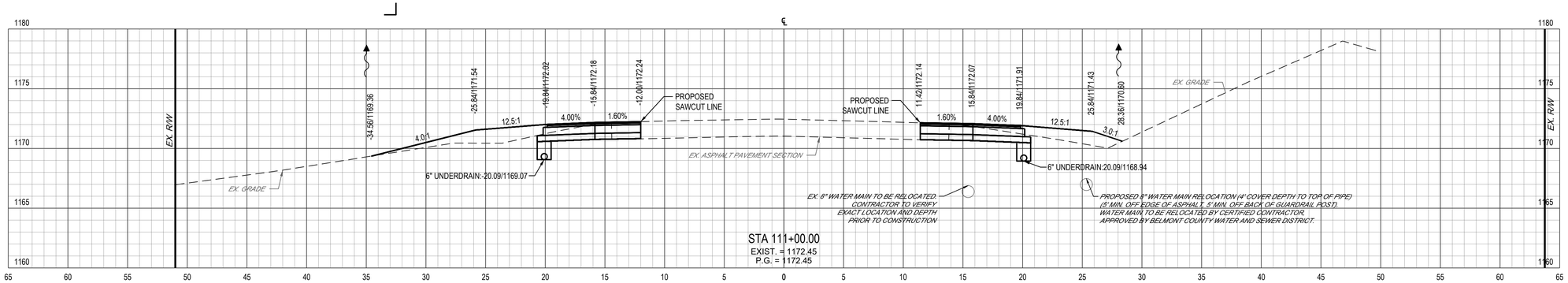
BEL-149-23.44

R17
R31









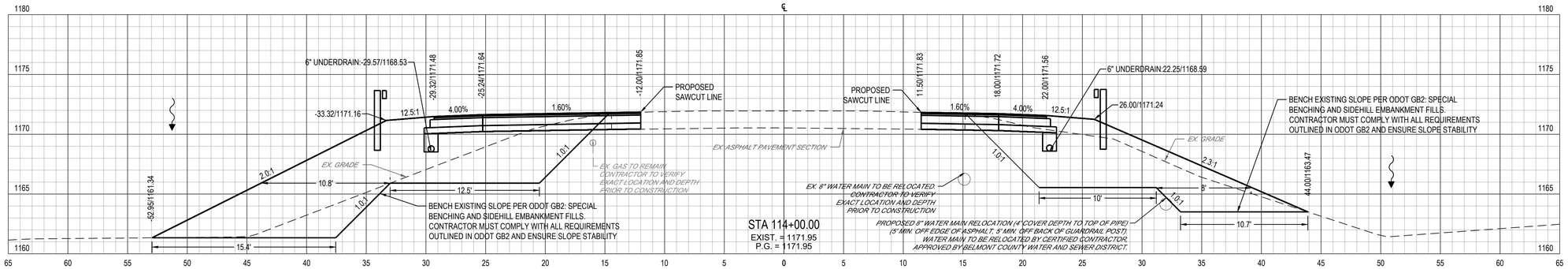
GRAPHIC SCALE (IN FEET)
10 5 0 2.5 5

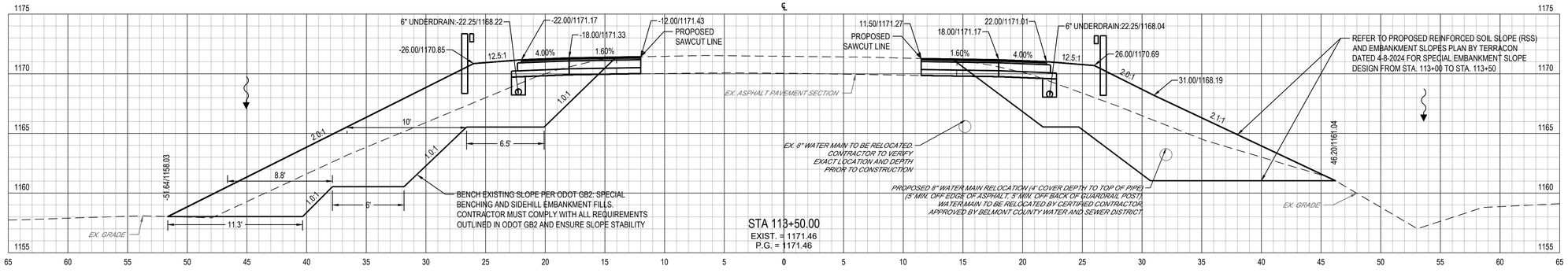
CALCULATED PJD
CHECKED TDH

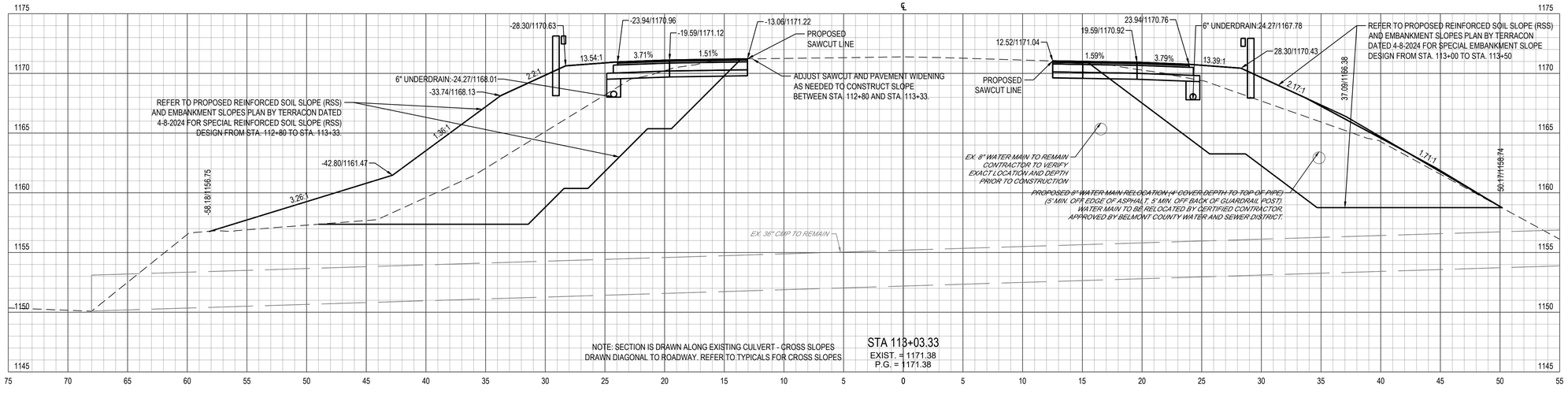
CROSS SECTIONS - STA. 111+00 TO STA. 112+50
S.R. 149

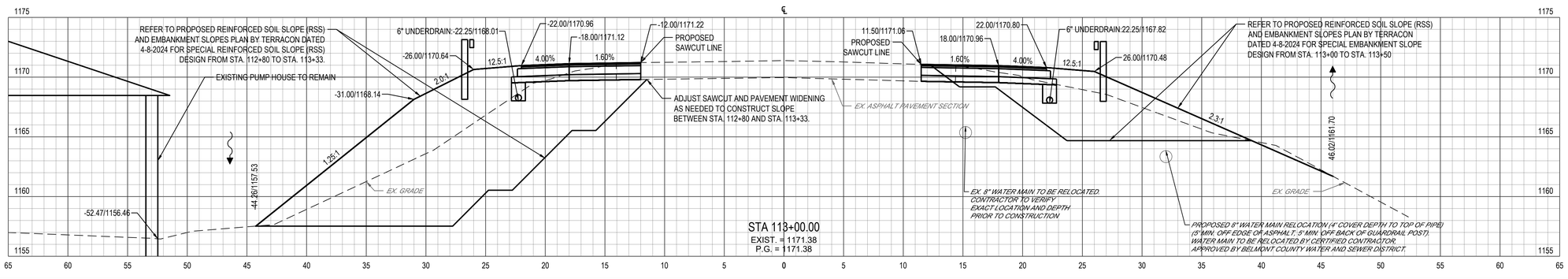
BEL-149-23.44

R18
R31









GRAPHIC SCALE (IN FEET)
10 5 0 2.5 5

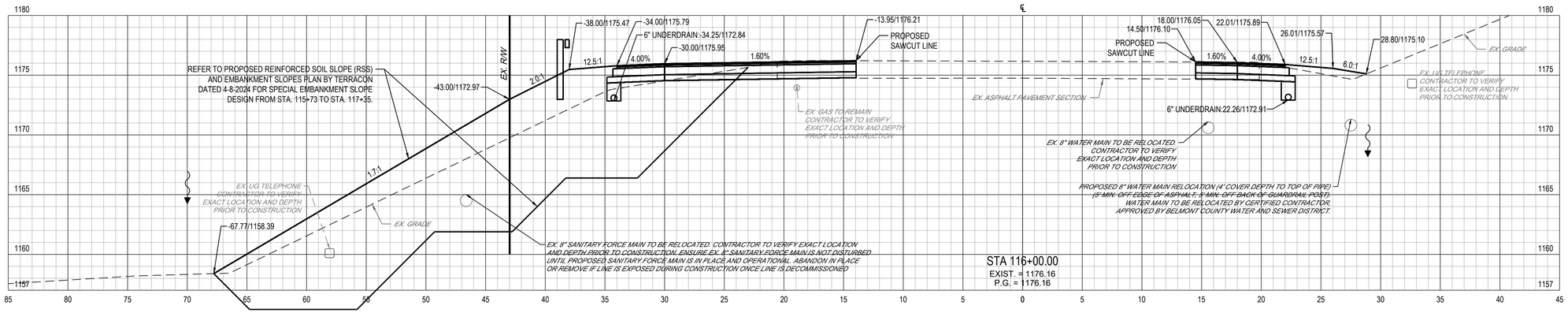
CALCULATED PJD
CHECKED TDH

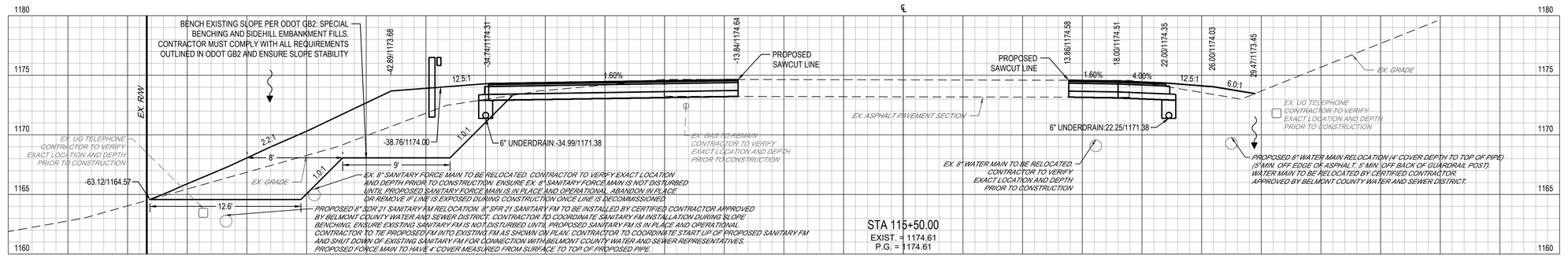
CROSS SECTIONS - STA. 113+00 TO STA. 114+00

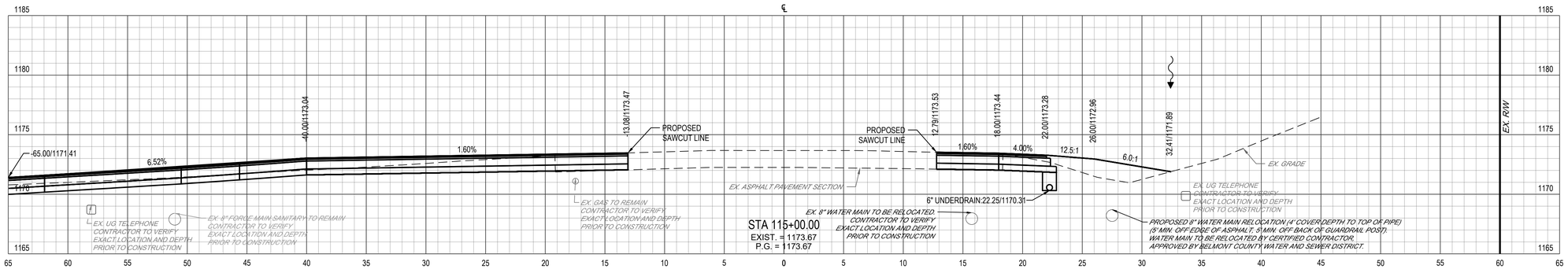
S.R. 149

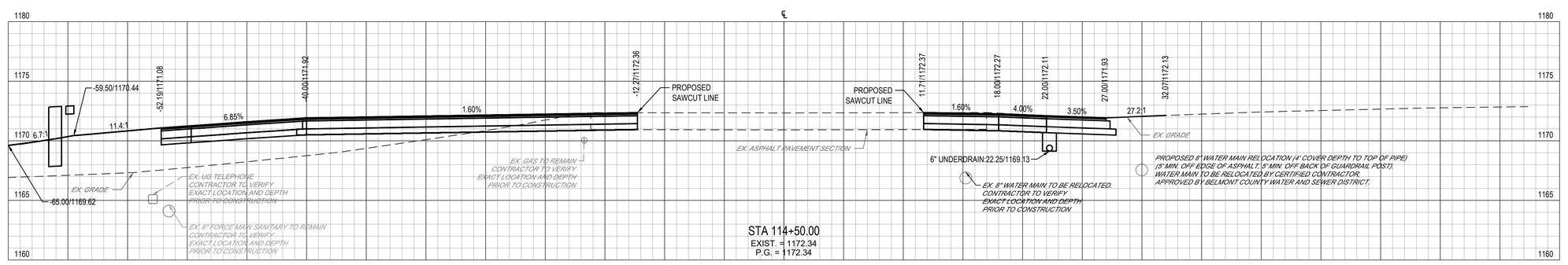
BEL-149-23.44

R19
R31









GRAPHIC SCALE (IN FEET)
10 5 2.5 0 5

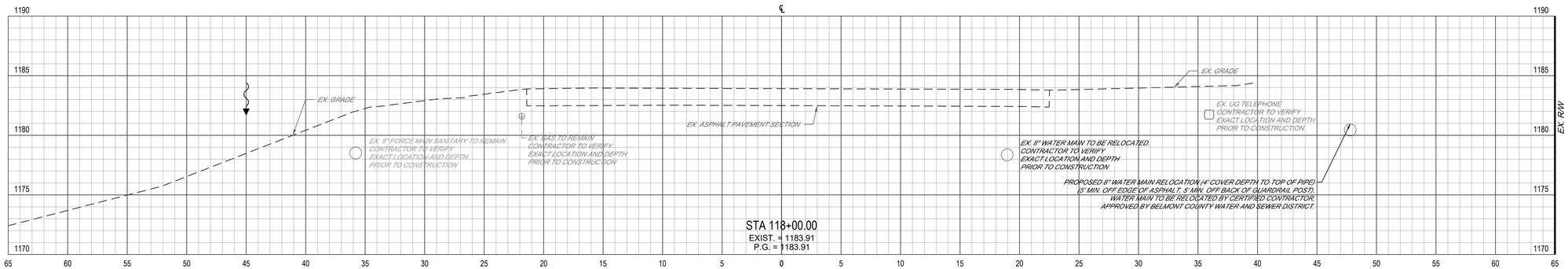
CALCULATED PJD
CHECKED TDH

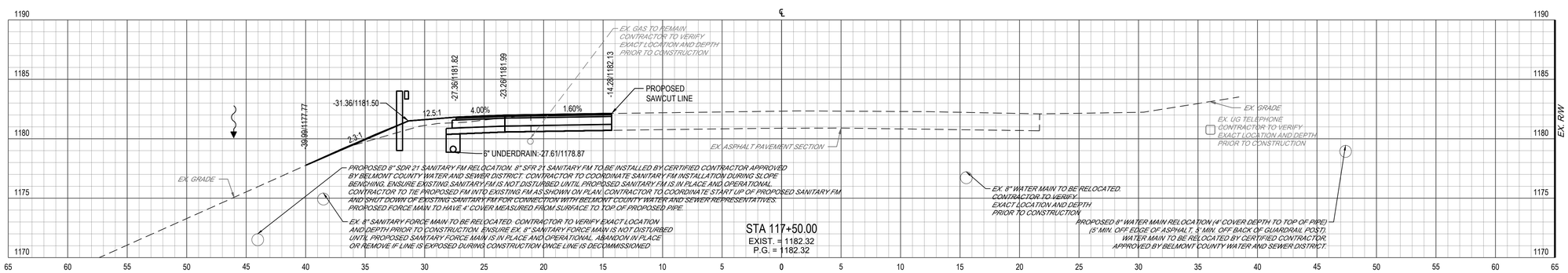
CROSS SECTIONS - STA. 114+50 TO STA. 116+00

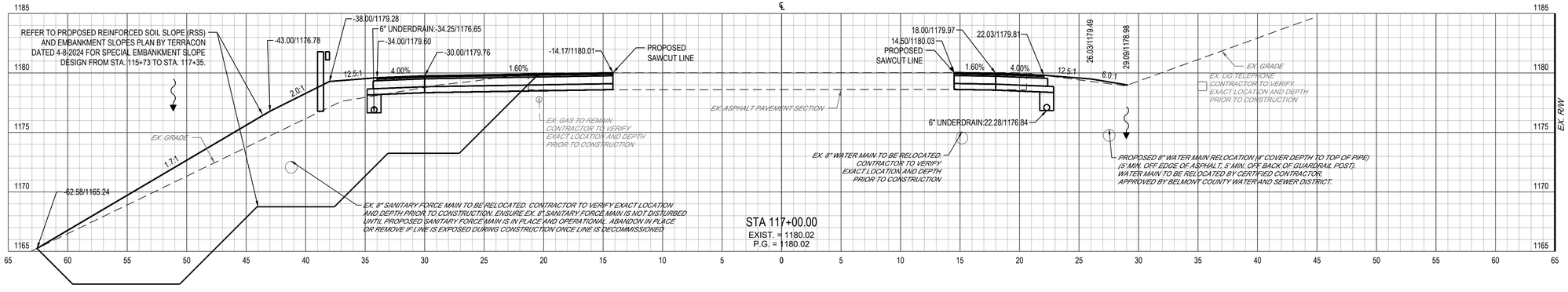
S.R. 149

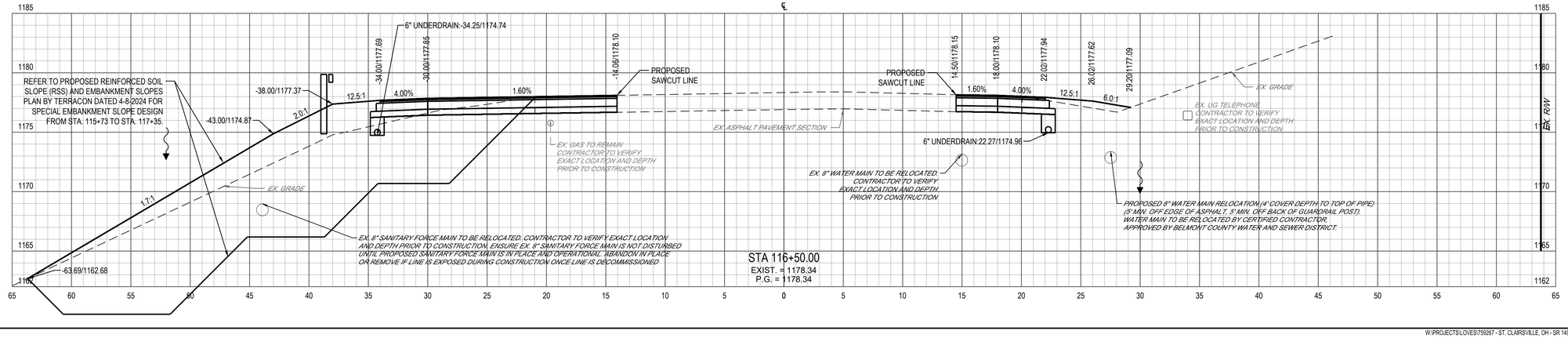
BEL-149-23.44

R20
R31









GRAPHIC SCALE (IN FEET)
10 5 2.5 0 5

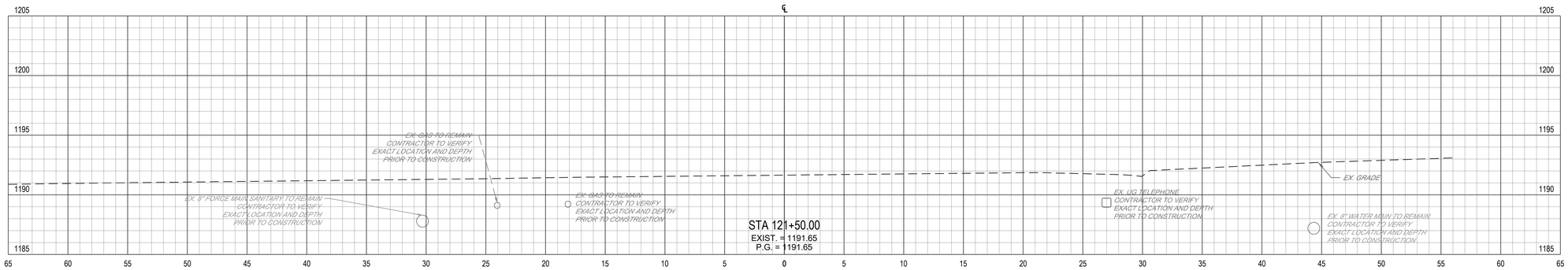
CALCULATED P.JD
CHECKED TDH

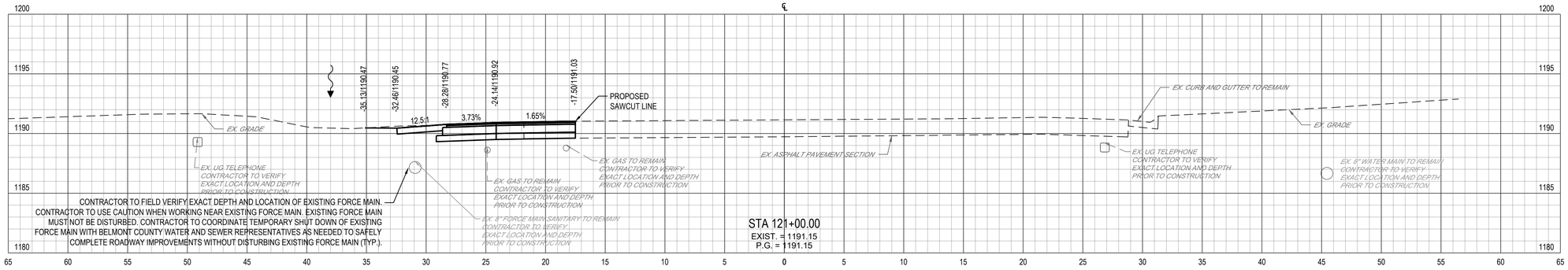
CROSS SECTIONS - STA. 116+50 TO STA. 118+00

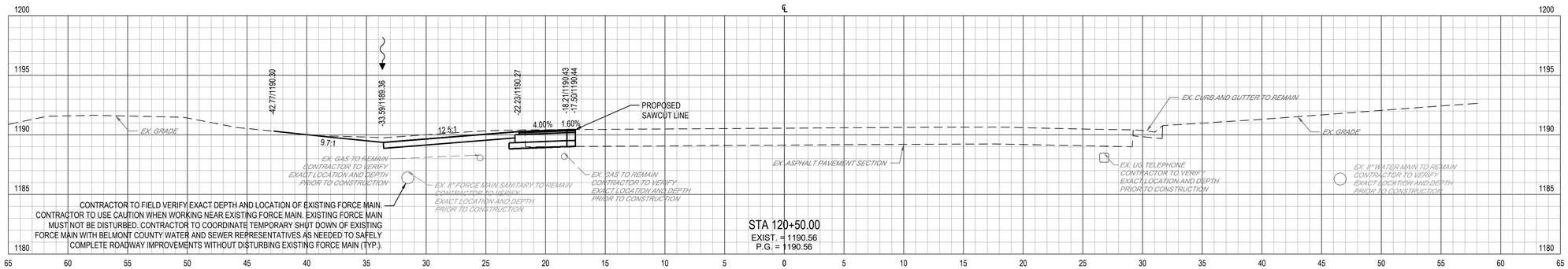
S.R. 149

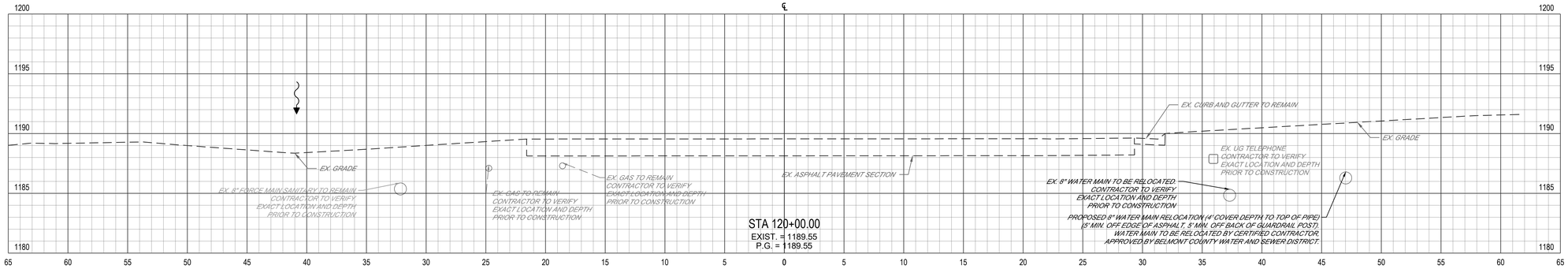
BEL-149-23.44

R21
R31









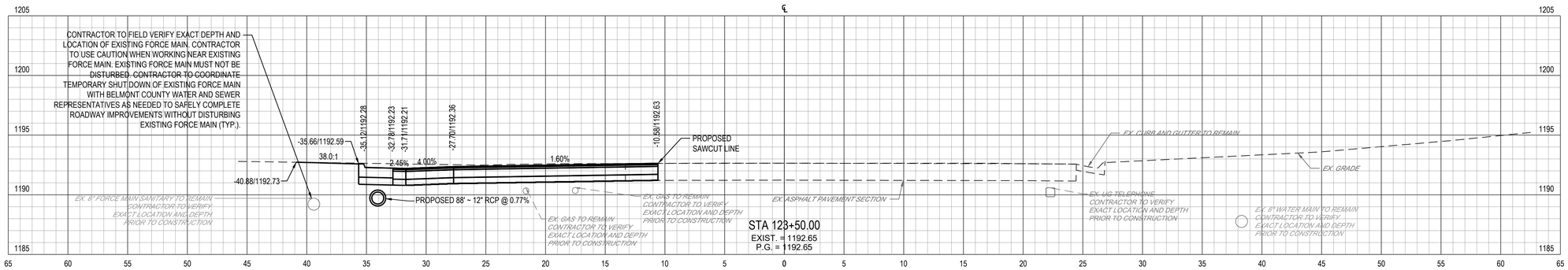
GRAPHIC SCALE (IN FEET)
10 5 2.5 0 5

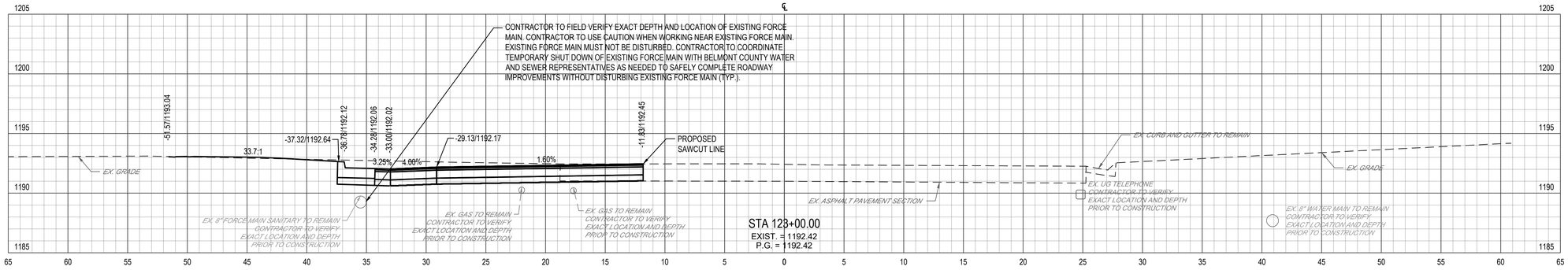
CALCULATED P.JD
CHECKED TDH

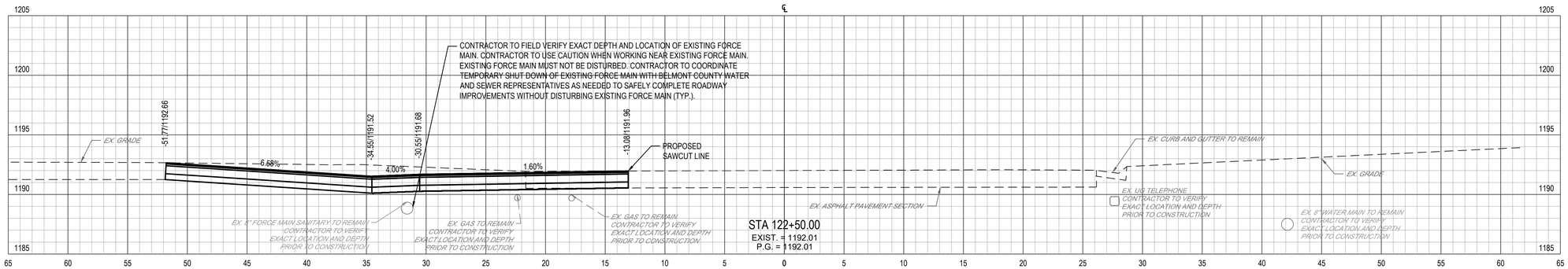
CROSS SECTIONS - STA. 120+00 TO STA. 121+50
S.R. 149

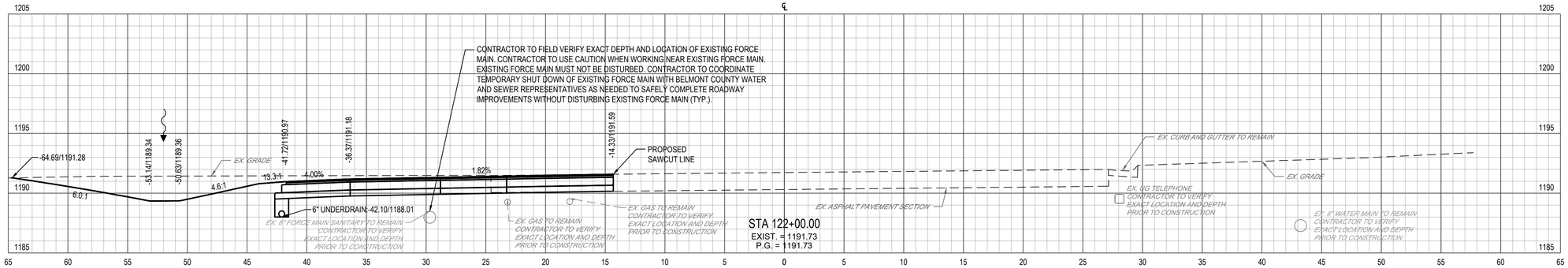
BEL-149-23.44

R22
R31









GRAPHIC SCALE (IN FEET)
10 5 0 2.5 5

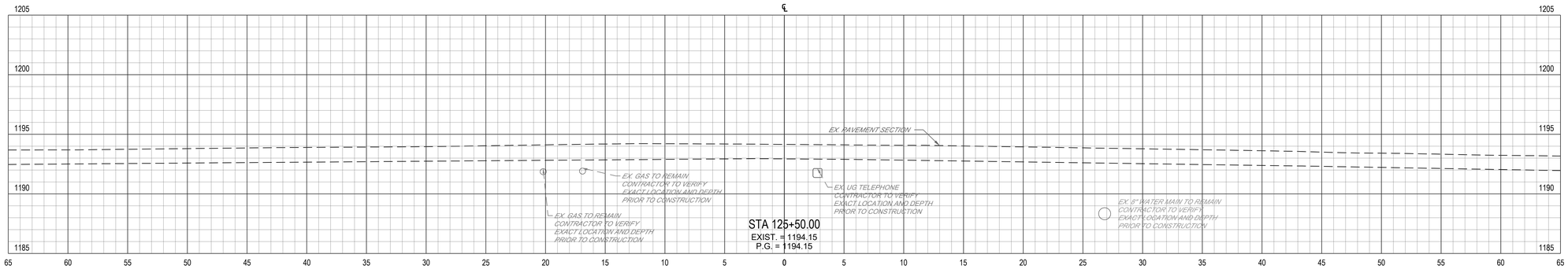
CALCULATED P.JD
CHECKED TDH

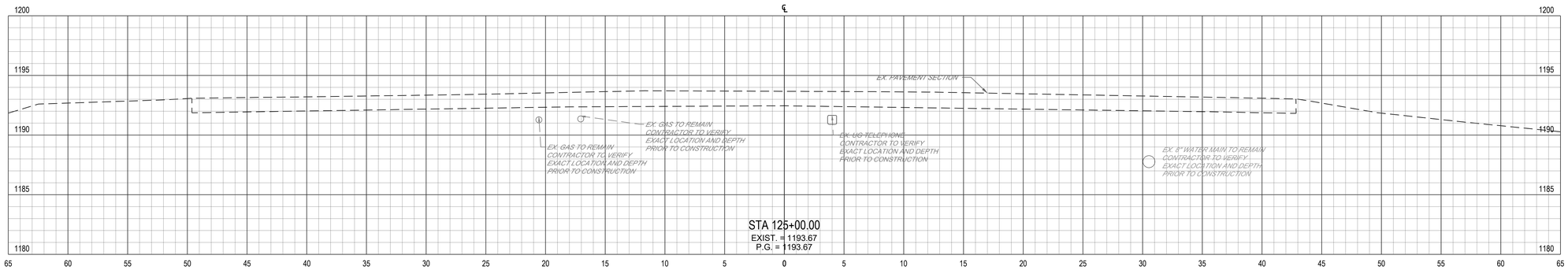
CROSS SECTIONS - STA. 122+00 TO STA. 123+50
S.R. 149

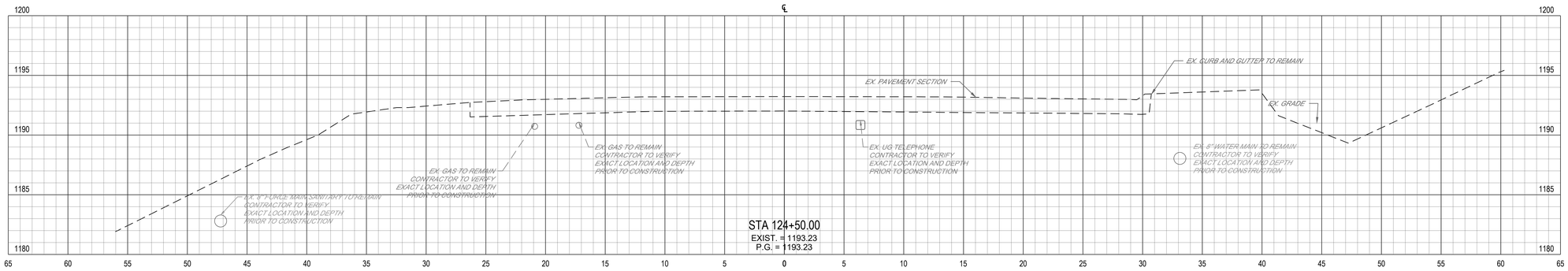
BEL-149-23.44

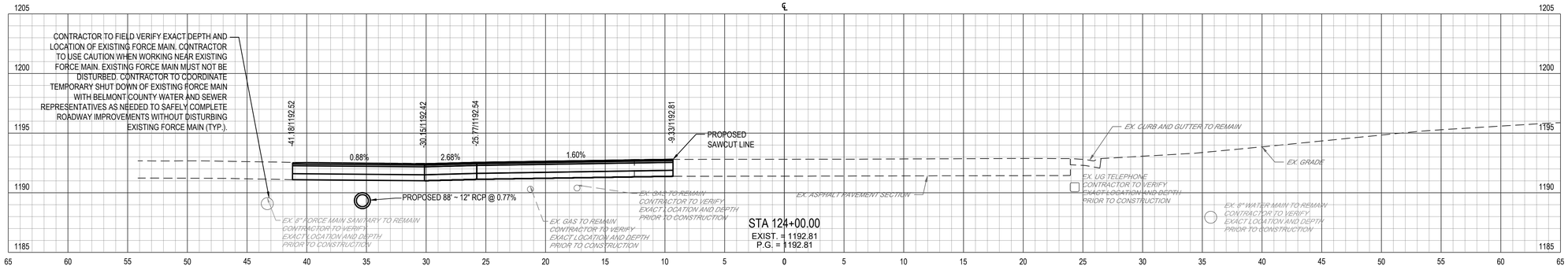
R23
R31

W:\PROJECTS\LOVES\759267 - ST. CLAIRSVILLE, OH - SR 149\03-CIVIL\PLAN\ROADWAY\PLOT\759267_XS001.DWG - 4/30/2024 12:49:02 PM









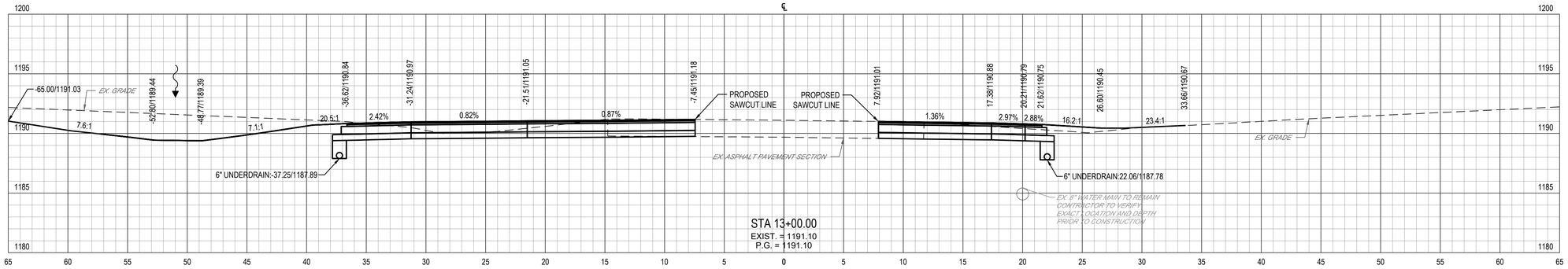
GRAPHIC SCALE (IN FEET)
10 5 2.5 0 5

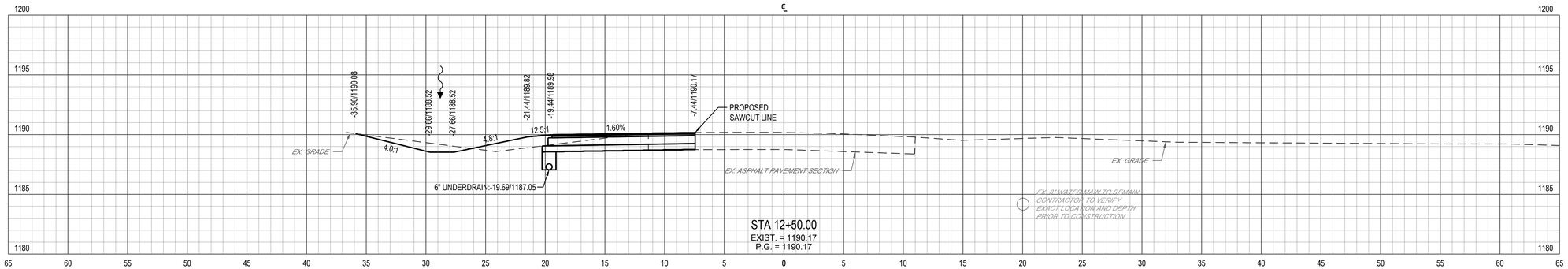
CALCULATED PJD
CHECKED TDH

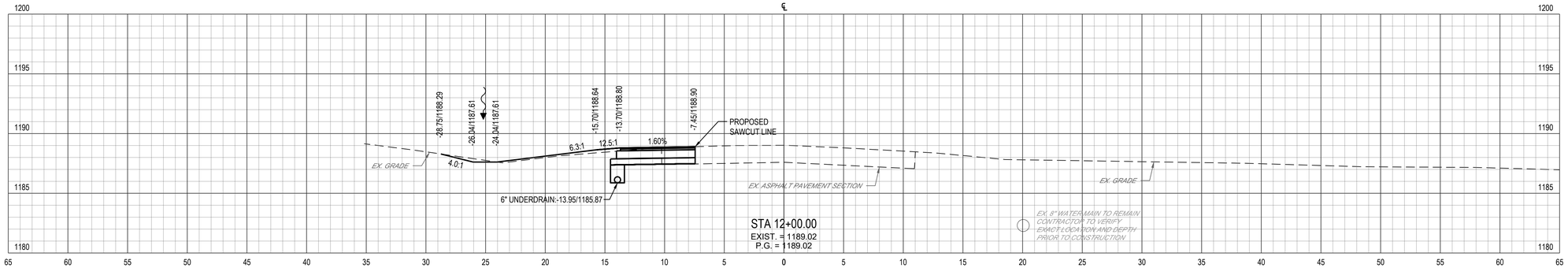
CROSS SECTIONS - STA. 124+00 TO STA. 125+50
S.R. 149

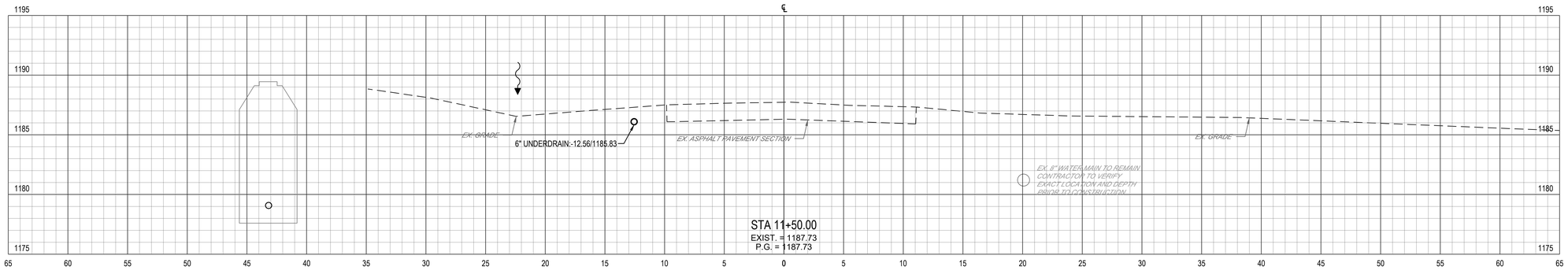
BEL-149-23.44

R24
R31









GRAPHIC SCALE (IN FEET)

CALCULATED P.JD
CHECKED TDH

CROSS SECTIONS - STA. 11+50 TO STA. 13+00
RECO DRIVE

BEL-149-23.44

R25
R31

Ex R/W

STA. 114+59.95, 98.08'LT.
MATCH SITE GRADE

1168.67 E/P

1169.10

23.5'

23.5'

7.45'

1169.04 E/P

10' TYP.

1169.55 E/P

1169.58

R/W

STA. 114+09.94, 82.10'LT.
50' RAD. CENTER
R=50.00'
L=66.97'
T=39.59'
C=62.07'
N 72° 06' 22" W
Δ=76° 44' 25"

END 50' RAD.
STA. 114+59.94, 82.06'LT.

STA. 114+41.26, 77.13'LT.
12 GUAGE W-BEAM
ROUNDED-END SECTION

STA. 114+48.72, 76.52'LT.
END 6' GUARDRAIL RAD.

1170.05 E/P

STA. 114+53.97, 68.81'LT.
END TYPE T ANCHOR ASSEMBLY
BEGIN 6' GUARDRAIL RAD.

1170.55 E/P

STA. 114+48.85, 57.57'LT.
BEGIN TYPE T ANCHOR ASSEMBLY
END 46' GUARDRAIL RAD.

STA. 114+20.53, 37.34'LT.
BEGIN 46' GUARDRAIL RAD.

1171.05 E/P

4'

1171.55 E/P

1171.82 G/B

1171.86 E/P

1171.63 E/P

1171.60 E/P

1171.53 E/P

1171.46 E/P

1171.39 E/P

1171.32 E/P

1171.27 E/P

1171.22 E/P

1171.16 E/P

END TAPER
BEGIN 50' RAD.
STA. 114+31.33, 33.42'LT.

STA. 113+61.58, 26.00'LT.
GUARDRAIL ANGLE

PROPOSED GUARDRAIL, TYPE MGS

EDGE OF TRAVEL LANE

STA. 113+61.96, 22.00'LT.
BEGIN TAPER

LOVE'S DRIVEWAY
CONSTRUCTION ℄

-6.99%

-6.18%

1170.19

1170.79

1171.39

1171.99

112.77'
N69° 31' 26"E
15=00

STA. 114+42.35, 40.00'LT.
BEGIN GRADE BREAK

1172.59

2.9'

7.1'

3.96'

6.04'

??? G/B

1171.91 G/B

1172.04 G/B

1172.29 G/B

1172.50 G/B

1172.76 G/B

1173.03 G/B

1173.29 G/B

1173.56 G/B

1173.72 G/B

1173.91 G/B

10' TYP.

3.91'

1172.75

10' TYP.

1172.91

7.19'

0.81'

1173.03

12.81'

-1.60%

4.00%

1171.79 G/B

1171.73 G/B

1171.66 G/B

1171.59 G/B

1171.52 G/B

1171.45 G/B

1171.42 G/B

1171.38 EX.

1171.44 EX.

1171.51 EX.

1171.58 EX.

1171.67 EX.

1171.78 EX.

1171.88 EX.

1171.98 EX.

1172.06 EX.

1172.14 EX.

1172.27 EX.

1172.39 EX.

1172.52 EX.

1172.82 EX.

1173.01 EX.

1173.27 EX.

1173.54 EX.

1173.81 EX.

1174.03 EX.

1174.19 EX.

1174.42 EX.

1174.72 EX.

1175.01 EX.

1175.30 EX.

1175.59 EX.

1175.88 EX.

1176.33 EX.

1176.73 EX.

1177.10 EX.

1177.46 EX.

TRAVEL LANE CROSS SLOPE =
1.60% TYP., PAVED SHOULDER
CROSS SLOPE = 4.00% TYP.

1171.35 G/B

1177.28 G/B

12'

4'

10' TYP.

S.R. 149

CONSTRUCTION ℄

STA. 114+33.11, 12.00'LT.
SAWCUT ANGLE

PROPOSED SAWCUT LINE

90°22'3"

89°57'57"

15=00

1172.78 EX.

1173.32 EX.

1173.41 EX.

1173.52 EX.

1173.67 EX.

1173.83 EX.

1173.98 EX.

1174.14 EX.

1174.32 EX.

1171.31 EX.

1171.46 EX.

1171.61 EX.

1171.75 EX.

1171.85 EX.

1171.90 EX.

1171.95 EX.

1172.00 EX.

1172.05 EX.

1172.10 EX.

1172.21 EX.

1172.34 EX.

1172.51 EX.

115+00

116+00

N20° 30' 57"W
2936.25'

3.38'

6.62'

STA. 114+38.87, 22.00'RT.
BEGIN 5' APRON RAD.
ELEV. = 1171.92.

STA. 114+40.25, 11.50'RT.
SAWCUT ANGLE

PROPOSED SAWCUT LINE

STA. 114+21.51, 26.00'RT.
BEGIN TYPE T ANCHOR ASSEMBLY

STA. 114+34.01, 26.00'RT.
BEGIN 8' GUARDRAIL RAD.
END TYPE T ANCHOR ASSEMBLY

STA. 114+42.01, 33.84'RT.
END 8' GUARDRAIL RAD.
12 GAUGE W-BEAM
ROUNDED-END SECTION

STA. 114+43.87, 27.00'RT.
END 5' APRON RAD.
ELEV. = 1171.80.

STA. 114+64.87, 22.00'RT.
END 5' APRON RAD.
ELEV. = 1172.36.

STA. 114+59.87, 27.00'RT.
BEGIN 5' APRON RAD.
ELEV. = 1172.15.

STA. 114+83.38 STATE ROUTE 149 =
STA. 15+50.00 LOVES ACCESS DRIVEWAY
N:752268.65325457, E:2374059.73553123

STA. 115+11.44, 103.75'LT.
BEGIN GUARDRAIL
SPLICE TO TIE INTO
SITE GUARDRAIL

3.42'

1169.55 E/P

1169.76 E/P

STA. 115+06.95, 98.05'LT.
MATCH SITE GRADE
BEGIN 68' RAD.

STA. 115+11.42, 92.82'LT.
BEGIN 64' GUARDRAIL RAD.

10' TYP.

1170.39 E/P

Ex R/W

1171.02 E/P

R/W

STA. 115+74.95, 98.00'LT.
68' RAD. CENTER
R=68.00'
L=83.42'
T=47.87'
C=78.29'
S 34° 22' 44" W
Δ=70° 17' 22"

1171.64 E/P

4'

1172.27 E/P

1172.90 E/P

1173.53 E/P

1174.04 E/P

1174.66 E/P

1174.77 E/P

1175.16 E/P

1175.47 E/P

1175.88 E/P

1176.50 E/P

1176.66 E/P

1177.02 E/P

STA. 115+51.97, 24.00'LT.
END 68' RAD.

STA. 115+60.29, 38.00'LT.
END 64' GUARDRAIL RAD.

PROPOSED GUARDRAIL, TYPE MGS

STA. 115+39.45, 40.00'LT.
END GRADE BREAK

10' TYP.

4'

-4.00%

1174.70 G/B

1175.01 G/B

1175.30 G/B

1175.61 G/B

1176.02 G/B

1176.44 G/B

1176.80 G/B

1177.16 G/B

12'

-1.60%

EDGE OF TRAVEL LANE

STA. 115+46.93, 13.83'LT.
SAWCUT ANGLE

TRAVEL LANE CROSS SLOPE =
1.60% TYP., PAVED SHOULDER
CROSS SLOPE = 4.00% TYP.

1174.61 EX.

1174.90 EX.

1175.19 EX.

1175.49 EX.

1175.79 EX.

1176.16 EX.

1176.62 EX.

1177.07 EX.

1177.53 EX.

STA. 115+79.47, 14.50'RT.
SAWCUT ANGLE

Ex R/W

NOTES:

1. LOVE'S TRAVEL STOP IMPROVEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE SITE CONSTRUCTION PLANS FOR DETAIL.
2. F/D DENOTES FULL DEPTH. RAD. DENOTES RADIUS. RADIUS IS MEASURED FROM EDGE OF ASPHALT/CONCRETE (TYP.). EX. DENOTES EXISTING. C/G DENOTES CURB AND GUTTER. G/B DENOTES GRADE BREAK. F/L DENOTES FLOW LINE.
3. CONTRACTOR MUST LOCATE ALL EXISTING UTILITIES IN PROJECT AREA PRIOR TO CONSTRUCTION. UPON LOCATION, IF ANY UTILITY WILL PREVENT CONSTRUCTION OF PROPOSED ROADWAY IMPROVEMENTS, CONTRACTOR MUST COORDINATE WITH UTILITY COMPANY FOR RELOCATION AND NOTIFY THE ENGINEER IMMEDIATELY.

GRAPHIC SCALE (IN FEET)
20 10 0 5 10

CALCULATED PJD
CHECKED TDH

INTERSECTION DETAIL
S.R. 149

BEL-149-23.44

R26
R31

NOTES:
1. LOVE'S TRAVEL STOP IMPROVEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE SITE CONSTRUCTION PLANS FOR DETAIL.
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Ex R/W
RECO DRIVE
CONSTRUCTION ℄
PROPOSED DITCH FLOW LINE
PROPOSED SAWCUT LINE
SOUTH MARATHON DRIVEWAY
S.R. 149
CONSTRUCTION ℄
DRAINAGE TANGENT ACROSS DRIVEWAY
ENSURE POSITIVE FLOW FROM GUTTER PAN TO DRAINAGE TANGENT. ENSURE NO LOW POINTS FOR PONDING WATER EXIST IN GUTTER AT THIS LOCATION
MATCHLINE STA 123+10 - SEE SHEET R28

STA. 120+84.13, 84.07'LT.
58' RAD. CENTER
R=58.00'
L=84.76'
T=51.97'
C=77.41'
N 68° 06' 55" W
Δ=83° 43' 34"

STA. 120+30.94, 34.26'LT.
AGGREGATE SHOULDER ANGLE

STA. 120+44.92, 21.70'LT.
MATCH EXISTING
BEGIN SAWCUT
BEGIN F/D ASPHALT
BEGIN TAPER

END TAPER
STA. 120+89.92, 26.36'LT.

STA. 120+44.92, 17.50'LT.
SAWCUT ANGLE
F/D ASPHALT ANGLE

STA. 120+30.95, 21.70'LT.
BEGIN AGGREGATE SHOULDER

STA. 121+45.21, 83.49'LT.
SAWCUT ANGLE
F/D ASPHALT ANGLE

END 58' RAD.
END F/D ASPHALT
END SAWCUT
MATCH EXISTING
STA. 121+42.12, 83.52'LT.

STA. 121+44.82, 40.57'LT.
SAWCUT ANGLE
F/D ASPHALT ANGLE

STA. 121+10.30, 32.31'LT.
END AGGREGATE SHOULDER

STA. 121+29.23, 17.50'LT.
SAWCUT ANGLE
F/D ASPHALT ANGLE

STA. 121+52.37 STATE ROUTE 149 =
STA. 13+50.00 RECO DRIVE
N:752895.21381336, E:2373825.27565131

STA. 121+74.80, 80.05'LT.
BEGIN 50' RAD.

STA. 121+60.23, 45.67'LT.
SAWCUT ANGLE
F/D ASPHALT ANGLE

STA. 121+98.27, 14.37'LT.
SAWCUT ANGLE
F/D ASPHALT ANGLE

STA. 122+24.53, 85.29'LT.
50' RAD. CENTER

STA. 122+17.06, 35.85'LT.
ELEV. = 1191.14.
BEGIN 10' RAD.

STA. 122+17.06, 35.85'LT.
END 50' RAD.
BEGIN 10' RAD.

STA. 122+28.73, 51.50'LT.
ELEV. = 1192.58.
BEGIN SAWCUT
MATCH EXISTING
F/D ASPHALT ANGLE

STA. 122+28.55, 45.46'LT.
ELEV. = 1192.16.
END 10' RAD.

STA. 122+98.35, 52.38'LT.
ELEV. = 1193.04.
MATCH EXISTING
BEGIN ODOT TYPE 2 C/G
TAPER CURB FROM FLUSH
TO FULL HEIGHT CURB OVER 10'
F/D ASPHALT ANGLE

STA. 122+95.92, 47.37'LT.
ELEV. = 1192.82.
BEGIN 10' RAD.

STA. 123+00.15, 51.50'LT.
END SAWCUT

STA. 123+04.62, 33.00'LT.
ELEV. = 1192.03.
END 10' RAD.

GRAPHIC SCALE (IN FEET)
20 10 0 5 10

CALCULATED P.JD
CHECKED TDH

INTERSECTION DETAIL
S.R. 149

BEL-149-23.44

R27
R31

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NOTES:

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2. F/D DENOTES FULL DEPTH. RAD. DENOTES RADIUS. RADIUS IS MEASURED FROM EDGE OF ASPHALT/CONCRETE (TYP.). EX. DENOTES EXISTING. C/G DENOTES CURB AND GUTTER. G/B DENOTES GRADE BREAK. F/L DENOTES FLOW LINE.
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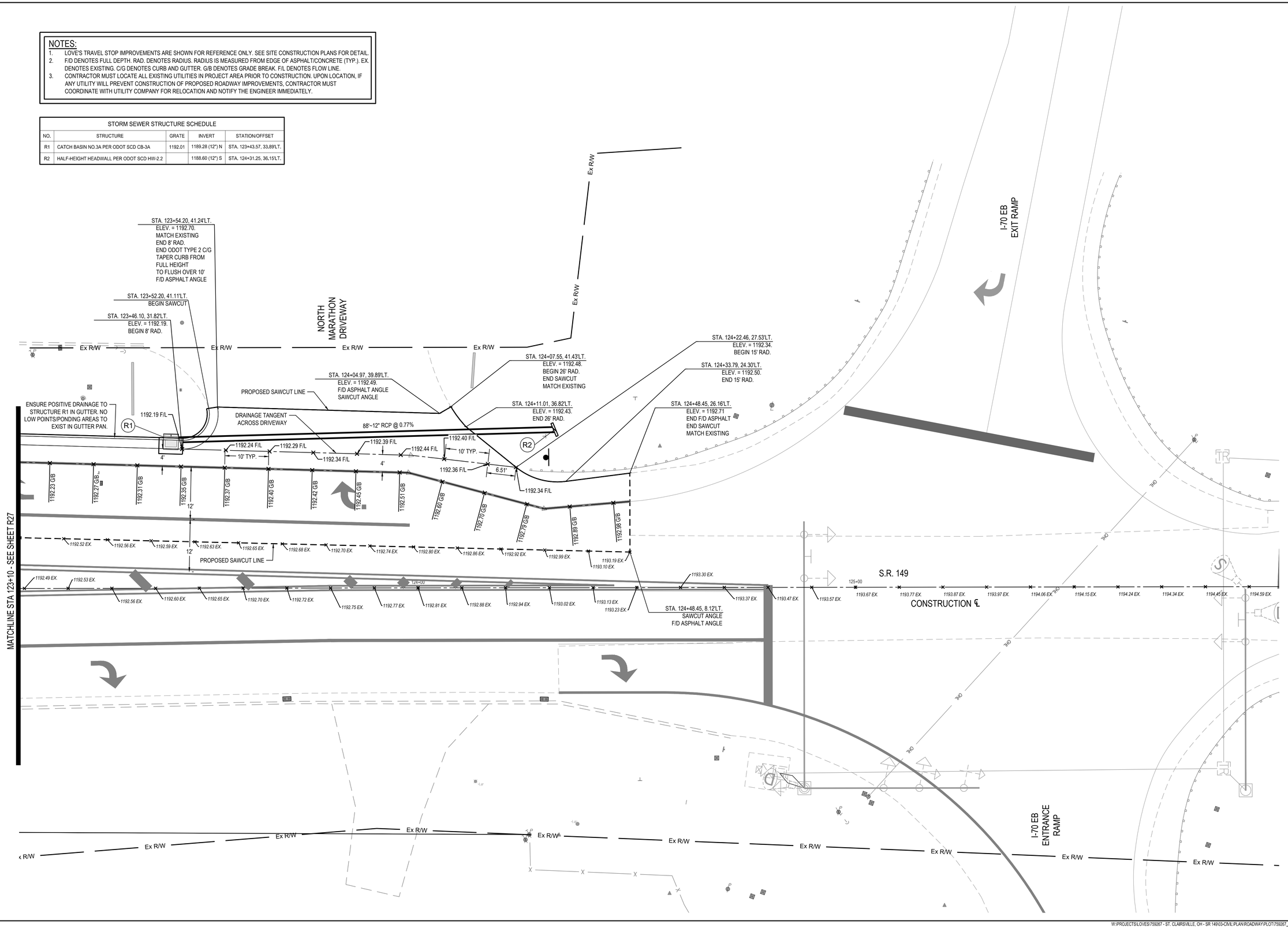
STORM SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	GRATE	INVERT	STATION/OFFSET
R1	CATCH BASIN NO.3A PER ODOT SCD CB-3A	1192.01	1189.28 (12") N	STA. 123+43.57, 33.89'LT.
R2	HALF-HEIGHT HEADWALL PER ODOT SCD HW-2.2		1188.60 (12") S	STA. 124+31.25, 36.15'LT.



GRAPHIC SCALE (IN FEET)
20 10 5 0 10

CALCULATED PJD
CHECKED TDH

INTERSECTION DETAIL
S.R. 149

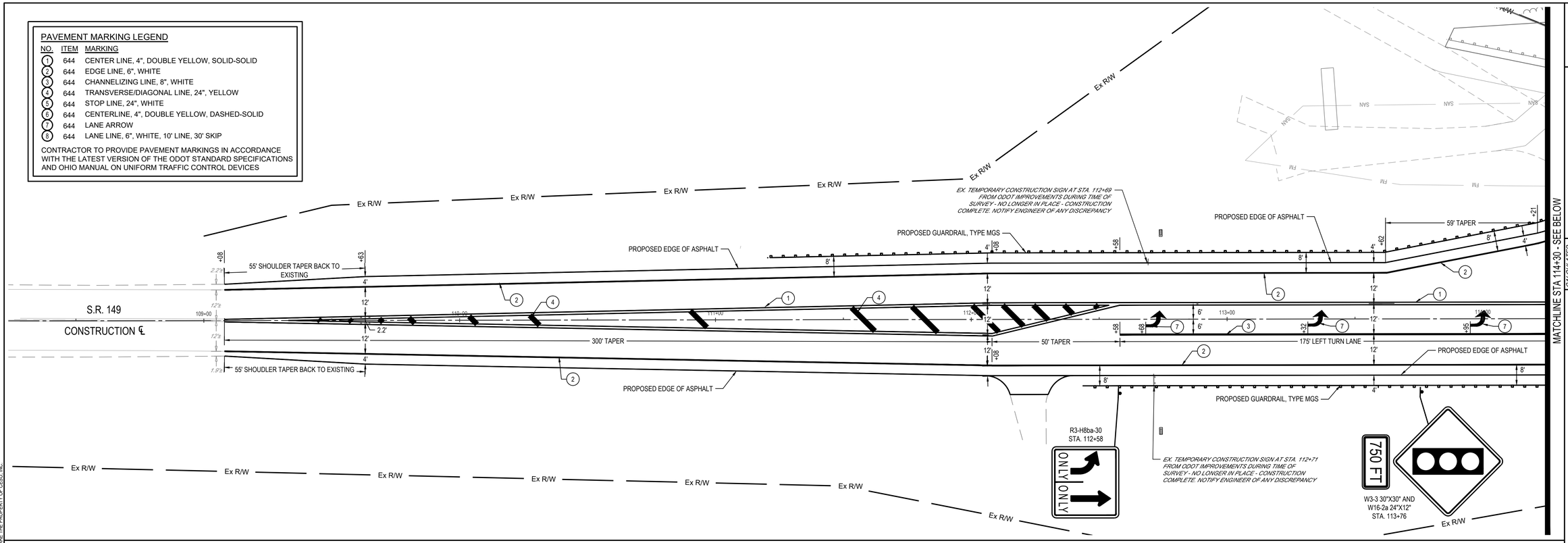
BEL-149-23.44

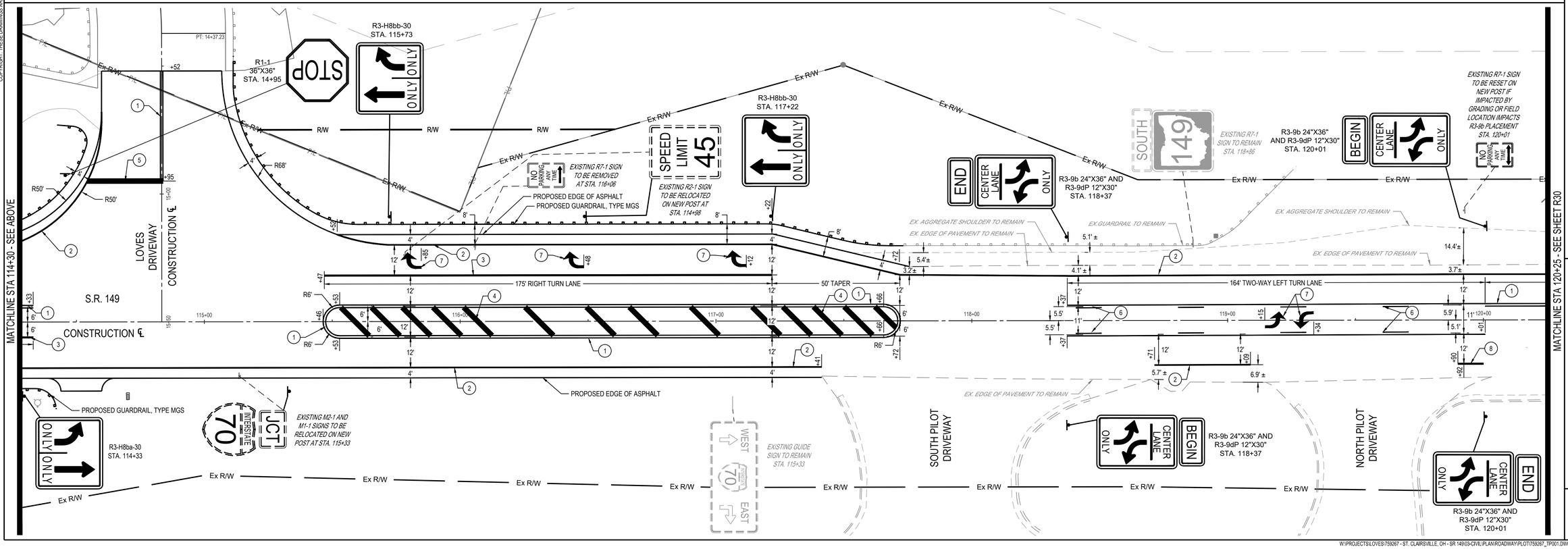
R28
R31

PAVEMENT MARKING LEGEND

NO.	ITEM	MARKING
1	644	CENTER LINE, 4", DOUBLE YELLOW, SOLID-SOLID
2	644	EDGE LINE, 6", WHITE
3	644	CHANNELIZING LINE, 8", WHITE
4	644	TRANSVERSE/DIAGONAL LINE, 24", YELLOW
5	644	STOP LINE, 24", WHITE
6	644	CENTERLINE, 4", DOUBLE YELLOW, DASHED-SOLID
7	644	LANE ARROW
8	644	LANE LINE, 6", WHITE, 10' LINE, 30' SKIP

CONTRACTOR TO PROVIDE PAVEMENT MARKINGS IN ACCORDANCE WITH THE LATEST VERSION OF THE ODOT STANDARD SPECIFICATIONS AND OHIO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES





PAVEMENT MARKING & SIGNAGE - STA. 108+50 TO STA. 120+25

S.R. 149

BEL-149-23.44

GRAPHIC SCALE (IN FEET)

CALCULATED PJD

CHECKED TDH

R29
R31

PAVEMENT MARKING LEGEND

NO.	ITEM	MARKING
1	644	CENTER LINE, 4", DOUBLE YELLOW, SOLID-SOLID
2	644	EDGE LINE, 6", WHITE
3	644	CHANNELIZING LINE, 8", WHITE
4	644	TRANSVERSE/DIAGONAL LINE, 24", YELLOW
5	644	STOP LINE, 24", WHITE
6	644	CENTERLINE, 4", DOUBLE YELLOW, DASHED-SOLID
7	644	LANE ARROW
8	644	LANE LINE, 6", WHITE, 10' LINE, 30' SKIP

CONTRACTOR TO PROVIDE PAVEMENT MARKINGS IN ACCORDANCE WITH THE LATEST VERSION OF THE ODOT STANDARD SPECIFICATIONS AND OHIO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

MATCHLINE STA 120+25 - SEE SHEET R29

EXISTING R7-1 SIGN TO REMAIN STA. 11+00

EXISTING R7-1 SIGN TO REMAIN STA. 11+58

EXISTING R7-1 SIGN TO REMAIN STA. 12+56

EXISTING R1-1 SIGN TO BE REMOVED STA. 13+12

EXISTING R7-1 SIGN TO BE RESET ON NEW POST IF IMPACTED BY GRADING STA. 121+93

EXISTING R7-1 SIGN TO REMAIN STA. 11+00

EXISTING R7-1 SIGN TO REMAIN, RELOCATE ON NEW POST AS NEEDED FOR CONSTRUCTION STA. 12+56

EXISTING R7-1 SIGN TO BE RELOCATED ON NEW POST STA. 12+56

EXISTING R7-1 SIGN TO BE REMOVED STA. 121+90

PROPOSED EDGE AGGREGATE SHOULDER REPLACEMENT

PROPOSED EDGE OF ASPHALT

EX. AGGREGATE SHOULDER TO BE REPLACED FOR GRADING IMPROVEMENTS

RECO DRIVE CONSTRUCTION ℄

103' TAPER

200' RIGHT TURN LANE

50' TAPER

SOUTH MARATHON DRIVEWAY

NORTH MARATHON DRIVEWAY

45' TAPER

125' LEFT TURN LANE

282' TAPER NORTH SIDE OF CONSTRUCTION CL. START TAPER STA. 121+98 END TAPER STA. 124+80

310' TAPER EAST OF CONSTRUCTION CL TO MATCH EXISTING EAST SIDE OF ROAD CURB AND GUTTER TAPER AS-BUILT AND SURVEYED. START TAPER STA. 120+70 END TAPER STA. 123+80

EX. CURB AND GUTTER TO REMAIN

EAST CENTERLINE TO RUN ALONG CONSTRUCTION CENTERLINE FROM STA. 123+80 TO STA. 124+80.

R3-H8bb-30 STA. 124+29

R6-1 54"X 18" R5-1 36"X 36" TO REMAIN

I-70 EB EXIT RAMP

I-70 EB ENTRANCE RAMP

S.R. 149 CONSTRUCTION ℄

R100'

R3-H8b-48 STA. 120+70

EXISTING R3-H8b-30 SIGN TO BE REMOVED STA. 120+70

EXISTING D1-H8A-132 SIGN TO REMAIN STA. 122+05

EXISTING R3-H8b-30 SIGN TO REMAIN STA. 122+70

EXISTING R3-H8b-30 SIGN TO REMAIN STA. 124+65

GRAPHIC SCALE (IN FEET) 40 20 0 10 20

CALCULATED PJD

CHECKED TDH

PAVEMENT MARKING & SIGNAGE - STA. 120+25 TO 126+00

S.R. 149

BEL-149-23.44

R30
R31

GENERAL CONSTRUCTION REQUIREMENTS

1. DETAIL PLANS OF PLANNED WATER LINE CONSTRUCTION WILL BE SUBMITTED TO THE BELMONT COUNTY WATER AND SEWER DISTRICT, FOR APPROVAL BY THE ENGINEER ASSOCIATE, PRIOR TO CONSTRUCTION. A PRECONSTRUCTION MEETING WILL BE REQUIRED BEFORE START OF CONST.
2. SIGNED WATER APPLICATIONS & APPLICABLE FEES MUST BE RECIEVED PRIOR TO CONSTRUCTION.
3. ALL WATERLINE'S SHALL BE C900 (DR-14) IN HIGH PRESSURE AREAS DUCTILE IRON CLASS 50 OR 52 WILL BE REQUIRED BY THE DISTRICT. (ALL DUCTILE IRON PIPE TO BE POLYETHYLENE WRAPPED AS PER AWWA C105/A21.5) PIPE SIZES TO BE 3/4"CTS, 1"CTS, 2"I.P., 4", 6", 8", 10", 12" C-900 DR 14-18 (3/4" OR 1" TO BE TYPE-K SOFT COPPER IF LINE PRESSURE IS GREATER THAN 200 PSI)
4. RESIDENTIAL PVC SEWER LINE WILL BE A MINIMUM OF 4 INCH SDR-35.
5. SEWER FORCE MAIN WILL BE A MINIMUM OF 1 1/2", OR 2", POLYETHYLENE CLASS 200, OR 2", 4", 6", OR 8" SDR-21 CL-200 PVC PIPE, AND GREEN IN COLOR. GRAVITY SEWER LINES SHALL BE AIR AND DEFLECTION TESTED IN ACCORDANCE WITH TABLE 1 PAGE 29 OF THIS BOOKLET.
6. ALL PIPE THAT IS INSTALLED SHALL BE BEDDED WITH A MINIMUM OF 6" ABOVE AND BELOW THE PIPE WITH GOOD TOP SOIL FREE OF STONE AND OTHER FOREIGN OBJECTS, OR CRUSH AND RUN STONE.
7. WATERLINE SHALL BE INSTALLED WITH 4 FOOT MINIMUM COVER UNLESS OTHERWISE APPROVED.
8. A MINIMUM VERTICAL CLEARANCE OF 18 INCHES SHALL BE PROVIDED BETWEEN THE PROPOSED WATER MAIN AND OTHER UTILITIES OR STRUCTURES, UNLESS OTHERWISE NOTED.
9. A MINIMUM HORIZONTAL CLEARANCE OF 4 FEET SHALL BE PROVIDED BETWEEN THE PROPOSED WATER LINE AND OTHER UTILITIES OR STRUCTURES UNLESS OTHERWISE APPROVED.
10. THE WATERLINE SHALL BE PLACED WITH A MINIMUM OF 10 FOOT HORIZONTAL SEPARATION FROM ANY SANITARY SEWERS OR WHEN THE THE WATER LINE CROSSES A SANITARY SEWER, THE WATER LINE SHALL BE A MINIMUM OF 18 INCHES ABOVE THE SEWER.
11. SEWER LINES MUST CROSS UNDER ALL WATERLINES WITH A MINIMUM OF 18" OF CLEARANCE. IF NOT POSSIBLE THE BCSSD WILL PERMIT CROSSING OVER WITH STEEL CASING OR PLASTIC CASING AND CONCRETE. MINIMUM CASING LENGTH IS 10FT. AS PER NOTE ON SHT.- #16
12. ALL FITTINGS SHALL BE MECHANICAL JOINT (MJ), FUSION EPOXY COATED, DUCTILE IRON, RESTRAINED BY THE USE OF RESTRAINERS AND/OR MEGALUGS AND THRUST BLOCKED WITH CONCRETE AS REQUIRED. SEE SHT# 25 FOR THRUST BLOCKING DETAIL
13. A 16FT. MIN. LENGTH OF WATERLINE SHALL BE PROVIDED ON EACH SIDE OF ANY MAINLINE FITTING, OR THE JOINT SHALL BE RESTRAINED WITH BELL RESTRAINT FITTINGS.
14. ALL SERVICE CONNECTIONS MADE TO EXISTING LINES WILL BE MADE BY THE DISTRICT. THE CONNECTION SHALL BE MADE WET USING A TAPPING TEE AND VALVE. IF A LINE TO BE CONNECTED IS THE SAME AS THE EXISTING LINE, 2" CONNECTED TO 2" OR 6" CONNECTED TO 6", THE CONNECTION WILL BE MADE DRY. EXCEPTIONS MAY BE MADE DUE TO UNFORESEEN FIELD CIRCUMSTANCES.

CONTINUES ON NEXT PAGE

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

12/14/17

GENERAL CONSTRUCTION REQUIREMENTS

15. MAGNETIC DETECTABLE TRACER TAPE SHALL BE INSTALLED AT 18 INCHES DEEP WITH ALL PVC PIPE.
16. TRACE WIRE TO BE INSTALLED ON ALL WATER & SEWER LINES.
    A.) OPEN-TRENCH INSTALLATION: DIRECT BURIAL #12 AWG SOLID (0.0808" DIA.),STEEL CORE SOFT DRAWN TRACER WIRE, 250# AVERAGE TENSILE BREAK LOAD, 30 MIL HIGH MOLECULAR-HIGH DENSITY POLYETHYLENE JACKET COMPLYING WITH ASTM-D-1248,30 VOLT RATING, 45 MIL JACKET WHEN DIRECTIONAL BORED.

    B.) CONNECTORS
    SPLICES ALONG THE CONTINUOUS RUN OF TRACE WIRE FOR REPAIR OF A WIRE BREAK OR REPLACEMENT OF FAILED SEGMENT OF WIRE SHALL USE 3M BRAND DBR DIRECT BURY SPLICE KIT OR APPROVED EQUAL.

    C.) INSTALLATION
    TRACE WIRE ACCESS POINT SHALL BE ACCESSIBLE AT ALL NEW WATER VALVE BOXES, WATER METER BOXES, BLOWOFFS, ARVs, FIRE HYDRANTS AND MANHOLES.

    D.) TESTING REQUIREMENTS
    CONTRACTOR SHALL PERFORM A CONTINUITY TEST ON ALL TRACE WIRE IN THE PRESENCE OF BCWSD. IF THE TRACE WIRE IS FOUND TO BE NOT CONTINUOUS AFTER TESTING, CONTRACTOR SHALL REPAIR OR REPLACE THE FAILED SEGMENT OF WIRE.
17. THE CONTRACTOR WILL SCHEDULE WITH THE DISTRICT APPROXIMATE TIMES FOR THE INSPECTION OF LINES, FITTINGS & ETC., PRIOR TO BACKFILLING. THE COUNTY SHALL BE GIVEN A MINIMUM 48 HOURS OF NOTICE WHEN A INSPECTION IS REQUIRED
18. EXISTING MAINLINE VALVES WILL ONLY BE OPERATED BY DISTRICT PERSONNEL.
19. A MINIMUM OF 24 HOURS NOTICE FOR ANY INSTALLATIONS BY CONTRACTORS THAT MAY DISRUPT WATER SERVICE TO EXISTING WATER CUSTOMERS. THE NOTICE SHALL BE MADE THROUGH THE DISTRICTS OFFICE.
20. ALL SERVICE CONNECTIONS INSTALLED WILL BE STAKED AT THE TIME OF CONSTRUCTION WITH IRON "TEE BAR STAKES" PER DISTRICT REQUIREMENTS.
21. CHANGES IN GRADE AND ALIGNMENT TO BE OBTAINED BY DEFLECTIONS AT PIPE JOINTS SHALL BE NO GREATER THAN RECOMMENDED BY THE MANUFACTURER OF THE WATER LINE.
22. PRESSURE TESTING OF WATER LINES AND SEWER FORCE MAINS SHALL BE IN ACCORDANCE WITH AWWA C600-87. TESTING AT 1-1/2 TIMES EXISTING PRESSURE AND/OR WORKING PRESSURE OR MINIMUM OF 100PSI/MAX. OF 200 PSI. PRESSURE TESTING MUST BE DONE WITHIN 2 WORKING WEEKS ONCE LINE IS IN PLACE.
23. THE CONTRACTOR WILL CHLORINATE THE INSTALLED WATER LINE AT RECOMMENDED AWWA 651 STANDARDS, FOR A MINIMUM OF 24 HOURS, AT 50 P.P.M.
24. THE DISTRICT WILL TAKE REPRESENTATIVE SAMPLES OF THE WATER IN THE LINES, AND HAVE AN APPROVED LABORATORY MAKE THE BACTERIOLOGICAL EXAMINATIONS OF THE SAMPLE TO ESTABLISH THE ACCEPTABILITY OF THAT PORTION OF THE SYSTEM PRIOR TO ANY TURN ON OF SERVICE TO ANY FACILITY. THERE WILL BE NO EXCEPTION TO THIS STANDARD.

CONTINUES ON NEXT PAGE

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

10/31/17

GENERAL CONSTRUCTION REQUIREMENTS

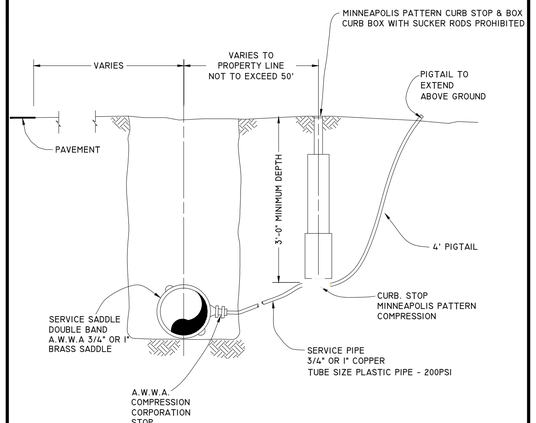
25. ALL MAIN LINE VALVES & FLUSH-OUT ASSEMBLIES SHALL BE MARKED BY A WHITE FIBERGLASS MARKER AS PER THE WATER DISTRICTS REQUIREMENTS.
26. LOCATION OF THE PROPOSED SERVICE TAPS SHALL BE FIELD LOCATED BY THE OWNER PRIOR TO CONSTRUCTION OR AT TIME OF CONSTRUCTION.
27. ALL MATERIAL AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BELMONT COUNTY SPECIFICATIONS AS OUTLINED IN STANDARD DETAILS MANUAL.
28. ALL PARTS, LABOR, EQUIPMENT, AND MISC. EXPENSES BY THE BELMONT COUNTY SANITARY SEWER DISTRICT WILL BE INVOICED TO THE DEVELOPER.
29. CONTRACTOR IS RESPONSIBLE FOR ALL WORK PERFORMED FOR THE FIRST YEAR OF CUSTOMER SERVICE.
30. ALL PRESSURE TESTING STARTS BEFORE NOON.
31. AS-BUILTS DRAWINGS (MAPS) MUST BE PROVIDED TO BCWSD WITHIN 3 MONTHS OF THE BACTERIA TEST, WHICH MARKS THE WATER LINE COMPLETION DATE. FOR 6" AND LARGER LINES/ AND WITHIN ONE MONTH FOR 2"&4" LINES
32. AS-BUILTS FOR 6" & LARGER LINES ARE REQUIRED TO HAVE GPS POINT WHEN SUBMITTED FOR APPROVAL THEY ARE TO POINT OUT THE FOLLOWING:HYDRANTS,FITTINGS CURB BOXES, METER WELLS, MAN HOLES, CLEAN OUTS, VALVES, AND WATER OR SEWER LINES IN 100FT. INCREMENTS.

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

10/31/17

NOT TO SCALE

NOTE: TEE BAR STAKES TO MARK CURB BOX ON ALL VACANT AND OR UNDEVELOPED PROPERTY.

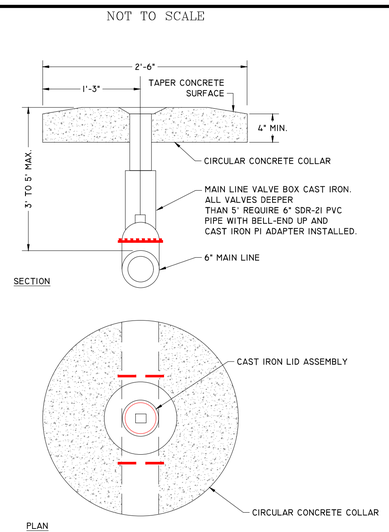


BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS	DWG. NO.
INSIDE SERVICE SETTING	2

9/25/17

NOT TO SCALE



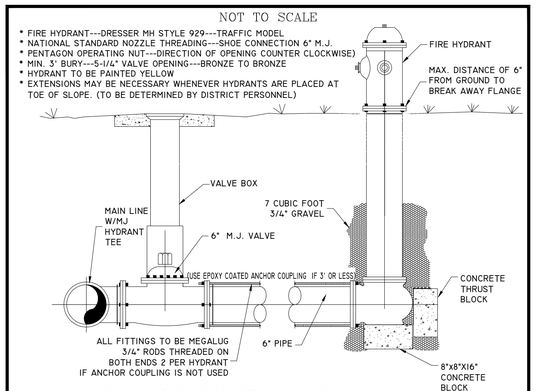
BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS	DWG. NO.
VALVE BOX SETTING	5

10/31/17

NOT TO SCALE

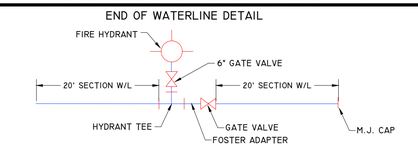
* FIRE HYDRANT---DRESSER MH STYLE 929---TRAFFIC MODEL
* NATIONAL STANDARD NOZZLE THREADING---SHOE CONNECTION 6" M.J.
* PENTAGON OPERATING NUT---DIRECTION OF OPENING COUNTER CLOCKWISE)
* MIN. 3' BURY---5-1/4" VALVE OPENING---BRONZE TO BRONZE
* HYDRANT TO BE PAINTED YELLOW
* EXTENSIONS MAY BE NECESSARY WHENEVER HYDRANTS ARE PLACED AT TOE OF SLOPE. (TO BE DETERMINED BY DISTRICT PERSONNEL)



TIE RODS: NOT REQUIRED FOR SETTINGS OVER 6' FROM MAIN IN WHICH CASE A MORE SUBSTANTIAL THRUST BLOCK IS REQUIRED.

NOTE: KEEP FLANGES AND WEEP HOLES CLEAR OF CONCRETE.

END OF WATERLINE DETAIL



BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS	DWG. NO.
FIRE HYDRANT ASSEMBLY ARRANGMENT AT END OF WATERLINE EXTENSION	7

10/31/17

CALCULATED PJD
CHECKED TDH

CONSTRUCTION DETAILS
S.R. 149

BEL-149-23.44

R31
R31

ITEM 632 - POWER SERVICE, AS PER PLAN

ELECTRIC POWER SHALL BE OBTAINED FROM THE AEP AT THE LOCATION INDICATED ON THE PLANS. POWER SUPPLIED SHALL BE 120 VOLTS.

POWER SERVICE SHALL BE AS PER CMS ITEM 632 AND SCD TC- 83.10 WITH THE FOLLOWING EXCEPTIONS:

1. THE CONTRACTOR SHALL MEET WITH A REPRESENTATIVE FROM THE POWER SUPPLY AGENCY TO CONFIRM HOW THE PROPOSED POWER SERVICE IS TO BE WIRED, HOOKED UP, AND ITS LOCATION

2. ALL POWER SERVICES SHALL BE METERED. THE METER SHALL HAVE A LEVER OPERATED BYPASS.

DISCONNECT SWITCH ENCLOSURES FURNISHED IN ACCORDANCE WITH CMS ITEM 632, POWER SERVICE, AS PER PLAN, SHALL INCLUDE A PADLOCK EQUAL TO MASTER NO. 4BKA OR WILSON BOHANNON 660, WITH LOCK BODY OF BRONZE OR BRASS AND KEYING SHALL BE TO THE STATE MASTER. THE CONTRACTOR SHALL CONTACT THE METER SECTION OF THE POWER COMPANY FOR INFORMATION REGARDING THE METER BASE INSTALLATION PRIOR TO ORDERING POLES. CONTRACTOR WILL BE RESPONSIBLE FOR REQUESTING AND SCHEDULING ANY INSPECTIONS THE POWER COMPANY MAY REQUIRE FOR THE POWER SERVICE HOOK UP. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT THE POWER COMPANY FOR THE ELECTRICAL SERVICE CONNECTION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR SPLICE POWER CABLE INTO THE POWER COMPANY'S CIRCUITS. THE VOLTAGE SUPPLIED SHALL BE NOMINALLY 120 VOLTS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS AND THE PAYING OF ALL FEES. THE CONTRACTOR SHALL PAY ALL POWER CHARGES UNTIL THE SIGNAL IS ACCEPTED BY MAINTAINING AGENCY.

SIGNAL ACTIVATION

PRIOR TO ACTIVATION THE NEW TRAFFIC SIGNAL TO STOP-AND- GO MODE AND/OR REMOVING THE EXISTING TRAFFIC SIGNAL FROM SERVICE, ALL ITEMS IN THE PROPOSED SIGNAL PLAN SHALL BE FULLY COMPLETED, (I.E, VEHICLE DETECTION, PEDESTRIAN SIGNAL HEADS, ETC.). IF THERE ARE CONSTRUCTABILITY ISSUES (I.E., ROADWAY WIDENING, ETC.) THAT PREVENT THE SIGNAL FROM BEING COMPLETED PRIOR TO ACTIVATION, IT SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER. THE DISTRICT TRAFFIC ENGINEER WILL THEN REVIEW, APPROVE OR REJECT PROPOSALS TO ACTIVATE THE TRAFFIC SIGNAL PRIOR TO COMPLETION.

THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER AT LEAST 10 WORKING DAYS PRIOR TO SCHEDULING THE FINAL INSPECTION OF THE SIGNAL INSTALLATION. FINAL INSPECTION IS NOT CONSIDERED COMPLETE UNTIL DESIGNATED DISTRICT TRAFFIC PERSONNEL INSPECT THE TRAFFIC SIGNAL AND ISSUE WRITTEN APPROVAL. IF ISSUES ARE FOUND DURING THE FINAL INSPECTION THAT EFFECT THE SAFETY OF THE TRAVELING PUBLIC AND/OR THE EFFICIENCY OF THE INTERSECTION, THE SIGNAL SHALL NOT BE ACTIVATED OF THE PROPOSED DATE. ANY PUNCH LIST ITEMS THAT ARE FOUND SHALL BE CORRECTED AND REINSPECTED BY DISTRICT TRAFFIC PERSONNEL PRIOR TO FINAL ACCEPTANCE. ODOT FORCES SHALL ONLY ASSUME DAY TO DAY MAINTENANCE OF THE TRAFFIC SIGNAL AFTER FINAL WRITTEN ACCEPTANCE HAS BEEN ISSUED.

ITEM 632 - SIGNAL SUPPORT FOUNDATION

PRIOR TO ORDERING THE SIGNAL SUPPORTS, THE CONTRACTOR SHALL CONTACT OUPS TO HAVE ALL THE UTILITIES LOCATED IN THE FIELD. THEN, THE CONTRACTOR SHALL MEET WITH THE PROJECT ENGINEER TO LOCATE THE PROPOSED SUPPORT LOCATIONS TO INSURE THERE ARE NO CONFLICTS WITH UTILITIES. IF THERE ARE ISSUES, THE PROJECT ENGINEER SHALL PROVIDE GUIDANCE AS TO THE RELOCATION OF THE SUPPORT POLES.

DUE TO THE FURTHER POSSIBILITY OF CONFLICT WITH EXISTING OR PROPOSED UNDERGROUND OBSTRUCTIONS (INCLUDING THE POSSIBILITY OF UNRECORDED OBSTRUCTIONS) WHICH COULD AFFECT THE LOCATION OF THE FOUNDATION FOR THIS ITEM, AND CONSEQUENTLY, THE DESIGN OF THE SUPPORT AND/OR ARMS, THE CONTRACTOR SHALL NOT PLACE FINAL ORDERS FOR THE ITEM UNTIL THE FOUNDATIONS HAVE BEEN INSTALLED, AT FINAL GRADE, AND THE CONTRACTOR HAS RECEIVED, FROM ENGINEER, WRITTEN NOTICE TO PROCEED WITH THE ORDERS FOR THE ITEM.

IF ANY FOUNDATION LOCATIONS MUST BE ADJUSTED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND MAINTAINING AGENCY, WHO WILL DETERMINE THE REVISED LOCATION AND IF NEEDED, THE SUPPORT DESIGN. THE CONTRACTOR WILL NOT BE RESPONSIBLE FOR DETERMINING THE REVISED DESIGN. THE ENGINEER WILL INFORM THE CONTRACTOR OF ANY CHANGES NECESSARY AND AUTHORIZE THE CONTRACTOR TO ORDER THE SUPPORT.

THE CONTRACTOR SHALL, WHEN DEVELOPING THE PROGRESS SCHEDULE, AND THOSE OF SUBCONTRACTORS, ENSURE THAT THE FOUNDATIONS ARE INSTALLED AT THE EARLIEST TIME AS IS FEASIBLE AND PRACTICAL, AND SHALL INCLUDE SUFFICIENT TIME IN THE PROGRESS SCHEDULE FOR ORDERING, MANUFACTURING, DELIVERY, AND INSTALLATION OF THE SUPPORT ITEMS AFTER THE FOUNDATIONS ARE IN PLACE.

NO PAYMENTS FOR DELIVERED MATERIALS FOR THE FOUNDATION OR SUPPORT ITEMS SHALL BE MADE UNTIL THE FOUNDATIONS ARE IN PLACE, AND IF CHANGES IN THE DESIGN OF THIS ITEM ARE REQUIRED, NO PAYMENT SHALL BE MADE FOR THE ITEMS MANUFACTURED TO THE ORIGINAL DESIGN.

PAYMENT WILL BE AT THE CONTRACT UNIT PRICE AND WILL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND OTHER INCIDENTALS NECESSARY FOR EACH SUPPORT FURNISHED, IN PLACE, COMPLETE AND ACCEPTED.

UNDERDRAINS FOR PULL BOXES

REFERENCE TRAFFIC SCD HL-30.11 FOR DETAILS ABOUT DRAINING PULL BOXES. UNDERDRAINS FOR PULL BOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED 20 FEET. THE FOLLOWING ESTIMATED QUANTITY IS CARRIED TO THE GENERAL SUMMARY FOR THIS PURPOSE:

ITEM 611 - 4" CONDUIT, TYPE E FOR UNDERDRAIN OUTLET
10 FT

WORK INSPECTION

THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER AND THE DISTRICT TRAFFIC ENGINEER WITH 72 HOUR NOTICE OF ANY SIGNAL WORK TO BE PERFORMED AT THE INTERSECTION SITE(S) SO THAT INSPECTION SERVICES CAN BE SUPPLIED.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 90 DAYS FOLLOWING COMPLETION OF THE 10-DAY PERFORMANCE TEST. IN THE EVENT OF UNSATISFACTORY OPERATION THE CONTRACTOR SHALL CORRECT FAULTY INSTALLATIONS, MAKE REPAIRS AND REPLACE DEFECTIVE PARTS WITH NEW PARTS OF EQUAL OR BETTER QUALITY.

EQUIPMENT, MATERIAL AND LABOR COSTS INCURRED IN CORRECTING AN UNSATISFACTORY OPERATION SHALL BE BORNE BY THE CONTRACTOR.

THE GUARANTEE SHALL COVER THE FOLLOWING ITEMS OF THE TRAFFIC CONTROL SYSTEM: CONTROLLER, CABINET, UNINTERRUPTIBLE POWER SUPPLY, VEHICLE DETECTION EQUIPMENT, LED LAMP UNITS, NETWORK AND COMMUNICATION/INTERCONNECT EQUIPMENT.

CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING ITEMS SHALL BE TURNED OVER TO ODOT DISTRICT 11 FOLLOWING ACCEPTANCE OF THE EQUIPMENT.

THE COST OF GUARANTEEING THE TRAFFIC CONTROL SYSTEM WILL BE INCIDENTAL TO AND INCLUDED IN THE CONTRACT UNIT PRICE OF THE VARIOUS ITEMS MAKING UP THE SYSTEM.

ITEM 625 - ARC FLASH CALCULATIONS AND LABEL

THIS ITEM SHALL INCLUDE PROVIDING ARC FLASH HAZARD CALCULATIONS AND LABELS PER SUPPLEMENTAL SPECIFICATION 825. LABELS SHALL BE APPLIED TO THE OUTSIDE OF EACH CONTROLLER CABINET. LABELS SHALL BE PROVIDED BY THE ODOT SIGN SHOP.

1606 WEST BROAD STREET
COLUMBUS, OHIO 43223

LOCATIONS OF ARC FLASH HAZARD LABELS ARE:

SIGNAL CONTROLLER (STA. 120+90.62, 36.58' LT.)

PAYMENT WILL BE MADE AT THE UNIT PRICE BID FOR EACH ITEM 625 "ARC FLASH CALCULATION LABEL" FOR EACH SET OF CALCULATIONS ACCEPTED AND LABEL INSTALLED, INCLUDING ALL LABOR, MATERIALS, AND INCIDENTALS NECESSARY.

ITEM 633 - CABINET, TYPE 332L, AS PER PLAN

THE CABINET SHALL BE FURNISHED AND INSTALLED ACCORDING TO CMS 633 AND 733, AND BE LISTED ON THE TRAFFIC AUTHORIZED PRODUCTS LIST (TAP).

THE CABINET SHALL BE FURNISHED WITH AN EDI MONITOR AS ALLOWED ON THE TAP/APPROVED PRODUCTS LIST. THE CABINET SHALL INCLUDE A CABINET RISER (12 INCH MINIMUM).

THE CONTRACTOR SHALL NOT REASSIGN THE CABINET DETECTOR INPUTS IN ORDER TO REDUCE THE NUMBER OF 2-CHANNEL DETECTOR UNITS SUPPLIED AND SHALL USE THE STANDARD CALTRANS INPUT FILE DESIGNATIONS FOLLOWING SHEET T6.

PAYMENT FOR ITEM 633 CABINET, TYPE 332L, AS PER PLAN WILL BE AT THE CONTRACT BID PRICE PER EACH COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS TESTED AND ACCEPTED.

ITEM 809 - ATC CONTROLLER, AS PER PLAN (PROGRAM AND INSTALL ONLY)

ALL REQUIREMENTS OF SS 809 SHALL BE FOLLOWED, ALONG WITH THE ADDITIONAL DESCRIPTION AS STATED BELOW. THE ATC CONTROLLER WILL BE PROVIDED BY THE DISTRICT WITHOUT PROGRAMMING.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROGRAMMING THE CONTROLLER TO THE PROPOSED CONDITIONS ACCORDING TO THE PLANS. ODOT WILL NOT BE RESPONSIBLE FOR THE PROGRAMMING.

PAYMENT SHALL BE MADE ONCE THE CONTROLLER IS PROGRAMMED, INSTALLED, TESTED, FUNCTIONING ACCORDING TO THE PLANS, AND SHALL INCLUDE INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS TO COMPLETE WORK.

CONTROLLER ITEM, MISC.: TIMING AND COORDINATION

THIS ITEM SHALL INCLUDE THE WORK NECESSARY TO CHANGE THE SIGNAL TIMING AND NETWORK COORDINATION IN THE LOCAL CONTROLLER LOCATED AT THE IR 70 WB RAMPS AS INDICATED ON SHEET T11.

COORDINATION TIMING WILL BE IMPLEMENTED AT THE FOLLOWING FOUR (4) INTERSECTIONS: S.R. 149 & RECO DRIVE, I-70 EASTBOUND RAMPS & S.R. 149, I-70 WESTBOUND RAMPS & S.R. 149, AND S.R. 149 & BOND DRIVE/SCHOOL STREET.

CALCULATED JMP
CHECKED TMC

TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

BEL-149-23.44

T1
T14

ITEM 633 - UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF C&MS 633 AND 733, POLE ATTACHMENT HARDWARE WILL BE INCLUDED FOR POLE-MOUNTED CABINETS, AND A CABINET RISER (8-INCH MINIMUM) AND ANCHOR BOLTS WILL BE PROVIDED FOR BASE-MOUNTED CABINETS. BEFORE PERFORMING THE WORK, THE CONTRACTOR, THE DISTRICT TRAFFIC ENGINEER, AND THE PROJECT ENGINEER WILL PERFORM A SITE INSPECTION TO ESTABLISH THE LOCATION OF THE UPS CABINET AND FOUNDATION.

THE UPS CABINET SHALL INCLUDE A GENERATOR POWER PANEL +WITH A HEAVY-DUTY POWER RELAY VERSUS THE LINE VOLTAGE GENERATOR SWITCH. THE GENERATOR INLET SHALL BE A RECESSED PANEL WITH A DOOR THAT IS FLUSH WITH THE EXTERNAL SIDE OF THE UPS CABINET. IT SHALL INCLUDE A RECESSED PLUG, AUTOMATIC TRANSFER SWITCH AND A DOOR THAT SECURELY CLOSES OVER THE POWER CORD.

THE CABINET SHALL HAVE A DOOR STOP MECHANISM AND THERMOSTATICALLY CONTROLLED FAN.

THE CABINET SHALL INCLUDE A BATTERY BALANCING DEVICE THAT REGULATES THE BATTERIES AND OPTIMIZES PERFORMANCE.

AFTER FOUR (4) HOURS OF BATTERY RUNTIME, THE SYSTEM SHALL BE PROGRAMMED TO SWITCH THE INTERSECTION FROM FULL OPERATION TO CONTROLLER AUTOMATIC FLASH OPERATION THROUGH THE MONITOR. THE CONTROLLER SHALL BE PROGRAMMED SO THAT FLASH OPERATION SHALL BEGIN ONCE THE INTERSECTION RUNS MINOR STREET GREEN (TYP. PH. 4 & 8), ALL-RED CLEARANCE, AND THEN FLASH OPERATION.

THE UPS OUTPUT NOTIFICATIONS FOR ON BATTERY, BATTERY 2-HOUR TIMER, AND LOW BATTERY SHALL BE WIRED INTO THE TRAFFIC SIGNAL CABINET BACK PANEL OR THROUGH THE CONTROLLER WITH A C11 TO PROVIDE SPECIAL STATUS ALARMS FOR EACH OUTPUT INTO THE SIGNAL CONTROLLER.

THIS ITEM SHALL INCLUDE A RED LED STATUS INDICATOR LAMP TO ALLOW MAINTENANCE PERSONNEL AND LAW ENFORCEMENT TO QUICKLY ASSESS WHETHER A TRAFFIC SIGNAL CABINET IS BEING POWERED BY A UPS. THE LED HOUSING SHALL BE NEMA 4X, IP65 OR IP66, RATED FOR OUTDOOR USE AND BE TAMPER/SHATTER RESISTANT. IT SHALL BE A DOMED ENCLOSURE CONTAINING A RED LENS WITH LED THAT IS VISIBLE FROM 100 FOOT MINIMUM. THE ENCLOSURE AND LED MODULE SHOULD BE PLACED ON THE SIDE OF THE UPS CABINET FACING TOWARDS THE MAINLINE ROADWAY AND SEALED FROM WATER INTRUSION. IT SHOULD BE WIRED USING MINIMUM 20GA STRANDED, INSULATED HOOKUP WIRE TO THE STATUS RELAY OUTPUTS OF THE UPS. THE WIRES SHALL BE TERMINATED BY LUGS AT THE DISPLAY END AND PERMANENTLY LABELED "BACKUP POWER STATUS DISPLAY," WITH WIRE POLARITY INDICATED. THE RED LED SHALL ONLY ILLUMINATE TO INDICATE THE CABINET IS OPERATING UNDER UPS BACKUP POWER (THE "BACKUP" OPERATING CONDITION). THIS ITEM INCLUDES PROGRAMMING THE UPS STATUS RELAY OUTPUTS TO PRODUCE THE LAMP STATUS DISPLAYS. THESE STATUS DISPLAYS WILL BE SOLID 100% DUTY CYCLE (NOT FLASHING) DISPLAYS. THE OPERATING VOLTAGE OF THE LED LAMP SHALL BE 120V AC UNLESS OTHERWISE INDICATED.

ITEM 809 - ADVANCE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR ADVANCE DETECTION UNTIL (MODEL SS-200E). THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:

1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
2. ALL REQUIRED INPUTS CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
3. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
4. SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
5. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
6. A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).
7. THE POWER SUPPLY AND COMMUNICATION MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
8. THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.
9. THE INSTALLATION SHALL INCLUDE ALL CONTROLLER PROGRAMMING FOR COMPLETE INSTALLATION, WHICH INCLUDES MODIFICATIONS FOR REMOVAL OF EXISTING DETECTION.

PAYMENT FOR ITEM 809 ADVANCE RADAR DETECTION, AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH UNIT, COMPLETE AND IN PLACE INCLUDING ALL REQUIRED CABINET HARDWARE, MOUNTING BRACKETS, CABLES, CONDUIT, CONNECTIONS TESTED AND ACCEPTED, AND ANY OTHER NECESSARY HARDWARE TO ESTA`BLISH A FULLY FUNCTIONAL DETECTION SYSTEM.

DETECTION MAINTENANCE

IF VEHICLE DETECTION BECOMES UNEXPECTEDLY DISABLED, REQUIRES MODIFICATION, OR IS SCHEDULED TO BE TEMPORARILY REMOVED DURING THE CONSTRUCTION PROJECT, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER.

IF THE LOSS OF VEHICLE DETECTION IS KNOWN PRIOR TO THE START OF CONSTRUCTION, IT SHALL BE DISCUSSED AT THE PRECONSTRUCTION MEETING. AT SUCH TIME, THE DISTRICT TRAFFIC ENGINEER SHALL ADVISE THE PROJECT ENGINEER AND CONTRACTOR ON THE APPROPRIATE ACTION TO RECTIFY ANY LOSS OF VEHICLE DETECTION. THIS MAY INCLUDE PLACING THE TRAFFIC SIGNAL ON MINIMUM OR MAXIMUM RECALL, MODIFYING THE MINIMUM GREEN TIMES, AND REMOVING THE MALFUNCTIONING DETECTION FROM SERVICE. WHERE NON-INTRUSIVE DETECTION (I.E. VIDEO, RADAR) ALREADY EXISTS, THE CONTRACTOR SHALL INSURE THAT DETECTION IS OPERATING AND MAINTAINED BY RECONFIGURING THE DETECTION UNITS ACCORDINGLY DURING ALL CONSTRUCTION PHASES. THIS IS TO AVOID THE SIGNAL FROM MAXING OUT THE EFFECTED SIGNAL PHASE AND CREATING UNNECESSARY DELAYS.

LOCATIONS WHERE NON-INTRUSIVE DETECTION IS PROPOSED AND THE EXISTING VEHICLE DETECTION IS TO BE ABANDON, THE NON-INTRUSIVE VEHICLE DETECTION SHALL BE INSTALLED, CONFIGURED AND MADE FULLY FUNCTIONAL PRIOR TO THE EXISTING DETECTION BEING DISABLED. THE CONTRACTOR SHALL CONTINUE TO MAINTAIN AND MODIFY THE DETECTION UNTIL FINAL ACCEPTANCE OF THE TRAFFIC SIGNAL.THIS IS TO ENSURE VEHICLE DETECTION REMAINS FULLY FUNCTIONAL THROUGHOUT CONSTRUCTION.

ITEM 633 - COMMUNICATIONS, AS PER PLAN

FURNISH A CELLULAR MODEM, ONE 3-ANTENNA ASSEMBLY (PART #6001136), AND A 10' ETHERNET CABLE FOR REMOTE WIRELESS CELLULAR COMMUNICATION.

FOR NETWORK CONSISTENCY CELLULAR MODEMS SHALL BE THE SIERRA WIRELESS:

MODEM, AIRLINK MP70 ETHERNET WITH AC TO DC POWER CABLE - MODEL 1102709KIT

THIS ITEM SHALL INCLUDE THE FURNISHING A MOUNTING BRACKET FOR THE ANTENNA WITH ALL NECESSARY HARDWARE INCLUDING BUT NOT LIMITED TO SPRING NUTS, WASHERS, AND BOLTS THAT INSTALLS TO THE MOUNTING CHANNEL ON THE SIDE OF THE SIGNAL CABINET.

THE CELLULAR MODEM EQUIPMENT SHALL BE DELIVERED TO ODOT DISTRICT 11 TRAFFIC FOR PROGRAMMING AND INSTALLATION.

JOSEPH PARISI, P.E.
(330) 308-7813
2201 REISER AVENUE SE
NEW PHILADELPHIA, OHIO 44663

THE CONTRACTOR SHALL PROVIDE THE MODEM SERIAL NUMBERS AND NECESSARY ESN NUMBERS FOR ODOT TO ESTABLISH WIRELESS SERVICE.

THE DEPARTMENT WILL MEASURE "COMMUNICATIONS, AS PER PLAN" BY THE NUMBER OF COMPLETE UNITS FURNISHED, RECEIVED, AND ACCEPTED BY ODOT DISTRICT 11 TRAFFIC.

ITEM 809 - STOP LINE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR MATRIX DETECTION UNIT. THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:

1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
2. ALL REQUIRED INPUTS CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
3. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
4. SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
5. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
6. A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).
7. THE POWER SUPPLY AND COMMUNICATION MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
8. THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.
9. THE INSTALLATION SHALL INCLUDE ALL CONTROLLER PROGRAMMING FOR COMPLETE INSTALLATION, WHICH INCLUDES MODIFICATIONS FOR REMOVAL OF EXISTING DETECTION.

PAYMENT FOR ITEM 809 STOP-LINE RADAR DETECTION, AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH UNIT, COMPLETE AND IN PLACE INCLUDING ALL REQUIRED CABINET HARDWARE, MOUNTING BRACKETS, CABLES, CONDUIT AND CONNECTIONS TESTED AND ACCEPTED.

CALCULATED JMP CHECKED TMC

TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

BEL-149-23.44

T2
T14

GROUNDING AND BONDING

THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (C&MS) AND THE TC SERIES OF STANDARD CONSTRUCTION DRAWINGS ARE MODIFIED AS FOLLOWS:

1. ALL METALLIC PARTS CONTAINING ELECTRICAL CONDUCTORS SHALL BE PERMANENTLY JOINED TO FORM AN EFFECTIVE GROUND FAULT CURRENT PATH BACK TO THE GROUNDED CONDUCTOR IN THE POWER SERVICE DISCONNECT SWITCH.

   A. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN METALLIC CONDUITS (725.04) IN ADDITION TO THE CONDUCTORS SPECIFIED AND BOND THE CONDUIT TO THIS GROUNDING CONDUCTOR.

   B. WHEN AN EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED IN PLASTIC CONDUIT (725.05), THE INSTALLATION SHALL INCLUDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN ADDITION TO THE CONDUCTORS SPECIFIED.

   C. METALLIC CONDUIT CARRYING THE LOOP WIRES FROM IN THE PAVEMENT TO THE PULL BOX SPLICE LOCATION WILL ONLY BE BONDED AT THE PULL BOX END, AND WILL NOT CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR.

   D. IF MULTIPLE CONDUIT RUNS BEGIN AND END AT THE SAME POINTS, ONLY ONE EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED.

   E. IF AN EQUIPMENT GROUNDING CONDUCTOR IS NEEDED IN CONDUIT BETWEEN SIGNALIZED INTERSECTIONS FOR UNDERGROUND INTERCONNECT CABLE, THE GROUNDING SYSTEM FOR EACH SIGNALIZED INTERSECTION WILL BE SEPARATED ABOUT MIDWAY BETWEEN THE INTERSECTIONS.

   F. THE MESSENGER WIRE AT SIGNALIZED INTERSECTIONS WILL BE USED AS THE CONDUCTIVE PATH FROM CORNER TO CORNER IF CONDUIT IS NOT PROVIDED UNDER THE ROADWAY. WHEN CONDUIT CONNECTS THE CORNERS OF AN INTERSECTION, AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE USED IN THE CONDUIT.

2. CONDUITS

   A. THE 725.04 CONDUIT SHALL HAVE GROUNDING BUSHINGS INSTALLED AT ALL TERMINATION POINTS. THE BUSHING MATERIAL SHALL BE COMPATIBLE WITH GALVANIZED STEEL CONDUIT AND THE GROUNDING LUG MATERIAL SHALL BE COMPATIBLE FOR USE WITH COPPER WIRE. THREADED OR COMPRESSION TYPE BUSHINGS MAY BE USED.

   B. THE 725.05 CONDUIT SHALL HAVE THE INSIDE AND OUTSIDE DIAMETERS OF THE CONDUIT DEBURRED AT ALL TERMINATION POINTS.

   C. BOTH ENDS OF METALLIC CONDUIT SHALL BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.

   D. METALLIC CONDUIT MAY BE BONDED TO METALLIC BOXES THROUGH THE USE OF CONDUIT FITTINGS UL APPROVED FOR THIS TYPE OF CONNECTION, WITH THE BOX BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.

GROUNDING AND BONDING (CONT.)

3. WIRE FOR GROUNDING AND BONDING.

   A. USE INSULATED, COPPER WIRE FOR THE EQUIPMENT GROUNDING CONDUCTOR. BONDING JUMPERS IN BOXES AND ENCLOSURES MAY BE BARE OR INSULATED COPPER WIRE. WIRE SIZE SHALL BE AS FOLLOWS:

   I. USE 4 AWG BETWEEN THE POWER SERVICE AND SUPPORTS, POLES, PEDESTALS, CONTROLLER OR FLASHER CABINETS.

   II. USE A MINIMUM 8 AWG BETWEEN LOOP DETECTOR PULL BOXES AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE.

   III. USE A MINIMUM 8 AWG BETWEEN THE "PREPARE TO STOP WHEN FLASHING" INSTALLATION (INCLUDING SUPPORT) AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE.

   IV. THE INSULATION SHALL BE GREEN OR GREEN WITH YELLOW STRIPE(S). FOR 4 AWG OR LARGER, INSULATION MAY ALSO BE BLACK WITH GREEN TAPE/LABELS INSTALLED AT ALL ACCESS POINTS.

   B. IN A HIGHWAY LIGHTING SYSTEM, THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE THE SAME WIRE SIZE AS THE DUCT CABLE OR DISTRIBUTION CABLE CIRCUIT CONDUCTORS, WITH THE MINIMUM CONDUCTOR SIZE OF 4 AWG. BONDING JUMPERS WILL BE MINIMUM SIZE 4 AWG.

4. GROUND ROD

   A. A 3/4 INCH SCHEDULE 40 PVC CONDUIT WILL BE USED IN FOUNDATIONS AND CONCRETE WALLS FOR THE GROUNDING CONDUCTOR (GROUND WIRE) RACEWAY TO THE GROUND ROD. SHOULD METALLIC CONDUIT BE USED, BOTH ENDS OF THE CONDUIT SHALL BE BONDED TO THE GROUNDING CONDUCTOR.

   B. THE TYPICAL GROUNDING CONDUCTOR (GROUND WIRE) SHALL BE 4 AWG INSULATED, COPPER.

5. THE GREEN CONDUCTOR IN SIGNAL CABLES (CONDUCTOR #4) SHALL NOT BE USED TO SUPPLY POWER TO A SIGNAL INDICATION. IT WILL BE CONNECTED TO THE SIGNAL BODY AS AN EQUIPMENT GROUND IN ALUMINUM HEADS AND IT WILL BE UNUSED IN PLASTIC HEADS. UNUSED CONDUCTORS SHALL BE GROUNDED IN THE CABINET. TYPICAL USE OF CONDUCTORS IS AS FOLLOWS:

COND. NO	COLOR	VEHICLE SIGNAL	PEDESTRIAN SIGNAL
1	BLACK	GREEN BALL	#1 WALK
2	WHITE	AC NEUTRAL	AC NEUTRAL
3	RED	RED BALL	#1 DW/FDW
4	GREEN	EQUIPMENT GROUND	EQUIPMENT GROUND
5	ORANGE	YELLOW BALL	#2 DW/FDW
6	BLUE	GREEN ARROW	#2 WALK
7	WHITE/BLACK STRIPE	YELLOW ARROW	NOT USED

GROUNDING AND BONDING (CONT.)

6. POWER SERVICE AND DISCONNECT SWITCH.

   A. AT THE POWER SERVICE LOCATION, THE GROUNDING CONDUCTOR (GROUND WIRE) FROM THE DISCONNECT SWITCH NEUTRAL (AC-) BAR TO THE GROUND ROD SHALL BE A CONTINUOUS, UNSPLICED CONDUCTOR. IF SPLICED, IT SHALL BE AN EXOTHERMIC WELD BUTT SPLICE.

   B. THE SERVICE NEUTRAL (AC-) SHALL ONLY BE CONNECTED TO GROUND AT THE PRIMARY POWER SERVICE DISCONNECT SWITCH.

   I. NEMA CONTROLLER CABINETS: IF A POWER SERVICE DISCONNECT SWITCH IS LOCATED BEFORE THE CONTROLLER CABINET, THE NEUTRAL (AC-) AND THE GROUNDING BARS IN THE CONTROLLER CABINET SHALL NOT BE CONNECTED TOGETHER AS SHOWN IN NEMA TS-2, FIGURE 5-4.

   II. IF SECONDARY DISCONNECT SWITCHES ARE CONNECTED AFTER THE PRIMARY DISCONNECT SWITCH, THE NEUTRAL (AC-) SHALL ONLY BE GROUNDED AT THE PRIMARY SWITCH. EQUIPMENT GROUNDING CONDUCTORS SHALL BE BROUGHT TO THE PRIMARY SWITCH, BUT SHALL BE GROUNDED AT BOTH SECONDARY AND PRIMARY SWITCHES.

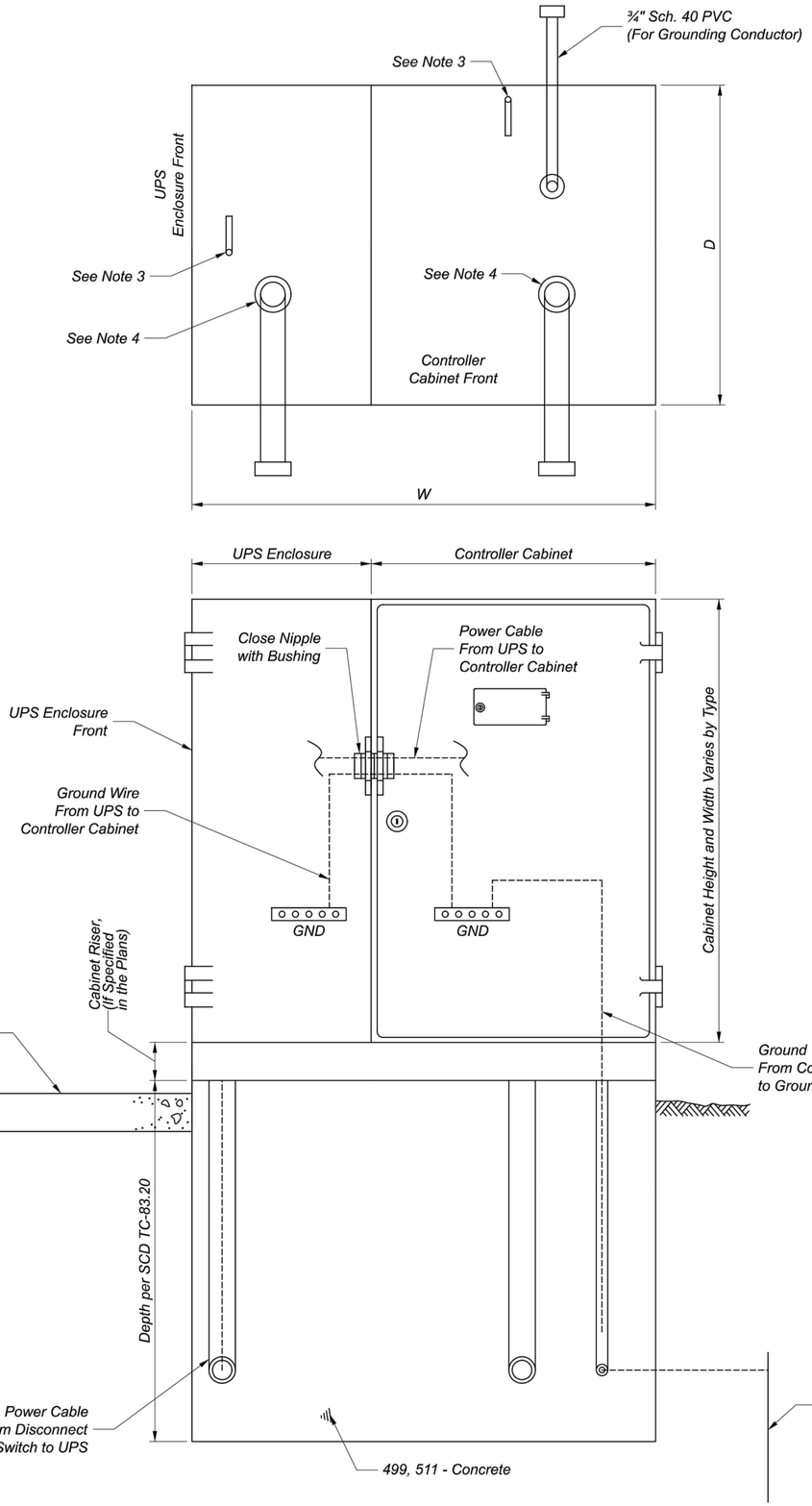
7. PAYMENT - ALL MATERIALS AND WORK REQUIRED TO COMPLETE THE EFFECTIVE GROUND FAULT CURRENT PATH SYSTEM ARE INCIDENTAL TO THE CONDUCTORS INSTALLED BY CONTRACT.

CALCULATED: JMP
CHECKED: TMC

TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

BEL-149-23.44

T3
T14



NOTES:

1. *THE UNINTERRUPTIBLE POWER SUPPLY (UPS) ENCLOSURE SHALL BE MOUNTED FLUSH UP AGAINST THE TRAFFIC SIGNAL CABINET AND SEALED WITH SILICONE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE NECESSARY POWER CABLE BETWEEN THE UPS UNIT AND SIGNAL CABINET.*

2. *THE UPS SHOULD BE PLACED ON THE OPPOSITE SIDE OF THE PULL BOX ON A 332/336 CABINET (PER STANDARD CONSTRUCTION DRAWING (SCD) TC-83.20). THE UPS PLACEMENT FOR A NEMA CABINET VARIES, PLACEMENT SHOULD PROVIDE ADEQUATE ACCESS WITH RESPECT TO SLOPE, GUARDRAIL SPACING, ETC.*

3. *THE SIZE, NUMBER, AND LOCATION OF ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.*

4. *THE SIZE, NUMBER, AND ORIENTATION OF CONDUIT ELLS SHALL BE AS SHOWN IN THE PLAN, EXCEPT THAT A ¾" SCHEDULE 40 PVC SHALL BE INSTALLED IN EACH FOUNDATION.*

5. *½" PREFORMED JOINT FILLER AS PER CMS 705.03 SHALL BE USED BETWEEN FOUNDATIONS AND ADJACENT PAVED AREAS.*

6. *SEE SCD TC-83.20 FOR FURTHER DETAILS.*

TYPE	*W (IN.)*	*D (IN.)*	*FOUNDATION CONCRETE (CU. YD.)*
TS-1	*60*	*24*	*1.23*
TS-2	*70*	*36*	*2.16*
2070/170	*50*	*36*	*1.54*

CALCULATED IMP
CHECKED TMC

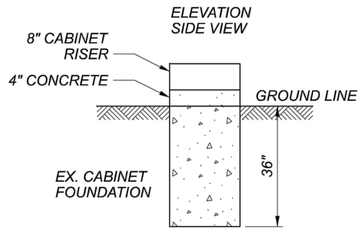
TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

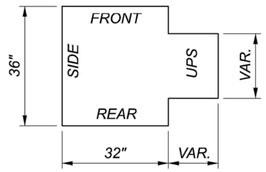
BEL-149-23.44

T4
T14

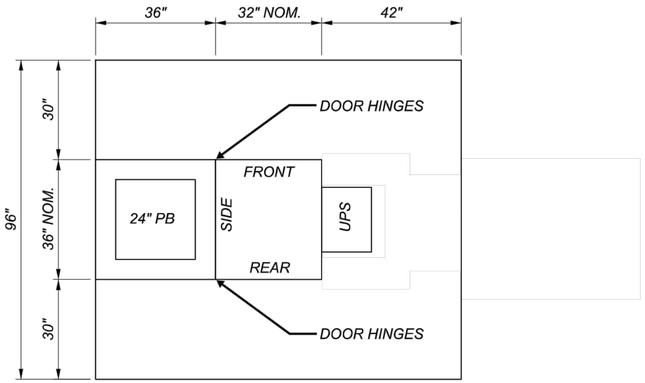
MODEL 332 CABINET DETAIL (TYP.)

UPS FOUNDATION DETAIL





UPS WORK PAD DETAIL



PLAN VIEW

NOTES:

1) THE SIZE OF THE UPS FOUNDATION MAY VARY BASED ON THE CABINET SIZE PROVIDED.

2) UPS FOUNDATION ELEVATION SHOULD MATCH CABINET FOUNDATION ELEVATION.

3) THE UPS CABINET SHALL BE MOUNTED FLUSH UP AGAINST THE SIGNAL CABINET AND SEALED.

4) CONDUIT AND WIRING FROM THE SIGNAL CABINET TO THE UPS SHALL BE INSTALLED THROUGH THE CABINET RISER.

CALCULATED IMP
CHECKED TMC

TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

BEL-149-23.44

T5
T14

SEPAC AND ASC/3 INPUT FILE INFORMATION FOR THE 332 CABINET

UPPER INPUT FILE (FILE=I)

UPPER CHANNEL															
	PHASE	1	2	2	2	3	4	4	4	1		MANUAL	2	6	FLASH
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	CONTROL ADV.	PED	PED	SENSE
	SEPAC DETECTOR NO.	VEH 1	VEH 3	VEH 5	VEH 7	VEH 9	VEH 11	VEH 13	VEH 15	VEH 17			PED 2	PED 6	
	ASC/3 DETECTOR NO.	VEH 1	VEH 2	VEH 3	VEH 4	VEH 5	VEH 6	VEH 7	VEH 8	VEH 9			PED 2	PED 6	
	C1 PIN NUMBER	56	39	63	47	58	41	65	49	60		80	67	68	81
	FIELD TERMINALS	1-D,E	2-D,E	3-D,E	4-D,E	5-D,E	6-D,E	7-D,E	8-D,E	9-D,E	10-D,E	11-D,E	12-D,E	13-D,E	14-D,E
SLOT NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOWER CHANNEL															
	PHASE	1	2	2	2	3	4	4	4	3		ADV.	4	8	STOP
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	ENABLE	PED	PED	TIME
	SEPAC DETECTOR NO.	VEH 1	VEH 4	VEH 6	VEH 7	VEH 9	VEH 12	VEH 14	VEH 15	VEH 18			PED 4	PED 8	
	ASC/3 DETECTOR NO.	VEH 1	VEH 10	VEH 11	VEH 4	VEH 5	VEH 14	VEH 15	VEH 8	VEH 13			PED 4	PED 8	
	C1 PIN NUMBER	56	43	76	47	58	45	78	49	62		53	69	70	82
	FIELD TERMINALS	1-J,K	2-J,K	3-J,K	4-J,K	5-J,K	6-J,K	7-J,K	8-J,K	9-J,K	10-J,K	11-J,K	12-J,K	13-J,K	14-J,K

LOWER INPUT FILE (FILE=J)

UPPER CHANNEL															
	PHASE	5	6	6	6	7	8	8	8	5					
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	SPARE	EV - A	EV - B	RR - 1
	SEPAC DETECTOR NO.	VEH 19	VEH 21	VEH 23	VEH 25	VEH 29	VEH 31	VEH 33	VEH 35	VEH 37					
	ASC/3 DETECTOR NO.	VEH 17	VEH 18	VEH 19	VEH 20	VEH 21	VEH 22	VEH 23	VEH 24	VEH 25					
	C1 PIN NUMBER	55	40	64	48	57	42	66	50	59		54	71	72	51
	FIELD TERMINALS	1-D,E	2-D,E	3-D,E	4-D,E	5-D,E	6-D,E	7-D,E	8-D,E	9-D,E	10-D,E	11-D,E	12-D,E	13-D,E	14-D,E
SLOT NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOWER CHANNEL															
	PHASE	5	6	6	6	7	8	8	8	7					
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	SPARE	EV - C	EV - D	RR - 2
	SEPAC DETECTOR NO.	VEH 19	VEH 22	VEH 24	VEH 25	VEH 29	VEH 32	VEH 34	VEH 35	VEH 38					
	ASC/3 DETECTOR NO.	VEH 17	VEH 26	VEH 27	VEH 20	VEH 21	VEH 30	VEH 31	VEH 24	VEH 29					
	C1 PIN NUMBER	55	44	77	48	57	46	79	50	61		75	73	74	52
	FIELD TERMINALS	1-J,K	2-J,K	3-J,K	4-J,K	5-J,K	6-J,K	7-J,K	8-J,K	9-J,K	10-J,K	11-J,K	12-J,K	13-J,K	14-J,K

SEPAC AND ASC/3 INPUT FILE INFORMATION FOR THE 336 CABINET

UPPER CHANNEL															
	PHASE	1	2	3	4	5	6	7	8				2	6	FLASH
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	RR - 1	EV - A	EV - B	PED	PED	SENSE
	SEPAC DETECTOR NO.	VEH 1	VEH 3	VEH 9	VEH 11	VEH 19	VEH 21	VEH 29	VEH 31				PED 2	PED 6	
	ASC/3 DETECTOR NO.	VEH 1	VEH 2	VEH 5	VEH 6	VEH 17	VEH 18	VEH 21	VEH 22				PED 2	PED 6	
	C1 PIN NUMBER	56	39	58	41	55	40	57	42	51	71	72	67	68	81
	FIELD TERMINALS	1-D,E	2-D,E	3-D,E	4-D,E	5-D,E	6-D,E	7-D,E	8-D,E	9-D,E	10-D,E	11-D,E	12-D,E	13-D,E	14-D,E
SLOT NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOWER CHANNEL															
	PHASE	2	2	4	4	6	6	8	8				4	8	STOP
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	RR - 2	EV - C	EV - D	PED	PED	TIME
	SEPAC DETECTOR NO.	VEH 7	VEH 4	VEH 15	VEH 12	VEH 25	VEH 22	VEH 35	VEH 32				PED 4	PED 8	
	ASC/3 DETECTOR NO.	VEH 4	VEH 10	VEH 8	VEH 14	VEH 20	VEH 26	VEH 24	VEH 30				PED 4	PED 8	
	C1 PIN NUMBER	47	43	49	45	48	44	50	46	52	73	74	69	70	82
	FIELD TERMINALS	1-J,K	2-J,K	3-J,K	4-J,K	5-J,K	6-J,K	7-J,K	8-J,K	9-J,K	10-J,K	11-J,K	12-J,K	13-J,K	14-J,K

CALCULATED IMP
CHECKED TMC

TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

BEL-149-23.44

T6
T14

PROPOSED VEHICULAR SIGNAL HEADS

SIGNALS

2A 2B 4A 4B 6A 6B

SIGNALS

5A

R3-5L
30" x 36"

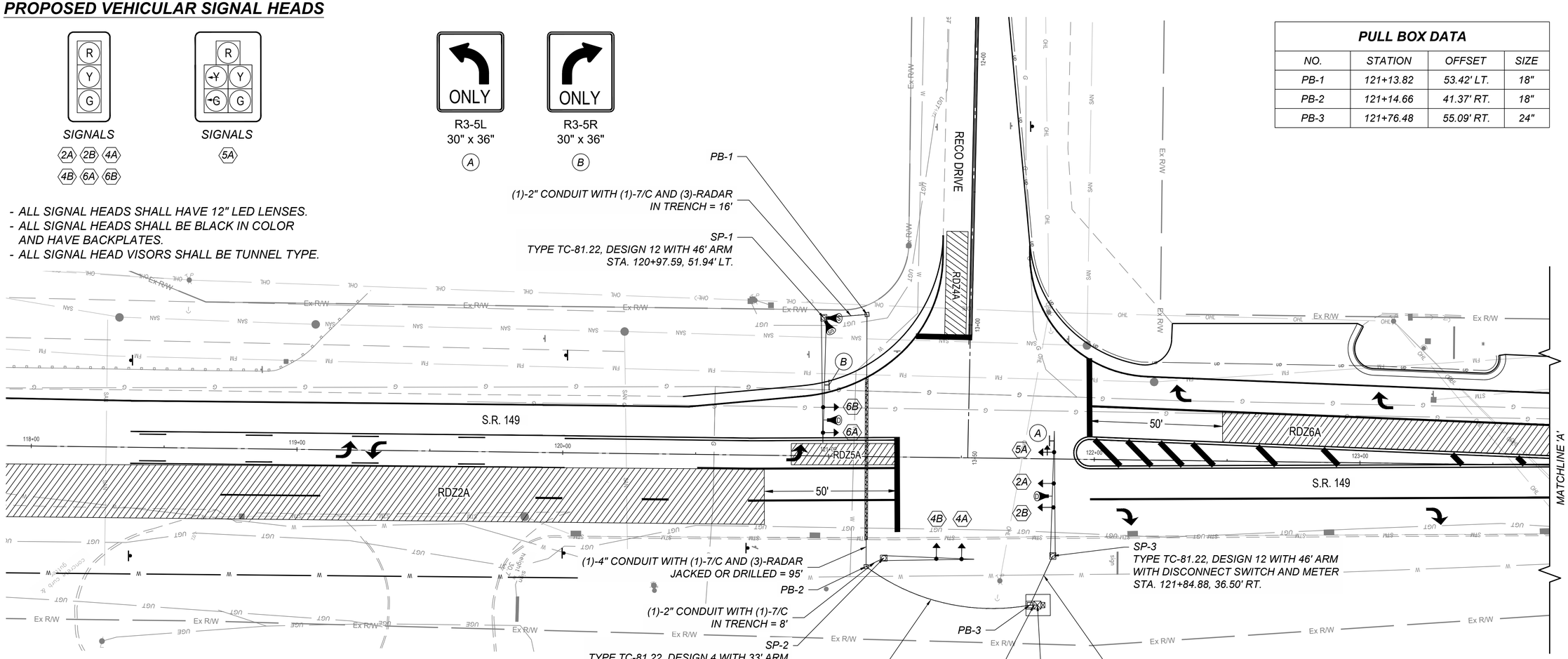
A

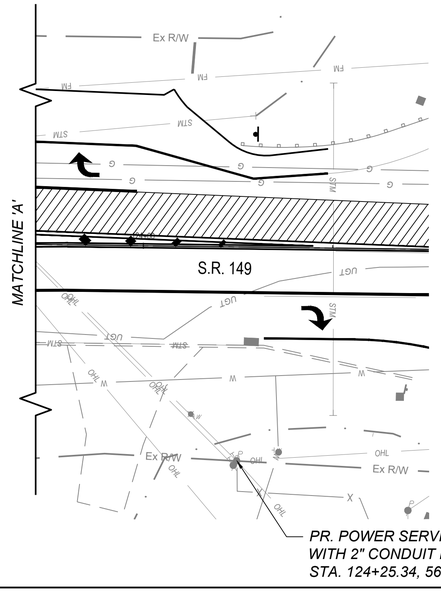
R3-5R
30" x 36"

B

- ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
- ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
- ALL SIGNAL HEAD VISORS SHALL BE TUNNEL TYPE.

PULL BOX DATA			
NO.	STATION	OFFSET	SIZE
PB-1	121+13.82	53.42' LT.	18"
PB-2	121+14.66	41.37' RT.	18"
PB-3	121+76.48	55.09' RT.	24"





LEGEND

- MAST ARM SIGNAL SUPPORT POLE
- 3-SECTION VEHICLE SIGNAL HEAD
- 5-SECTION VEHICLE SIGNAL HEAD
- OVERHEAD SIGN
- CONTROLLER CABINET AND WORK PAD (332L)
- PULL BOX
- CONDUIT
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- DETECTION ZONE

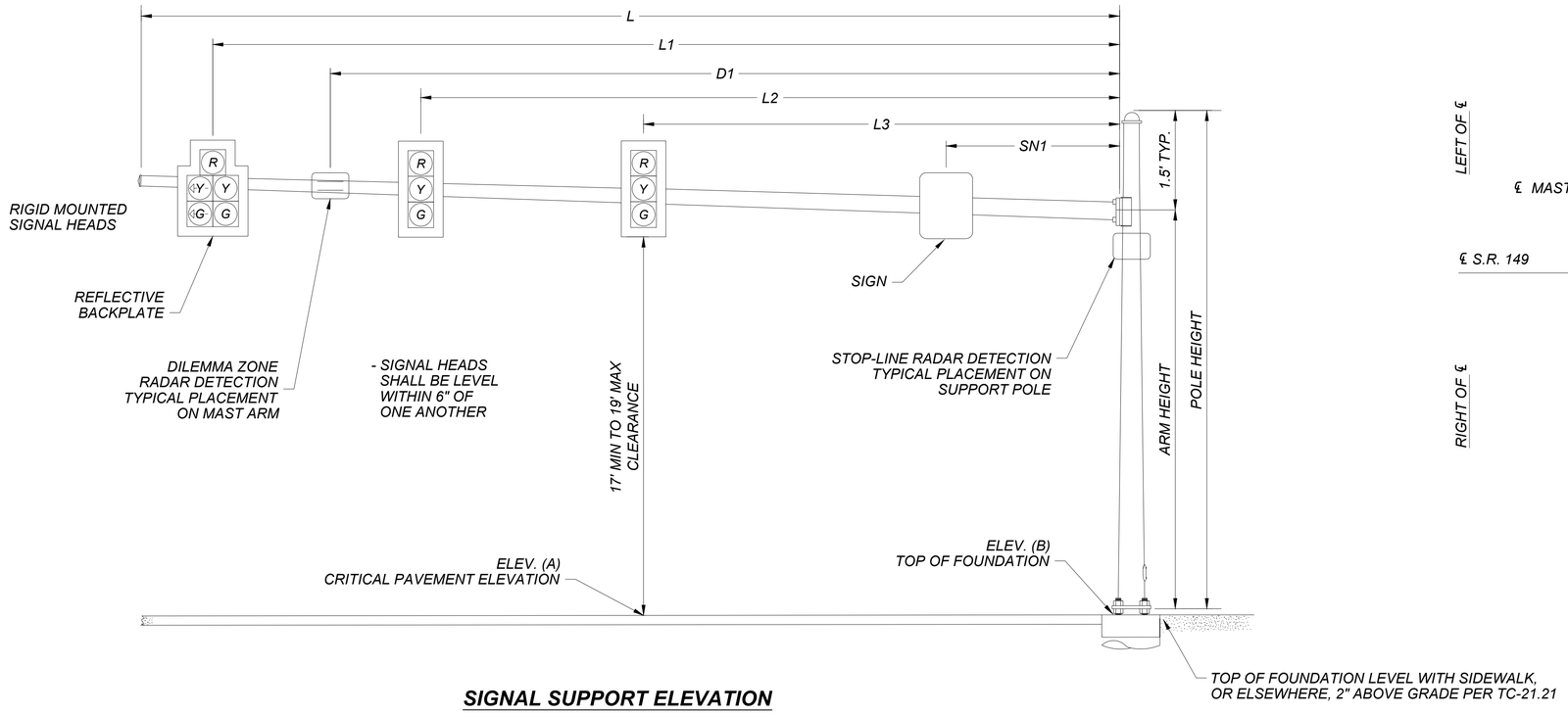
GRAPHIC SCALE (IN FEET)
40 20 0 10 20

CALCULATED JMP
CHECKED TMC

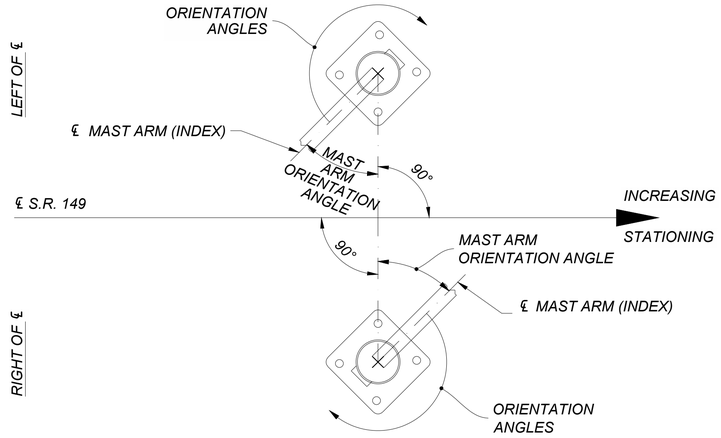
TRAFFIC SIGNAL PLAN
S.R. 149

BEL-149-23.44

T7
T14



SIGNAL SUPPORT ELEVATION



POLE ORIENTATION

MAST ARM TABLE

TEM Fig. 498-37: Plan Details for Signal Supports - Arm Lengths																TEM Fig. 498-38: Plan Details for Signal Supports - Mast Arm Orientation			
			ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM			
SUPPORT NO.	STATION	OFFSET	A (Pavt. Elev.)	B (Top of Found.)	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	R1	R2	R3	SN1	MAST ARM ANGLE	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG
SP-1	120+97.59	51.94' LT	1191.07	1191.92	TC-81.22	12	21	19.5	46	42	33	-	0	0	37.5	24	0	-	180	-
SP-2	121+21.28	38.10' RT	1192.35	1192.26	TC-81.22	4	21	19.5	33	19	28.5	-	-	-	-	-	90	-	180	-
SP-3	121+84.88	36.50' RT	1191.88	1192.72	TC-81.22	12	21	19.5	46	17.5	26.5	38	21.5	-	-	42.5	0	180	180	180
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CALCULATED IMP
CHECKED TMC

TRAFFIC SIGNAL PLAN DETAILS
S.R. 149

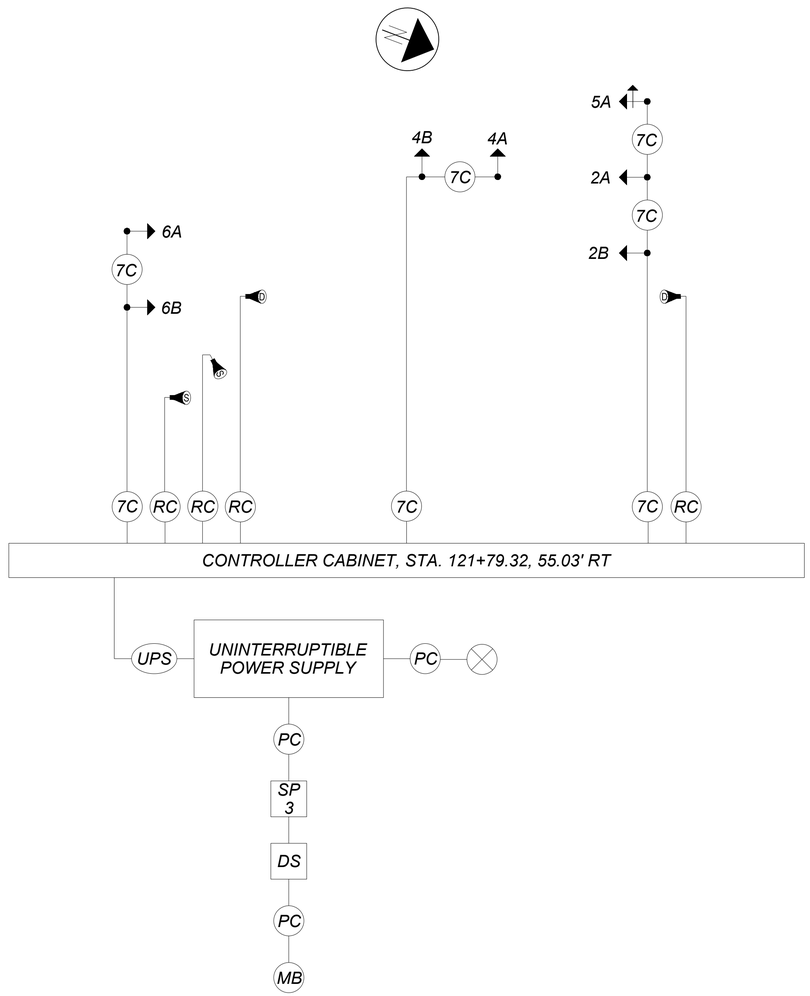
BEL-149-23.44

T8
T14

FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
5A (NB LT)	R	Ø2 R	R
	Y	Ø2 Y	
	G	Ø2 G	
	<--Y---	Ø5 Y	
	<--G---	Ø5 G	
2A, 2B (NB)	R	Ø2 R	R
	Y	Ø2 Y	
	G	Ø2 G	
4A, 4B (EB)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
6A, 6B (SB)	R	Ø6 R	R
	Y	Ø6 Y	
	G	Ø6 G	
LS = LOAD SWITCH			

WIRING DIAGRAM



WIRING DIAGRAM LEGEND

- *5-SECTION VEHICULAR SIGNAL HEAD, 1-WAY*
- *3-SECTION VEHICULAR SIGNAL HEAD, 1-WAY*
- *STOP BAR RADAR DETECTION UNIT*
- *DILEMMA ZONE RADAR DETECTION UNIT*
- *7C — SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG*
- *RC — RADAR DETECTION CABLE*
- *POWER SOURCE*
- *PC — POWER CABLE, 2 CONDUCTOR, NO. 6 AWG*
- *MB — METER BASE*
- *DS — SIGNAL DISCONNECT SWITCH*
- *UPS — UNINTERRUPTIBLE POWER SUPPLY CABLE*

CALCULATED IMP
CHECKED TMC

TRAFFIC SIGNAL PLAN DETAILS
S.R. 149

BEL-149-23.44

T9
T14

SIGNAL TIMING CHART

INTERSECTION: S.R. 149 & RECO DRIVE MAINTAINING AGENCY: ODOT DISTRICT 11									
START UP		DUAL ENTRY: YES			PHASES:		2 + 6		
		REST IN RED:			RING 1 -		RING 2 -		
START IN: ALL RED TIME FOR FLASH, ALL RED: 5 SEC. FIRST PHASE(S): Ø2 + Ø6 COLOR DISPLAYED: GREEN		OVERLAP				A	B	C	D
		PHASES				-	-	-	-
INTERVAL OR FEATURE		CONTROLLER MOVEMENT NO.							
INTERSECTION MOVEMENT (PHASE)		1	2	3	4	5	6	7	8
DIRECTION		-	NB	-	EB	NBLT	SB	-	-
MINIMUM GREEN (INITIAL)	(SEC.)	-	20	-	10	7	20	-	-
ADDED INITIAL	*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL	*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)	(SEC.)	-	2.0	-	2.0	2.0	2.0	-	-
TIME BEFORE REDUCTION	*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP	*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE	*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I	(SEC.)	-	34	-	14	8	21	-	-
MAXIMUM GREEN II	(SEC.)	-	-	-	-	-	-	-	-
YELLOW CHANGE	(SEC.)	-	4.5	-	4.5	4.0	5.0	-	-
ALL RED CLEARANCE	(SEC.)	-	1.0	-	1.0	1.5	1.0	-	-
DELAYED GREEN (LPI) #	(SEC.)	-	-	-	-	-	-	-	-
WALK	(SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE	(SEC.)	-	-	-	-	-	-	-	-
RECALL	MAXIMUM (ON/OFF)	-	OFF	-	OFF	-	OFF	-	OFF
	MINIMUM (ON/OFF)	-	ON	-	OFF	-	ON	-	OFF
	PEDESTRIAN (ON/OFF)	-	OFF	-	OFF	-	OFF	-	OFF
MEMORY	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	OFF

*VOLUME DENSITY CONTROLS

NOTES:

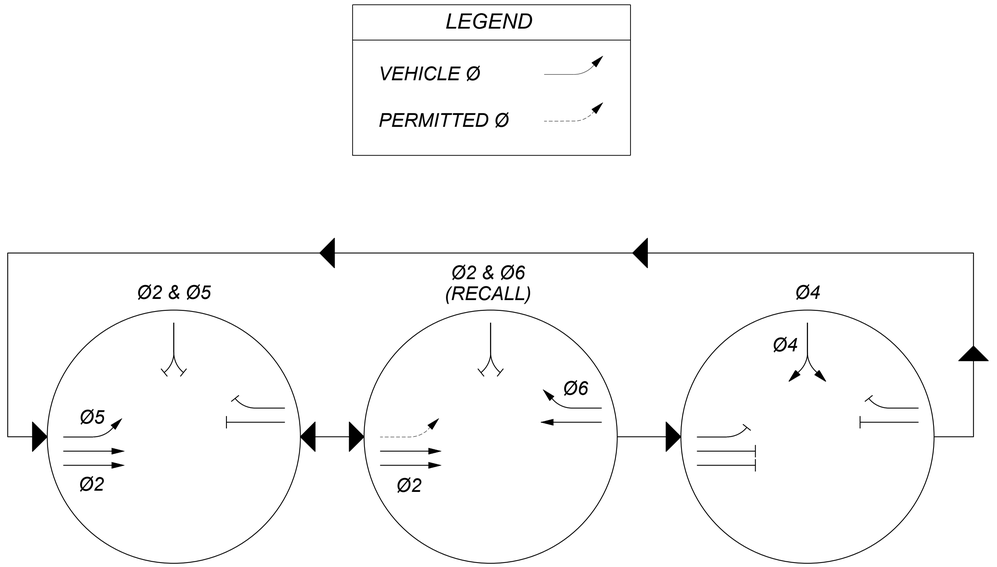
- ALL MOVEMENTS SHALL BE ACTUATED. THE PRIMARY THRU MOVEMENT SHOULD HAVE MIN RECALL ACTIVE TO REST IN GREEN.

-RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLE TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6.0 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.

-RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM THE STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.

- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PHASING DIAGRAM



RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	DETECTOR NO.	PURPOSE	DETECTION ZONE LENGTH (FT)
RDZ5A	NB LT	PRESENCE	Ø5	5.0	2.0	D2A	STOP BAR	40
RDZ2A	NB	PULSE	Ø2	0.0	2.0	D2B	DILEMMA ZONE	850
RDZ4A	EB LR	PRESENCE	Ø4	10.0	2.0	D4A	STOP BAR	40
RDZ6A	SB	PULSE	Ø6	0.0	2.0	D6A	DILEMMA ZONE	850

NOTE: ALL DETECTION ZONES SHALL BE CENTERED IN THEIR RESPECTIVE LANES UNLESS OTHERWISE SHOWN.

CALCULATED IMP
CHECKED TMC

TRAFFIC SIGNAL PLAN DETAILS
S.R. 149

BEL-149-23.44

T10
T14

COORDINATION TIME CHART

"INTERSECTION 1" - S.R. 149 & RECO DRIVE										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	EB	NBLT	SB	-	-		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	40	-	20	13.4	26.6	-	-	55	-
2	-	52.6	-	17.4	13.4	39.2	-	-	64	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

"INTERSECTION 2" - I-70 EASTBOUND RAMPS & S.R. 149										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	EB	-	SB	-	-		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	42	-	18	-	42	-	-	52	-
2	-	47.5	-	22.5	-	47.5	-	-	62	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

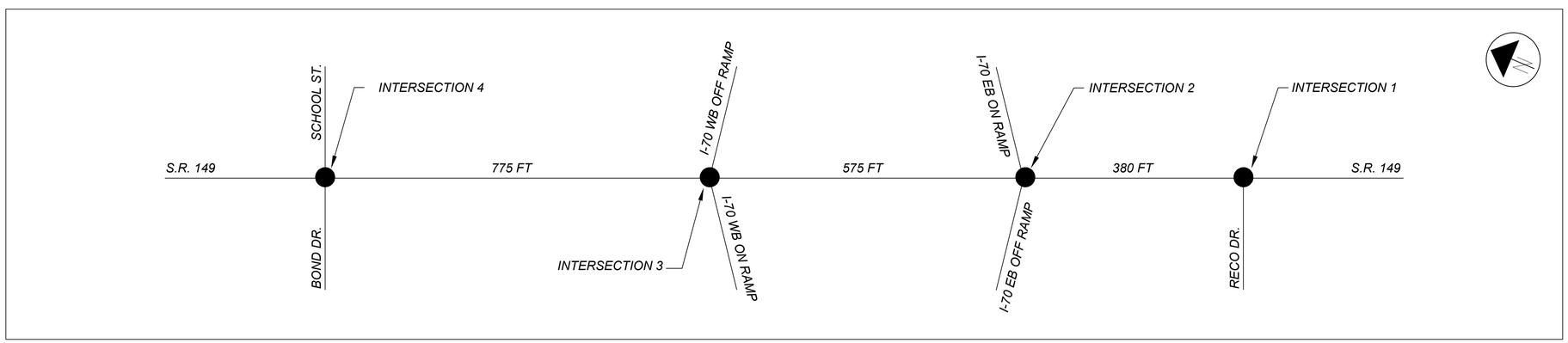
"INTERSECTION 3" - I-70 WESTBOUND RAMPS & S.R. 149 (MASTER)										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	WB	-	SB	-	WB		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	37.5	-	22.5	-	37.5	-	-	0	-
2	-	43	-	27	-	43	-	-	0	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

"INTERSECTION 4" - S.R. 149 & BOND DRIVE/SCHOOL STREET										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	EB	-	SB	-	WB		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	37	-	23	-	37	-	23	12	-
2	-	42	-	28	-	42	-	28	5	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

COORDINATION TIMING PLANS

DAY(S) OF WEEK	PLAN NAME	HOURS	PLAN NO. OR CYCLE/SPLIT/OFFSET	CYCLE LENGTH (SEC)
-	-	-	-	-
SAT-SUN	FREE	0000 - 2400	FREE	FREE
-	-	-	-	-
MON-FRI	FREE	0000 - 0700	FREE	FREE
MON-FRI	AM PEAK	0700 - 0930	1	60
MON-FRI	FREE	0930 - 1430	FREE	FREE
MON-FRI	PM PEAK	1430 - 1800	2	70
MON-FRI	FREE	1800 - 2400	FREE	FREE
-	-	-	-	-

COORDINATION LAYOUT



CALCULATED IMP
CHECKED TMC

TRAFFIC SIGNAL COORDINATION PLAN
S.R. 149

BEL-149-23.44

T11
T14

SHEET NO.	REFERENCE	STATION TO STATION					625 CONDUIT, 2", 725.04 FT	625 CONDUIT, 3", 725.04 FT	625 TRENCH FT	625 CONDUIT, JACKED OR DRILLED, 725.04, 4" FT	625 PULL BOX, 725.08, 18" EACH	625 PULL BOX, 725.08, 24" EACH	625 GROUND ROD EACH	625 UNDERGROUND WARNING/MARKING TAPE FT	625 ARC FLASH CALCULATIONS AND LABEL EACH	632 VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE EACH	632 VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE EACH	632 COVERING OF VEHICULAR SIGNAL HEAD EACH	632 SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG FT	632 SIGNAL SUPPORT FOUNDATION EACH	632 POWER CABLE, 2 CONDUCTOR, NO. 6 AWG FT	632 POWER SERVICE, AS PER PLAN EACH	632 CONDUIT RISER, 2" DIAMETER EACH	632 SIGNAL SUPPORT, TYPE TC-81.22, DESIGN 4 EACH	632 SIGNAL SUPPORT, TYPE TC-81.22, DESIGN 12 EACH	633 CABINET, TYPE 332L, AS PER PLAN EACH	633 CABINET FOUNDATION EACH	633 CONTROLLER WORK PAD EACH	633 UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN EACH	633 CONTROLLER ITEM, MISC.: TIMING AND COORDINATION EACH	633 COMMUNICATIONS, AS PER PLAN EACH	809 ADVANCED RADAR DETECTION, AS PER PLAN EACH	809 STOP LINE RADAR DETECTION, AS PER PLAN EACH	809 ATC CONTROLLER, AS PER PLAN EACH
		SR 149																																
T7	CONTR.	121+79.32	RT										1		1													1	1	1	1	1	1			1
		121+79.32	RT	TO	121+76.48	RT		3	3					3					24		8														
	PB-3	121+76.48	RT									1																							
		121+76.48	RT	TO	121+84.88	RT	42		21					21					26		31														
	SP-3	121+84.88	RT										1			2	1	3	82.5	1			1		1								1		
		121+76.48	RT	TO	121+14.66	RT		66	66					66					142																
	PB-2	121+14.66	RT								1																								
		121+14.66	RT	TO	121+21.28	RT	8		8					8					13																
	SP-2	121+21.28	RT										1			2		2	68	1					1										
		121+14.66	RT	TO	121+13.82	LT				95									100																
	PB-1	121+13.82	LT								1																								
		121+13.82	LT	TO	120+97.59	LT	16		16					16					21																
	SP-1	120+97.59	LT										1			2		2	66	1					1								1	2	
	POWER	124+25.34	RT																			1	1												
		124+25.34	RT	TO	121+79.32	RT																													
	CONTR.	121+79.32	RT																																
TOTALS CARRIED TO GENERAL SUMMARY							66	69	114	95	2	1	4	114	1	6	1	7	543	3	39	1	2	1	2	1	1	1	1	1	1	2	2	1

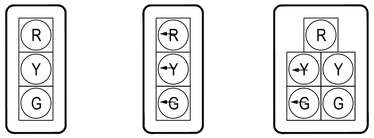
CALCULATED JMP
CHECKED TMC

TRAFFIC SIGNAL SUBSUMMARY
S.R. 149

BEL-149-23.44

T12
T14

SIGNAL HEADS, 12", LED WITH BACK PLATES



SIGNALS 2A, 2B, 2C, 4C, 6A, 6C

SIGNALS 4A

SIGNALS 4B, 6B

TRAFFIC SIGNAL SUBSUMMARY			
ITEM	QUANTITY	UNIT	
614	1	LS	MAINTAINING TRAFFIC
632	1	EACH	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE
809	1	EACH	STOP LINE RADAR DETECTION, AS PER PLAN

EXISTING 3-SECTION SIGNAL HEAD TO BE REPLACED WITH 5-SECTION SIGNAL HEAD.

CONTRACTOR TO WIRE LEFT TURN ARROWS TO PHASE 1 AND THROUGH BALLS TO PHASE 6 IN THE CABINET.

CONTROLLER WORK (TO BE DONE BY ODOT ONCE CONSTRUCTION IS COMPLETED).

- ACTIVATE PHASE 1.
- CHANGE RING STRUCTURE TO MAKE IT A LAGGING LEFT.
- ENABLE PREEMPT 3 FOR SB APPROACH (PH 1 & PH 6).
- SOLDER MONITOR CARD SO 1&6 CAN TURN ON AT THE SAME TIME.

EX. PB-3

EX. 70'-CONDUIT, 3", 725.04
1-7/C
PR. 1-WAVETRONIX

EX. SIGNAL SUPPORT (SP-3)
STA. 126+55, 27' LT.

CONTRACTOR TO MOUNT STOP LINE RADAR DETECTION UNIT TO TOP OF POLE.
ASSIGN DETECTOR TO PHASE 1.
PUT 5 SECOND DELAY ON THE DETECTOR IN CONTROLLER.

EX. 71'-CONDUIT, JACKED OR DRILLED, 3"
1-7/C
PR. 1-WAVETRONIX

EX. SIGNAL SUPPORT (SP-2)
STA. 125+90, 46' RT.

EX. 102'-CONDUIT, JACKED OR DRILLED, 3"
2-7/C, 2-WAVETRONIX RADAR
PR. 1-WAVETRONIX RADAR

EX. SIGNAL SUPPORT (SP-1)
W/ 2" CONDUIT RISER
STA. 124+90, 46' RT.

RAMP A

RAMP B

S.R. 149

RDZ2A

RDZ2B

RDZ4B

RDZ4A

RDZ6

6A

6B

6C

2A

2B

2C

4C 4B 4A

PB-2

125+00

126+00

127+00

Ex R/W

R/W

PULL BOX DATA			
NO.	STATION	OFFSET	SIZE
PB-1	124+82.8	42' RT.	24"
PB-2	125+85	41' RT.	18"
PB-3	125+85	30' LT.	18"

LEGEND

	EXISTING	PROPOSED
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
TRAFFIC SIGNAL, 3 UNIT HEAD, 12" WITH ARROWS		
TRAFFIC SIGNAL, 5 UNIT HEAD, 12" WITH ARROWS		
SIGNAL SUPPORT POLE		
332 CONTROLLER AND WORK PAD		
TRAFFIC PULL BOX		
DILEMMA ZONE RADAR DETECTION UNIT		
STOP LINE RADAR DETECTION UNIT		
DETECTION ZONE		

GRAPHIC SCALE (IN FEET)
40 20 0 10 20

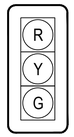
CALCULATED TJC
CHECKED REM

TRAFFIC SIGNAL PLAN
S.R. 149 & EASTBOUND I.R. 70 RAMPS

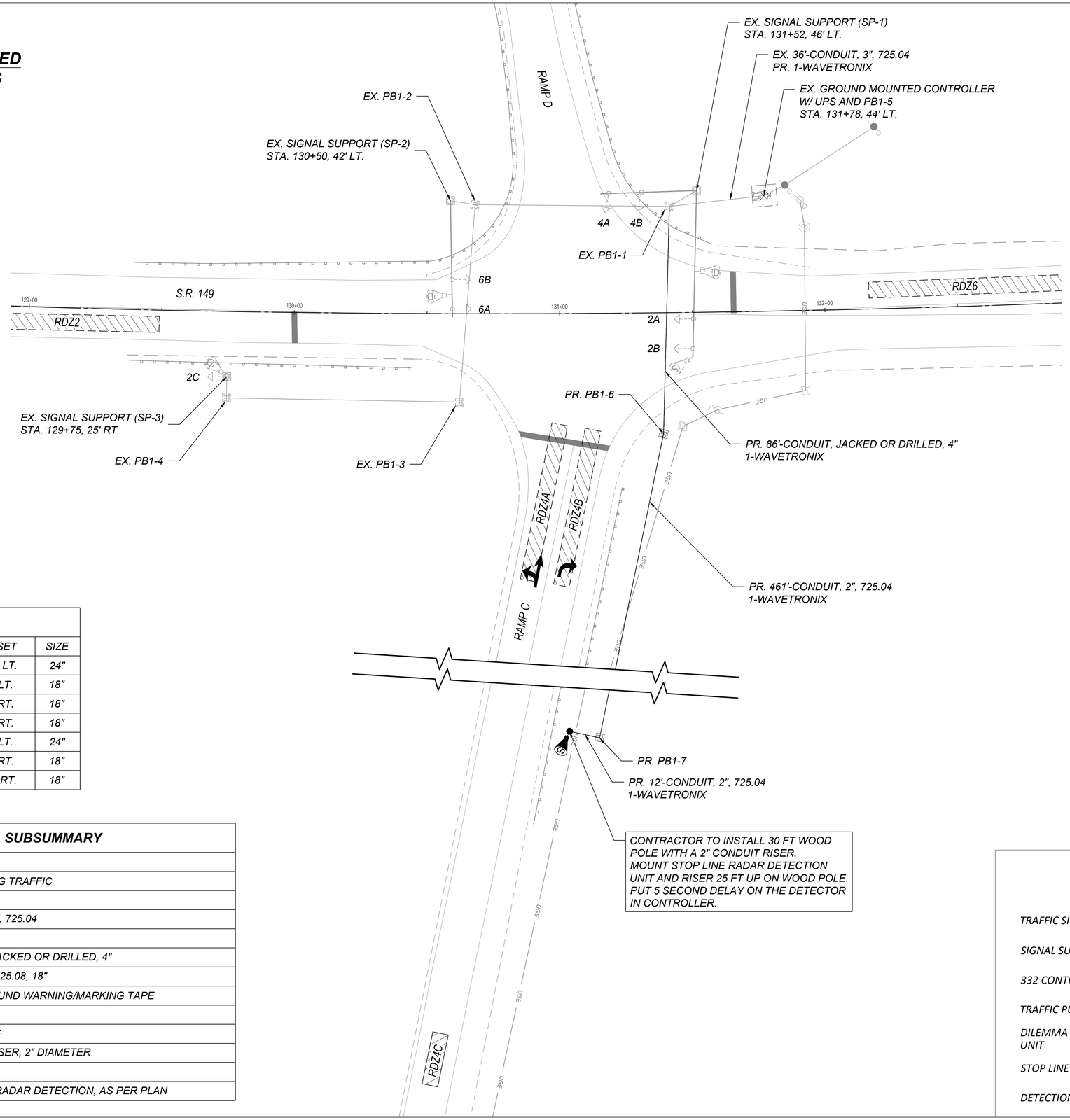
BEL-149-23.44

T13
T14

SIGNAL HEADS, 12", LED WITH BACK PLATES



SIGNALS
2A, 2B, 2C,
4A, 4B, 6A, 6B



PULL BOX DATA

	NO.	STATION	OFFSET	SIZE
EX.	PB1-1	131+42	40.5' LT.	24"
EX.	PB1-2	130+68	41' LT.	18"
EX.	PB1-3	130+68	31' RT.	18"
EX.	PB1-4	129+75	30' RT.	18"
EX.	PB1-5	131+78	44' LT.	24"
PR.	PB1-6	131+39	46' RT.	18"
PR.	PB1-7	130+49	497' RT.	18"

TRAFFIC SIGNAL SUBSUMMARY

ITEM	QUANTITY	UNIT	
614	1	LS	MAINTAINING TRAFFIC
625	473	FT	CONDUIT, 2", 725.04
625	473	FT	TRENCH
625	86	FT	CONDUIT, JACKED OR DRILLED, 4"
625	2	EACH	PULL BOX, 725.08, 18"
625	473	FT	UNDERGROUND WARNING/MARKING TAPE
632	1	EACH	WOOD POLE
632	1	EACH	CONDUIT RISER, 2" DIAMETER
809	1	EACH	STOP LINE RADAR DETECTION, AS PER PLAN

LEGEND

	EXISTING	PROPOSED
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
SIGNAL SUPPORT POLE		
332 CONTROLLER AND WORK PAD		
TRAFFIC PULL BOX		
DILEMMA ZONE RADAR DETECTION UNIT		
STOP LINE RADAR DETECTION UNIT		
DETECTION ZONE		

GRAPHIC SCALE (IN FEET)
40 20 0 10 20

CALCULATED TMC
CHECKED REM

TRAFFIC SIGNAL PLAN
S.R. 149 & WESTBOUND I.R. 70 RAMPS

BEL-149-23.44

T14
T14

ROADWAY IMPROVEMENTS
LOVE'S TRAVEL STOPS
BEL-149-23.44

UNION TOWNSHIP
BELMONT COUNTY, OH

INDEX OF SHEETS

PROJECT DESCRIPTION

CONSTRUCTION TO WIDEN EAST AND WEST SIDE OF S.R. 149 TO PROVIDE 175' NB LEFT TURN LANE INTO LOVE'S DRIVEWAY, 175' SB RIGHT-TURN LANE INTO LOVE'S DRIVEWAY, 164' TWLTL BETWEEN SOUTH PILOT DRIVEWAY & NORTH PILOT DRIVEWAY, 125' NB LEFT TURN LANE INTO RECO DRIVE, 200' SB RIGHT TURN LANE INTO RECO DRIVE AND ASSOCIATED LANE RECONFIGURATION TO ACCOMMODATE AFOREMENTIONED IMPROVEMENTS. CONSTRUCTION TO WIDEN RECO DRIVE AND INSTALLATION OF TRAFFIC SIGNAL AT S.R. 149 & RECO DRIVE INTERSECTION. DITCH AND SLOPE GRADING AND INSTALLATION OF NECESSARY TRAFFIC CONTROL DEVICES. STORMWATER STRUCTURE AND CONDUIT MODIFICATIONS BETWEEN SOUTH MARATHON DRIVEWAY AND NORTH MARATHON DRIVEWAY.

EARTH DISTURBED AREAS AND TOTAL AREA OF PROJECT

TOTAL AREA OF PROJECT: 2.07 ACRES.
PROJECT EARTH DISTURBING ACTIVITIES AREA: 1.77 ACRES
CONTRACTOR EARTH DISTURBING ACTIVITIES AREA: 0.30 ACRES
NOI EARTH DISTURBING ACTIVITIES AREA: 2.07 ACRES

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I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

APPROVED _____

DATE _____ DISTRICT DEPUTY DIRECTOR

APPROVED _____

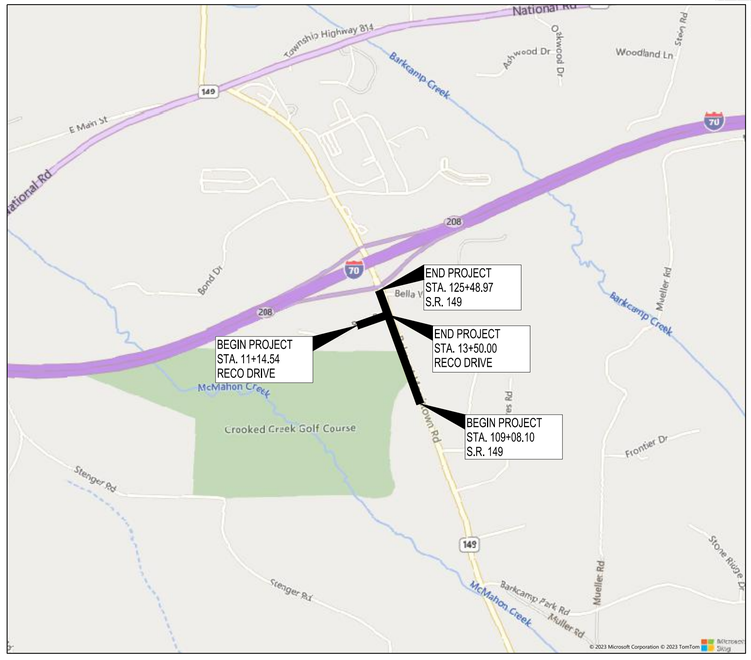
DATE _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

RAILROAD INVOLVEMENT

NONE

FEDERAL PROJECT NUMBER

NON-FEDERAL



LOCATION MAP

NOT TO SCALE

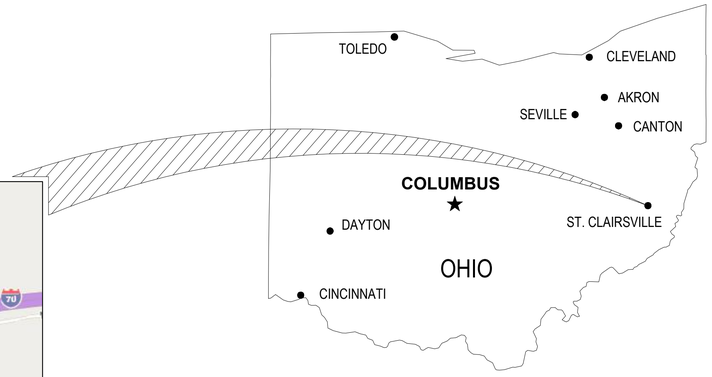
PROJECT LOCATED ALONG S.R. 149 - BELMONT MORRISTOWN ROAD, 1.29 MILES SOUTHEAST OF MORRISTOWN, OHIO AND SOUTH OF THE THE S.R. 149 AND I-70 INTERCHANGE. APPROXIMATELY 8.00 MILES WEST OF CLAIRSVILLE, OHIO

SCALES

PLAN _____ 20 0 20

PROFILE _____ HORIZONTAL 20 0 20 VERTICAL 5 0 5

CROSS SECTION _____ HORIZONTAL 5 0 5 VERTICAL 5 0 5



STATE LOCATION MAP

NOT TO SCALE

SITE LOCATION

LAT = N 40° 03' 27"
LONG = W 81° 03' 09"

DESIGN DESIGNATION - STATE ROUTE 149 (BELMONT MORRISTOWN ROAD):

AADT (2024)	10,000
DESIGN YEAR AADT (2044)	14,500
DESIGN HOURLY VOLUME (2044)	1,300
DIRECTIONAL DISTRIBUTION	55%
TRUCKS (24 HOUR B&C)	21%
DESIGN SPEED	50 MPH
LEGAL SPEED	45 MPH
DESIGN FUNCTIONAL CLASSIFICATION	5 - RURAL MAJOR COLLECTOR
NHS PROJECT	NO

2023 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN PLANS AND CHANGES LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

PLAN PREPARED BY:

CESO
WWW.CESOINC.COM
3601 RIGBY ROAD, SUITE 300
MIAMISBURG, OHIO 45342
PH (937) 435-8584 | FAX (937) 435-3307

ENGINEER'S STAMP

STATE OF OHIO
TODD D. HANAHAN
E-81708
REGISTERED
PROFESSIONAL ENGINEER

SIGNED: Todd Hanahan
DATE: 10/02/2024

STANDARD CONSTRUCTION DRAWINGS

ODOT HW-2.2	7/20/2018	ODOT DM-1.1	7/17/2020	ODOT MT-95.31	7/19/2019	ODOT TC-41.41	7/19/2019	ODOT TC-81.22	7/21/2023		
		ODOT DM-1.2	7/16/2021	ODOT MT-97.10	4/19/2019	ODOT TC-42.20	10/18/2013	ODOT TC-83.10	1/17/2020		
ODOT CB-3A	7/16/2021	ODOT DM-4.3	1/15/2016	ODOT MT-97.11	1/20/2017	ODOT TC-52.10	10/18/2013	ODOT TC-83.20	1/19/2024		
		ODOT DM-4.4	1/15/2016	ODOT MT-99.20	7/19/2019	ODOT TC-52.20	1/15/2021	ODOT TC-85.20	4/1/2023		
ODOT BP-3.1	1/21/2022			ODOT MT-101.90	7/17/2020	ODOT TC-61.30	7/19/2019				
ODOT BP-4.1	7/19/2013	ODOT MGS-1.1	7/16/2021	ODOT MT-120.00	1/19/2024						
ODOT BP-5.1	7/15/2022	ODOT MGS-2.1	1/19/2018	ODOT TC-21.21	1/20/2023	ODOT TC-65.10	1/17/2014				
		ODOT MGS-4.2	7/19/2013	ODOT TC-41.20	10/18/2013	ODOT TC-65.11	7/15/2022				
				ODOT TC-41.30	4/21/2023	ODOT TC-71.10	4/21/2023				

SUPPLEMENTAL SPECIFICATIONS

SS 800	1/19/2024
SS 832	7/21/2023
SS 863	7/21/2023
SS 809	1/19/2024
SS 825	4/21/2023
SS 909	1/19/2024

REVISIONS

BY	DATE	DESCRIPTION
PD	11/8/2023	ODOT COMMENTS #1
PD	1/2/2024	ODOT COMMENTS #2
PD	1/3/2024	REV 1
PD	2/9/2024	ADDENDUM #3
PD	2/23/2024	ODOT COMMENTS #3
PD	2/23/2024	ADDENDUM #4
PD	4/29/2024	ODOT COMMENTS #4
PD	6/24/2024	CCD07
PD	8/1/2024	CCD09
PD	8/12/2024	CCD10
PD	9/20/2024	CCD11

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UNDERGROUND UTILITIES
Contact Two Working Days Before You Dig
OHIO811.org Before You Dig
OHIO811, 8-1-1, or 1-800-362-2764
(Non-members must be called directly)

11 DATE 9-20-2024
ISSUE AGENCY REVIEW
CALCULATED PJD CHECKED TDH

TITLE SHEET
S.R. 149
BEL-149-23.44
R1
R32

BENCHMARKS	
BM #A	"X" CHISELED IN THE SOUTH SIDE OF RIM OF SANITARY MANHOLE ON NORTH SIDE OF RECO DRIVE, EAST OF ADDRESS 41245 RECO DRIVE
	ELEV=1239.44'
BM #B	EAST BOLT ON HYDRANT ON SOUTH SIDE OF RECO DRIVE, ACROSS FROM ADDRESS 41371 RECO DRIVE
	ELEV=1207.05'
BM #C	SOUTHWEST BOLT ON HYDRANT ON EAST SIDE OF BELMONT MORRISTOWN ROAD AT ADDRESS 66377 BELMONT MORRISTOWN ROAD
	ELEV=1193.84'

BENCHMARK NOTES:
BM "A" AND BM "B" LOCATED OUTSIDE OF PROJECT VIEWPORT LIMITS. REFER TO ORIGINAL SURVEY CONDUCTED BY CESO, INC. DATED APRIL 12, 2023 FOR MARKED LOCATION OF BENCHMARKS.

DATUM NOTES:

HORIZONTAL DATUM:
OHIO STATE PLANE COORDINATE SYSTEM, OHIO SOUTH ZONE, NAD83 (2011) AS DETERMINED BY OPUS POST PROCESSED STATIC SESSION.

VERTICAL DATUM:
NAVD 88 AS DETERMINED BY OPUS POST PROCESSED STATIC SESSIONS USING GEOID 18 (CONUS)

UTILITY DISCLAIMER:
THE UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION OUPS #A218001060 AND/OR EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES LOCATED HERE ON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES LOCATED ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

DATE OF FIELD SURVEY: AUGUST 9, 2022

DATE OF SURVEY MAP: APRIL 12, 2023

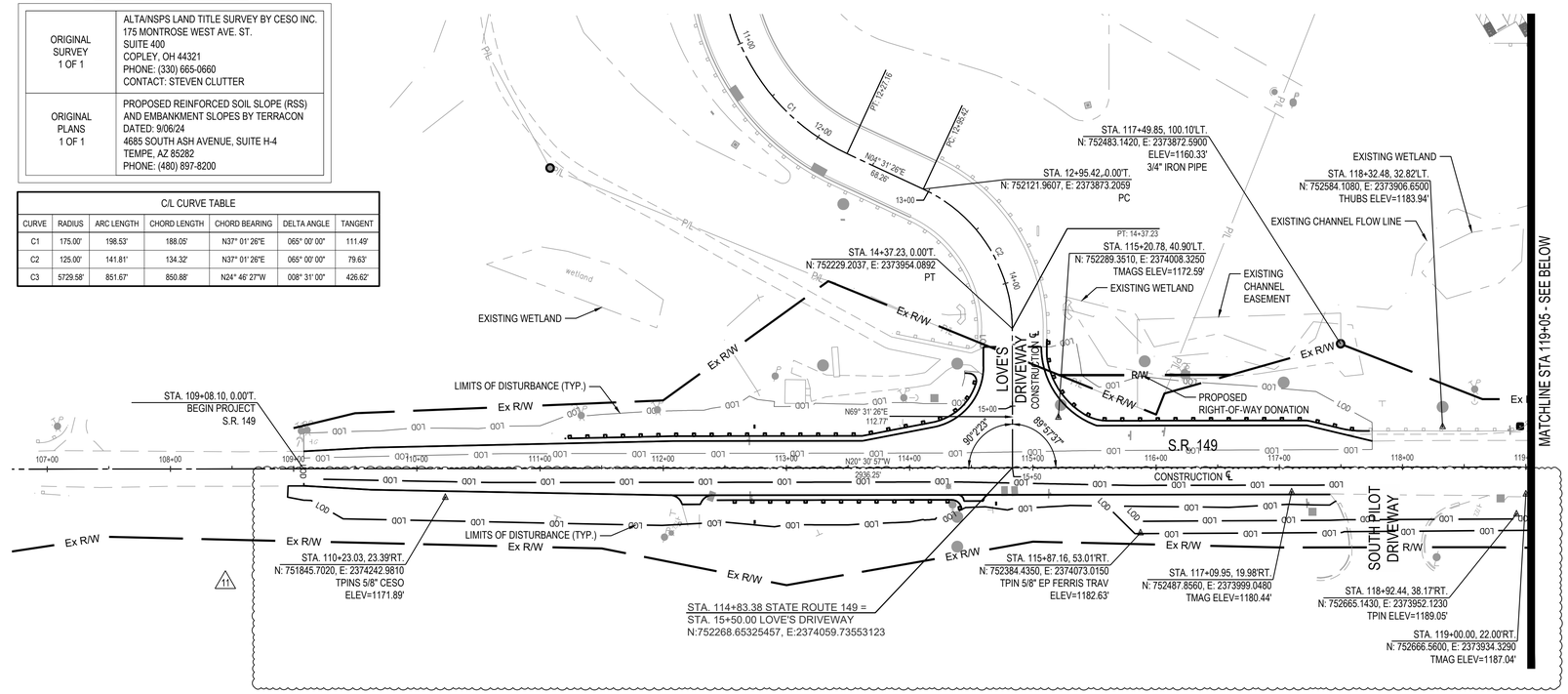
LANDSCAPE NOTE:
THERE ARE NO EXISTING LANDSCAPED AREAS WITHIN THE WORK LIMITS.

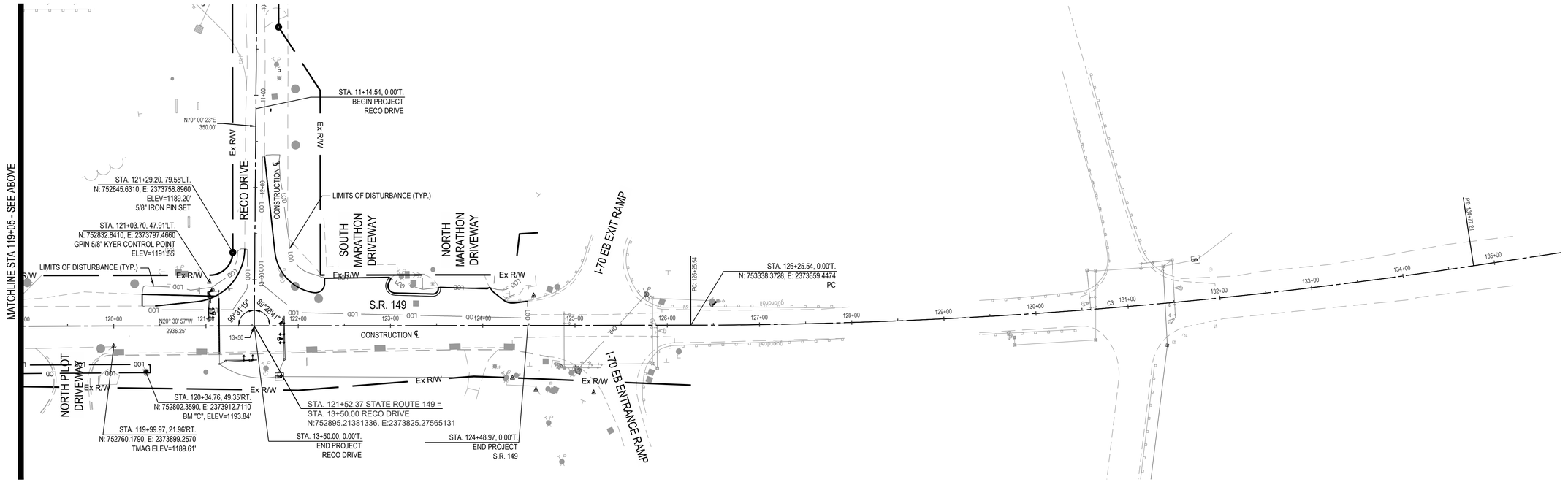
REFERENCE DRAWINGS:

ORIGINAL SURVEY 1 OF 1	ALTA/NSPS LAND TITLE SURVEY BY CESO INC. 175 MONTROSE WEST AVE. ST. SUITE 400 COPLEY, OH 44321 PHONE: (330) 665-0660 CONTACT: STEVEN CLUTTER
ORIGINAL PLANS 1 OF 1	PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES BY TERRACON DATED: 9/06/24 4685 SOUTH ASH AVENUE, SUITE H-4 TEMPE, AZ 85282 PHONE: (480) 897-8200

C/L CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE	TANGENT
C1	175.00'	198.53'	188.05'	N37° 01' 26"E	065° 00' 00"	111.49'
C2	125.00'	141.81'	134.32'	N37° 01' 26"E	065° 00' 00"	79.63'
C3	5729.58'	851.67'	850.88'	N24° 46' 27"W	008° 31' 00"	426.62'





GRAPHIC SCALE (IN FEET)
120 60 30 0 60

CALCULATED PJD
CHECKED TDH

SCHEMATIC PLAN
S.R. 149

BEL-149-23.44

R2
R32

SPECIFICATIONS AND STANDARD CONSTRUCTION DRAWINGS
THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION, 2023 CONSTRUCTION AND MATERIALS SPECIFICATIONS, AND THE NOTED STANDARD CONSTRUCTION DRAWINGS SHALL GOVERN THIS IMPROVEMENT. WHEREVER THE WORD "STATE" OCCURS, IT IS TO MEAN THE OHIO DEPARTMENT OF TRANSPORTATION (ODOT).

WHENEVER THE WORD "ENGINEER" OR "DEPARTMENT" IS USED HEREIN, IT SHALL BE HELD TO MEAN THE ODOT PROJECT ENGINEER, OR DULY AUTHORIZED AUTHORITY.

EXISTING SURVEY MONUMENTS
EXISTING SURVEY MONUMENTS, INCLUDING BUT NOT LIMITED TO PROPERTY CORNERS, CENTERLINE MONUMENTS, RIGHT-OF-WAY MONUMENTS, ETC., MAY POTENTIALLY BE DISTURBED OR DESTROYED BY CONSTRUCTION OF THESE ROADWAY IMPROVEMENTS. THE CONTRACTOR SHALL RETAIN A PROFESSIONAL SURVEYOR, LICENSED IN THE STATE OF OHIO, TO IDENTIFY MONUMENTS THAT MAY BE DISTURBED AND TO PROPERLY REPLACE DISTURBED MONUMENTS IN-KIND AFTER CONSTRUCTION IS COMPLETE.

PERMITS FEES AND NOTICES
THE CONTRACTOR SHALL OBTAIN, AT HIS EXPENSE, ANY AND ALL PERMITS AND INSPECTIONS REQUIRED FOR THE PROSECUTION OF THE WORK BY LOCAL LAWS, ORDINANCES, RULES AND REGULATIONS.

MATERIALS AND WORKMANSHIP
UNLESS OTHERWISE SPECIFIED, ALL MATERIALS SHALL BE NEW AND BOTH WORKMANSHIP AND MATERIALS SHALL BE OF THE FIRST QUALITY, PROPER AND SUFFICIENT FOR THE PURPOSE CONTEMPLATED. THE CONTRACTOR SHALL FURNISH, IF SO REQUIRED, SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND WORKMANSHIP. ALL ITEMS OF EQUIPMENT AND/OR MATERIALS PROPOSED FOR SUBSTITUTION MUST BE APPROVED BY THE ENGINEER IN WRITING AND SHALL BE EQUAL OR BE SUPERIOR TO THE ITEMS SPECIFIED IN THE CONTRACT DOCUMENTS. IF SAID SUBSTITUTION PROPOSED BY THE CONTRACTOR FOR A SPECIFIED ITEM REQUIRED ENGINEERING REVISIONS, THE EXPENSE OF SUCH REVISIONS SHALL BE PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

EXISTING FACILITIES
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM HIS WORK IN SUCH A MANNER AS NOT TO DAMAGE OR DESTROY ANY EXISTING FACILITY. IF ANY SUCH DAMAGE DOES OCCUR DUE TO THE CONTRACTOR'S OPERATIONS, HE SHALL REPLACE THE DAMAGED PORTION AT HIS EXPENSE AND TO THE SATISFACTION OF THE ENGINEER.

EXAMINATION OF THE SITE
THE CONTRACTOR SHALL CAREFULLY EXAMINE THE SITE OF THE PROPOSED WORK, THE PLANS AND SPECIFICATIONS. THE SUBMISSION OF A BID SHALL BE CONSIDERED EVIDENCE THAT THE CONTRACTOR HAS MADE SUCH EXAMINATION AND IS SATISFIED AS TO THE CONDITIONS TO BE ENCOUNTERED IN PERFORMING THE WORK IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

WORK LIMITS
THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATION OF ALL TEMPORARY TRAFFIC CONTROL AND TEMPORARY TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

RELOCATION OF UTILITIES
ALL UTILITIES WHICH ARE SHOWN OR LOCATED DURING THE COURSE OF CONSTRUCTION THAT ARE FOUND TO BE IN CONFLICT WITH THESE PLANS ARE TO BE RELOCATED OR ADJUSTED BY THE OWNER OF THE UTILITY.

UNDERGROUND UTILITIES
THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLAN AREAS OBTAINED FROM THE OWNERS OF THE UTILITIES. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES LOCATED HEREON COMPROMISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES LOCATED ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE/SHE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

SEEDING AND MULCHING

THE FOLLOWING QUANTITIES ARE PROVIDED TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDING AREAS:

ITEM 659, TOPSOIL	661 CU.YD
ITEM 659, SEEDING AND MULCHING	3,965 SQ. YD.
ITEM 659, COMMERCIAL FERTILIZER	0.54 TON
ITEM 659, LIME	0.82 ACRES
ITEM 659, WATER	10.7 M.GAL

APPLY SEEDING AND MULCHING TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

ITEM 659 SEEDING AND MULCHING
SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR ITEM 659, SEEDING AND MULCHING, ARE BASED ON THESE LIMITS.

WEATHER CONDITIONS
NO CONSTRUCTION SHALL BE DONE DURING STORMY, FREEZING OR INCLEMENT WEATHER UNLESS PERMISSION IS GIVEN BY THE ENGINEER WHENEVER WORK PROCEEDS DURING SUCH WEATHER, THE CONTRACTOR SHALL PROVIDE APPROVED FACILITIES, INCLUDING HEAT (IF REQUIRED), FOR THE PROTECTION OF ALL MATERIALS AND FINISHED WORK.

AGENCY NOTIFICATIONS
CONTRACTOR TO NOTIFY LOCAL EMERGENCY SERVICE PROVIDERS, UNITED STATES POSTAL SERVICE, LOCAL SCHOOL DISTRICTS PRIOR TO START OF CONSTRUCTION.

REVIEW OF DRAINAGE FACILITIES
PRIOR TO THE START OF WORK AND AGAIN BEFORE FINAL ACCEPTANCE, PERFORM AN INSPECTION WITH REPRESENTATIVES OF THE DEPARTMENT, CONTRACTOR AND LOCALS OF ALL EXISTING DRAINAGE FACILITIES THAT ARE TO REMAIN IN SERVICE WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCES IS DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTION ARE MAINTAINED BY THE DEPARTMENT. CONFIRM ALL EXISTING SEWERS INSPECTED INITIALLY BY THE ABOVE-MENTIONED PARTIES ARE MAINTAINED AND LEFT IN A CONDITION COMPARABLE TO THAT DETERMINED BY THE ORIGINAL INSPECTION. THE CONTRACTOR IS RESPONSIBLE TO CORRECT ANY CHANGE IN THE CONDITION RESULTING FROM THEIR OPERATIONS AS DIRECTED AND APPROVED BY THE ENGINEER. PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE IS INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 611 CONDUIT ITEMS.

ROUNDING
THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLIES TO ALL CROSS SECTIONS, EVEN THOUGH OTHERWISE SHOWN.

COOPERATION WITH UTILITY COMPANIES
WHILE THE WORK OF THIS CONTRACT IS BEING PERFORMED, THE UTILITY COMPANIES MAY BE WORKING IN THE AREA ADJUSTING AND RESETTING EXISTING FACILITIES. THE CONTRACTOR SHALL FULLY COOPERATE WITH UTILITY COMPANIES SO THAT THE ENTIRE WORK IS COMPLETED IN A MANNER CONSISTENT WITH GOOD CONSTRUCTION PRACTICES. THE CONTRACTOR, UTILITIES, AND ENGINEER SHALL DISCUSS THE NECESSARY CONSTRUCTION SCHEDULES TO COMPLETE THE PROJECT.

CROSSINGS TO EXISTING PIPES AND UTILITIES
WHERE PLANS PROVIDE FOR A PROPOSED CONDUIT TO CROSS OVER OR UNDER AN EXISTING SEWER OR UNDERGROUND UTILITY, THE CONTRACTOR SHALL LOCATE THE EXISTING PIPES OR UTILITIES BOTH AS TO LINE AND GRADE BEFORE STARTING THE PROPOSED CONDUIT.

UTILITY COORDINATION
THE FOLLOWING IS A LIST OF THE KNOWN EXISTING UTILITIES IN THE PROJECT AREA ALONG WITH THE RESPECTIVE OWNERS. THE LIST IS INCLUDED FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITY OWNERS IN THE PROJECT AREA PRIOR TO START OF CONSTRUCTION WHETHER LISTED ON THIS PAGE OR NOT.

SANITARY SEWER
BELMONT COUNTY
WATER & SEWER DISTRICT
67711 OAK VIEW DRIVE
ST. CLAIRSVILLE, OH 43950
PH: (740) 695-3144
CONTACT: JEANNE KINNEY

FIRE
LAFFERTY VOLUNTEER
FIRE DEPARTMENT
70191 IRWIN ROAD
LAFFERTY, OH 43951
PH: (740) 310-0901
CONTACT: DUSTIN HUDAK

WATER
BELMONT COUNTY
WATER & SEWER DISTRICT
67711 OAK VIEW DRIVE
ST. CLAIRSVILLE, OH 43950
PH: (740) 695-3144
CONTACT: JEANNE KINNEY

EROSION CONTROL
OEPA - SEDO
2195 EAST FRONT STREET
LOGAN, OH 43138
PH: (740) 385-8501

ROADWAY
STATE DOT: ODOT DISTRICT 11
41061 BOND DR.
BELMONT, OH 43718
PH: (330) 308-6510
CONTACT: DAVID SCHAFER

LOCAL DOT: UNION TOWNSHIP
PH: (740) 782-1337
CONTACT: JUSTIN DEMARCHI

COMMUNICATION
COMCAST
PH: (412) 337-1049
CONTACT: ANGELA MEYERS

ELECTRIC
AMERICAN ELECTRIC POWER (AEP)
47687 NATIONAL RD. W
ST. CLAIRSVILLE, OH 43950
PH: (740) 238-3630
CONTACT: BRENT PANEPUCCI

GAS
COLUMBIA GAS
290 W NATIONWIDE BLVD
COLUMBUS, OH 43215
PH: (614) 460-8928
CONTACT: DAVID BASSITT

STORM SEWER
STATE DOT: ODOT DISTRICT 11
41061 BOND DR.
BELMONT, OH 43718
PH: (330) 308-6510
CONTACT: DAVID SCHAFER

OWNER/DEVELOPER
LOVE'S TRAVEL STOPS & COUNTRY STORES, INC.
10601 N. PENNSYLVANIA AVE.
OKLAHOMA CITY, OK 73120
CONTACT: RICK SHUFFIELD
PH: (405) 302-6646
EMAIL: RICK.SHUFFIELD@LOVES.COM

ENGINEER
CESO, INC.
175 MONTROSE WEST AVE. SUITE 400
AKRON, OH 44321
CONTACT: KIMBERLY COOPER, P.E.
PH: (330) 396-5682
EMAIL: COOPER@CESOINC.COM

UTILITIES NOTIFICATION
AT LEAST TWO WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION OPERATIONS IN AN AREA WHICH MAY INVOLVE UNDERGROUND UTILITY FACILITIES, THE CONTRACTOR SHALL CONTACT OHIO811 OUPS AT 8-1-1 OR 1-800-362-2764 (OHIO811.ORG), THE ENGINEER, THE REGISTERED UTILITY PROTECTION SERVICE AND THE OWNERS OF EACH UNDERGROUND UTILITY FACILITY SHOWN ON THE PLAN. THE OWNER OF THE UNDERGROUND FACILITY SHALL, WITHIN 48 HOURS (EXCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS), MARK THE LOCATION OF THE UNDERGROUND UTILITY FACILITIES IN THE CONSTRUCTION AREA IN SUCH A MANNER AS TO INDICATE THEIR COURSE AND THE APPROXIMATE DEPTH AT WHICH THEY WERE INSTALLED. THE MARKING OR LOCATING SHALL BE COORDINATED TO STAY APPROXIMATELY TWO DAYS AHEAD OF THE PLANNED CONSTRUCTION.

TEMPORARY TRAFFIC CONTROL
IT IS ESSENTIAL THAT THE ENGINEER HAVE THE AUTHORITY TO CONTROL THE PROGRESS OF THE WORK ON THE PROJECT IN ITS RELATION TO OBTAINING SAFE CONDITIONS. THIS INCLUDES THE AUTHORITY TO MODIFY CONDITIONS OR HALT WORK UNTIL APPLICABLE OR REMEDIAL SAFETY MEASURES ARE TAKEN. THE CONTRACTOR IS TO SUPPLY ALL TRAFFIC CONTROL, AS THE ENGINEER DEEMS NECESSARY. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH SECTION 614 OF THE ODOT STANDARD SPECIFICATIONS AND OTHER APPLICABLE PORTIONS OF THE ODOT SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

CLEARING AND GRUBBING
ALTHOUGH THERE ARE NO TREES OR STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE LIMITS OF THE PROJECT, A LUMP SUM QUANTITY IS INCLUDED IN THE GENERAL SUMMARY FOR ITEM 201, CLEARING AND GRUBBING. ALL PROVISIONS AS SET FORTH IN THE SPECIFICATIONS UNDER THIS ITEM ARE INCLUDED IN THE LUMP SUM PRICE BIG FOR ITEM 201, CLEARING AND GRUBBING.

SURVEY DATA
PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE SHEET R2 OF THE PLANS FOR A TABLE CONTAINING PROJECT CONTROL INFORMATION. USE THE FOLLOWING PROJECT CONTROL, VERTICAL POSITIONING, AND HORIZONTAL POSITIONING PARAMETERS FOR ALL SURVEYING:

BASIS OF BEARINGS: BEARINGS ARE BASED UPON OHIO STATE PLANE SOUTH ZONE

PROJECT CONTROL
POSITIONING METHOD: ODOT REAL TIME NETWORK
MONUMENT TYPE: TYPE 'B'

VERTICAL POSITIONING
ORTHOMETRIC HEIGHT DATUM: NAVD88
GEOID: 18B

HORIZONTAL POSITIONING
REFERENCE FRAME: NAD83 (2011)
ELLIPSOID: GRS 80
COORDINATE SYSTEM: OHIO STATE PLANE SOUTH ZONE
PROJECTION: LAMBERT CONFORMAL CONIC
CENTRAL LATITUDE: N 40° 03' 28"
CENTRAL LONGITUDE: W 81° 03' 06"
PROJECTION SCALE FACTOR: 1.00000000

USE THE POSITIONING METHODS AND PRIMARY MONUMENT TYPE USED IN THE ORIGINAL SURVEY TO RESTORE ALL MONUMENTS RELATED TO PRIMARY PROJECT CONTROL THAT ARE DAMAGED OR DESTROYED BY CONSTRUCTION ACTIVITIES. RESTORE THE DAMAGED OR DESTROYED MONUMENTS IN ACCORDANCE WITH CMS 623.

UNITS ARE IN U.S. SURVEY FEET. USE THE FOLLOWING CONVERSION FACTOR: 1 METER=3.2808333333 U.S. SURVEY FEET

ITEM SPECIAL - MAILBOX SUPPORT
THIS WORK SHALL CONSIST OF FURNISHING AND ERECTING MAILBOX SUPPORTS AND ANY ASSOCIATED MOUNTING HARDWARE IN ACCORDANCE WITH PLAN DETAILS, AND ATTACHING AN OWNER-SUPPLIED MAILBOX AT LOCATIONS SPECIFIED IN THE PLAN, OR OTHERWISE ESTABLISED BY THE ENGINEER. WOOD POSTS SHALL BE NOMINAL 4 INCHES BY 4 INCHES SQUARE OR 4.5 INCHES DIAMETER ROUND, AND CONFORM TO 710.14. STEEL POSTS SHAL BE NOMINAL PIPE SIZE 2 INCHES I.D., AND CONFORM TO AASHTO M 181. ALL HARDWARE INCLUDING BUT NOT LIMITED TO PLATES, SCREWS, BOLTS, AND ETC. SHALL BE COMMERCIAL-GRADE GALVANIZED STEEL. POSTS SHALL BE SET PER THE FIRST PARAGRAPH OF 606.03, AND SHALL IN NO INSTANCE BE ENCASED IN CONCRETE. SUPPORT HARDWARE SHALL ACCOMMODATE EITHER A SINGLE OR A DOUBLE MAILBOX INSTALLATION, AND NO MORE THAN TWO BOXES MAY BE MOUNTED ON A SINGLE POST. THE MAILBOX SHALL BE SECURELY AND NEATLY ATTACHED BY THE CONTRACTOR TO THE NEW SUPPORT. THE CONTRACTOR SHALL FURNISH ALL NECESSARY ATTACHMENT HARDWARE (NUTS, BOLTS, PLATES, SPACERS, AND WASHERS) AS NECESSARY TO ACCOMMODATE THE COMPLETE INSTALLATION. IN THE ABSENCE OF A NEW BOX SUPPLIED BY THE OWNER, THE CONTRACTOR SHALL SALVAGE THE EXISTING BOX AND PLACE IT ON THE NEW SUPPORT. DUE CARE SHALL BE EXERCISED IN SUCH AN OPERATION, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY BOX DAMAGED BY IMPROPER HANDLING ON HIS PART, AS JUDGED AND DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL POST MASTER REGARDING THE TIMING OF THE MOVEMENT OF ANY MAILBOX TO A NEW LOCATION. PAYMENT UNDER THIS ITEM SHALL BE LIMITED TO FINAL PERMANENT INSTALLATIONS, TEMPORARY INSTALLATIONS SHALL BE IN ACCORDANCE WITH 107.10. HOWEVER, THE SAME MATERIAL AND SIZE LIMITATIONS AS FOR PERMANENT INSTALLATIONS SHALL APPLY. MAILBOX SUPPORTS, COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH, FOR ITEM SPECIAL MAILBOX SUPPORT SYSTEM, (SINGLE) (DOUBLE).

RESTORATION
THE CONTRACTOR SHALL PROVIDE FOR PROTECTION OF THE FOLLOWING:

EXISTING STREETS, DRIVEWAYS, SIDEWALKS, CURBS, GUTTERS, RE-SEEDING/RE-SODDING, REMOVAL OF TREES, RESTORATION OF AGRICULTURAL LAND, THE MAINTENANCE OF THE CONSTRUCTION AREA DURING PROGRESS OF THE WORK AND THE COMPLETE RESTORATION OF THE CONSTRUCTION AREA TO ITS ORIGINAL CONDITION AT THE COMPLETION OF THE WORK. THE CONTRACTOR SHALL CONTINUOUSLY CARRY ON WITH THE FINAL RESTORATION OF THE CONSTRUCTION AREA AFTER THE BACKFILLING IS COMPLETED, AND HE SHALL PROCEED TO RESTORE TO ITS ORIGINAL CONDITION ALL STREETS, DRIVEWAYS, SIDEWALKS, CURBS, GUTTERS, STRUCTURES, AND ALL AREAS THAT WERE DAMAGED, DISTURBED, OR OCCUPIED BY THE CONTRACTOR IN CONNECTION WITH ANY PHASE OF THE WORK.

PAVEMENTS, PAVEMENT MARKINGS, TREES, SHRUBS, FENCES, POLES. OR OTHER PROPERTY AND SURFACE STRUCTURES WHICH HAVE BEEN DAMAGED, REMOVED, OR DISTURBED BY THE CONTRACTOR, WHETHER DELIBERATELY OR THROUGH FAILURE TO CARRY OUT THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, STATE LAWS, MUNICIPAL ORDINANCES, THE SPECIFIC DIRECTION OF THE ENGINEER, OR THROUGH FAILURE TO EMPLOY USUAL AND REASONABLE SAFEGUARDS SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR.

ALL TEMPORARY SIGNS, SPRINKLER SYSTEMS, LANDSCAPING, ORNAMENTAL FENCING, ETC., LOCATED WITHIN THE PROJECT LIMITS MUST BE REPLACED OR RELOCATED UPON COMPLETION OF THE CONSTRUCTION.

ITEM 832: EROSION CONTROL
ALL EROSION AND SEDIMENTATION CONTROL SHALL BE PERFORMED ACCORDING TO: DETAIL PLANS; ACCORDING TO THE LATEST OHIO EPA AUTHORIZATION FOR CONSTRUCTION ACTIVITY UNDER THE "NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM" (NPDES); ANY AND ALL REQUIRED PERMITS, REPORTS, AND RELATED DOCUMENTS. SEE OHIO EPA PERMIT NO. OHR000006 FOR REGULATIONS. ALL CONTRACTORS AND SUBCONTRACTORS MUST BECOME FAMILIAR WITH ALL OF THE ABOVE. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED IN THE FIELD BY THE INSPECTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL EROSION CONTROL MEASURES THAT ARE USED FOR WATER QUALITY. THE EROSION AND SEDIMENTATION CONTROL FACILITIES SHOWN ON THESE PLANS ARE TO BE CONSIDERED ADEQUATE BASIC REQUIREMENTS FOR THE ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION, DEVIATIONS FROM THIS PLAN MAY BE NECESSARY IN ORDER TO MAINTAIN WATER QUALITY. THE CONTRACTOR SHALL ADHERE TO ODOT'S SUPPLEMENTAL SPECIFICATION 832 FOR EROSION AND SEDIMENTATION CONTROL.

ASPHALT CONCRETE JOINT SEALER
THE CONTRACTOR SHALL APPLY LIQUID ASPHALT CONCRETE (PG64-22) TO THE VERTICAL FACE OF ALL EXISTING ASPHALT PRIOR TO THE PLACEMENT OF THE ADJOINING ASPHALT CONCRETE LIFT. PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO EACH RESPECTIVE ASPHALT CONCRETE COURSE OR BASE BEING PLACED.

BENCHING OF FOUNDATION SLOPES
ALTHOUGH CROSS-SECTIONS INDICATE SPECIFIC DIMENSIONS FOR PROPOSED BENCHING OF THE EMBANKMENT FOUNDATIONS IN CERTAIN AREAS, NO WAIVER OF THE SPECIFICATIONS IS INTENDED. BENCH ALL OTHER SLOPED EMBANKMENT AREAS AS SET FORTH IN SECTION 203.05 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (C&MS). NO ADDITIONAL PAYMENT WILL BE MADE FOR BENCHING REQUIRED UNDER THE PROVISIONS OF SECTION 203.05.

PART-WIDTH CONSTRUCTION
BECAUSE OF THE NECESSITY TO BUILD THIS PROJECT UNDER TRAFFIC AND TO CONSTRUCT THE FULL PAVEMENT WIDTH IN STAGES, EXERCISE CARE TO PREVENT THE CONSTRUCTION OF A BUTT JOINT IN THE BASE COURSES. LAP LONGITUDINAL JOINTS AS SHOWN ON STANDARD CONSTRUCTION DRAWING BP-3.1.

CONNECTION BETWEEN EXISTING AND PROPOSED GUARDRAIL
WHEN IT IS NECESSARY TO SPLICE PROPOSED GUARDRAIL TO EXISTING GUARDRAIL, ONLY THE EXISTING GUARDRAIL SHALL BE CUT, DRILLED, OR PUNCHED. THE CONNECTION SHALL BE MADE USING A W-BEAM, BEAM SPLICE AS SHOWN IN AASHTO M 180-12, EXCEPT THE BEAM WASHERS ARE NOT TO BE USED. PAYMENT SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE RESPECTIVE GUARDRAIL ITEMS.

ITEM 606 - ANCHOR ASSEMBLY, MGS TYPE E
THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING ANY OF THE GUARDRAIL END TERMINALS FOR TYPE MGS GUARDRAIL AS LISTED ON ROADWAY ENGINEERING'S WEB PAGE UNDER ROADSIDE SAFETY DEVICES FOR APPROVED GUARDRAIL END TREATMENTS. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. THE FACE OF THE TYPE E IMPACT HEAD SHALL BE COVERED WITH REBOUNDABLE RETROREFLECTIVE SHEETING, PER CMS 730.191. REFER TO THE MANUFACTURER'S INSTRUCTIONS REGARDING THE INSTALLATION OF, AND THE GRADING AROUND THE FOUNDATION TUBES AND GROUND STRUT. THE TOP OF ANY FOUNDATION TUBE SHOULD BE LESS THAN 4 INCHES ABOVE THE GROUND. THE PLACEMENT OF THE FOUNDATION TUBES SHOULD BE AN APPROPRIATE DEPTH BELOW THE LEVEL LINE IN ORDER TO MAINTAIN THE FINISHED GUARDRAIL HEIGHT OF 31 INCHES FROM THE EDGE OF THE SHOULDER. ON-SITE GRADING IS REQUIRED IF THE TOP OF THE FOUNDATION TUBES OR TOP OF THE GROUND STRUT DOES PROJECT MORE THAN 4 INCHES ABOVE THE GROUND LINE. PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT PRICE BID FOR ITEM 606, ANCHOR ASSEMBLY, MGS TYPE E, EACH, AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT A COMPLETE AND FUNCTIONAL ANCHOR ASSEMBLY SYSTEM, INCLUDING ALL RELATED TRANSITIONS, REFLECTIVE SHEETING, HARDWARE, GRADING, EMBANKMENT AND EXCAVATION NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

DATUM NOTES:

HORIZONTAL DATUM:
OHIO STATE PLANE COORDINATE SYSTEM, OHIO SOUTH ZONE, NAD83 (2011) AS DETERMINED BY OPUS POST PROCESSED STATIC SESSION.

VERTICAL DATUM:
NAVD 88 AS DETERMINED BY OPUS POST PROCESSED STATIC SESSIONS USING GEOID 18 (CONUS)

UTILITY DISCLAIMER:
THE UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION OUPS #A218001060 AND/OR EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES LOCATED HERE ON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES LOCATED ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

DATE OF FIELD SURVEY: AUGUST 9, 2022
DATE OF SURVEY MAP: APRIL 12, 2023

REFERENCE DRAWINGS:

ORIGINAL SURVEY 1 OF 1	ALTA/NSPS LAND TITLE SURVEY BY CESO INC. 175 MONTROSE WEST AVE. ST. SUITE 400 COPLEY, OH 44321 PHONE: (330) 665-0660 CONTACT: STEVEN CLUTTER
ORIGINAL PLANS 1 OF 1	PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES BY TERRACON DATED: 9/06/24 4685 SOUTH ASH AVENUE, SUITE H-4 TEMPE, AZ 85282 PHONE: (480) 897-8200

ODOT ITEM 408 - PRIME COAT, AS PER PLAN
THE CONTRACTOR SHALL APPLY ONE COAT OF MC-70 (AS PER SECTION 702) AT A RATE OF 0.40 GAL/SY TO THE COMPLETED AGGREGATE SHOULDER AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE A SHIELD TO PREVENT THE SPRAYING OR DRIFTING OF LIQUID BITUMINOUS MATERIAL ONTO THE EDGE OF PAVEMENT OR EDGE LINE. THE ATTENTION OF THE CONTRACTOR IS DIRECTED TO 107.10 OF THE SPECIFICATIONS.

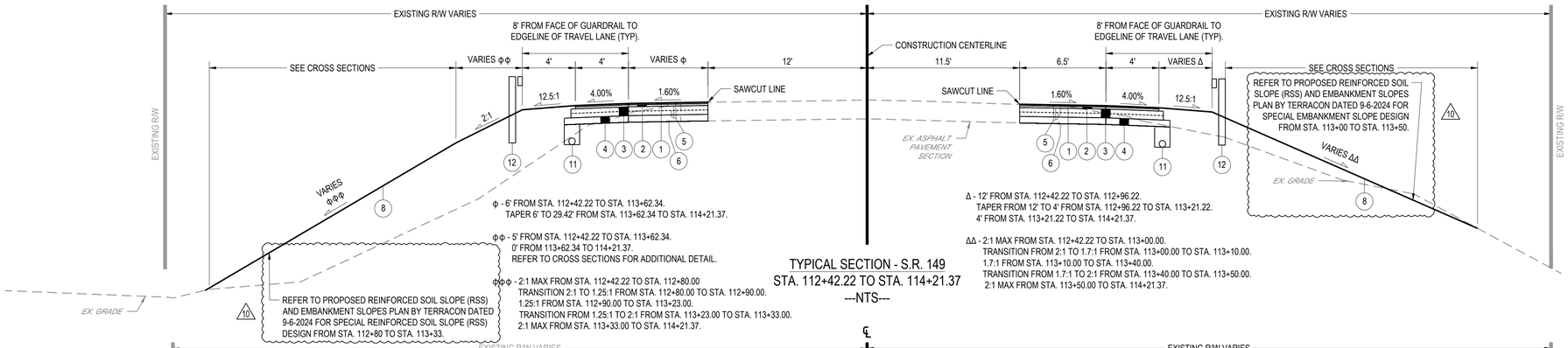
10

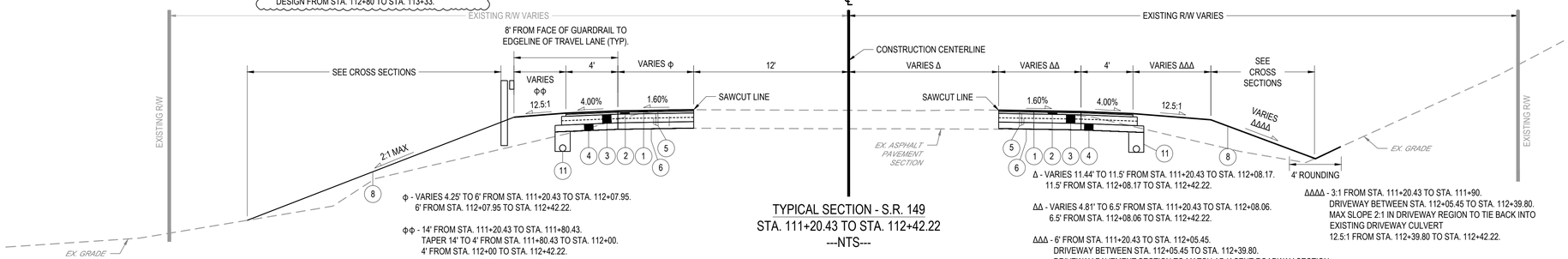
CALCULATED P.JD
CHECKED TDH

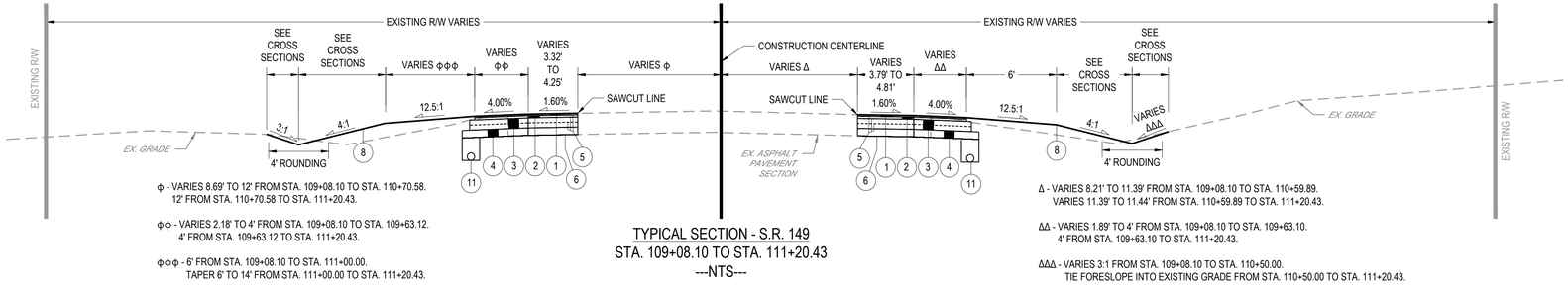
GENERAL NOTES
S.R. 149

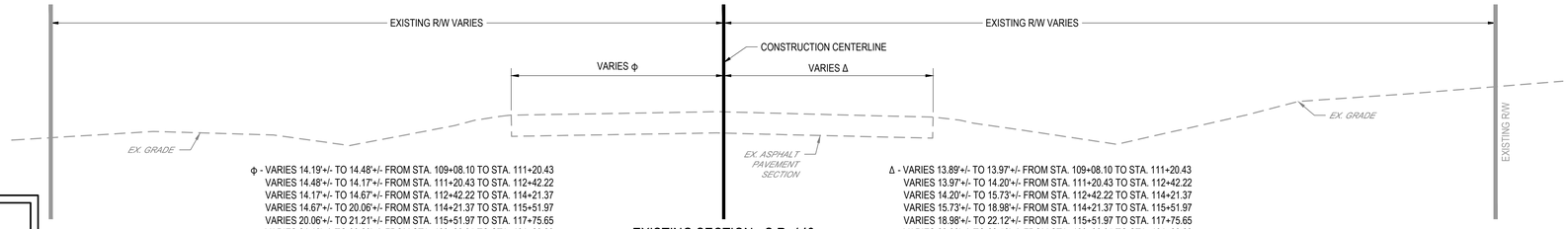
BEL-149-23.44

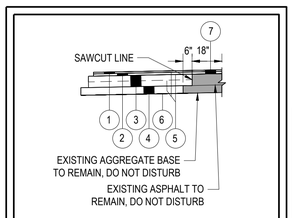
R3
R32











STEPPED CONSTRUCTION AT SAWCUT JOINT DETAIL (TYP.)

NOTE: WHERE PHASING FOR MAINTENANCE OF TRAFFIC WILL NOT ALLOW LAPPING COLD LONGITUDINAL JOINTS PER SCD BP3.1, PROVIDE A MINIMUM OF 6 INCHES OFFSET BETWEEN COLD JOINTS FOR EACH COURSE PLACED.

LEGEND

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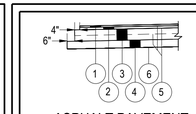
12. ITEM 606 - GUARDRAIL, TYPE MGS WITH LONG POSTS

EXISTING GRADE/PAVEMENT SECTION



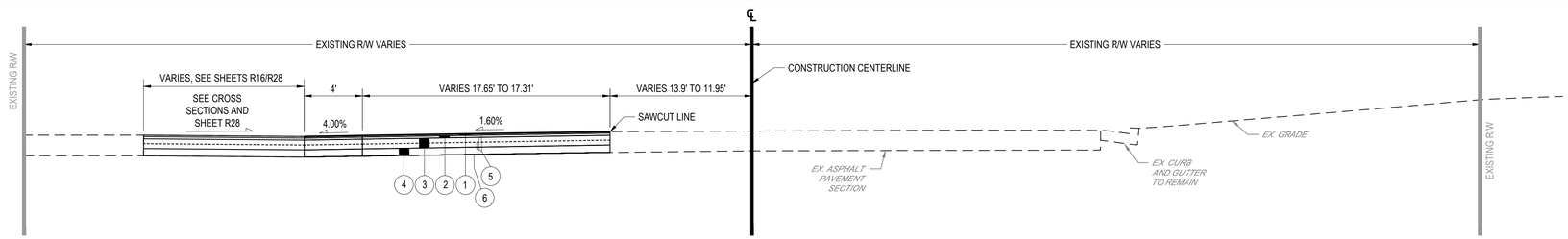
ASPHALT PAVEMENT STEP-OUT DETAIL (TYP.)

CALCULATED PJD
CHECKED TDH

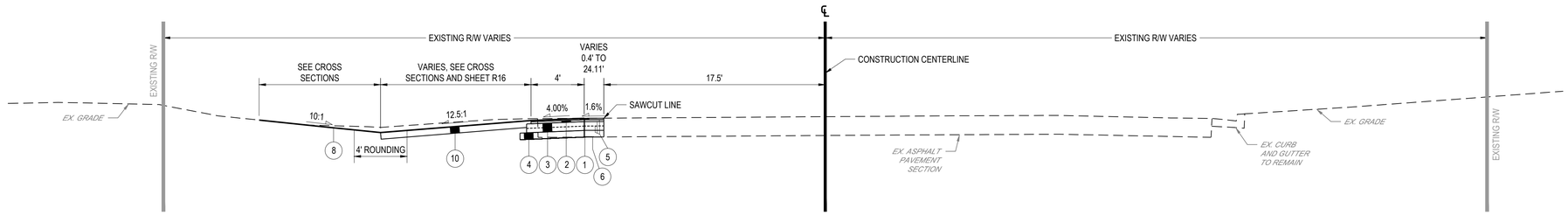
TYPICAL SECTIONS
S.R. 149

BEL-149-23.44

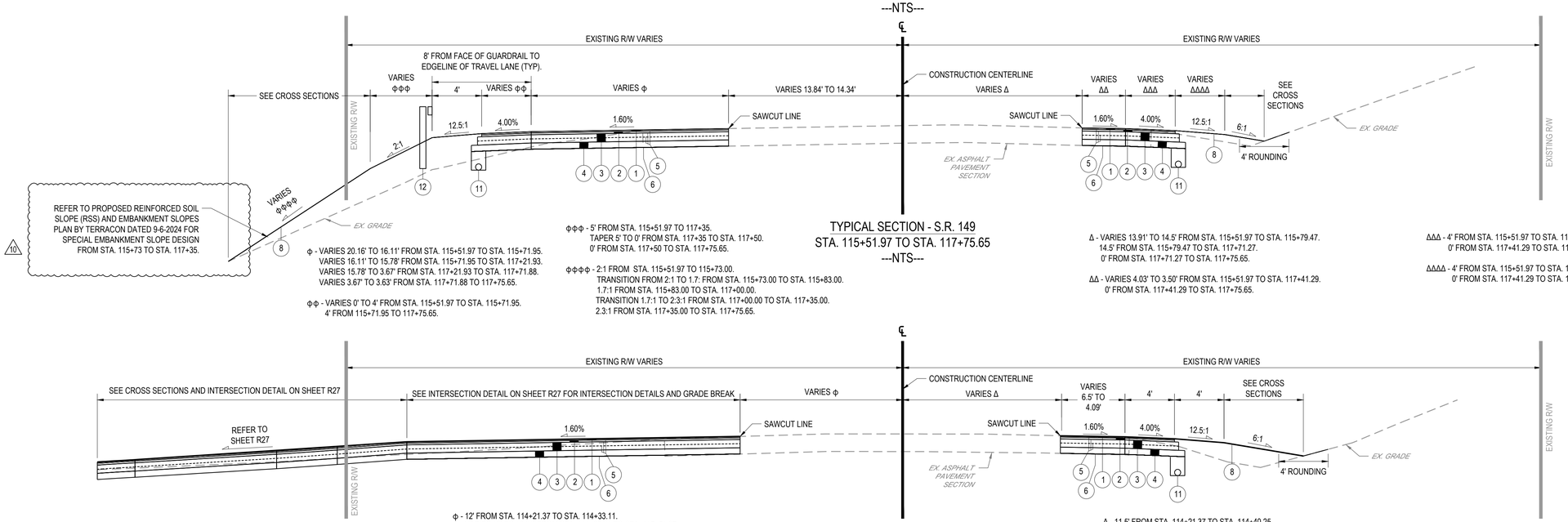
R4
R32



TYPICAL SECTION - S.R. 149
STA. 122+17.06 TO STA. 122+95.92
---NTS---

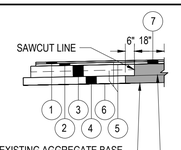


TYPICAL SECTION - S.R. 149
STA. 120+30.95 TO STA. 121+29.23
---NTS---



TYPICAL SECTION - S.R. 149
STA. 115+51.97 TO STA. 117+75.65
---NTS---

TYPICAL SECTION - S.R. 149
STA. 114+21.37 TO STA. 115+51.97
---NTS---



STEPPED CONSTRUCTION AT SAWCUT JOINT DETAIL (TYP.)

NOTE: WHERE PHASING FOR MAINTENANCE OF TRAFFIC WILL NOT ALLOW LAPPING COLD LONGITUDINAL JOINTS PER SCD BP3.1, PROVIDE A MINIMUM OF 6 INCHES OFFSET BETWEEN COLD JOINTS FOR EACH COURSE PLACED.

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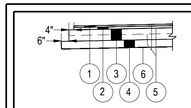
12. ITEM 606 - GUARDRAIL, TYPE MGS WITH LONG POSTS

EXISTING GRADE/PAVEMENT SECTION



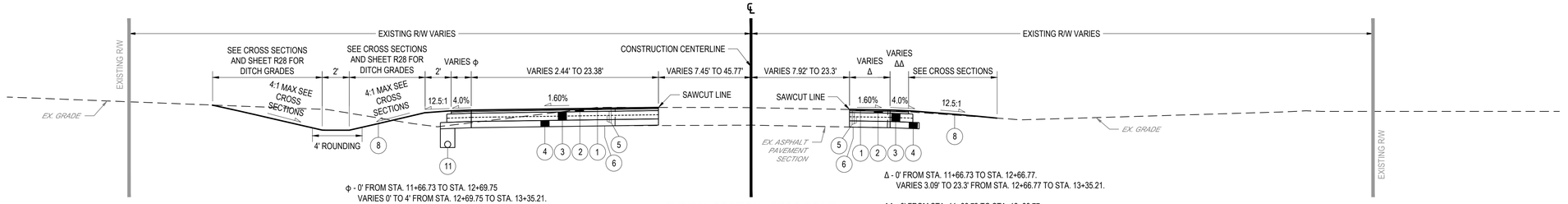
ASPHALT PAVEMENT STEP-OUT DETAIL (TYP.)

CALCULATED PJD
CHECKED TDH

TYPICAL SECTIONS S.R. 149

BEL-149-23.44

R5
R32

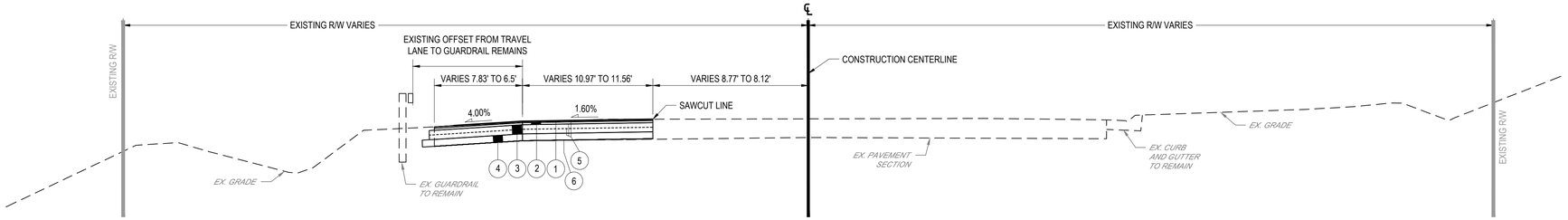


Φ - 0' FROM STA. 11+66.73 TO STA. 12+69.75
VARIES 0' TO 4' FROM STA. 12+69.75 TO STA. 13+35.21.

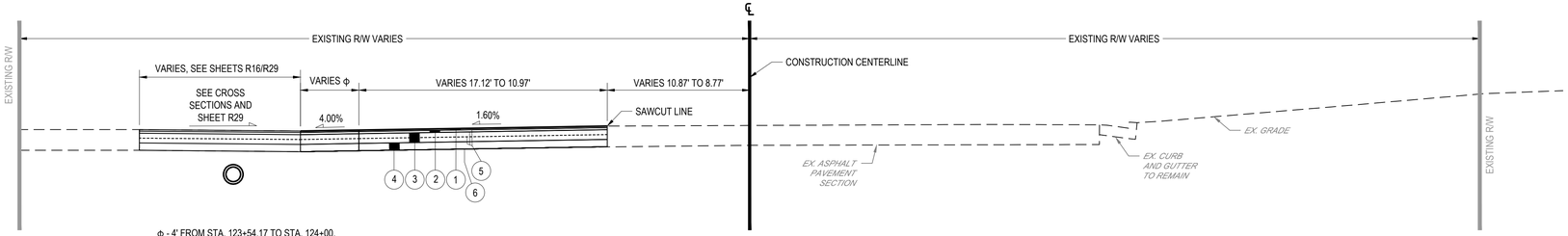
Δ - 0' FROM STA. 11+66.73 TO STA. 12+66.77.
VARIES 3.09' TO 23.3' FROM STA. 12+66.77 TO STA. 13+35.21.

ΔΔ - 0' FROM STA. 11+66.73 TO STA. 12+66.77.
VARIES 0' TO 4' FROM STA. 12+66.77 TO STA. 13+35.21.

TYPICAL SECTION - RECO DRIVE
STA. 11+66.73 TO STA. 13+35.21
---NTS---

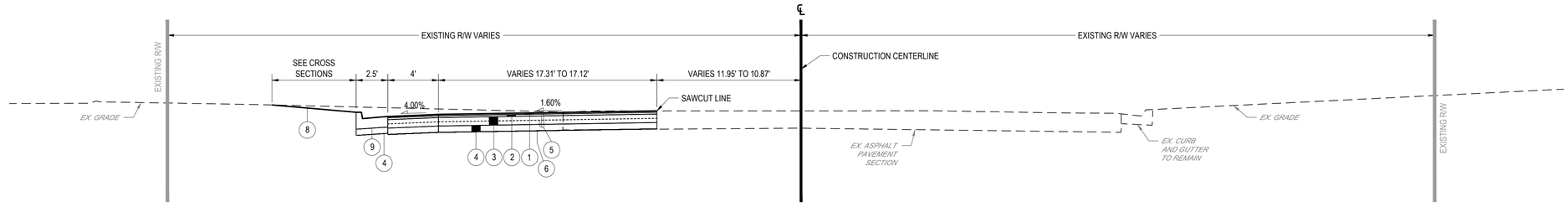


TYPICAL SECTION - S.R. 149
STA. 124+22.46 TO STA. 124+48.45
---NTS---

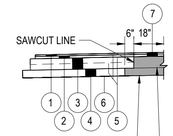


Φ - 4' FROM STA. 123+54.17 TO STA. 124+00.
VARIES 4' TO 7.83' FROM STA. 124+00 TO STA. 124+22.46.

TYPICAL SECTION - S.R. 149
STA. 123+54.17 TO STA. 124+22.46
---NTS---



TYPICAL SECTION - S.R. 149
STA. 122+95.92 TO STA. 123+54.17
---NTS---



STEPPED CONSTRUCTION AT SAWCUT JOINT DETAIL (TYP.)

NOTE: WHERE PHASING FOR MAINTENANCE OF TRAFFIC WILL NOT ALLOW LAPPING COLD LONGITUDINAL JOINTS PER SCD BP3.1, PROVIDE A MINIMUM OF 6 INCHES OFFSET BETWEEN COLD JOINTS FOR EACH COURSE PLACED.

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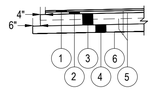
12. ITEM 606 - GUARDRAIL, TYPE MGS WITH LONG POSTS

— — — EXISTING GRADE/PAVEMENT SECTION



ASPHALT PAVEMENT STEP-OUT DETAIL (TYP.)

CALCULATED P.JD
CHECKED TDH

TYPICAL SECTIONS
S.R. 149

BEL-149-23.44

9

R6
R32

MAINTAINING TRAFFIC
THE CONTRACTOR SHALL PROVIDE, ERECT, AND MAINTAIN SIGNS (IN PROPER POSITION, CLEAN AND LEGIBLE, AND IN GOOD WORKING CONDITION) AND REMOVE ALL LIGHTS, SIGNS, CONES, DRUMS, AND ANY OTHER TRAFFIC CONTROL DEVICES NECESSARY FOR THE MAINTENANCE OF TRAFFIC ACCORDING TO THESE PLAN NOTES AND DETAILS.

NO CHANGES IN TRAFFIC CONTROL PATTERNS SHALL BE MADE BETWEEN THE HOURS OF 6:00 AM TO 9:00 PM MONDAY THROUGH FRIDAY, 8:00 AM-8:00 PM SATURDAY, AND 8:00 AM-8:00 PM SUNDAY; IN ADDITION, LANE CLOSURES ARE NOT PERMITTED 6:00 AM TO 9:00 PM MONDAY THROUGH FRIDAY, 8:00 AM-8:00 PM SATURDAY, AND 8:00 AM-8:00 PM SUNDAY. REFER TO LANE VALUE CONTRACT TABLE.

LANES OPEN DURING HOLIDAYS AND SPECIAL EVENTS
NO WORK SHALL BE PERFORMED AND THE SAME NUMBER OF LANES AS WERE AVAILABLE AT THE START OF THE PROJECT SHALL BE OPEN TO TRAFFIC DURING THE FOLLOWING DESIGNATED HOLIDAYS OR SPECIAL EVENTS:

HOLIDAYS:
NEW YEAR'S (OBSERVED), TOTAL SOLAR ECLIPSE (4/8/24), MEMORIAL DAY, FOURTH OF JULY (OBSERVED), LABOR DAY, GENERAL/REGULAR ELECTION DAY (NOV), THANKSGIVING, CHRISTMAS (OBSERVED).

THE PERIOD OF TIME THAT THE LANES ARE TO BE OPEN DEPENDS ON THE DAY OF THE WEEK ON WHICH THE HOLIDAY OR SPECIAL EVENT FALLS. THE FOLLOWING SCHEDULE SHALL BE USED TO DETERMINE THIS PERIOD:

DAY OF HOLIDAY OR SPECIAL EVENT	TIME ALL LANES MUST BE OPEN TO TRAFFIC
SUNDAY	12:00 NOON FRIDAY THROUGH 6:00 AM MONDAY
MONDAY	12:00 NOON FRIDAY THROUGH 6:00 AM TUESDAY
MONDAY (TOTAL SOLAR ECLIPSE)	12:00 NOON FRIDAY THROUGH 6:00 AM WEDNESDAY
TUESDAY	12:00 NOON MONDAY THROUGH 6:00 AM WEDNESDAY
TUESDAY (GEN./REG. ELECTION)	5:00 AM TUESDAY THROUGH 12:00 AM WEDNESDAY
WEDNESDAY	12:00 NOON TUESDAY THROUGH 6:00 AM THURSDAY
THURSDAY	12:00 NOON WEDNESDAY THROUGH 6:00 AM FRIDAY
THANKSGIVING	6:00 AM WEDNESDAY THROUGH 6:00 AM MONDAY
FRIDAY	12:00 NOON THURSDAY THROUGH 6:00 AM MONDAY
SATURDAY	12:00 NOON FRIDAY THROUGH 6:00 AM MONDAY

DURING THE SAME PERIODS, MAINTAIN PEDESTRIAN ACCESS IF PEDESTRIAN ACCESS WAS PRESENT PRIOR TO CONSTRUCTION.

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY-WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED A DISINCENTIVE IN THE AMOUNT OF $6,000/HR THE ABOVE DESCRIBED LANE CLOSURE RESTRICTIONS ARE VIOLATED.

LENGTH AND DURATION OF LANE CLOSURES AND RESTRICTIONS SHALL BE AT THE APPROVAL OF THE ENGINEER. IT IS THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME, AS DETERMINED BY THE ENGINEER, SHALL NOT BE PERMITTED. THE LEVEL OF UTILIZATION OF MAINTENANCE OF TRAFFIC DEVICES SHALL BE COMMENSURATE WITH THE WORK IN PROGRESS.

BEFORE THE WORK BEGINS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE NAMES AND TELEPHONE NUMBERS OF PERSONS WHO CAN BE CONTACTED TWENTY-FOUR (24) HOURS PER DAY BY ODOT AND ALL INTERESTED POLICE AGENCIES. THIS PERSON OR PERSONS SHALL BE RESPONSIBLE FOR PLACING OR REPLACING NECESSARY TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN TRAFFIC AT ALL TIMES. IT IS THE INTENTION TO PERFORM THE REQUIRED WORK WITH THE LEAST INCONVENIENCE TO AND THE MAXIMUM SAFETY OF THE WORKERS AND THE TRAVELING PUBLIC OCCASIONALLY, MODIFICATIONS IN TRAFFIC CONTROLS OR WORKING CONDITIONS MAY BE REQUIRED IN ORDER TO EXPEDITE SAFE TRAFFIC MOVEMENT AND TO PROMOTE WORKER SAFETY.

NOTIFICATION OF TRAFFIC RESTRICTIONS
THROUGHOUT THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN WRITING OF ALL TRAFFIC RESTRICTIONS AND UPCOMING MAINTENANCE OF TRAFFIC CHANGES. THE CONTRACTOR SHALL ENSURE THE WRITTEN NOTIFICATION IS SUBMITTED IN A TIMELY MANNER TO ALLOW THE PROJECT ENGINEER TO MEET THE REQUIRED TIME FRAMES SET FORTH IN THE TABLE BELOW TO INFORM THE SPECIAL HAULING PERMITS SECTION (HAULING.PERMITS@DOT.OHIO.GOV) AND THE DISTRICT PUBLIC INFORMATION OFFICE (PIO). THIS NOTIFICATION SHALL BE RECEIVED BY THE PROJECT ENGINEER PRIOR TO THE PHYSICAL SETUP OF ANY APPLICABLE SIGNS OR MESSAGE BOARDS. INFORMATION SHOULD INCLUDE, BUT IS NOT LIMITED TO, ALL CONSTRUCTION ACTIVITIES THAT IMPACT OR INTERFERE WITH TRAFFIC AND SHALL LIST THE SPECIFIC LOCATION, TYPE OF WORK, ROAD STATUS, DATE AND TIME OF RESTRICTION, DURATION OF RESTRICTION, NUMBER OF LANES MAINTAINED, NUMBER OF LANES CLOSED, MINIMUM VERTICAL CLEARANCE, MINIMUM WIDTH OF DRIVABLE PAVEMENT, DETOUR ROUTES, IF APPLICABLE, AND ANY OTHER INFORMATION REQUESTED BY THE PROJECT ENGINEER.

NOTIFICATION OF TRAFFIC RESTRICTIONS TIME TABLE

ITEM	DURATION OF CLOSURE	NOTICE DUE TO PERMITS & PIO
RAMP &	> 2 WEEKS	21 CALENDAR DAYS PRIOR TO CLOSURE
ROAD	> 12 HOURS & < 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
CLOSURES	< 12 HOURS	4 BUSINESS DAYS PRIOR TO CLOSURE
LANE	> 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
CLOSURES &		
RESTRICTIONS	< 2 WEEKS	5 BUSINESS DAYS PRIOR TO CLOSURE
START OF CONSTRUCTION &		
TRAFFIC PATTERN CHANGES	N/A	14 CALENDAR DAYS PRIOR TO IMPLEMENTATION

ANY UNFORESEEN CONDITIONS NOT SPECIFIED IN THE PLANS REQUIRING TRAFFIC RESTRICTIONS SHALL ALSO BE REPORTED TO THE PROJECT ENGINEER USING THE NOTIFICATION TIME TABLE.

WORK SITE LIGHTING
FLOODLIGHTING OF THE WORK SITE FOR OPERATIONS CONDUCTED DURING NIGHTTIME PERIODS SHALL BE ACCOMPLISHED SO THAT THE LIGHTS DO NOT CAUSE GLARE TO THE DRIVERS ON THE ROADWAY. TO ENSURE THE ADEQUACY OF FLOODLIGHT PLACEMENT, THE CONTRACTOR, AND THE ENGINEER SHALL DRIVE THROUGH THE WORK SITE EACH NIGHT WHEN THE LIGHTING IS IN PLACE AND OPERATIVE PRIOR TO COMMENCING ANY WORK. IF GLARE IS DETECTED, THE LIGHT PLACEMENT AND SHIELDING SHALL BE ADJUSTED TO THE SATISFACTION OF THE ENGINEER BEFORE WORK PROCEEDS. PAVEMENT FOR ALL LABOR, EQUIPMENT, AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACTOR PRICE FOR ITEM 614, MAINTAINING TRAFFIC.

MUD, DIRT AND DEBRIS
THE TRACKING OR SPILLAGE OF MUD, DIRT OR DEBRIS UPON STATE HIGHWAYS IS PROHIBITED AND ANY SUCH OCCURRENCE SHALL BE CLEANED UP IMMEDIATELY BY THE CONTRACTOR.

PERSONAL PROTECTIVE EQUIPMENT
ODOT REQUIRES ALL CONTRACTORS' PERSONNEL TO WEAR THE CORRECT PPE WHILE WITHIN ODOT RIGHT-OF-WAY. ALL VEHICLES SHALL HAVE THE CORRECT SAFETY EQUIPMENT ALSO.

THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN SIGNS AND SIGN
SUPPORTS, AS DETAILED IN THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

ALL VEHICLES, EQUIPMENT AND WORKERS AND THEIR ACTIVITIES ARE RESTRICTED TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE APPROVED BY THE ENGINEER, CONSTRUCTION VEHICLES SHALL ALWAYS MOVE WITH AND NOT AGAINST THE FLOW OF TRAFFIC. CONSTRUCTION VEHICLES AND EQUIPMENT SHALL ENTER AND LEAVE WORK AREAS IN A MANNER WHICH WILL NOT BE HAZARDOUS TO, OR INTERFERE WITH THE NORMAL FLOW OF TRAFFIC. PERSONAL VEHICLES ARE NOT PERMITTED IN THE RIGHT-OF-WAY EXCEPT IN SPECIFIC AREAS DESIGNATED BY THE ENGINEER.

MAINTAINING TRAFFIC (SIGNS AND BARRICADES)
THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN SIGNS AND SIGN SUPPORTS, AS DETAILED IN THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND TYPE III BARRICADES AS DIRECTED IN CONSTRUCTION SEQUENCE.

TEMPORARY PAVEMENT WEDGE
TEMPORARY PAVEMENT WEDGES SHALL BE PROVIDED AT ALL TIMES WHERE TRAFFIC IS REQUIRED TO TRAVEL FROM OR ONTO A PAVEMENT SURFACE OF A DIFFERENT ELEVATION. THE MINIMUM SLOPE OF THE TEMPORARY PAVEMENT WEDGE SHALL BE 3:1 ALONG LONGITUDINAL JOINTS AND 120:1 AT TRANSVERSE JOINTS. THESE WEDGES SHALL BE REMOVED PRIOR TO PLACING THE SPECIFIED PAVEMENT COURSE.

PLACEMENT OF ASPHALT CONCRETE
TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES EXCEPT THAT ONE WAY TRAFFIC WILL BE PERMITTED FOR MINIMUM PERIODS OF TIME CONSISTENT WITH THE REQUIREMENTS OF THE SPECIFICATIONS FOR PROTECTION OF COMPLETED ASPHALT COURSES.

TRENCH FOR WIDENING
TRENCH FOR EXCAVATION FOR BASE WIDENING SHALL BE FOR ONLY ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH DRUMS OR BARRICADES AT ALL TIMES. PLACEMENT OF PROPOSED SUBBASE AND BASE MATERIAL SHALL FOLLOW CLOSELY AS POSSIBLE BEHIND EXCAVATION OPERATIONS. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT ALL TIMES BE SUBJECT TO APPROVAL BY THE ENGINEER.

THE CONTRACTOR SHALL ENSURE THAT THE TRENCH FOR WIDENING HAS A VERTICAL DROP OF NO MORE THAN 5 INCHES. THE TRENCH CAN BE BACKFILLED BY A COMPACTED AGGREGATE WEDGE. THE MINIMUM SLOPE OF THE TEMPORARY COMPACTED AGGREGATE WEDGE SHALL BE 3:1 ALONG THE EXISTING PAVEMENT AND PROTECTED WITH DRUMS AT ALL TIMES.

OVERNIGHT TRENCH CLOSING
THE BASE WIDENING SHALL BE COMPLETED TO A DEPTH OF NO MORE THAN 5 INCHES BELOW THE EXISTING PAVEMENT BY THE END OF EACH WORK DAY. NO TRENCH SHALL BE LEFT OPEN OVERNIGHT EXCEPT FOR A SHORT LENGTH (25 FEET OR LESS) OF A WORK SECTION AT THE END OF THE DAY. IN CASE WORK MUST BE SUSPENDED BECAUSE OF INCLEMENT WEATHER OR OTHER REASONS, THE TRENCH FOR THE UNCOMPLETED BASE WIDENING SHALL BE BACKFILLED AT THE DIRECTION OF THE ENGINEER.

DROPOFFS IN WORK ZONE
THE DROPOFF ADJACENT TO THE TRAVELED LANE SHALL MEET THE CRITERIA OUTLINED ODOT STANDARD DRAWING MT-101.90. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR MATERIALS, LABOR OR EQUIPMENT NECESSARY TO MEET THE REQUIREMENTS OF MT-101.90.

ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS
USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED.

IN ADDITION TO THE REQUIREMENTS OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

- DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.
- DURING A TRAFFIC SIGNAL INSTALLATION WHEN IMPACTING THE NORMAL FUNCTION OF THE SIGNAL OR THE FLOW OF TRAFFIC, OR WHEN TRAFFIC NEEDS TO BE DIRECTED THROUGH AN ENERGIZED TRAFFIC SIGNAL CONTRARY TO THE SIGNAL DISPLAY (E.G., DIRECTING MOTORISTS THROUGH A RED LIGHT).

IN ADDITION TO THE REQUIREMENT OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHOULD BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS AS APPROVED BY THE ENGINEER:

- FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP).
- FOR OPERATIONS WITHOUT POSITIVE PROTECTION OCCURRING WITHIN 10 FEET OF AN OPEN TRAVELED LANE THAT MEET ALL OF THE FOLLOWING CRITERIA:
  - O ON A MULTI-LANE DIVIDED INTERSTATE, OTHER FREEWAY OR EXPRESSWAY; AND
  - O AN AUTHORIZED SPEED LIMIT OF 45 MPH OR GREATER THAT IS IN EFFECT AT THE TIME OF OPERATION; AND,
  - O AADT OF 50,000 (OR AADT OF 30,000 WITH 25% OR HIGHER PERCENT TRUCKS)

"WITHOUT POSITIVE PROTECTION" MEANS USE OF DRUMS, CONES, SHADOW VEHICLE, ETC, WITHOUT
PROTECTION FROM PORTABLE BARRIER OR OTHER RIGID BARRIER ALONG THE WORK AREA. THIS PHRASE DOES NOT APPLY TO CASES WHERE POSITIVE PROTECTION IS REQUIRED. MOBILE OPERATIONS ARE REGARDED AS "WITHOUT POSITIVE PROTECTION". FOR WORK ZONES USING A COMBINATION OF BARRIER AND TEMPORARY TRAFFIC CONTROL DEVICES (CONES, DRUMS, ETC), THE DESIGNATION SHALL BE BASED UPON THE TYPE OF DEVICES USED IN THE AREA THAT WORKERS ARE LOCATED.

IF MULTIPLE ACTIVE LOCALIZED QUALIFYING WORK AREAS OCCUR WITHOUT POSITIVE PROTECTION, PER
MAINLINE TRAFFIC DIRECTION, PROVIDE A UNIFORMED LEO AND OFFICIAL PATROL CAR IN ADVANCE OF:
THE FIRST ACTIVE WORK AREA THAT DRIVERS WILL ENCOUNTER; OR
THE ACTIVE WORK AREA LATERALLY CLOSEST TO THE OPEN TRAVELED LANE; OR
OTHER LOCATION AS APPROVED BY THE ENGINEER.

THE UNIFORMED LEO AND OFFICIAL PATROL CAR MAY RELOCATE AMONG THE LISTED LOCATIONS AS
APPROPRIATE AS THE OPERATIONS PROCEED IN THE LOCALIZED QUALIFYING WORK AREAS.

IN GENERAL, LEOS SHOULD BE POSITIONED IN ADVANCE OF AND ON THE SAME SIDE AS THE LANE RESTRICTION OR AT THE POINT OF ROAD CLOSURE, AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH SIGNALIZED INTERSECTIONS IN WORK ZONES.

LEOS SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORISTS FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST'S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE. THE LEOS WORK AT THE DIRECTION OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS' DUTIES AND PLACEMENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES. ENSURE PROVIDED LEOS HAVE BEEN TRAINED APPROPRIATE TO THE JOB DECISIONS THEY ARE REQUIRED TO MAKE WHILE ON THE PROJECT, IN ACCORDANCE WITH C&MS 614.03. THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO-WAY COMMUNICATION DEVICE THAT SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. LEOS (WITH PATROL CAR) REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY.

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 100 HOURS. THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED. ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

ACCESS TO PRIVATE PROPERTY
ACCESS TO DRIVES SHALL BE MAINTAINED VIA EXISTING PAVEMENT, TEMPORARY PAVEMENT IN THE EVENT THAT A DRIVE CANNOT BE MAINTAINED AND A CLOSURE IS NEEDED THE CONTRACTOR WILL COORDINATE WITH THE PROPERTY OWNER TO MINIMIZE THE IMPACT TO THE OWNER. COMMERCIAL PROPERTY WITH MULTIPLE DRIVES MAY HAVE ONE DRIVE CLOSED WHEN WORKING IN THE AREA OF THE DRIVE. COMMERCIAL PROPERTY WITH ONLY ONE DRIVEWAY OR DRIVEWAYS WITH ONE DIRECTION TRAFFIC USE WILL BE CONSTRUCTED PART WIDTH. THE CONTRACTOR WILL COORDINATE WITH THE PROPERTY OWNER TO MINIMIZE THE IMPACT TO THE OWNER. MAINTAIN ACCESS TO RESIDENTIAL PROPERTIES AT ALL TIMES. WHEN A RESIDENTIAL DRIVE IS CLOSED FOR CONSTRUCTION, MAINTAIN ALTERNATE ACCESS TO THE PROPERTY. IT MAY BE REQUIRED FOR THE CONTRACTOR TO MAINTAIN ONE PASSABLE LANE WITHIN A CLOSURE IN ORDER FOR VEHICLES TO ACCESS RESIDENCY WITH A VEHICLE. UNLESS CALLED OUT IN THE PLANS THE CONTRACTOR WILL COORDINATED ANY CLOSURES WITH PROPERTY OWNERS AND BE RESPONSIBLE FOR ANY AND ALL PROPERTY USE AGREEMENTS FOR ALTERNATIVE ACCESS. SUCCESSFULLY NOTIFY THE OCCUPANTS/OWNERS OF COMMERCIAL OR RESIDENTIAL DRIVES TO BE CLOSED AND COORDINATE THE CLOSURE AT LEAST 48 HOURS BEFORE THE CLOSURE BEGINS (SIMPLY LEAVING A WRITTEN NOTICE OR PHONE MESSAGE IS NOT SUFFICIENT). COORDINATE ALTERNATE ACCESS TO RESIDENTIAL PROPERTIES WITH THE OWNER/OCCUPANT. PAYMENT FOR ALL LABOR, EQUIPMENT, LAW ENFORCEMENT OFFICERS AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC UNLESS ITEMIZED SEPARATELY.

ITEM 615 - ROADS FOR MAINTAINING TRAFFIC, AS PER PLAN
IN ADDITION TO THE REQUIREMENTS OF ODOT C&MS 615, THIS ITEM SHALL INCLUDE TEMPORARY DRAINAGE ITEMS, RESTORATION OF ALL SURFACES AND SIGNS DISTURBED BY THE PLACEMENT OF PAVEMENT FOR MAINTAINING TRAFFIC OUTSIDE OF THE PROJECT LIMITS.

TEMPORARY PAVEMENT SECTION
TEMPORARY PAVEMENT SECTION TO BE INSTALLED PER ODOT ITEM 615 FOR S.R. 149/RECO DRIVE. TEMPORARY PAVEMENT SECTION MAY BE SUBSTITUTED AT DIRECTION OF ENGINEER.

ITEM 614 - WORK ZONE IMPACT ATTENUATOR FOR 24" WIDE HAZARDS (UNIDIRECTIONAL OR BIDIRECTIONAL)
THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING A NON-GATING IMPACT ATTENUATOR. FURNISH AN IMPACT ATTENUATOR FROM THE OFFICE OF ROADWAY ENGINEERING'S APPROVED LIST FOR WORK ZONE IMPACT ATTENUATORS, FROM THE ROADWAY STANDARDS APPROVED PRODUCTS WEB PAGE. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. THE CONTRACTOR SHALL REPAIR OR REPLACE A DAMAGED UNIT WITHIN 24 HOURS OF A DAMAGING IMPACT. WHEN BIDIRECTIONAL DESIGNS ARE SPECIFIED, THE CONTRACTOR SHALL SUPPLY APPROPRIATE TRANSITIONS. WHEN GATING IMPACT ATTENUATORS ARE DESIRED, THE CONTRACTOR SHALL SUBMIT DOCUMENTATION TO THE ENGINEER FOR ACCEPTANCE. THE COST FOR THE ADDITIONAL BARRIER REQUIRED FOR A GATING IMPACT ATTENUATOR SHALL BE INCLUDED IN THE COST OF THE GATING IMPACT ATTENUATOR. PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT PRICE BID AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT AND MAINTAIN A COMPLETE AND FUNCTIONAL IMPACT ATTENUATOR SYSTEM, INCLUDING ALL RELATED BACKUPS, TRANSITIONS, LEVELING PADS, HARDWARE AND GRADING, NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

DUST CONTROL
THE CONTRACTOR SHALL FURNISH AND APPLY WATER FOR DUST CONTROL AS DIRECTED BY THE ENGINEER. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED FOR DUST CONTROL PURPOSES:

ITEM 616 WATER 9.0 M.GAL.

CONSTRUCTION SEQUENCE FOR MAINTENANCE OF TRAFFIC (MOT)

PRE-ROADWAY TRAFFIC SIGNAL MODIFICATION:
INSTALL THE PROPOSED TRAFFIC SIGNAL AND ASSOCIATED UNDERGROUND SIGNAL COMPONENTS AT THE S.R. 149 AND THE I-70 EB ENTRANCE/EXIT RAMPS. SIGNAL COMPONENTS CAN BE INSTALLED CONCURRENTLY WITH ANY OF THE PHASES PRIOR TO FINAL PAVEMENT MARKING OPERATIONS. PROPOSED TRAFFIC SIGNAL HEADS TO REMAIN COVERED AND EXISTING TRAFFIC SIGNAL TO REMAIN OPERABLE UNTIL FINAL PAVEMENT MARKINGS AND FINAL PROPOSED SIGNAL CONFIGURATION IS READY TO BE IN OPERATION. CONTRACTOR TO INSTALL SIGNAL COMPONENTS IN OFF-PEAK HOURS IN EXPEDITED FASHION. CONTROL TRAFFIC WITH FLAGGING OPERATION PER ODOT SCD MT-97.10 AS REQUIRED TO SAFELY INSTALL SIGNAL COMPONENTS DURING OFF PEAK HOURS. FLAGGERS MUST NOT DIRECT TRAFFIC THROUGH RED LIGHTS AND CONTRACTOR MUST ENSURE I-70 EB EXIT RAMP DOES NOT BACK UP TO MAIN LINE.

PRE-PHASE 1:
INSTALL TEMPORARY PAVEMENT AS SHOWN ON WEST SIDE OF S.R. 149 AND EAST SIDE OF S.R. 149 (FOR IMPACT ATTENUATOR PLACEMENT). TEMPORARY PAVEMENT TO BE INSTALLED IN EXPEDITED FASHION DURING OFF PEAK TRAFFIC HOURS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS/GUIDELINES AND ODOT SCD MT-97.11. EXISTING CONDITION TO BE RESTORED WHEN NO LONGER NEEDED FOR MOT OPERATIONS. CONTRACTOR TO COORDINATE TEMPORARY GUY-WIRES/STABILIZATION FOR UTILITY POLES ADJACENT TO TEMPORARY PAVEMENT PRIOR TO ANY CONSTRUCTION.

PHASE 1:
COMPLETE WORK ON EAST SIDE OF BELMONT MORRISTOWN ROAD (S.R. 149). SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AS SHOWN IN PLAN. TEMPORARY CONSTRUCTION BARRICADES TO BE PLACED PRIOR TO GUARDRAIL REMOVAL ON EAST SIDE OF S.R. 149. GUARDRAIL TO REMAIN ON WEST SIDE OF S.R. 149 DURING PHASE 1. CONSTRUCTION BARRICADES SHALL NOT BE REMOVED UNTIL NEW GUARDRAIL IS INSTALLED ON THE EAST SIDE OF S.R. 149.

PRE-PHASE 2:
INSTALL TEMPORARY PAVEMENT AS SHOWN ON EAST SIDE OF S.R. 149 AND WEST SIDE OF S.R. 149 (FOR IMPACT ATTENUATOR PLACEMENT). TEMPORARY PAVEMENT TO BE INSTALLED IN EXPEDITED FASHION DURING OFF PEAK TRAFFIC HOURS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS/GUIDELINES AND ODOT SCD MT-97.11. EXISTING CONDITION TO BE RESTORED WHEN NO LONGER NEEDED FOR MOT OPERATIONS.

PHASE 2:
COMPLETE WORK ON WEST SIDE OF BELMONT MORRISTOWN ROAD (S.R. 149) AND SOUTH WEST QUADRANT OF RECO DRIVE. SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AND RECO DRIVE AS SHOWN IN PLAN. TEMPORARY CONSTRUCTION BARRICADES TO BE PLACED PRIOR TO GUARDRAIL REMOVAL ON WEST SIDE OF S.R. 149. CONSTRUCTION BARRICADES SHALL NOT BE REMOVED UNTIL NEW GUARDRAIL IS INSTALLED ON THE WEST SIDE OF S.R. 149.

PRE-PHASE 3A/3B:
INSTALL TEMPORARY PAVEMENT AS SHOWN ON SOUTH SIDE OF RECO DRIVE. TEMPORARY PAVEMENT TO BE INSTALLED IN EXPEDITED FASHION DURING OFF PEAK TRAFFIC HOURS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS/GUIDELINES AND ODOT SCD MT-97.11. EXISTING CONDITION TO BE RESTORED WHEN NO LONGER NEEDED FOR MOT OPERATIONS.

PHASE 3A:
COMPLETE WORK IN NORTHWEST QUADRANT OF BELMONT MORRISTOWN ROAD (S.R. 149) AND RECO DRIVE. SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AND RECO DRIVE AS SHOWN IN PLAN. COMPLETE SOUTH MARATHON DRIVEWAY WORK. NORTH MARATHON DRIVEWAY TO REMAIN OPEN.

PHASE 3B:
RECONFIGURE MOT PHASE 3A AS SHOWN ON PHASE 3B TO REOPEN MARATHON SOUTH DRIVEWAY AND CLOSE NORTH MARATHON DRIVEWAY TO COMPLETE WORK. COMPLETE WORK IN EXPEDITED FASHION DURING OFF PEAK HOURS TO LIMIT DISRUPTION TO TRUCK TRAFFIC AND ADJACENT BUSINESSES.

PHASE 3C:
COMPLETE WORK IN SOUTHWEST QUADRANT OF THE BELMONT MORRISTOWN ROAD (S.R. 149) AND RECO DRIVE INTERSECTION. SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AND RECO DRIVE AS SHOWN IN PLAN.

△9

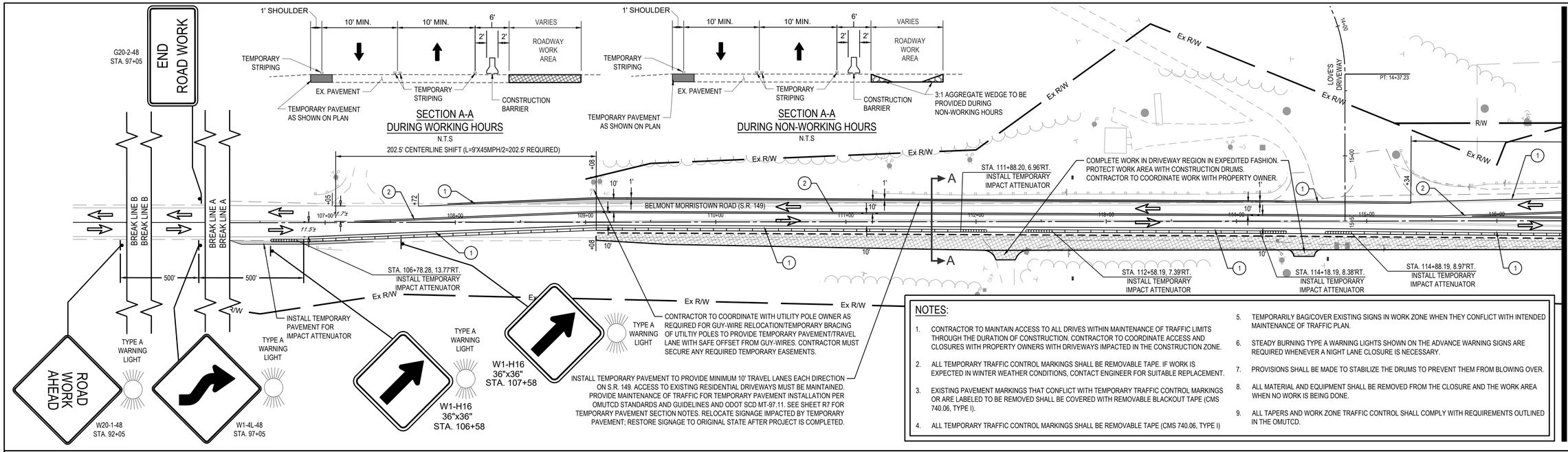
CALCULATED P.JD
CHECKED TDH

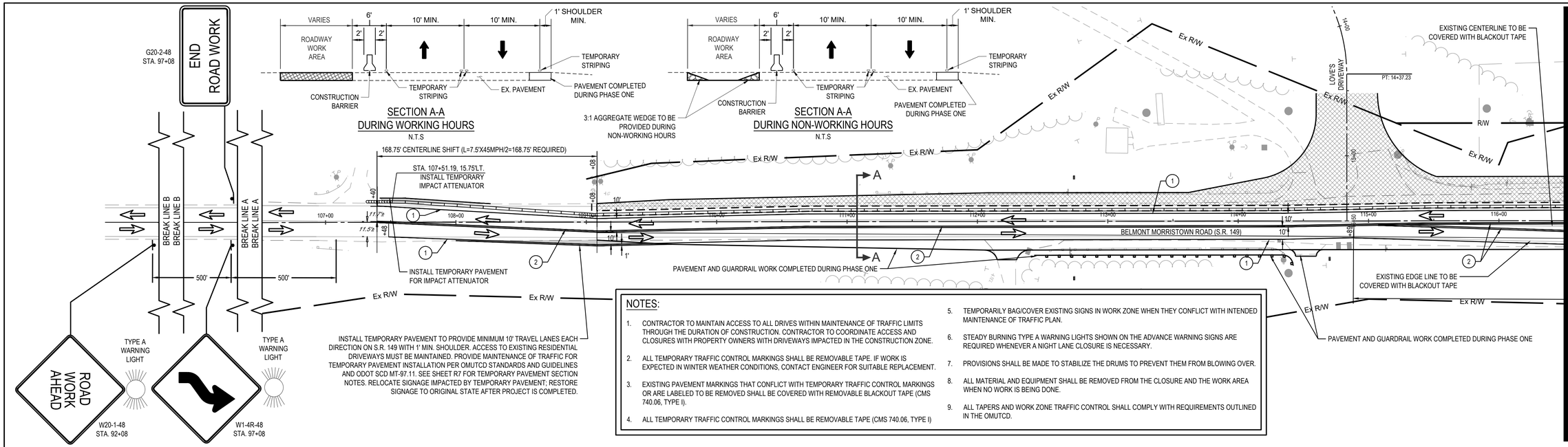
MAINTENANCE OF TRAFFIC NOTES
S.R. 149

BEL-149-23.44

△9

R7
R32





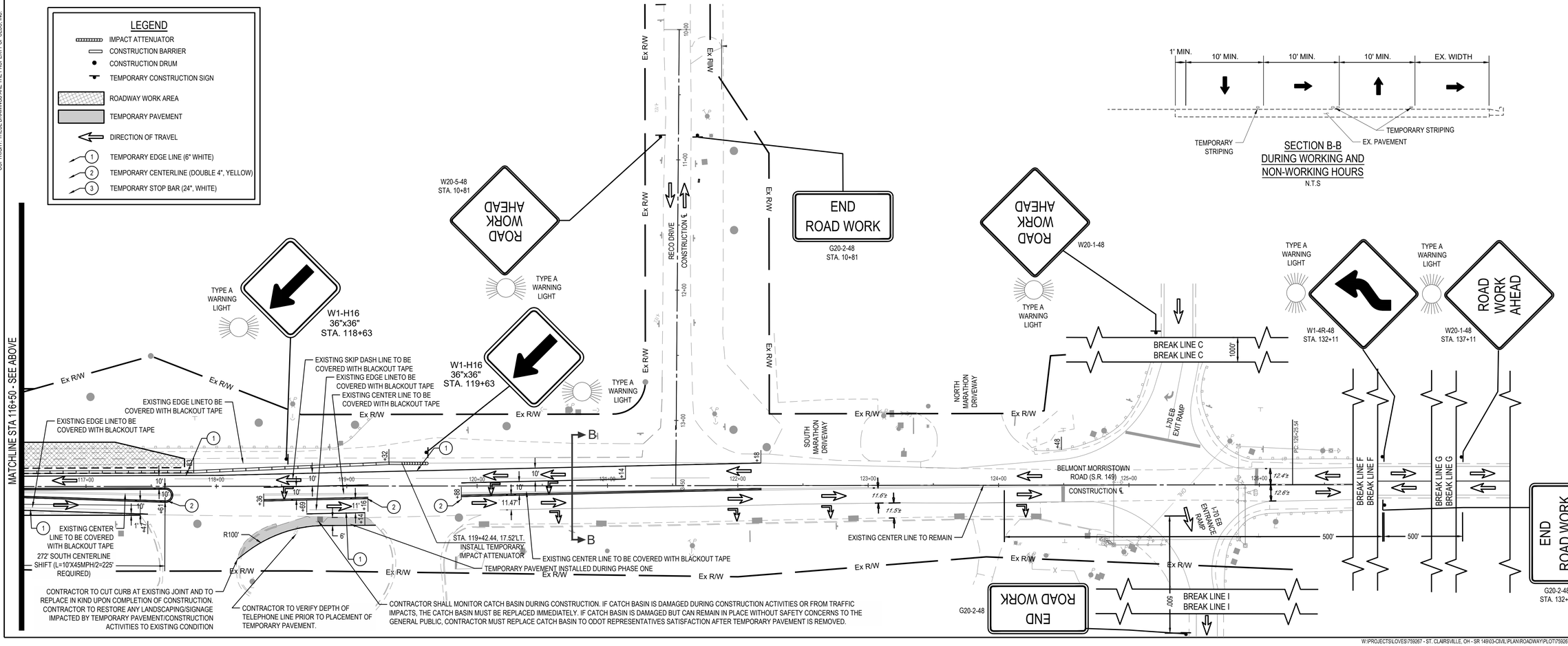
INSTALL TEMPORARY PAVEMENT TO PROVIDE MINIMUM 10' TRAVEL LANES EACH DIRECTION ON S.R. 149 WITH 1' MIN. SHOULDER. ACCESS TO EXISTING RESIDENTIAL DRIVEWAYS MUST BE MAINTAINED. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS AND GUIDELINES AND ODOT SCD MT-97.11. SEE SHEET R7 FOR TEMPORARY PAVEMENT SECTION NOTES. RELOCATE SIGNAGE IMPACTED BY TEMPORARY PAVEMENT; RESTORE SIGNAGE TO ORIGINAL STATE AFTER PROJECT IS COMPLETED.

NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
2. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE. IF WORK IS EXPECTED IN WINTER WEATHER CONDITIONS, CONTACT ENGINEER FOR SUITABLE REPLACEMENT.
3. EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL MARKINGS OR ARE LABELED TO BE REMOVED SHALL BE COVERED WITH REMOVABLE BLACKOUT TAPE (CMS 740.06, TYPE I).
4. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE (CMS 740.06, TYPE I)
5. TEMPORARILY BAG/COVER EXISTING SIGNS IN WORK ZONE WHEN THEY CONFLICT WITH INTENDED MAINTENANCE OF TRAFFIC PLAN.
6. STEADY BURNING TYPE A WARNING LIGHTS SHOWN ON THE ADVANCE WARNING SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
7. PROVISIONS SHALL BE MADE TO STABILIZE THE DRUMS TO PREVENT THEM FROM BLOWING OVER.
8. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.
9. ALL TAPERS AND WORK ZONE TRAFFIC CONTROL SHALL COMPLY WITH REQUIREMENTS OUTLINED IN THE OMUTCD.

LEGEND

- IMPACT ATTENUATOR
- CONSTRUCTION BARRIER
- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)



SECTION B-B
DURING WORKING AND NON-WORKING HOURS
N.T.S

GRAPHIC SCALE (IN FEET)
80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH

MAINTENANCE OF TRAFFIC - PHASE 2
S.R. 149

BEL-149-23.44

R9
R32

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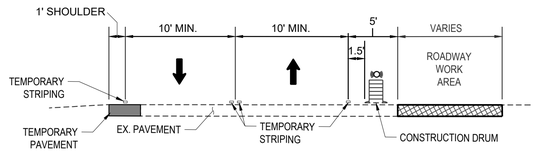
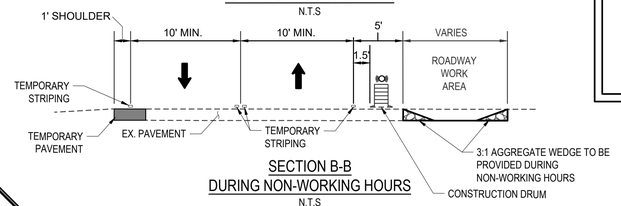
NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
2. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE. IF WORK IS EXPECTED IN WINTER WEATHER CONDITIONS, CONTACT ENGINEER FOR SUITABLE REPLACEMENT.
3. EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL MARKINGS OR ARE LABELED TO BE REMOVED SHALL BE COVERED WITH REMOVABLE BLACKOUT TAPE (CMS 740.06, TYPE I).
4. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE (CMS 740.06, TYPE I)
5. TEMPORARILY BAG/COVER EXISTING SIGNS IN WORK ZONE WHEN THEY CONFLICT WITH INTENDED MAINTENANCE OF TRAFFIC PLAN.
6. STEADY BURNING TYPE A WARNING LIGHTS SHOWN ON THE ADVANCE WARNING SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
7. PROVISIONS SHALL BE MADE TO STABILIZE THE DRUMS TO PREVENT THEM FROM BLOWING OVER.
8. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.
9. ALL TAPERS AND WORK ZONE TRAFFIC CONTROL SHALL COMPLY WITH REQUIREMENTS OUTLINED IN THE OMUTCD.



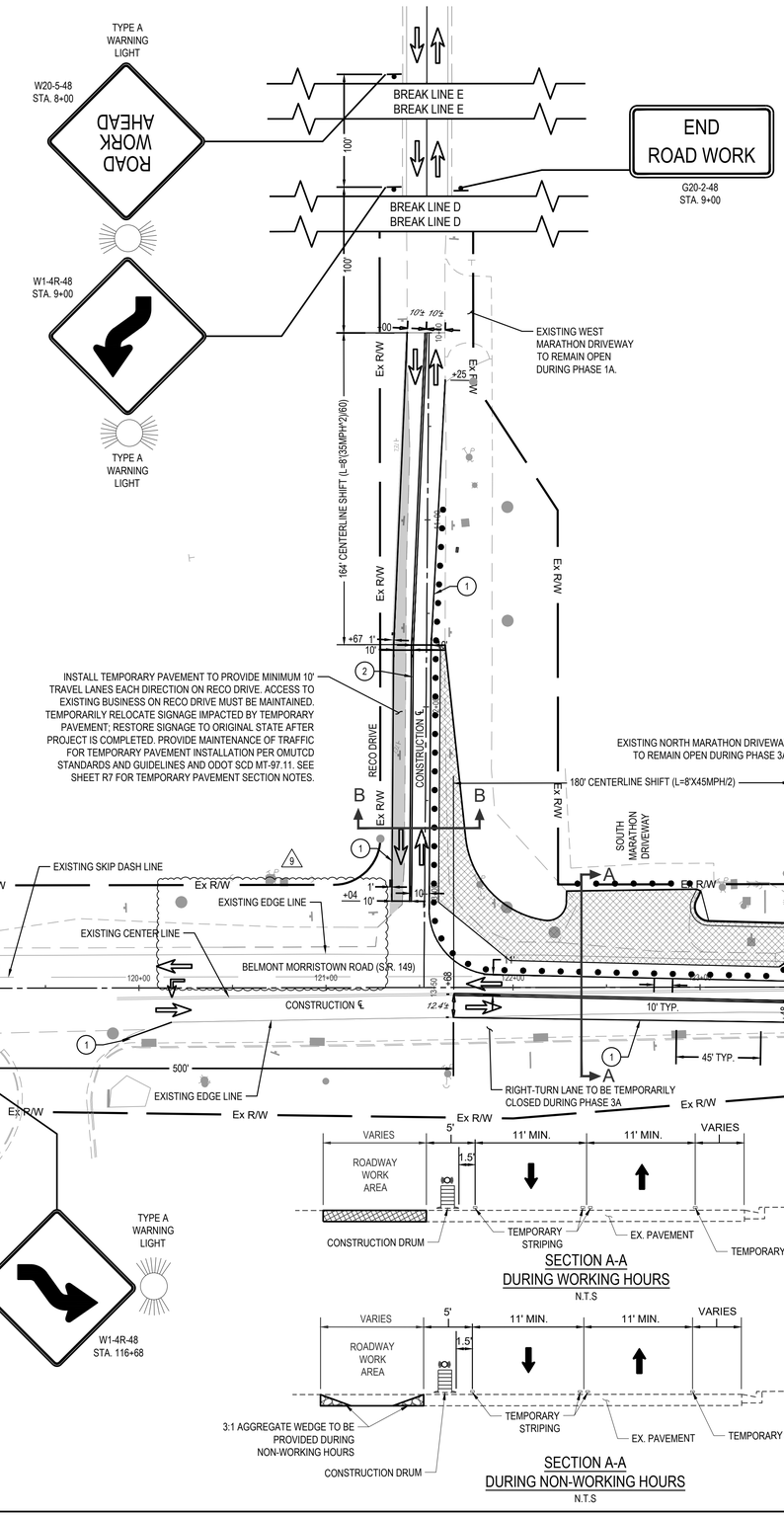
SECTION B-B
DURING WORKING HOURS
N.T.S



SECTION B-B
DURING NON-WORKING HOURS
N.T.S

LEGEND

- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)



SECTION A-A
DURING WORKING HOURS
N.T.S

SECTION A-A
DURING NON-WORKING HOURS
N.T.S

GRAPHIC SCALE (IN FEET)
80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH

MAINTENANCE OF TRAFFIC - PHASE 3A
S.R. 149

BEL-149-23.44

R10
R32

9

NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
2. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE. IF WORK IS EXPECTED IN WINTER WEATHER CONDITIONS, CONTACT ENGINEER FOR SUITABLE REPLACEMENT.
3. EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL MARKINGS OR ARE LABELED TO BE REMOVED SHALL BE COVERED WITH REMOVABLE BLACKOUT TAPE (CMS 740.06, TYPE I).
4. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE (CMS 740.06, TYPE I)
5. TEMPORARILY BAG/COVER EXISTING SIGNS IN WORK ZONE WHEN THEY CONFLICT WITH INTENDED MAINTENANCE OF TRAFFIC PLAN.
6. STEADY BURNING TYPE A WARNING LIGHTS SHOWN ON THE ADVANCE WARNING SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
7. PROVISIONS SHALL BE MADE TO STABILIZE THE DRUMS TO PREVENT THEM FROM BLOWING OVER.
8. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.
9. ALL TAPERS AND WORK ZONE TRAFFIC CONTROL SHALL COMPLY WITH REQUIREMENTS OUTLINED IN THE OMUTCD.

LEGEND

- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)

GRAPHIC SCALE (IN FEET): 80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH

TYPE A WARNING LIGHT
W20-5-48 STA. 8+00
ROAD WORK AHEAD
W1-4R-48 STA. 9+00
TYPE A WARNING LIGHT
END ROAD WORK
G20-2-48 STA. 9+00
BREAK LINE E
BREAK LINE E
BREAK LINE D
BREAK LINE D
EXISTING WEST MARATHON DRIVEWAY TO REMAIN OPEN DURING PHASE 1A.
164' CENTERLINE SHIFT (L=8'(35MPH*2)/60)
Ex R/W
CONSTRUCTION ℄
RECO DRIVE
INSTALL TEMPORARY PAVEMENT TO PROVIDE MINIMUM 10' TRAVEL LANES EACH DIRECTION ON RECO DRIVE. ACCESS TO EXISTING BUSINESS ON RECO DRIVE MUST BE MAINTAINED. TEMPORARILY RELOCATE SIGNAGE IMPACTED BY TEMPORARY PAVEMENT; RESTORE SIGNAGE TO ORIGINAL STATE AFTER PROJECT IS COMPLETED. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS AND GUIDELINES AND ODOT SCD MT-97.11. SEE SHEET R7 FOR TEMPORARY PAVEMENT SECTION NOTES.
ADD NO RIGHT TURN SIGNS FOR SEMI-TRUCKS TO I-70 EB OFF RAMP AND COMPLETE NORTH MARATHON DRIVEWAY WORK IN EXPEDITED FASHION DURING OFF-PEAK HOURS. WORK MUST BE COMPLETED QUICKLY TO LIMIT IMPACTS TO EXISTING TRUCK PATTERNS TO MAXIMUM EXTENT POSSIBLE. OPEN NEW PAVEMENT AND ALLOW TRUCK MOVEMENTS AS SOON AS POSSIBLE AFTER COMPLETING WORK.
180' CENTERLINE SHIFT (L=8'X45MPH/2)
100' TANGENT SECTION
SOUTH MARATHON DRIVEWAY
PROPOSED SOUTH MARATHON DRIVEWAY TO BE OPEN DURING PHASE 3B.
NORTH MARATHON DRIVEWAY
BREAK LINE H
BREAK LINE H
263' CENTERLINE SHIFT (L=8'X45MPH/2=180' REQUIRED)
112.5' WEST EDGE LINE TAPER FROM EXISTING L=5'X45MPH/2
I-70 EB EXIT RAMP
I-70 EB ENTRANCE RAMP
EXISTING SKIP DASH LINE
EXISTING EDGE LINE
EXISTING CENTER LINE
BELMONT MORRISTOWN ROAD (S.R. 149)
CONSTRUCTION ℄
EXISTING EDGE LINE
RIGHT-TURN LANE TO BE TEMPORARILY CLOSED DURING PHASE 3B
EXISTING STOP BAR TO BE RELOCATED AS SHOWN
BREAK LINE A / BREAK LINE A
BREAK LINE B / BREAK LINE B
BREAK LINE C / BREAK LINE C
BREAK LINE F / BREAK LINE F
BREAK LINE G / BREAK LINE G
BREAK LINE I / BREAK LINE I
500'
ROAD WORK AHEAD
W20-1-48 STA. 106+68
RIGHT LANE CLOSED AHEAD
W20-5-48 STA. 111+68
W1-4R-48 STA. 116+68
W20-1-48
W1-4L-48 STA. 132+11
W20-1-48 STA. 137+11
END ROAD WORK
G20-2-48 STA. 116+68
G20-2-48 STA. 132+11
END ROAD WORK
G20-2-48

1' SHOULDER, 10' MIN., 10' MIN., 5', VARIES, 1.5', ROADWAY WORK AREA, TEMPORARY STRIPING, TEMPORARY PAVEMENT, EX. PAVEMENT, TEMPORARY STRIPING, CONSTRUCTION DRUM

SECTION B-B
DURING WORKING HOURS
N.T.S

1' SHOULDER, 10' MIN., 10' MIN., 5', VARIES, 1.5', ROADWAY WORK AREA, TEMPORARY STRIPING, TEMPORARY PAVEMENT, EX. PAVEMENT, TEMPORARY STRIPING, 3:1 AGGREGATE WEDGE TO BE PROVIDED DURING NON-WORKING HOURS, CONSTRUCTION DRUM

SECTION B-B
DURING NON-WORKING HOURS
N.T.S

VARIES, 5', 11' MIN., 11' MIN., VARIES, 1.5', ROADWAY WORK AREA, CONSTRUCTION DRUM, TEMPORARY STRIPING, EX. PAVEMENT, TEMPORARY STRIPING

SECTION A-A
DURING WORKING HOURS
N.T.S

VARIES, 5', 11' MIN., 11' MIN., VARIES, 1.5', ROADWAY WORK AREA, 3:1 AGGREGATE WEDGE TO BE PROVIDED DURING NON-WORKING HOURS, CONSTRUCTION DRUM, TEMPORARY STRIPING, EX. PAVEMENT, TEMPORARY STRIPING

SECTION A-A
DURING NON-WORKING HOURS
N.T.S

MAINTENANCE OF TRAFFIC - PHASE 3B
S.R. 149
BEL-149-23.44
R11
R32

NOTES:

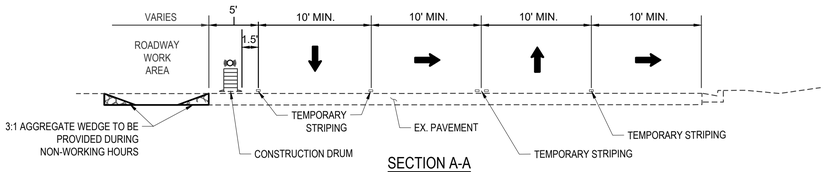
1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
2. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE. IF WORK IS EXPECTED IN WINTER WEATHER CONDITIONS, CONTACT ENGINEER FOR SUITABLE REPLACEMENT.
3. EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL MARKINGS OR ARE LABELED TO BE REMOVED SHALL BE COVERED WITH REMOVABLE BLACKOUT TAPE (CMS 740.06, TYPE I).
4. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE (CMS 740.06, TYPE I)
5. TEMPORARILY BAG/COVER EXISTING SIGNS IN WORK ZONE WHEN THEY CONFLICT WITH INTENDED MAINTENANCE OF TRAFFIC PLAN.
6. STEADY BURNING TYPE A WARNING LIGHTS SHOWN ON THE ADVANCE WARNING SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
7. PROVISIONS SHALL BE MADE TO STABILIZE THE DRUMS TO PREVENT THEM FROM BLOWING OVER.
8. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.
9. ALL TAPERS AND WORK ZONE TRAFFIC CONTROL SHALL COMPLY WITH REQUIREMENTS OUTLINED IN THE OMUTCD.

LEGEND

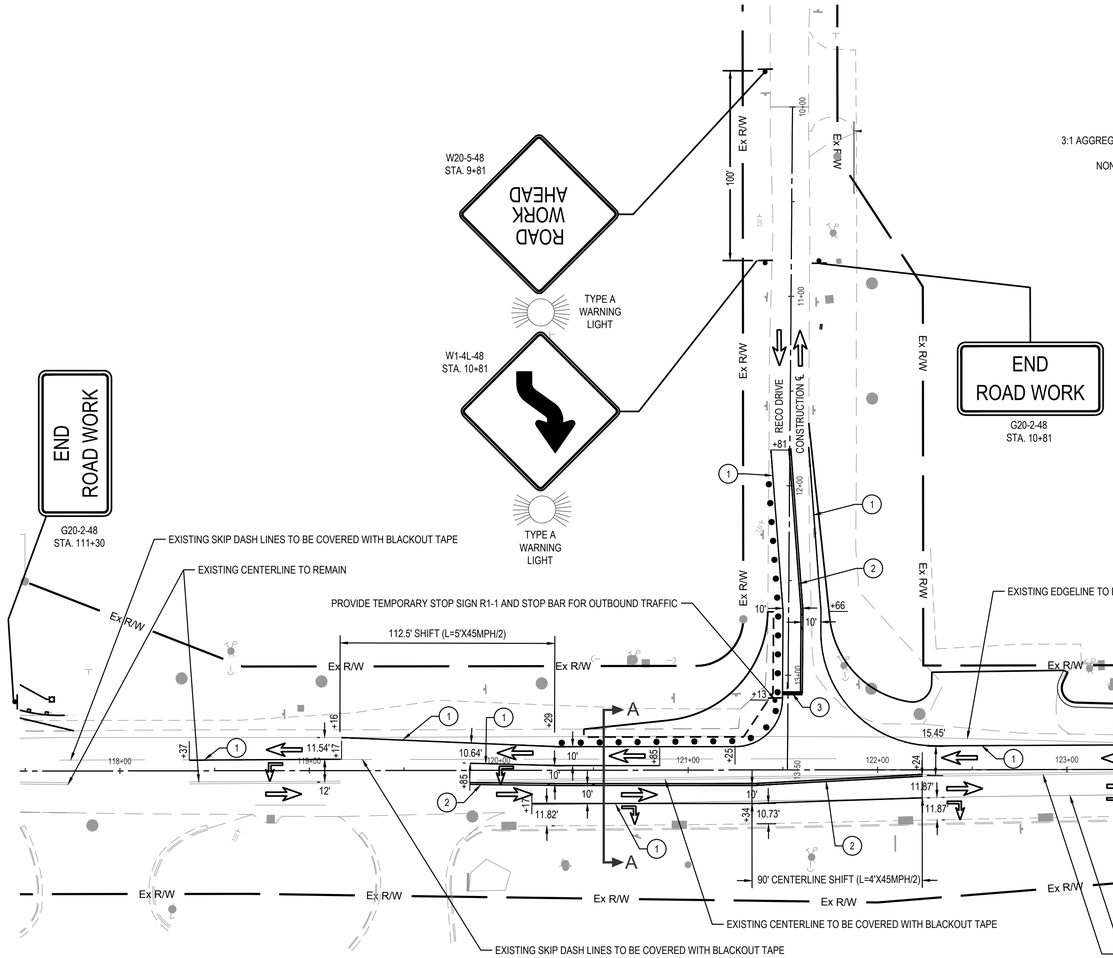
- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)

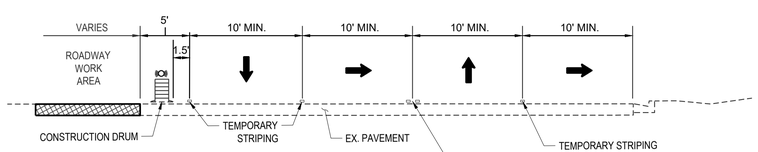
GRAPHIC SCALE (IN FEET): 80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH



SECTION A-A
DURING NON-WORKING HOURS
N.T.S





SECTION A-A
DURING WORKING HOURS
N.T.S

MAINTENANCE OF TRAFFIC - PHASE 3C
S.R. 149

BEL-149-23.44

R12
R32

SITE DESCRIPTION

CONSTRUCTION TO WIDEN EAST AND WEST SIDE OF S.R. 149 TO PROVIDE 175' NB LEFT TURN LANE INTO LOVE'S DRIVEWAY, 175' SB RIGHT-TURN LANE INTO LOVE'S DRIVEWAY, 164' TWLTL BETWEEN SOUTH PILOT DRIVEWAY & NORTH PILOT DRIVEWAY, 125' NB LEFT TURN LANE INTO RECO DRIVE, 200' SB RIGHT TURN LANE INTO RECO DRIVE AND ASSOCIATED LANE RECONFIGURATION TO ACCOMMODATE AFOREMENTIONED IMPROVEMENTS. CONSTRUCTION TO WIDEN RECO DRIVE AND INSTALLATION OF TRAFFIC SIGNAL AT S.R. 149 & RECO DRIVE INTERSECTION. DITCH AND SLOPE GRADING AND INSTALLATION OF NECESSARY TRAFFIC CONTROL DEVICES. STORMWATER STRUCTURE AND CONDUIT MODIFICATIONS BETWEEN SOUTH MARATHON DRIVEWAY AND NORTH MARATHON DRIVEWAY.

NOI AND BMP NOTE

NOI AND BMP'S FOR ROADWAY WORK ARE INCLUDED WITH OVERALL SITE SUBMISSION FOR LOVE'S TRAVEL STOP DEVELOPMENT.

EARTH DISTURBED AREAS AND TOTAL AREA OF PROJECT

TOTAL AREA OF PROJECT: 2.07 ACRES
PROJECT EARTH DISTURBING ACTIVITIES AREA: 1.77 ACRES
CONTRACTOR EARTH DISTURBING ACTIVITIES AREA: 0.30 ACRES
NOI EARTH DISTURBING ACTIVITIES AREA: 2.07 ACRES

SITE LOCATION

LAT = N 40° 03' 27"
LONG = W 81° 03' 09"

REFER TO PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES PLAN BY TERRACON DATED 9-6-2024 FOR SPECIAL REINFORCED SOIL SLOPE (RSS) DESIGN FROM STA. 112+80 TO STA. 113+33.

SEED AND MULCHING, CLASS 2 PER ODOT ITEM 659. CONTRACTOR TO ESTABLISH PERMANENT VEGEATATIVE COVER FOR ALL DISTURBED EARTH AREAS (TYP.)

REFER TO SITE PLANS FOR SITE GRADING. ROADWAY CONTRACTOR TO COORDINATE GRADING TIE IN AND ON SITE SWPPP MEASURES WITH SITE CONTRACTOR

REFER TO SITE PLANS FOR SITE GRADING. ROADWAY CONTRACTOR TO COORDINATE GRADING TIE IN AND ON SITE SWPPP MEASURES WITH SITE CONTRACTOR

BELMONT MORRISTOWN ROAD (S.R. 149)

CONSTRUCTION ℄

LOVE'S DRIVEWAY CONSTRUCTION ℄

MATCHLINE STA 117+00 - SEE BELOW

SEED AND MULCHING, CLASS 2 PER ODOT ITEM 659. CONTRACTOR TO ESTABLISH PERMANENT VEGEATATIVE COVER FOR ALL DISTURBED EARTH AREAS (TYP.)

REFER TO PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES PLAN BY TERRACON DATED 9-6-2024 FOR SPECIAL EMBANKMENT SLOPE DESIGN FROM STA. 113+00 TO STA. 113+50.

SEED AND MULCHING, CLASS 2 PER ODOT ITEM 659. CONTRACTOR TO ESTABLISH PERMANENT VEGEATATIVE COVER FOR ALL DISTURBED EARTH AREAS (TYP.)

REFER TO PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES PLAN BY TERRACON DATED 9-6-2024 FOR SPECIAL EMBANKMENT SLOPE DESIGN FROM STA. 115+73 TO STA. 117+35.

MATCHLINE STA 117+00 - SEE ABOVE

RECO DRIVE CONSTRUCTION ℄

SOUTH PILOT DRIVEWAY

NORTH PILOT DRIVEWAY

EXISTING LAND USE
452-AUTOMOTIVE
SERVICE STATION

SOUTH MARATHON DRIVEWAY

NORTH MARATHON DRIVEWAY

EXISTING LAND USE
452-AUTOMOTIVE
SERVICE STATION

SEED AND MULCHING, CLASS 2 PER ODOT ITEM 659. CONTRACTOR TO ESTABLISH PERMANENT VEGEATATIVE COVER FOR ALL DISTURBED EARTH AREAS (TYP.)

REPLACE EXISTING ROCK CHANNEL PROTECTION IMPACTED BY GRADING ACTIVITY IN TYPE AND KIND

I-70 EB EXIT RAMP

I-70 EB ENTRANCE RAMP

KEY

- 962 — EXISTING CONTOUR
- 962 — PROPOSED CONTOUR, COORDINATE WITH SITE GRADING PLANS
- LOD — GRADING/SEEDING LIMITS (L.O.D. - LIMITS OF DISTURBANCE)
- SF — SF — SILT FENCE
- DC — DITCH CHECK (ODOT SCD DM-4.4)
- IP — INLET PROTECTION (ODOT SCD DM-4.4)
- RC — ROCK CHANNEL PROTECTION
- WL — EXISTING WETLAND - DO NOT DISTURB
- SM — SEEDING AND MULCHING
- FLOW ARROW
- EM — TEMPORARY EROSION CONTROL MAT, TYPE B

SWPPP NOTES:

1. CONTRACTOR IS RESPONSIBLE TO MAINTAIN POST-CONSTRUCTION PERMANENT EROSION CONTROL MEASURES UNTIL ADEQUATE RE-VEGETATION AND STABILIZATION ARE ACHIEVED.
2. CONTRACTOR TO PLACE SILT FENCE (PER ODOT SCD DM-4.4) AS SHOWN AND AS NEEDED IN THE FIELD TO RETAIN ALL SOILS ON THE DISTURBED LAND AND PREVENT RUNOFF INTO THE SURROUNDING STORMWATER SYSTEM.
3. ALL ITEMS SHALL BE LOCATED, FURNISHED AND INSTALLED PER ODOT REQUIREMENTS/STANDARDS AND SPECIFICATIONS.
4. TOTAL DISTURBED AREA FOR ENTIRE ROADWAY PROJECT: 1.83 ACRES

RATIONAL METHOD RUNOFF COEFFICIENT

PRECONSTRUCTION = 0.70
POST CONSTRUCTION = 0.72
(0.9 USED FOR PAVEMENT, 0.6 USED FOR LAWN)

ESTIMATE OF IMPERVIOUS AREA

PRE-CONSTRUCTION = 0.3829 ACRES
POST-CONSTRUCTION = 0.7850 ACRES
AREAS OBTAINED FROM REGION WITHIN SAWCUT LIMITS

IMMEDIATE RECEIVING STREAM OR SURFACE WATER:

IMMEDIATE RECEIVING STREAM: UPPER MCMAHON CREEK
SUBSEQUENT RECEIVING WATERS: OHIO RIVER

USGS 7.5-MINUTE QUADRANGLE MAP:

NAME: BETHESDA QUADRANGLE
NUMBER: 466004

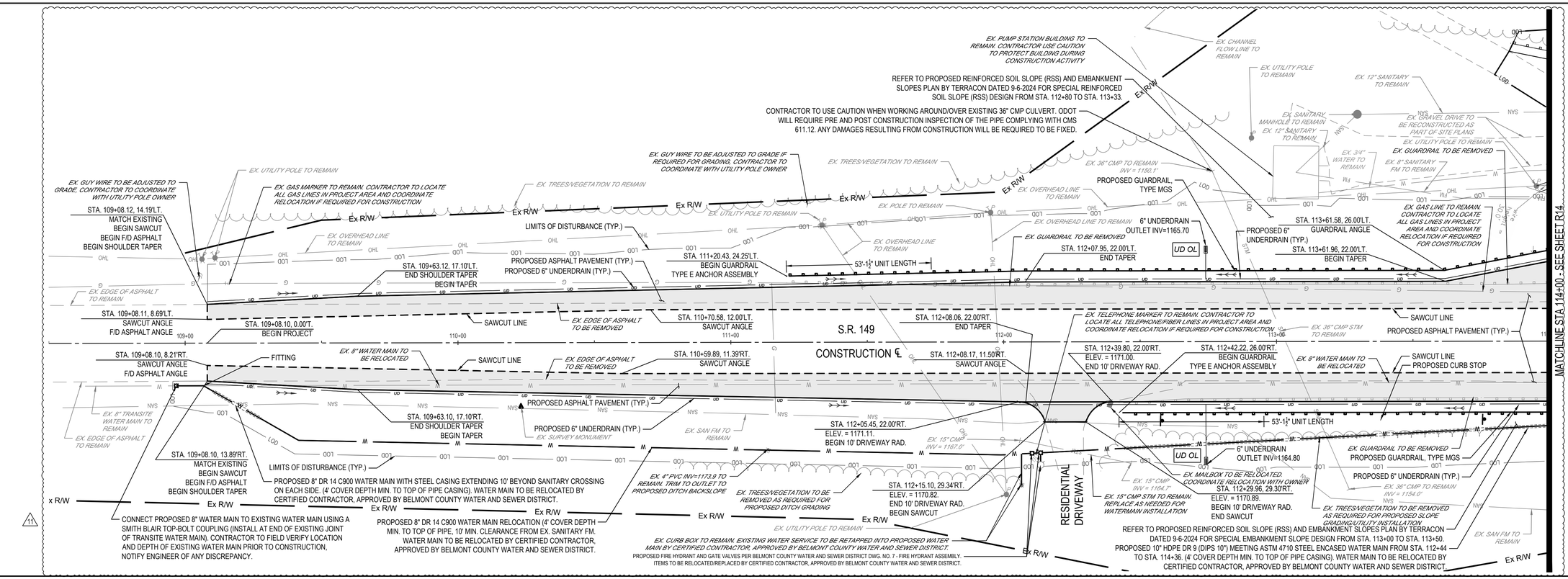
GRAPHIC SCALE (IN FEET): 60 30 0 15 30

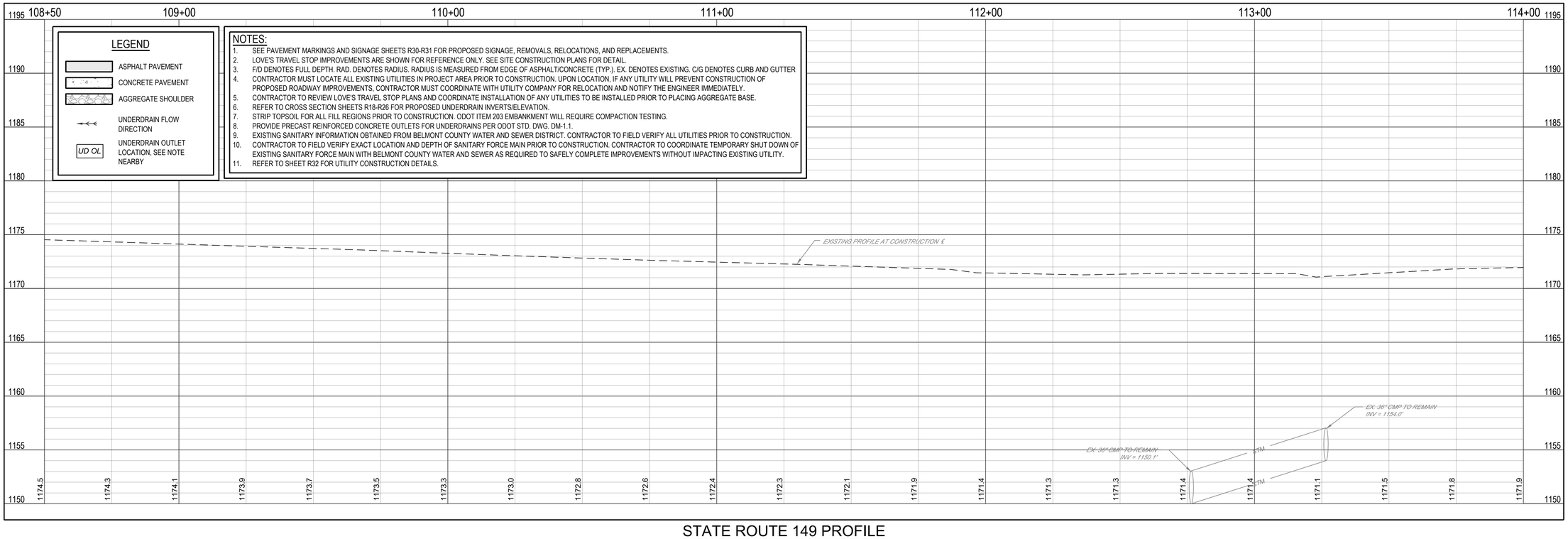
CALCULATED PJD
CHECKED TDH

SITE PLAN
S.R. 149

BEL-149-23.44

R13
R32





LEGEND

- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- AGGREGATE SHOULDER
- UNDERDRAIN FLOW DIRECTION
- UD OL — UNDERDRAIN OUTLET LOCATION, SEE NOTE NEARBY

NOTES:

1. SEE PAVEMENT MARKINGS AND SIGNAGE SHEETS R30-R31 FOR PROPOSED SIGNAGE, REMOVALS, RELOCATIONS, AND REPLACEMENTS.
2. LOVE'S TRAVEL STOP IMPROVEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE SITE CONSTRUCTION PLANS FOR DETAIL.
3. F/D DENOTES FULL DEPTH. RAD. DENOTES RADIUS. RADIUS IS MEASURED FROM EDGE OF ASPHALT/CONCRETE (TYP.). EX. DENOTES EXISTING. C/G DENOTES CURB AND GUTTER
4. CONTRACTOR MUST LOCATE ALL EXISTING UTILITIES IN PROJECT AREA PRIOR TO CONSTRUCTION. UPON LOCATION, IF ANY UTILITY WILL PREVENT CONSTRUCTION OF PROPOSED ROADWAY IMPROVEMENTS, CONTRACTOR MUST COORDINATE WITH UTILITY COMPANY FOR RELOCATION AND NOTIFY THE ENGINEER IMMEDIATELY.
5. CONTRACTOR TO REVIEW LOVE'S TRAVEL STOP PLANS AND COORDINATE INSTALLATION OF ANY UTILITIES TO BE INSTALLED PRIOR TO PLACING AGGREGATE BASE.
6. REFER TO CROSS SECTION SHEETS R18-R26 FOR PROPOSED UNDERDRAIN INVERTS/ELEVATION.
7. STRIP TOPSOIL FOR ALL FILL REGIONS PRIOR TO CONSTRUCTION. ODOT ITEM 203 EMBANKMENT WILL REQUIRE COMPACTION TESTING.
8. PROVIDE PRECAST REINFORCED CONCRETE OUTLETS FOR UNDERDRAINS PER ODOT STD. DWG. DM-1.1.
9. EXISTING SANITARY INFORMATION OBTAINED FROM BELMONT COUNTY WATER AND SEWER DISTRICT. CONTRACTOR TO FIELD VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION.
10. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND DEPTH OF SANITARY FORCE MAIN PRIOR TO CONSTRUCTION. CONTRACTOR TO COORDINATE TEMPORARY SHUT DOWN OF EXISTING SANITARY FORCE MAIN WITH BELMONT COUNTY WATER AND SEWER AS REQUIRED TO SAFELY COMPLETE IMPROVEMENTS WITHOUT IMPACTING EXISTING UTILITY.
11. REFER TO SHEET R32 FOR UTILITY CONSTRUCTION DETAILS.

STATE ROUTE 149 PROFILE

Scale: 1" = 20' Horiz.; 1" = 5' Vert.

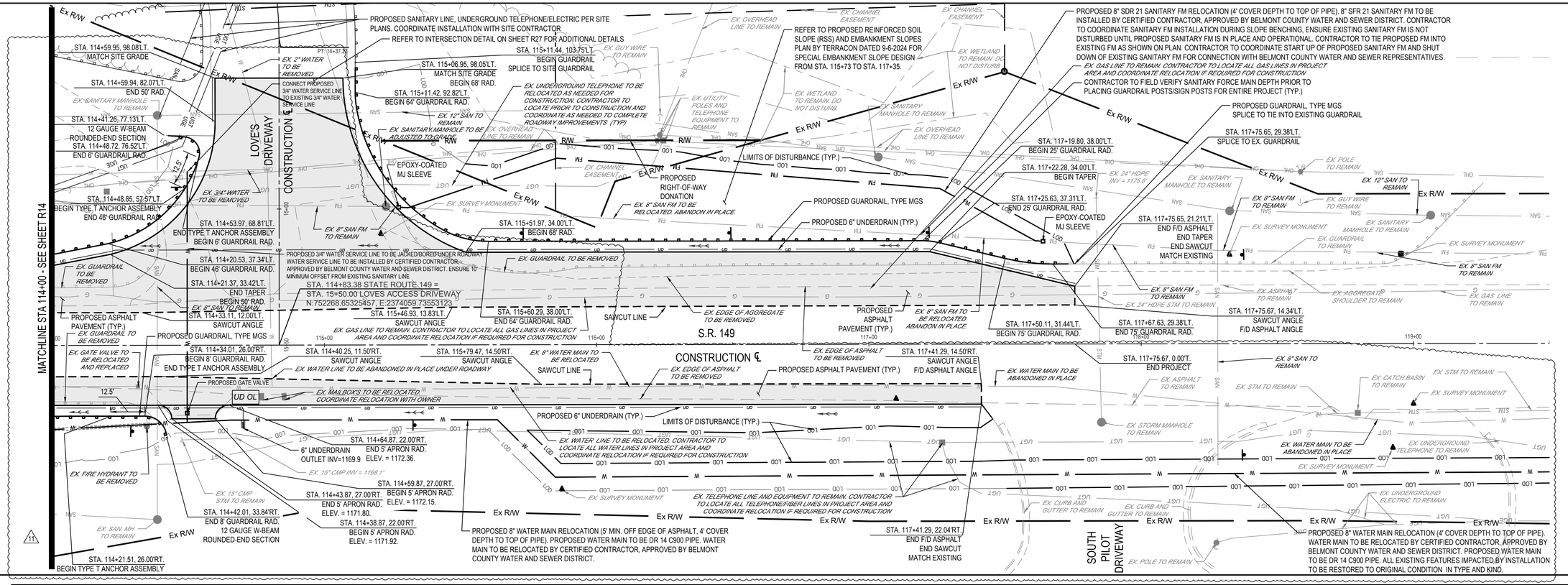
GRAPHIC SCALE (IN FEET)
40 20 0 10 20

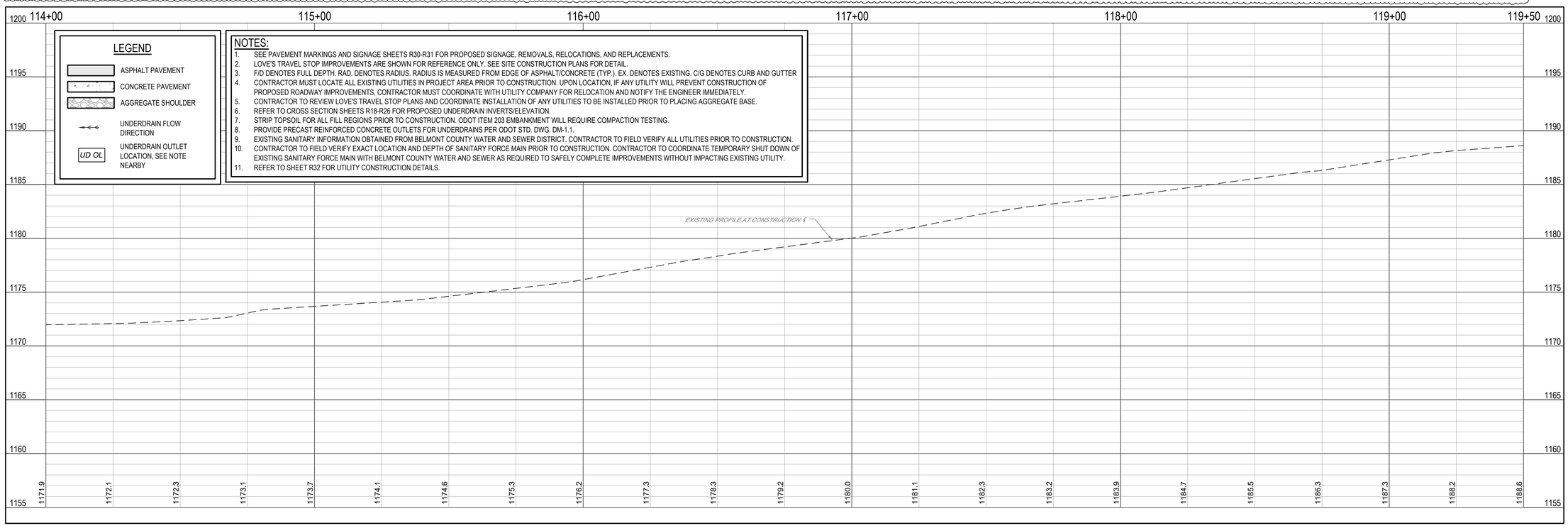
CALCULATED PJD
CHECKED TDH

PLAN & PROFILE - STA. 108+50 TO STA. 114+00
S.R. 149

BEL-149-23.44

R14
R32





STATE ROUTE 149 PROFILE
Scale: 1" = 20' Horiz.; 1" = 5' Vert.

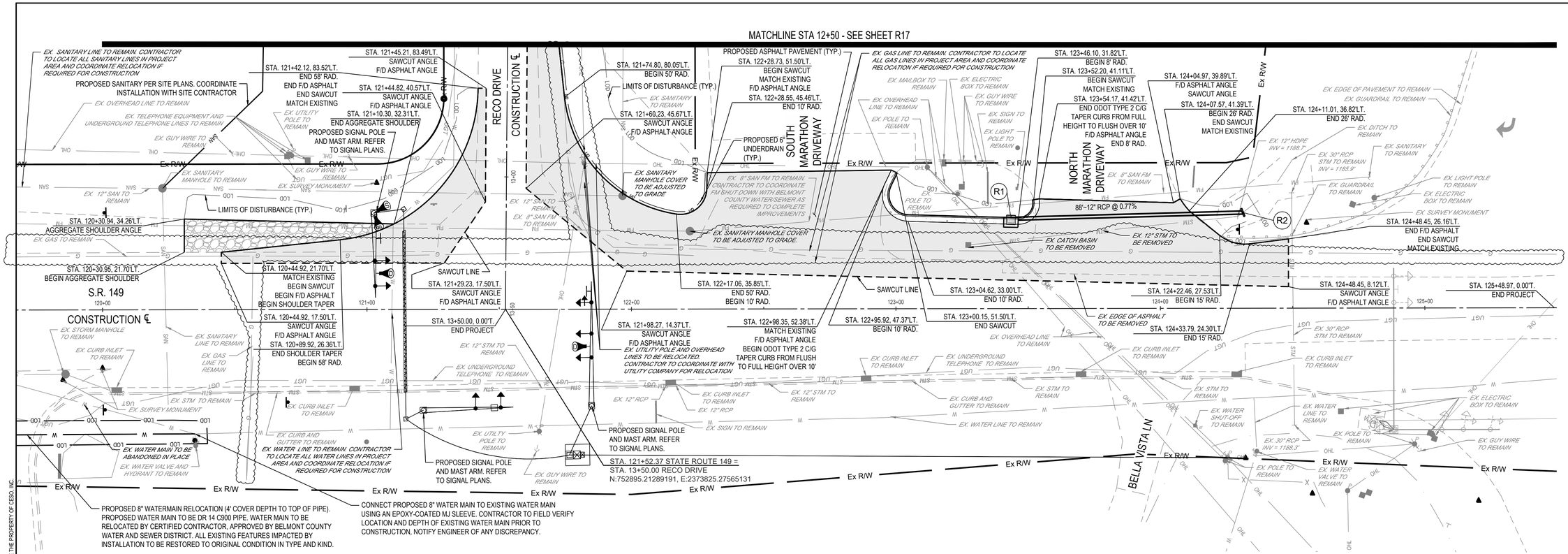
GRAPHIC SCALE (IN FEET)
40 20 0 10 20 40

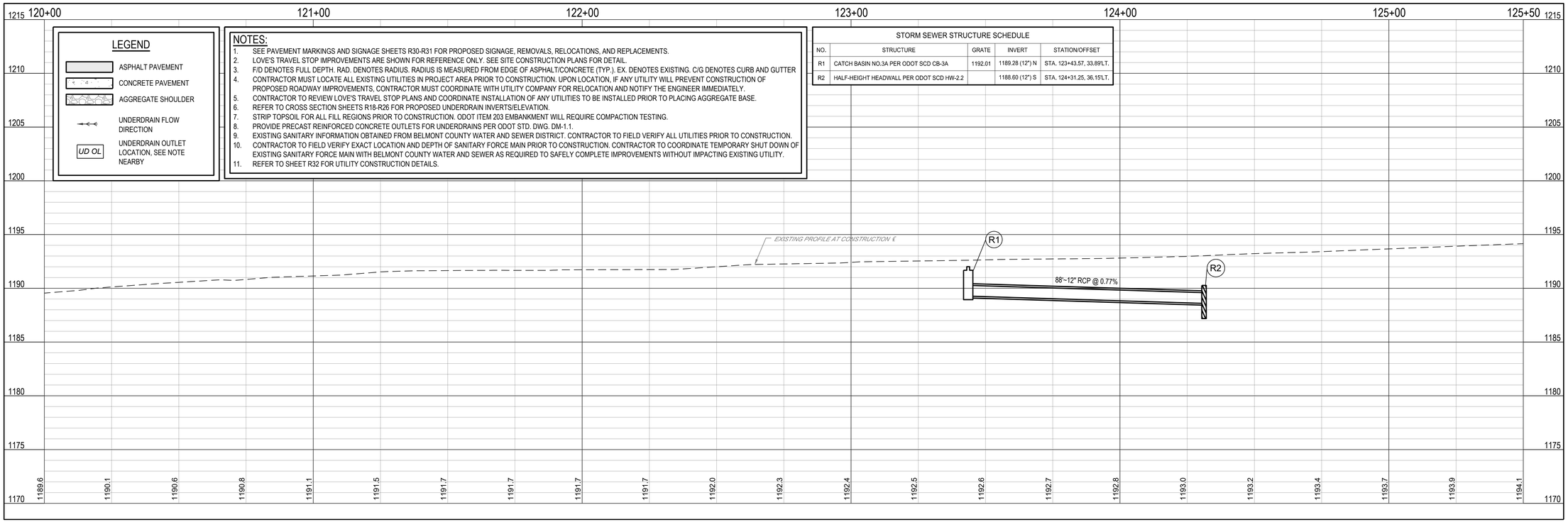
CALCULATED PJD
CHECKED TDH

PLAN & PROFILE - STA. 114+00 TO STA. 119+50
S.R. 149

BEL-149-23.44

R15
R32





STORM SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	GRATE	INVERT	STATION/OFFSET
R1	CATCH BASIN NO.3A PER ODOT SCD CB-3A	1192.01	1189.28 (12") N	STA. 123+43.57, 33.89'LT.
R2	HALF-HEIGHT HEADWALL PER ODOT SCD HW-2.2		1188.60 (12") S	STA. 124+31.25, 36.15'LT.

STATE ROUTE 149 PROFILE
Scale: 1" = 20' Horiz.; 1" = 5' Vert.

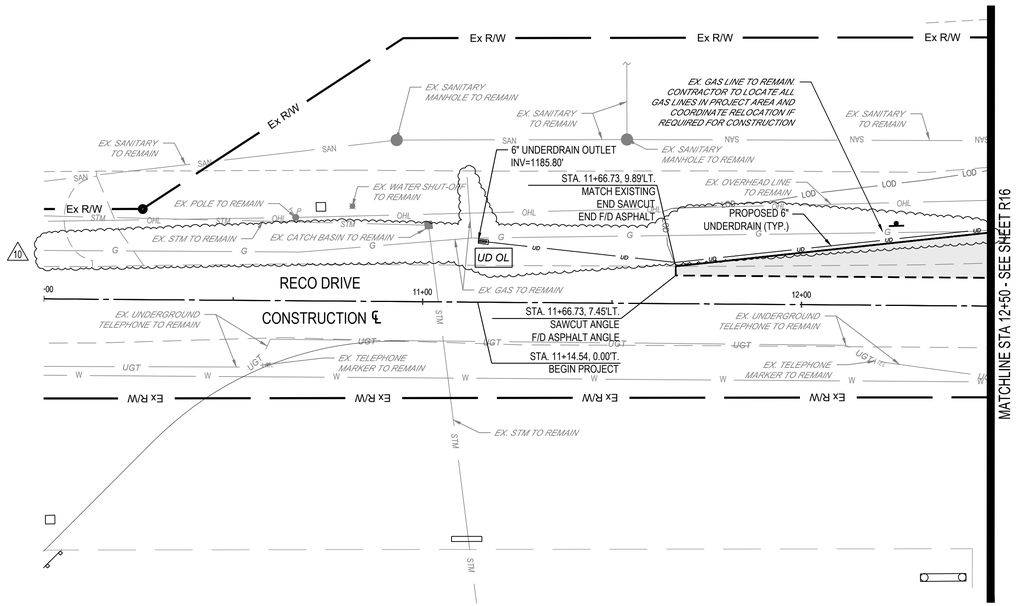
GRAPHIC SCALE (IN FEET)
40 20 0 10 20

CALCULATED P.JD
CHECKED TDH

PLAN & PROFILE - STA. 120+00 TO STA. 125+50
S.R. 149

BEL-149-23.44

R16
R32



NOTES:

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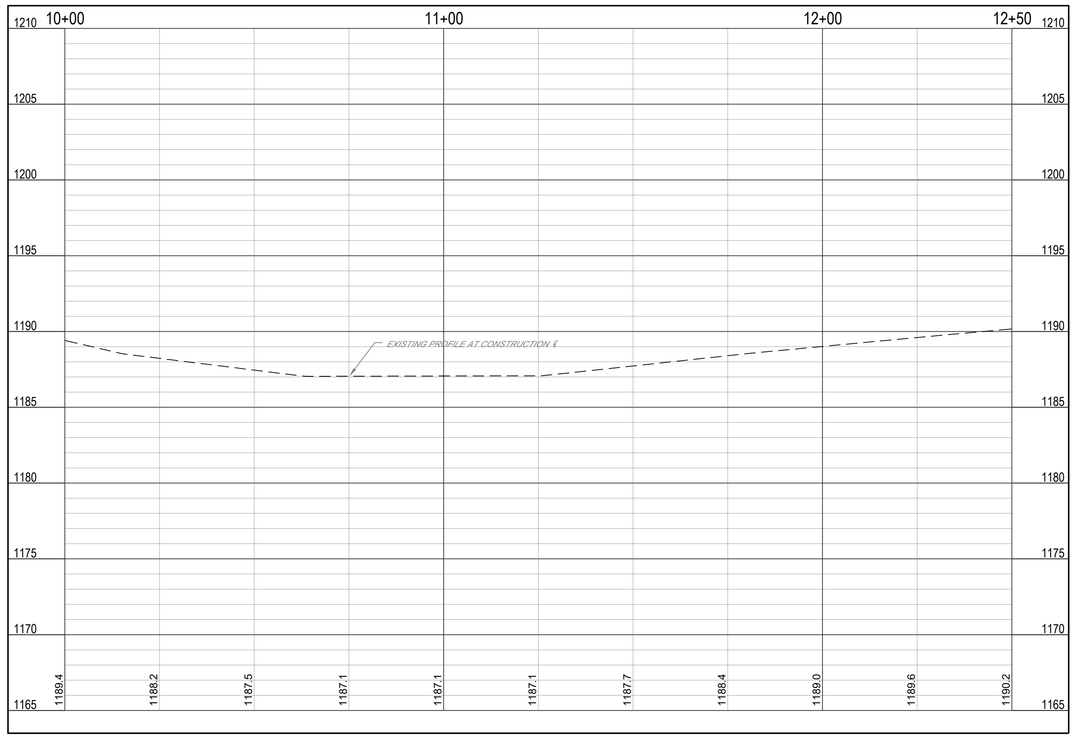
LEGEND

- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- AGGREGATE SHOULDER
- UNDERDRAIN FLOW DIRECTION
- UD OL — UNDERDRAIN OUTLET LOCATION, SEE NOTE NEARBY



GRAPHIC SCALE (IN FEET)
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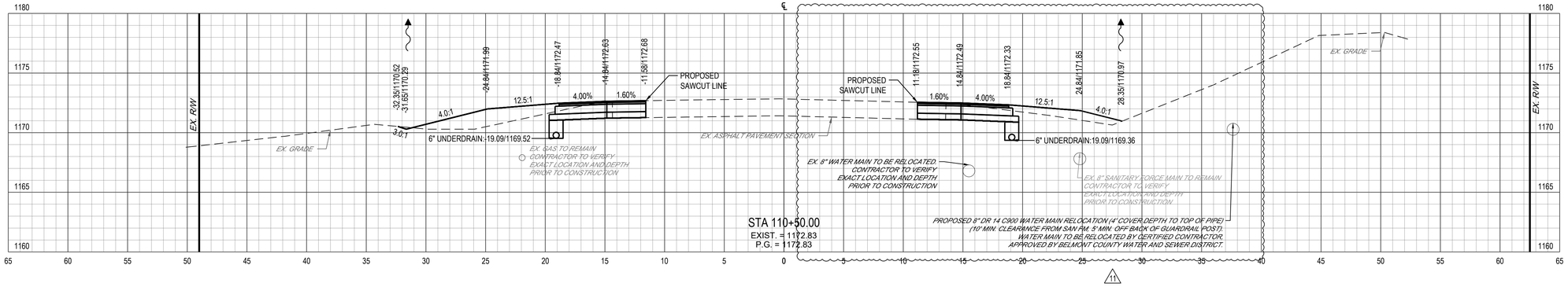
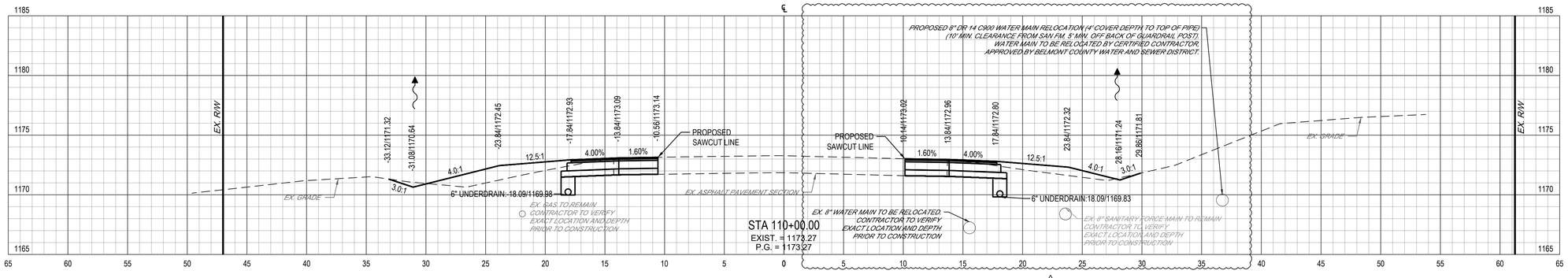
CALCULATED P.JD
CHECKED TDH

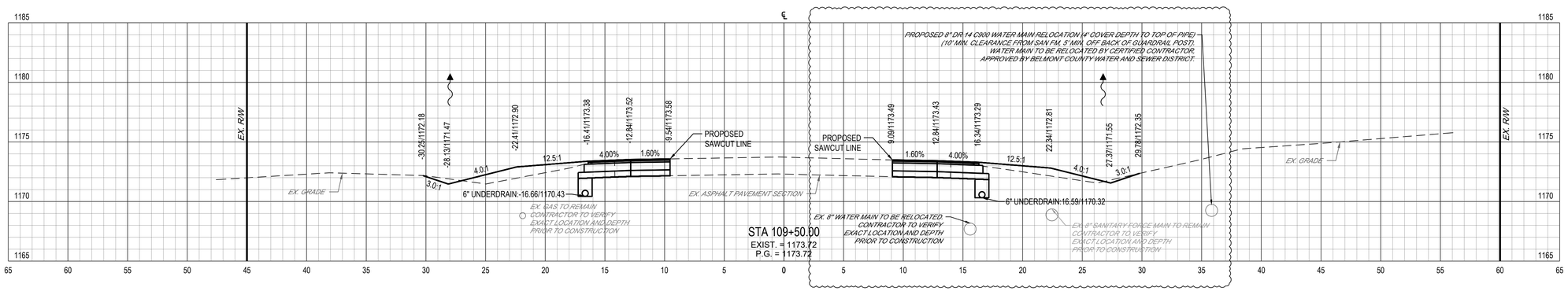
PLAN & PROFILE - RECO DRIVE
S.R. 149

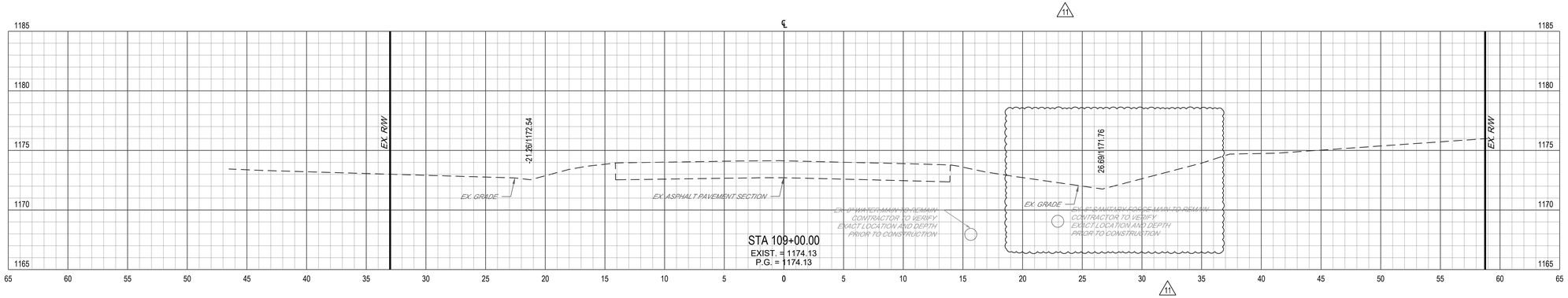
BEL-149-23.44

R17
R32









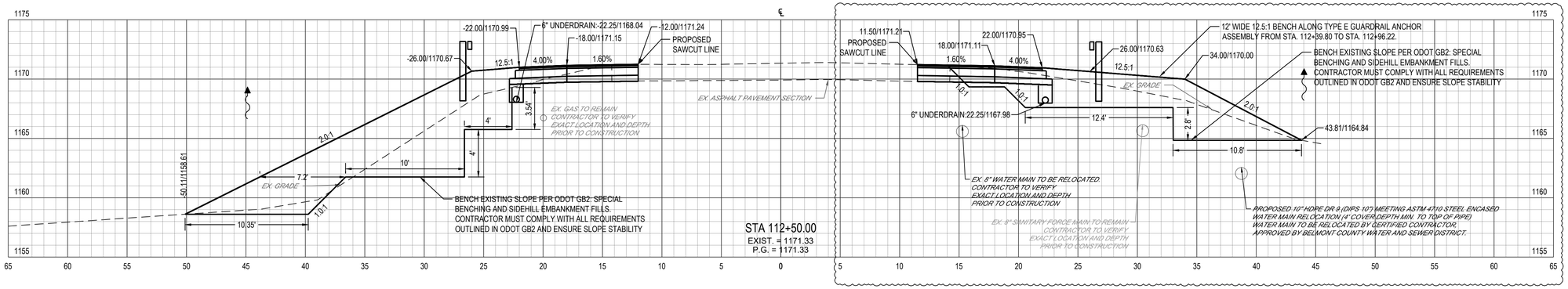
GRAPHIC SCALE (IN FEET)
10 5 0 2.5 5

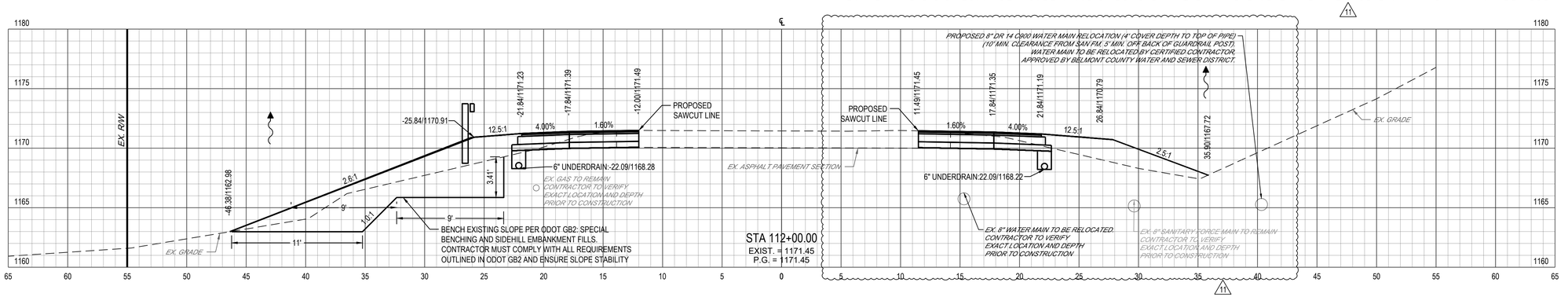
CALCULATED P.D
CHECKED TDH

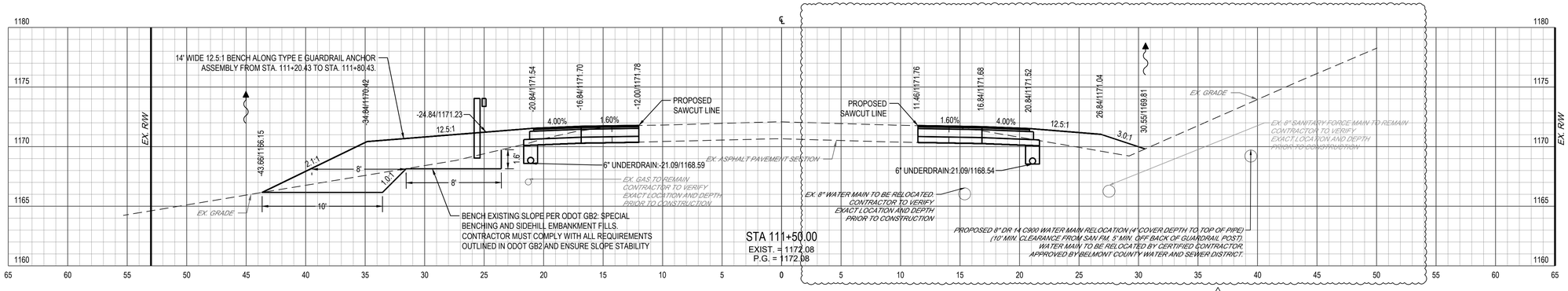
CROSS SECTIONS - STA. 109+00 TO STA. 110+50
S.R. 149

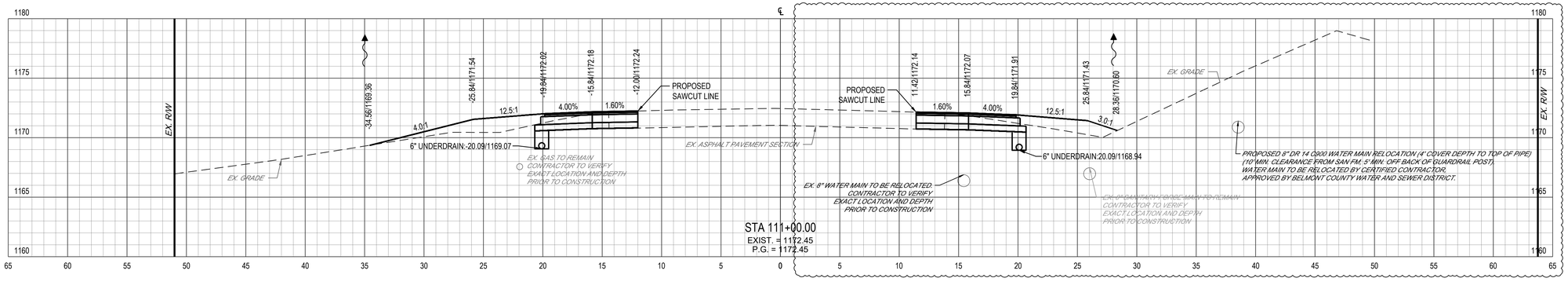
BEL-149-23.44

R18
R32









GRAPHIC SCALE (IN FEET)
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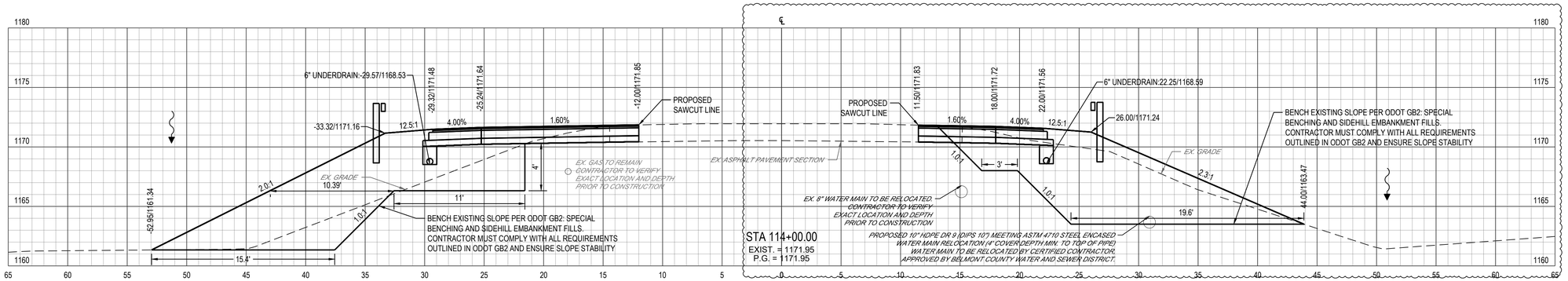
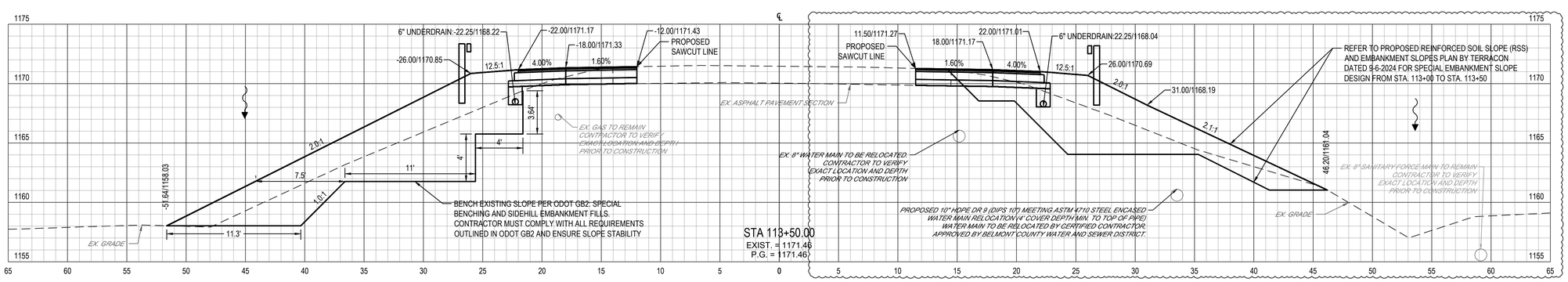
CALCULATED P.JD
CHECKED TDH

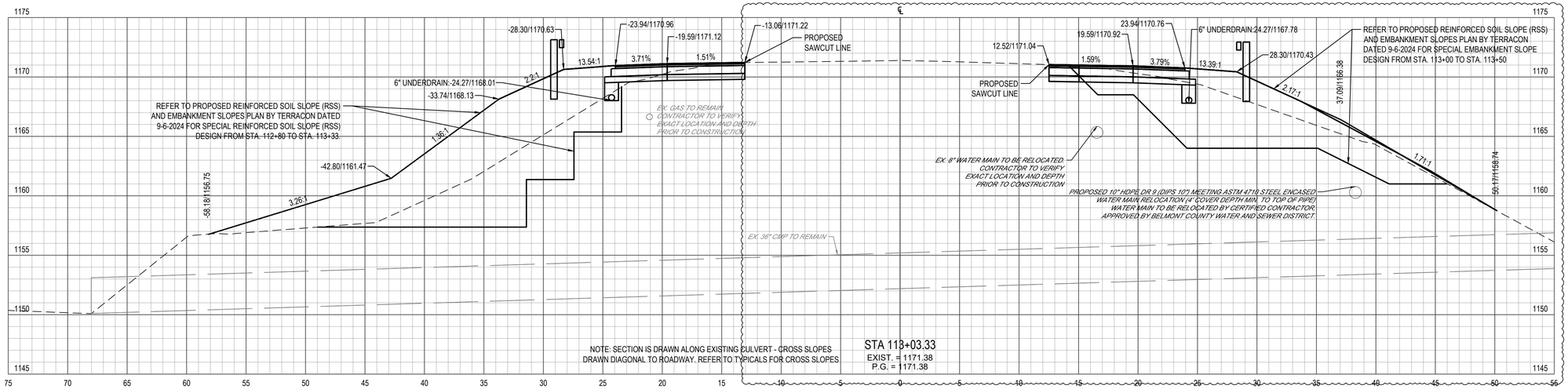
CROSS SECTIONS - STA. 111+00 TO STA. 112+50
S.R. 149

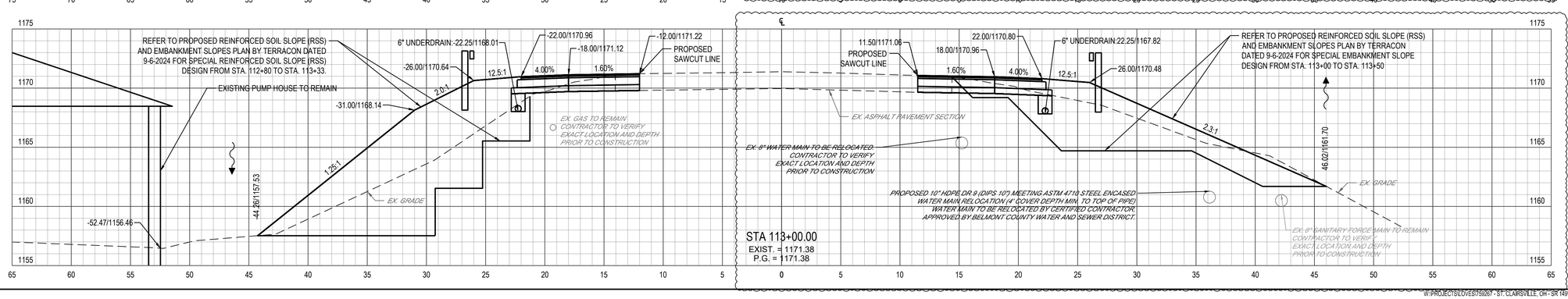
BEL-149-23.44

R19
R32









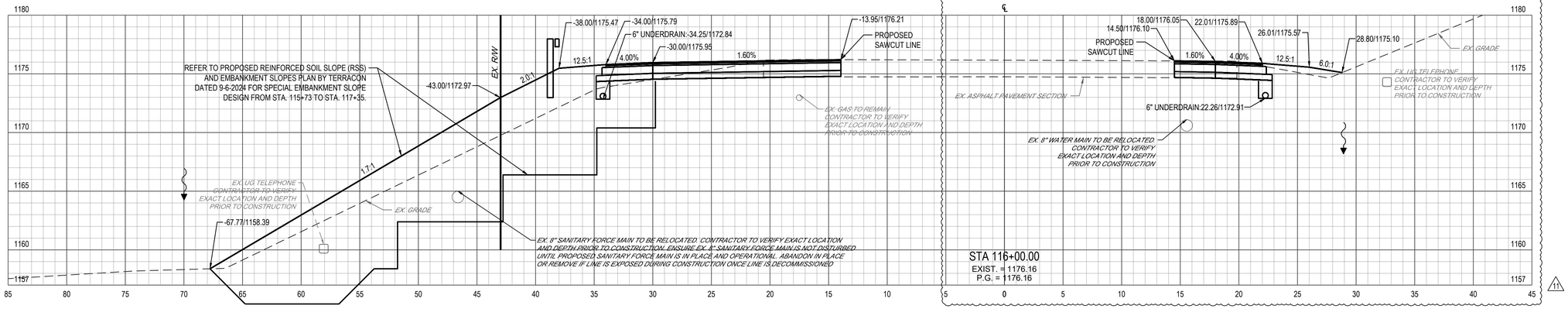
GRAPHIC SCALE (IN FEET)
10 5 0 2.5 5

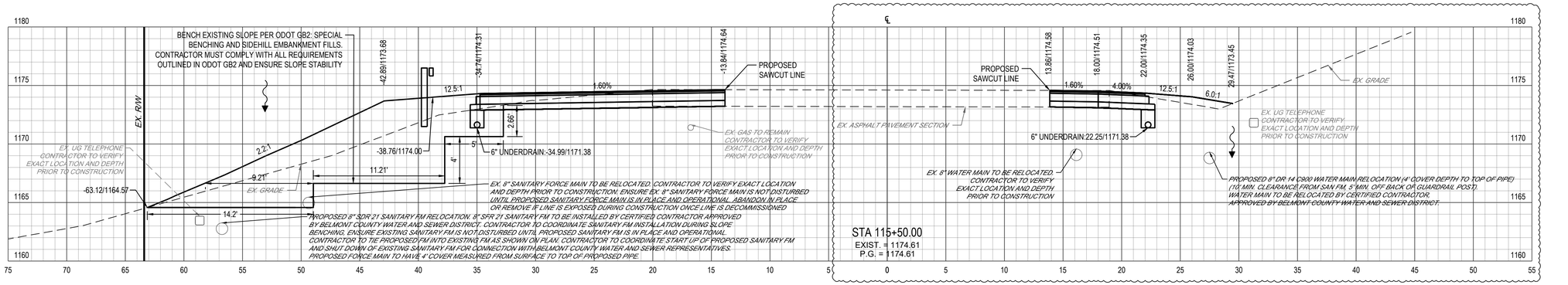
CALCULATED PJD
CHECKED TDH

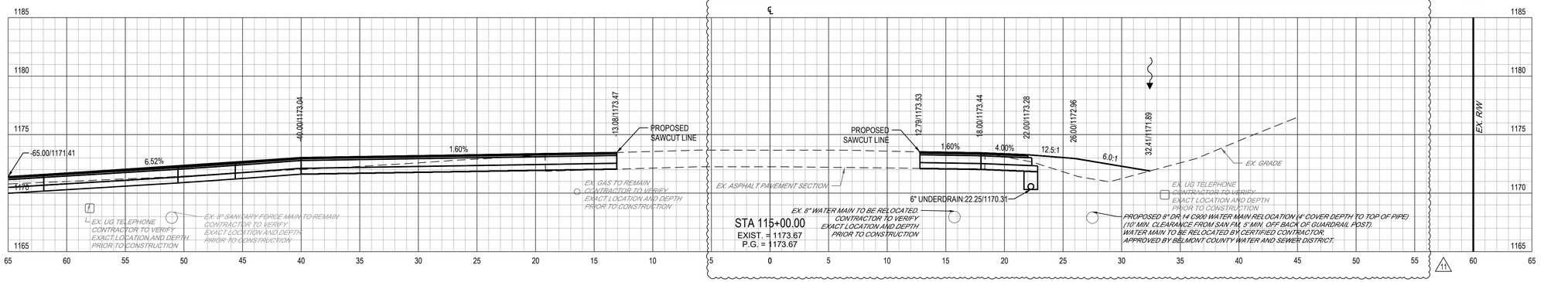
CROSS SECTIONS - STA. 113+00 TO STA. 114+00
S.R. 149

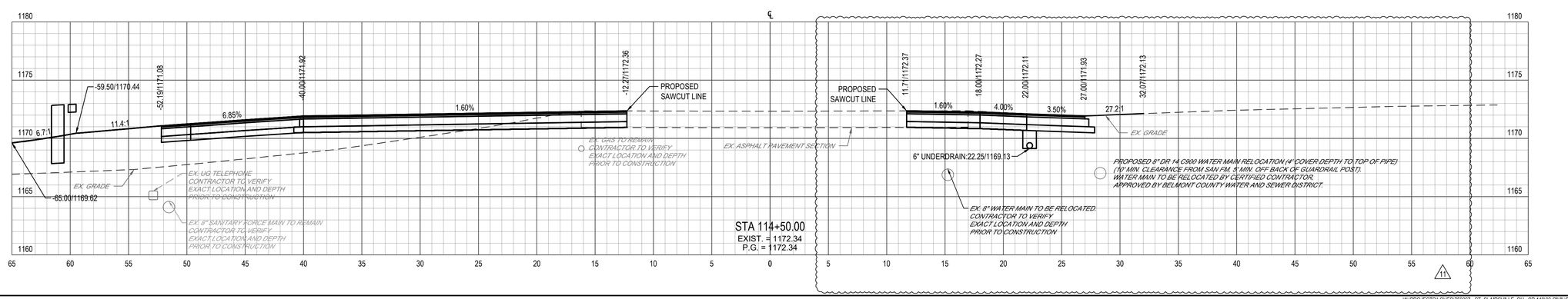
BEL-149-23.44

R20
R32









GRAPHIC SCALE (IN FEET)
10 5 0 2.5 5

CALCULATED PJD
CHECKED TDH

CROSS SECTIONS - STA. 114+50 TO STA. 116+00

S.R. 149

BEL-149-23.44

R21
R32

W:\PROJECTS\LOVES\759267 - ST. CLAIRSVILLE, OH - SR 149\03-CIVIL\PLAN\ROADWAY\PLOT\759267_XS001.DWG - 9/30/2024 1:03:11 PM

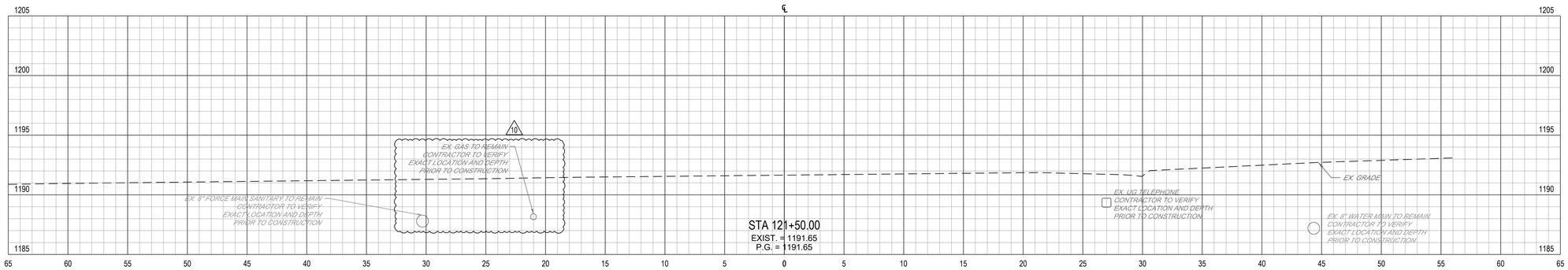
GRAPHIC SCALE (IN FEET)

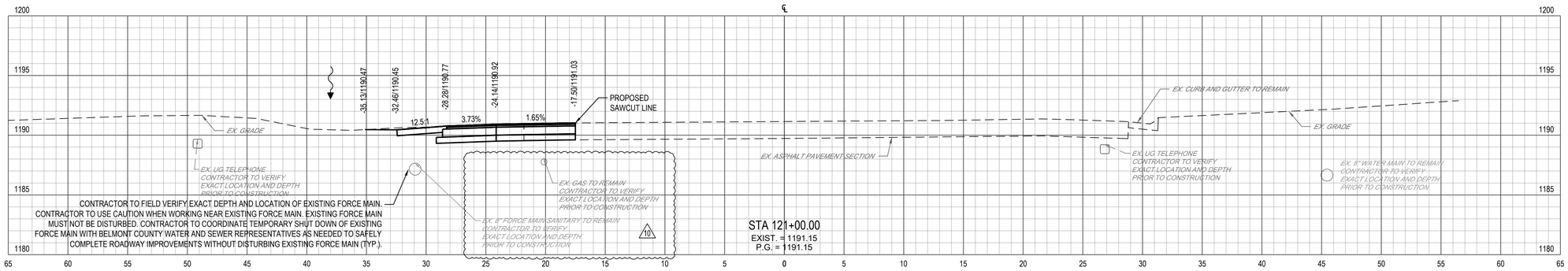
CALCULATED P.JD
CHECKED TDH

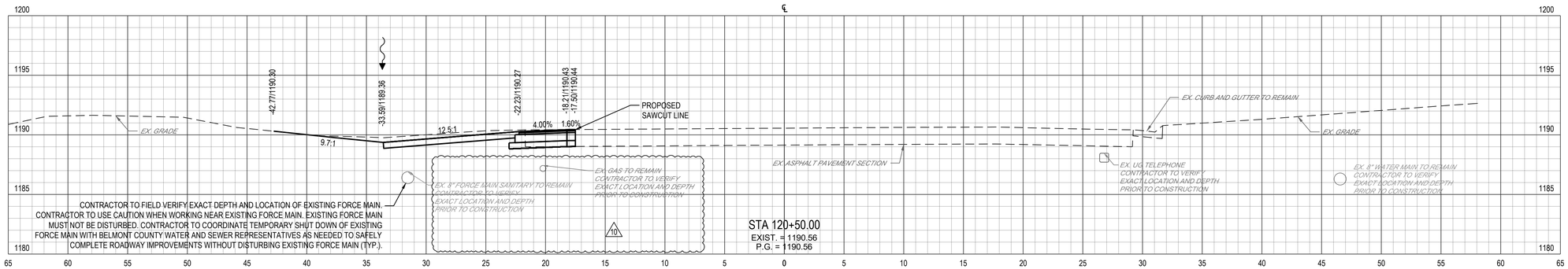
CROSS SECTIONS - STA. 116+50 TO STA. 118+00
S.R. 149
BEL-149-23.44

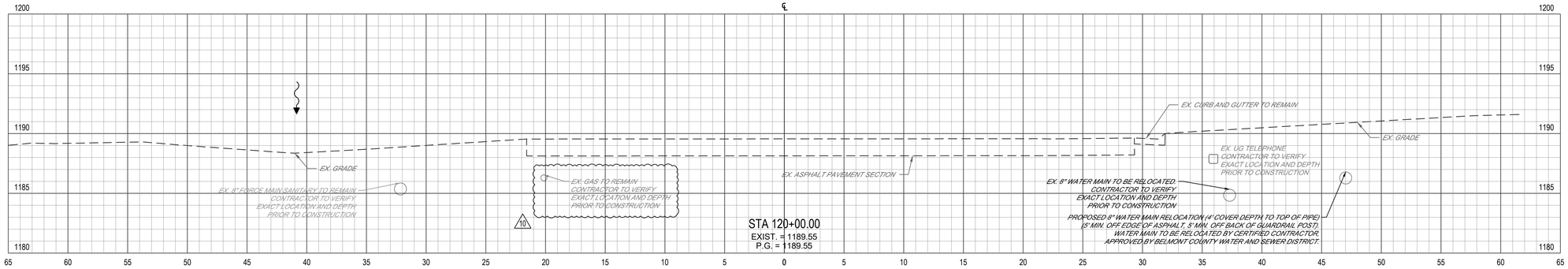
R22
R32

W:\PROJECTS\LOVES\759267 - ST. CLAIRSVILLE, OH - SR 149\03-CIVIL\PLAN\ROADWAY\PLOT\759267_XS001.DWG - 9/30/2024 1:04:47 PM









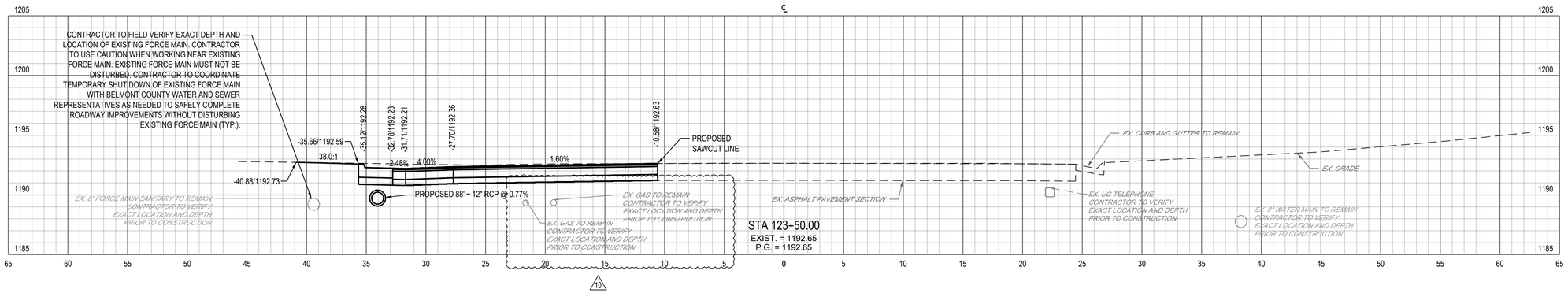
GRAPHIC SCALE (IN FEET)
10 5 2.5 0 5

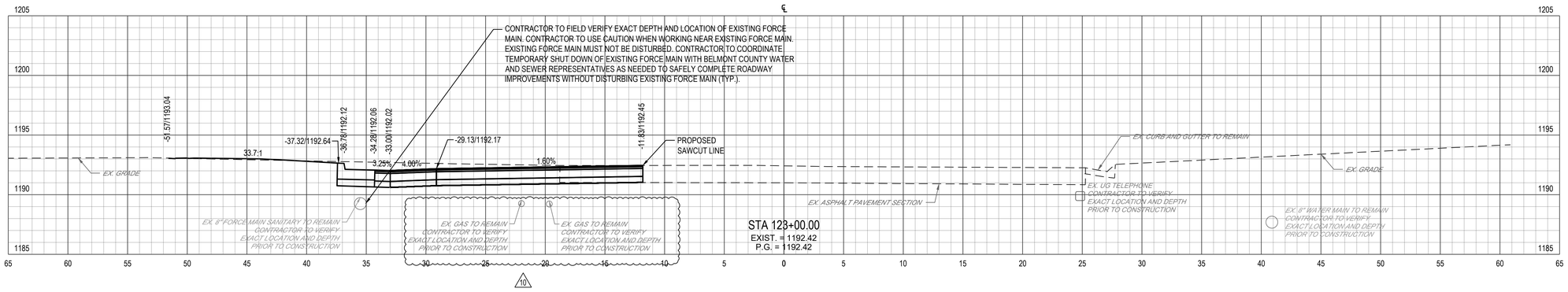
CALCULATED PJD
CHECKED TDH

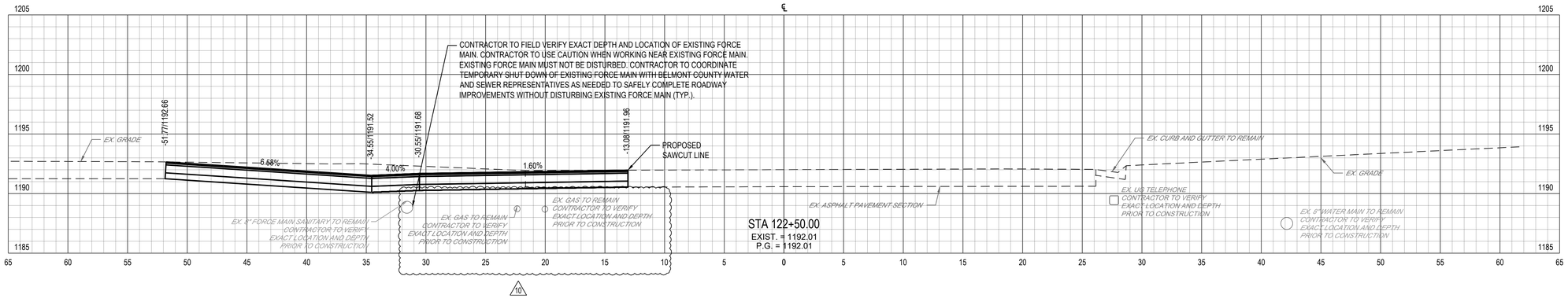
CROSS SECTIONS - STA. 120+00 TO STA. 121+50
S.R. 149

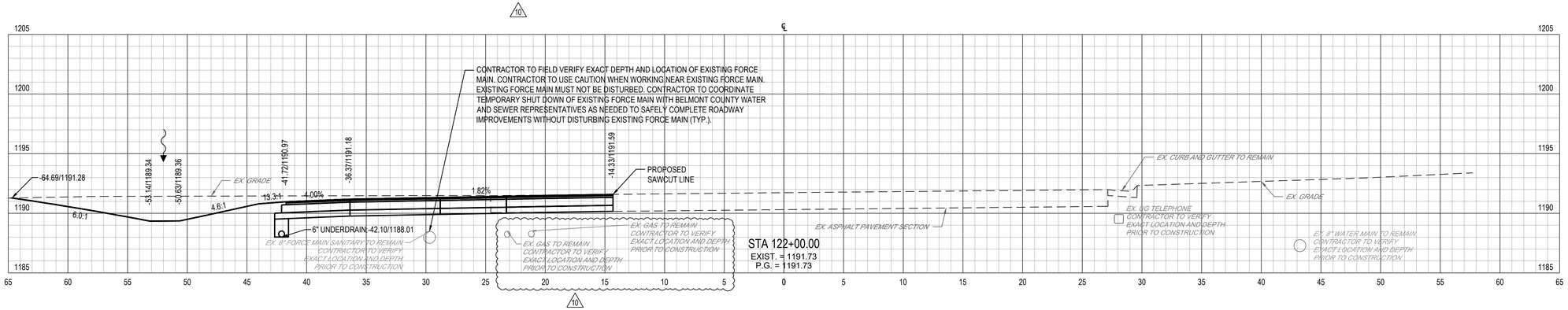
BEL-149-23.44

R23
R32









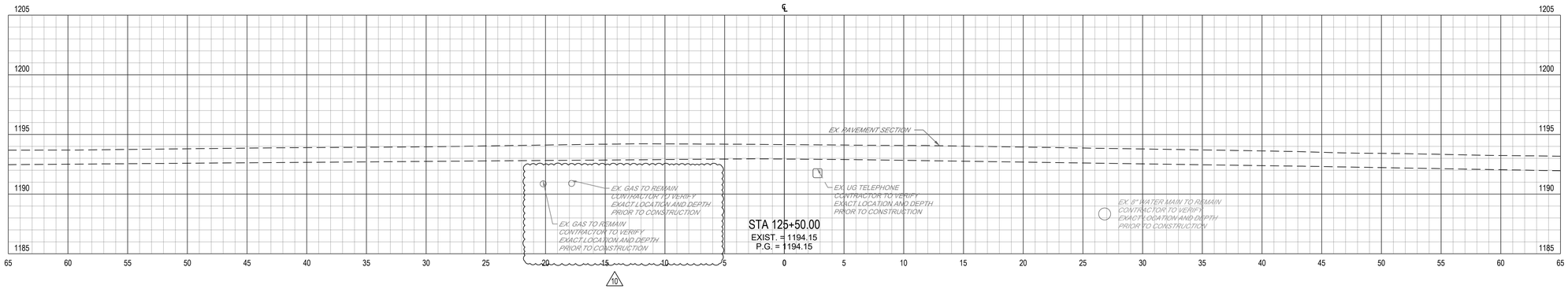
GRAPHIC SCALE (IN FEET)
10 5 2.5 0 5

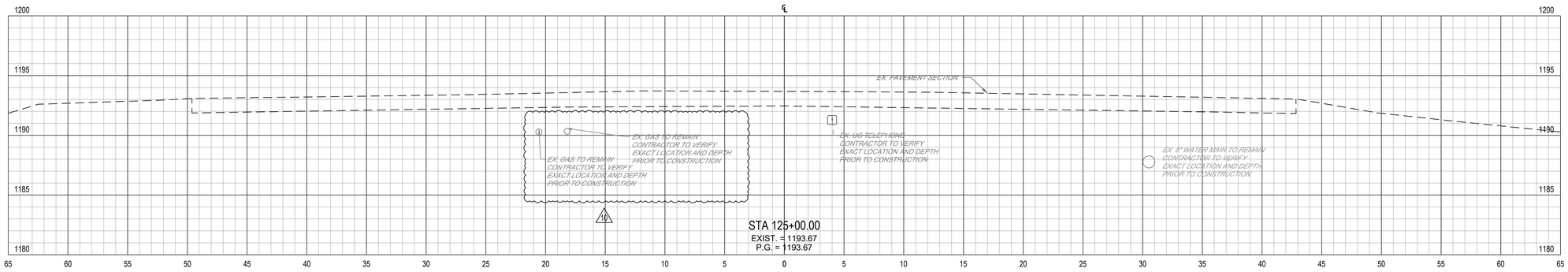
CALCULATED P.JD
CHECKED TDH

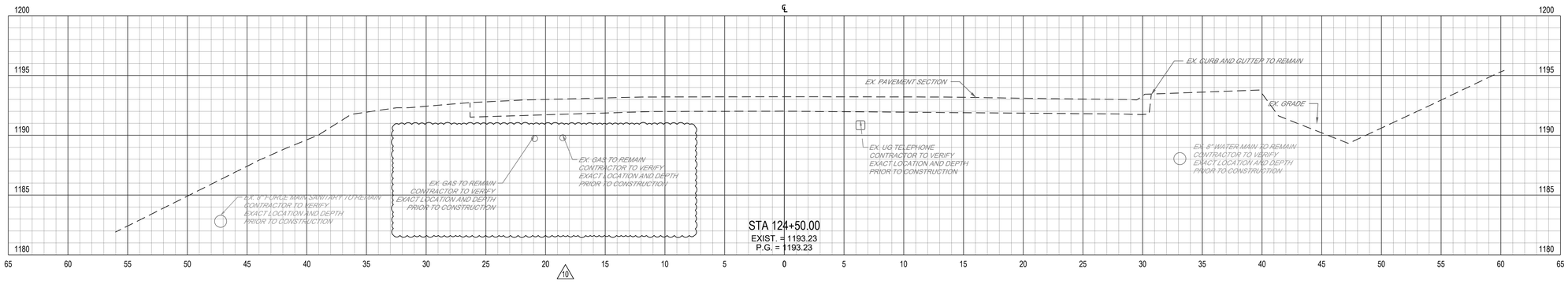
CROSS SECTIONS - STA. 122+00 TO STA. 123+50
S.R. 149

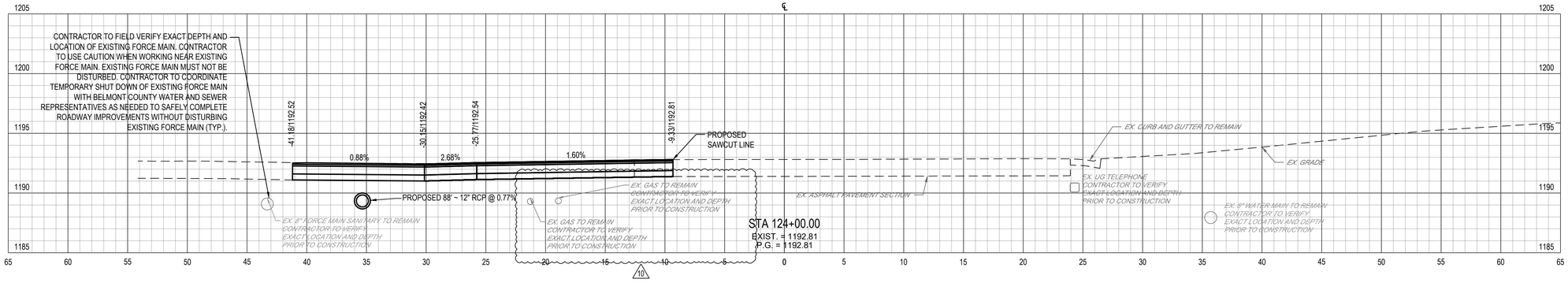
BEL-149-23.44

R24
R32









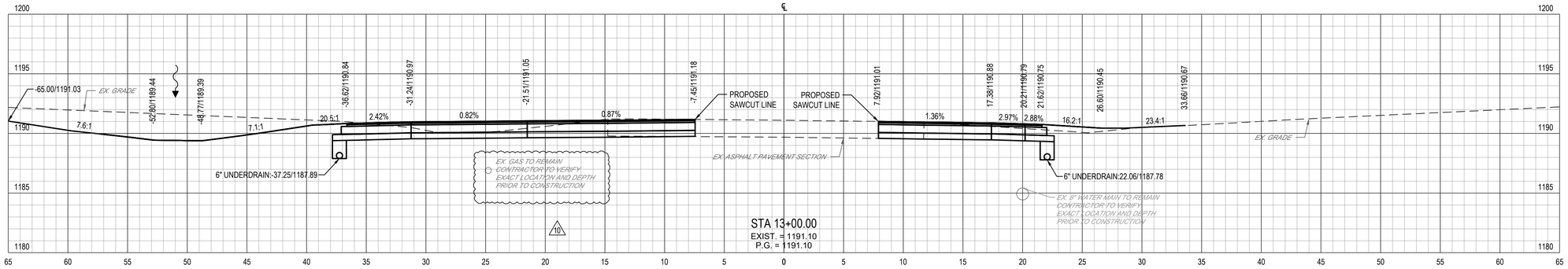
GRAPHIC SCALE (IN FEET)
10 5 2.5 0 5

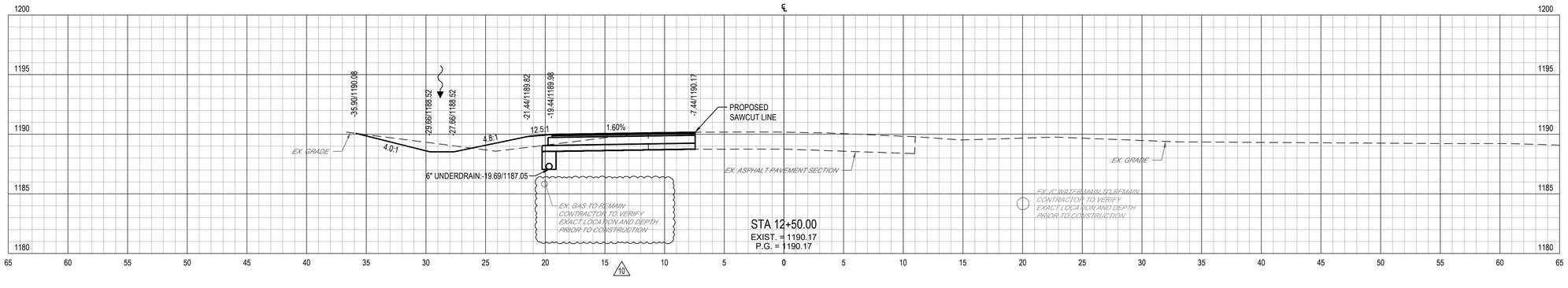
CALCULATED PJD
CHECKED TDH

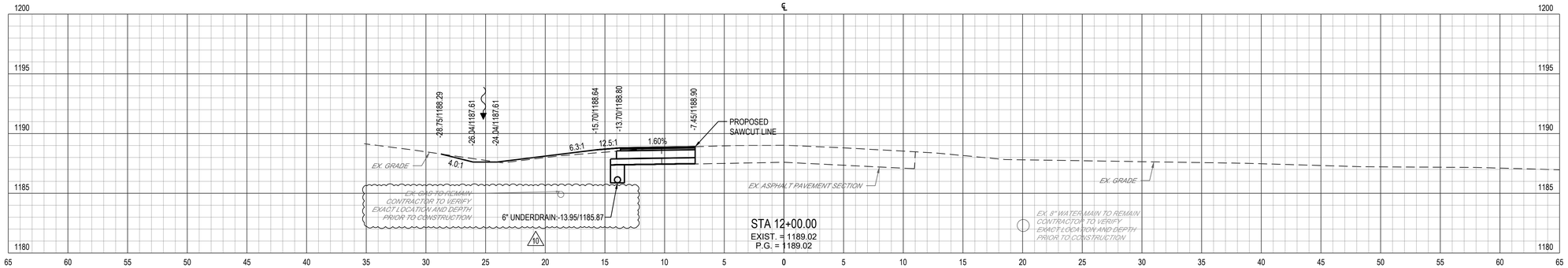
CROSS SECTIONS - STA. 124+00 TO STA. 125+50
S.R. 149

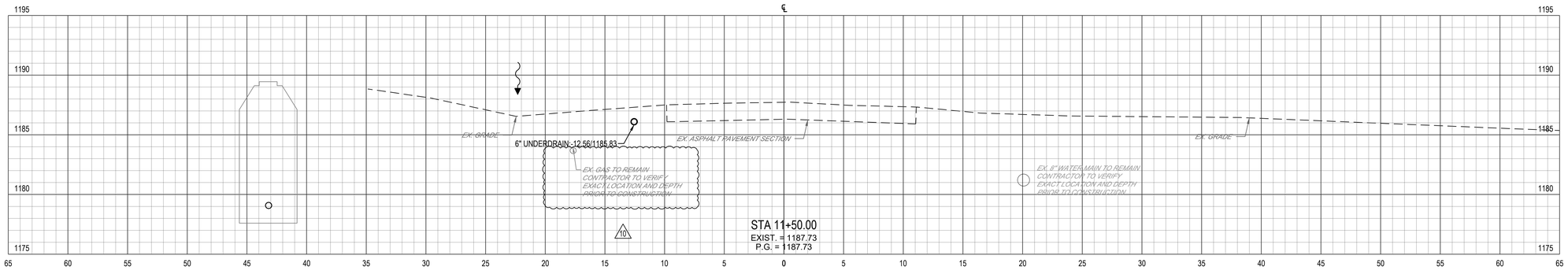
BEL-149-23.44

R25
R32









GRAPHIC SCALE (IN FEET)

CALCULATED PJD
CHECKED TDH

CROSS SECTIONS - STA. 11+50 TO STA. 13+00
RECO DRIVE

BEL-149-23.44

R26
R32

Ex R/W

STA. 114+59.95, 98.08'LT.
MATCH SITE GRADE

1168.67 E/P

1169.10

23.5'

23.5'

7.45'

1169.04 E/P

10' TYP.

1169.55 E/P

1169.58

R/W

STA. 114+09.94, 82.10'LT.
50' RAD. CENTER
R=50.00'
L=66.97'
T=39.59'
C=62.07'
N 72° 06' 22" W
Δ=76° 44' 25"

END 50' RAD.
STA. 114+59.94, 82.06'LT.

STA. 114+41.26, 77.13'LT.
12 GUAGE W-BEAM
ROUNDED-END SECTION

STA. 114+48.72, 76.52'LT.
END 6' GUARDRAIL RAD.

1170.05 E/P

STA. 114+53.97, 68.81'LT.
END TYPE T ANCHOR ASSEMBLY
BEGIN 6' GUARDRAIL RAD.

1170.55 E/P

STA. 114+48.85, 57.57'LT.
BEGIN TYPE T ANCHOR ASSEMBLY
END 46' GUARDRAIL RAD.

STA. 114+20.53, 37.34'LT.
BEGIN 46' GUARDRAIL RAD.

1171.05 E/P

4'

1171.55 E/P

1171.82 G/B

1171.86 E/P

1171.63 E/P

1171.60 E/P

1171.53 E/P

1171.46 E/P

1171.39 E/P

1171.32 E/P

1171.27 E/P

1171.22 E/P

1171.16 E/P

END TAPER
BEGIN 50' RAD.
STA. 114+31.33, 33.42'LT.

STA. 113+61.58, 26.00'LT.
GUARDRAIL ANGLE

PROPOSED GUARDRAIL, TYPE MGS

EDGE OF TRAVEL LANE

STA. 113+61.96, 22.00'LT.
BEGIN TAPER

4'

10' TYP.

4'

4.00%

-1.60%

1171.79 G/B

1171.73 G/B

1171.66 G/B

1171.59 G/B

1171.52 G/B

1171.45 G/B

1171.28 G/B

1171.35 G/B

1171.38 EX.

1171.44 EX.

1171.51 EX.

12'

TRAVEL LANE CROSS SLOPE =
1.60% TYP., PAVED SHOULDER
CROSS SLOPE = 4.00% TYP.

1171.58 EX.

1171.67 EX.

1171.78 EX.

1171.88 EX.

1171.98 EX.

1172.06 EX.

1172.14 EX.

1171.82 G/B

1171.91 G/B

1172.04 G/B

1172.29 G/B

1172.50 G/B

1172.76 G/B

1173.03 G/B

1173.29 G/B

1173.56 G/B

1173.72 G/B

1173.91 G/B

??? G/B

2.9'

7.1'

3.96'

6.04'

STA. 114+42.35, 40.00'LT.
BEGIN GRADE BREAK

1172.59

1171.99

112.77'
N69° 31' 26"E
15=00

LOVE'S DRIVEWAY
CONSTRUCTION ℄

6.99%

6.18%

1169.55 E/P

1170.19

1170.79

1171.39

1172.75

10' TYP.

1172.91

7.19'

0.81'

1173.03

12.81'

1172.27 EX.

1172.39 EX.

1172.52 EX.

1172.82 EX.

1173.01 EX.

1173.27 EX.

1173.54 EX.

1173.81 EX.

1174.03 EX.

1174.19 EX.

1174.42 EX.

1174.72 EX.

1175.01 EX.

1175.30 EX.

1175.59 EX.

1175.88 EX.

1176.33 EX.

1176.73 EX.

1177.10 EX.

1177.46 EX.

STA. 115+11.44, 103.75'LT.
BEGIN GUARDRAIL
SPLICE TO TIE INTO
SITE GUARDRAIL

1169.55 E/P

STA. 115+06.95, 98.05'LT.
MATCH SITE GRADE
BEGIN 68' RAD.

3.42'

1169.76 E/P

STA. 115+11.42, 92.82'LT.
BEGIN 64' GUARDRAIL RAD.

10' TYP.

1170.39 E/P

Ex R/W

1171.02 E/P

R/W

1171.64 E/P

1172.27 E/P

1172.90 E/P

1173.53 E/P

1174.16 E/P

1174.78 E/P

STA. 115+51.97, 24.00'LT.
END 68' RAD.

STA. 115+60.29, 38.00'LT.
END 64' GUARDRAIL RAD.

STA. 115+39.45, 40.00'LT.
END GRADE BREAK

3.91'

10' TYP.

1173.91 G/B

1174.70 G/B

1174.77 E/P

1175.16 E/P

1175.47 E/P

1175.88 E/P

1176.50 E/P

1176.66 E/P

1177.02 E/P

PROPOSED GUARDRAIL, TYPE MGS

4'

10' TYP.

4'

4.00%

-4.00%

1174.70 G/B

1175.01 G/B

1175.30 G/B

1175.61 G/B

1176.02 G/B

1176.44 G/B

1176.80 G/B

1177.16 G/B

12'

EDGE OF TRAVEL LANE

-1.60%

STA. 115+46.93, 13.83'LT.
SAWCUT ANGLE

PROPOSED SAWCUT LINE

TRAVEL LANE CROSS SLOPE =
1.60% TYP., PAVED SHOULDER
CROSS SLOPE = 4.00% TYP.

1174.72 EX.

1175.01 EX.

1175.30 EX.

1175.59 EX.

1175.88 EX.

1176.33 EX.

1176.73 EX.

1177.10 EX.

1177.46 EX.

S.R. 149

CONSTRUCTION ℄

STA. 114+33.11, 12.00'LT.
SAWCUT ANGLE

10' TYP.

90°27'23"

89°32'37"

15=00

115+00

N20° 30' 57"W
2936.25'

1172.78 EX.

1173.32 EX.

1173.41 EX.

1173.52 EX.

1173.67 EX.

1173.83 EX.

1173.98 EX.

1174.14 EX.

1174.32 EX.

1174.61 EX.

1174.90 EX.

1175.19 EX.

1175.49 EX.

1175.79 EX.

116+00

1176.16 EX.

1176.62 EX.

1177.07 EX.

1177.53 EX.

10' TYP.

3.38'

6.62'

STA. 114+38.87, 22.00'RT.
BEGIN 5' APRON RAD.
ELEV. = 1171.92.

STA. 114+40.25, 11.50'RT.
SAWCUT ANGLE

PROPOSED SAWCUT LINE

STA. 115+79.47, 14.50'RT.
SAWCUT ANGLE

1171.31 EX.

1171.46 EX.

1171.61 EX.

1171.75 EX.

1171.85 EX.

1171.90 EX.

1171.95 EX.

1172.00 EX.

1172.05 EX.

1172.10 EX.

1172.21 EX.

1172.34 EX.

1172.51 EX.

STA. 114+21.51, 26.00'RT.
BEGIN TYPE T ANCHOR ASSEMBLY

STA. 114+34.01, 26.00'RT.
BEGIN 8' GUARDRAIL RAD.
END TYPE T ANCHOR ASSEMBLY

STA. 114+42.01, 33.84'RT.
END 8' GUARDRAIL RAD.
12 GAUGE W-BEAM
ROUNDED-END SECTION

STA. 114+43.87, 27.00'RT.
END 5' APRON RAD.
ELEV. = 1171.80.

STA. 114+64.87, 22.00'RT.
END 5' APRON RAD.
ELEV. = 1172.36.

STA. 114+59.87, 27.00'RT.
BEGIN 5' APRON RAD.
ELEV. = 1172.15.

STA. 114+83.38 STATE ROUTE 149 =
STA. 15+50.00 LOVES ACCESS DRIVEWAY
N:752268.65325457, E:2374059.73553123

NOTES:

1. LOVE'S TRAVEL STOP IMPROVEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE SITE CONSTRUCTION PLANS FOR DETAIL.
2. F/D DENOTES FULL DEPTH. RAD. DENOTES RADIUS. RADIUS IS MEASURED FROM EDGE OF ASPHALT/CONCRETE (TYP.). EX. DENOTES EXISTING. C/G DENOTES CURB AND GUTTER. G/B DENOTES GRADE BREAK. F/L DENOTES FLOW LINE.
3. CONTRACTOR MUST LOCATE ALL EXISTING UTILITIES IN PROJECT AREA PRIOR TO CONSTRUCTION. UPON LOCATION, IF ANY UTILITY WILL PREVENT CONSTRUCTION OF PROPOSED ROADWAY IMPROVEMENTS, CONTRACTOR MUST COORDINATE WITH UTILITY COMPANY FOR RELOCATION AND NOTIFY THE ENGINEER IMMEDIATELY.

Ex R/W

GRAPHIC SCALE (IN FEET)
20 10 5 0 10

CALCULATED PJD
CHECKED TDH

INTERSECTION DETAIL
S.R. 149

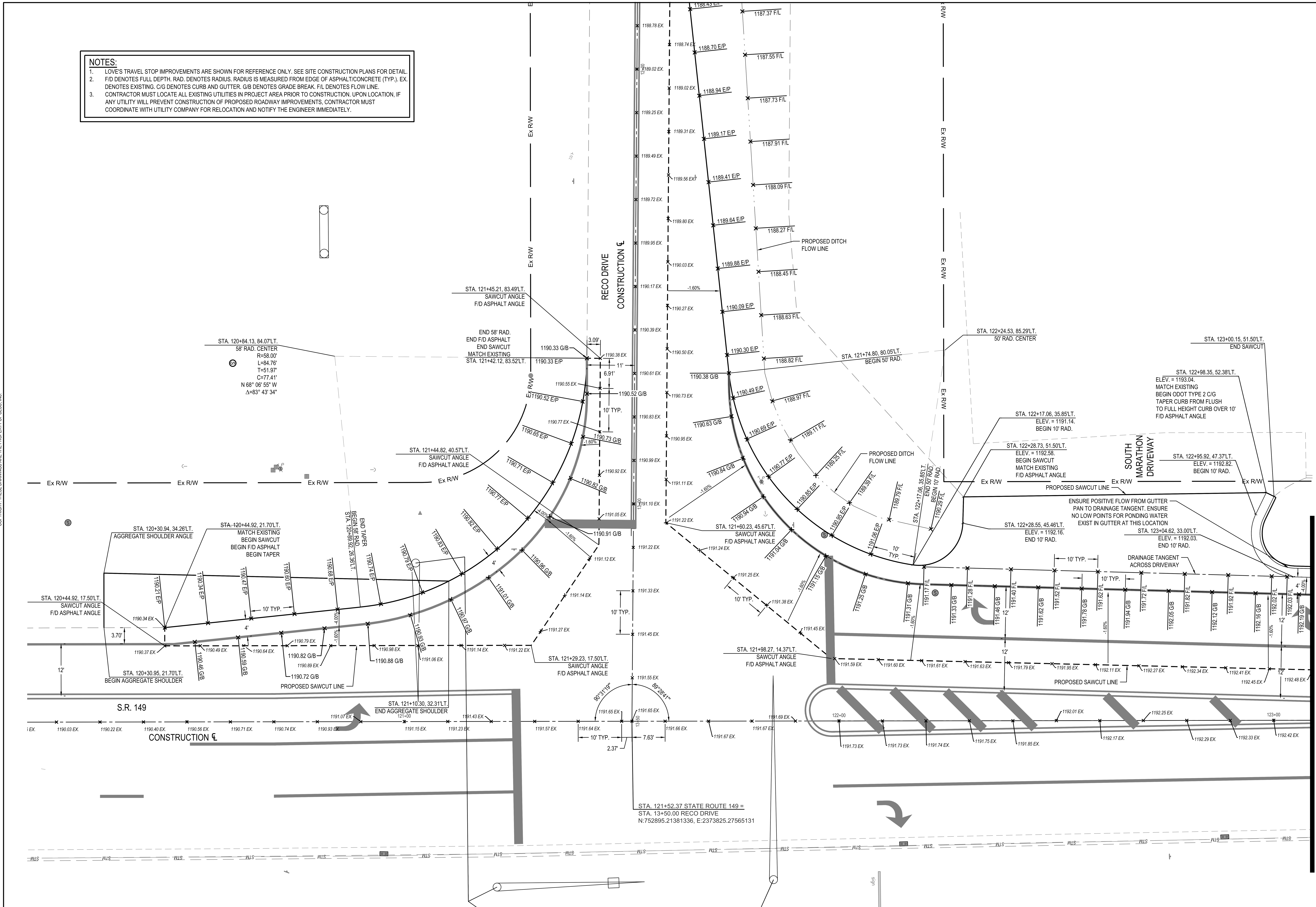
BEL-149-23.44

9

R27
R32

NOTES:

1. LOVE'S TRAVEL STOP IMPROVEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE SITE CONSTRUCTION PLANS FOR DETAIL.
2. F/D DENOTES FULL DEPTH. RAD. DENOTES RADIUS. RADIUS IS MEASURED FROM EDGE OF ASPHALT/CONCRETE (TYP.). EX. DENOTES EXISTING. C/G DENOTES CURB AND GUTTER. G/B DENOTES GRADE BREAK. F/L DENOTES FLOW LINE.
3. CONTRACTOR MUST LOCATE ALL EXISTING UTILITIES IN PROJECT AREA PRIOR TO CONSTRUCTION. UPON LOCATION, IF ANY UTILITY WILL PREVENT CONSTRUCTION OF PROPOSED ROADWAY IMPROVEMENTS, CONTRACTOR MUST COORDINATE WITH UTILITY COMPANY FOR RELOCATION AND NOTIFY THE ENGINEER IMMEDIATELY.



CALCULATED PJD
CHECKED TDH

INTERSECTION DETAIL
S.R. 149

BEL-149-23.44

9

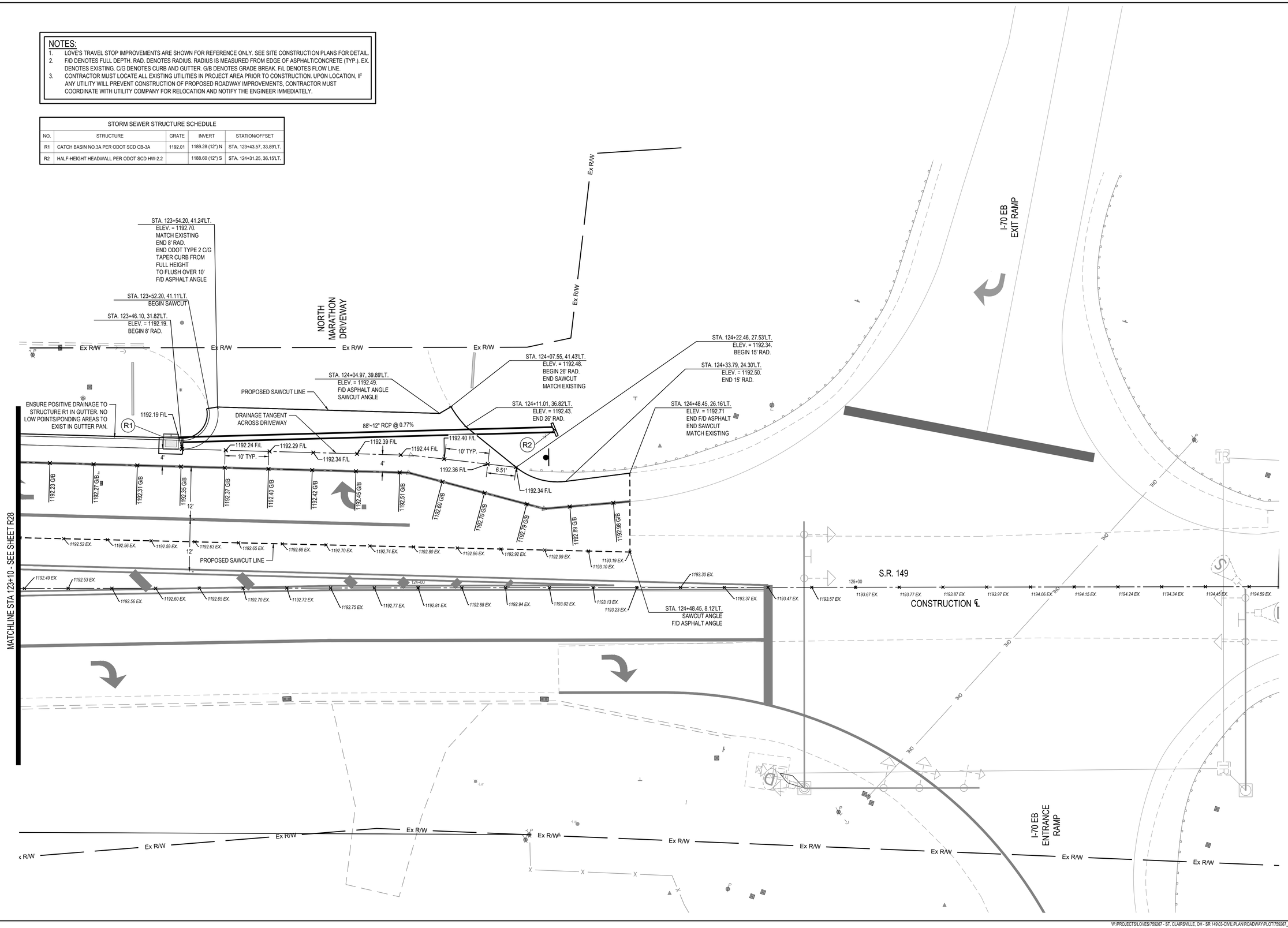
R28
R32

NOTES:

1. LOVE'S TRAVEL STOP IMPROVEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE SITE CONSTRUCTION PLANS FOR DETAIL.
2. F/D DENOTES FULL DEPTH. RAD. DENOTES RADIUS. RADIUS IS MEASURED FROM EDGE OF ASPHALT/CONCRETE (TYP.). EX. DENOTES EXISTING. C/G DENOTES CURB AND GUTTER. G/B DENOTES GRADE BREAK. F/L DENOTES FLOW LINE.
3. CONTRACTOR MUST LOCATE ALL EXISTING UTILITIES IN PROJECT AREA PRIOR TO CONSTRUCTION. UPON LOCATION, IF ANY UTILITY WILL PREVENT CONSTRUCTION OF PROPOSED ROADWAY IMPROVEMENTS, CONTRACTOR MUST COORDINATE WITH UTILITY COMPANY FOR RELOCATION AND NOTIFY THE ENGINEER IMMEDIATELY.

STORM SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	GRATE	INVERT	STATION/OFFSET
R1	CATCH BASIN NO.3A PER ODOT SCD CB-3A	1192.01	1189.28 (12") N	STA. 123+43.57, 33.89'LT.
R2	HALF-HEIGHT HEADWALL PER ODOT SCD HW-2.2		1188.60 (12") S	STA. 124+31.25, 36.15'LT.



GRAPHIC SCALE (IN FEET)
20 10 5 0 10

CALCULATED P.JD
CHECKED TDH

INTERSECTION DETAIL
S.R. 149

BEL-149-23.44

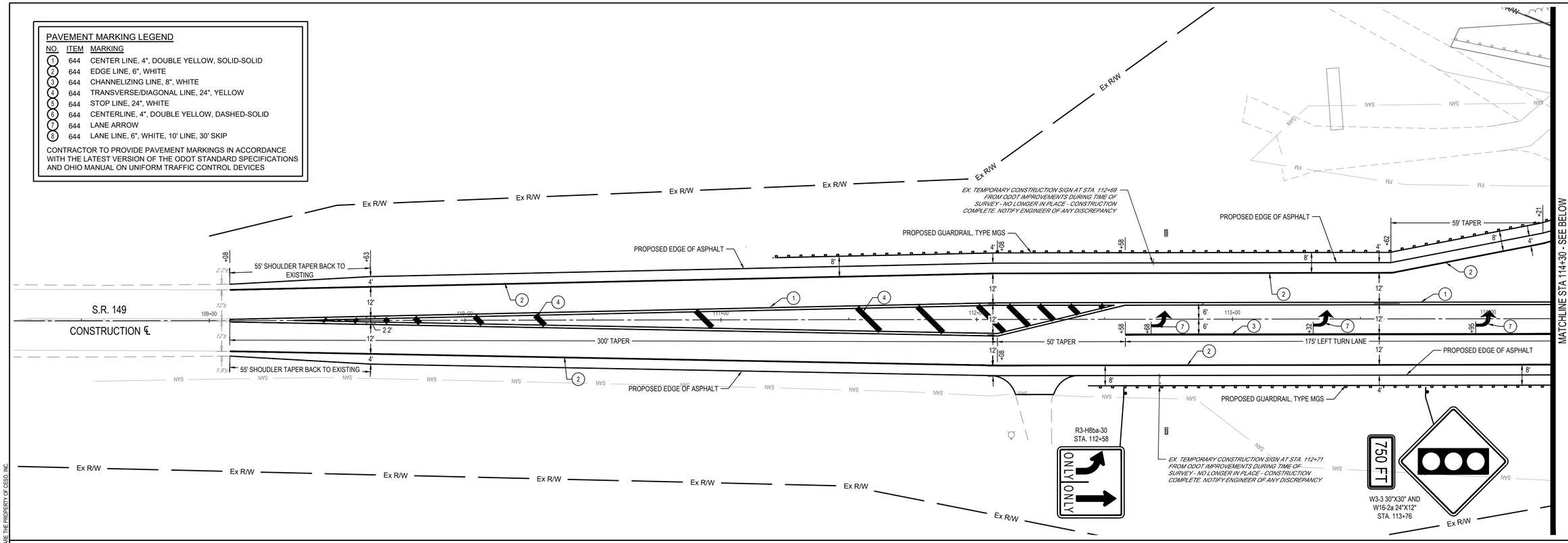
9

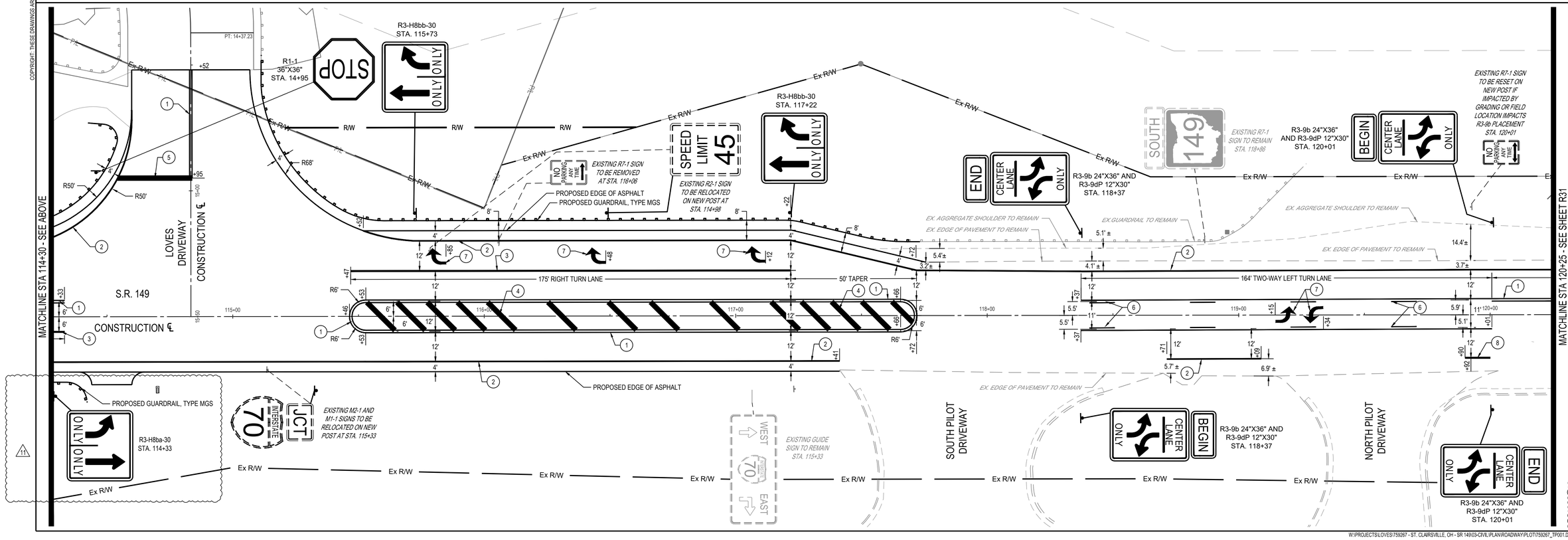
R29
R32

PAVEMENT MARKING LEGEND

NO.	ITEM	MARKING
1	644	CENTER LINE, 4", DOUBLE YELLOW, SOLID-SOLID
2	644	EDGE LINE, 6", WHITE
3	644	CHANNELIZING LINE, 8", WHITE
4	644	TRANSVERSE/DIAGONAL LINE, 24", YELLOW
5	644	STOP LINE, 24", WHITE
6	644	CENTERLINE, 4", DOUBLE YELLOW, DASHED-SOLID
7	644	LANE ARROW
8	644	LANE LINE, 6", WHITE, 10' LINE, 30' SKIP

CONTRACTOR TO PROVIDE PAVEMENT MARKINGS IN ACCORDANCE WITH THE LATEST VERSION OF THE ODOT STANDARD SPECIFICATIONS AND OHIO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES





GRAPHIC SCALE (IN FEET)
40 20 0 10 20

CALCULATED PJD
CHECKED TDH

MATCHLINE STA. 108+50 TO STA. 120+25

PAVEMENT MARKING & SIGNAGE - S.R. 149

BEL-149-23.44

9

R30
R32

PAVEMENT MARKING LEGEND

NO.	ITEM	MARKING
1	644	CENTER LINE, 4", DOUBLE YELLOW, SOLID-SOLID
2	644	EDGE LINE, 6", WHITE
3	644	CHANNELIZING LINE, 8", WHITE
4	644	TRANSVERSE/DIAGONAL LINE, 24", YELLOW
5	644	STOP LINE, 24", WHITE
6	644	CENTERLINE, 4", DOUBLE YELLOW, DASHED-SOLID
7	644	LANE ARROW
8	644	LANE LINE, 6", WHITE, 10' LINE, 30' SKIP

CONTRACTOR TO PROVIDE PAVEMENT MARKINGS IN ACCORDANCE WITH THE LATEST VERSION OF THE ODOT STANDARD SPECIFICATIONS AND OHIO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

MATCHLINE STA 120+25 - SEE SHEET R30

EXISTING R7-1 SIGN TO REMAIN STA. 11+00

EXISTING R7-1 SIGN TO REMAIN STA. 11+58

EXISTING R7-1 SIGN TO REMAIN STA. 12+56

EXISTING R1-1 SIGN TO BE REMOVED STA. 13+12

EXISTING R7-1 SIGN TO BE RESET ON NEW POST IF IMPACTED BY GRADING STA. 121+93

EXISTING R7-1 SIGN TO REMAIN STA. 11+00

EXISTING R7-1 SIGN TO REMAIN, RELOCATE ON NEW POST AS NEEDED FOR CONSTRUCTION STA. 12+56

EXISTING R7-1 SIGN TO BE RELOCATED ON NEW POST STA. 12+56

EXISTING R7-1 SIGN TO BE REMOVED STA. 121+90

PROPOSED EDGE AGGREGATE SHOULDER REPLACEMENT

PROPOSED EDGE OF ASPHALT

EX. AGGREGATE SHOULDER TO BE REPLACED FOR GRADING IMPROVEMENTS

RECO DRIVE CONSTRUCTION ℄

103' TAPER

200' RIGHT TURN LANE

50' TAPER

SOUTH MARATHON DRIVEWAY

NORTH MARATHON DRIVEWAY

45' TAPER

125' LEFT TURN LANE

282' TAPER NORTH SIDE OF CONSTRUCTION CL. START TAPER STA. 121+98 END TAPER STA. 124+80

310' TAPER EAST OF CONSTRUCTION CL TO MATCH EXISTING EAST SIDE OF ROAD CURB AND GUTTER TAPER AS-BUILT AND SURVEYED. START TAPER STA. 120+70 END TAPER STA. 123+80

EX. CURB AND GUTTER TO REMAIN

EAST CENTERLINE TO RUN ALONG CONSTRUCTION CENTERLINE FROM STA. 123+80 TO STA. 124+80.

R3-H8bb-30 STA. 124+29

R6-1 54"X 18" R5-1 36"X 36" TO REMAIN

I-70 EB EXIT RAMP

I-70 EB ENTRANCE RAMP

S.R. 149 CONSTRUCTION ℄

R100'

R3-H8b-48 STA. 120+70

EXISTING R3-H8b-30 SIGN TO BE REMOVED STA. 120+70

EXISTING D1-H8A-132 SIGN TO REMAIN STA. 122+05

EXISTING R3-H8b-30 SIGN TO REMAIN STA. 122+70

EXISTING R3-H8b-30 SIGN TO REMAIN STA. 124+65

CALCULATED PJD
CHECKED TDH

GRAPHIC SCALE (IN FEET) 40 20 0 10 20

PAVEMENT MARKING & SIGNAGE - STA. 120+25 TO 126+00
S.R. 149

BEL-149-23.44

9

R31
R32

GENERAL CONSTRUCTION REQUIREMENTS

1. DETAIL PLANS OF PLANNED WATER LINE CONSTRUCTION WILL BE SUBMITTED TO THE BELMONT COUNTY WATER AND SEWER DISTRICT, FOR APPROVAL BY THE ENGINEER ASSOCIATE, PRIOR TO CONSTRUCTION. A PRECONSTRUCTION MEETING WILL BE REQUIRED BEFORE START OF CONST.
2. SIGNED WATER APPLICATIONS & APPLICABLE FEES MUST BE RECIEVED PRIOR TO CONSTRUCTION.
3. ALL WATERLINE'S SHALL BE C900 (DR-14) IN HIGH PRESSURE AREAS DUCTILE IRON CLASS 50 OR 52 WILL BE REQUIRED BY THE DISTRICT. (ALL DUCTILE IRON PIPE TO BE POLYETHYLENE WRAPPED AS PER AWWA C105/A21.5) PIPE SIZES TO BE 3/4"CTS, 1"CTS, 2"I.P., 4", 6", 8", 10", 12" C-900 DR 14-18 (3/4" OR 1" TO BE TYPE-K SOFT COPPER IF LINE PRESSURE IS GREATER THAN 200 PSI)
4. RESIDENTIAL PVC SEWER LINE WILL BE A MINIMUM OF 4 INCH SDR-35.
5. SEWER FORCE MAIN WILL BE A MINIMUM OF 1 1/2", OR 2", POLYETHYLENE CLASS 200, OR 2", 4", 6", OR 8" SDR-21 CL-200 PVC PIPE, AND GREEN IN COLOR. GRAVITY SEWER LINES SHALL BE AIR AND DEFLECTION TESTED IN ACCORDANCE WITH TABLE 1 PAGE 29 OF THIS BOOKLET.
6. ALL PIPE THAT IS INSTALLED SHALL BE BEDDED WITH A MINIMUM OF 6" ABOVE AND BELOW THE PIPE WITH GOOD TOP SOIL FREE OF STONE AND OTHER FOREIGN OBJECTS, OR CRUSH AND RUN STONE.
7. WATERLINE SHALL BE INSTALLED WITH 4 FOOT MINIMUM COVER UNLESS OTHERWISE APPROVED.
8. A MINIMUM VERTICAL CLEARANCE OF 18 INCHES SHALL BE PROVIDED BETWEEN THE PROPOSED WATER MAIN AND OTHER UTILITIES OR STRUCTURES, UNLESS OTHERWISE NOTED.
9. A MINIMUM HORIZONTAL CLEARANCE OF 4 FEET SHALL BE PROVIDED BETWEEN THE PROPOSED WATER LINE AND OTHER UTILITIES OR STRUCTURES UNLESS OTHERWISE APPROVED.
10. THE WATERLINE SHALL BE PLACED WITH A MINIMUM OF 10 FOOT HORIZONTAL SEPARATION FROM ANY SANITARY SEWERS OR WHEN THE THE WATER LINE CROSSES A SANITARY SEWER, THE WATER LINE SHALL BE A MINIMUM OF 18 INCHES ABOVE THE SEWER.
11. SEWER LINES MUST CROSS UNDER ALL WATERLINES WITH A MINIMUM OF 18" OF CLEARANCE. IF NOT POSSIBLE THE BCSSD WILL PERMIT CROSSING OVER WITH STEEL CASING OR PLASTIC CASING AND CONCRETE. MINIMUM CASING LENGTH IS 10FT. AS PER NOTE ON SHT.- #16
12. ALL FITTINGS SHALL BE MECHANICAL JOINT (MJ). FUSION EPOXY COATED, DUCTILE IRON, RESTRAINED BY THE USE OF RESTRAINERS AND/OR MEGALUGS AND THRUST BLOCKED WITH CONCRETE AS REQUIRED. SEE SHT# 25 FOR THRUST BLOCKING DETAIL
13. A 16FT. MIN. LENGTH OF WATERLINE SHALL BE PROVIDED ON EACH SIDE OF ANY MAINLINE FITTING, OR THE JOINT SHALL BE RESTRAINED WITH BELL RESTRAINT FITTINGS.
14. ALL SERVICE CONNECTIONS MADE TO EXISTING LINES WILL BE MADE BY THE DISTRICT. THE CONNECTION SHALL BE MADE WET USING A TAPPING TEE AND VALVE. IF A LINE TO BE CONNECTED IS THE SAME AS THE EXISTING LINE, 2" CONNECTED TO 2" OR 6" CONNECTED TO 6", THE CONNECTION WILL BE MADE DRY. EXCEPTIONS MAY BE MADE DUE TO UNFORESEEN FIELD CIRCUMSTANCES.

CONTINUES ON NEXT PAGE

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

12/14/17

GENERAL CONSTRUCTION REQUIREMENTS

15. MAGNETIC DETECTABLE TRACER TAPE SHALL BE INSTALLED AT 18 INCHES DEEP WITH ALL PVC PIPE.
16. TRACE WIRE TO BE INSTALLED ON ALL WATER & SEWER LINES.
    A.) OPEN-TRENCH INSTALLATION: DIRECT BURIAL #12 AWG SOLID (0.0808" DIA.),STEEL CORE SOFT DRAWN TRACER WIRE, 250# AVERAGE TENSILE BREAK LOAD, 30 MIL HIGH MOLECULAR-HIGH DENSITY POLYETHYLENE JACKET COMPLYING WITH ASTM-D-1248,30 VOLT RATING, 45 MIL JACKET WHEN DIRECTIONAL BORED.

    B.) CONNECTORS
    SPLICES ALONG THE CONTINUOUS RUN OF TRACE WIRE FOR REPAIR OF A WIRE BREAK OR REPLACEMENT OF FAILED SEGMENT OF WIRE SHALL USE 3M BRAND DBR DIRECT BURY SPLICE KIT OR APPROVED EQUAL.

    C.) INSTALLATION
    TRACE WIRE ACCESS POINT SHALL BE ACCESSIBLE AT ALL NEW WATER VALVE BOXES, WATER METER BOXES, BLOWOFFS, ARVs, FIRE HYDRANTS AND MANHOLES.

    D.) TESTING REQUIREMENTS
    CONTRACTOR SHALL PERFORM A CONTINUITY TEST ON ALL TRACE WIRE IN THE PRESENCE OF BCWSD. IF THE TRACE WIRE IS FOUND TO BE NOT CONTINUOUS AFTER TESTING, CONTRACTOR SHALL REPAIR OR REPLACE THE FAILED SEGMENT OF WIRE.
17. THE CONTRACTOR WILL SCHEDULE WITH THE DISTRICT APPROXIMATE TIMES FOR THE INSPECTION OF LINES, FITTINGS & ETC., PRIOR TO BACKFILLING. THE COUNTY SHALL BE GIVEN A MINIMUM 48 HOURS OF NOTICE WHEN A INSPECTION IS REQUIRED
18. EXISTING MAINLINE VALVES WILL ONLY BE OPERATED BY DISTRICT PERSONNEL.
19. A MINIMUM OF 24 HOURS NOTICE FOR ANY INSTALLATIONS BY CONTRACTORS THAT MAY DISRUPT WATER SERVICE TO EXISTING WATER CUSTOMERS. THE NOTICE SHALL BE MADE THROUGH THE DISTRICTS OFFICE.
20. ALL SERVICE CONNECTIONS INSTALLED WILL BE STAKED AT THE TIME OF CONSTRUCTION WITH IRON "TEE BAR STAKES" PER DISTRICT REQUIREMENTS.
21. CHANGES IN GRADE AND ALIGNMENT TO BE OBTAINED BY DEFLECTIONS AT PIPE JOINTS SHALL BE NO GREATER THAN RECOMMENDED BY THE MANUFACTURER OF THE WATER LINE.
22. PRESSURE TESTING OF WATER LINES AND SEWER FORCE MAINS SHALL BE IN ACCORDANCE WITH AWWA C600-87. TESTING AT 1-1/2 TIMES EXISTING PRESSURE AND/OR WORKING PRESSURE OR MINIMUM OF 100PSI/MAX. OF 200 PSI. PRESSURE TESTING MUST BE DONE WITHIN 2 WORKING WEEKS ONCE LINE IS IN PLACE.
23. THE CONTRACTOR WILL CHLORINATE THE INSTALLED WATER LINE AT RECOMMENDED AWWA 651 STANDARDS, FOR A MINIMUM OF 24 HOURS, AT 50 P.P.M.
24. THE DISTRICT WILL TAKE REPRESENTATIVE SAMPLES OF THE WATER IN THE LINES, AND HAVE AN APPROVED LABORATORY MAKE THE BACTERIOLOGICAL EXAMINATIONS OF THE SAMPLE TO ESTABLISH THE ACCEPTABILITY OF THAT PORTION OF THE SYSTEM PRIOR TO ANY TURN ON OF SERVICE TO ANY FACILITY. THERE WILL BE NO EXCEPTION TO THIS STANDARD.

CONTINUES ON NEXT PAGE

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

10/31/17

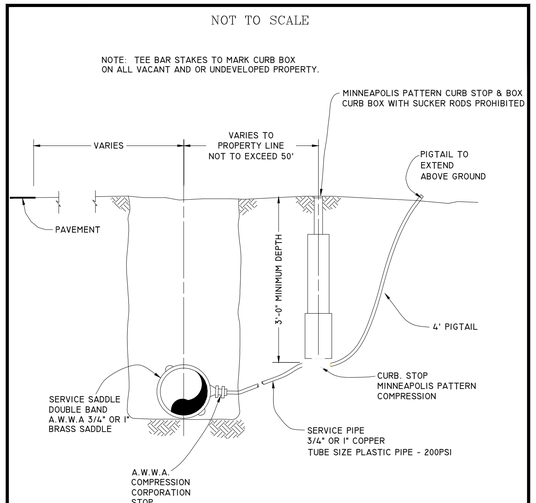
GENERAL CONSTRUCTION REQUIREMENTS

25. ALL MAIN LINE VALVES & FLUSH-OUT ASSEMBLIES SHALL BE MARKED BY A WHITE FIBERGLASS MARKER AS PER THE WATER DISTRICTS REQUIREMENTS.
26. LOCATION OF THE PROPOSED SERVICE TAPS SHALL BE FIELD LOCATED BY THE OWNER PRIOR TO CONSTRUCTION OR AT TIME OF CONSTRUCTION.
27. ALL MATERIAL AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BELMONT COUNTY SPECIFICATIONS AS OUTLINED IN STANDARD DETAILS MANUAL.
28. ALL PARTS, LABOR, EQUIPMENT, AND MISC. EXPENSES BY THE BELMONT COUNTY SANITARY SEWER DISTRICT WILL BE INVOICED TO THE DEVELOPER.
29. CONTRACTOR IS RESPONSIBLE FOR ALL WORK PERFORMED FOR THE FIRST YEAR OF CUSTOMER SERVICE.
30. ALL PRESSURE TESTING STARTS BEFORE NOON.
31. AS-BUILTS DRAWINGS (MAPS) MUST BE PROVIDED TO BCWSD WITHIN 3 MONTHS OF THE BACTERIA TEST, WHICH MARKS THE WATER LINE COMPLETION DATE. FOR 6" AND LARGER LINES/ AND WITHIN ONE MONTH FOR 2"&4" LINES
32. AS-BUILTS FOR 6" & LARGER LINES ARE REQUIRED TO HAVE GPS POINT WHEN SUBMITTED FOR APPROVAL THEY ARE TO POINT OUT THE FOLLOWING:HYDRANTS,FITTINGS CURB BOXES, METER WELLS, MAN HOLES, CLEAN OUTS, VALVES, AND WATER OR SEWER LINES IN 100FT. INCREMENTS.

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

10/31/17

NOT TO SCALE



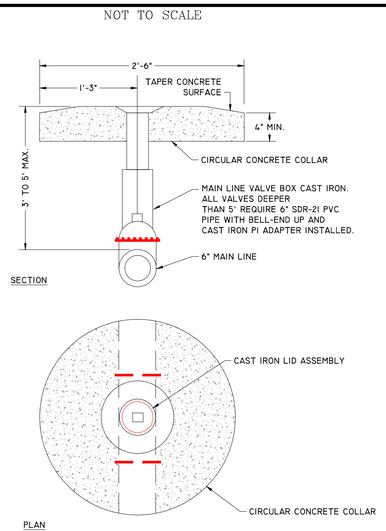
BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS
INSIDE SERVICE SETTING

DWG. NO. 2

9/25/17

NOT TO SCALE



BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

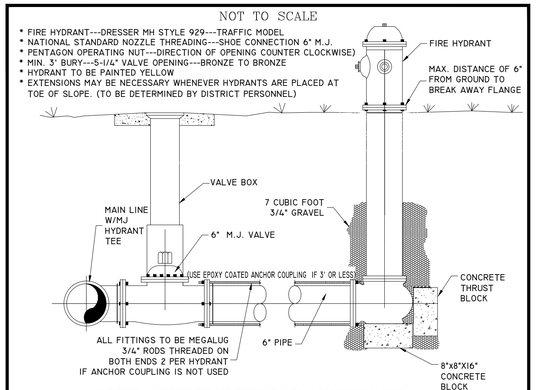
STANDARD DETAILS
VALVE BOX SETTING

DWG. NO. 5

10/31/17

NOT TO SCALE

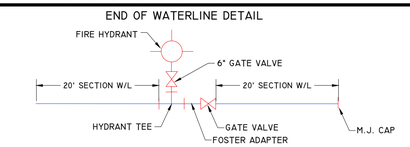
* FIRE HYDRANT---DRESSER MH STYLE 929---TRAFFIC MODEL
* NATIONAL STANDARD NOZZLE THREADING---SHOE CONNECTION 6" M.J.
* PENTAGON OPERATING NUT---DIRECTION OF OPENING COUNTER CLOCKWISE)
* MIN. 3' BURY---5-1/4" VALVE OPENING---BRONZE TO BRONZE
* HYDRANT TO BE PAINTED YELLOW
* EXTENSIONS MAY BE NECESSARY WHENEVER HYDRANTS ARE PLACED AT TOE OF SLOPE. (TO BE DETERMINED BY DISTRICT PERSONNEL)



TIE RODS: NOT REQUIRED FOR SETTINGS OVER 6' FROM MAIN IN WHICH CASE A MORE SUBSTANTIAL THRUST BLOCK IS REQUIRED.

NOTE: KEEP FLANGES AND WEEP HOLES CLEAR OF CONCRETE.

END OF WATERLINE DETAIL



BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

STANDARD DETAILS
FIRE HYDRANT ASSEMBLY
ARRANGMENT AT END OF WATERLINE EXTENSION

DWG. NO. 7

10/31/17

CALCULATED PJD
CHECKED TDH

CONSTRUCTION DETAILS
S.R. 149

BEL-149-23.44

9

R32
R32

ITEM 632 - POWER SERVICE, AS PER PLAN

ELECTRIC POWER SHALL BE OBTAINED FROM THE AEP AT THE LOCATION INDICATED ON THE PLANS. POWER SUPPLIED SHALL BE 120 VOLTS.

POWER SERVICE SHALL BE AS PER CMS ITEM 632 AND SCD TC- 83.10 WITH THE FOLLOWING EXCEPTIONS:

1. THE CONTRACTOR SHALL MEET WITH A REPRESENTATIVE FROM THE POWER SUPPLY AGENCY TO CONFIRM HOW THE PROPOSED POWER SERVICE IS TO BE WIRED, HOOKED UP, AND ITS LOCATION

2. ALL POWER SERVICES SHALL BE METERED. THE METER SHALL HAVE A LEVER OPERATED BYPASS.

DISCONNECT SWITCH ENCLOSURES FURNISHED IN ACCORDANCE WITH CMS ITEM 632, POWER SERVICE, AS PER PLAN, SHALL INCLUDE A PADLOCK EQUAL TO MASTER NO. 4BKA OR WILSON BOHANNON 660, WITH LOCK BODY OF BRONZE OR BRASS AND KEYING SHALL BE TO THE STATE MASTER. THE CONTRACTOR SHALL CONTACT THE METER SECTION OF THE POWER COMPANY FOR INFORMATION REGARDING THE METER BASE INSTALLATION PRIOR TO ORDERING POLES. CONTRACTOR WILL BE RESPONSIBLE FOR REQUESTING AND SCHEDULING ANY INSPECTIONS THE POWER COMPANY MAY REQUIRE FOR THE POWER SERVICE HOOK UP. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT THE POWER COMPANY FOR THE ELECTRICAL SERVICE CONNECTION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR SPLICE POWER CABLE INTO THE POWER COMPANY'S CIRCUITS. THE VOLTAGE SUPPLIED SHALL BE NOMINALLY 120 VOLTS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS AND THE PAYING OF ALL FEES. THE CONTRACTOR SHALL PAY ALL POWER CHARGES UNTIL THE SIGNAL IS ACCEPTED BY MAINTAINING AGENCY.

SIGNAL ACTIVATION

PRIOR TO ACTIVATION THE NEW TRAFFIC SIGNAL TO STOP-AND- GO MODE AND/OR REMOVING THE EXISTING TRAFFIC SIGNAL FROM SERVICE, ALL ITEMS IN THE PROPOSED SIGNAL PLAN SHALL BE FULLY COMPLETED, (I.E, VEHICLE DETECTION, PEDESTRIAN SIGNAL HEADS, ETC.). IF THERE ARE CONSTRUCTABILITY ISSUES (I.E., ROADWAY WIDENING, ETC.) THAT PREVENT THE SIGNAL FROM BEING COMPLETED PRIOR TO ACTIVATION, IT SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER. THE DISTRICT TRAFFIC ENGINEER WILL THEN REVIEW, APPROVE OR REJECT PROPOSALS TO ACTIVATE THE TRAFFIC SIGNAL PRIOR TO COMPLETION.

THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER AT LEAST 10 WORKING DAYS PRIOR TO SCHEDULING THE FINAL INSPECTION OF THE SIGNAL INSTALLATION. FINAL INSPECTION IS NOT CONSIDERED COMPLETE UNTIL DESIGNATED DISTRICT TRAFFIC PERSONNEL INSPECT THE TRAFFIC SIGNAL AND ISSUE WRITTEN APPROVAL. IF ISSUES ARE FOUND DURING THE FINAL INSPECTION THAT EFFECT THE SAFETY OF THE TRAVELING PUBLIC AND/OR THE EFFICIENCY OF THE INTERSECTION, THE SIGNAL SHALL NOT BE ACTIVATED OF THE PROPOSED DATE. ANY PUNCH LIST ITEMS THAT ARE FOUND SHALL BE CORRECTED AND REINSPECTED BY DISTRICT TRAFFIC PERSONNEL PRIOR TO FINAL ACCEPTANCE. ODOT FORCES SHALL ONLY ASSUME DAY TO DAY MAINTENANCE OF THE TRAFFIC SIGNAL AFTER FINAL WRITTEN ACCEPTANCE HAS BEEN ISSUED.

UNDERDRAINS FOR PULL BOXES

REFERENCE TRAFFIC SCD HL-30.11 FOR DETAILS ABOUT DRAINING PULL BOXES. UNDERDRAINS FOR PULL BOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED 20 FEET. THE FOLLOWING ESTIMATED QUANTITY IS CARRIED TO THE GENERAL SUMMARY FOR THIS PURPOSE:

ITEM 611 - 4" CONDUIT, TYPE E FOR UNDERDRAIN OUTLET
10 FT

WORK INSPECTION

THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER AND THE DISTRICT TRAFFIC ENGINEER WITH 72 HOUR NOTICE OF ANY SIGNAL WORK TO BE PERFORMED AT THE INTERSECTION SITE(S) SO THAT INSPECTION SERVICES CAN BE SUPPLIED.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 90 DAYS FOLLOWING COMPLETION OF THE 10-DAY PERFORMANCE TEST. IN THE EVENT OF UNSATISFACTORY OPERATION THE CONTRACTOR SHALL CORRECT FAULTY INSTALLATIONS, MAKE REPAIRS AND REPLACE DEFECTIVE PARTS WITH NEW PARTS OF EQUAL OR BETTER QUALITY.

EQUIPMENT, MATERIAL AND LABOR COSTS INCURRED IN CORRECTING AN UNSATISFACTORY OPERATION SHALL BE BORNE BY THE CONTRACTOR.

THE GUARANTEE SHALL COVER THE FOLLOWING ITEMS OF THE TRAFFIC CONTROL SYSTEM: CONTROLLER, CABINET, UNINTERRUPTIBLE POWER SUPPLY, VEHICLE DETECTION EQUIPMENT, LED LAMP UNITS, NETWORK AND COMMUNICATION/INTERCONNECT EQUIPMENT.

CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING ITEMS SHALL BE TURNED OVER TO ODOT DISTRICT 11 FOLLOWING ACCEPTANCE OF THE EQUIPMENT.

THE COST OF GUARANTEEING THE TRAFFIC CONTROL SYSTEM WILL BE INCIDENTAL TO AND INCLUDED IN THE CONTRACT UNIT PRICE OF THE VARIOUS ITEMS MAKING UP THE SYSTEM.

ITEM 625 - ARC FLASH CALCULATIONS AND LABEL

THIS ITEM SHALL INCLUDE PROVIDING ARC FLASH HAZARD CALCULATIONS AND LABELS PER SUPPLEMENTAL SPECIFICATION 825. LABELS SHALL BE APPLIED TO THE OUTSIDE OF EACH CONTROLLER CABINET. LABELS SHALL BE PROVIDED BY THE ODOT SIGN SHOP.

1606 WEST BROAD STREET
COLUMBUS, OHIO 43223

LOCATIONS OF ARC FLASH HAZARD LABELS ARE:

SIGNAL CONTROLLER (STA. 120+90.62, 36.58' LT.)

PAYMENT WILL BE MADE AT THE UNIT PRICE BID FOR EACH ITEM 625 "ARC FLASH CALCULATION LABEL" FOR EACH SET OF CALCULATIONS ACCEPTED AND LABEL INSTALLED, INCLUDING ALL LABOR, MATERIALS, AND INCIDENTALS NECESSARY.

ITEM 633 - CABINET, TYPE 332L, AS PER PLAN

THE CABINET SHALL BE FURNISHED AND INSTALLED ACCORDING TO CMS 633 AND 733, AND BE LISTED ON THE TRAFFIC AUTHORIZED PRODUCTS LIST (TAP).

THE CABINET SHALL BE FURNISHED WITH AN EDI MONITOR AS ALLOWED ON THE TAP/APPROVED PRODUCTS LIST. THE CABINET SHALL INCLUDE A CABINET RISER (12 INCH MINIMUM).

THE CONTRACTOR SHALL NOT REASSIGN THE CABINET DETECTOR INPUTS IN ORDER TO REDUCE THE NUMBER OF 2-CHANNEL DETECTOR UNITS SUPPLIED AND SHALL USE THE STANDARD CALTRANS INPUT FILE DESIGNATIONS FOLLOWING SHEET T6.

PAYMENT FOR ITEM 633 CABINET, TYPE 332L, AS PER PLAN WILL BE AT THE CONTRACT BID PRICE PER EACH COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS TESTED AND ACCEPTED.

ITEM 809 - ATC CONTROLLER, AS PER PLAN (PROGRAM AND INSTALL ONLY)

ALL REQUIREMENTS OF SS 809 SHALL BE FOLLOWED, ALONG WITH THE ADDITIONAL DESCRIPTION AS STATED BELOW. THE ATC CONTROLLER WILL BE PROVIDED BY THE DISTRICT WITHOUT PROGRAMMING.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROGRAMMING THE CONTROLLER TO THE PROPOSED CONDITIONS ACCORDING TO THE PLANS. ODOT WILL NOT BE RESPONSIBLE FOR THE PROGRAMMING.

PAYMENT SHALL BE MADE ONCE THE CONTROLLER IS PROGRAMMED, INSTALLED, TESTED, FUNCTIONING ACCORDING TO THE PLANS, AND SHALL INCLUDE INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS TO COMPLETE WORK.

CONTROLLER ITEM, MISC.: TIMING AND COORDINATION

THIS ITEM SHALL INCLUDE THE WORK NECESSARY TO CHANGE THE SIGNAL TIMING AND NETWORK COORDINATION IN THE LOCAL CONTROLLER LOCATED AT THE IR 70 WB RAMPS AS INDICATED ON SHEET T11.

COORDINATION TIMING WILL BE IMPLEMENTED AT THE FOLLOWING FOUR (4) INTERSECTIONS: S.R. 149 & RECO DRIVE, I-70 EASTBOUND RAMPS & S.R. 149, I-70 WESTBOUND RAMPS & S.R. 149, AND S.R. 149 & BOND DRIVE/SCHOOL STREET.

CALCULATED IMP
CHECKED REM

TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

BEL-149-23.44

T1
T13

ITEM 633 - UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF C&MS 633 AND 733, POLE ATTACHMENT HARDWARE WILL BE INCLUDED FOR POLE-MOUNTED CABINETS, AND A CABINET RISER (8-INCH MINIMUM) AND ANCHOR BOLTS WILL BE PROVIDED FOR BASE-MOUNTED CABINETS. BEFORE PERFORMING THE WORK, THE CONTRACTOR, THE DISTRICT TRAFFIC ENGINEER, AND THE PROJECT ENGINEER WILL PERFORM A SITE INSPECTION TO ESTABLISH THE LOCATION OF THE UPS CABINET AND FOUNDATION.

THE UPS CABINET SHALL INCLUDE A GENERATOR POWER PANEL +WITH A HEAVY-DUTY POWER RELAY VERSUS THE LINE VOLTAGE GENERATOR SWITCH. THE GENERATOR INLET SHALL BE A RECESSED PANEL WITH A DOOR THAT IS FLUSH WITH THE EXTERNAL SIDE OF THE UPS CABINET. IT SHALL INCLUDE A RECESSED PLUG, AUTOMATIC TRANSFER SWITCH AND A DOOR THAT SECURELY CLOSES OVER THE POWER CORD.

THE CABINET SHALL HAVE A DOOR STOP MECHANISM AND THERMOSTATICALLY CONTROLLED FAN.

THE CABINET SHALL INCLUDE A BATTERY BALANCING DEVICE THAT REGULATES THE BATTERIES AND OPTIMIZES PERFORMANCE.

AFTER FOUR (4) HOURS OF BATTERY RUNTIME, THE SYSTEM SHALL BE PROGRAMMED TO SWITCH THE INTERSECTION FROM FULL OPERATION TO CONTROLLER AUTOMATIC FLASH OPERATION THROUGH THE MONITOR. THE CONTROLLER SHALL BE PROGRAMMED SO THAT FLASH OPERATION SHALL BEGIN ONCE THE INTERSECTION RUNS MINOR STREET GREEN (TYP. PH. 4 & 8), ALL-RED CLEARANCE, AND THEN FLASH OPERATION.

THE UPS OUTPUT NOTIFICATIONS FOR ON BATTERY, BATTERY 2-HOUR TIMER, AND LOW BATTERY SHALL BE WIRED INTO THE TRAFFIC SIGNAL CABINET BACK PANEL OR THROUGH THE CONTROLLER WITH A C11 TO PROVIDE SPECIAL STATUS ALARMS FOR EACH OUTPUT INTO THE SIGNAL CONTROLLER.

THIS ITEM SHALL INCLUDE A RED LED STATUS INDICATOR LAMP TO ALLOW MAINTENANCE PERSONNEL AND LAW ENFORCEMENT TO QUICKLY ASSESS WHETHER A TRAFFIC SIGNAL CABINET IS BEING POWERED BY A UPS. THE LED HOUSING SHALL BE NEMA 4X, IP65 OR IP66, RATED FOR OUTDOOR USE AND BE TAMPER/SHATTER RESISTANT. IT SHALL BE A DOMED ENCLOSURE CONTAINING A RED LENS WITH LED THAT IS VISIBLE FROM 100 FOOT MINIMUM. THE ENCLOSURE AND LED MODULE SHOULD BE PLACED ON THE SIDE OF THE UPS CABINET FACING TOWARDS THE MAINLINE ROADWAY AND SEALED FROM WATER INTRUSION. IT SHOULD BE WIRED USING MINIMUM 20GA STRANDED, INSULATED HOOKUP WIRE TO THE STATUS RELAY OUTPUTS OF THE UPS. THE WIRES SHALL BE TERMINATED BY LUGS AT THE DISPLAY END AND PERMANENTLY LABELED "BACKUP POWER STATUS DISPLAY," WITH WIRE POLARITY INDICATED. THE RED LED SHALL ONLY ILLUMINATE TO INDICATE THE CABINET IS OPERATING UNDER UPS BACKUP POWER (THE "BACKUP" OPERATING CONDITION). THIS ITEM INCLUDES PROGRAMMING THE UPS STATUS RELAY OUTPUTS TO PRODUCE THE LAMP STATUS DISPLAYS. THESE STATUS DISPLAYS WILL BE SOLID 100% DUTY CYCLE (NOT FLASHING) DISPLAYS. THE OPERATING VOLTAGE OF THE LED LAMP SHALL BE 120V AC UNLESS OTHERWISE INDICATED.

ITEM 809 - ADVANCE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR ADVANCE DETECTION UNTIL (MODEL SS-200E). THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:

1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
2. ALL REQUIRED INPUTS CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
3. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
4. SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
5. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
6. A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).
7. THE POWER SUPPLY AND COMMUNICATION MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
8. THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.
9. THE INSTALLATION SHALL INCLUDE ALL CONTROLLER PROGRAMMING FOR COMPLETE INSTALLATION, WHICH INCLUDES MODIFICATIONS FOR REMOVAL OF EXISTING DETECTION.

PAYMENT FOR ITEM 809 ADVANCE RADAR DETECTION, AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH UNIT, COMPLETE AND IN PLACE INCLUDING ALL REQUIRED CABINET HARDWARE, MOUNTING BRACKETS, CABLES, CONDUIT, CONNECTIONS TESTED AND ACCEPTED, AND ANY OTHER NECESSARY HARDWARE TO ESTA`BLISH A FULLY FUNCTIONAL DETECTION SYSTEM.

DETECTION MAINTENANCE

IF VEHICLE DETECTION BECOMES UNEXPECTEDLY DISABLED, REQUIRES MODIFICATION, OR IS SCHEDULED TO BE TEMPORARILY REMOVED DURING THE CONSTRUCTION PROJECT, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER.

IF THE LOSS OF VEHICLE DETECTION IS KNOWN PRIOR TO THE START OF CONSTRUCTION, IT SHALL BE DISCUSSED AT THE PRECONSTRUCTION MEETING. AT SUCH TIME, THE DISTRICT TRAFFIC ENGINEER SHALL ADVISE THE PROJECT ENGINEER AND CONTRACTOR ON THE APPROPRIATE ACTION TO RECTIFY ANY LOSS OF VEHICLE DETECTION. THIS MAY INCLUDE PLACING THE TRAFFIC SIGNAL ON MINIMUM OR MAXIMUM RECALL, MODIFYING THE MINIMUM GREEN TIMES, AND REMOVING THE MALFUNCTIONING DETECTION FROM SERVICE. WHERE NON-INTRUSIVE DETECTION (I.E. VIDEO, RADAR) ALREADY EXISTS, THE CONTRACTOR SHALL INSURE THAT DETECTION IS OPERATING AND MAINTAINED BY RECONFIGURING THE DETECTION UNITS ACCORDINGLY DURING ALL CONSTRUCTION PHASES. THIS IS TO AVOID THE SIGNAL FROM MAXING OUT THE EFFECTED SIGNAL PHASE AND CREATING UNNECESSARY DELAYS.

LOCATIONS WHERE NON-INTRUSIVE DETECTION IS PROPOSED AND THE EXISTING VEHICLE DETECTION IS TO BE ABANDON, THE NON-INTRUSIVE VEHICLE DETECTION SHALL BE INSTALLED, CONFIGURED AND MADE FULLY FUNCTIONAL PRIOR TO THE EXISTING DETECTION BEING DISABLED. THE CONTRACTOR SHALL CONTINUE TO MAINTAIN AND MODIFY THE DETECTION UNTIL FINAL ACCEPTANCE OF THE TRAFFIC SIGNAL.THIS IS TO ENSURE VEHICLE DETECTION REMAINS FULLY FUNCTIONAL THROUGHOUT CONSTRUCTION.

ITEM 633 - COMMUNICATIONS, AS PER PLAN

FURNISH A CELLULAR MODEM, ONE 3-ANTENNA ASSEMBLY (PART #6001136), AND A 10' ETHERNET CABLE FOR REMOTE WIRELESS CELLULAR COMMUNICATION.

FOR NETWORK CONSISTENCY CELLULAR MODEMS SHALL BE THE SIERRA WIRELESS:

MODEM, AIRLINK MP70 ETHERNET WITH AC TO DC POWER CABLE - MODEL 1102709KIT

THIS ITEM SHALL INCLUDE THE FURNISHING A MOUNTING BRACKET FOR THE ANTENNA WITH ALL NECESSARY HARDWARE INCLUDING BUT NOT LIMITED TO SPRING NUTS, WASHERS, AND BOLTS THAT INSTALLS TO THE MOUNTING CHANNEL ON THE SIDE OF THE SIGNAL CABINET.

THE CELLULAR MODEM EQUIPMENT SHALL BE DELIVERED TO ODOT DISTRICT 11 TRAFFIC FOR PROGRAMMING AND INSTALLATION.

JOSEPH PARISI, P.E.
(330) 308-7813
2201 REISER AVENUE SE
NEW PHILADELPHIA, OHIO 44663

THE CONTRACTOR SHALL PROVIDE THE MODEM SERIAL NUMBERS AND NECESSARY ESN NUMBERS FOR ODOT TO ESTABLISH WIRELESS SERVICE.

THE DEPARTMENT WILL MEASURE "COMMUNICATIONS, AS PER PLAN" BY THE NUMBER OF COMPLETE UNITS FURNISHED, RECEIVED, AND ACCEPTED BY ODOT DISTRICT 11 TRAFFIC.

ITEM 809 - STOP LINE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR MATRIX DETECTION UNIT. THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:

1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
2. ALL REQUIRED INPUTS CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
3. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
4. SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
5. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
6. A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).
7. THE POWER SUPPLY AND COMMUNICATION MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD-WIRED TO THE COMMUNICATION MODULES, AS NECESSARY.
8. THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.
9. THE INSTALLATION SHALL INCLUDE ALL CONTROLLER PROGRAMMING FOR COMPLETE INSTALLATION, WHICH INCLUDES MODIFICATIONS FOR REMOVAL OF EXISTING DETECTION.

PAYMENT FOR ITEM 809 STOP-LINE RADAR DETECTION, AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH UNIT, COMPLETE AND IN PLACE INCLUDING ALL REQUIRED CABINET HARDWARE, MOUNTING BRACKETS, CABLES, CONDUIT AND CONNECTIONS TESTED AND ACCEPTED.

CALCULATED IMP
CHECKED REM

TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

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GROUNDING AND BONDING

THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (C&MS) AND THE TC SERIES OF STANDARD CONSTRUCTION DRAWINGS ARE MODIFIED AS FOLLOWS:

1. ALL METALLIC PARTS CONTAINING ELECTRICAL CONDUCTORS SHALL BE PERMANENTLY JOINED TO FORM AN EFFECTIVE GROUND FAULT CURRENT PATH BACK TO THE GROUNDED CONDUCTOR IN THE POWER SERVICE DISCONNECT SWITCH.

   A. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN METALLIC CONDUITS (725.04) IN ADDITION TO THE CONDUCTORS SPECIFIED AND BOND THE CONDUIT TO THIS GROUNDING CONDUCTOR.

   B. WHEN AN EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED IN PLASTIC CONDUIT (725.05), THE INSTALLATION SHALL INCLUDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN ADDITION TO THE CONDUCTORS SPECIFIED.

   C. METALLIC CONDUIT CARRYING THE LOOP WIRES FROM IN THE PAVEMENT TO THE PULL BOX SPLICE LOCATION WILL ONLY BE BONDED AT THE PULL BOX END, AND WILL NOT CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR.

   D. IF MULTIPLE CONDUIT RUNS BEGIN AND END AT THE SAME POINTS, ONLY ONE EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED.

   E. IF AN EQUIPMENT GROUNDING CONDUCTOR IS NEEDED IN CONDUIT BETWEEN SIGNALIZED INTERSECTIONS FOR UNDERGROUND INTERCONNECT CABLE, THE GROUNDING SYSTEM FOR EACH SIGNALIZED INTERSECTION WILL BE SEPARATED ABOUT MIDWAY BETWEEN THE INTERSECTIONS.

   F. THE MESSENGER WIRE AT SIGNALIZED INTERSECTIONS WILL BE USED AS THE CONDUCTIVE PATH FROM CORNER TO CORNER IF CONDUIT IS NOT PROVIDED UNDER THE ROADWAY. WHEN CONDUIT CONNECTS THE CORNERS OF AN INTERSECTION, AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE USED IN THE CONDUIT.

2. CONDUITS

   A. THE 725.04 CONDUIT SHALL HAVE GROUNDING BUSHINGS INSTALLED AT ALL TERMINATION POINTS. THE BUSHING MATERIAL SHALL BE COMPATIBLE WITH GALVANIZED STEEL CONDUIT AND THE GROUNDING LUG MATERIAL SHALL BE COMPATIBLE FOR USE WITH COPPER WIRE. THREADED OR COMPRESSION TYPE BUSHINGS MAY BE USED.

   B. THE 725.05 CONDUIT SHALL HAVE THE INSIDE AND OUTSIDE DIAMETERS OF THE CONDUIT DEBURRED AT ALL TERMINATION POINTS.

   C. BOTH ENDS OF METALLIC CONDUIT SHALL BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.

   D. METALLIC CONDUIT MAY BE BONDED TO METALLIC BOXES THROUGH THE USE OF CONDUIT FITTINGS UL APPROVED FOR THIS TYPE OF CONNECTION, WITH THE BOX BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.

GROUNDING AND BONDING (CONT.)

3. WIRE FOR GROUNDING AND BONDING.

   A. USE INSULATED, COPPER WIRE FOR THE EQUIPMENT GROUNDING CONDUCTOR. BONDING JUMPERS IN BOXES AND ENCLOSURES MAY BE BARE OR INSULATED COPPER WIRE. WIRE SIZE SHALL BE AS FOLLOWS:

   I. USE 4 AWG BETWEEN THE POWER SERVICE AND SUPPORTS, POLES, PEDESTALS, CONTROLLER OR FLASHER CABINETS.

   II. USE A MINIMUM 8 AWG BETWEEN LOOP DETECTOR PULL BOXES AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE.

   III. USE A MINIMUM 8 AWG BETWEEN THE "PREPARE TO STOP WHEN FLASHING" INSTALLATION (INCLUDING SUPPORT) AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE.

   IV. THE INSULATION SHALL BE GREEN OR GREEN WITH YELLOW STRIPE(S). FOR 4 AWG OR LARGER, INSULATION MAY ALSO BE BLACK WITH GREEN TAPE/LABELS INSTALLED AT ALL ACCESS POINTS.

   B. IN A HIGHWAY LIGHTING SYSTEM, THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE THE SAME WIRE SIZE AS THE DUCT CABLE OR DISTRIBUTION CABLE CIRCUIT CONDUCTORS, WITH THE MINIMUM CONDUCTOR SIZE OF 4 AWG. BONDING JUMPERS WILL BE MINIMUM SIZE 4 AWG.

4. GROUND ROD

   A. A 3/4 INCH SCHEDULE 40 PVC CONDUIT WILL BE USED IN FOUNDATIONS AND CONCRETE WALLS FOR THE GROUNDING CONDUCTOR (GROUND WIRE) RACEWAY TO THE GROUND ROD. SHOULD METALLIC CONDUIT BE USED, BOTH ENDS OF THE CONDUIT SHALL BE BONDED TO THE GROUNDING CONDUCTOR.

   B. THE TYPICAL GROUNDING CONDUCTOR (GROUND WIRE) SHALL BE 4 AWG INSULATED, COPPER.

5. THE GREEN CONDUCTOR IN SIGNAL CABLES (CONDUCTOR #4) SHALL NOT BE USED TO SUPPLY POWER TO A SIGNAL INDICATION. IT WILL BE CONNECTED TO THE SIGNAL BODY AS AN EQUIPMENT GROUND IN ALUMINUM HEADS AND IT WILL BE UNUSED IN PLASTIC HEADS. UNUSED CONDUCTORS SHALL BE GROUNDED IN THE CABINET. TYPICAL USE OF CONDUCTORS IS AS FOLLOWS:

COND. NO	COLOR	VEHICLE SIGNAL	PEDESTRIAN SIGNAL
1	BLACK	GREEN BALL	#1 WALK
2	WHITE	AC NEUTRAL	AC NEUTRAL
3	RED	RED BALL	#1 DW/FDW
4	GREEN	EQUIPMENT GROUND	EQUIPMENT GROUND
5	ORANGE	YELLOW BALL	#2 DW/FDW
6	BLUE	GREEN ARROW	#2 WALK
7	WHITE/BLACK STRIPE	YELLOW ARROW	NOT USED

GROUNDING AND BONDING (CONT.)

6. POWER SERVICE AND DISCONNECT SWITCH.

   A. AT THE POWER SERVICE LOCATION, THE GROUNDING CONDUCTOR (GROUND WIRE) FROM THE DISCONNECT SWITCH NEUTRAL (AC-) BAR TO THE GROUND ROD SHALL BE A CONTINUOUS, UNSPLICED CONDUCTOR. IF SPLICED, IT SHALL BE AN EXOTHERMIC WELD BUTT SPLICE.

   B. THE SERVICE NEUTRAL (AC-) SHALL ONLY BE CONNECTED TO GROUND AT THE PRIMARY POWER SERVICE DISCONNECT SWITCH.

   I. NEMA CONTROLLER CABINETS: IF A POWER SERVICE DISCONNECT SWITCH IS LOCATED BEFORE THE CONTROLLER CABINET, THE NEUTRAL (AC-) AND THE GROUNDING BARS IN THE CONTROLLER CABINET SHALL NOT BE CONNECTED TOGETHER AS SHOWN IN NEMA TS-2, FIGURE 5-4.

   II. IF SECONDARY DISCONNECT SWITCHES ARE CONNECTED AFTER THE PRIMARY DISCONNECT SWITCH, THE NEUTRAL (AC-) SHALL ONLY BE GROUNDED AT THE PRIMARY SWITCH. EQUIPMENT GROUNDING CONDUCTORS SHALL BE BROUGHT TO THE PRIMARY SWITCH, BUT SHALL BE GROUNDED AT BOTH SECONDARY AND PRIMARY SWITCHES.

7. PAYMENT - ALL MATERIALS AND WORK REQUIRED TO COMPLETE THE EFFECTIVE GROUND FAULT CURRENT PATH SYSTEM ARE INCIDENTAL TO THE CONDUCTORS INSTALLED BY CONTRACT.

CALCULATED IMP
CHECKED REM

TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

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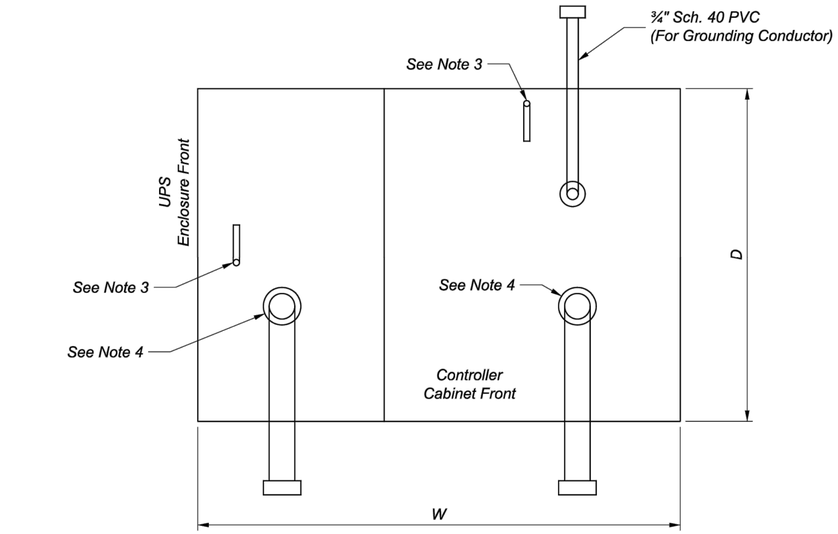

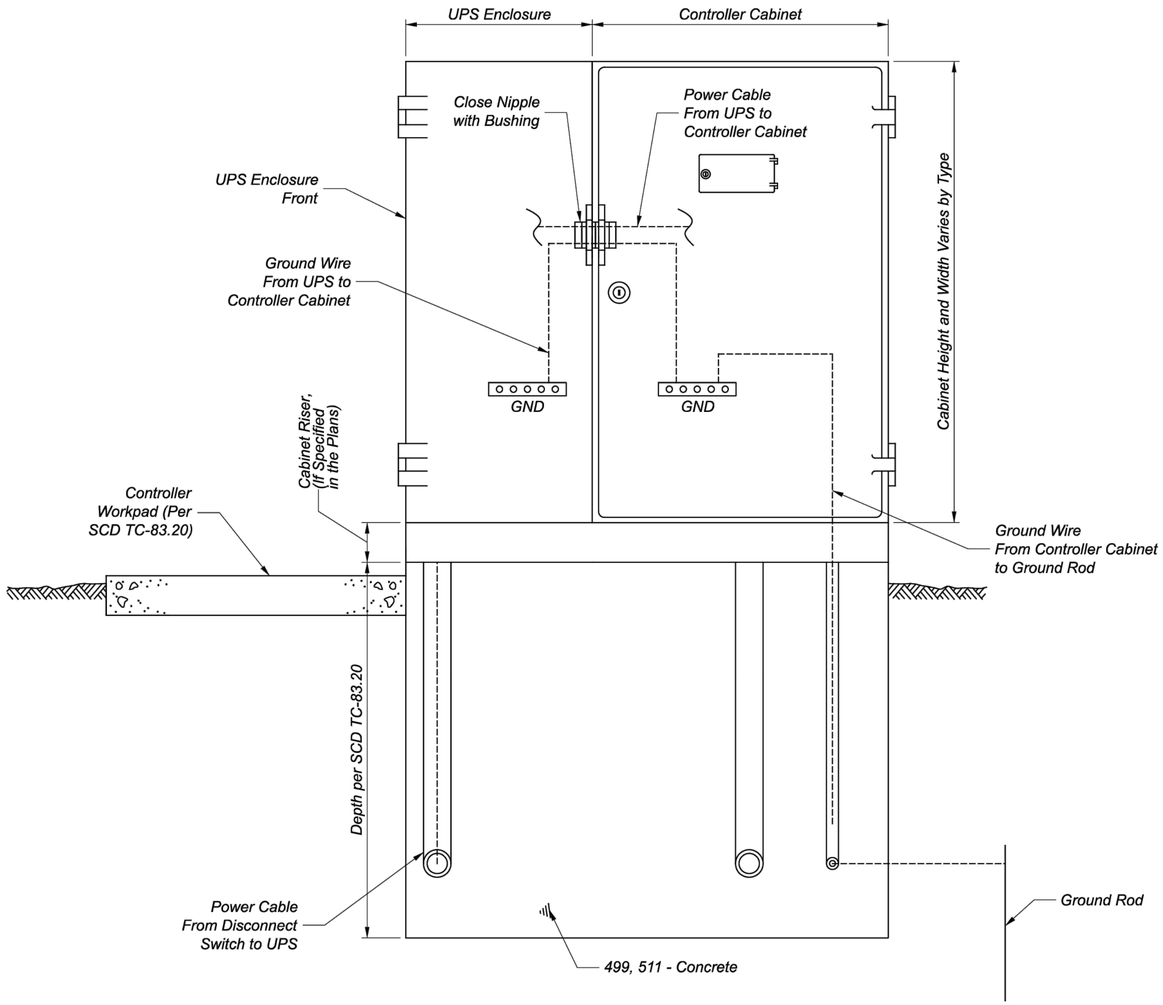

NOTES:

1. THE UNINTERRUPTIBLE POWER SUPPLY (UPS) ENCLOSURE SHALL BE MOUNTED FLUSH UP AGAINST THE TRAFFIC SIGNAL CABINET AND SEALED WITH SILICONE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE NECESSARY POWER CABLE BETWEEN THE UPS UNIT AND SIGNAL CABINET.
2. THE UPS SHOULD BE PLACED ON THE OPPOSITE SIDE OF THE PULL BOX ON A 332/336 CABINET (PER STANDARD CONSTRUCTION DRAWING (SCD) TC-83.20). THE UPS PLACEMENT FOR A NEMA CABINET VARIES, PLACEMENT SHOULD PROVIDE ADEQUATE ACCESS WITH RESPECT TO SLOPE, GUARDRAIL SPACING, ETC.
3. THE SIZE, NUMBER, AND LOCATION OF ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. THE SIZE, NUMBER, AND ORIENTATION OF CONDUIT ELLS SHALL BE AS SHOWN IN THE PLAN, EXCEPT THAT A ¾" SCHEDULE 40 PVC SHALL BE INSTALLED IN EACH FOUNDATION.
5. ½" PREFORMED JOINT FILLER AS PER CMS 705.03 SHALL BE USED BETWEEN FOUNDATIONS AND ADJACENT PAVED AREAS.
6. SEE SCD TC-83.20 FOR FURTHER DETAILS.

TYPE	W (IN.)	D (IN.)	FOUNDATION CONCRETE (CU. YD.)
TS-1	60	24	1.23
TS-2	70	36	2.16
2070/170	50	36	1.54

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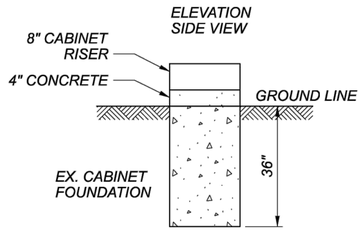
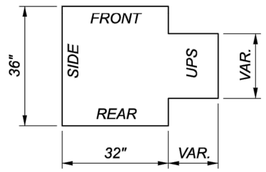
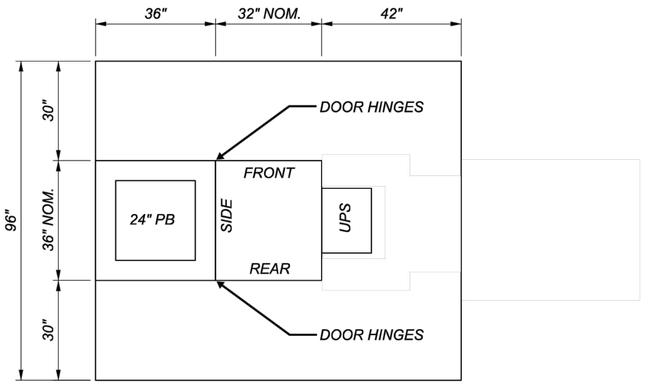
MODEL 332 CABINET DETAIL (TYP.)

UPS FOUNDATION DETAIL





UPS WORK PAD DETAIL



PLAN VIEW

NOTES:

1) THE SIZE OF THE UPS FOUNDATION MAY VARY BASED ON THE CABINET SIZE PROVIDED.

2) UPS FOUNDATION ELEVATION SHOULD MATCH CABINET FOUNDATION ELEVATION.

3) THE UPS CABINET SHALL BE MOUNTED FLUSH UP AGAINST THE SIGNAL CABINET AND SEALED.

4) CONDUIT AND WIRING FROM THE SIGNAL CABINET TO THE UPS SHALL BE INSTALLED THROUGH THE CABINET RISER.

CALCULATED IMP
CHECKED REM

TRAFFIC SIGNAL GENERAL NOTES
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SEPAC AND ASC/3 INPUT FILE INFORMATION FOR THE 332 CABINET

UPPER INPUT FILE (FILE=I)

UPPER CHANNEL	PHASE	1	2	2	2	3	4	4	4	1		MANUAL	2	6	FLASH
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	CONTROL ADV.	PED	PED	SENSE
	SEPAC DETECTOR NO.	VEH 1	VEH 3	VEH 5	VEH 7	VEH 9	VEH 11	VEH 13	VEH 15	VEH 17			PED 2	PED 6	
	ASC/3 DETECTOR NO.	VEH 1	VEH 2	VEH 3	VEH 4	VEH 5	VEH 6	VEH 7	VEH 8	VEH 9			PED 2	PED 6	
	C1 PIN NUMBER	56	39	63	47	58	41	65	49	60		80	67	68	81
	FIELD TERMINALS	1-D,E	2-D,E	3-D,E	4-D,E	5-D,E	6-D,E	7-D,E	8-D,E	9-D,E	10-D,E	11-D,E	12-D,E	13-D,E	14-D,E
SLOT NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOWER CHANNEL	PHASE	1	2	2	2	3	4	4	4	3		ADV.	4	8	STOP
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	ENABLE	PED	PED	TIME
	SEPAC DETECTOR NO.	VEH 1	VEH 4	VEH 6	VEH 7	VEH 9	VEH 12	VEH 14	VEH 15	VEH 18			PED 4	PED 8	
	ASC/3 DETECTOR NO.	VEH 1	VEH 10	VEH 11	VEH 4	VEH 5	VEH 14	VEH 15	VEH 8	VEH 13			PED 4	PED 8	
	C1 PIN NUMBER	56	43	76	47	58	45	78	49	62		53	69	70	82
	FIELD TERMINALS	1-J,K	2-J,K	3-J,K	4-J,K	5-J,K	6-J,K	7-J,K	8-J,K	9-J,K	10-J,K	11-J,K	12-J,K	13-J,K	14-J,K

LOWER INPUT FILE (FILE=J)

UPPER CHANNEL	PHASE	5	6	6	6	7	8	8	8	5					
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	SPARE	EV - A	EV - B	RR - 1
	SEPAC DETECTOR NO.	VEH 19	VEH 21	VEH 23	VEH 25	VEH 29	VEH 31	VEH 33	VEH 35	VEH 37					
	ASC/3 DETECTOR NO.	VEH 17	VEH 18	VEH 19	VEH 20	VEH 21	VEH 22	VEH 23	VEH 24	VEH 25					
	C1 PIN NUMBER	55	40	64	48	57	42	66	50	59		54	71	72	51
	FIELD TERMINALS	1-D,E	2-D,E	3-D,E	4-D,E	5-D,E	6-D,E	7-D,E	8-D,E	9-D,E	10-D,E	11-D,E	12-D,E	13-D,E	14-D,E
SLOT NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOWER CHANNEL	PHASE	5	6	6	6	7	8	8	8	7					
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	SPARE	EV - C	EV - D	RR - 2
	SEPAC DETECTOR NO.	VEH 19	VEH 22	VEH 24	VEH 25	VEH 29	VEH 32	VEH 34	VEH 35	VEH 38					
	ASC/3 DETECTOR NO.	VEH 17	VEH 26	VEH 27	VEH 20	VEH 21	VEH 30	VEH 31	VEH 24	VEH 29					
	C1 PIN NUMBER	55	44	77	48	57	46	79	50	61		75	73	74	52
	FIELD TERMINALS	1-J,K	2-J,K	3-J,K	4-J,K	5-J,K	6-J,K	7-J,K	8-J,K	9-J,K	10-J,K	11-J,K	12-J,K	13-J,K	14-J,K

SEPAC AND ASC/3 INPUT FILE INFORMATION FOR THE 336 CABINET

UPPER CHANNEL	PHASE	1	2	3	4	5	6	7	8				2	6	FLASH
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	RR - 1	EV - A	EV - B	PED	PED	SENSE
	SEPAC DETECTOR NO.	VEH 1	VEH 3	VEH 9	VEH 11	VEH 19	VEH 21	VEH 29	VEH 31				PED 2	PED 6	
	ASC/3 DETECTOR NO.	VEH 1	VEH 2	VEH 5	VEH 6	VEH 17	VEH 18	VEH 21	VEH 22				PED 2	PED 6	
	C1 PIN NUMBER	56	39	58	41	55	40	57	42	51	71	72	67	68	81
	FIELD TERMINALS	1-D,E	2-D,E	3-D,E	4-D,E	5-D,E	6-D,E	7-D,E	8-D,E	9-D,E	10-D,E	11-D,E	12-D,E	13-D,E	14-D,E
SLOT NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOWER CHANNEL	PHASE	2	2	4	4	6	6	8	8				4	8	STOP
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	RR - 2	EV - C	EV - D	PED	PED	TIME
	SEPAC DETECTOR NO.	VEH 7	VEH 4	VEH 15	VEH 12	VEH 25	VEH 22	VEH 35	VEH 32				PED 4	PED 8	
	ASC/3 DETECTOR NO.	VEH 4	VEH 10	VEH 8	VEH 14	VEH 20	VEH 26	VEH 24	VEH 30				PED 4	PED 8	
	C1 PIN NUMBER	47	43	49	45	48	44	50	46	52	73	74	69	70	82
	FIELD TERMINALS	1-J,K	2-J,K	3-J,K	4-J,K	5-J,K	6-J,K	7-J,K	8-J,K	9-J,K	10-J,K	11-J,K	12-J,K	13-J,K	14-J,K

CALCULATED IMP CHECKED REM

TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

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NOTES:

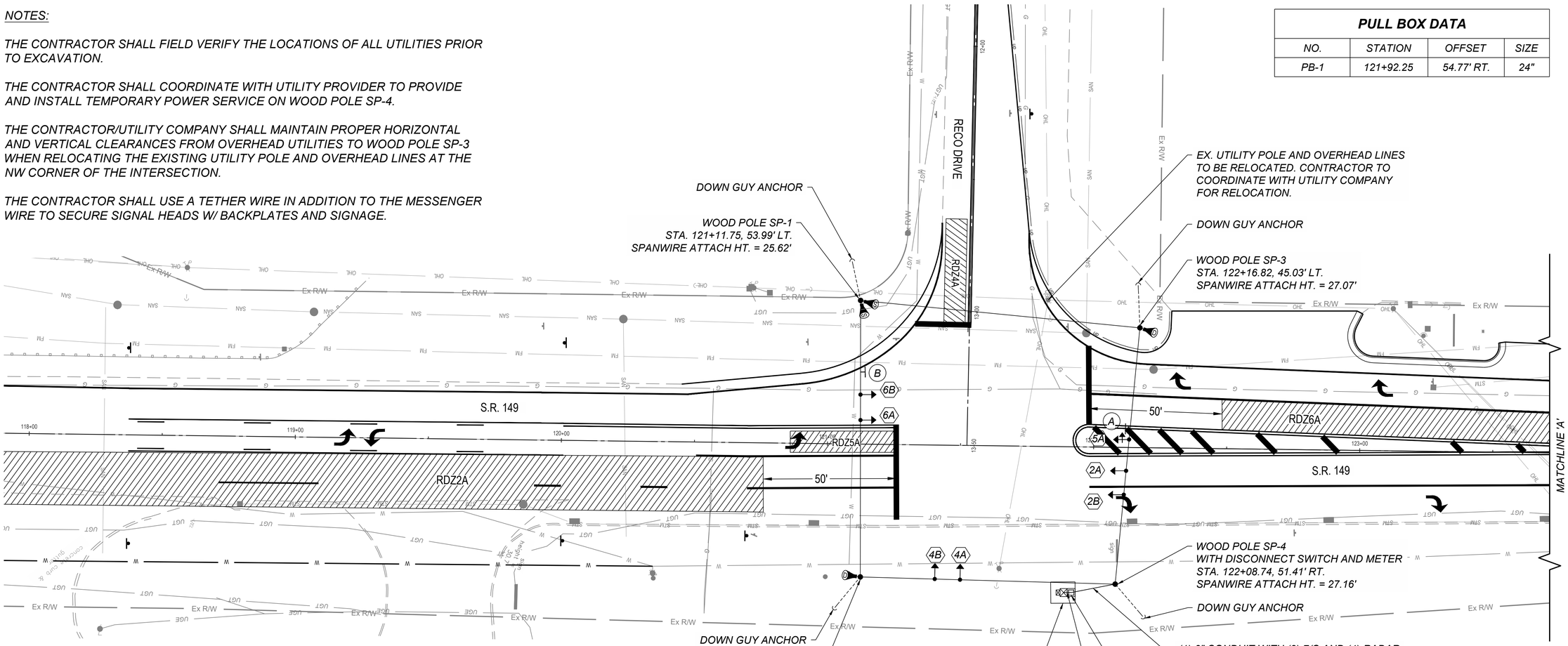
THE CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL UTILITIES PRIOR TO EXCAVATION.

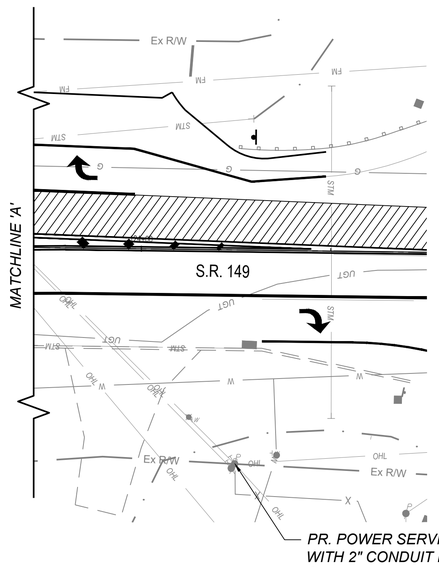
THE CONTRACTOR SHALL COORDINATE WITH UTILITY PROVIDER TO PROVIDE AND INSTALL TEMPORARY POWER SERVICE ON WOOD POLE SP-4.

THE CONTRACTOR/UTILITY COMPANY SHALL MAINTAIN PROPER HORIZONTAL AND VERTICAL CLEARANCES FROM OVERHEAD UTILITIES TO WOOD POLE SP-3 WHEN RELOCATING THE EXISTING UTILITY POLE AND OVERHEAD LINES AT THE NW CORNER OF THE INTERSECTION.

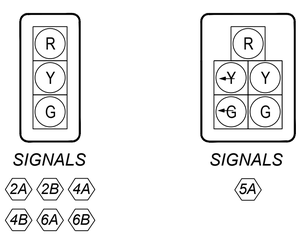
THE CONTRACTOR SHALL USE A TETHER WIRE IN ADDITION TO THE MESSENGER WIRE TO SECURE SIGNAL HEADS W/ BACKPLATES AND SIGNAGE.

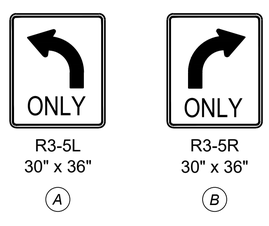
PULL BOX DATA			
NO.	STATION	OFFSET	SIZE
PB-1	121+92.25	54.77' RT.	24"





PROPOSED VEHICULAR SIGNAL HEADS





- ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
- ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
- ALL SIGNAL HEAD VISORS SHALL BE TUNNEL TYPE.

LEGEND

- WOOD SIGNAL SUPPORT POLE
- 3-SECTION VEHICLE SIGNAL HEAD
- 5-SECTION VEHICLE SIGNAL HEAD
- OVERHEAD SIGN
- CONTROLLER CABINET AND WORK PAD (332L)
- PULL BOX
- CONDUIT
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- DETECTION ZONE

GRAPHIC SCALE (IN FEET): 40 20 0 10 20

CALCULATED: JMP
CHECKED: REM

TRAFFIC SIGNAL PLAN
S.R. 149

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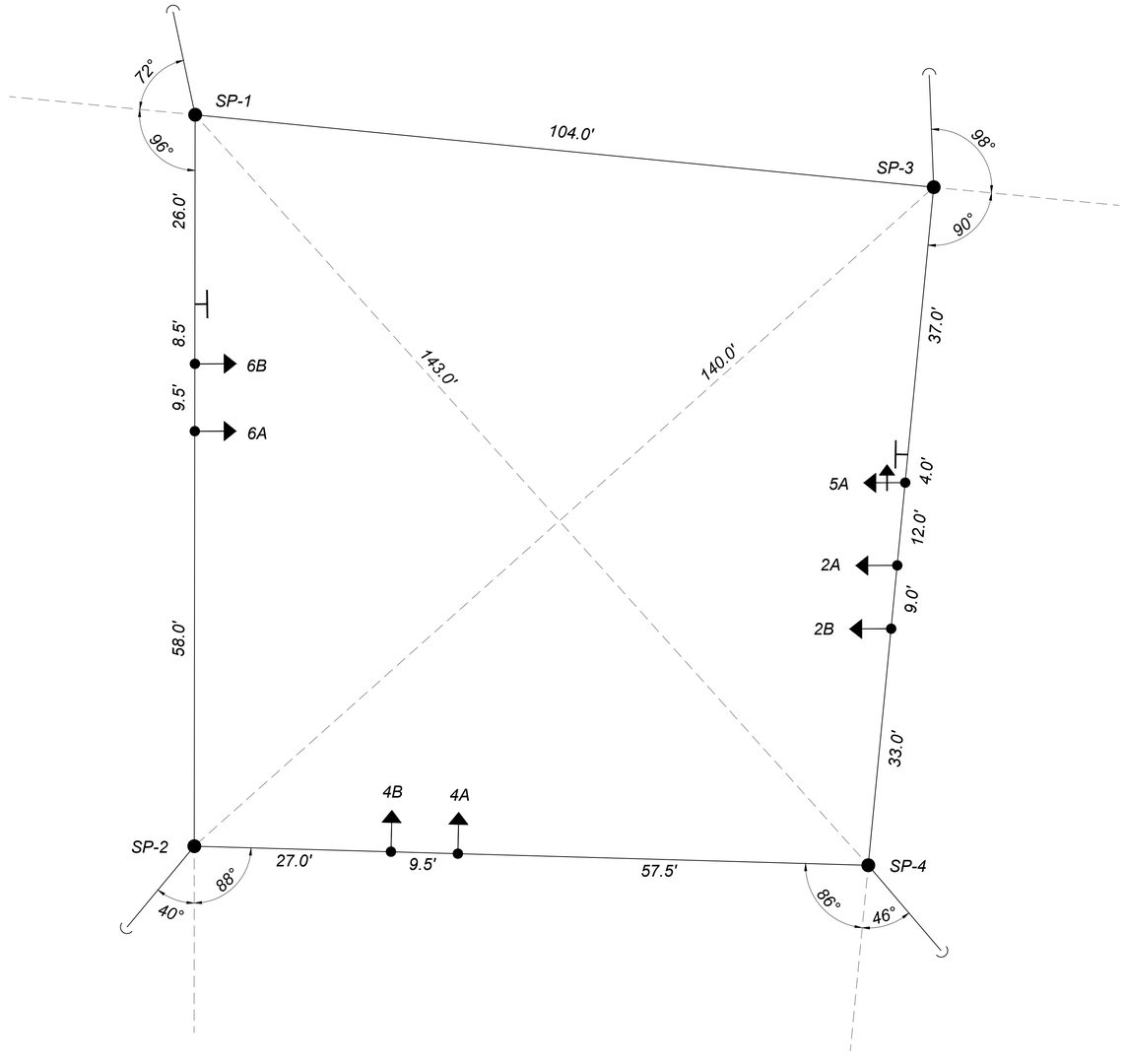
T13



SPAN WIRE PLAN VIEW DETAIL

WOOD POLE TABLE

REFERENCE SHEET NO.	STATION & OFFSET	POLE NO.	WOOD POLE CLASS	POLE HEIGHT (FT.)	FOUNDATION ELEVATION (FT.)	SPAN WIRE ATTACHEMENT HEIGHT (FT.)
T7	STA. 121+11.75, 53.99' LT	SP-1	H2	35.0	1190.95	25.62
T7	STA. 121+12.96, 49.92' RT	SP-2	H2	35.0	1192.55	25.66
T7	STA. 122+16.82, 45.03' LT	SP-3	H2	40.0	1190.23	27.07
T7	STA. 122+08.74, 51.41' RT	SP-4	H2	40.0	1193.15	27.16

CALCULATED IMP
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TRAFFIC SIGNAL PLAN DETAILS
S.R. 149

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SIGNAL TIMING CHART

INTERSECTION: S.R. 149 & RECO DRIVE MAINTAINING AGENCY: ODOT DISTRICT 11									
START UP		DUAL ENTRY: YES			PHASES:		2 + 6		
		REST IN RED:			RING 1 -		RING 2 -		
START IN: ALL RED TIME FOR FLASH, ALL RED: 5 SEC. FIRST PHASE(S): Ø2 + Ø6 COLOR DISPLAYED: GREEN		OVERLAP				A	B	C	D
		PHASES				-	-	-	-
INTERVAL OR FEATURE		CONTROLLER MOVEMENT NO.							
INTERSECTION MOVEMENT (PHASE)		1	2	3	4	5	6	7	8
DIRECTION		-	NB	-	EB	NBLT	SB	-	-
MINIMUM GREEN (INITIAL)	(SEC.)	-	20	-	10	7	20	-	-
ADDED INITIAL	*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL	*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)	(SEC.)	-	2.0	-	2.0	2.0	2.0	-	-
TIME BEFORE REDUCTION	*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP	*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE	*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I	(SEC.)	-	34	-	14	8	21	-	-
MAXIMUM GREEN II	(SEC.)	-	-	-	-	-	-	-	-
YELLOW CHANGE	(SEC.)	-	5.0	-	4.5	4.0	5.0	-	-
ALL RED CLEARANCE	(SEC.)	-	1.0	-	1.0	1.5	1.0	-	-
DELAYED GREEN (LPI) #	(SEC.)	-	-	-	-	-	-	-	-
WALK	(SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE	(SEC.)	-	-	-	-	-	-	-	-
RECALL	MAXIMUM (ON/OFF)	-	OFF	-	OFF	-	OFF	-	OFF
	MINIMUM (ON/OFF)	-	ON	-	OFF	-	ON	-	OFF
	PEDESTRIAN (ON/OFF)	-	OFF	-	OFF	-	OFF	-	OFF
MEMORY	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	OFF

*VOLUME DENSITY CONTROLS

NOTES:

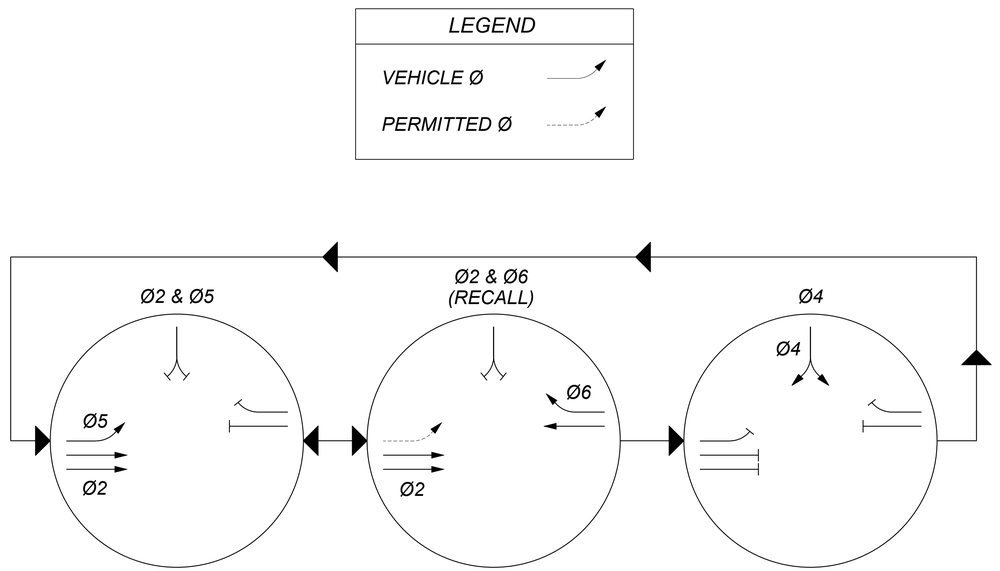
- ALL MOVEMENTS SHALL BE ACTUATED. THE PRIMARY THRU MOVEMENT SHOULD HAVE MIN RECALL ACTIVE TO REST IN GREEN.

-RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLE TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6.0 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.

-RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM THE STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.

- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PHASING DIAGRAM



RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	DETECTOR NO.	PURPOSE	DETECTION ZONE LENGTH (FT)
RDZ5A	NB LT	PRESENCE	Ø5	5.0	2.0	D2A	STOP BAR	40
RDZ2A	NB	PULSE	Ø2	0.0	2.0	D2B	DILEMMA ZONE	850
RDZ4A	EB LR	PRESENCE	Ø4	10.0	2.0	D4A	STOP BAR	40
RDZ6A	SB	PULSE	Ø6	0.0	2.0	D6A	DILEMMA ZONE	850

NOTE: ALL DETECTION ZONES SHALL BE CENTERED IN THEIR RESPECTIVE LANES UNLESS OTHERWISE SHOWN.

CALCULATED IMP
CHECKED REM

TRAFFIC SIGNAL PLAN DETAILS
S.R. 149

BEL-149-23.44

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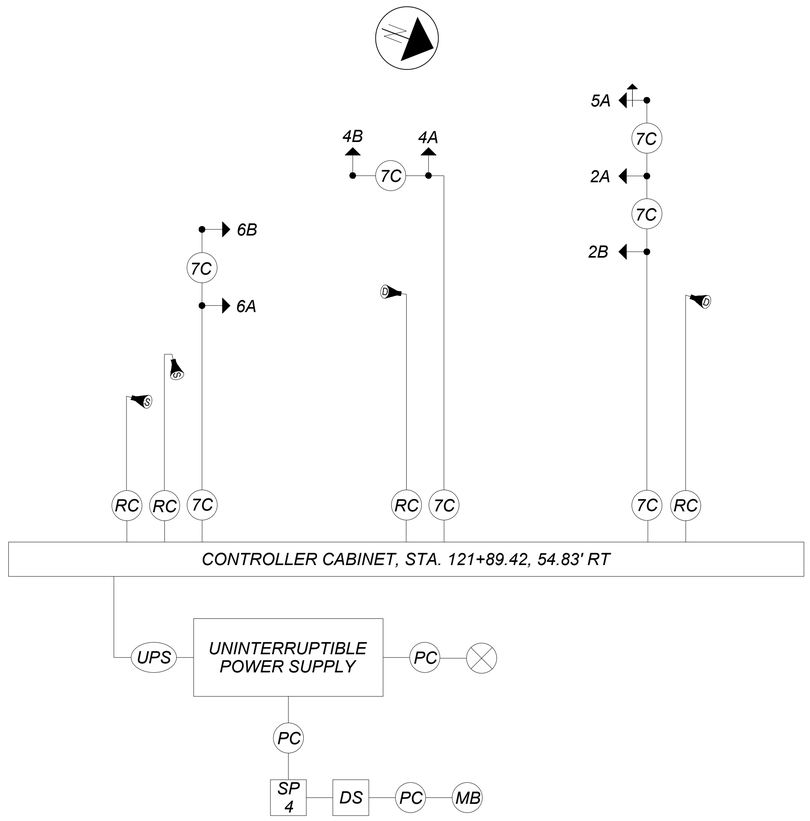
WIRING DIAGRAM



WIRING DIAGRAM LEGEND

5-SECTION VEHICULAR SIGNAL HEAD, 1-WAY		POWER SOURCE	
3-SECTION VEHICULAR SIGNAL HEAD, 1-WAY		PC	POWER CABLE, 2 CONDUCTOR, NO. 6 AWG
STOP BAR RADAR DETECTION UNIT		MB	METER BASE
DILEMMA ZONE RADAR DETECTION UNIT		DS	SIGNAL DISCONNECT SWITCH
7C	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	UPS	UNINTERRUPTIBLE POWER SUPPLY CABLE
RC	RADAR DETECTION CABLE		

TRAFFIC SIGNAL SUBSUMMARY

ITEM	DESCRIPTION	QUANTITY	UNIT
625	CONDUIT, 2", 725.04	FT	20
625	CONDUIT, 3", 725.04	FT	20
625	TRENCH	FT	20
625	PULL BOX, 725.08, 24"	EACH	1
625	GROUND ROD	EACH	5
625	UNDERGROUND WARNING/MARKING TAPE	FT	20
625	ARC FLASH CALCULATIONS AND LABEL	EACH	1
630	SIGN HANGER ASSEMBLY, SPAN WIRE	EACH	2
630	SIGN, FLAT SHEET	SF	15
632	VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE	EACH	6
632	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE	EACH	1
632	COVERING OF VEHICULAR SIGNAL HEAD	EACH	7
632	MESSENGER WIRE, 7 STRAND, 3/8" DIAMETER WITH ACCESSORIES	FT	435
632	TETHER WIRE, WITH ACCESSORIES	FT	435
632	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	FT	518
632	WOOD POLE	EACH	4
632	DOWN GUY	EACH	4
632	POWER CABLE, 2 CONDUCTOR, NO. 6 AWG	FT	40
632	POWER SERVICE, AS PER PLAN	EACH	1
632	CONDUIT RISER, 2" DIAMETER	EACH	2
633	CABINET, TYPE 332L, AS PER PLAN	EACH	1
633	CABINET FOUNDATION	EACH	1
633	CONTROLLER WORK PAD	EACH	1
633	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN	EACH	1
633	CONTROLLER ITEM, MISC.: TIMING AND COORDINATION	EACH	1
633	COMMUNICATIONS, AS PER PLAN	EACH	1
809	ADVANCED RADAR DETECTION, AS PER PLAN	EACH	2
809	STOP LINE RADAR DETECTION, AS PER PLAN	EACH	2
809	ATC CONTROLLER, AS PER PLAN	EACH	1

FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
5A (NB LT)	R	Ø2 R	R
	Y	Ø2 Y	
	G	Ø2 G	
	<--Y---	Ø5 Y	
	<--G---	Ø5 G	
2A, 2B (NB)	R	Ø2 R	R
	Y	Ø2 Y	
	G	Ø2 G	
4A, 4B (EB)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
6A, 6B (SB)	R	Ø6 R	R
	Y	Ø6 Y	
	G	Ø6 G	
LS = LOAD SWITCH			

CALCULATED IMP
CHECKED REM

TRAFFIC SIGNAL PLAN DETAILS
S.R. 149

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COORDINATION TIME CHART

"INTERSECTION 1" - S.R. 149 & RECO DRIVE										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	EB	NBLT	SB	-	-		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	40	-	20	13.4	26.6	-	-	55	-
2	-	52.6	-	17.4	13.4	39.2	-	-	64	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

"INTERSECTION 2" - I-70 EASTBOUND RAMPS & S.R. 149										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	EB	-	SB	-	-		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	42	-	18	-	42	-	-	52	-
2	-	47.5	-	22.5	-	47.5	-	-	62	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

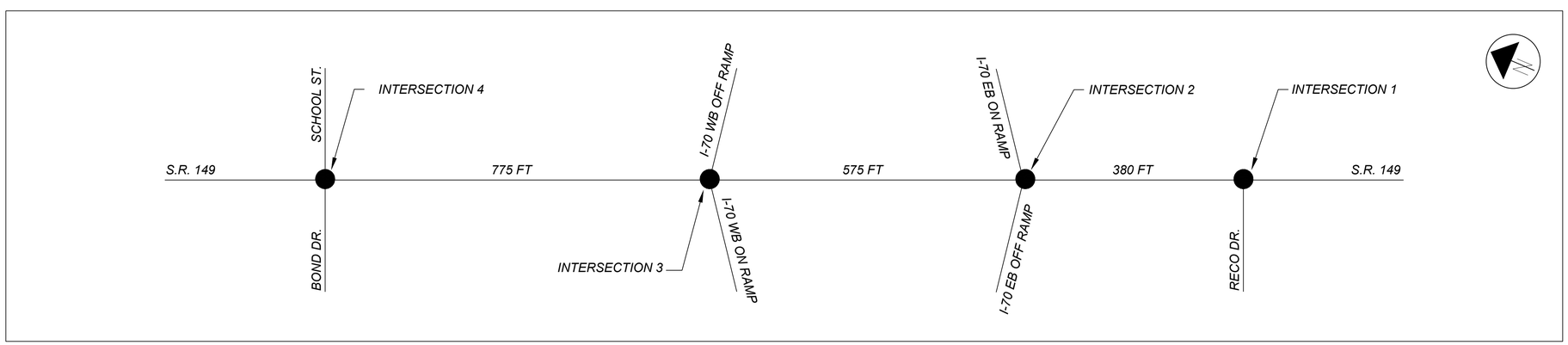
"INTERSECTION 3" - I-70 WESTBOUND RAMPS & S.R. 149 (MASTER)										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	WB	-	SB	-	WB		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	37.5	-	22.5	-	37.5	-	-	0	-
2	-	43	-	27	-	43	-	-	0	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

"INTERSECTION 4" - S.R. 149 & BOND DRIVE/SCHOOL STREET										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	EB	-	SB	-	WB		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	37	-	23	-	37	-	23	12	-
2	-	42	-	28	-	42	-	28	5	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

COORDINATION TIMING PLANS

DAY(S) OF WEEK	PLAN NAME	HOURS	PLAN NO. OR CYCLE/SPLIT/OFFSET	CYCLE LENGTH (SEC)
-	-	-	-	-
SAT-SUN	FREE	0000 - 2400	FREE	FREE
-	-	-	-	-
MON-FRI	FREE	0000 - 0700	FREE	FREE
MON-FRI	AM PEAK	0700 - 0930	1	60
MON-FRI	FREE	0930 - 1430	FREE	FREE
MON-FRI	PM PEAK	1430 - 1800	2	70
MON-FRI	FREE	1800 - 2400	FREE	FREE
-	-	-	-	-

COORDINATION LAYOUT



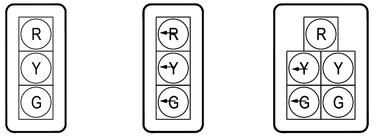
CALCULATED IMP
CHECKED REM

TRAFFIC SIGNAL COORDINATION PLAN
S.R. 149

BEL-149-23.44

T11
T13

SIGNAL HEADS, 12", LED WITH BACK PLATES



SIGNALS 2A, 2B, 2C, 4C, 6A, 6C

SIGNALS 4A

SIGNALS 4B, 6B

TRAFFIC SIGNAL SUBSUMMARY			
ITEM	QUANTITY	UNIT	
614	1	LS	MAINTAINING TRAFFIC
632	1	EACH	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE
809	1	EACH	STOP LINE RADAR DETECTION, AS PER PLAN

EXISTING 3-SECTION SIGNAL HEAD TO BE REPLACED WITH 5-SECTION SIGNAL HEAD.

CONTRACTOR TO WIRE LEFT TURN ARROWS TO PHASE 1 AND THROUGH BALLS TO PHASE 6 IN THE CABINET.

CONTROLLER WORK (TO BE DONE BY ODOT ONCE CONSTRUCTION IS COMPLETED).

- ACTIVATE PHASE 1.
- CHANGE RING STRUCTURE TO MAKE IT A LAGGING LEFT.
- ENABLE PREEMPT 3 FOR SB APPROACH (PH 1 & PH 6).
- SOLDER MONITOR CARD SO 1&6 CAN TURN ON AT THE SAME TIME.

EX. PB-3

EX. 70'-CONDUIT, 3", 725.04
1-7/C
PR. 1-WAVETRONIX

EX. SIGNAL SUPPORT (SP-3)
STA. 126+55, 27' LT.

CONTRACTOR TO MOUNT STOP LINE RADAR DETECTION UNIT TO TOP OF POLE.
ASSIGN DETECTOR TO PHASE 1.
PUT 5 SECOND DELAY ON THE DETECTOR IN CONTROLLER.

EX. 71'-CONDUIT, JACKED OR DRILLED, 3"
1-7/C
PR. 1-WAVETRONIX

EX. SIGNAL SUPPORT (SP-2)
STA. 125+90, 46' RT.

EX. 102'-CONDUIT, JACKED OR DRILLED, 3"
2-7/C, 2-WAVETRONIX RADAR
PR. 1-WAVETRONIX RADAR

EX. SIGNAL SUPPORT (SP-1)
W/ 2" CONDUIT RISER
STA. 124+90, 46' RT.

RAMP A

RAMP B

S.R. 149

RDZ2A

RDZ2B

RDZ4B

RDZ4A

RDZ6

6A

6B

6C

2A

2B

2C

4C 4B 4A

PB-2

Ex R/W

R/W

PULL BOX DATA			
NO.	STATION	OFFSET	SIZE
PB-1	124+82.8	42' RT.	24"
PB-2	125+85	41' RT.	18"
PB-3	125+85	30' LT.	18"

LEGEND

	EXISTING	PROPOSED
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
TRAFFIC SIGNAL, 3 UNIT HEAD, 12" WITH ARROWS		
TRAFFIC SIGNAL, 5 UNIT HEAD, 12" WITH ARROWS		
SIGNAL SUPPORT POLE		
332 CONTROLLER AND WORK PAD		
TRAFFIC PULL BOX		
DILEMMA ZONE RADAR DETECTION UNIT		
STOP LINE RADAR DETECTION UNIT		
DETECTION ZONE		

GRAPHIC SCALE (IN FEET)
40 20 0 10 20

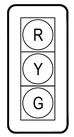
CALCULATED TMC
CHECKED REM

TRAFFIC SIGNAL PLAN
S.R. 149 & EASTBOUND I.R. 70 RAMPS

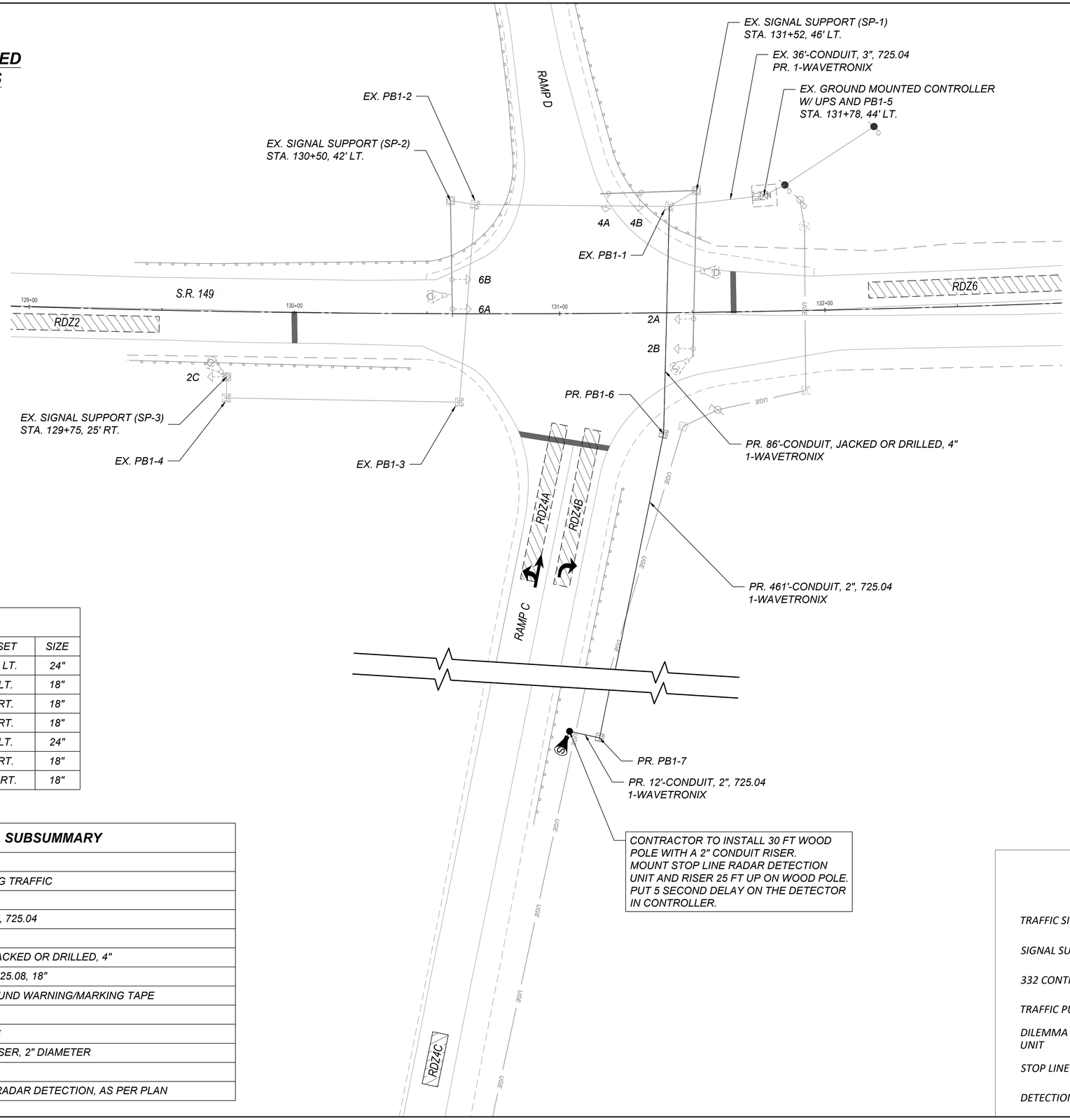
BEL-149-23.44

T12
T13

SIGNAL HEADS, 12", LED WITH BACK PLATES



SIGNALS
2A, 2B, 2C,
4A, 4B, 6A, 6B



PULL BOX DATA

	NO.	STATION	OFFSET	SIZE
EX.	PB1-1	131+42	40.5' LT.	24"
EX.	PB1-2	130+68	41' LT.	18"
EX.	PB1-3	130+68	31' RT.	18"
EX.	PB1-4	129+75	30' RT.	18"
EX.	PB1-5	131+78	44' LT.	24"
PR.	PB1-6	131+39	46' RT.	18"
PR.	PB1-7	130+49	497' RT.	18"

TRAFFIC SIGNAL SUBSUMMARY

ITEM	QUANTITY	UNIT	
614	1	LS	MAINTAINING TRAFFIC
625	473	FT	CONDUIT, 2", 725.04
625	473	FT	TRENCH
625	86	FT	CONDUIT, JACKED OR DRILLED, 4"
625	2	EACH	PULL BOX, 725.08, 18"
625	473	FT	UNDERGROUND WARNING/MARKING TAPE
632	1	EACH	WOOD POLE
632	1	EACH	CONDUIT RISER, 2" DIAMETER
809	1	EACH	STOP LINE RADAR DETECTION, AS PER PLAN

LEGEND

	EXISTING	PROPOSED
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
SIGNAL SUPPORT POLE		
332 CONTROLLER AND WORK PAD		
TRAFFIC PULL BOX		
DILEMMA ZONE RADAR DETECTION UNIT		
STOP LINE RADAR DETECTION UNIT		
DETECTION ZONE		

GRAPHIC SCALE (IN FEET)
40 20 0 10 20

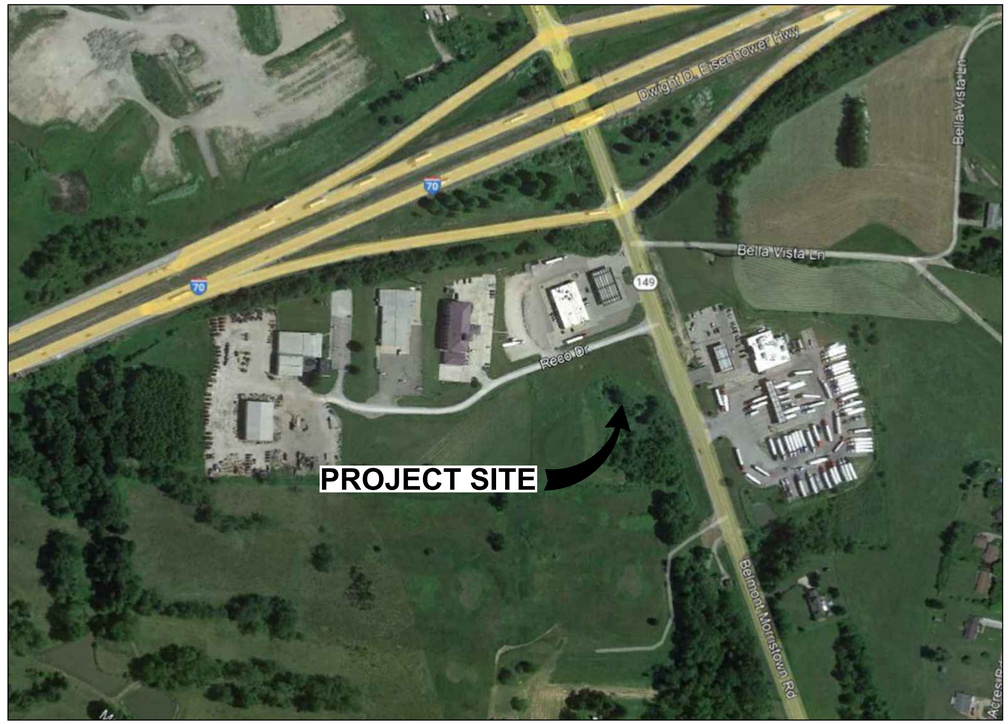
CALCULATED TMC
CHECKED REM

TRAFFIC SIGNAL PLAN
S.R. 149 & WESTBOUND I.R. 70 RAMPS

BEL-149-23.44

T13
T13

PROPOSED REINFORCED SOIL SLOPE (RSS) AND EMBANKMENT SLOPES FOR LOVE'S TRAVEL STOP - S.R. 149 ROADWAY SLOPES ST. CLAIRSVILLE, OHIO



N

SCALE: N.T.S.

NOTE: SITE IMAGE PROVIDED BY GOOGLE EARTH, PRO, 2023.

VICINITY MAP

PREPARED FOR:

Love's Travel Stops & Country Stores

OHIO811.org Before You Dig

SHEET INDEX

REV	DATE	BY	DESCRIPTION
10	08-12-2024	MWF	CCD10

COVER SHEET

LOVE'S TRAVEL STOP - S.R. 149 ROADWAY SLOPES
66320 BELMONT-MORRISTOWN ROAD
ST. CLAIRSVILLE OHIO

terracon
4685 SOUTH ASH AVENUE, SUITE H-4
PH: (480) 897-8200
TEMPE, AZ 85282
FAX: (480) 897-1133

STATE OF OHIO
YOGESH REGE
E-65651
REGISTERED PROFESSIONAL ENGINEER

GR-1	
DESIGNED BY:	JP
DRAWN BY:	MWF
APPVD. BY:	TMK
SCALE:	AS SHOWN
DATE:	9/06/24
JOB NO.	65235270
ACAD NO.	1 GR-1
SHEET NO.:	1 OF 6

SECTION 1: GENERAL TECHNICAL NOTES

1.01 Description:

The work shall consist of furnishing and constructing a reinforced soil slope system and embankment slope systems in accordance with this technical scope of work and in reasonably close conformity with the lines, grades, and dimensions shown on the CAD file of the Civil grading plans for Love's Travel Stop – St. Clairsville, OH, by Ceso, Inc., received via email dated February 23, 2024.

1.02 Work Included:

A. Excavation, placement and compaction of backfill material as specified herein and as shown on the construction drawings.

B. Furnishing and installing uniaxial and biaxial geogrid reinforcement for the reinforced slope system as shown on the construction drawings.

C. Furnishing and installing a geotextile fabric used to wrap the face of the reinforced slope system as shown on the construction drawings.

D. Furnishing and installing a Flexamat erosion control mat as shown on the construction drawings.

E. Installing a subdrain system as shown on the construction drawings.

1.03 Reference Documents:

A. American Association of State Highway and Transportation Officials (AASHTO)
- T-99 Moisture-Density Relations of Soils Using a 5.5 Pound Rammer in a 12-inch Drop

B. American Society for Testing and Materials Standards (ASTM)
- D-422 Method for Particle Size Analysis of Soils
- D-698 Method for Laboratory Compaction Characteristics of Soils Using Standard Effort
- D-1556 Method for Density and Unit Weight of Soil in-Place by the Sand Cone Method
- D-6938 Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods
- D-4253 Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
- D-4254 Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
- D-6637 Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method

C. Ceso Inc., Civil CAD files for Love's Travel Stop – St. Clairsville, OH, received via email dated February 23, 2024.

D. Terracon Consultants, Inc., Revised Geotechnical Engineering Report, Love's Travel Stop, Project No. N4225529, dated August 3, 2023.

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E. Terracon Consultants, Inc., Confirmatory Borings Performed on September 5, 2024 and In-Situ Shear Strength Testing Performed on September 13, 2024 at the Proposed Embankment Slope Locations.

F. Ohio Department of Transportation, Historical Boring Info along S.R. 149.

G. Ohio Department of Transportation, Construction and Material Specifications, January 1, 2023.

H. Ohio Department of Transportation, Supplemental Specification 863, Reinforced Soil Slopes, October 17, 2014.

I. Where specifications and reference documents conflict, the Engineer shall make final determination of the applicable document.

1.04 Special Provisions:

A. The designs presented herein are based on slope profiles, soil parameters, foundation conditions and loadings stated in documentation as outlined in Section 1.03, Items C through H, and Section 4.01.

B. The slope backfill to be used in the slope construction must meet specific engineering requirements as outlined in this Technical Scope of Work. The suitability of on-site materials for use in the slope construction, as specified herein, should be determined prior to construction.

C. We understand an existing sanitary sewer line will be decommissioned and a new sanitary sewer line will be established below the proposed embankment slope as shown on the construction drawings. Construction of the new sanitary sewer line shall be done coincidentally with construction of the proposed embankment slope.

D. The Contractor shall be responsible for the cost of all means of subsoil improvement; cost of additional subsoil exploration; and for all labor tools, equipment and incidentals necessary to complete the work.

E. The Contractor shall be responsible for complying with all federal, state and local requirements for execution of the work, including local building inspection and current OSHA excavation regulations.

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F. The Contractor shall provide a means of construction sequencing around the existing gas line including temporary excavation stability to maintain the integrity of the existing gas line and roadway. Temporary traffic detour will be necessary to maintain a minimum travel offset of no less than 10-feet from the crest of the temporary excavation slope. Traffic control to be provided by others.

G. Prior to undertaking any grading or excavation of the site, the Contractor shall confirm the locations of the proposed slopes and all underground features, including utility locations within the area of construction.

H. All work undertaken in the construction of the proposed slopes are subject to the quality control/assurance and special inspection provisions outlined in Section 3.08.

I. Construction of wet utilities including but not limited to water lines and landscape irrigation should not be permitted within the slope backfill.

J. Terracon has completed engineering design of the proposed slopes based upon the information provided to us as outlined above.

K. Any changes in planned grading, locations of structures or changes in slope profiles should be brought to the attention of Terracon for modification of the slope designs as necessary. Verify all dimensions and grades prior to slope construction.

SECTION 2: MATERIALS

2.01 Definitions:

A. Slope Backfill – compacted granular soil which is within the new compacted slope soil volume as outlined on the plans.

B. Erosion Control Mat – a tied concrete block mat with doubled layered underlayment or an approved equivalent system.

C. Primary Geogrid Reinforcement – a uniaxial geogrid reinforcement used for stability for the reinforced soil slope.

D. Secondary Geogrid Reinforcement – a biaxial geogrid reinforcement used for facial stability for the reinforced soil slope.

E. Geotextile – a spun-bound non-woven engineering fabric intended for facial stability for the reinforced soil slope.

F. Subdrain – a combined system of perforated pipe and geotextile fabric provided for drainage for the slope system.

G. Foundation Soil – compacted or in-situ soil beneath the entire slope.

H. Engineer – Terracon Consultants, Inc. – Phoenix, AZ

I. Geotechnical Engineer – Terracon Consultants, inc. – Columbus, OH

2.02 Slope Backfill:

A. Slope backfill shall consist of suitable granular materials meeting Ohio Department of Transportation, Section 703.16C, Granular Material Type C with the following gradation as determined in accordance with ASTM D-422:

Sieve Size	Percent Passing
3 inch	100
2 inch	70 - 90
1/2 inch	30 - 60
No. 200	0 – 13

B. The plasticity index of the fine fraction, per AASHTO T-90, shall be less than 6.

C. Slope backfill material shall have a soundness loss of 30 or less when tested in accordance with AASHTO T-104 using a magnesium sulfate solution with test duration of four cycles.

D. Slope backfill material shall exhibit an effective (drained) angle of friction of not less than 38°, determined in accordance with AASHTO T-236. The test shall be run on the portion finer than the No. 10 sieve. The sample will be compacted at optimum moisture content to 95% of the maximum dry density. No direct shear testing will be required when 80% or more of the material is larger than ¾-inch.

2.03 Below Grade Backfill:

A. Below grade backfill shall consist of suitable granular materials meeting Ohio Department of Transportation, Section 703.17 with the following gradation as determined in accordance with ASTM D-422:

Sieve Size	Percent Passing
2 inch	100
1 inch	70 - 100
3/4 inch	50 – 90
No. 4	30 – 60
No. 30	9 – 33
No. 200	0 – 15

B. Below grade backfill should only be placed at locations specified on the plans contained herein.

2.04 Erosion Control Mat:

A. The tied concrete block mat with doubled layered underlayment shall be a Flexamat Standard, manufactured by Motz Enterprises, Inc. or approved equivalent.

B. Concrete blocks, bi-axial geogrid, and underlayment materials shall be per the manufacturer's recommendations.

C. Chipping or missing concrete resulting in a weight loss exceeding 15% of the average weight of a concrete unit is grounds for rejection by the Engineer of record. Replace, repair or patch the damaged areas per the manufacturer's recommendations.

2.05 Primary Geogrid Reinforcement:

A. The primary geogrids for the reinforced soil slope shall be Type P2 uniaxial structural geogrid per Table 863.02-1 of the Supplemental Specification 863 for Reinforced Soil Slopes.

B. The primary geogrid reinforcement shall meet or exceed the following properties:

Geogrid Type	Minimum Long Term Design Strength (lb./ft)
P2	2000 plf

2.06 Secondary Geogrid Reinforcement:

A. The secondary geogrids for the reinforced soil slope shall be Type S2 biaxial geogrid per Table 863.02-1 of the Supplemental Specification 863 for Reinforced Soil Slopes.

B. The secondary geogrid reinforcement shall meet or exceed the following properties:

Geogrid Type	Minimum Ultimate Tensile Strength (lb./ft)
S2	2100 plf

2.07 Geotextiles:

A. The geotextile shall be Mirafi 160N as shown on the plans, or equivalent, consisting of spun-bound 100% continuous filament polyester needle punched engineering fabric or an approved equivalent.

2.08 Subdrain:

A. Geotextile used for subdrain construction shall be non-woven needle-punched fabric such as Mirafi 160N or equivalent.

B. The 4-inch diameter perforated pipe and solid pipe shall be PVC or HDPE such as ADS or an approved equivalent.

2.09 Delivery, Storage, Handling:

A. Erosion Control Mat

1. Contractor shall check to ensure that the proper materials have been received upon delivery.
2. Contractor shall prevent excessive mud, wet cement, epoxy, and like material which may affix themselves to the gridwork, from coming in contact with the erosion control mat.
3. Erosion control mats shall be stored according to manufacturer's recommendations.

B. Structural Geogrid and Geotextile

1. Contractor shall check to ensure that the proper materials have been received upon delivery.
2. All geogrids and geotextiles shall be stored above -20°F.
3. Contractor shall prevent excessive mud, wet cement, epoxy, and like material which may affix themselves to the gridwork, from coming in contact with the geogrid or geotextile material.
4. Geogrid and geotextiles shall be stored according to manufacturer's recommendations.

SECTION 3: EXECUTION

3.01 Construction:

A. The excavation shall be carried to the lines and grades shown on the construction drawings and to the extent necessary to place the new granular slope backfill. The Contractor shall be careful not to disturb base or existing soils/fills beyond the lines shown except for that necessary to comply with applicable safety regulations.

B. Excavations will be made in a manner which will not disturb the existing construction on the site. The Contractor will provide protection or will construct the slopes in such a manner to maintain the integrity of existing improvements during construction.

C. In-situ materials excavated from the location of the slopes shall be stockpiled on-site at locations designated by the Owner and in locations which will not interfere with the execution of the work.

D. Temporary traffic detour will be necessary to maintain a minimum travel offset of no less than 10-feet from the crest of the temporary excavation slope. Traffic control to be provided by others.

3.02 Subgrade Preparation:

A. Subgrade shall be excavated as required for placement of the slope backfill as shown on the construction drawings, or as directed by the Geotechnical Engineer.

B. Subgrade shall be examined by the Geotechnical Engineer to confirm that the actual foundation conditions meet or exceed design assumptions. As a minimum, soil shall be proof-rolled before construction proceeds. Subgrade conditions not meeting the required strength shall be removed and replaced with acceptable material.

C. Over-excavated areas shall be replaced with compacted granular backfill material or soils approved by the Geotechnical Engineer to the lines and grade shown on the construction drawings.

D. Granular backfill shall be placed in loose lifts not exceeding 10 inches in thickness, compacted to a minimum of 95 percent of the maximum density as determined by AASHTO T-99 or ASTM D-698. The moisture content of the backfill prior to, and during compaction shall be uniformly distributed throughout each layer and shall be within a range of 2% below, to 2% above optimum moisture content.

3.03 Slope Backfill Placement:

A. Slope backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8-10 inches where heavy mechanical compaction equipment is used.

B. Slope backfill shall be compacted to a minimum of 95 percent of the maximum density as determined by AASHTO T-99 or ASTM D-698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be within a range of 2% below, to 2% above optimum moisture content. If a well-defined maximum density curve cannot be generated by impact compaction in the laboratory, the backfill shall be compacted to a minimum of 70 percent of relative density as determined by ASTM D-4253 and D-4254.

C. Slope backfill shall be compacted in all areas to the lines and grades shown on the plans.

3.04 Structural Geogrid Installation:

A. Geogrid shall be orientated with the highest strength axis perpendicular to the slope alignment.

B. Geogrid reinforcement shall be placed at the elevations and to the extents shown on the construction drawings or as directed by the Engineer.

C. The geogrid soil reinforcement shall be laid horizontally on compacted backfill. The geogrid shall be pulled taut and anchored prior to backfill placement on the geogrid. No tensioning of the geogrid materials shall be required.

D. Geogrid reinforcements shall be continuous throughout their embedment lengths. Spliced connections between shorter pieces of geogrid will not be allowed.

E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent racks from displacing the fill and damaging the geogrid.

F. No changes to geogrid layout, including, but not limited to, length, geogrid type, or elevation, shall be made without approval of the Engineer.

3.05 Geotextile Installation:

A. Geotextiles shall be placed at the elevations, locations and to the extent shown on the construction drawings. Each layer shall be placed as shown on the drawings, with a minimum embedment length of 1.5 feet.

B. A minimum of 3 inches of soils shall be maintained between any geogrid reinforcement and the geotextile fabric.

3.06 Erosion Mat Installation:

A. Prior to installing Flexamat Standard, or approved equivalent, prepare the subgrade as detailed in the plans. All subgrade surfaces to be smooth and free of all rocks, stones, sticks, roots, and other protrusions or debris of any kind that would result in an individual block being raised more than 3/4 in. above the adjoining blocks.

B. Install mats to the lines and grades shown on the plans and per the manufacturer's guidelines. The manufacturer will provide technical assistance during preparation and installation of the concrete block mats as needed.

C. Provide a minimum 18 in. deep concrete mat embedment toe trench at all edges exposed to concentrated flows. Recess exterior edges subject to sheet flow a minimum of 6 in.

D. Provide fastening or anchoring as recommended by the manufacturer or Engineer for the site conditions.

3.07 Site Safety: 10

A. Daily inspections should be made of the excavation and adjacent areas, particularly at the tops of the cut slopes, by a competent person as defined by OSHA in 29 CFR Part 1926. Inspections should be made to evaluate conditions as outlined in applicable parts of the regulations. Any abnormal conditions should be evaluated for the potential impact on slope stability.

B. The stability of the slopes is highly dependent upon maintaining relatively dry (or existing) conditions. Surface drainage should be directed away from the face of all excavations. Ponding should not be allowed above any of the excavation slopes. On-site engineering observations of excavation conditions are recommended after any precipitation event during construction.

C. Spoil piles, other materials, and construction traffic should be maintained a sufficient distance from the edge of the crest of the slope. We recommend soil piles be located laterally from the edge of the excavation a minimum distance equal to the excavation depth and construction traffic should be a minimum of 10 feet from the crest of the slope.

D. OSHA dictates the competent person responsible for site safety must have knowledge of soil analysis, the use of protection systems, and OSHA standards and have the authority to take prompt measures to abate excavation hazards. This would require daily on-site inspection before workers enter the excavation, inspections periodically throughout the day and after rainfall or other hazard increasing occurrences. We recommend the person or persons responsible for performing the excavations become familiar with the appropriate OSHA guidelines and our excavation plan.

3.08 Quality Assurance:

A. Construction testing and inspection for the slope construction shall be conducted in accordance with the requirements of the Ohio Department of Transportation or as listed in the contract documents, project specifications and requirements. Unless otherwise outlined in the contract documents or ODOT specifications, the minimum quality assurance testing and inspection for the slope construction should be as outlined in this section.

B. All Special Inspectors shall be under the supervision of a registered engineer.

C. Testing and inspection services shall be performed only by trained and experienced personnel and experienced technicians currently qualified for the work they are to perform.

D. If Special Inspection is provided by anyone other than the Engineer of Record, the qualifications of all special inspectors shall be reviewed and approved by the Engineer of Record.

E. All work requiring Special Inspection shall be made available and remain accessible and exposed until it is observed by the Special Inspector.

F. Duties of the Special Inspector:

1. The Special Inspector shall observe the work requiring special inspection for conformance with the approved design drawings and specifications.
2. The Special Inspector shall furnish inspection reports to be kept at the site for use by the Ohio Department of Transportation, the Contractor and the Engineer of Record. If Special Inspection is provided by anyone other than the Engineer of Record, reports shall be submitted to the office of the Engineer of Record on a weekly basis. All discrepancies shall be brought to the attention of the Contractor for correction, then if uncorrected, to the design authority and the Owner/Ohio Department of Transportation.
3. Upon completion of the assigned work, the Special Inspector shall complete and sign a final report certifying that to the best of his knowledge, the work is in conformance with the approved plans and specifications, and the applicable workmanship provisions of the code.

G. The following Special Inspection Schedule provides the types, extents and frequency of specific items requiring special inspections and structural tests as part of this project:

SPECIAL INSPECTION SCHEDULE

Areas requiring special inspection:	Frequency: Continuous	Frequency: Periodic	Comments:
SPECIAL CASES			
Geogrid, Geotextile, and Erosion Control Mat	X		Special Inspection shall be made of the type, location, orientation and extent of the geogrid, geotextile, and erosion control mat placement in each slope.
Subdrain Installation		X	Special inspection shall be made of the placement and extent of the subdrain system within each wall.
SOILS			
Excavations		X	Verify excavations are extended to proper depth and have reached proper material. Verify extent and depth of benching in the slope.
Field Density		X	In accordance with ASTM D-6938 or ASTM D-1556. • Subgrade – One test every 500 to 1000 square feet of subgrade area. • Slope Backfill – One test every 500 to 1000 square feet of backfill per lift.
Moisture-Density Relationships		X	In accordance with AASHTO or ASTM criteria as specified for subgrade and slope backfill.
Gradation Analysis & Atterberg Limits		X	In accordance with ASTM D-422. • Slope Backfill – One test every 500 cubic yards of material.
Slope Backfill	X		Verify use of proper materials, densities and lift thickness during placement and compaction of slope backfill.
Direct Shear Testing		X	A minimum of no less than two (2) tests per soil type or change in soil borrow source. At the discretion of the Engineer, additional tests may be required if the source material or gradation of the slope backfill changes during construction.

SECTION 4: DESIGN NOTES FOR SLOPE SYSTEMS

4.01 Design Parameters:

A. Design of the proposed slopes are based on the following parameters:

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Slope Segment	Friction Angle	Cohesion	Unit Weight
Slope Backfill	38°	0 psf	120 pcf
Sandy Lean Clay (Native)	28°	100 psf	120 pcf
Existing Embankment Fill	18°	85 psf	115 pcf
Below Grade Backfill	30°	0 psf	120 pcf

B. Internal Stability
Minimum Factor of Safety (Geogrid Strength) 1.5
Minimum Factor of Safety (Sliding) 1.5
Percent Coverage of Geogrid 100%

C. External Stability
Minimum Factor of Safety (Global Stability) 1.5
Uniform Surcharge (Traffic) ..... 250 psf

D. Seismic Considerations
Factor of Safety Seismic Conditions ..... 0.75xStatic FS
Seismic Acceleration Coefficient (A) 0.045
Horizontal Pseudo-Static Seismic Coefficient (kh) 0.0225

REV	DATE	BY	DESCRIPTION
10	06-12-2024	MWF	CCD10

TECHNICAL SCOPE OF WORK

LOVE'S TRAVEL STOP - S.R. 149 ROADWAY SLOPES
66320 BELMONT-MORRISTOWN ROAD
ST. CLAIRSVILLE OHIO

terracon
TEMPE, AZ 85282
FAX: (480) 897-1133
4685 SOUTH ASH AVENUE, SUITE H-4
PH: (480) 897-8200

STATE OF OHIO
YOGESH REGE
E-65651
REGISTERED PROFESSIONAL ENGINEER

GR-2	
DESIGNED BY:	JP
DRAWN BY:	MWF
APPVD. BY:	TMK
SCALE:	AS SHOWN
DATE:	9/06/24
JOB NO.	65235270
ACAD NO.	2 GR-2
SHEET NO.:	2 OF 6

SITE PLAN BASED ON THE CIVIL CAD FILES FOR LOVE'S TRAVEL STOP - ST. CLAIRSVILLE, OH, RECEIVED VIA EMAIL DATED FEBRUARY 23, 2024.

THIS SITE PLAN IS FOR PROPOSED REINFORCED AND EMBANKMENT SLOPE LOCATIONS ONLY. REFER TO THE GRADING AND DRAINAGE PLAN BY CESO INC. FOR GRADING, SURVEY, DRAINAGE, PAVING AND ALL OTHER CIVIL ASPECTS OF THE PROJECT.

EMBANKMENT SLOPE WEST OF S.R. 149
STA 115+73 TO 117+35

REINFORCED SOIL SLOPE (RSS) WEST OF S.R. 149
STA 112+80 TO 113+33

EMBANKMENT SLOPE EAST OF S.R. 149
STA 113+00 TO 113+50

S.R. 149 (BELMONT MORRISTOWN ROAD)

C-C GR-5

A-A GR-4

B-B GR-4

STA 115+73

STA 117+35

STA 112+80

STA 113+33

STA 113+00

STA 113+50

WETLAND

ASPHALT APRON

SITE PLAN

SCALE 1"=20'
0 10 20 FEET

KEY PLAN

SCALE 1"=200'
0 100 200 FEET

REV	DATE	BY	DESCRIPTION
10	06-12-2024	MWF	CCD10

PROPOSED SLOPE EXTENTS AND SITE PLAN

LOVE'S TRAVEL STOP - S.R. 149 ROADWAY SLOPES
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STATE OF OHIO
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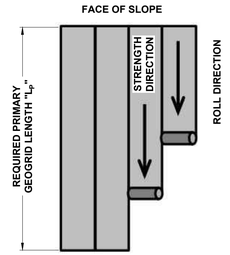
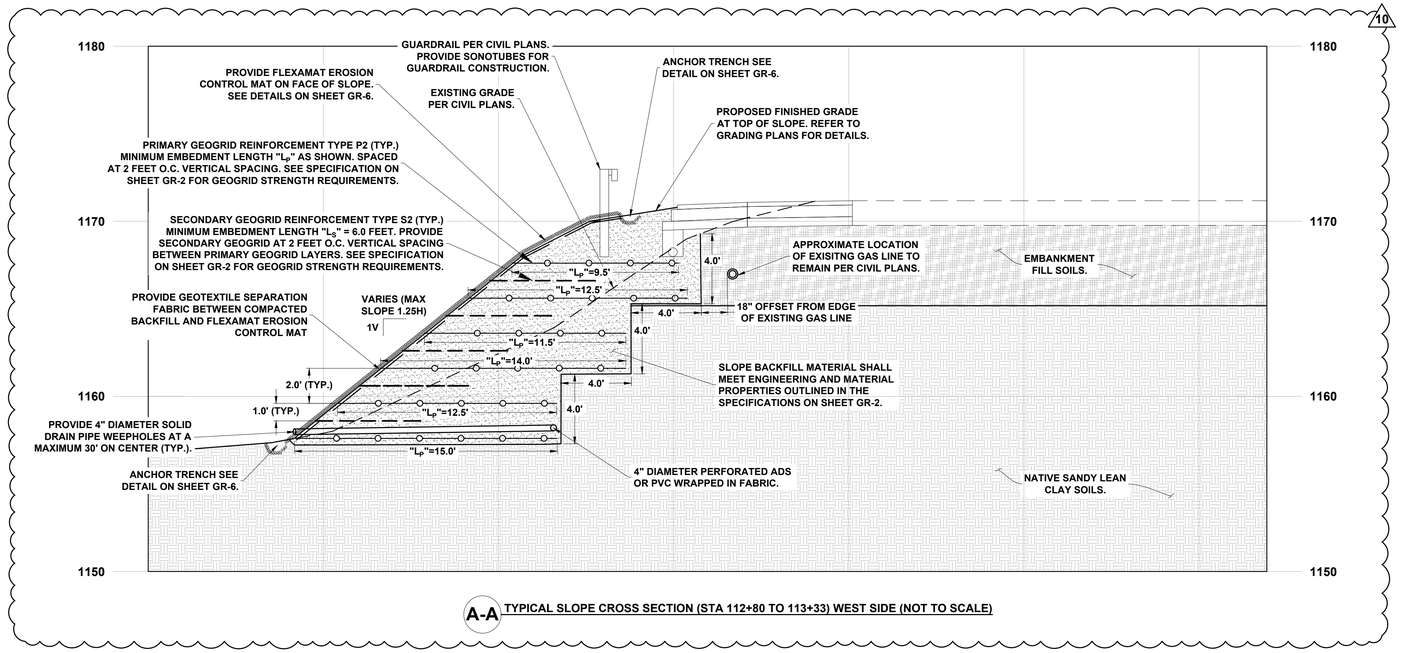
E-65651
REGISTERED PROFESSIONAL ENGINEER

GR-3	
DESIGNED BY:	JP
DRAWN BY:	MWF
APPVD. BY:	TMK
SCALE:	AS SHOWN
DATE:	9/06/24
JOB NO.	65235270
ACAD NO.	3 GR-3
SHEET NO.:	3 OF 6

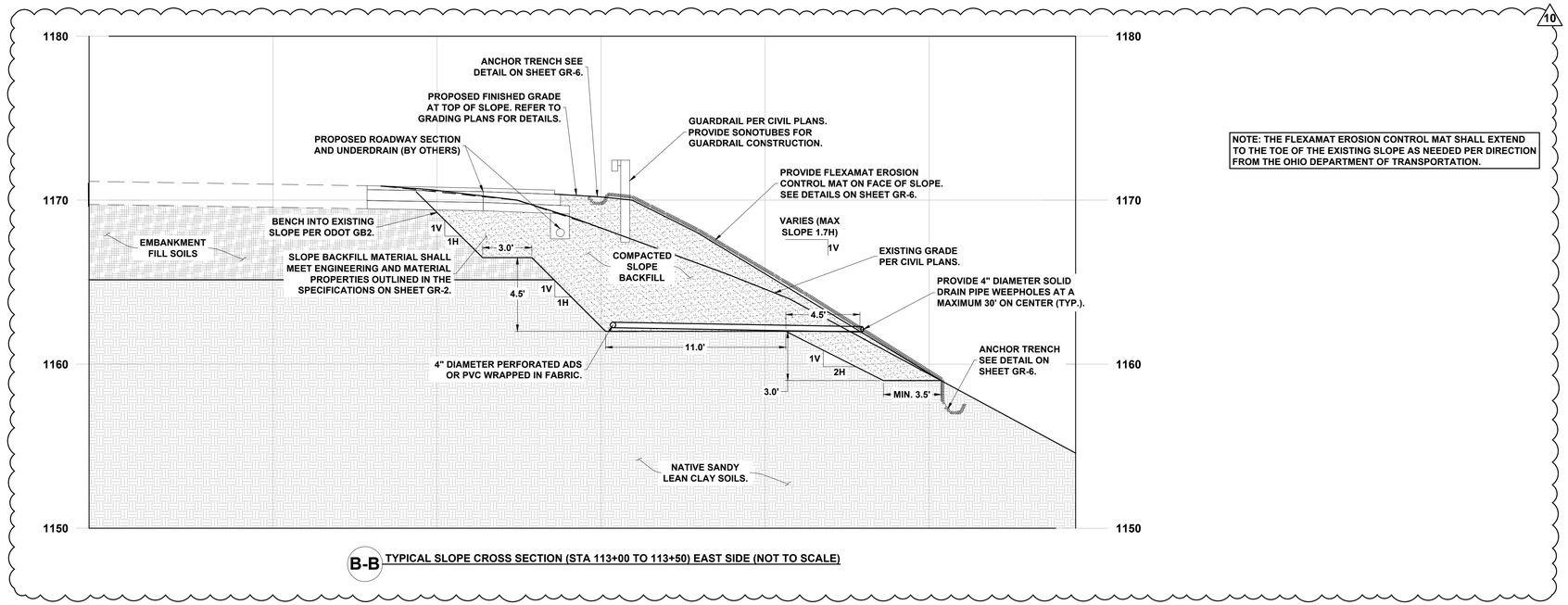
N:\Projects\2023\65235270\PROJECT DOCUMENTS\Reports+Letters\Drafts to Client\Submittal (CSA 149 Slopes)\GR3.dwg WAS LAST SAVED 9/6/2024 9:03 AM AND PLOTTED 9/6/2024 9:05 AM



GEOGRID ORIENTATION DETAIL (N.T.S.)



A-A TYPICAL SLOPE CROSS SECTION (STA 112+80 TO 113+33) WEST SIDE (NOT TO SCALE)



B-B TYPICAL SLOPE CROSS SECTION (STA 113+00 TO 113+50) EAST SIDE (NOT TO SCALE)

NOTE: THE FLEXAMAT EROSION CONTROL MAT SHALL EXTEND TO THE TOE OF THE EXISTING SLOPE AS NEEDED PER DIRECTION FROM THE OHIO DEPARTMENT OF TRANSPORTATION.

REV	DATE	BY	DESCRIPTION
10	06-12-2024	MWF	CCD10

TYPICAL SLOPE SECTIONS

LOVE'S TRAVEL STOP - S.R. 149 ROADWAY SLOPES
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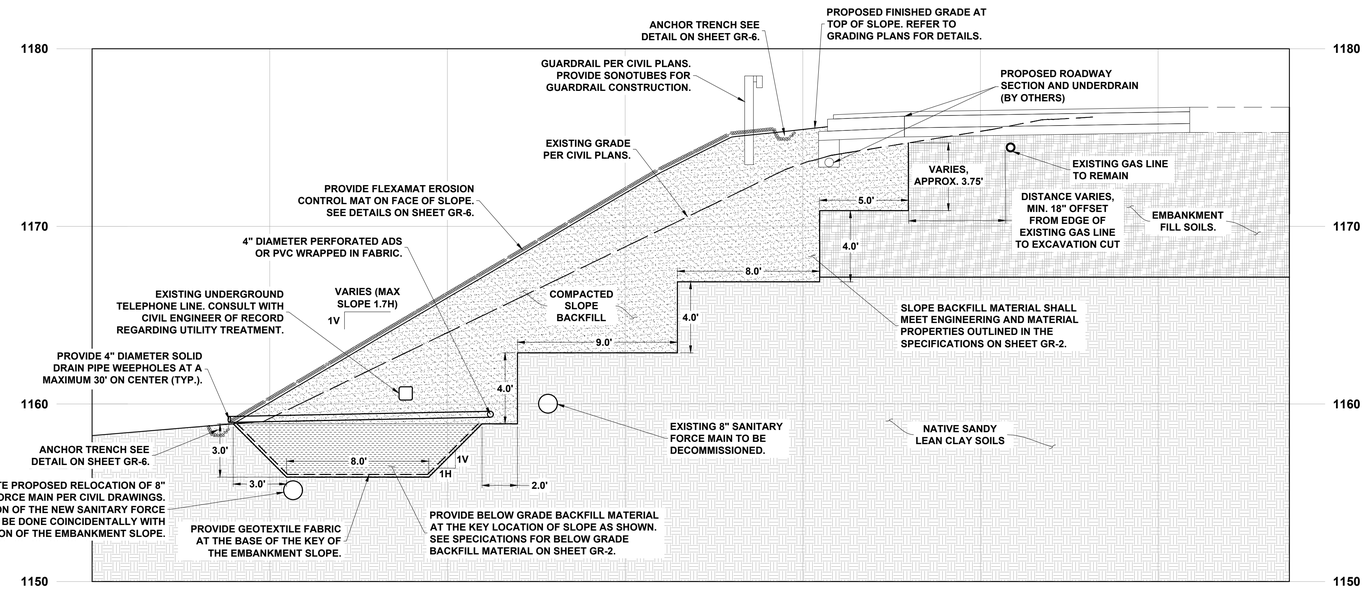
SCALE:	AS SHOWN
DATE:	9/06/24
JOB NO.	65235270
ACAD NO.	4 GR-4
SHEET NO.:	4 OF 6

GR-4

10



NOTE: THE FLEXAMAT EROSION CONTROL MAT SHALL EXTEND TO THE TOE OF THE EXISTING SLOPE AS NEEDED PER DIRECTION FROM THE OHIO DEPARTMENT OF TRANSPORATION.

C-C TYPICAL SLOPE CROSS SECTION (STA 115+73 TO 117+35) WEST SIDE (NOT TO SCALE)

REV	DATE	BY	DESCRIPTION
10	06-12-2024	MWF	CCD10

TYPICAL SLOPE SECTIONS

LOVE'S TRAVEL STOP - S.R. 149 ROADWAY SLOPES
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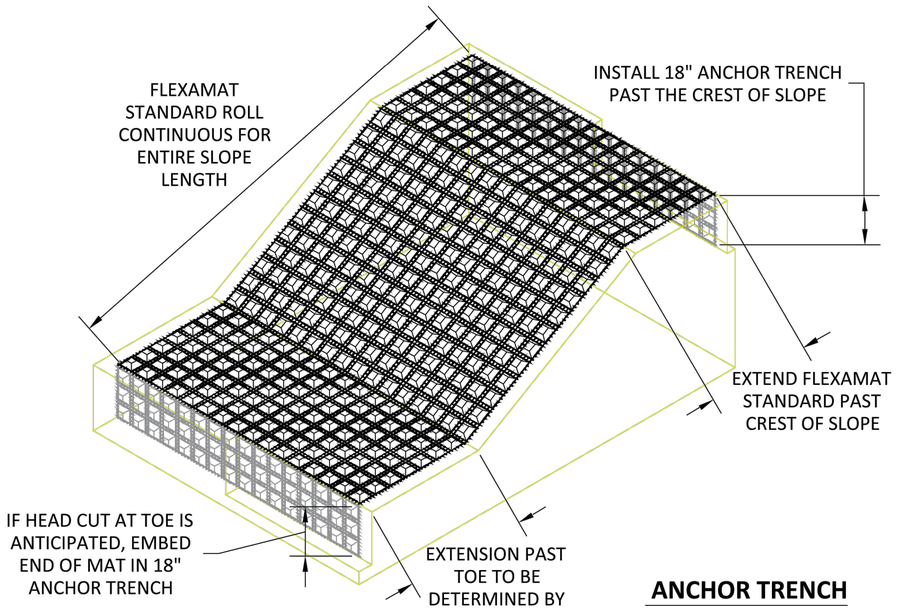
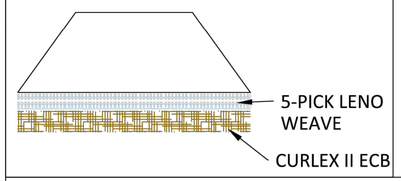
GR-5	
DESIGNED BY:	JP
DRAWN BY:	MWF
APPVD. BY:	TMK
SCALE:	AS SHOWN
DATE:	9/06/24
JOB NO.	66235270
ACAD NO.	5_GR-5
SHEET NO.:	5 OF 6

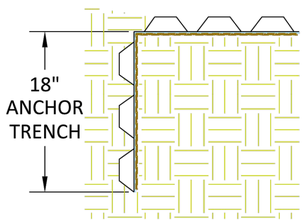
ISOMETRIC VIEW OF SLOPE AND ANCHOR TRENCHES



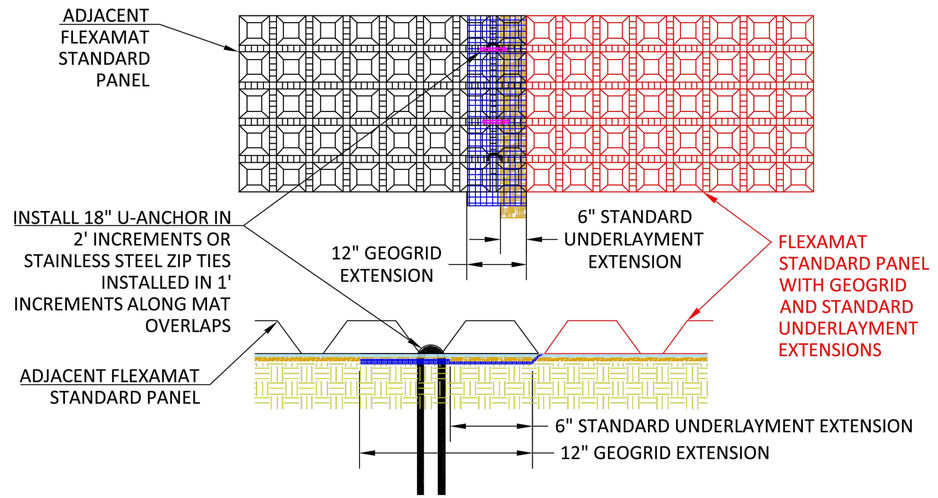
FLEXAMAT STANDARD UNDERLAYMENT



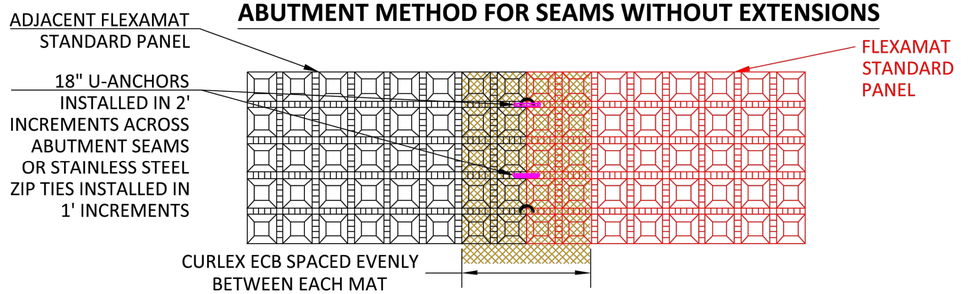
ANCHOR TRENCH



ABUTMENT METHOD FOR SEAMS WITH EXTENSIONS



ABUTMENT METHOD FOR SEAMS WITHOUT EXTENSIONS



FLEXAMAT STANDARD - SLOPE ARMORING

CONSTRUCTION NOTES:

1. AN ENGINEER OR MANUFACTURERS REPRESENTATIVE SHALL BE ONSITE FOR THE START OF THE INSTALLATION.
2. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND.
3. PRIOR TO FLEXAMAT STANDARD INSTALLATION SEED AND FERTILIZE SUBGRADE WITH SITE SPECIFIC SEED MIX IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
4. INSTALL FLEXAMAT STANDARD ROLLS THAT ARE CONTINUOUS FOR ENTIRE SLOPE LENGTH. FOR SLOPES LONGER THAN 16', USE MATS WITH EXTENSIONS CUT TO THE LENGTH OF THE SLOPE. INSTALL MATS TO THAT THE MATTING EXTENDS PAST THE CREST OF SLOPE AND INTO AN 18" ANCHOR TRENCH.
   - 4.1. FOR ARMORED SLOPE LENGTHS 16' OR LESS, INSTALL CURLEX ECB EQUALLY UNDER ADJACENT MATS. SECURE SEAM WITH #3 REBAR 18" U-ANCHORS IN 2' INCREMENTS THE LENGTH OF THE ABUTMENT.
   - 4.2. ARMORED SLOPE LENGTHS LONGER THAN 16', INSTALL NEXT MAT OVER EXTENSIONS.
5. INSTALL SUBSEQUENT MATS OVER THE GEOGRID EXTENSION AND STANDARD UNDERLAYMENT EXTENSION OF THE PREVIOUSLY INSTALLED MAT. ENSURE THE GEOGRID AND STANDARD UNDERLAYMENT EXTENSIONS ARE LAYING FLAT ON THE SUBGRADE BEFORE INSTALLING ADJACENT MAT OVER THE EXTENSIONS.
6. INSTALL #3 REBAR 18" U-ANCHORS IN 2' INCREMENTS ACROSS THE GEOGRID AND STANDARD EXTENSION ABUTMENT. INSTALL ANCHORS PERPENDICULAR TO THE SLOPE DIRECTLY BEHIND FIRST ROW OF BLOCKS ON THE ADJACENT MAT.
7. AT THE END OF THE ARMORED SLOPE, IF HEAD CUT IS ANTICIPATED, EMBED THE MAT 18" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH SUITABLE FILL.

MOTZ ENTERPRISES, INC.

Flexamat

(513)772-6689

Info@Flexamat.com

Flexamat.com

Flexamat® PERMANENT EROSION CONTROL

REV - 1

REV	DATE	BY	DESCRIPTION
10	06-12-2024	MWF	CCD10

SLOPE CONSTRUCTION DETAILS

LOVE'S TRAVEL STOP - S.R. 149 ROADWAY SLOPES

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STATE OF OHIO
YOGESH REGE
65651
REGISTERED PROFESSIONAL ENGINEER

GR-6	
DESIGNED BY:	JP
DRAWN BY:	MWF
APPVD. BY:	TMK
SCALE:	AS SHOWN
DATE:	9/06/24
JOB NO.	65235270
ACAD NO.	6 GR-6
SHEET NO.:	6 OF 6

MAINTAINING TRAFFIC
THE CONTRACTOR SHALL PROVIDE, ERECT, AND MAINTAIN SIGNS (IN PROPER POSITION, CLEAN AND LEGIBLE, AND IN GOOD WORKING CONDITION) AND REMOVE ALL LIGHTS, SIGNS, CONES, DRUMS, AND ANY OTHER TRAFFIC CONTROL DEVICES NECESSARY FOR THE MAINTENANCE OF TRAFFIC ACCORDING TO THESE PLAN NOTES AND DETAILS.

NO CHANGES IN TRAFFIC CONTROL PATTERNS SHALL BE MADE BETWEEN THE HOURS OF 6:00 AM TO 9:00 PM MONDAY THROUGH FRIDAY, 8:00 AM-8:00 PM SATURDAY, AND 8:00 AM-8:00 PM SUNDAY; IN ADDITION, LANE CLOSURES ARE NOT PERMITTED 6:00 AM TO 9:00 PM MONDAY THROUGH FRIDAY, 8:00 AM-8:00 PM SATURDAY, AND 8:00 AM-8:00 PM SUNDAY. REFER TO LANE VALUE CONTRACT TABLE.

LANES OPEN DURING HOLIDAYS AND SPECIAL EVENTS
NO WORK SHALL BE PERFORMED AND THE SAME NUMBER OF LANES AS WERE AVAILABLE AT THE START OF THE PROJECT SHALL BE OPEN TO TRAFFIC DURING THE FOLLOWING DESIGNATED HOLIDAYS OR SPECIAL EVENTS:

HOLIDAYS:
NEW YEAR'S (OBSERVED), TOTAL SOLAR ECLIPSE (4/8/24), MEMORIAL DAY, FOURTH OF JULY (OBSERVED), LABOR DAY, GENERAL/REGULAR ELECTION DAY (NOV), THANKSGIVING, CHRISTMAS (OBSERVED).

THE PERIOD OF TIME THAT THE LANES ARE TO BE OPEN DEPENDS ON THE DAY OF THE WEEK ON WHICH THE HOLIDAY OR SPECIAL EVENT FALLS. THE FOLLOWING SCHEDULE SHALL BE USED TO DETERMINE THIS PERIOD:

DAY OF HOLIDAY OR SPECIAL EVENT	TIME ALL LANES MUST BE OPEN TO TRAFFIC
SUNDAY	12:00 NOON FRIDAY THROUGH 6:00 AM MONDAY
MONDAY	12:00 NOON FRIDAY THROUGH 6:00 AM TUESDAY
MONDAY (TOTAL SOLAR ECLIPSE)	12:00 NOON FRIDAY THROUGH 6:00 AM WEDNESDAY
TUESDAY	12:00 NOON MONDAY THROUGH 6:00 AM WEDNESDAY
TUESDAY (GEN./REG. ELECTION)	5:00 AM TUESDAY THROUGH 12:00 AM WEDNESDAY
WEDNESDAY	12:00 NOON TUESDAY THROUGH 6:00 AM THURSDAY
THURSDAY	12:00 NOON WEDNESDAY THROUGH 6:00 AM FRIDAY
THANKSGIVING	6:00 AM WEDNESDAY THROUGH 6:00 AM MONDAY
FRIDAY	12:00 NOON THURSDAY THROUGH 6:00 AM MONDAY
SATURDAY	12:00 NOON FRIDAY THROUGH 6:00 AM MONDAY

DURING THE SAME PERIODS, MAINTAIN PEDESTRIAN ACCESS IF PEDESTRIAN ACCESS WAS PRESENT PRIOR TO CONSTRUCTION.

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY-WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED A DISINCENTIVE IN THE AMOUNT OF $6,000/HR THE ABOVE DESCRIBED LANE CLOSURE RESTRICTIONS ARE VIOLATED.

LENGTH AND DURATION OF LANE CLOSURES AND RESTRICTIONS SHALL BE AT THE APPROVAL OF THE ENGINEER. IT IS THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME, AS DETERMINED BY THE ENGINEER, SHALL NOT BE PERMITTED. THE LEVEL OF UTILIZATION OF MAINTENANCE OF TRAFFIC DEVICES SHALL BE COMMENSURATE WITH THE WORK IN PROGRESS.

BEFORE THE WORK BEGINS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE NAMES AND TELEPHONE NUMBERS OF PERSONS WHO CAN BE CONTACTED TWENTY-FOUR (24) HOURS PER DAY BY ODOT AND ALL INTERESTED POLICE AGENCIES. THIS PERSON OR PERSONS SHALL BE RESPONSIBLE FOR PLACING OR REPLACING NECESSARY TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN TRAFFIC AT ALL TIMES. IT IS THE INTENTION TO PERFORM THE REQUIRED WORK WITH THE LEAST INCONVENIENCE TO AND THE MAXIMUM SAFETY OF THE WORKERS AND THE TRAVELING PUBLIC OCCASIONALLY, MODIFICATIONS IN TRAFFIC CONTROLS OR WORKING CONDITIONS MAY BE REQUIRED IN ORDER TO EXPEDITE SAFE TRAFFIC MOVEMENT AND TO PROMOTE WORKER SAFETY.

NOTIFICATION OF TRAFFIC RESTRICTIONS
THROUGHOUT THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN WRITING OF ALL TRAFFIC RESTRICTIONS AND UPCOMING MAINTENANCE OF TRAFFIC CHANGES. THE CONTRACTOR SHALL ENSURE THE WRITTEN NOTIFICATION IS SUBMITTED IN A TIMELY MANNER TO ALLOW THE PROJECT ENGINEER TO MEET THE REQUIRED TIME FRAMES SET FORTH IN THE TABLE BELOW TO INFORM THE SPECIAL HAULING PERMITS SECTION (HAULING.PERMITS@DOT.OHIO.GOV) AND THE DISTRICT PUBLIC INFORMATION OFFICE (PIO). THIS NOTIFICATION SHALL BE RECEIVED BY THE PROJECT ENGINEER PRIOR TO THE PHYSICAL SETUP OF ANY APPLICABLE SIGNS OR MESSAGE BOARDS. INFORMATION SHOULD INCLUDE, BUT IS NOT LIMITED TO, ALL CONSTRUCTION ACTIVITIES THAT IMPACT OR INTERFERE WITH TRAFFIC AND SHALL LIST THE SPECIFIC LOCATION, TYPE OF WORK, ROAD STATUS, DATE AND TIME OF RESTRICTION, DURATION OF RESTRICTION, NUMBER OF LANES MAINTAINED, NUMBER OF LANES CLOSED, MINIMUM VERTICAL CLEARANCE, MINIMUM WIDTH OF DRIVABLE PAVEMENT, DETOUR ROUTES, IF APPLICABLE, AND ANY OTHER INFORMATION REQUESTED BY THE PROJECT ENGINEER.

NOTIFICATION OF TRAFFIC RESTRICTIONS TIME TABLE

ITEM	DURATION OF CLOSURE	NOTICE DUE TO PERMITS & PIO
RAMP &	> 2 WEEKS	21 CALENDAR DAYS PRIOR TO CLOSURE
ROAD	> 12 HOURS & < 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
CLOSURES	< 12 HOURS	4 BUSINESS DAYS PRIOR TO CLOSURE
LANE	> 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
CLOSURES &		
RESTRICTIONS	< 2 WEEKS	5 BUSINESS DAYS PRIOR TO CLOSURE
START OF CONSTRUCTION &		
TRAFFIC PATTERN CHANGES	N/A	14 CALENDAR DAYS PRIOR TO IMPLEMENTATION

ANY UNFORESEEN CONDITIONS NOT SPECIFIED IN THE PLANS REQUIRING TRAFFIC RESTRICTIONS SHALL ALSO BE REPORTED TO THE PROJECT ENGINEER USING THE NOTIFICATION TIME TABLE.

WORK SITE LIGHTING
FLOODLIGHTING OF THE WORK SITE FOR OPERATIONS CONDUCTED DURING NIGHTTIME PERIODS SHALL BE ACCOMPLISHED SO THAT THE LIGHTS DO NOT CAUSE GLARE TO THE DRIVERS ON THE ROADWAY. TO ENSURE THE ADEQUACY OF FLOODLIGHT PLACEMENT, THE CONTRACTOR, AND THE ENGINEER SHALL DRIVE THROUGH THE WORK SITE EACH NIGHT WHEN THE LIGHTING IS IN PLACE AND OPERATIVE PRIOR TO COMMENCING ANY WORK. IF GLARE IS DETECTED, THE LIGHT PLACEMENT AND SHIELDING SHALL BE ADJUSTED TO THE SATISFACTION OF THE ENGINEER BEFORE WORK PROCEEDS. PAVEMENT FOR ALL LABOR, EQUIPMENT, AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACTOR PRICE FOR ITEM 614, MAINTAINING TRAFFIC.

MUD, DIRT AND DEBRIS
THE TRACKING OR SPILLAGE OF MUD, DIRT OR DEBRIS UPON STATE HIGHWAYS IS PROHIBITED AND ANY SUCH OCCURRENCE SHALL BE CLEANED UP IMMEDIATELY BY THE CONTRACTOR.

PERSONAL PROTECTIVE EQUIPMENT
ODOT REQUIRES ALL CONTRACTORS' PERSONNEL TO WEAR THE CORRECT PPE WHILE WITHIN ODOT RIGHT-OF-WAY. ALL VEHICLES SHALL HAVE THE CORRECT SAFETY EQUIPMENT ALSO.

THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN SIGNS AND SIGN
SUPPORTS, AS DETAILED IN THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

ALL VEHICLES, EQUIPMENT AND WORKERS AND THEIR ACTIVITIES ARE RESTRICTED TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE APPROVED BY THE ENGINEER, CONSTRUCTION VEHICLES SHALL ALWAYS MOVE WITH AND NOT AGAINST THE FLOW OF TRAFFIC. CONSTRUCTION VEHICLES AND EQUIPMENT SHALL ENTER AND LEAVE WORK AREAS IN A MANNER WHICH WILL NOT BE HAZARDOUS TO, OR INTERFERE WITH THE NORMAL FLOW OF TRAFFIC. PERSONAL VEHICLES ARE NOT PERMITTED IN THE RIGHT-OF-WAY EXCEPT IN SPECIFIC AREAS DESIGNATED BY THE ENGINEER.

MAINTAINING TRAFFIC (SIGNS AND BARRICADES)
THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN SIGNS AND SIGN SUPPORTS, AS DETAILED IN THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND TYPE III BARRICADES AS DIRECTED IN CONSTRUCTION SEQUENCE.

TEMPORARY PAVEMENT WEDGE
TEMPORARY PAVEMENT WEDGES SHALL BE PROVIDED AT ALL TIMES WHERE TRAFFIC IS REQUIRED TO TRAVEL FROM OR ONTO A PAVEMENT SURFACE OF A DIFFERENT ELEVATION. THE MINIMUM SLOPE OF THE TEMPORARY PAVEMENT WEDGE SHALL BE 3:1 ALONG LONGITUDINAL JOINTS AND 120:1 AT TRANSVERSE JOINTS. THESE WEDGES SHALL BE REMOVED PRIOR TO PLACING THE SPECIFIED PAVEMENT COURSE.

PLACEMENT OF ASPHALT CONCRETE
TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES EXCEPT THAT ONE WAY TRAFFIC WILL BE PERMITTED FOR MINIMUM PERIODS OF TIME CONSISTENT WITH THE REQUIREMENTS OF THE SPECIFICATIONS FOR PROTECTION OF COMPLETED ASPHALT COURSES.

TRENCH FOR WIDENING
TRENCH FOR EXCAVATION FOR BASE WIDENING SHALL BE FOR ONLY ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH DRUMS OR BARRICADES AT ALL TIMES. PLACEMENT OF PROPOSED SUBBASE AND BASE MATERIAL SHALL FOLLOW CLOSELY AS POSSIBLE BEHIND EXCAVATION OPERATIONS. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT ALL TIMES BE SUBJECT TO APPROVAL BY THE ENGINEER.

THE CONTRACTOR SHALL ENSURE THAT THE TRENCH FOR WIDENING HAS A VERTICAL DROP OF NO MORE THAN 5 INCHES. THE TRENCH CAN BE BACKFILLED BY A COMPACTED AGGREGATE WEDGE. THE MINIMUM SLOPE OF THE TEMPORARY COMPACTED AGGREGATE WEDGE SHALL BE 3:1 ALONG THE EXISTING PAVEMENT AND PROTECTED WITH DRUMS AT ALL TIMES.

OVERNIGHT TRENCH CLOSING
THE BASE WIDENING SHALL BE COMPLETED TO A DEPTH OF NO MORE THAN 5 INCHES BELOW THE EXISTING PAVEMENT BY THE END OF EACH WORK DAY. NO TRENCH SHALL BE LEFT OPEN OVERNIGHT EXCEPT FOR A SHORT LENGTH (25 FEET OR LESS) OF A WORK SECTION AT THE END OF THE DAY. IN CASE WORK MUST BE SUSPENDED BECAUSE OF INCLEMENT WEATHER OR OTHER REASONS, THE TRENCH FOR THE UNCOMPLETED BASE WIDENING SHALL BE BACKFILLED AT THE DIRECTION OF THE ENGINEER.

DROPOFFS IN WORK ZONE
THE DROPOFF ADJACENT TO THE TRAVELED LANE SHALL MEET THE CRITERIA OUTLINED ODOT STANDARD DRAWING MT-101.90. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR MATERIALS, LABOR OR EQUIPMENT NECESSARY TO MEET THE REQUIREMENTS OF MT-101.90.

ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS
USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED.

IN ADDITION TO THE REQUIREMENTS OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

- DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.
- DURING A TRAFFIC SIGNAL INSTALLATION WHEN IMPACTING THE NORMAL FUNCTION OF THE SIGNAL OR THE FLOW OF TRAFFIC, OR WHEN TRAFFIC NEEDS TO BE DIRECTED THROUGH AN ENERGIZED TRAFFIC SIGNAL CONTRARY TO THE SIGNAL DISPLAY (E.G., DIRECTING MOTORISTS THROUGH A RED LIGHT).

IN ADDITION TO THE REQUIREMENT OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHOULD BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS AS APPROVED BY THE ENGINEER:

- FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP).
- FOR OPERATIONS WITHOUT POSITIVE PROTECTION OCCURRING WITHIN 10 FEET OF AN OPEN TRAVELED LANE THAT MEET ALL OF THE FOLLOWING CRITERIA:
  - O ON A MULTI-LANE DIVIDED INTERSTATE, OTHER FREEWAY OR EXPRESSWAY; AND
  - O AN AUTHORIZED SPEED LIMIT OF 45 MPH OR GREATER THAT IS IN EFFECT AT THE TIME OF OPERATION; AND,
  - O AADT OF 50,000 (OR AADT OF 30,000 WITH 25% OR HIGHER PERCENT TRUCKS)

"WITHOUT POSITIVE PROTECTION" MEANS USE OF DRUMS, CONES, SHADOW VEHICLE, ETC, WITHOUT
PROTECTION FROM PORTABLE BARRIER OR OTHER RIGID BARRIER ALONG THE WORK AREA. THIS PHRASE DOES NOT APPLY TO CASES WHERE POSITIVE PROTECTION IS REQUIRED. MOBILE OPERATIONS ARE REGARDED AS "WITHOUT POSITIVE PROTECTION". FOR WORK ZONES USING A COMBINATION OF BARRIER AND TEMPORARY TRAFFIC CONTROL DEVICES (CONES, DRUMS, ETC), THE DESIGNATION SHALL BE BASED UPON THE TYPE OF DEVICES USED IN THE AREA THAT WORKERS ARE LOCATED.

IF MULTIPLE ACTIVE LOCALIZED QUALIFYING WORK AREAS OCCUR WITHOUT POSITIVE PROTECTION, PER
MAINLINE TRAFFIC DIRECTION, PROVIDE A UNIFORMED LEO AND OFFICIAL PATROL CAR IN ADVANCE OF:
THE FIRST ACTIVE WORK AREA THAT DRIVERS WILL ENCOUNTER; OR
THE ACTIVE WORK AREA LATERALLY CLOSEST TO THE OPEN TRAVELED LANE; OR
OTHER LOCATION AS APPROVED BY THE ENGINEER.

THE UNIFORMED LEO AND OFFICIAL PATROL CAR MAY RELOCATE AMONG THE LISTED LOCATIONS AS
APPROPRIATE AS THE OPERATIONS PROCEED IN THE LOCALIZED QUALIFYING WORK AREAS.

IN GENERAL, LEOS SHOULD BE POSITIONED IN ADVANCE OF AND ON THE SAME SIDE AS THE LANE RESTRICTION OR AT THE POINT OF ROAD CLOSURE, AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH SIGNALIZED INTERSECTIONS IN WORK ZONES.

LEOS SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORISTS FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST'S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE. THE LEOS WORK AT THE DIRECTION OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS' DUTIES AND PLACEMENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES. ENSURE PROVIDED LEOS HAVE BEEN TRAINED APPROPRIATE TO THE JOB DECISIONS THEY ARE REQUIRED TO MAKE WHILE ON THE PROJECT, IN ACCORDANCE WITH C&MS 614.03. THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO-WAY COMMUNICATION DEVICE THAT SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. LEOS (WITH PATROL CAR) REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY.

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 100 HOURS. THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED. ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

ACCESS TO PRIVATE PROPERTY
ACCESS TO DRIVES SHALL BE MAINTAINED VIA EXISTING PAVEMENT, TEMPORARY PAVEMENT IN THE EVENT THAT A DRIVE CANNOT BE MAINTAINED AND A CLOSURE IS NEEDED THE CONTRACTOR WILL COORDINATE WITH THE PROPERTY OWNER TO MINIMIZE THE IMPACT TO THE OWNER. COMMERCIAL PROPERTY WITH MULTIPLE DRIVES MAY HAVE ONE DRIVE CLOSED WHEN WORKING IN THE AREA OF THE DRIVE. COMMERCIAL PROPERTY WITH ONLY ONE DRIVEWAY OR DRIVEWAYS WITH ONE DIRECTION TRAFFIC USE WILL BE CONSTRUCTED PART WIDTH. THE CONTRACTOR WILL COORDINATE WITH THE PROPERTY OWNER TO MINIMIZE THE IMPACT TO THE OWNER. MAINTAIN ACCESS TO RESIDENTIAL PROPERTIES AT ALL TIMES. WHEN A RESIDENTIAL DRIVE IS CLOSED FOR CONSTRUCTION, MAINTAIN ALTERNATE ACCESS TO THE PROPERTY. IT MAY BE REQUIRED FOR THE CONTRACTOR TO MAINTAIN ONE PASSABLE LANE WITHIN A CLOSURE IN ORDER FOR VEHICLES TO ACCESS RESIDENCY WITH A VEHICLE. UNLESS CALLED OUT IN THE PLANS THE CONTRACTOR WILL COORDINATED ANY CLOSURES WITH PROPERTY OWNERS AND BE RESPONSIBLE FOR ANY AND ALL PROPERTY USE AGREEMENTS FOR ALTERNATIVE ACCESS. SUCCESSFULLY NOTIFY THE OCCUPANTS/OWNERS OF COMMERCIAL OR RESIDENTIAL DRIVES TO BE CLOSED AND COORDINATE THE CLOSURE AT LEAST 48 HOURS BEFORE THE CLOSURE BEGINS (SIMPLY LEAVING A WRITTEN NOTICE OR PHONE MESSAGE IS NOT SUFFICIENT). COORDINATE ALTERNATE ACCESS TO RESIDENTIAL PROPERTIES WITH THE OWNER/OCCUPANT. PAYMENT FOR ALL LABOR, EQUIPMENT, LAW ENFORCEMENT OFFICERS AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC UNLESS ITEMIZED SEPARATELY.

ITEM 615 - ROADS FOR MAINTAINING TRAFFIC, AS PER PLAN
IN ADDITION TO THE REQUIREMENTS OF ODOT C&MS 615, THIS ITEM SHALL INCLUDE TEMPORARY DRAINAGE ITEMS, RESTORATION OF ALL SURFACES AND SIGNS DISTURBED BY THE PLACEMENT OF PAVEMENT FOR MAINTAINING TRAFFIC OUTSIDE OF THE PROJECT LIMITS.

TEMPORARY PAVEMENT SECTION
TEMPORARY PAVEMENT SECTION TO BE INSTALLED PER ODOT ITEM 615 FOR S.R. 149/RECO DRIVE. TEMPORARY PAVEMENT SECTION MAY BE SUBSTITUTED AT DIRECTION OF ENGINEER.

ITEM 614 - WORK ZONE IMPACT ATTENUATOR FOR 24" WIDE HAZARDS (UNIDIRECTIONAL OR BIDIRECTIONAL)
THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING A NON-GATING IMPACT ATTENUATOR. FURNISH AN IMPACT ATTENUATOR FROM THE OFFICE OF ROADWAY ENGINEERING'S APPROVED LIST FOR WORK ZONE IMPACT ATTENUATORS, FROM THE ROADWAY STANDARDS APPROVED PRODUCTS WEB PAGE. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. THE CONTRACTOR SHALL REPAIR OR REPLACE A DAMAGED UNIT WITHIN 24 HOURS OF A DAMAGING IMPACT. WHEN BIDIRECTIONAL DESIGNS ARE SPECIFIED, THE CONTRACTOR SHALL SUPPLY APPROPRIATE TRANSITIONS. WHEN GATING IMPACT ATTENUATORS ARE DESIRED, THE CONTRACTOR SHALL SUBMIT DOCUMENTATION TO THE ENGINEER FOR ACCEPTANCE. THE COST FOR THE ADDITIONAL BARRIER REQUIRED FOR A GATING IMPACT ATTENUATOR SHALL BE INCLUDED IN THE COST OF THE GATING IMPACT ATTENUATOR. PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT PRICE BID AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT AND MAINTAIN A COMPLETE AND FUNCTIONAL IMPACT ATTENUATOR SYSTEM, INCLUDING ALL RELATED BACKUPS, TRANSITIONS, LEVELING PADS, HARDWARE AND GRADING, NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

DUST CONTROL
THE CONTRACTOR SHALL FURNISH AND APPLY WATER FOR DUST CONTROL AS DIRECTED BY THE ENGINEER. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED FOR DUST CONTROL PURPOSES:

ITEM 616 WATER 9.0 M.GAL.

CONSTRUCTION SEQUENCE FOR MAINTENANCE OF TRAFFIC (MOT)

PRE-ROADWAY TRAFFIC SIGNAL MODIFICATION:
INSTALL THE PROPOSED TRAFFIC SIGNAL AND ASSOCIATED UNDERGROUND SIGNAL COMPONENTS AT THE S.R. 149 AND THE I-70 EB ENTRANCE/EXIT RAMPS. SIGNAL COMPONENTS CAN BE INSTALLED CONCURRENTLY WITH ANY OF THE PHASES PRIOR TO FINAL PAVEMENT MARKING OPERATIONS. PROPOSED TRAFFIC SIGNAL HEADS TO REMAIN COVERED AND EXISTING TRAFFIC SIGNAL TO REMAIN OPERABLE UNTIL FINAL PAVEMENT MARKINGS AND FINAL PROPOSED SIGNAL CONFIGURATION IS READY TO BE IN OPERATION. CONTRACTOR TO INSTALL SIGNAL COMPONENTS IN OFF-PEAK HOURS IN EXPEDITED FASHION. CONTROL TRAFFIC WITH FLAGGING OPERATION PER ODOT SCD MT-97.10 AS REQUIRED TO SAFELY INSTALL SIGNAL COMPONENTS DURING OFF PEAK HOURS. FLAGGERS MUST NOT DIRECT TRAFFIC THROUGH RED LIGHTS AND CONTRACTOR MUST ENSURE I-70 EB EXIT RAMP DOES NOT BACK UP TO MAIN LINE.

PRE-PHASE 1:
INSTALL TEMPORARY PAVEMENT AS SHOWN ON WEST SIDE OF S.R. 149 AND EAST SIDE OF S.R. 149 (FOR IMPACT ATTENUATOR PLACEMENT). TEMPORARY PAVEMENT TO BE INSTALLED IN EXPEDITED FASHION DURING OFF PEAK TRAFFIC HOURS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS/GUIDELINES AND ODOT SCD MT-97.11. EXISTING CONDITION TO BE RESTORED WHEN NO LONGER NEEDED FOR MOT OPERATIONS. CONTRACTOR TO COORDINATE TEMPORARY GUY-WIRES/STABILIZATION FOR UTILITY POLES ADJACENT TO TEMPORARY PAVEMENT PRIOR TO ANY CONSTRUCTION.

PHASE 1:
COMPLETE WORK ON EAST SIDE OF BELMONT MORRISTOWN ROAD (S.R. 149). SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AS SHOWN IN PLAN. TEMPORARY CONSTRUCTION BARRICADES TO BE PLACED PRIOR TO GUARDRAIL REMOVAL ON EAST SIDE OF S.R. 149. GUARDRAIL TO REMAIN ON WEST SIDE OF S.R. 149 DURING PHASE 1. CONSTRUCTION BARRICADES SHALL NOT BE REMOVED UNTIL NEW GUARDRAIL IS INSTALLED ON THE EAST SIDE OF S.R. 149.

PRE-PHASE 2:
INSTALL TEMPORARY PAVEMENT AS SHOWN ON EAST SIDE OF S.R. 149 AND WEST SIDE OF S.R. 149 (FOR IMPACT ATTENUATOR PLACEMENT). TEMPORARY PAVEMENT TO BE INSTALLED IN EXPEDITED FASHION DURING OFF PEAK TRAFFIC HOURS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS/GUIDELINES AND ODOT SCD MT-97.11. EXISTING CONDITION TO BE RESTORED WHEN NO LONGER NEEDED FOR MOT OPERATIONS.

PHASE 2:
COMPLETE WORK ON WEST SIDE OF BELMONT MORRISTOWN ROAD (S.R. 149) AND SOUTH WEST QUADRANT OF RECO DRIVE. SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AND RECO DRIVE AS SHOWN IN PLAN. TEMPORARY CONSTRUCTION BARRICADES TO BE PLACED PRIOR TO GUARDRAIL REMOVAL ON WEST SIDE OF S.R. 149. CONSTRUCTION BARRICADES SHALL NOT BE REMOVED UNTIL NEW GUARDRAIL IS INSTALLED ON THE WEST SIDE OF S.R. 149.

PRE-PHASE 3A/3B:
INSTALL TEMPORARY PAVEMENT AS SHOWN ON SOUTH SIDE OF RECO DRIVE. TEMPORARY PAVEMENT TO BE INSTALLED IN EXPEDITED FASHION DURING OFF PEAK TRAFFIC HOURS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS/GUIDELINES AND ODOT SCD MT-97.11. EXISTING CONDITION TO BE RESTORED WHEN NO LONGER NEEDED FOR MOT OPERATIONS.

PHASE 3A:
COMPLETE WORK IN NORTHWEST QUADRANT OF BELMONT MORRISTOWN ROAD (S.R. 149) AND RECO DRIVE. SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AND RECO DRIVE AS SHOWN IN PLAN. COMPLETE SOUTH MARATHON DRIVEWAY WORK. NORTH MARATHON DRIVEWAY TO REMAIN OPEN.

PHASE 3B:
RECONFIGURE MOT PHASE 3A AS SHOWN ON PHASE 3B TO REOPEN MARATHON SOUTH DRIVEWAY AND CLOSE NORTH MARATHON DRIVEWAY TO COMPLETE WORK. COMPLETE WORK IN EXPEDITED FASHION DURING OFF PEAK HOURS TO LIMIT DISRUPTION TO TRUCK TRAFFIC AND ADJACENT BUSINESSES.

PHASE 3C:
COMPLETE WORK IN SOUTHWEST QUADRANT OF THE BELMONT MORRISTOWN ROAD (S.R. 149) AND RECO DRIVE INTERSECTION. SHIFT TRAFFIC AND MODIFY TRAVEL LANES FOR S.R. 149 AND RECO DRIVE AS SHOWN IN PLAN.

CALCULATED PJD
CHECKED TDH

MAINTENANCE OF TRAFFIC NOTES
S.R. 149

BEL-149-23.44

R7
R32

LEGEND

- IMPACT ATTENUATOR
- CONSTRUCTION BARRIER
- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)

G20-2-48 STA. 97+05 — END ROAD WORK

W20-1-48 STA. 92+05 — ROAD WORK AHEAD

W1-4L-48 STA. 97+05

TYPE A WARNING LIGHT

BREAK LINE B / BREAK LINE B — 500' — BREAK LINE A / BREAK LINE A — 500' — R/W

SECTION A-A DURING WORKING HOURS

N.T.S

1' SHOULDER | 10' MIN. | 10' MIN. | 6' | VARIES

2' | 2' | ROADWAY WORK AREA

TEMPORARY STRIPING — EX. PAVEMENT — TEMPORARY STRIPING — CONSTRUCTION BARRIER

TEMPORARY PAVEMENT AS SHOWN ON PLAN

SECTION A-A DURING NON-WORKING HOURS

N.T.S

1' SHOULDER | 10' MIN. | 10' MIN. | 6' | VARIES

2' | 2' | ROADWAY WORK AREA

TEMPORARY STRIPING — EX. PAVEMENT — TEMPORARY STRIPING — CONSTRUCTION BARRIER

3:1 AGGREGATE WEDGE TO BE PROVIDED DURING NON-WORKING HOURS

TEMPORARY PAVEMENT AS SHOWN ON PLAN

202.5' CENTERLINE SHIFT (L=9'X45MPH/2=202.5' REQUIRED)

BELMONT MORRISTOWN ROAD (S.R. 149)

Ex R/W

STA. 106+78.28, 13.77'RT. INSTALL TEMPORARY IMPACT ATTENUATOR

INSTALL TEMPORARY PAVEMENT FOR IMPACT ATTENUATOR

W1-H16 36"x36" STA. 107+58

W1-H16 36"x36" STA. 106+58

CONTRACTOR TO COORDINATE WITH UTILITY POLE OWNER AS REQUIRED FOR GUY-WIRE RELOCATION/TEMPORARY BRACING OF UTILTIY POLES TO PROVIDE TEMPORARY PAVEMENT/TRAVEL LANE WITH SAFE OFFSET FROM GUY-WIRES. CONTRACTOR MUST SECURE ANY REQUIRED TEMPORARY EASEMENTS.

INSTALL TEMPORARY PAVEMENT TO PROVIDE MINIMUM 10' TRAVEL LANES EACH DIRECTION ON S.R. 149. ACCESS TO EXISTING RESIDENTIAL DRIVEWAYS MUST BE MAINTAINED. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS AND GUIDELINES AND ODOT SCD MT-97.11. SEE SHEET R7 FOR TEMPORARY PAVEMENT SECTION NOTES. RELOCATE SIGNAGE IMPACTED BY TEMPORARY PAVEMENT; RESTORE SIGNAGE TO ORIGINAL STATE AFTER PROJECT IS COMPLETED.

STA. 111+88.20, 6.96'RT. INSTALL TEMPORARY IMPACT ATTENUATOR

COMPLETE WORK IN DRIVEWAY REGION IN EXPEDITED FASHION. PROTECT WORK AREA WITH CONSTRUCTION DRUMS. CONTRACTOR TO COORDINATE WORK WITH PROPERTY OWNER.

LOVE'S DRIVEWAY — PT: 14+37.23

STA. 112+58.19, 7.39'RT. INSTALL TEMPORARY IMPACT ATTENUATOR

STA. 114+18.19, 8.38'RT. INSTALL TEMPORARY IMPACT ATTENUATOR

STA. 114+88.19, 8.97'RT. INSTALL TEMPORARY IMPACT ATTENUATOR

MATCHLINE STA 116+50 - SEE BELOW

NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
2. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE. IF WORK IS EXPECTED IN WINTER WEATHER CONDITIONS, CONTACT ENGINEER FOR SUITABLE REPLACEMENT.
3. EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL MARKINGS OR ARE LABELED TO BE REMOVED SHALL BE COVERED WITH REMOVABLE BLACKOUT TAPE (CMS 740.06, TYPE I).
4. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE (CMS 740.06, TYPE I)
5. TEMPORARILY BAG/COVER EXISTING SIGNS IN WORK ZONE WHEN THEY CONFLICT WITH INTENDED MAINTENANCE OF TRAFFIC PLAN.
6. STEADY BURNING TYPE A WARNING LIGHTS SHOWN ON THE ADVANCE WARNING SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
7. PROVISIONS SHALL BE MADE TO STABILIZE THE DRUMS TO PREVENT THEM FROM BLOWING OVER.
8. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.
9. ALL TAPERS AND WORK ZONE TRAFFIC CONTROL SHALL COMPLY WITH REQUIREMENTS OUTLINED IN THE OMUTCD.

SECTION B-B DURING WORKING HOURS

N.T.S

1' MIN. TO EOP | 10' MIN. | 10' MIN. | 6' | VARIES

2' | 2' | ROADWAY WORK AREA

TEMPORARY STRIPING — EX. PAVEMENT — TEMPORARY STRIPING — CONSTRUCTION BARRIER

TEMPORARY STRIPING

SECTION B-B DURING NON-WORKING HOURS

N.T.S

1' MIN. TO EOP | 10' MIN. | 10' MIN. | 6' | VARIES

2' | 2' | ROADWAY WORK AREA

TEMPORARY STRIPING — EX. PAVEMENT — TEMPORARY STRIPING — CONSTRUCTION BARRIER

3:1 AGGREGATE WEDGE TO BE PROVIDED DURING NON-WORKING HOURS

TEMPORARY STRIPING

W20-5-48 STA. 10+81 — ROAD WORK AHEAD

TYPE A WARNING LIGHT

G20-2-48 STA. 10+81 — END ROAD WORK

RECO DRIVE — CONSTRUCTION ℄

INSTALL TEMPORARY PAVEMENT TO FACILITATE TRUCK TURNING MOVEMENTS. PROVIDE MAINTENANCE OF TRAFFIC FOR TEMPORARY PAVEMENT INSTALLATION PER OMUTCD STANDARDS AND GUIDELINES AND ODOT SCD MT-97.11. SEE SHEET R7 FOR TEMPORARY PAVEMENT SECTION NOTES. RELOCATE SIGNAGE/EXISTING FEATURES IMPACTED BY TEMPORARY PAVEMENT; RESTORE SIGNAGE/CURB/LANDSCAPING/EXISTING FEATURES TO ORIGINAL STATE AFTER PROJECT IS COMPLETED.

CONTRACTOR SHALL MONITOR CATCH BASIN DURING CONSTRUCTION. IF CATCH BASIN IS DAMAGED DURING CONSTRUCTION ACTIVITIES OR FROM TRAFFIC IMPACTS, THE CATCH BASIN MUST BE REPLACED IMMEDIATELY. IF CATCH BASIN IS DAMAGED BUT CAN REMAIN IN PLACE WITHOUT SAFETY CONCERNS TO THE GENERAL PUBLIC, CONTRACTOR MUST REPLACE CATCH BASIN TO ODOT REPRESENTATIVES SATISFACTION AFTER TEMPORARY PAVEMENT IS REMOVED.

MATCHLINE STA 116+50 - SEE ABOVE

225' CENTERLINE SHIFT (L=10'X45MPH/2=225' REQUIRED)

EXISTING EDGE LINE TO BE COVERED WITH BLACKOUT TAPE

EXISTING SKIP DASH LINE TO BE COVERED WITH BLACKOUT TAPE

EXISTING EDGE LINE TO BE COVERED WITH BLACKOUT TAPE

270' CENTERLINE SHIFT (L=10'X45MPH/2=225' REQUIRED)

NORTH MARATHON DRIVEWAY — SOUTH MARATHON DRIVEWAY

STA. 117+28.18, 12.37'RT. INSTALL TEMPORARY IMPACT ATTENUATOR

EXISTING CENTER LINE TO BE COVERED WITH BLACKOUT TAPE

CONTRACTOR TO CUT CURB AT EXISTING JOINT AND TO REPLACE IN KIND UPON COMPLETION OF CONSTRUCTION. CONTRACTOR TO RESTORE ANY LANDSCAPING/SIGNAGE IMPACTED BY TEMPORARY PAVEMENT/CONSTRUCTION ACTIVITIES TO EXISTING CONDITION

R100'

EXISTING CENTER LINE TO BE COVERED WITH BLACKOUT TAPE

CONTRACTOR TO VERIFY DEPTH OF TELEPHONE LINE PRIOR TO PLACEMENT OF TEMPORARY PAVEMENT.

CONTRACTOR TO PROVIDE ADDITIONAL BARRELS TO DELINEATE WORK ZONE AS REQUIRED FOR INSTALLATION OF PROPOSED WATER MAIN. CONTRACTOR TO PHASE WATER MAIN INSTALLATION WORK TO ENSURE ACCESS TO PILOT IS MAINTAINED. COMPLETE WORK IN DRIVEWAY REGION IN EXPEDITED FASHION DURING OFF-PEAK

NORTH PILOT DRIVEWAY

EXISTING CENTER LINE TO REMAIN

EXISTING EDGE LINETO REMAIN

EXISTING NORTHBOUND THROUGH LANE AND RIGHT TURN LANE TO REMAIN OPEN

CONTRACTOR TO PROVIDE ADDITIONAL BARRELS TO DELINEATE WORK ZONE AS REQUIRED FOR INSTALLATION OF PROPOSED WATER MAIN. CONTRACTOR TO PHASE WATER MAIN INSTALLATION WORK TO ENSURE ACCESS TO PILOT IS MAINTAINED. COMPLETE WORK IN DRIVEWAY REGION IN EXPEDITED FASHION DURING OFF-PEAK HOURS.

W20-1-48 — ROAD WORK AHEAD

TYPE A WARNING LIGHT

W1-4R-48 STA. 132+11

W20-1-48 STA. 137+11

BREAK LINE C / BREAK LINE C — 1000'

I-70 EB EXIT RAMP — I-70 EB ENTRANCE RAMP

BELMONT MORRISTOWN ROAD (S.R. 149) — CONSTRUCTION ℄

PC: 125+55.54

BREAK LINE E / BREAK LINE E — 500' — BREAK LINE F / BREAK LINE F — 500'

BREAK LINE D / BREAK LINE D — 500'

G20-2-48 STA. 132+11 — END ROAD WORK

G20-2-48 — END ROAD WORK

GRAPHIC SCALE (IN FEET): 80 40 0 20 40 80

CALCULATED: PJD

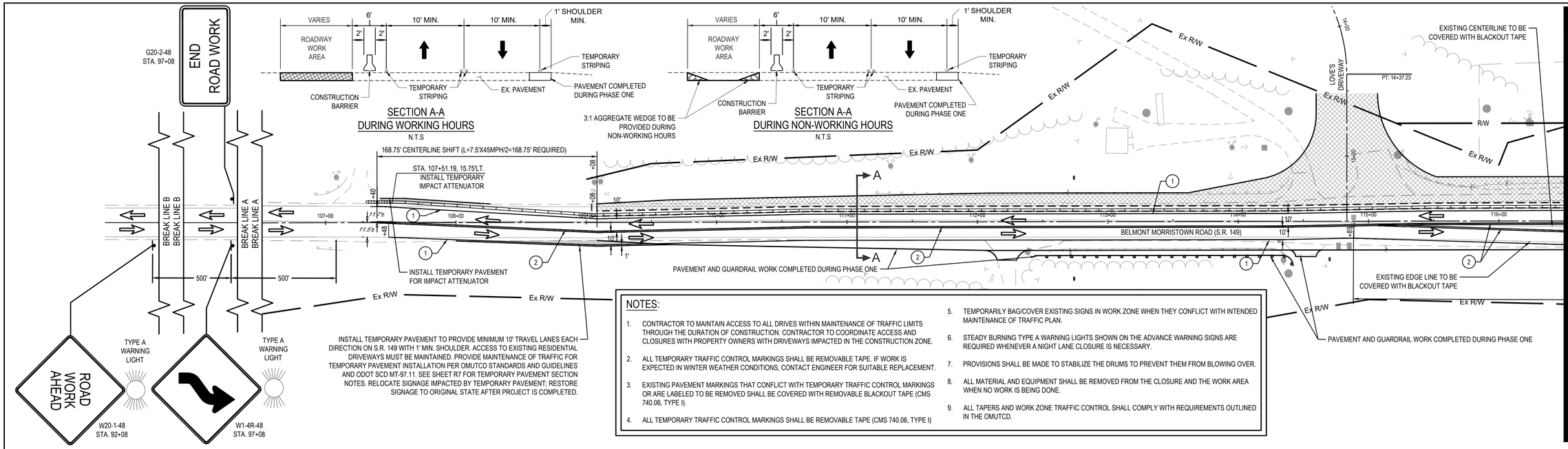
CHECKED: TDH

MAINTENANCE OF TRAFFIC - PHASE 1

S.R. 149

BEL-149-23.44

R8 / R32



NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
2. ALL TEMPORARY TRAFFIC CONTROL MARKINGS SHALL BE REMOVABLE TAPE. IF WORK IS EXPECTED IN WINTER WEATHER CONDITIONS, CONTACT ENGINEER FOR SUITABLE REPLACEMENT.
3. EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL MARKINGS OR ARE LABELED TO BE REMOVED SHALL BE COVERED WITH REMOVABLE BLACKOUT TAPE (CMS 740.06, TYPE I).
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5. TEMPORARILY BAG/COVER EXISTING SIGNS IN WORK ZONE WHEN THEY CONFLICT WITH INTENDED MAINTENANCE OF TRAFFIC PLAN.
6. STEADY BURNING TYPE A WARNING LIGHTS SHOWN ON THE ADVANCE WARNING SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
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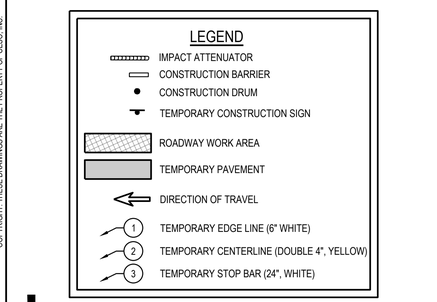
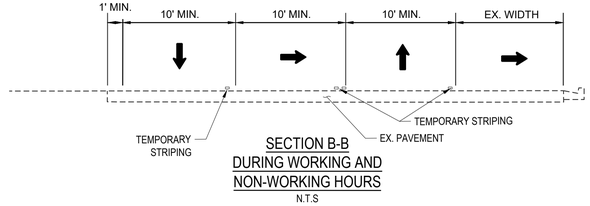
9. ALL TAPERS AND WORK ZONE TRAFFIC CONTROL SHALL COMPLY WITH REQUIREMENTS OUTLINED IN THE OMUTCD.

LEGEND

- IMPACT ATTENUATOR
- CONSTRUCTION BARRIER
- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)





SECTION B-B
DURING WORKING AND NON-WORKING HOURS
N.T.S

GRAPHIC SCALE (IN FEET)
80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH

MAINTENANCE OF TRAFFIC - PHASE 2
S.R. 149

BEL-149-23.44

R9
R32

NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
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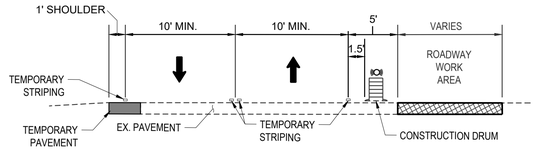
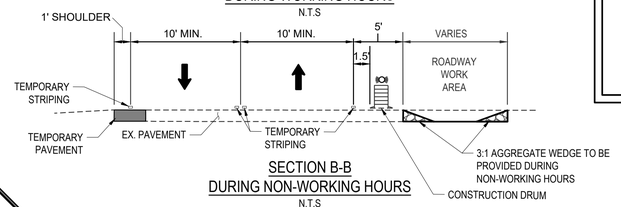


SECTION B-B
DURING WORKING HOURS
N.T.S



SECTION B-B
DURING NON-WORKING HOURS
N.T.S

LEGEND

- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
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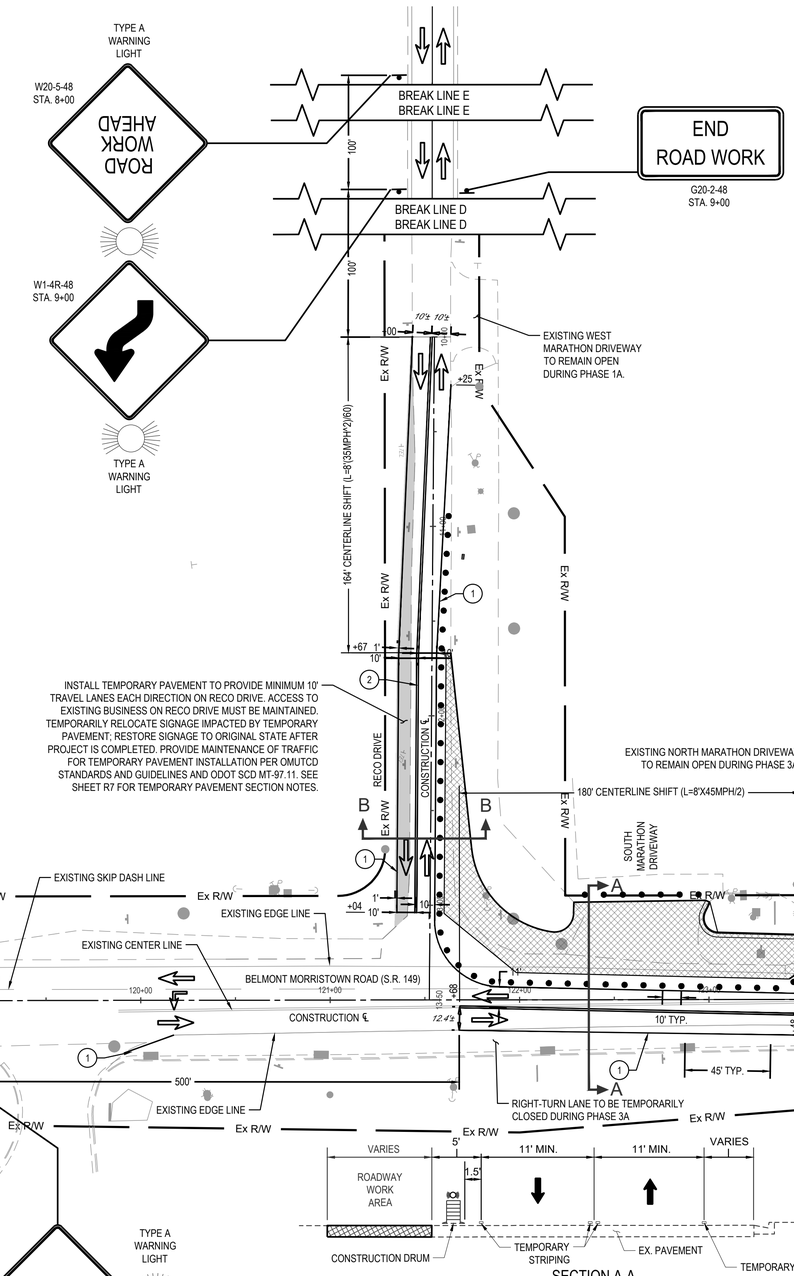
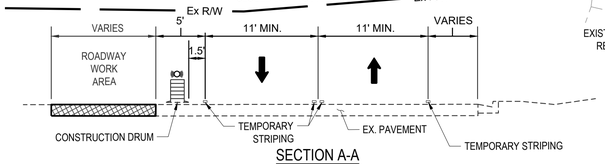
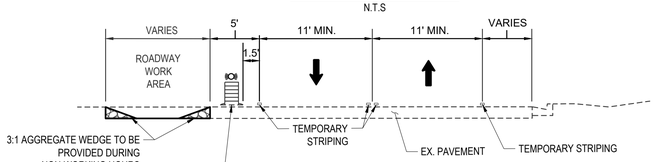




SECTION A-A
DURING WORKING HOURS
N.T.S



SECTION A-A
DURING NON-WORKING HOURS
N.T.S

GRAPHIC SCALE (IN FEET)
80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH

MAINTENANCE OF TRAFFIC - PHASE 3A
S.R. 149

BEL-149-23.44

R10
R32

NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
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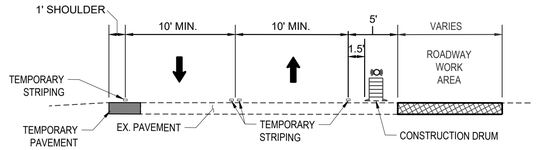
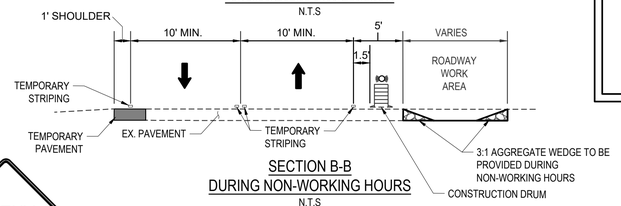


SECTION B-B
DURING WORKING HOURS
N.T.S



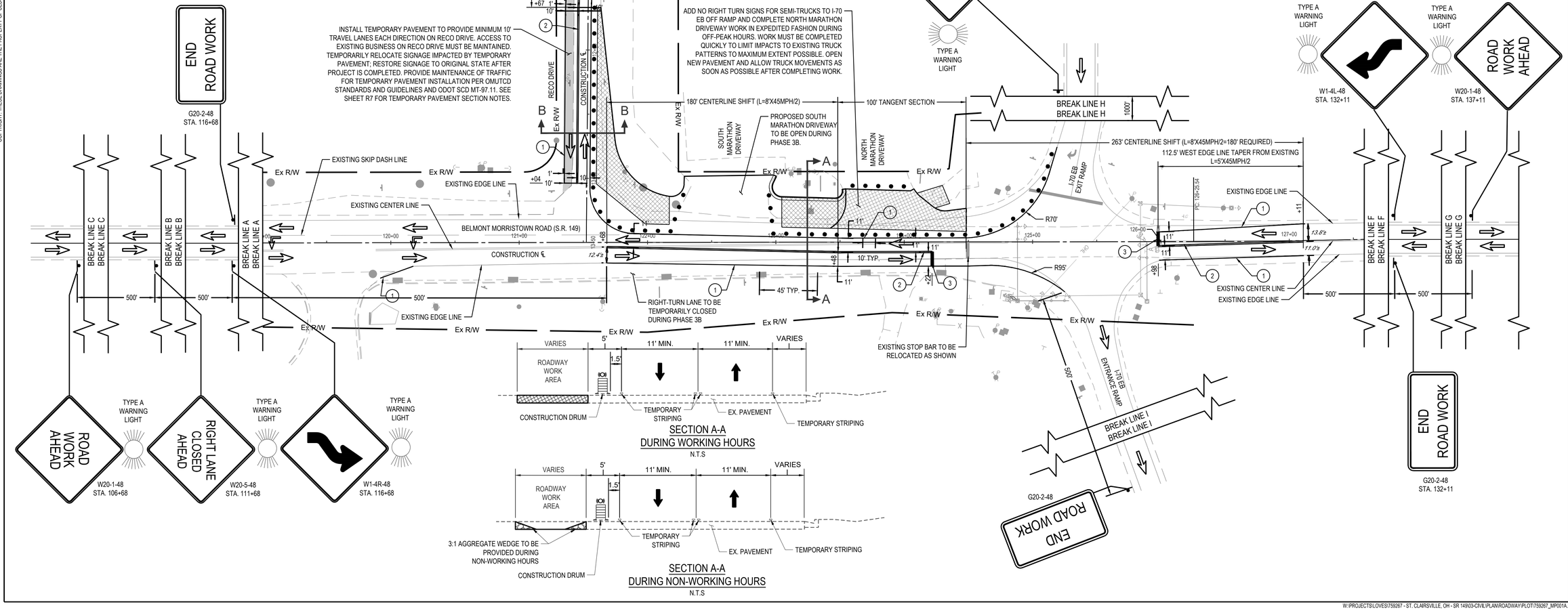
SECTION B-B
DURING NON-WORKING HOURS
N.T.S

LEGEND

- CONSTRUCTION DRUM
- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
- (2) TEMPORARY CENTERLINE (DOUBLE 4", YELLOW)
- (3) TEMPORARY STOP BAR (24", WHITE)

GRAPHIC SCALE (IN FEET): 80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH



SECTION A-A
DURING WORKING HOURS
N.T.S

SECTION A-A
DURING NON-WORKING HOURS
N.T.S

MAINTENANCE OF TRAFFIC - PHASE 3B
S.R. 149

BEL-149-23.44

R11
R32

NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVES WITHIN MAINTENANCE OF TRAFFIC LIMITS THROUGH THE DURATION OF CONSTRUCTION. CONTRACTOR TO COORDINATE ACCESS AND CLOSURES WITH PROPERTY OWNERS WITH DRIVEWAYS IMPACTED IN THE CONSTRUCTION ZONE.
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- TEMPORARY CONSTRUCTION SIGN
- ROADWAY WORK AREA
- TEMPORARY PAVEMENT
- DIRECTION OF TRAVEL
- (1) TEMPORARY EDGE LINE (6" WHITE)
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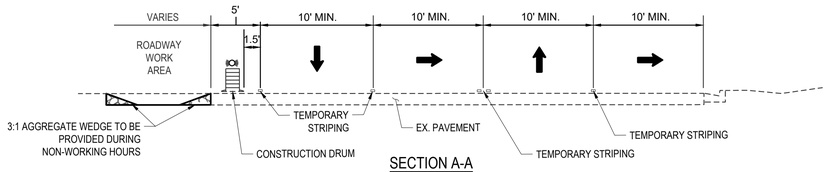
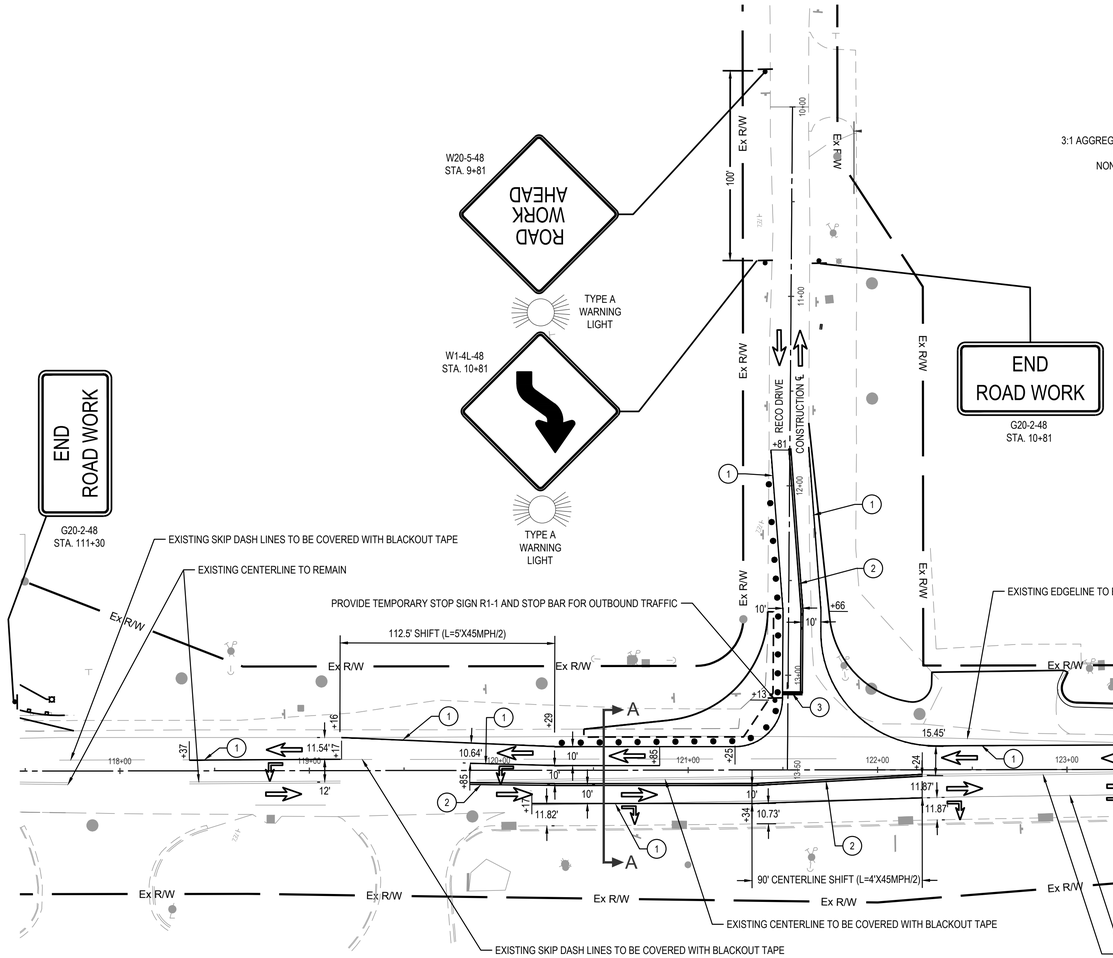
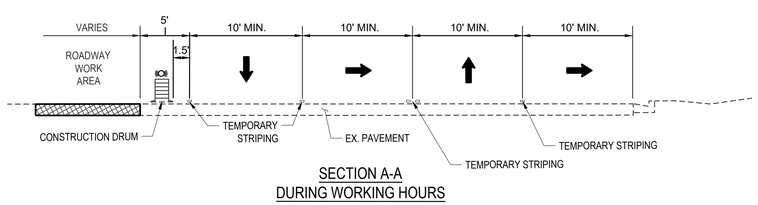


SECTION A-A
DURING NON-WORKING HOURS
N.T.S





SECTION A-A
DURING WORKING HOURS
N.T.S

GRAPHIC SCALE (IN FEET)
80 40 0 20 40 80

CALCULATED PJD
CHECKED TDH

MAINTENANCE OF TRAFFIC - PHASE 3C
S.R. 149

BEL-149-23.44

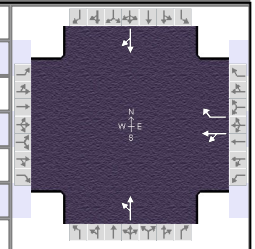
R12
R32

APPENDIX F
2043 DESIGN YEAR TRAFFIC SCENARIO
CAPACITY ANALYSIS SUMMARY SHEETS

CONDITION 1

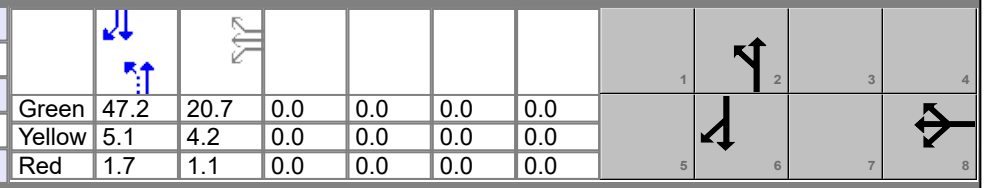
HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD AM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	47.2	20.7	0.0	0.0	0.0	0.0						
Yellow	5.1	4.2	0.0	0.0	0.0	0.0						
Red	1.7	1.1	0.0	0.0	0.0	0.0						

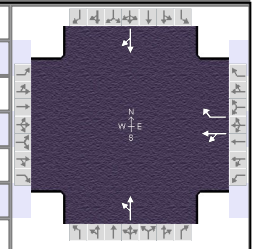
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55
Initial Queue (Q_b), veh/h				0	0	0	0	0			0	0
Base Saturation Flow Rate (s_o), veh/h				1750	1750	1750	1750	1750			1750	1750
Parking (N_m), man/h					None			None			None	
Heavy Vehicles (P_{HV}), %					17	17		13			11	
Ped / Bike / RTOR, /h	0	0		0	0	0	0	0		0	0	0
Buses (N_b), buses/h				0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)				3	3	3	3	3			3	3
Upstream Filtering (*I*)				1.00	1.00	1.00	0.85	0.85			1.00	1.00
Lane Width (*W*), ft					12.0	12.0		12.0			12.0	
Turn Bay Length, ft					1145	350		400			635	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h				35	35	35	45	45			45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s				26.0		54.0		54.0
Yellow Change Interval (*Y*), s				4.2		5.1		5.1
Red Clearance Interval (R_c), s				1.1		1.7		1.7
Minimum Green (G_{min}), s				10		20		20
Start-Up Lost Time (*l*t), s			2.0	2.0	2.0	2.0		2.0
Extension of Effective Green (*e*), s			2.0	2.0	2.0	2.0		2.0
Passage (*PT*), s				2.0		2.0		2.0
Recall Mode				Off		Min		Min
Dual Entry				Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0	0.0	No	25.0			
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0	9.0	12.0	0.0			
Street Width / Island / Curb, ft		0		0.0	0	No	0.0	0	No	0.0		No
Width Outside / Bike Lane / Shoulder, ft				12.0	5.0	2.0	12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No			No	0.50		No	0.50			0.50	

HCS Signalized Intersection Results Summary

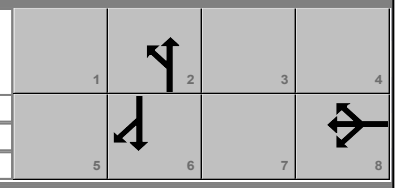
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD AM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	47.2	20.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



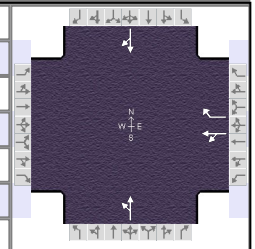
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2		6
Case Number				11.0		8.0		8.0
Phase Duration, s				26.0		54.0		54.0
Change Period, (*Y+R c*), s				5.3		6.8		6.8
Max Allow Headway (*MAH*), s				3.2		0.0		0.0
Queue Clearance Time (*g s*), s				20.7				
Green Extension Time (*g e*), s				0.0		0.0		0.0
Phase Call Probability				1.00				
Max Out Probability				1.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	5	2			6	16
Adjusted Flow Rate (*v*), veh/h					347	259		551			423	
Adjusted Saturation Flow Rate (*s*), veh/h/ln					1446	1286		1060			1555	
Queue Service Time (*g s*), s					18.7	15.0		28.1			12.3	
Cycle Queue Clearance Time (*g c*), s					18.7	15.0		40.3			12.3	
Green Ratio (*g/C*)					0.26	0.26		0.59			0.59	
Capacity (*c*), veh/h					374	333		685			917	
Volume-to-Capacity Ratio (*X*)					0.927	0.779		0.803			0.462	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					14.0	9.1		16.1			6.6	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.35	0.74		1.11			0.28	
Uniform Delay (*d 1*), s/veh					28.9	27.5		24.0			9.2	
Incremental Delay (*d 2*), s/veh					28.4	10.2		8.3			1.7	
Initial Queue Delay (*d 3*), s/veh					0.0	0.0		0.0			0.0	
Control Delay (*d*), s/veh					57.3	37.8		32.4			10.9	
Level of Service (LOS)					E	D		C			B	
Approach Delay, s/veh / LOS	0.0			49.0		D	32.4		C	10.9		B
Intersection Delay, s/veh / LOS	33.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.72	B	1.72	B	1.65	B	1.36	A
Bicycle LOS Score / LOS			1.49	A	1.49	A	1.19	A

HCS Signalized Intersection Intermediate Values

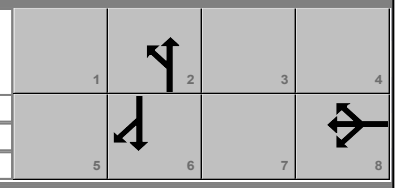
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD AM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	47.2	20.7	0.0	0.0	0.0	0.0						
Yellow	5.1	4.2	0.0	0.0	0.0	0.0						
Red	1.7	1.1	0.0	0.0	0.0	0.0						



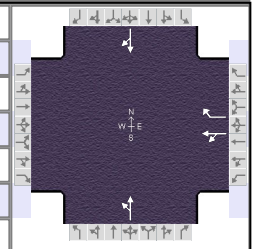
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})				0.953	0.953		0.674	0.674		1.000	0.972	
Right-Turn Adjustment Factor (f_{RT})					0.000	0.847		0.000	0.674		0.000	0.972
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})				1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})						1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h				1441	5	1286	346	714	0	0	1306	249
Proportion of Vehicles Arriving on Green (P)	0.00	0.00	0.00	0.26	0.26	0.26	0.30	0.46	0.00	0.00	0.59	0.59
Incremental Delay Factor (k)					0.43	0.30		0.50			0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)				4.0		6.8		6.8
Green Ratio (g/C)				0.26		0.59		0.59
Permitted Saturation Flow Rate (s_p), veh/h/ln				0		979		1028
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						0		1600
Permitted Effective Green Time (g_p), s				0.0		47.2		0.0
Permitted Service Time (g_u), s				0.0		34.9		0.0
Permitted Queue Service Time (g_{ps}), s						28.1		
Time to First Blockage (g_f), s				0.0		4.0		47.2
Queue Service Time Before Blockage (g_{fs}), s						4.0		
Protected Right Saturation Flow (s_R), veh/h/ln				0				
Protected Right Effective Green Time (g_R), s				0.0				

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	0.972	0.000	0.972	0.000	0.972	0.000	0.681	0.000
Pedestrian F_s / F_{delay}	0.000	0.148	0.000	0.148	0.000	0.076	0.000	0.076
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		45.16		46.55	1180.00	6.72	1180.00	6.72
Bicycle F_w / F_v	-3.64		-3.64	1.00	-3.64	1.00	-3.64	0.70

HCS Signalized Intersection Results Graphical Summary

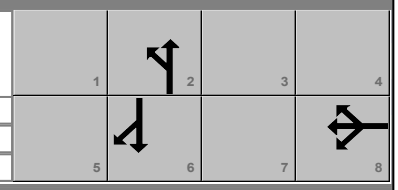
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD AM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



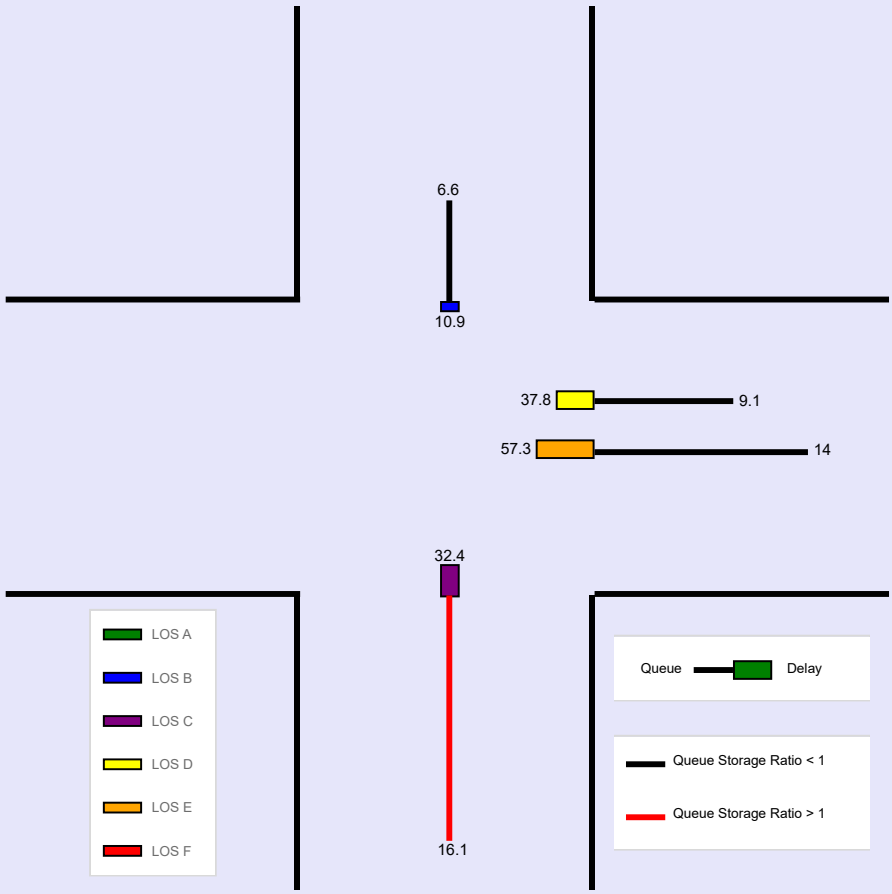
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	47.2	20.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					14.0	9.1		16.1			6.6	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.35	0.74		1.11			0.28	
Control Delay (*d*), s/veh					57.3	37.8		32.4			10.9	
Level of Service (LOS)					E	D		C			B	
Approach Delay, s/veh / LOS	0.0			49.0		D	32.4		C	10.9		B
Intersection Delay, s/veh / LOS	33.0						C					



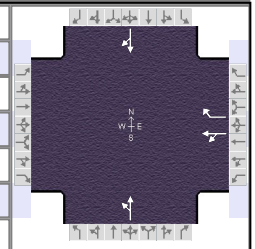
--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

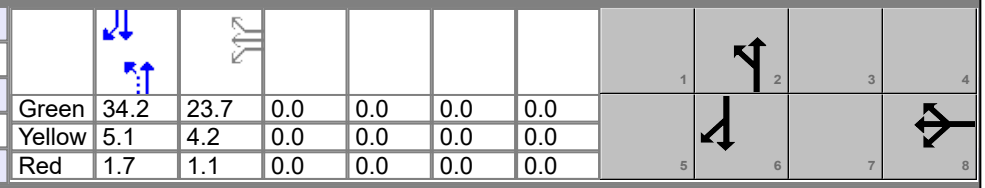
HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD PM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	34.2	23.7	0.0	0.0	0.0	0.0						
Yellow	5.1	4.2	0.0	0.0	0.0	0.0						
Red	1.7	1.1	0.0	0.0	0.0	0.0						

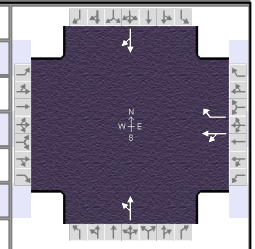
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65
Initial Queue (Q_b), veh/h				0	0	0	0	0			0	0
Base Saturation Flow Rate (s_o), veh/h				1750	1750	1750	1750	1750			1750	1750
Parking (N_m), man/h					None			None			None	
Heavy Vehicles (P_{HV}), %					10	10		12			3	
Ped / Bike / RTOR, /h	0	0		0	0	0	0	0		0	0	0
Buses (N_b), buses/h				0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)				3	3	3	3	3			3	3
Upstream Filtering (*I*)				1.00	1.00	1.00	0.87	0.87			1.00	1.00
Lane Width (*W*), ft					12.0	12.0		12.0			12.0	
Turn Bay Length, ft					1145	350		400			635	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h				35	35	35	45	45			45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s				29.0		41.0		41.0
Yellow Change Interval (*Y*), s				4.2		5.1		5.1
Red Clearance Interval (R_c), s				1.1		1.7		1.7
Minimum Green (G_{min}), s				10		20		20
Start-Up Lost Time (*l*t), s			2.0	2.0	2.0	2.0		2.0
Extension of Effective Green (*e*), s			2.0	2.0	2.0	2.0		2.0
Passage (*PT*), s				2.0		2.0		2.0
Recall Mode				Off		Min		Min
Dual Entry				Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0	0.0	No	25.0			
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0	9.0	12.0	0.0			
Street Width / Island / Curb, ft		0		0.0	0	No	0.0	0	No	0.0		No
Width Outside / Bike Lane / Shoulder, ft				12.0	5.0	2.0	12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No			No		0.50	No		0.50			0.50

HCS Signalized Intersection Results Summary

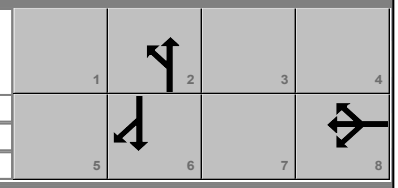
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD PM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	34.2	23.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



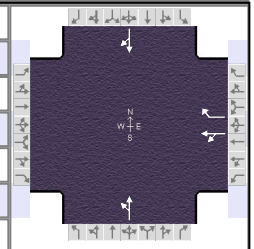
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2		6
Case Number				11.0		8.0		8.0
Phase Duration, s				29.0		41.0		41.0
Change Period, ($Y+R_c$), s				5.3		6.8		6.8
Max Allow Headway (*MAH*), s				3.2		0.0		0.0
Queue Clearance Time (g_s), s				25.7				
Green Extension Time (g_e), s				0.0		0.0		0.0
Phase Call Probability				1.00				
Max Out Probability				1.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	5	2			6	16
Adjusted Flow Rate (*v*), veh/h					596	310		555			438	
Adjusted Saturation Flow Rate (*s*), veh/h/ln					1537	1367		960			1660	
Queue Service Time (g_s), s					23.7	13.6		21.4			12.8	
Cycle Queue Clearance Time (g_c), s					23.7	13.6		34.2			12.8	
Green Ratio (*g/C*)					0.34	0.34		0.49			0.49	
Capacity (*c*), veh/h					520	463		536			811	
Volume-to-Capacity Ratio (*X*)					1.145	0.670		1.035			0.540	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					29.8	7.7		21.2			7.8	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.70	0.59		1.45			0.32	
Uniform Delay (d_1), s/veh					23.2	19.8		22.8			12.4	
Incremental Delay (d_2), s/veh					85.8	3.0		45.5			2.6	
Initial Queue Delay (d_3), s/veh					0.0	0.0		0.0			0.0	
Control Delay (*d*), s/veh					109.0	22.8		68.2			15.0	
Level of Service (LOS)					F	C		F			B	
Approach Delay, s/veh / LOS	0.0			79.5		E	68.2		E	15.0		B
Intersection Delay, s/veh / LOS	61.3						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.71	B	1.71	B	1.66	B	1.37	A
Bicycle LOS Score / LOS			1.98	B	1.43	A	1.21	A

HCS Signalized Intersection Intermediate Values

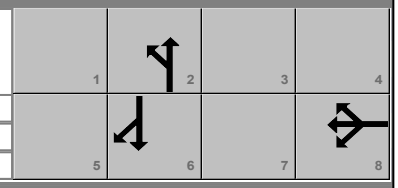
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD PM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	34.2	23.7	0.0	0.0	0.0	0.0						
Yellow	5.1	4.2	0.0	0.0	0.0	0.0						
Red	1.7	1.1	0.0	0.0	0.0	0.0						



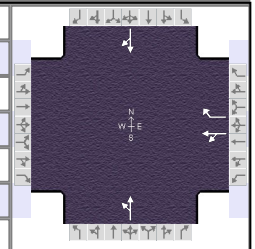
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})				0.952	0.952		0.605	0.605		1.000	0.971	
Right-Turn Adjustment Factor (f_{RT})					0.000	0.847		0.000	0.605		0.000	0.971
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})				1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})						1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h				1534	3	1367	292	668	0	0	1386	274
Proportion of Vehicles Arriving on Green (P)	0.00	0.00	0.00	0.34	0.34	0.34	0.37	0.52	0.00	0.00	0.49	0.49
Incremental Delay Factor (k)					0.50	0.20		0.50			0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)				4.0		6.8		6.8
Green Ratio (g/C)				0.34		0.49		0.49
Permitted Saturation Flow Rate (s_p), veh/h/ln				0		966		1013
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						0		1709
Permitted Effective Green Time (g_p), s				0.0		34.2		0.0
Permitted Service Time (g_u), s				0.0		21.4		0.0
Permitted Queue Service Time (g_{ps}), s						21.4		
Time to First Blockage (g_f), s				0.0		3.6		34.2
Queue Service Time Before Blockage (g_{fs}), s						3.6		
Protected Right Saturation Flow (s_R), veh/h/ln				0				
Protected Right Effective Green Time (g_R), s				0.0				

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	0.972	0.000	0.972	0.000	0.972	0.000	0.681	0.000
Pedestrian F_s / F_{delay}	0.000	0.143	0.000	0.143	0.000	0.089	0.000	0.089
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		40.18		41.58	977.14	9.15	977.14	9.15
Bicycle F_w / F_v	-3.64		-3.64	1.49	-3.64	0.95	-3.64	0.72

HCS Signalized Intersection Results Graphical Summary

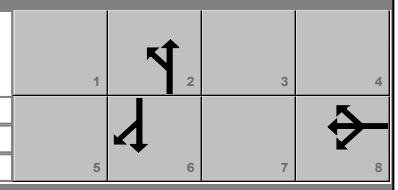
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD PM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



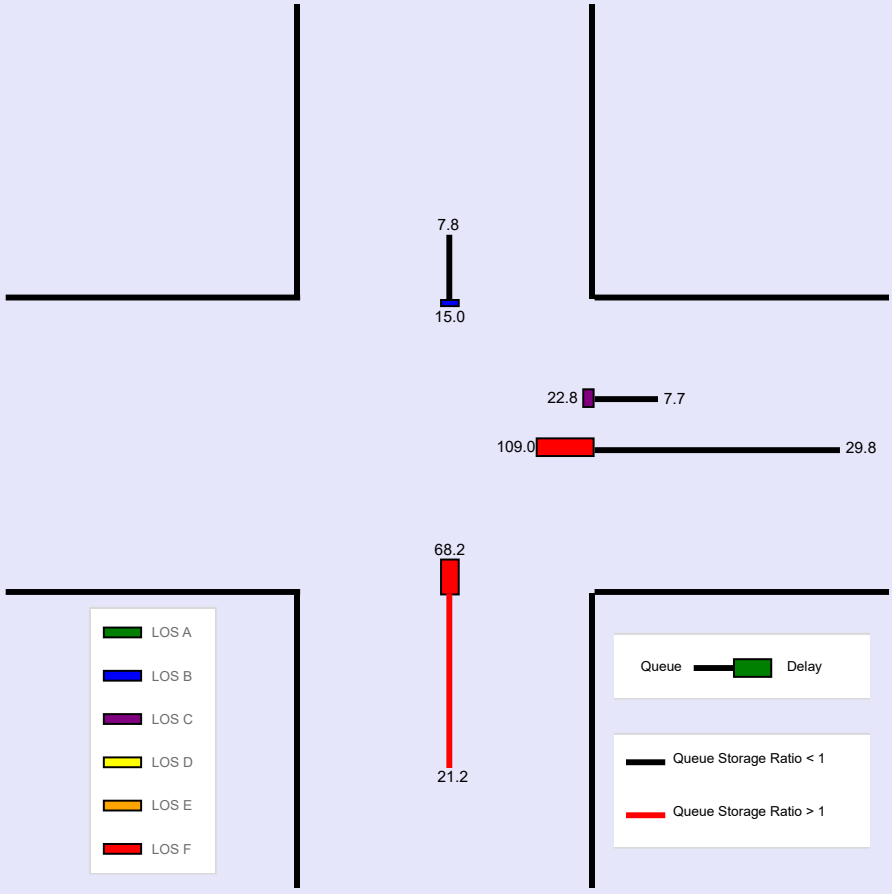
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	34.2	23.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					29.8	7.7		21.2			7.8	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.70	0.59		1.45			0.32	
Control Delay (*d*), s/veh					109.0	22.8		68.2			15.0	
Level of Service (LOS)					F	C		F			B	
Approach Delay, s/veh / LOS	0.0			79.5		E	68.2		E	15.0		B
Intersection Delay, s/veh / LOS	61.3						E					



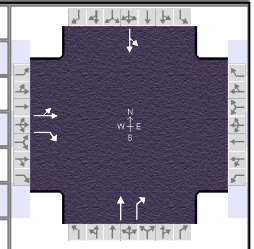
--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

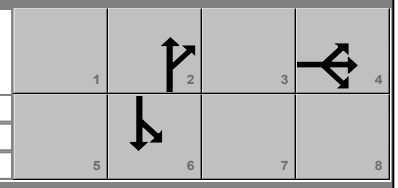
HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD AM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	

Signal Information					EB			WB			NB			SB		
Cycle, s	80.0	Reference Phase	2		L	T	R	L	T	R	L	T	R	L	T	R
Offset, s	28	Reference Point	End	Green	43.6	24.6		0.0	0.0		0.0			0.0		
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4		0.0	0.0		0.0			0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0		0.0	0.0		0.0			0.0		



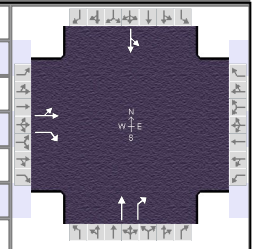
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	
Initial Queue (Q_b), veh/h	0	0	0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1750	1750	1750					1750	1750	1750	1750	
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %		19	19					13	13		16	
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3					3	3	3	3	
Upstream Filtering (*I*)	1.00	1.00	1.00					1.00	1.00	0.66	0.66	
Lane Width (*W*), ft		12.0	12.0					12.0	12.0		12.0	
Turn Bay Length, ft		1425	250					470	410		400	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35					45	45	45	45	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		30.0				50.0		50.0
Yellow Change Interval (*Y*), s		4.4				5.1		5.1
Red Clearance Interval (R_c), s		1.0				1.3		1.3
Minimum Green (G_{min}), s		10				20		20
Start-Up Lost Time (*l*t), s	2.0	2.0				2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0				2.0	2.0	2.0
Passage (*PT*), s		2.0				2.0		2.0
Recall Mode		Off				Min		Min
Dual Entry		Yes				Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0				0.0	No	25.0
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0				9.0	12.0	0.0
Street Width / Island / Curb, ft	0.0	0	No		0		0.0		No	0.0	0	No
Width Outside / Bike Lane / Shoulder, ft	12.0	5.0	2.0				12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

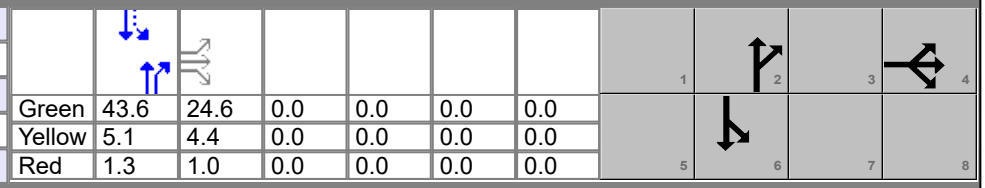
HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD AM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	28	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB				WB				NB				SB			
Green	43.6	24.6			0.0	0.0	0.0	0.0								
Yellow	5.1	4.4			0.0	0.0	0.0	0.0								
Red	1.3	1.0			0.0	0.0	0.0	0.0								

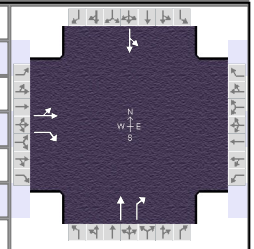
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2		6
Case Number		11.0				7.0		8.0
Phase Duration, s		30.0				50.0		50.0
Change Period, ($Y+R_c$), s		5.4				6.4		6.4
Max Allow Headway (*MAH*), s		3.3				0.0		0.0
Queue Clearance Time (g_s), s		10.4						
Green Extension Time (g_e), s		0.4				0.0		0.0
Phase Call Probability		1.00						
Max Out Probability		0.00						

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h		71	166					483	478		701	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1423	1263					1573	1333		967	
Queue Service Time (g_s), s		2.9	8.4					16.1	20.3		27.5	
Cycle Queue Clearance Time (g_c), s		2.9	8.4					16.1	20.3		43.6	
Green Ratio (*g/C*)		0.31	0.31					0.55	0.55		0.55	
Capacity (*c*), veh/h		438	388					857	726		582	
Volume-to-Capacity Ratio (*X*)		0.162	0.428					0.564	0.657		1.205	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		1.7	4.3					8.9	9.7		39.9	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.03	0.49					0.53	0.66		2.81	
Uniform Delay (d_1), s/veh		20.2	22.1					12.0	12.9		29.3	
Incremental Delay (d_2), s/veh		0.1	0.3					2.7	4.6		103.0	
Initial Queue Delay (d_3), s/veh		0.0	0.0					0.0	0.0		0.0	
Control Delay (*d*), s/veh		20.3	22.4					14.6	17.5		132.3	
Level of Service (LOS)		C	C					B	B		F	
Approach Delay, s/veh / LOS	21.7	C		0.0			16.1	B		132.3	F	
Intersection Delay, s/veh / LOS	59.7						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.72	B	1.37	A	1.66	B
Bicycle LOS Score / LOS	0.88	A			2.07	B	1.54	B

HCS Signalized Intersection Intermediate Values

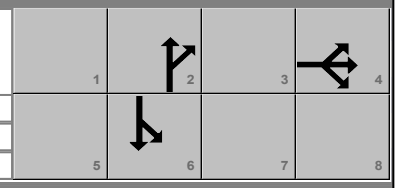
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD AM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	28	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	43.6	24.6	0.0	0.0	0.0	0.0						
Yellow	5.1	4.4	0.0	0.0	0.0	0.0						
Red	1.3	1.0	0.0	0.0	0.0	0.0						



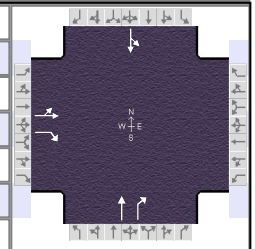
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.955	0.955					1.000	1.000		0.631	0.631	
Right-Turn Adjustment Factor (f_{RT})		0.000	0.847					0.000	0.847		0.000	0.631
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000						1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000						1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h	1355	68	1263				0	1573	1333	216	751	0
Proportion of Vehicles Arriving on Green (P)	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.55	0.55	0.57	0.35	0.00
Incremental Delay Factor (k)		0.04	0.04					0.50	0.50		0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		4.0				6.4		6.4
Green Ratio (g/C)		0.31				0.55		0.55
Permitted Saturation Flow Rate (s_p), veh/h/ln		0				876		927
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						1573		0
Permitted Effective Green Time (g_p), s		0.0				0.0		43.6
Permitted Service Time (g_u), s		0.0				0.0		27.5
Permitted Queue Service Time (g_{ps}), s								27.5
Time to First Blockage (g_f), s		0.0				43.6		4.6
Queue Service Time Before Blockage (g_{fs}), s								4.6
Protected Right Saturation Flow (s_R), veh/h/ln		0				0		
Protected Right Effective Green Time (g_R), s		0.0				0.0		

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.198	0.000	0.972	0.000	0.681	0.000	0.972	0.000
Pedestrian F_s / F_{delay}	0.000	0.148	0.000	0.148	0.000	0.085	0.000	0.085
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		46.66		45.16	1090.00	8.28	1090.00	8.28
Bicycle F_w / F_v	-3.64	0.39	-3.64		-3.64	1.59	-3.64	1.05

HCS Signalized Intersection Results Graphical Summary

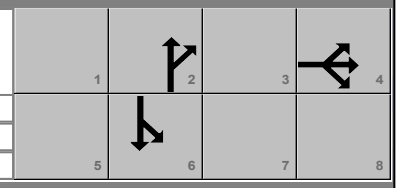
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD AM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



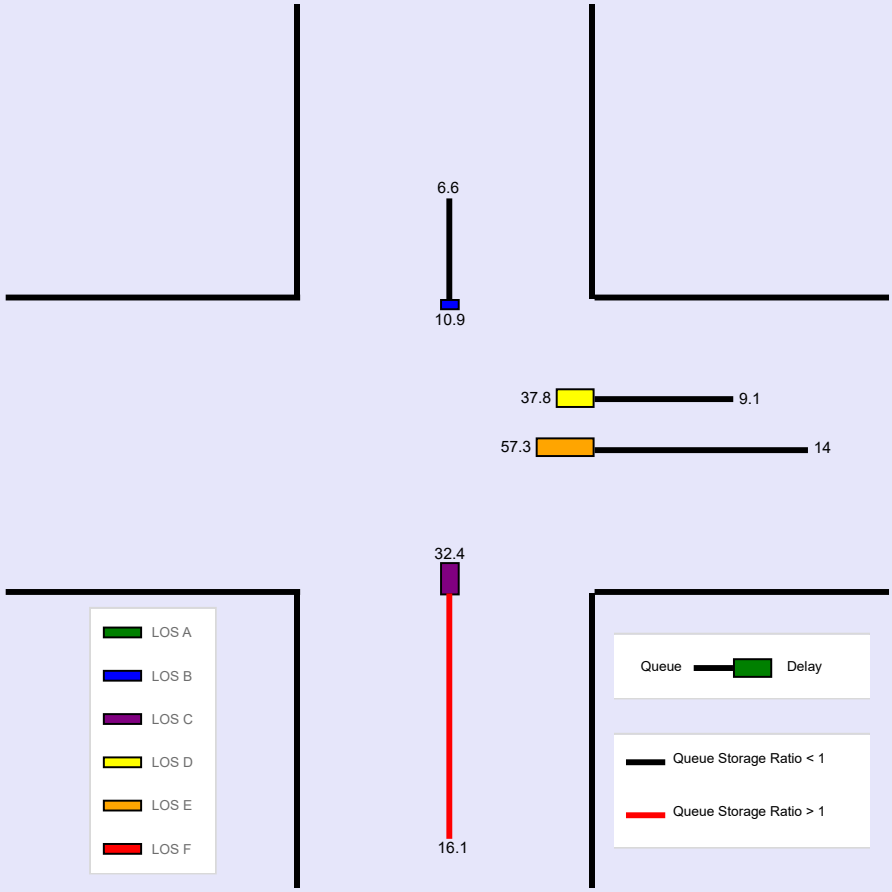
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	28	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	43.6	24.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		1.7	4.3					8.9	9.7		39.9	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.03	0.49					0.53	0.66		2.81	
Control Delay (*d*), s/veh		20.3	22.4					14.6	17.5		132.3	
Level of Service (LOS)		C	C					B	B		F	
Approach Delay, s/veh / LOS	21.7	C		0.0			16.1	B		132.3	F	
Intersection Delay, s/veh / LOS	59.7	E										



--- Messages ---

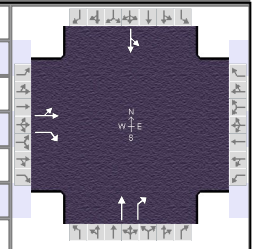
WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

WARNING: If demand exceeds capacity, a multiple-period analysis should be conducted.

--- Comments ---

HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD PM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	

Signal Information					EB		WB		NB		SB			
Cycle, s	70.0	Reference Phase	2											
Offset, s	38	Reference Point	End	Green	42.6	15.6	0.0	0.0	0.0	0.0	1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0	5	6	7	8
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0				

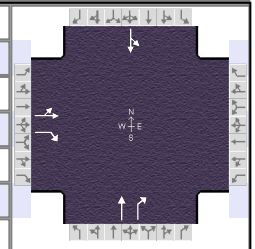
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	
Initial Queue (Q_b), veh/h	0	0	0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1750	1750	1750					1750	1750	1750	1750	
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %		37	37					17	17		9	
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3					3	3	3	3	
Upstream Filtering (*I*)	1.00	1.00	1.00					1.00	1.00	0.28	0.28	
Lane Width (*W*), ft		12.0	12.0					12.0	12.0		12.0	
Turn Bay Length, ft		1425	250					470	410		400	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35					45	45	45	45	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		21.0				49.0		49.0
Yellow Change Interval (*Y*), s		4.4				5.1		5.1
Red Clearance Interval (R_c), s		1.0				1.3		1.3
Minimum Green (G_{min}), s		10				20		20
Start-Up Lost Time (*lt*), s	2.0	2.0				2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0				2.0	2.0	2.0
Passage (*PT*), s		2.0				2.0		2.0
Recall Mode		Off				Min		Min
Dual Entry		Yes				Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0				0.0	No	25.0
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0				9.0	12.0	0.0
Street Width / Island / Curb, ft	0.0	0	No		0		0.0		No	0.0	0	No
Width Outside / Bike Lane / Shoulder, ft	12.0	5.0	2.0				12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

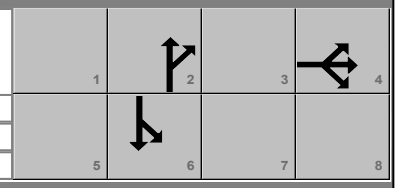
HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD PM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	

Signal Information					EB		WB		NB		SB		
Cycle, s	70.0	Reference Phase	2										
Offset, s	38	Reference Point	End	Green	42.6	15.6	0.0	0.0	0.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0			



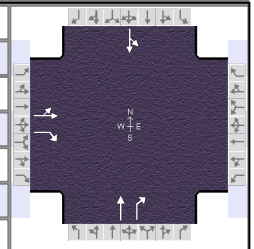
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2		6
Case Number		11.0				7.0		8.0
Phase Duration, s		21.0				49.0		49.0
Change Period, ($Y+R_c$), s		5.4				6.4		6.4
Max Allow Headway (*MAH*), s		3.3				0.0		0.0
Queue Clearance Time (g_s), s		16.9						
Green Extension Time (g_e), s		0.0				0.0		0.0
Phase Call Probability		1.00						
Max Out Probability		1.00						

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h		85	227					474	355		885	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1189	1055					1518	1286		1455	
Queue Service Time (g_s), s		4.2	14.9					12.4	10.4		30.1	
Cycle Queue Clearance Time (g_c), s		4.2	14.9					12.4	10.4		42.6	
Green Ratio (*g/C*)		0.22	0.22					0.61	0.61		0.61	
Capacity (*c*), veh/h		265	235					924	783		942	
Volume-to-Capacity Ratio (*X*)		0.321	0.965					0.513	0.453		0.939	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		2.0	10.9					6.0	4.3		14.5	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.05	1.41					0.36	0.30		0.97	
Uniform Delay (d_1), s/veh		22.8	26.9					7.8	7.4		14.3	
Incremental Delay (d_2), s/veh		0.3	48.4					2.0	1.9		6.8	
Initial Queue Delay (d_3), s/veh		0.0	0.0					0.0	0.0		0.0	
Control Delay (*d*), s/veh		23.0	75.4					9.8	9.3		21.0	
Level of Service (LOS)		C	E					A	A		C	
Approach Delay, s/veh / LOS	61.1	E		0.0			9.6	A		21.0	C	
Intersection Delay, s/veh / LOS	22.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.71	B	1.35	A	1.64	B
Bicycle LOS Score / LOS	1.00	A			1.86	B	2.02	B

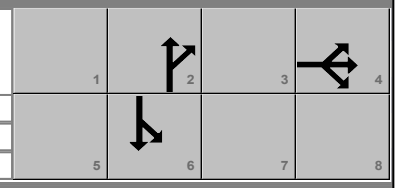
HCS Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD PM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	

Signal Information					EB		WB		NB		SB		
Cycle, s	70.0	Reference Phase	2		L	T	R	L	T	R	L	T	R
Offset, s	38	Reference Point	End	Green	42.6	15.6	0.0	0.0	0.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0			



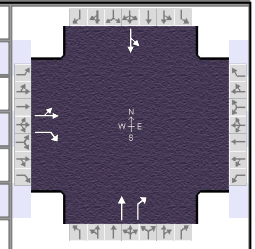
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.955	0.955					1.000	1.000		0.894	0.894	
Right-Turn Adjustment Factor (f_{RT})		0.000	0.847					0.000	0.847		0.000	0.894
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000						1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000						1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h	1128	60	1055				0	1518	1286	150	1305	0
Proportion of Vehicles Arriving on Green (P)	0.22	0.22	0.22	0.00	0.00	0.00	0.00	0.61	0.61	0.63	0.59	0.00
Incremental Delay Factor (k)		0.04	0.47					0.50	0.50		0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		4.0				6.4		6.4
Green Ratio (g/C)		0.22				0.61		0.61
Permitted Saturation Flow Rate (s_p), veh/h/ln		0				694		934
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						1518		0
Permitted Effective Green Time (g_p), s		0.0				0.0		42.6
Permitted Service Time (g_u), s		0.0				0.0		30.2
Permitted Queue Service Time (g_{ps}), s								30.1
Time to First Blockage (g_f), s		0.0				42.6		10.4
Queue Service Time Before Blockage (g_{fs}), s								10.4
Protected Right Saturation Flow (s_R), veh/h/ln		0				0		
Protected Right Effective Green Time (g_R), s		0.0				0.0		

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.198	0.000	0.972	0.000	0.681	0.000	0.972	0.000
Pedestrian F_s / F_{delay}	0.000	0.143	0.000	0.143	0.000	0.067	0.000	0.067
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		41.69		40.18	1217.14	5.36	1217.14	5.36
Bicycle F_w / F_v	-3.64	0.51	-3.64		-3.64	1.37	-3.64	1.53

HCS Signalized Intersection Results Graphical Summary

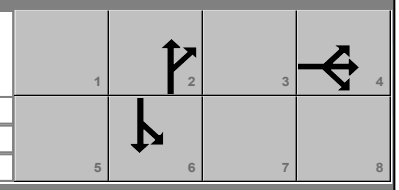
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 30, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD PM Peak - Int 1 & Int 2.xus		
Project Description	2043 Build Condition 1 Traffic Scenario				



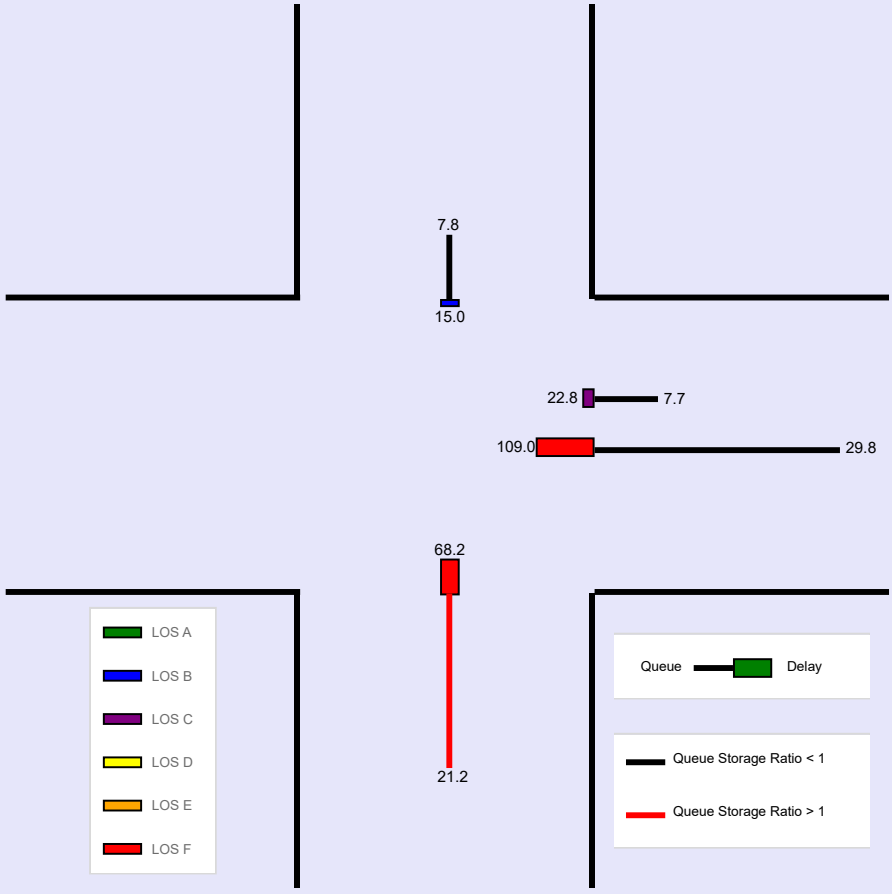
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	38	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	42.6	15.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		2.0	10.9					6.0	4.3		14.5	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.05	1.41					0.36	0.30		0.97	
Control Delay (*d*), s/veh		23.0	75.4					9.8	9.3		21.0	
Level of Service (LOS)		C	E					A	A		C	
Approach Delay, s/veh / LOS	61.1	E		0.0			9.6	A		21.0	C	
Intersection Delay, s/veh / LOS	22.5	C										



--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

HCS Two-Way Stop-Control Report

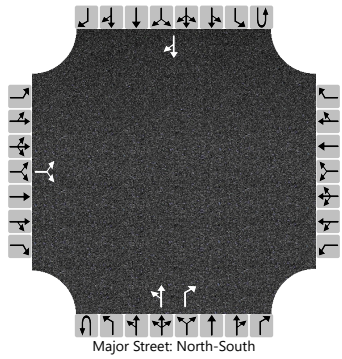
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/18/2022
Analysis Year	2043
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Build Condition 1

Site Information

Intersection	SR-149 & Reco Drive
Jurisdiction	ODOT
East/West Street	Reco Drive
North/South Street	SR-149
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	1	0	0	1	0
Configuration			LR							LT		R				TR
Volume (veh/h)		205		107						115	284	366			351	238
Percent Heavy Vehicles (%)		0		0						15						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized										No						
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		7.10		6.20						4.25						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.34						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			347							128						
Capacity, c (veh/h)			209							874						
v/c Ratio			1.66							0.15						
95% Queue Length, Q_{95} (veh)			22.9							0.5						
Control Delay (s/veh)			356.3							9.8	1.0					
Level of Service (LOS)			F							A	A					
Approach Delay (s/veh)		356.3								1.8						
Approach LOS		F								A						

HCS Two-Way Stop-Control Report

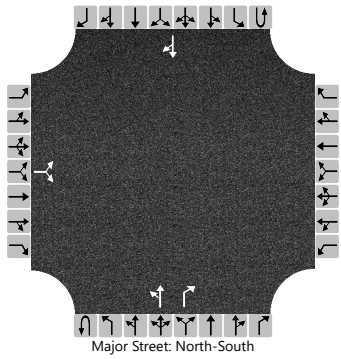
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/18/2022
Analysis Year	2043
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Build Condition 1

Site Information

Intersection	SR-149 & Reco Drive
Jurisdiction	ODOT
East/West Street	Reco Drive
North/South Street	SR-149
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	1	0	0	1	0
Configuration			LR							LT		R				TR
Volume (veh/h)		190		62						56	308	273			797	189
Percent Heavy Vehicles (%)		1		1						21						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized										No						
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		7.11		6.21						4.31						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.39						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			271							60						
Capacity, c (veh/h)			122							590						
v/c Ratio			2.22							0.10						
95% Queue Length, Q_{95} (veh)			23.0							0.3						
Control Delay (s/veh)			630.5							11.8	1.1					
Level of Service (LOS)			F							B	A					
Approach Delay (s/veh)		630.5								1.6						
Approach LOS		F								A						

HCS Two-Way Stop-Control Report

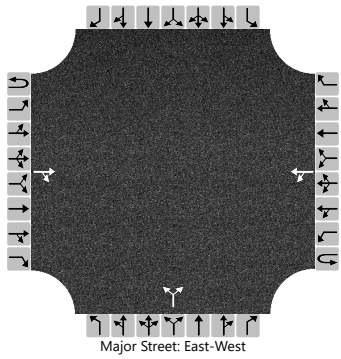
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/18/2022
Analysis Year	2043
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	Build Condition 1

Site Information

Intersection	Reco Drive & Love's Site Driveway #1
Jurisdiction	ODOT
East/West Street	Reco Drive
North/South Street	Love's Site Driveway #1
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			16	0		304	49			0		296				
Percent Heavy Vehicles (%)						2				0		0				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.12				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.22				3.50		3.30				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						330					322					
Capacity, c (veh/h)						1600					1067					
v/c Ratio						0.21					0.30					
95% Queue Length, Q_{95} (veh)						0.8					1.3					
Control Delay (s/veh)						7.8	1.7				9.8					
Level of Service (LOS)						A	A				A					
Approach Delay (s/veh)					7.0				9.8							
Approach LOS					A				A							

HCS Two-Way Stop-Control Report

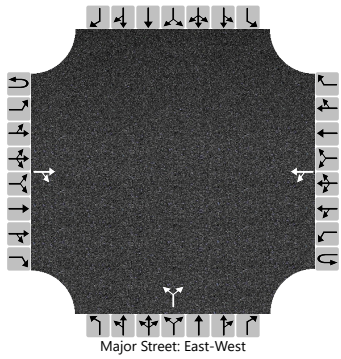
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/18/2022
Analysis Year	2043
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	Build Condition 1

Site Information

Intersection	Reco Drive & Love's Site Driveway #1
Jurisdiction	ODOT
East/West Street	Reco Drive
North/South Street	Love's Site Driveway #1
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			33	0		227	18			0		219				
Percent Heavy Vehicles (%)						1				0		0				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.11				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.50		3.30				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						247					238					
Capacity, c (veh/h)						1582					1043					
v/c Ratio						0.16					0.23					
95% Queue Length, Q_{95} (veh)						0.6					0.9					
Control Delay (s/veh)						7.7	1.2				9.5					
Level of Service (LOS)						A	A				A					
Approach Delay (s/veh)					7.2				9.5							
Approach LOS					A				A							

HCS Two-Way Stop-Control Report

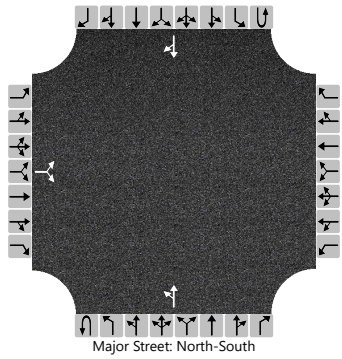
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/18/2022
Analysis Year	2043
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Build Condition 1

Site Information

Intersection	SR-149 & Love's Site Driveway #2
Jurisdiction	ODOT
East/West Street	Love's Site Driveway #2
North/South Street	SR-149
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		51		17						17	714				408	50
Percent Heavy Vehicles (%)		100		100						11						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		7.40		7.20						4.21						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		4.40		4.20						2.30						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			74							18						
Capacity, c (veh/h)			138							1021						
v/c Ratio			0.54							0.02						
95% Queue Length, Q_{95} (veh)			2.6							0.1						
Control Delay (s/veh)			58.0							8.6	0.3					
Level of Service (LOS)			F							A	A					
Approach Delay (s/veh)		58.0								0.5						
Approach LOS		F								A						

HCS Two-Way Stop-Control Report

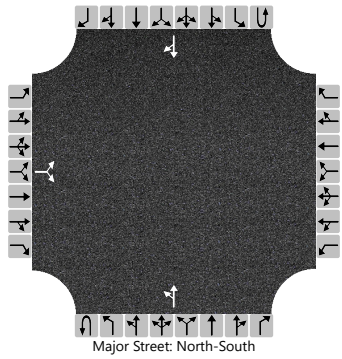
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/18/2022
Analysis Year	2043
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Build Condition 1

Site Information

Intersection	SR-149 & Love's Site Driveway #2
Jurisdiction	ODOT
East/West Street	Love's Site Driveway #2
North/South Street	SR-149
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		59		10						12	578				794	65
Percent Heavy Vehicles (%)		100		100						15						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		7.40		7.20						4.25						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		4.40		4.20						2.34						

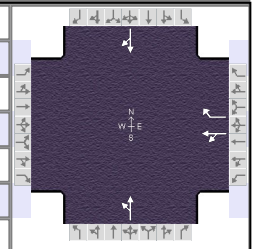
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			75							13						
Capacity, c (veh/h)			81							683						
v/c Ratio			0.93							0.02						
95% Queue Length, Q_{95} (veh)			5.0							0.1						
Control Delay (s/veh)			170.6							10.4	0.3					
Level of Service (LOS)			F							B	A					
Approach Delay (s/veh)		170.6								0.5						
Approach LOS		F								A						

CONDITION 2

HCS Signalized Intersection Input Data

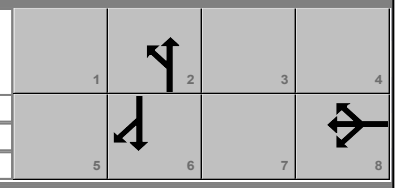
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	46.2	21.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



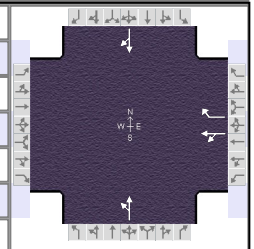
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55
Initial Queue (Q_b), veh/h				0	0	0	0	0			0	0
Base Saturation Flow Rate (s_o), veh/h				1750	1750	1750	1750	1750			1750	1750
Parking (N_m), man/h					None			None			None	
Heavy Vehicles (P_{HV}), %					17	17		13			11	
Ped / Bike / RTOR, /h	0	0		0	0	0	0	0		0	0	0
Buses (N_b), buses/h				0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)				3	3	3	3	3			3	3
Upstream Filtering (*I*)				1.00	1.00	1.00	0.97	0.97			1.00	1.00
Lane Width (*W*), ft					12.0	12.0		12.0			12.0	
Turn Bay Length, ft					1145	350		400			635	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h				35	35	35	45	45			45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s				52.0		28.0		28.0
Yellow Change Interval (*Y*), s				4.2		5.1		5.1
Red Clearance Interval (R_c), s				1.1		1.7		1.7
Minimum Green (G_{min}), s				10		20		20
Start-Up Lost Time (*l*t), s			2.0	2.0	2.0	2.0		2.0
Extension of Effective Green (*e*), s			2.0	2.0	2.0	2.0		2.0
Passage (*PT*), s				2.0		2.0		2.0
Recall Mode				Off		Min		Min
Dual Entry				Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0	0.0	No	25.0			
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0	9.0	12.0	0.0			
Street Width / Island / Curb, ft		0		0.0	0	No	0.0	0	No	0.0		No
Width Outside / Bike Lane / Shoulder, ft				12.0	5.0	2.0	12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No			No	0.50		No	0.50			0.50	

HCS Signalized Intersection Results Summary

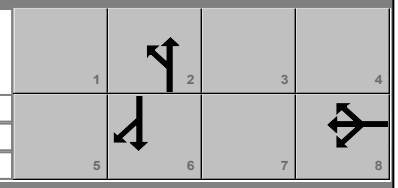
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	46.2	21.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



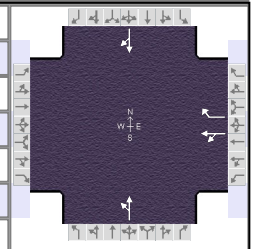
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2		6
Case Number				11.0		8.0		8.0
Phase Duration, s				27.0		53.0		53.0
Change Period, ($Y+R_c$), s				5.3		6.8		6.8
Max Allow Headway (*MAH*), s				3.2		0.0		0.0
Queue Clearance Time (g_s), s				20.4				
Green Extension Time (g_e), s				1.3		0.0		0.0
Phase Call Probability				1.00				
Max Out Probability				0.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	5	2			6	16
Adjusted Flow Rate (*v*), veh/h					347	259		341			423	
Adjusted Saturation Flow Rate (*s*), veh/h/ln					1446	1286		1049			1555	
Queue Service Time (g_s), s					18.4	14.7		9.6			12.6	
Cycle Queue Clearance Time (g_c), s					18.4	14.7		22.2			12.6	
Green Ratio (*g/C*)					0.27	0.27		0.58			0.58	
Capacity (*c*), veh/h					392	349		666			898	
Volume-to-Capacity Ratio (*X*)					0.885	0.743		0.512			0.471	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					10.4	7.8		6.8			6.9	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.26	0.63		0.47			0.30	
Uniform Delay (d_1), s/veh					28.0	26.6		11.3			9.8	
Incremental Delay (d_2), s/veh					2.7	1.2		2.7			1.8	
Initial Queue Delay (d_3), s/veh					0.0	0.0		0.0			0.0	
Control Delay (*d*), s/veh					30.7	27.8		14.0			11.6	
Level of Service (LOS)					C	C		B			B	
Approach Delay, s/veh / LOS	0.0			29.4		C	14.0		B	11.6		B
Intersection Delay, s/veh / LOS	20.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.72	B	1.72	B	1.65	B	1.36	A
Bicycle LOS Score / LOS			1.49	A	1.49	A	1.19	A

HCS Signalized Intersection Intermediate Values

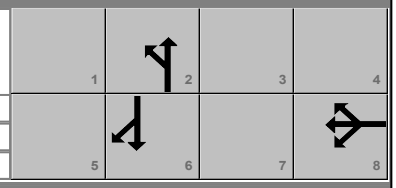
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	46.2	21.7	0.0	0.0	0.0	0.0						
Yellow	5.1	4.2	0.0	0.0	0.0	0.0						
Red	1.7	1.1	0.0	0.0	0.0	0.0						



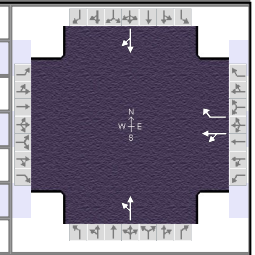
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})				0.953	0.953		0.667	0.667		1.000	0.972	
Right-Turn Adjustment Factor (f_{RT})					0.000	0.847		0.000	0.667		0.000	0.972
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})				1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})						1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h				1441	5	1286	342	706	0	0	1306	249
Proportion of Vehicles Arriving on Green (P)	0.00	0.00	0.00	0.27	0.27	0.27	0.49	0.68	0.00	0.00	0.58	0.58
Incremental Delay Factor (k)					0.04	0.04		0.50			0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)				4.0		6.8		6.8
Green Ratio (g/C)				0.27		0.58		0.58
Permitted Saturation Flow Rate (s_p), veh/h/ln				0		979		1169
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						0		1600
Permitted Effective Green Time (g_p), s				0.0		46.2		0.0
Permitted Service Time (g_u), s				0.0		33.6		0.0
Permitted Queue Service Time (g_{ps}), s						9.6		
Time to First Blockage (g_f), s				0.0		4.1		46.2
Queue Service Time Before Blockage (g_{fs}), s						4.1		
Protected Right Saturation Flow (s_R), veh/h/ln				0				
Protected Right Effective Green Time (g_R), s				0.0				

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	0.972	0.000	0.972	0.000	0.972	0.000	0.681	0.000
Pedestrian F_s / F_{delay}	0.000	0.148	0.000	0.148	0.000	0.079	0.000	0.079
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		45.16		46.55	1155.28	7.14	1155.28	7.14
Bicycle F_w / F_v	-3.64		-3.64	1.00	-3.64	1.00	-3.64	0.70

HCS Signalized Intersection Results Graphical Summary

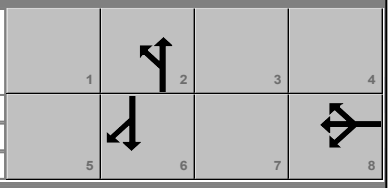
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



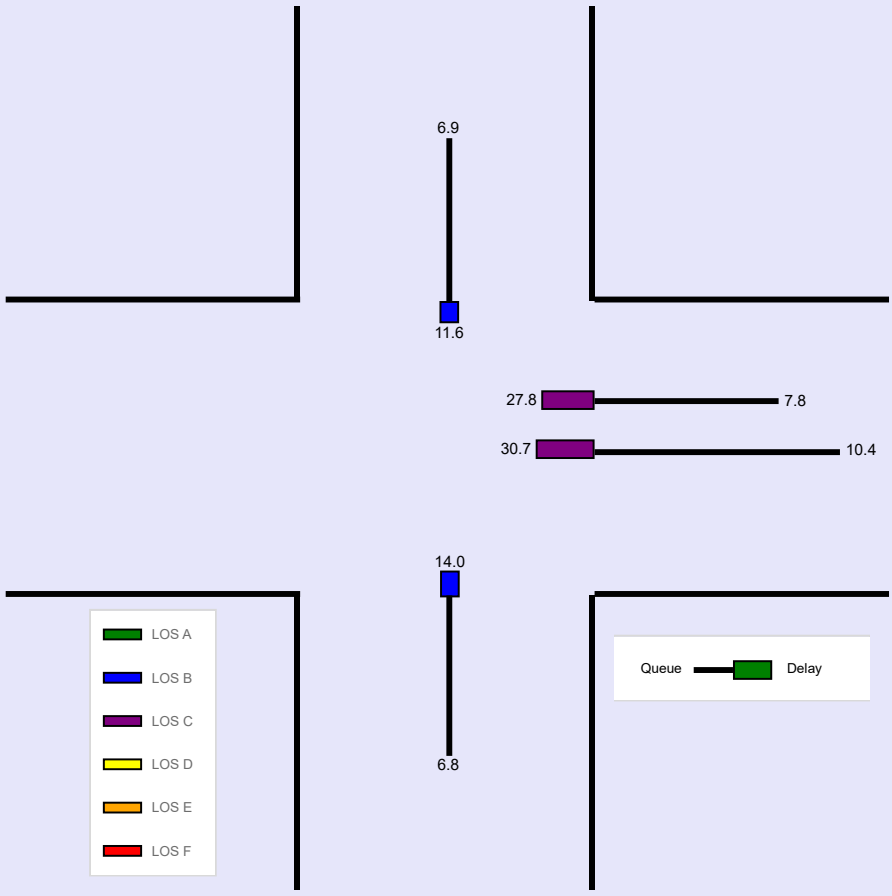
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				280	1	210	160	330			288	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	46.2	21.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					10.4	7.8		6.8			6.9	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.26	0.63		0.47			0.30	
Control Delay (*d*), s/veh					30.7	27.8		14.0			11.6	
Level of Service (LOS)					C	C		B			B	
Approach Delay, s/veh / LOS	0.0			29.4		C	14.0		B	11.6		B
Intersection Delay, s/veh / LOS	20.1						C					



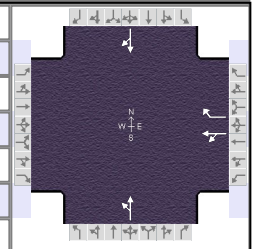
--- Messages ---

WARNING: According to input data, upstream feeding volume is equal to 56% of downstream exit volume during time period #1, for thru movement #2.

--- Comments ---

HCS Signalized Intersection Input Data

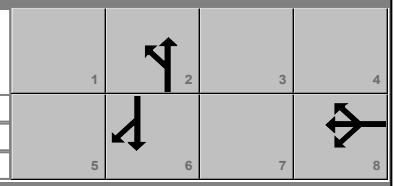
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	29.3	28.6	0.0	0.0	0.0	0.0						
Yellow	5.1	4.2	0.0	0.0	0.0	0.0						
Red	1.7	1.1	0.0	0.0	0.0	0.0						



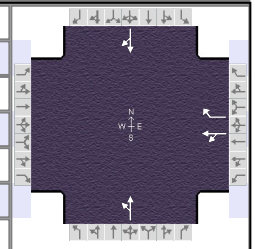
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65
Initial Queue (Q_b), veh/h				0	0	0	0	0			0	0
Base Saturation Flow Rate (s_o), veh/h				1750	1750	1750	1750	1750			1750	1750
Parking (N_m), man/h					None			None			None	
Heavy Vehicles (P_{HV}), %					10	10		12			3	
Ped / Bike / RTOR, /h	0	0		0	0	0	0	0		0	0	0
Buses (N_b), buses/h				0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)				3	3	3	3	3			3	3
Upstream Filtering (*I*)				1.00	1.00	1.00	0.95	0.95			1.00	1.00
Lane Width (*W*), ft					12.0	12.0		12.0			12.0	
Turn Bay Length, ft					1145	350		400			635	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h				35	35	35	45	45			45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s				35.0		35.0		35.0
Yellow Change Interval (*Y*), s				4.2		5.1		5.1
Red Clearance Interval (R_c), s				1.1		1.7		1.7
Minimum Green (G_{min}), s				10		20		20
Start-Up Lost Time (*l*t), s			2.0	2.0	2.0	2.0		2.0
Extension of Effective Green (*e*), s			2.0	2.0	2.0	2.0		2.0
Passage (*PT*), s				2.0		2.0		2.0
Recall Mode				Off		Min		Min
Dual Entry				Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0	0.0	No	25.0			
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0	9.0	12.0	0.0			
Street Width / Island / Curb, ft		0		0.0	0	No	0.0	0	No	0.0		No
Width Outside / Bike Lane / Shoulder, ft				12.0	5.0	2.0	12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No			No		0.50	No		0.50			0.50

HCS Signalized Intersection Results Summary

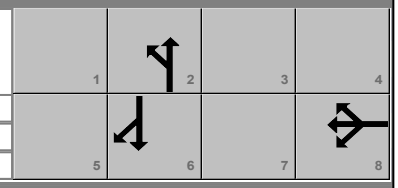
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	29.3	28.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



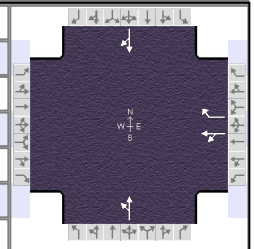
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2		6
Case Number				11.0		8.0		8.0
Phase Duration, s				33.9		36.1		36.1
Change Period, ($Y+R_c$), s				5.3		6.8		6.8
Max Allow Headway (*MAH*), s				3.2		0.0		0.0
Queue Clearance Time (g_s), s				28.2				
Green Extension Time (g_e), s				0.5		0.0		0.0
Phase Call Probability				1.00				
Max Out Probability				1.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	5	2			6	16
Adjusted Flow Rate (*v*), veh/h					596	310		387			438	
Adjusted Saturation Flow Rate (*s*), veh/h/ln					1537	1367		884			1660	
Queue Service Time (g_s), s					26.2	12.1		14.7			14.6	
Cycle Queue Clearance Time (g_c), s					26.2	12.1		29.3			14.6	
Green Ratio (*g/C*)					0.41	0.41		0.42			0.42	
Capacity (*c*), veh/h					629	560		437			694	
Volume-to-Capacity Ratio (*X*)					0.947	0.554		0.886			0.631	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					17.7	6.2		13.1			9.3	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.42	0.48		0.89			0.37	
Uniform Delay (d_1), s/veh					19.9	15.8		23.7			16.1	
Incremental Delay (d_2), s/veh					22.2	0.6		21.5			4.3	
Initial Queue Delay (d_3), s/veh					0.0	0.0		0.0			0.0	
Control Delay (*d*), s/veh					42.2	16.4		45.2			20.4	
Level of Service (LOS)					D	B		D			C	
Approach Delay, s/veh / LOS	0.0			33.3		C	45.2		D	20.4		C
Intersection Delay, s/veh / LOS	32.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.71	B	1.71	B	1.67	B	1.38	A
Bicycle LOS Score / LOS			1.98	B	1.43	A	1.21	A

HCS Signalized Intersection Intermediate Values

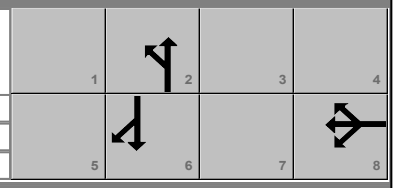
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	29.3	28.6	0.0	0.0	0.0	0.0						
Yellow	5.1	4.2	0.0	0.0	0.0	0.0						
Red	1.7	1.1	0.0	0.0	0.0	0.0						



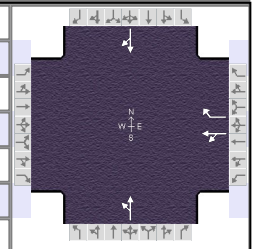
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})				0.952	0.952		0.557	0.557		1.000	0.971	
Right-Turn Adjustment Factor (f_{RT})					0.000	0.847		0.000	0.557		0.000	0.971
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})				1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})						1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h				1534	3	1367	269	615	0	0	1386	274
Proportion of Vehicles Arriving on Green (P)	0.00	0.00	0.00	0.41	0.41	0.41	0.58	0.31	0.00	0.00	0.42	0.42
Incremental Delay Factor (k)					0.42	0.07		0.50			0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)				4.0		6.8		6.8
Green Ratio (g/C)				0.41		0.42		0.42
Permitted Saturation Flow Rate (s_p), veh/h/ln				0		966		1128
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						0		1709
Permitted Effective Green Time (g_p), s				0.0		29.3		0.0
Permitted Service Time (g_u), s				0.0		14.7		0.0
Permitted Queue Service Time (g_{ps}), s						14.7		
Time to First Blockage (g_f), s				0.0		4.6		29.3
Queue Service Time Before Blockage (g_{fs}), s						4.6		
Protected Right Saturation Flow (s_R), veh/h/ln				0				
Protected Right Effective Green Time (g_R), s				0.0				

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	0.972	0.000	0.972	0.000	0.972	0.000	0.681	0.000
Pedestrian F_s / F_{delay}	0.000	0.143	0.000	0.143	0.000	0.099	0.000	0.099
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		40.18		41.58	835.84	11.86	835.84	11.86
Bicycle F_w / F_v	-3.64		-3.64	1.49	-3.64	0.95	-3.64	0.72

HCS Signalized Intersection Results Graphical Summary

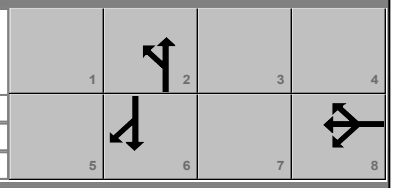
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



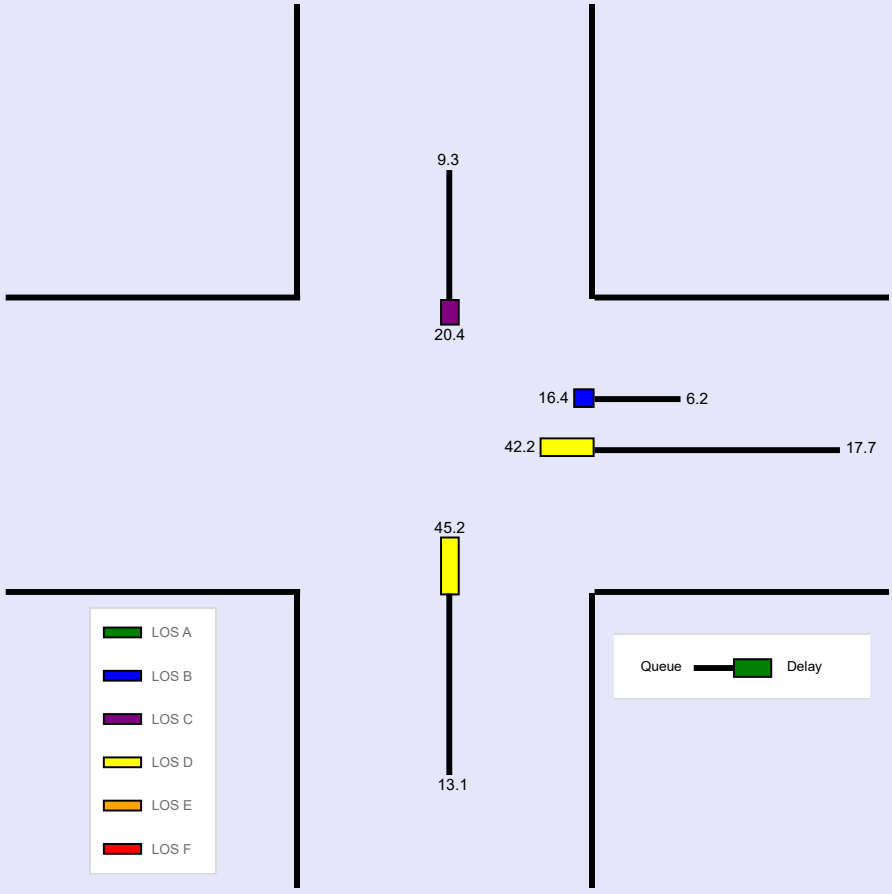
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				535	1	279	157	359			329	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	29.3	28.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					17.7	6.2		13.1			9.3	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.42	0.48		0.89			0.37	
Control Delay (*d*), s/veh					42.2	16.4		45.2			20.4	
Level of Service (LOS)					D	B		D			C	
Approach Delay, s/veh / LOS	0.0			33.3		C	45.2		D	20.4		C
Intersection Delay, s/veh / LOS	32.7						C					



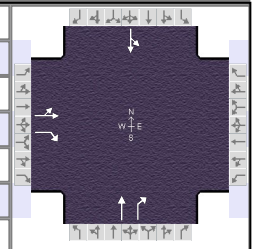
--- Messages ---

WARNING: According to input data, upstream feeding volume is equal to 67% of downstream exit volume during time period #1, for thru movement #2.

--- Comments ---

HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	

Signal Information					EB		WB				NB				SB			
Cycle, s	80.0	Reference Phase	2															
Offset, s	21	Reference Point	End	Green	55.6	12.6	0.0	0.0	0.0	0.0								
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0								
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0								

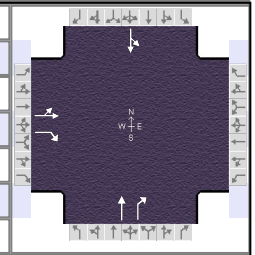
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	
Initial Queue (Q_b), veh/h	0	0	0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1750	1750	1750					1750	1750	1750	1750	
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %		19	19					13	13		16	
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3					3	3	3	3	
Upstream Filtering (*I*)	1.00	1.00	1.00					0.79	0.79	0.68	0.68	
Lane Width (*W*), ft		12.0	12.0					12.0	12.0		12.0	
Turn Bay Length, ft		1425	250					250	250		400	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35					45	45	45	45	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		44.0				36.0		36.0
Yellow Change Interval (*Y*), s		4.4				5.1		5.1
Red Clearance Interval (R_c), s		1.0				1.3		1.3
Minimum Green (G_{min}), s		10				20		20
Start-Up Lost Time (*lt*), s	2.0	2.0				2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0				2.0	2.0	2.0
Passage (*PT*), s		2.0				2.0		2.0
Recall Mode		Off				Min		Min
Dual Entry		Yes				Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0				0.0	No	25.0
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0				9.0	12.0	0.0
Street Width / Island / Curb, ft	0.0	0	No		0		0.0		No	0.0	0	No
Width Outside / Bike Lane / Shoulder, ft	12.0	5.0	2.0				12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

HCS Signalized Intersection Results Summary

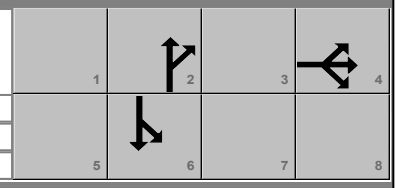
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	21	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	55.6	12.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



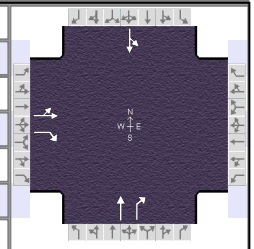
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2		6
Case Number		11.0				7.0		8.0
Phase Duration, s		18.0				62.0		62.0
Change Period, ($Y+R_c$), s		5.4				6.4		6.4
Max Allow Headway (*MAH*), s		3.3				0.0		0.0
Queue Clearance Time (g_s), s		12.2						
Green Extension Time (g_e), s		0.5				0.0		0.0
Phase Call Probability		0.99						
Max Out Probability		0.00						

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h		71	166					273	270		701	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1423	1263					1573	1333		1341	
Queue Service Time (g_s), s		3.5	10.2					8.1	6.4		28.0	
Cycle Queue Clearance Time (g_c), s		3.5	10.2					8.1	6.4		36.1	
Green Ratio (*g/C*)		0.16	0.16					0.69	0.69		0.69	
Capacity (*c*), veh/h		225	199					1092	926		986	
Volume-to-Capacity Ratio (*X*)		0.315	0.834					0.250	0.292		0.711	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		2.1	5.7					4.0	2.4		16.6	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.04	0.66					0.44	0.26		1.17	
Uniform Delay (d_1), s/veh		29.9	32.7					8.3	4.9		17.9	
Incremental Delay (d_2), s/veh		0.3	3.5					0.4	0.6		3.0	
Initial Queue Delay (d_3), s/veh		0.0	0.0					0.0	0.0		0.0	
Control Delay (*d*), s/veh		30.1	36.1					8.7	5.5		20.9	
Level of Service (LOS)		C	D					A	A		C	
Approach Delay, s/veh / LOS	34.4	C		0.0			7.1	A		20.9	C	
Intersection Delay, s/veh / LOS	18.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.72	B	1.33	A	1.62	B
Bicycle LOS Score / LOS	0.88	A			2.07	B	1.54	B

HCS Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	

Signal Information					EB		WB		NB		SB		
Cycle, s	80.0	Reference Phase	2										
Offset, s	21	Reference Point	End	Green	55.6	12.6	0.0	0.0	0.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0			

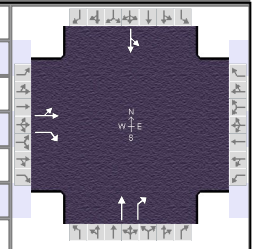
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.955	0.955					1.000	1.000		0.875	0.875	
Right-Turn Adjustment Factor (f_{RT})		0.000	0.847					0.000	0.847		0.000	0.875
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000						1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000						1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h	1355	68	1263				0	1573	1333	300	1041	0
Proportion of Vehicles Arriving on Green (P)	0.16	0.16	0.16	0.00	0.00	0.00	0.00	0.49	0.68	0.72	0.33	0.00
Incremental Delay Factor (k)		0.04	0.04					0.50	0.50		0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		4.0				6.4		6.4
Green Ratio (g/C)		0.16				0.69		0.69
Permitted Saturation Flow Rate (s_p), veh/h/ln		0				876		1124
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						1573		0
Permitted Effective Green Time (g_p), s		0.0				0.0		55.6
Permitted Service Time (g_u), s		0.0				0.0		47.5
Permitted Queue Service Time (g_{ps}), s								28.0
Time to First Blockage (g_f), s		0.0				55.6		6.4
Queue Service Time Before Blockage (g_{fs}), s								6.4
Protected Right Saturation Flow (s_R), veh/h/ln		0				0		
Protected Right Effective Green Time (g_R), s		0.0				0.0		

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.198	0.000	0.972	0.000	0.681	0.000	0.972	0.000
Pedestrian F_s / F_{delay}	0.000	0.148	0.000	0.148	0.000	0.053	0.000	0.053
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		46.66		45.16	1389.27	3.73	1389.27	3.73
Bicycle F_w / F_v	-3.64	0.39	-3.64		-3.64	1.59	-3.64	1.05

HCS Signalized Intersection Results Graphical Summary

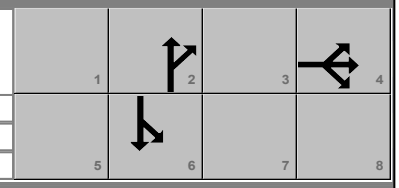
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



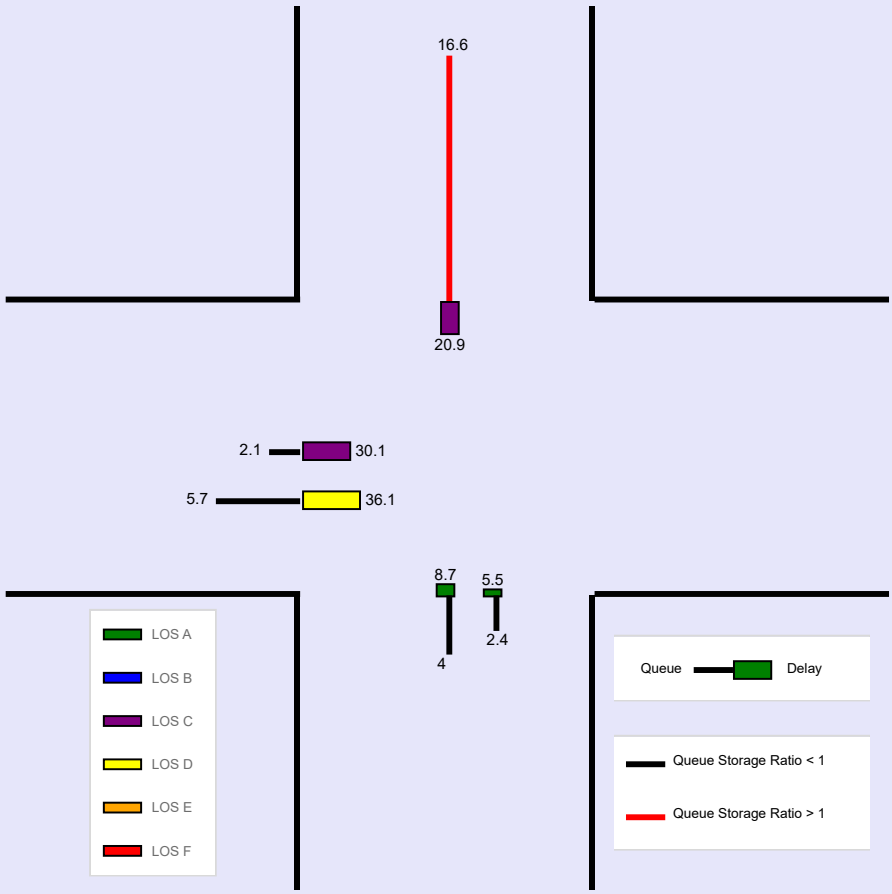
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	148					430	425	127	441	

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	21	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	55.6	12.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		2.1	5.7					4.0	2.4		16.6	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.04	0.66					0.44	0.26		1.17	
Control Delay (*d*), s/veh		30.1	36.1					8.7	5.5		20.9	
Level of Service (LOS)		C	D					A	A		C	
Approach Delay, s/veh / LOS	34.4	C		0.0			7.1	A		20.9	C	
Intersection Delay, s/veh / LOS	18.0						B					



--- Messages ---

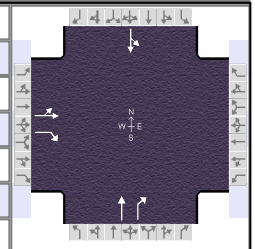
WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

WARNING: According to input data, upstream feeding volume is equal to 57% of downstream exit volume during time period #1, for thru movement #2.

--- Comments ---

HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	

Signal Information					EB		WB				NB				SB			
Cycle, s	70.0	Reference Phase	2															
Offset, s	59	Reference Point	End	Green	41.1	17.1	0.0	0.0	0.0	0.0	1	2	3	4				
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0	5	6	7	8				
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0								

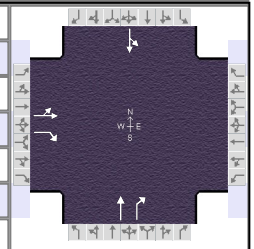
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	
Initial Queue (Q_b), veh/h	0	0	0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1750	1750	1750					1750	1750	1750	1750	
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %		37	37					17	17		9	
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3					3	3	3	3	
Upstream Filtering (*I*)	1.00	1.00	1.00					0.81	0.81	0.45	0.45	
Lane Width (*W*), ft		12.0	12.0					12.0	12.0		12.0	
Turn Bay Length, ft		1425	250					250	250		400	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35					45	45	45	45	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		37.0				33.0		33.0
Yellow Change Interval (*Y*), s		4.4				5.1		5.1
Red Clearance Interval (R_c), s		1.0				1.3		1.3
Minimum Green (G_{min}), s		10				20		20
Start-Up Lost Time (*l1*), s	2.0	2.0				2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0				2.0	2.0	2.0
Passage (*PT*), s		2.0				2.0		2.0
Recall Mode		Off				Min		Min
Dual Entry		Yes				Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0				0.0	No	25.0
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0				9.0	12.0	0.0
Street Width / Island / Curb, ft	0.0	0	No		0		0.0		No	0.0	0	No
Width Outside / Bike Lane / Shoulder, ft	12.0	5.0	2.0				12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

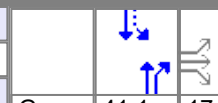
HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				

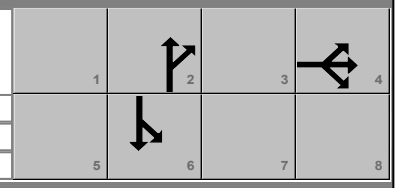


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	59	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	41.1	17.1	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



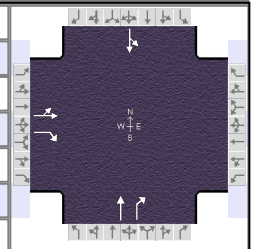
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2		6
Case Number		11.0				7.0		8.0
Phase Duration, s		22.5				47.5		47.5
Change Period, (*Y+R c*), s		5.4				6.4		6.4
Max Allow Headway (*MAH*), s		3.3				0.0		0.0
Queue Clearance Time (*g s*), s		16.5						
Green Extension Time (*g e*), s		0.6				0.0		0.0
Phase Call Probability		1.00						
Max Out Probability		0.00						

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h		85	227					306	229		960	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1189	1055					1518	1286		1485	
Queue Service Time (*g s*), s		4.1	14.5					11.1	8.5		30.1	
Cycle Queue Clearance Time (*g c*), s		4.1	14.5					11.1	8.5		41.1	
Green Ratio (*g/C*)		0.24	0.24					0.59	0.59		0.59	
Capacity (*c*), veh/h		290	257					892	756		930	
Volume-to-Capacity Ratio (*X*)		0.293	0.883					0.343	0.303		1.032	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		1.9	6.5					6.6	3.9		14.1	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.04	0.85					0.75	0.45		0.95	
Uniform Delay (*d 1*), s/veh		21.6	25.5					14.0	11.3		8.5	
Incremental Delay (*d 2*), s/veh		0.2	3.9					0.9	0.8		28.8	
Initial Queue Delay (*d 3*), s/veh		0.0	0.0					0.0	0.0		0.0	
Control Delay (*d*), s/veh		21.8	29.4					14.9	12.1		37.3	
Level of Service (LOS)		C	C					B	B		F	
Approach Delay, s/veh / LOS	27.4	C		0.0			13.7	B		37.3	D	
Intersection Delay, s/veh / LOS	28.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.71	B	1.35	A	1.64	B
Bicycle LOS Score / LOS	1.00	A			1.86	B	2.02	B

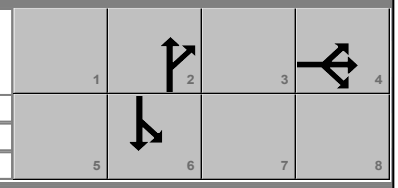
HCS Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	

Signal Information					EB		WB		NB		SB		
Cycle, s	70.0	Reference Phase	2		L	T	R	L	T	R	L	T	R
Offset, s	59	Reference Point	End	Green	41.1	17.1	0.0	0.0	0.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0			



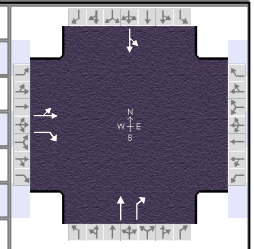
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.955	0.955					1.000	1.000		0.913	0.913	
Right-Turn Adjustment Factor (f_{RT})		0.000	0.847					0.000	0.847		0.000	0.913
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000						1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000						1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h	1128	60	1055				0	1518	1286	153	1332	0
Proportion of Vehicles Arriving on Green (P)	0.24	0.24	0.24	0.00	0.00	0.00	0.00	0.30	0.40	0.49	0.83	0.00
Incremental Delay Factor (k)		0.04	0.04					0.50	0.50		0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		4.0				6.4		6.4
Green Ratio (g/C)		0.24				0.59		0.59
Permitted Saturation Flow Rate (s_p), veh/h/ln		0				652		1090
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						1518		0
Permitted Effective Green Time (g_p), s		0.0				0.0		41.1
Permitted Service Time (g_u), s		0.0				0.0		30.1
Permitted Queue Service Time (g_{ps}), s								30.1
Time to First Blockage (g_f), s		0.0				41.1		9.2
Queue Service Time Before Blockage (g_{fs}), s								9.2
Protected Right Saturation Flow (s_R), veh/h/ln		0				0		
Protected Right Effective Green Time (g_R), s		0.0				0.0		

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.198	0.000	0.972	0.000	0.681	0.000	0.972	0.000
Pedestrian F_s / F_{delay}	0.000	0.143	0.000	0.143	0.000	0.071	0.000	0.071
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		41.69		40.18	1175.64	5.95	1175.64	5.95
Bicycle F_w / F_v	-3.64	0.51	-3.64		-3.64	1.37	-3.64	1.53

HCS Signalized Intersection Results Graphical Summary

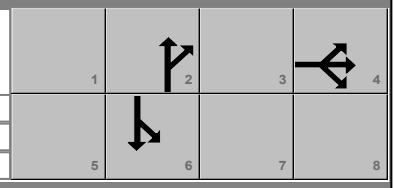
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



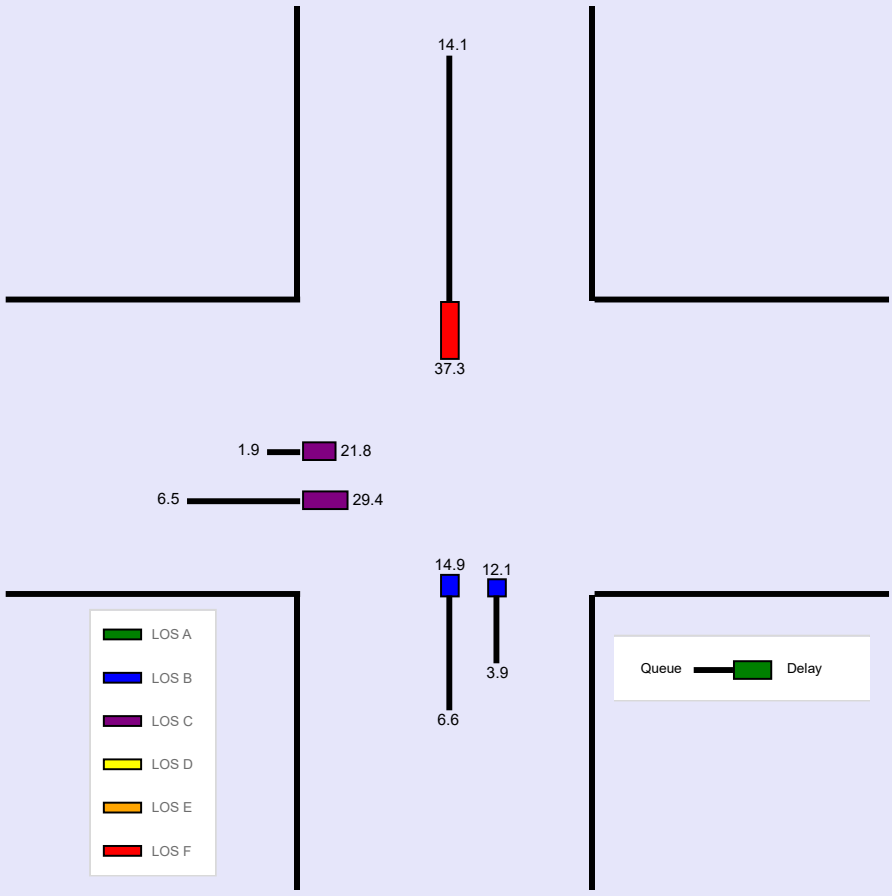
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	211					441	330	89	775	

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	59	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	41.1	17.1	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		1.9	6.5					6.6	3.9		14.1	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.04	0.85					0.75	0.45		0.95	
Control Delay (*d*), s/veh		21.8	29.4					14.9	12.1		37.3	
Level of Service (LOS)		C	C					B	B		F	
Approach Delay, s/veh / LOS	27.4	C		0.0			13.7	B		37.3	D	
Intersection Delay, s/veh / LOS	28.6						C					



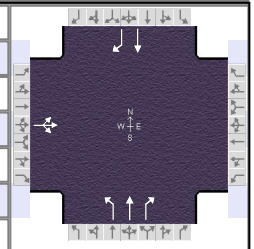
--- Messages ---

WARNING: According to input data, upstream feeding volume is equal to 65% of downstream exit volume during time period #1, for thru movement #2.

--- Comments ---

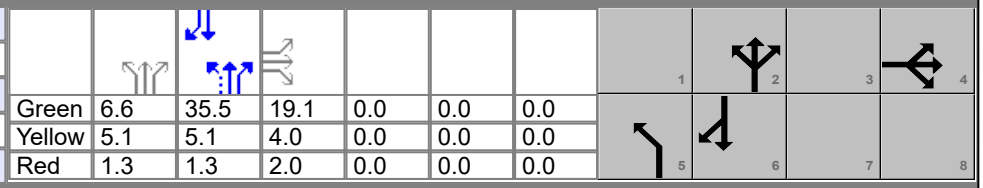
HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & Reco Drive	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	205	0	107				115	284	366		351	238

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	10	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	6.6	35.5	19.1	0.0	0.0	0.0						
Yellow	5.1	5.1	4.0	0.0	0.0	0.0						
Red	1.3	1.3	2.0	0.0	0.0	0.0						

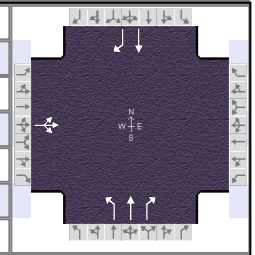
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	205	0	107				115	284	366		351	238
Initial Queue (Q_b), veh/h	0	0	0				0	0	0		0	0
Base Saturation Flow Rate (s_o), veh/h	1750	1750	1750				1750	1750	1750		1750	1750
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %		0					15	15	15		20	20
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3				3	3	3		3	3
Upstream Filtering (*I*)	1.00	1.00	1.00				1.00	1.00	1.00		0.75	0.75
Lane Width (*W*), ft		12.0					12.0	12.0	12.0		12.0	12.0
Turn Bay Length, ft		500					175	175	175		250	200
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	25	25	25				45	45	45		45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		28.0			14.0	52.0		38.0
Yellow Change Interval (*Y*), s		4.0			5.1	5.1		5.1
Red Clearance Interval (R_c), s		2.0			1.3	1.3		1.3
Minimum Green (G_{min}), s		10			7	20		20
Start-Up Lost Time (*l*t), s	2.0	2.0			2.0	2.0		2.0
Extension of Effective Green (*e*), s	2.0	2.0			2.0	2.0		2.0
Passage (*PT*), s		2.0			2.0	2.0		2.0
Recall Mode		Off			Off	Min		Min
Dual Entry		Yes			No	Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0				0.0	No	25.0
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0				9.0	12.0	0.0
Street Width / Island / Curb, ft	0.0	0	No		0		0.0		No	0.0	0	No
Width Outside / Bike Lane / Shoulder, ft	12.0	5.0	2.0				12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

HCS Signalized Intersection Results Summary

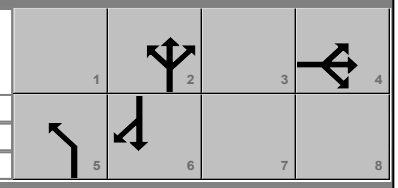
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & Reco Drive	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	205	0	107				115	284	366		351	238

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	10	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	6.6	35.5	19.1	0.0	0.0	0.0	
Yellow	5.1	5.1	4.0	0.0	0.0	0.0	
Red	1.3	1.3	2.0	0.0	0.0	0.0	



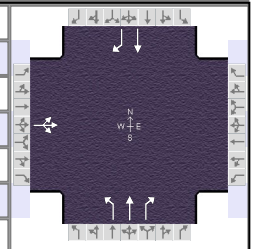
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		12.0			1.0	3.0		7.3
Phase Duration, s		25.1			13.0	54.9		41.9
Change Period, ($Y+R_c$), s		6.0			6.4	6.4		6.4
Max Allow Headway (*MAH*), s		3.4			3.0	0.0		0.0
Queue Clearance Time (g_s), s		18.9			5.4			
Green Extension Time (g_e), s		0.3			0.1	0.0		0.0
Phase Call Probability		1.00			0.94			
Max Out Probability		1.00			0.08			

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14				5	2	12		6	16
Adjusted Flow Rate (*v*), veh/h		347					128	316	407		424	287
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1599					1472	1545	1310		1477	1252
Queue Service Time (g_s), s		16.9					3.4	8.1	14.2		19.2	11.8
Cycle Queue Clearance Time (g_c), s		16.9					3.4	8.1	14.2		19.2	11.8
Green Ratio (*g/C*)		0.24					0.55	0.61	0.61		0.44	0.44
Capacity (*c*), veh/h		382					387	936	793		655	555
Volume-to-Capacity Ratio (*X*)		0.907					0.330	0.337	0.513		0.647	0.517
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		13.1					1.6	4.2	6.5		10.8	5.4
Queue Storage Ratio (*RQ*) (95 th percentile)		0.65					0.26	0.67	1.03		1.25	0.78
Uniform Delay (d_1), s/veh		29.6					12.1	7.8	9.0		20.6	13.0
Incremental Delay (d_2), s/veh		19.2					0.2	1.0	2.4		3.7	2.6
Initial Queue Delay (d_3), s/veh		0.0					0.0	0.0	0.0		0.0	0.0
Control Delay (*d*), s/veh		48.8					12.3	8.8	11.4		24.3	15.6
Level of Service (LOS)		D					B	A	B		C	B
Approach Delay, s/veh / LOS	48.8	D		0.0			10.6	B		20.8	C	
Intersection Delay, s/veh / LOS	21.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.14	B	1.95	B	1.35	A	1.67	B
Bicycle LOS Score / LOS	1.06	A			1.89	B	1.57	B

HCS Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & Reco Drive	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	205	0	107				115	284	366		351	238

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	10	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

							1	2	3	4
Green	6.6	35.5	19.1	0.0	0.0	0.0	5	6	7	8
Yellow	5.1	5.1	4.0	0.0	0.0	0.0				
Red	1.3	1.3	2.0	0.0	0.0	0.0				

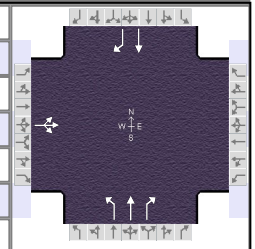
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.914	0.914					0.952	0.000		1.000	1.000	
Right-Turn Adjustment Factor (f_{RT})		0.000	0.000					0.000	0.847		0.000	0.847
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000						1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000						1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h	1050	0	548				1472	1545	1310	0	1477	1252
Proportion of Vehicles Arriving on Green (P)	0.24	0.00	0.24	0.00	0.00	0.00	0.08	0.61	0.61	0.00	0.35	0.54
Incremental Delay Factor (k)		0.31					0.04	0.50	0.50		0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		4.0			6.4	6.4		6.4
Green Ratio (g/C)		0.24			0.55	0.61		0.44
Permitted Saturation Flow Rate (s_p), veh/h/ln		0			864	0		1081
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								0
Permitted Effective Green Time (g_p), s		0.0			37.5	0.0		0.0
Permitted Service Time (g_u), s		0.0			16.3	0.0		0.0
Permitted Queue Service Time (g_{ps}), s					3.7			
Time to First Blockage (g_f), s		0.0			0.0	0.0		35.5
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln						0		0
Protected Right Effective Green Time (g_R), s						0.0		0.0

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.389	0.000	1.198	0.000	0.681	0.000	0.972	0.000
Pedestrian F_s / F_{delay}	0.000	0.148	0.000	0.148	0.000	0.073	0.000	0.101
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		47.31		45.16	1211.84	6.21	887.07	12.39
Bicycle F_w / F_v	-3.64	0.57	-3.64		-3.64	1.40	-3.64	1.08

HCS Signalized Intersection Results Graphical Summary

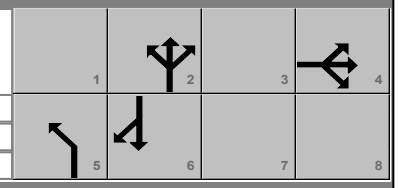
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & Reco Drive	File Name	2043 BD AM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



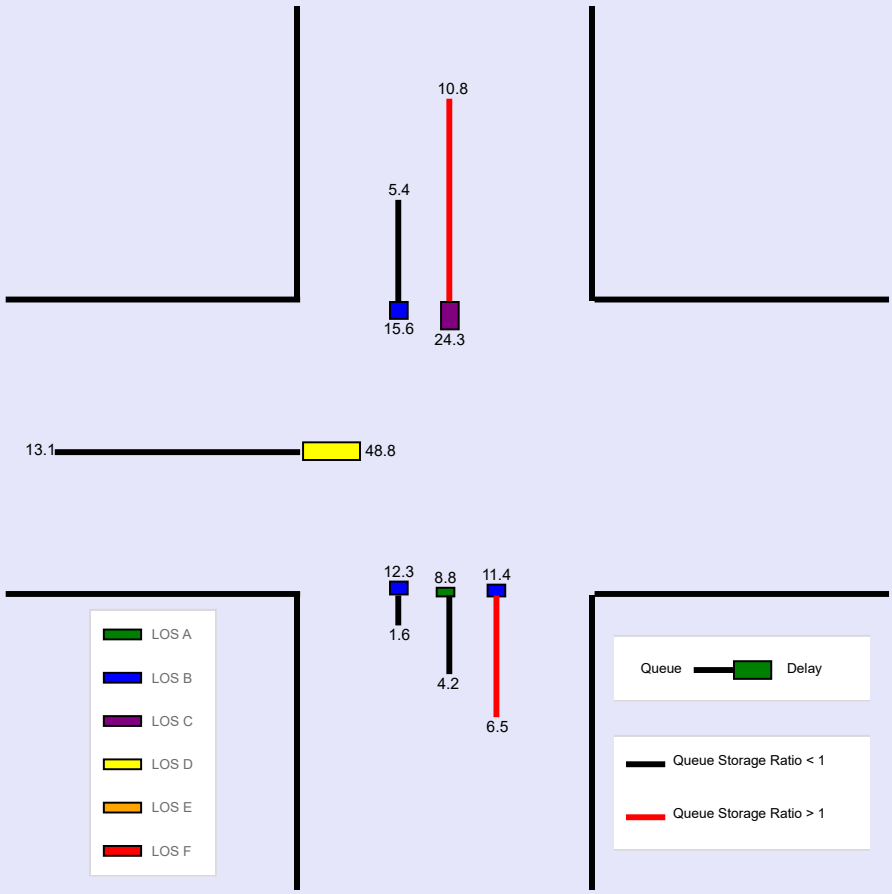
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	205	0	107				115	284	366		351	238

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	10	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	6.6	35.5	19.1	0.0	0.0	0.0	
Yellow	5.1	5.1	4.0	0.0	0.0	0.0	
Red	1.3	1.3	2.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		13.1					1.6	4.2	6.5		10.8	5.4
Queue Storage Ratio (*RQ*) (95 th percentile)		0.65					0.26	0.67	1.03		1.25	0.78
Control Delay (*d*), s/veh		48.8					12.3	8.8	11.4		24.3	15.6
Level of Service (LOS)		D					B	A	B		C	B
Approach Delay, s/veh / LOS	48.8	D		0.0			10.6	B		20.8	C	
Intersection Delay, s/veh / LOS	21.3						C					



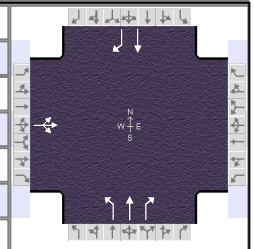
--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

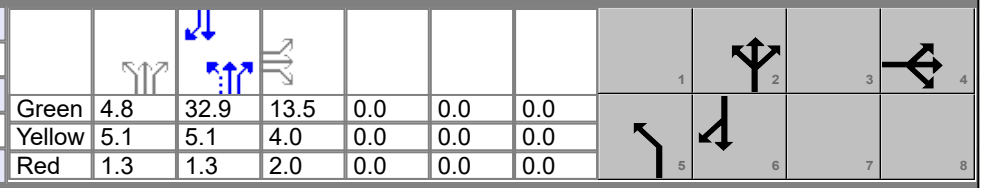
HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & Reco Drive	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	190	0	62				56	308	273		797	189

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	43	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	4.8	32.9	13.5	0.0	0.0	0.0						
Yellow	5.1	5.1	4.0	0.0	0.0	0.0						
Red	1.3	1.3	2.0	0.0	0.0	0.0						

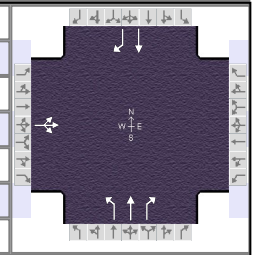
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	190	0	62				56	308	273		797	189
Initial Queue (Q_b), veh/h	0	0	0				0	0	0		0	0
Base Saturation Flow Rate (s_o), veh/h	1750	1750	1750				1750	1750	1750		1750	1750
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %		1					21	21	21		18	18
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3				3	3	3		3	3
Upstream Filtering (*I*)	1.00	1.00	1.00				1.00	1.00	1.00		0.22	0.22
Lane Width (*W*), ft		12.0					12.0	12.0	12.0		12.0	12.0
Turn Bay Length, ft		500					175	175	175		250	200
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	25	25	25				45	45	45		45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		20.0			14.0	50.0		36.0
Yellow Change Interval (*Y*), s		4.0			5.1	5.1		5.1
Red Clearance Interval (R_c), s		2.0			1.3	1.3		1.3
Minimum Green (G_{min}), s		10			7	20		20
Start-Up Lost Time (*l*t), s	2.0	2.0			2.0	2.0		2.0
Extension of Effective Green (*e*), s	2.0	2.0			2.0	2.0		2.0
Passage (*PT*), s		2.0			2.0	2.0		2.0
Recall Mode		Off			Off	Min		Min
Dual Entry		Yes			No	Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0				0.0	No	25.0
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0				9.0	12.0	0.0
Street Width / Island / Curb, ft	0.0	0	No		0		0.0		No	0.0	0	No
Width Outside / Bike Lane / Shoulder, ft	12.0	5.0	2.0				12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

HCS Signalized Intersection Results Summary

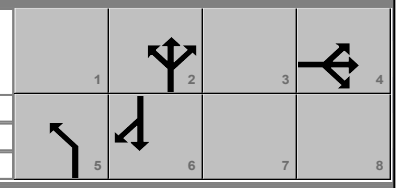
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & Reco Drive	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	190	0	62				56	308	273		797	189

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	43	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	4.8	32.9	13.5	0.0	0.0	0.0	
Yellow	5.1	5.1	4.0	0.0	0.0	0.0	
Red	1.3	1.3	2.0	0.0	0.0	0.0	



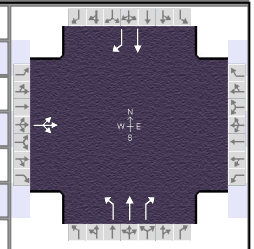
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		12.0			1.0	3.0		7.3
Phase Duration, s		19.5			11.2	50.5		39.3
Change Period, ($Y+R_c$), s		6.0			6.4	6.4		6.4
Max Allow Headway (*MAH*), s		3.3			3.0	0.0		0.0
Queue Clearance Time (g_s), s		13.5			3.4			
Green Extension Time (g_e), s		0.0			0.0	0.0		0.0
Phase Call Probability		0.99			0.69			
Max Out Probability		1.00			0.06			

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14				5	2	12		6	16
Adjusted Flow Rate (*v*), veh/h		271					60	331	294		834	198
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1605					1394	1463	1240		1504	1275
Queue Service Time (g_s), s		11.5					1.4	7.6	8.0		32.9	8.7
Cycle Queue Clearance Time (g_c), s		11.5					1.4	7.6	8.0		32.9	8.7
Green Ratio (*g/C*)		0.19					0.57	0.63	0.63		0.47	0.47
Capacity (*c*), veh/h		308					199	923	782		707	599
Volume-to-Capacity Ratio (*X*)		0.878					0.302	0.359	0.375		1.179	0.330
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		10.2					0.7	3.3	3.0		33.9	3.6
Queue Storage Ratio (*RQ*) (95 th percentile)		0.51					0.12	0.55	0.51		3.87	0.51
Uniform Delay (d_1), s/veh		27.5					15.5	6.2	6.3		19.1	16.7
Incremental Delay (d_2), s/veh		21.6					0.3	1.1	1.4		84.2	0.3
Initial Queue Delay (d_3), s/veh		0.0					0.0	0.0	0.0		0.0	0.0
Control Delay (*d*), s/veh		49.1					15.9	7.3	7.6		103.3	17.1
Level of Service (LOS)		D					B	A	A		F	B
Approach Delay, s/veh / LOS	49.1	D		0.0			8.2	A		86.8	F	
Intersection Delay, s/veh / LOS	54.6						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.13	B	1.94	B	1.34	A	1.66	B
Bicycle LOS Score / LOS	0.93	A			1.62	B	2.24	B

HCS Signalized Intersection Intermediate Values

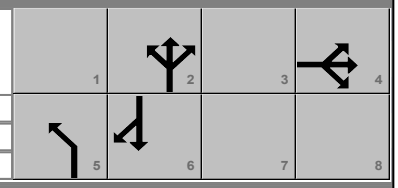
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & Reco Drive	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	190	0	62				56	308	273		797	189

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	43	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	4.8	32.9	13.5	0.0	0.0	0.0						
Yellow	5.1	5.1	4.0	0.0	0.0	0.0						
Red	1.3	1.3	2.0	0.0	0.0	0.0						



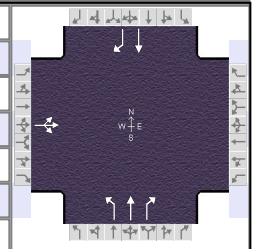
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.924	0.924					0.952	0.000		1.000	1.000	
Right-Turn Adjustment Factor (f_{RT})		0.000	0.000					0.000	0.847		0.000	0.847
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000						1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000						1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h	1210	0	395				1394	1463	1240	0	1504	1275
Proportion of Vehicles Arriving on Green (P)	0.19	0.00	0.19	0.00	0.00	0.00	0.07	0.63	0.63	0.00	0.45	0.27
Incremental Delay Factor (k)		0.36					0.04	0.50	0.50		0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		4.0			6.4	6.4		6.4
Green Ratio (g/C)		0.19			0.57	0.63		0.47
Permitted Saturation Flow Rate (s_p), veh/h/ln		0			559	0		1066
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								0
Permitted Effective Green Time (g_p), s		0.0			34.9	0.0		0.0
Permitted Service Time (g_u), s		0.0			0.0	0.0		0.0
Permitted Queue Service Time (g_{ps}), s					0.0			
Time to First Blockage (g_f), s		0.0			0.0	0.0		32.9
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln						0		0
Protected Right Effective Green Time (g_R), s						0.0		0.0

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.389	0.000	1.198	0.000	0.681	0.000	0.972	0.000
Pedestrian F_s / F_{delay}	0.000	0.143	0.000	0.143	0.000	0.063	0.000	0.092
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b	-200.00	42.35		40.18	1261.29	4.77	940.45	9.82
Bicycle F_w / F_v	-3.64	0.45	-3.64		-3.64	1.13	-3.64	1.75

HCS Signalized Intersection Results Graphical Summary

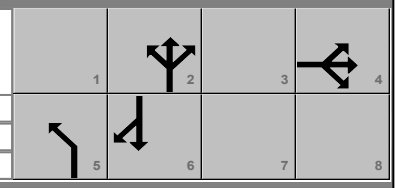
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	TMC	Analysis Date	11/18/2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & Reco Drive	File Name	2043 BD PM Peak - Int 1 - Int 3.xus		
Project Description	2043 Build Condition 2 Traffic Scenario				



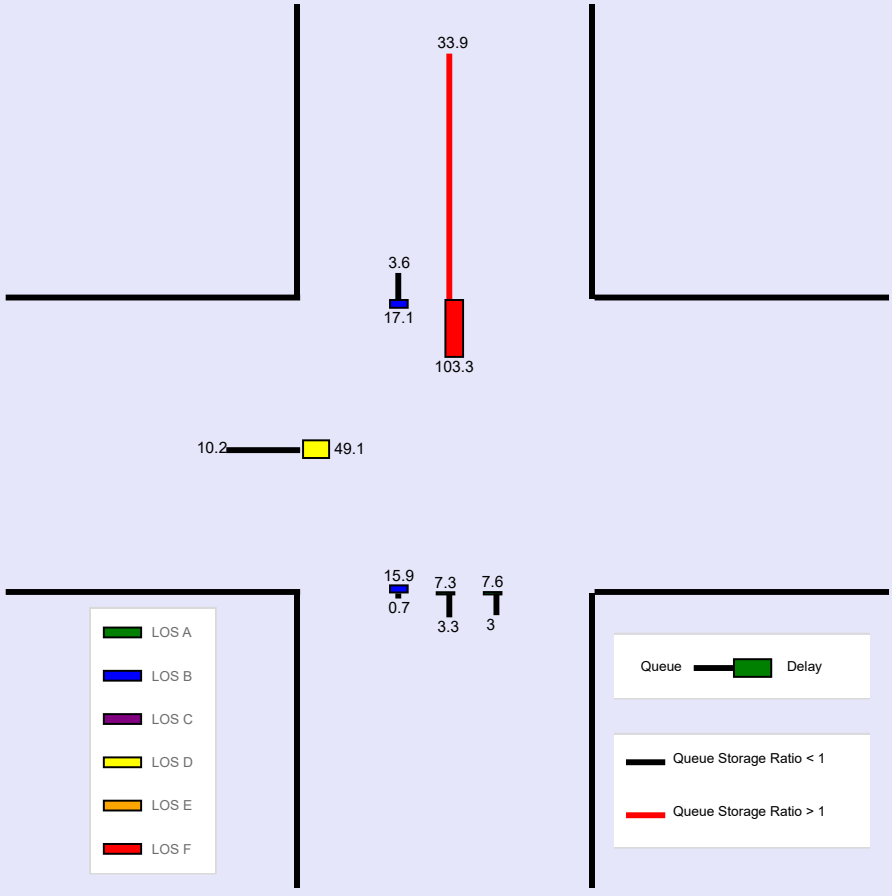
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	190	0	62				56	308	273		797	189

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	43	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	4.8	32.9	13.5	0.0	0.0	0.0	
Yellow	5.1	5.1	4.0	0.0	0.0	0.0	
Red	1.3	1.3	2.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		10.2					0.7	3.3	3.0		33.9	3.6
Queue Storage Ratio (*RQ*) (95 th percentile)		0.51					0.12	0.55	0.51		3.87	0.51
Control Delay (*d*), s/veh		49.1					15.9	7.3	7.6		103.3	17.1
Level of Service (LOS)		D					B	A	A		F	B
Approach Delay, s/veh / LOS	49.1		D	0.0			8.2		A	86.8		F
Intersection Delay, s/veh / LOS	54.6						D					



--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

WARNING: If demand exceeds capacity, a multiple-period analysis should be conducted.

--- Comments ---

HCS Two-Way Stop-Control Report

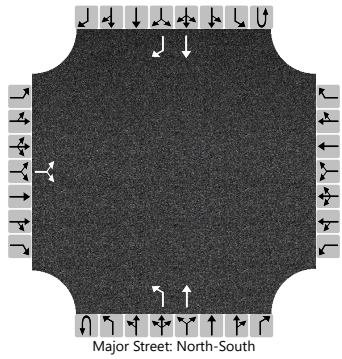
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/20/2022
Analysis Year	2043
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Build Condition 2

Site Information

Intersection	SR-149 & Love's Site Driveway #2
Jurisdiction	ODOT
East/West Street	Love's Site Driveway #2
North/South Street	SR-149
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		51		17						17	714				408	50
Percent Heavy Vehicles (%)		100		100						11						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized														No		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		7.40		7.20						4.21						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		4.40		4.20						2.30						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			74							18						
Capacity, c (veh/h)			146							1021						
v/c Ratio			0.51							0.02						
95% Queue Length, Q_{95} (veh)			2.4							0.1						
Control Delay (s/veh)			52.8							8.6						
Level of Service (LOS)			F							A						
Approach Delay (s/veh)		52.8								0.2						
Approach LOS		F								A						

HCS Two-Way Stop-Control Report

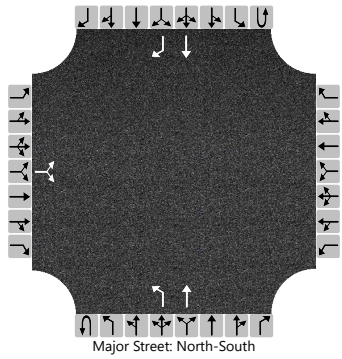
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/20/2022
Analysis Year	2043
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Build Condition 2

Site Information

Intersection	SR-149 & Love's Site Driveway #2
Jurisdiction	ODOT
East/West Street	Love's Site Driveway #2
North/South Street	SR-149
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		59		10						12	578				794	65
Percent Heavy Vehicles (%)		100		100						15						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized														No		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		7.40		7.20						4.25						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		4.40		4.20						2.34						

Delay, Queue Length, and Level of Service

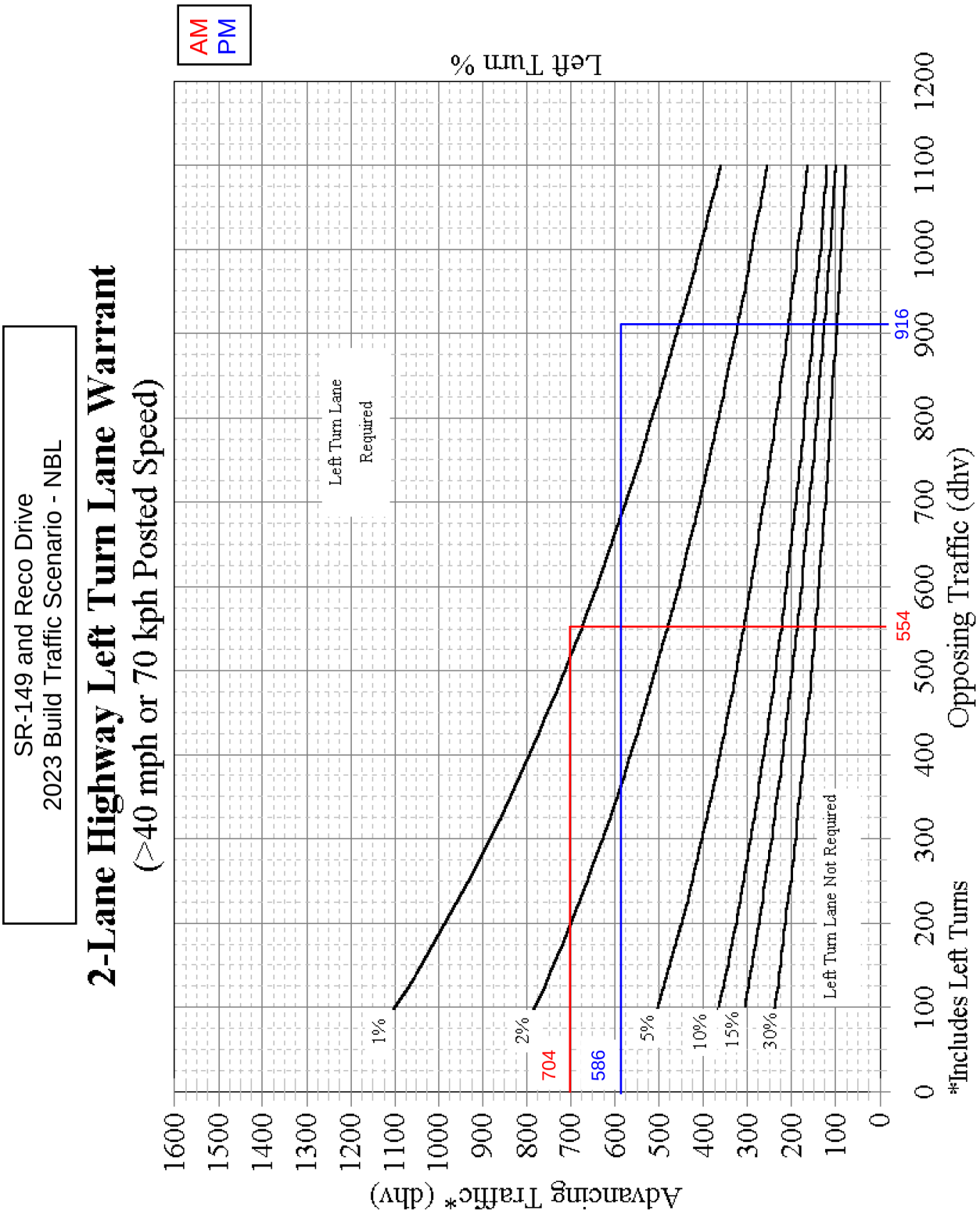
Flow Rate, v (veh/h)			75							13						
Capacity, c (veh/h)			86							683						
v/c Ratio			0.87							0.02						
95% Queue Length, Q_{95} (veh)			4.6							0.1						
Control Delay (s/veh)			147.7							10.4						
Level of Service (LOS)			F							B						
Approach Delay (s/veh)		147.7								0.2						
Approach LOS		F								A						

APPENDIX G
ODOT TURN LANE RESOURCES AND STORAGE LENGTH CALCULATION SHEETS

2-LANE LEFT TURN LANE WARRANT (HIGH SPEED)

401-5b

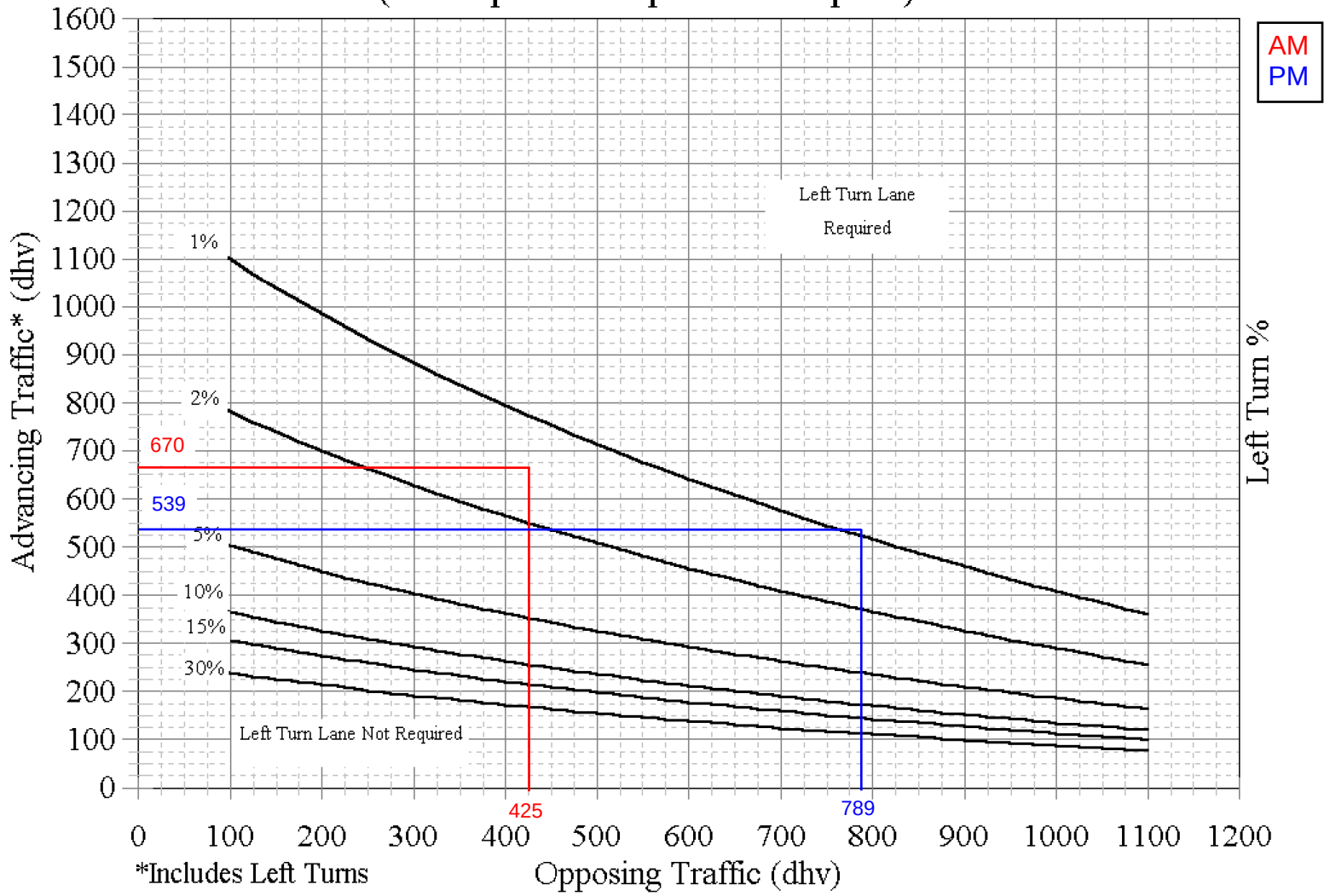
REFERENCE SECTION
401.6.1



SR-149 and Love's Site Driveway #2
2023 Build Traffic Scenario - NBL

2-Lane Highway Left Turn Lane Warrant

(>40 mph or 70 kph Posted Speed)



October 2004

2-LANE LEFT TURN LANE WARRANT (HIGH SPEED)

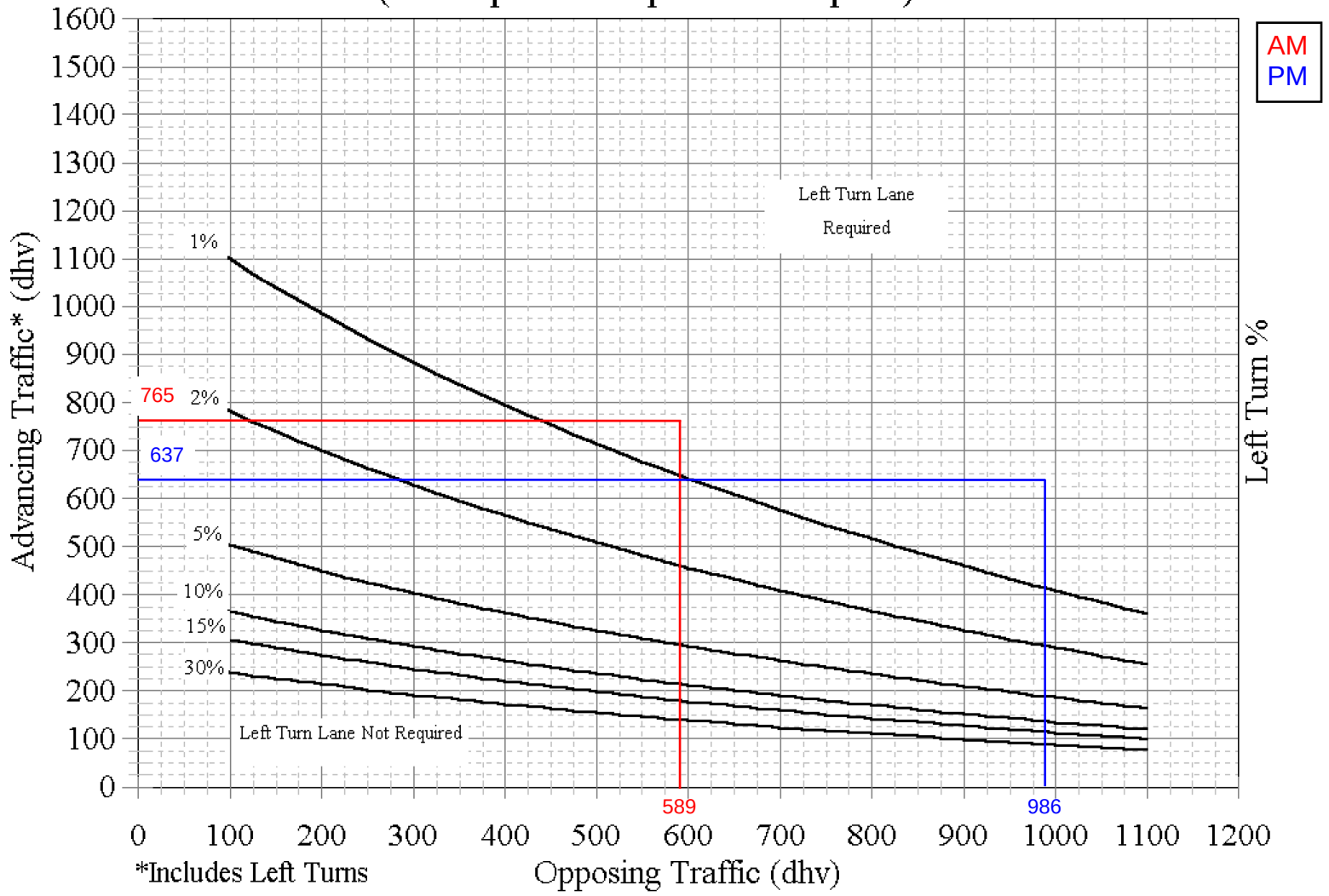
401-5b

REFERENCE SECTION 401.6.1

SR-149 and Reco Drive
2043 Design Year Traffic Scenario - NBL

2-Lane Highway Left Turn Lane Warrant

(>40 mph or 70 kph Posted Speed)



October 2004

2-LANE LEFT TURN LANE WARRANT (HIGH SPEED)

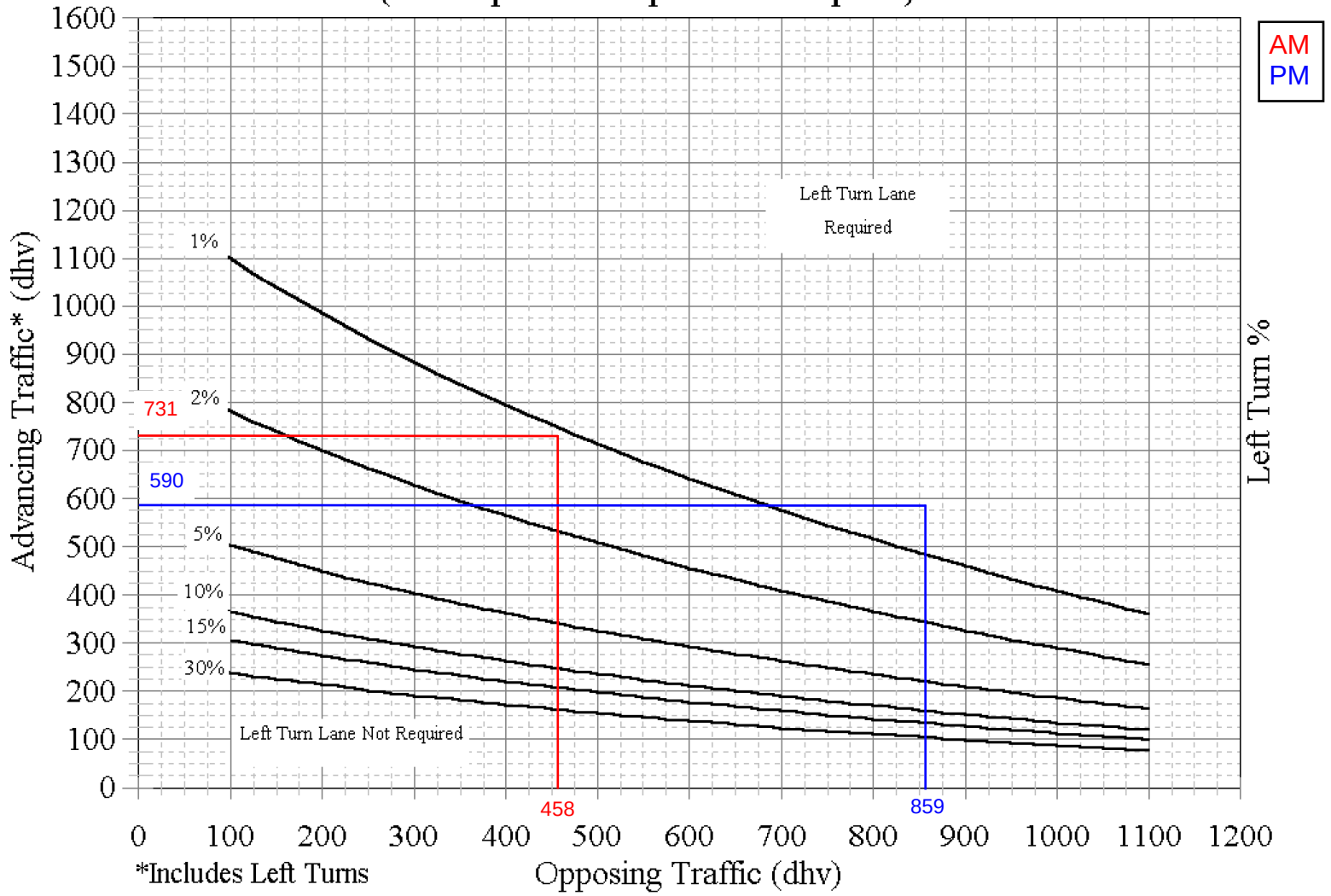
401-5b

REFERENCE SECTION 401.6.1

SR-149 and Love's Site Driveway #2
2043 Design Year Traffic Scenario - NBL

2-Lane Highway Left Turn Lane Warrant

(>40 mph or 70 kph Posted Speed)



October 2004

2-LANE LEFT TURN LANE WARRANT (HIGH SPEED)

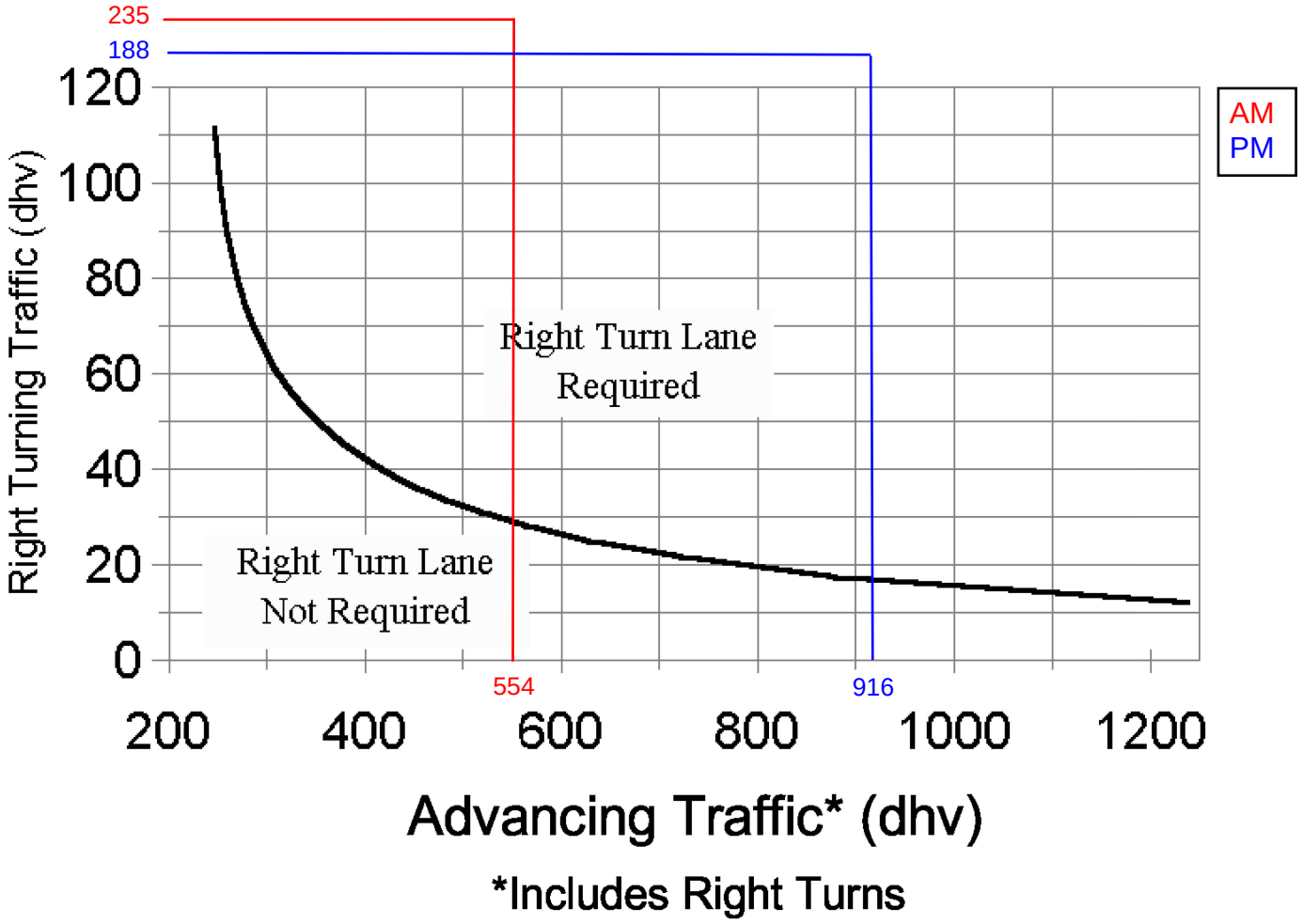
401-5b

REFERENCE SECTION 401.6.1

SR-149 and Reco Drive
2023 Build Traffic Scenario - SBR

2-Lane Highway Right Turn Lane Warrant

> 40 mph or 70 kph Posted Speed



*Includes Right Turns

October 2004

2-LANE RIGHT TURN LANE
WARRANT (HIGH SPEED)

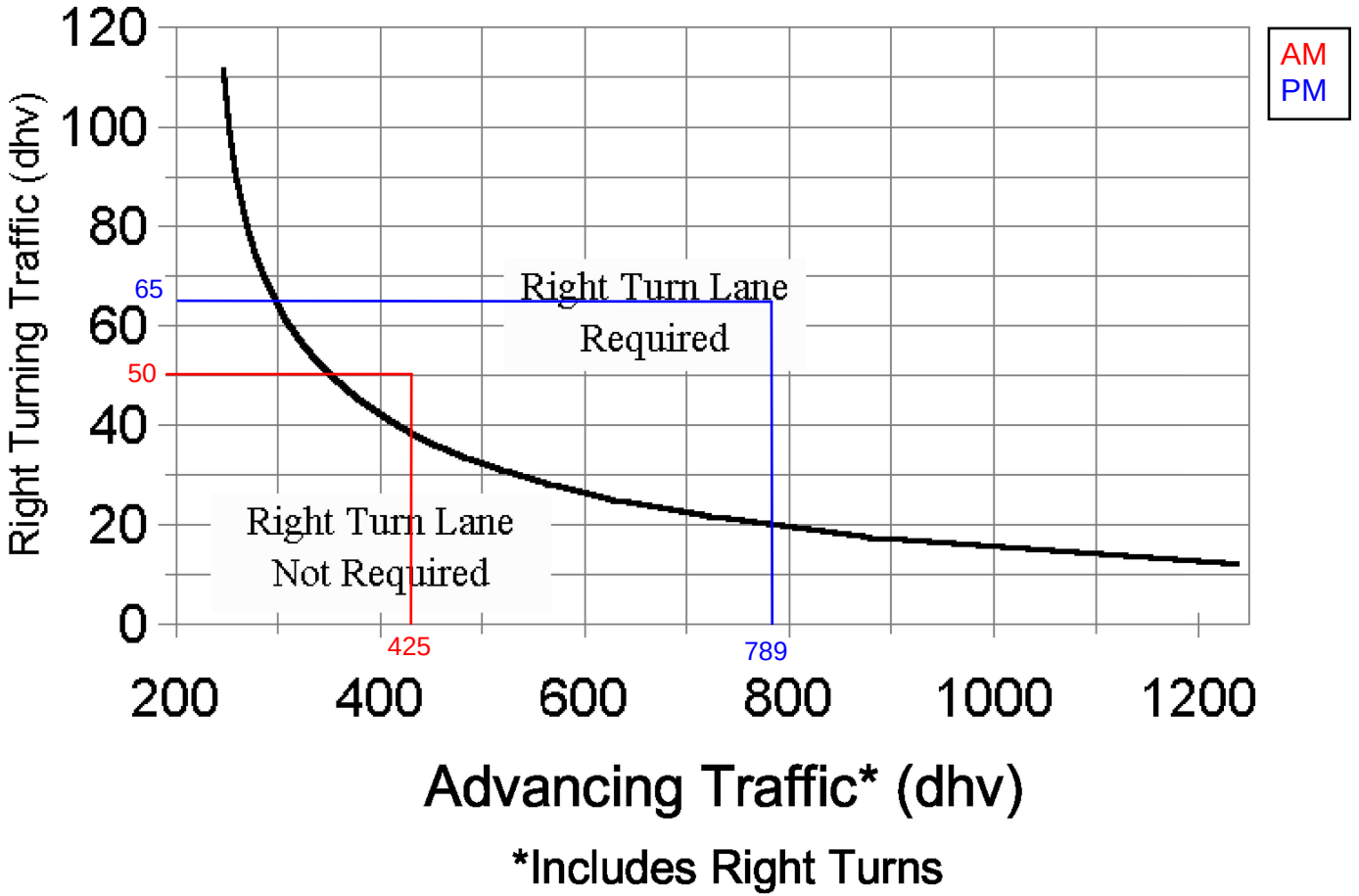
401-6b

REFERENCE SECTION
401.6.3

SR-149 and Love's Site Driveway #2
2023 Build Traffic Scenario - SBR

2-Lane Highway Right Turn Lane Warrant

> 40 mph or 70 kph Posted Speed



Advancing Traffic* (dhv)

*Includes Right Turns

October 2004

2-LANE RIGHT TURN LANE WARRANT (HIGH SPEED)

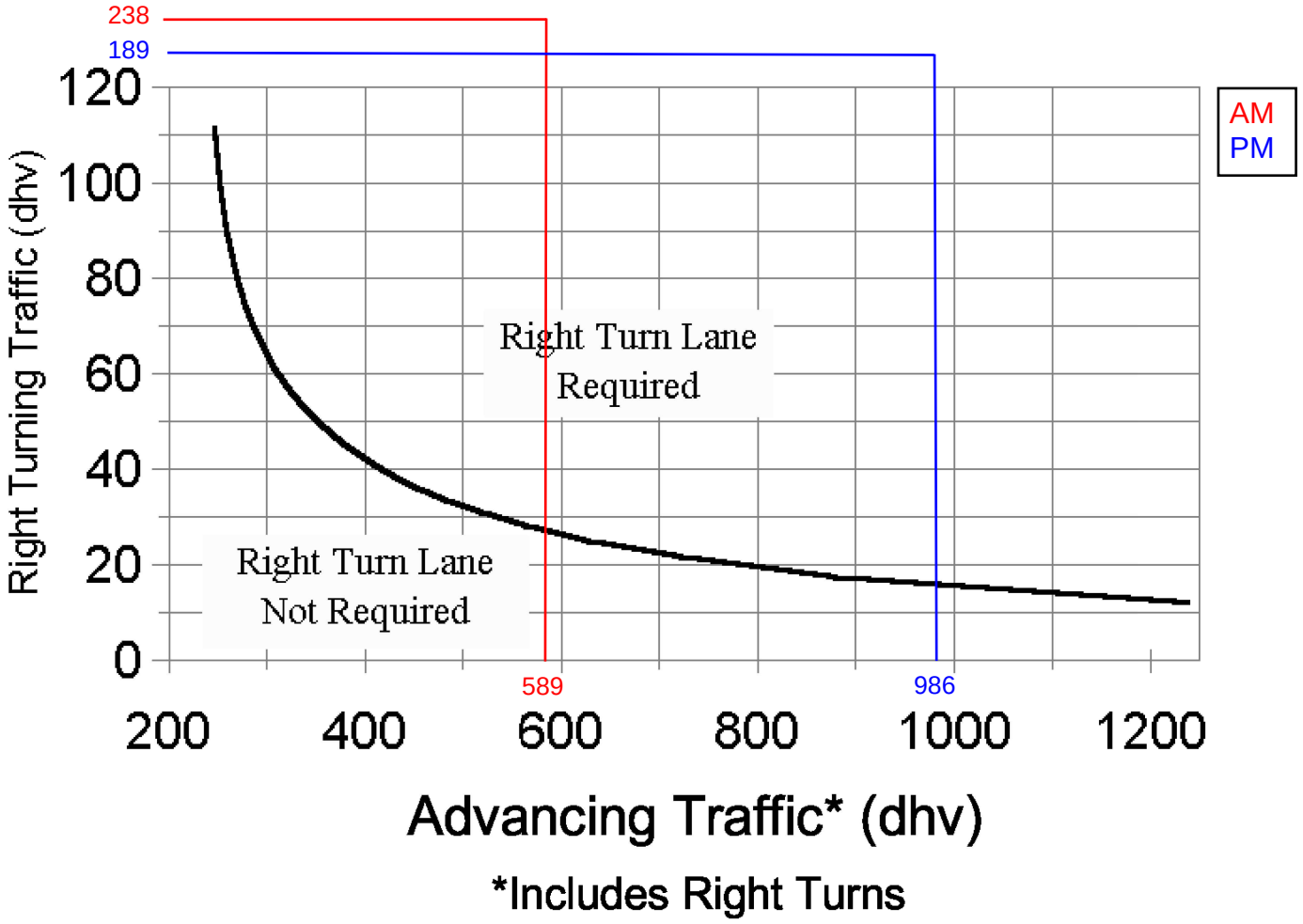
401-6b

REFERENCE SECTION 401.6.3

SR-149 and Reco Drive
2043 Design Year Traffic Scenario - SBR

2-Lane Highway Right Turn Lane Warrant

> 40 mph or 70 kph Posted Speed



*Includes Right Turns

October 2004

2-LANE RIGHT TURN LANE
WARRANT (HIGH SPEED)

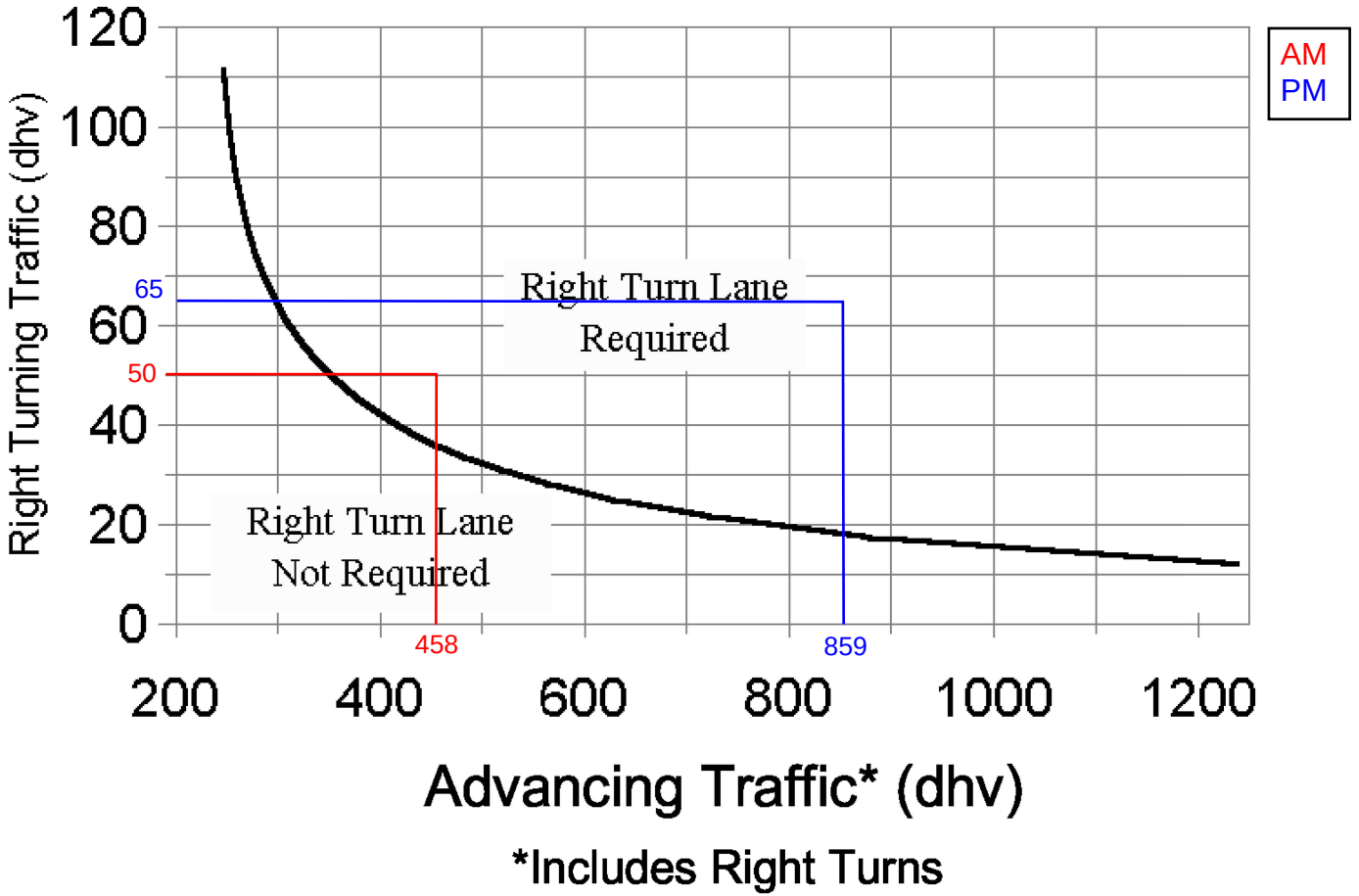
401-6b

REFERENCE SECTION
401.6.3

SR-149 and Love's Site Driveway #2
2043 Design Year Traffic Scenario - SBR

2-Lane Highway Right Turn Lane Warrant

> 40 mph or 70 kph Posted Speed



Advancing Traffic* (dhv)

*Includes Right Turns

2-LANE RIGHT TURN LANE
WARRANT (HIGH SPEED)

401-6b

REFERENCE SECTION
401.6.3

October 2004

Location	2043 Design Year Traffic Scenario - AM Peak Hour																			
	Direction	No. of Lanes	Design Speed	Type of Traffic Control	Condition	Cycle Length (Sec.)	Cycles Per Hour	Volume	Avg. Veh./Cycle/ Lane	Rounded Up Avg. Veh./Cycle	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition				Backup Length (ft)	Required Turn Lane Length* (ft)	Ex. Storage Length (ft)	Prop. Storage Length* (ft)	Turn Lane Length (Ex/Prop < Required)?	HCS 95th Perc. Queue
												A*	B*		C*						
SR-149 & I-70 WB On/Off Ramps	NBL	1	50 mph	Signalized	B or C	80	45	160	3.56	4.0	175		225	145	320		320	N/A	375	Yes	188.0
	NBT	1	50 mph	Signalized		80	45	330	7.33	8.0	325					325					188.0
SR-149 & I-70 EB On/Off Ramps	SBL	1	50 mph	Signalized	B or C	80	45	127	2.82	3.0	150		225	145	295		295	N/A	425	Yes	468.0
	SBT	1	50 mph	Signalized		80	45	441	9.80	10.0	375					375					468.0
SR-149 & Reco Drive	NBL	1	50 mph	Signalized	B or C	80	45	115	2.56	3.0	150		225	145	295		295	N/A	575	Yes	45.5
	NBT	1	50 mph	Signalized	B or C	80	45	650	14.44	15.0	525					525					117.3
	SBT	1	50 mph	Signalized	B or C	80	45	351	7.80	8.0	325					325					312.5
	SBR	1	50 mph	Signalized	B or C	80	45	238	5.29	6.0	250		225	145	395		395	N/A	395	Yes	156.0
SR-149 & Love's Site Driveway #2	NBL	1	50 mph	Unsignalized	B	N/A	60	17	0.28	1.0	50		225				225	N/A	225	No	2.5
	SBR	1	50 mph	Unsignalized	B or C	N/A	60	50	0.83	1.0	50		225	145	195		225	N/A	225	No	0.0

Location	2043 Design Year Traffic Scenario - PM Peak Hour																			
	Direction	No. of Lanes	Design Speed	Type of Traffic Control	Condition	Cycle Length (Sec.)	Cycles Per Hour	Volume	Avg. Veh./Cycle/ Lane	Rounded Up Avg. Veh./Cycle	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition				Backup Length (ft)	Required Turn Lane Length* (ft)	Ex. Storage Length (ft)	Prop. Storage Length* (ft)	Turn Lane Length (Ex/Prop < Required)?	HCS 95th Perc. Queue
												A*	B*		C*						
SR-149 & I-70 WB On/Off Ramps	NBL	1	50 mph	Signalized	B or C	70	51	157	3.08	4.0	175		225	145	320		320	N/A	375	Yes	356.0
	NBT	1	50 mph	Signalized		70	51	359	7.04	8.0	325					325					356.0
SR-149 & I-70 EB On/Off Ramps	SBL	1	50 mph	Signalized	B or C	70	51	89	1.75	2.0	100		225	145	245		245	N/A	600	Yes	380.0
	SBT	1	50 mph	Signalized		70	51	775	15.20	16.0	550					550					380.0
SR-149 & Reco Drive	NBL	1	50 mph	Signalized	B or C	70	51	56	1.10	2.0	100		225	145	245		245	N/A	500	Yes	21.0
	NBT	1	50 mph	Signalized	B or C	70	51	581	11.39	12.0	450					450					96.3
	SBT	1	50 mph	Signalized	B or C	70	51	797	15.63	16.0	550					550					967.5
	SBR	1	50 mph	Signalized	B or C	70	51	189	3.71	4.0	175		225	145	320		320	N/A	600	Yes	102.0
SR-149 & Love's Site Driveway #2	NBL	1	50 mph	Unsignalized	B	N/A	60	12	0.20	1.0	50		225				225	N/A	225	No	2.5
	SBR	1	50 mph	Unsignalized	B	N/A	60	65	1.08	2.0	100		225				225	N/A	225	No	0.0

* - Includes 50' taper

APPENDIX H
HCS 95TH PERCENTILE QUEUE LENGTH SHEETS

NOTE: Refer to Appendices E & F for 95th percentile queues included on the HCS output sheets

APPENDIX I
SIGNAL WARRANT STUDY CALCULATIONS

SR 149 & RECO DRIVE - EXISTING TRAFFIC COUNTS (YEAR 2022)												
TIME BEGIN	SR 149 (NORTHBOUND)			SR 149 (SOUTHBOUND)			RECO DRIVE (EASTBOUND)			N/A (WESTBOUND)		
	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT
6AM	3	314	0	0	152	8	11	0	5	0	0	0
7AM	9	510	0	0	217	29	5	0	7	0	0	0
8AM	10	392	0	0	247	8	14	0	10	0	0	0
11AM	2	241	0	0	258	9	15	0	13	0	0	0
12PM	4	318	0	0	293	6	14	0	10	0	0	0
1PM	1	288	0	0	289	12	11	0	4	0	0	0
2PM	5	313	0	0	366	5	12	0	4	0	0	0
3PM	2	321	0	0	457	4	20	0	11	0	0	0
4PM	3	360	0	0	411	13	26	0	12	0	0	0
5PM	4	351	0	0	448	11	18	0	5	0	0	0

SR 149 & RECO DRIVE - DHV TRAFFIC VOLUMES (YEAR 2022)												
TIME BEGIN	SR 149 (NORTHBOUND)			SR 149 (SOUTHBOUND)			RECO DRIVE (EASTBOUND)			N/A (WESTBOUND)		
	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT
6AM	3	355	0	0	172	9	11	0	5	0	0	0
7AM	10	576	0	0	245	33	5	0	7	0	0	0
8AM	11	443	0	0	279	9	14	0	10	0	0	0
11AM	2	272	0	0	292	10	15	0	13	0	0	0
12PM	5	359	0	0	331	7	14	0	10	0	0	0
1PM	1	325	0	0	327	14	12	0	5	0	0	0
2PM	6	354	0	0	414	6	14	0	5	0	0	0
3PM	2	363	0	0	516	5	20	0	11	0	0	0
4PM	3	407	0	0	464	15	26	0	12	0	0	0
5PM	5	397	0	0	506	12	18	0	5	0	0	0

DHV Factor	
SR 149	1.13

	EXISTING TRAFFIC VOLUMES - SR 149						
	MAJOR						TOTAL (Both Approaches)
	NBL	NBT	NBR	SBL	SBT	SBR	
6:00 AM	3	355	0	0	172	9	539
7:00 AM	10	576	0	0	245	33	864
8:00 AM	11	443	0	0	279	9	742
11:00 AM	2	272	0	0	292	10	576
12:00 PM	5	359	0	0	331	7	702
1:00 PM	1	325	0	0	327	14	667
2:00 PM	6	354	0	0	414	6	779
3:00 PM	2	363	0	0	516	5	886
4:00 PM	3	407	0	0	464	15	889
5:00 PM	5	397	0	0	506	12	920

	2023 NO-BUILD TRAFFIC VOLUMES - SR 149 (GROWTH FACTOR = 1.005)						
	MAJOR						TOTAL (Both Approaches)
	NBL	NBT	NBR	SBL	SBT	SBR	
6:00 AM	3	357	0	0	173	9	542
7:00 AM	10	579	0	0	246	33	869
8:00 AM	11	445	0	0	281	9	746
11:00 AM	2	274	0	0	293	10	579
12:00 PM	5	361	0	0	333	7	705
1:00 PM	1	327	0	0	328	14	670
2:00 PM	6	355	0	0	416	6	782
3:00 PM	2	365	0	0	519	5	890
4:00 PM	3	409	0	0	467	15	894
5:00 PM	5	399	0	0	509	12	924

	2043 NO-BUILD TRAFFIC VOLUMES - SR 149 (GROWTH FACTOR = 1.105)						
	MAJOR						TOTAL (Both Approaches)
	NBL	NBT	NBR	SBL	SBT	SBR	
6:00 AM	4	392	0	0	190	10	596
7:00 AM	11	637	0	0	271	36	955
8:00 AM	12	489	0	0	308	10	820
11:00 AM	2	301	0	0	322	11	637
12:00 PM	5	397	0	0	366	7	775
1:00 PM	1	360	0	0	361	15	737
2:00 PM	6	391	0	0	457	6	860
3:00 PM	2	401	0	0	571	5	979
4:00 PM	4	450	0	0	513	16	983
5:00 PM	5	438	0	0	559	14	1016

	EXISTING TRAFFIC VOLUMES - RECO DRIVE						TOTAL (Highest Volume Approach)
	MINOR						
	EBL	EBT	EBR	WBL	WBT	WBR	
6:00 AM	11	0	5	0	0	0	16
7:00 AM	5	0	7	0	0	0	12
8:00 AM	14	0	10	0	0	0	24
11:00 AM	15	0	13	0	0	0	28
12:00 PM	14	0	10	0	0	0	24
1:00 PM	12	0	5	0	0	0	17
2:00 PM	14	0	5	0	0	0	18
3:00 PM	20	0	11	0	0	0	31
4:00 PM	26	0	12	0	0	0	38
5:00 PM	18	0	5	0	0	0	23

	2023 NO-BUILD TRAFFIC VOLUMES - RECO DRIVE (GROWTH FACTOR = 1.005)						TOTAL (Highest Volume Approach)
	MINOR						
	EBL	EBT	EBR	WBL	WBT	WBR	
6:00 AM	11	0	5	0	0	0	16
7:00 AM	5	0	7	0	0	0	12
8:00 AM	14	0	10	0	0	0	24
11:00 AM	15	0	13	0	0	0	28
12:00 PM	14	0	10	0	0	0	24
1:00 PM	12	0	5	0	0	0	17
2:00 PM	14	0	5	0	0	0	18
3:00 PM	20	0	11	0	0	0	31
4:00 PM	26	0	12	0	0	0	38
5:00 PM	18	0	5	0	0	0	23

	2043 NO-BUILD TRAFFIC VOLUMES - RECO DRIVE (GROWTH FACTOR = 1.105)						TOTAL (Highest Volume Approach)
	MINOR						
	EBL	EBT	EBR	WBL	WBT	WBR	
6:00 AM	12	0	6	0	0	0	18
7:00 AM	6	0	8	0	0	0	13
8:00 AM	15	0	11	0	0	0	27
11:00 AM	17	0	14	0	0	0	31
12:00 PM	15	0	11	0	0	0	27
1:00 PM	14	0	5	0	0	0	19
2:00 PM	15	0	5	0	0	0	20
3:00 PM	22	0	12	0	0	0	34
4:00 PM	29	0	13	0	0	0	42
5:00 PM	20	0	6	0	0	0	25

MINOR STREET RIGHT-TURN REDUCTION CALCULATIONS - 2023 BUILD								
	Right Turns	Approach	% RT out of Approach	Mainline Volume per lane	Base Right Turn Reduction	Mainline Congestion Factor	Adjusted Right Turns	Adj. Total Highest Vol. Approach
6:00 AM	5	16	31%	182	20%	0%	4	15
7:00 AM	7	12	58%	279	40%	0%	4	9
8:00 AM	10	24	42%	290	40%	0%	6	20
11:00 AM	13	28	46%	303	40%	0%	8	23
12:00 PM	10	24	42%	340	40%	0%	6	20
1:00 PM	5	17	27%	342	20%	0%	4	16
2:00 PM	5	18	25%	421	20%	5%	4	17
3:00 PM	11	31	35%	524	20%	10%	10	30
4:00 PM	12	38	32%	482	20%	5%	10	36
5:00 PM	5	23	22%	521	20%	10%	5	23

MINOR STREET RIGHT-TURN REDUCTION CALCULATIONS - 2023 BUILD								
	Right Turns	Approach	% RT out of Approach	Mainline Volume per lane	Base Right Turn Reduction	Mainline Congestion Factor	Adjusted Right Turns	Adj. Total Highest Vol. Approach
6:00 AM	6	18	31%	200	20%	0%	4	17
7:00 AM	8	13	58%	307	40%	0%	5	10
8:00 AM	11	27	42%	318	40%	0%	7	22
11:00 AM	14	31	46%	333	40%	0%	9	25
12:00 PM	11	27	42%	373	40%	0%	7	22
1:00 PM	5	19	27%	376	20%	0%	4	18
2:00 PM	5	20	25%	463	20%	5%	4	19
3:00 PM	12	34	35%	576	20%	10%	11	33
4:00 PM	13	42	32%	529	20%	10%	12	41
5:00 PM	6	25	22%	573	20%	10%	5	25

LOVE'S DEVELOPMENT GASOLINE SERVICE STATION W/ CONVENIENCE MARKET (ITE 945) 16 VEHICLE FUELING POSITIONS

	PRIMARY	PRIMARY	PASS-BY	PASS-BY							
	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	TOTAL TRIPS			PRIMARY TRIPS		PASS BY TRIPS	
					Inbound	Outbound	Total	Inbound	Outbound	Inbound	Outbound
	Inbound	Outbound	Inbound	Outbound	2057	2057	4114	494	494	1563	1563
6:00 AM	4.7%	4.5%	4.7%	4.5%	97	93	189	23	22	73	70
7:00 AM	6.0%	5.9%	6.0%	5.9%	123	121	245	30	29	94	92
8:00 AM	6.5%	6.4%	6.5%	6.4%	134	132	265	32	32	102	100
11:00 AM	5.8%	5.7%	5.8%	5.7%	119	117	237	29	28	91	89
12:00 PM	6.6%	6.6%	6.6%	6.6%	136	136	272	33	33	103	103
1:00 PM	6.2%	5.9%	6.2%	5.9%	128	121	249	31	29	97	92
2:00 PM	6.0%	6.2%	6.0%	6.2%	123	128	251	30	31	94	97
3:00 PM	6.8%	6.8%	6.8%	6.8%	140	140	280	34	34	106	106
4:00 PM	6.3%	6.5%	6.3%	6.5%	130	134	263	31	32	98	102
5:00 PM	6.7%	6.9%	6.7%	6.9%	138	142	280	33	34	105	108

LOVE'S DEVELOPMENT FAST FOOD RESTAURANT W/ DRIVE-THROUGH WINDOW (ITE 934) 3,100 S.F.

	PRIMARY	PRIMARY	PASS-BY	PASS-BY							
	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	TOTAL TRIPS			PRIMARY TRIPS		PASS BY TRIPS	
					Inbound	Outbound	Total	Inbound	Outbound	Inbound	Outbound
	Inbound	Outbound	Inbound	Outbound	725	725	1450	341	341	384	384
6:00 AM	2.3%	1.9%	2.3%	1.9%	17	14	30	8	6	9	7
7:00 AM	3.4%	3.1%	3.4%	3.1%	25	22	47	12	11	13	12
8:00 AM	3.5%	3.4%	3.5%	3.4%	25	25	50	12	12	13	13
11:00 AM	9.1%	7.7%	9.1%	7.7%	66	56	122	31	26	35	30
12:00 PM	11.9%	12.0%	11.9%	12.0%	86	87	173	41	41	46	46
1:00 PM	7.9%	8.7%	7.9%	8.7%	57	63	120	27	30	30	33
2:00 PM	5.9%	6.5%	5.9%	6.5%	43	47	90	20	22	23	25
3:00 PM	5.7%	5.7%	5.7%	5.7%	41	41	83	19	19	22	22
4:00 PM	5.9%	5.6%	5.9%	5.6%	43	41	83	20	19	23	22
5:00 PM	6.9%	6.5%	6.9%	6.5%	50	47	97	24	22	27	25

LOVE'S DEVELOPMENT FAST FOOD RESTAURANT WITHOUT DRIVE-THROUGH WINDOW (ITE 933) 2,900 S.F.

	PRIMARY	PRIMARY	PASS-BY	PASS-BY							
	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	TOTAL TRIPS			PRIMARY TRIPS		PASS BY TRIPS	
					Inbound	Outbound	Total	Inbound	Outbound	Inbound	Outbound
	Inbound	Outbound	Inbound	Outbound	653	653	1306	653	653	0	0
6:00 AM	1.4%	0.7%	0.0%	0.0%	9	5	14	9	5	0	0
7:00 AM	1.9%	1.7%	0.0%	0.0%	12	11	24	12	11	0	0
8:00 AM	1.8%	2.1%	0.0%	0.0%	12	14	25	12	14	0	0
11:00 AM	12.2%	9.6%	0.0%	0.0%	80	63	142	80	63	0	0
12:00 PM	14.2%	14.1%	0.0%	0.0%	93	92	185	93	92	0	0
1:00 PM	10.5%	10.2%	0.0%	0.0%	69	67	135	69	67	0	0
2:00 PM	7.9%	8.1%	0.0%	0.0%	52	53	104	52	53	0	0
3:00 PM	9.6%	9.1%	0.0%	0.0%	63	59	122	63	59	0	0
4:00 PM	6.5%	6.3%	0.0%	0.0%	42	41	84	42	41	0	0
5:00 PM	5.6%	6.8%	0.0%	0.0%	37	44	81	37	44	0	0

LOVE'S DEVELOPMENT PASSENGER CAR GENERATED TRIPS

	Total		Total	
	primary		pass-by	
	inbound	outbound	inbound	outbound
6:00 AM	40	33	82	78
7:00 AM	54	51	107	104
8:00 AM	56	57	115	113
11:00 AM	139	117	126	119
12:00 PM	166	166	149	149
1:00 PM	126	125	127	126
2:00 PM	101	106	116	122
3:00 PM	116	112	128	128
4:00 PM	94	92	121	123
5:00 PM	93	101	131	133

LOVE'S DEVELOPMENT PASSENGER CAR GENERATED TRIPS W/ INTERNAL CAPTURE

	Total		Total	
	primary		pass-by	
	inbound	outbound	inbound	outbound
6:00 AM	35	29	72	68
7:00 AM	47	44	93	91
8:00 AM	49	49	100	98
11:00 AM	121	102	109	103
12:00 PM	134	134	121	121
1:00 PM	102	102	103	102
2:00 PM	82	86	94	99
3:00 PM	94	91	104	104
4:00 PM	76	75	98	100
5:00 PM	75	81	106	108

LOVE'S DEVELOPMENT TRUCK STOP (ITE 950) 9 TRUCK FUELING POSITIONS

	PRIMARY	PRIMARY	PASS-BY	PASS-BY							
	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	TOTAL TRIPS			PRIMARY TRIPS		PASS BY TRIPS	
					Inbound	Outbound	Total	Inbound	Outbound	Inbound	Outbound
	Inbound	Outbound	Inbound	Outbound	1008	1008	2016	1008	1008	0	0
6:00 AM	3.7%	5.1%	0.0%	0.0%	37	51	89	37	51	0	0
7:00 AM	3.3%	4.9%	0.0%	0.0%	33	49	83	33	49	0	0
8:00 AM	5.5%	5.7%	0.0%	0.0%	55	57	113	55	57	0	0
11:00 AM	5.8%	5.0%	0.0%	0.0%	58	50	109	58	50	0	0
12:00 PM	6.3%	6.0%	0.0%	0.0%	64	60	124	64	60	0	0
1:00 PM	5.7%	5.4%	0.0%	0.0%	57	54	112	57	54	0	0
2:00 PM	4.4%	4.4%	0.0%	0.0%	44	44	89	44	44	0	0
3:00 PM	5.6%	4.6%	0.0%	0.0%	56	46	103	56	46	0	0
4:00 PM	5.8%	4.6%	0.0%	0.0%	58	46	105	58	46	0	0
5:00 PM	5.8%	5.8%	0.0%	0.0%	58	58	117	58	58	0	0

LOVE'S DEVELOPMENT TIRE STORE (ITE 848) 3 SERVICE BAYS

	PRIMARY	PRIMARY	PASS-BY	PASS-BY							
	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	TOTAL TRIPS			PRIMARY TRIPS		PASS BY TRIPS	
					Inbound	Outbound	Total	Inbound	Outbound	Inbound	Outbound
	Inbound	Outbound	Inbound	Outbound	50	50	100	50	50	0	0
6:00 AM	0.7%	0.0%	0.0%	0.0%	0	0	0	0	0	0	0
7:00 AM	4.0%	0.8%	0.0%	0.0%	2	0	2	2	0	0	0
8:00 AM	9.0%	4.2%	0.0%	0.0%	5	2	7	5	2	0	0
11:00 AM	9.1%	8.7%	0.0%	0.0%	5	4	9	5	4	0	0
12:00 PM	6.8%	8.7%	0.0%	0.0%	3	4	8	3	4	0	0
1:00 PM	13.1%	11.7%	0.0%	0.0%	7	6	12	7	6	0	0
2:00 PM	9.5%	11.4%	0.0%	0.0%	5	6	10	5	6	0	0
3:00 PM	9.1%	10.2%	0.0%	0.0%	5	5	10	5	5	0	0
4:00 PM	8.5%	9.7%	0.0%	0.0%	4	5	9	4	5	0	0
5:00 PM	5.3%	7.7%	0.0%	0.0%	3	4	7	3	4	0	0

LOVE'S DEVELOPMENT CAMPGROUND/RECREATIONAL VEHICLE PARK (ITE 416) 70 CAMPSITES

	PRIMARY	PRIMARY	PASS-BY	PASS-BY							
	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	Hourly Percentage Distribution	TOTAL TRIPS			PRIMARY TRIPS		PASS BY TRIPS	
					Inbound	Outbound	Total	Inbound	Outbound	Inbound	Outbound
	Inbound	Outbound	Inbound	Outbound	95	95	190	95	95	0	0
6:00 AM	4.7%	4.5%	0.0%	0.0%	4	4	9	4	4	0	0
7:00 AM	6.0%	5.9%	0.0%	0.0%	3	6	9	3	6	0	0
8:00 AM	6.5%	6.4%	0.0%	0.0%	3	6	9	3	6	0	0
11:00 AM	5.8%	5.7%	0.0%	0.0%	3	5	8	3	5	0	0
12:00 PM	6.6%	6.6%	0.0%	0.0%	3	6	10	3	6	0	0
1:00 PM	6.2%	5.9%	0.0%	0.0%	3	6	9	3	6	0	0
2:00 PM	6.0%	6.2%	0.0%	0.0%	3	6	9	3	6	0	0
3:00 PM	6.8%	6.8%	0.0%	0.0%	3	6	10	3	6	0	0
4:00 PM	6.3%	6.5%	0.0%	0.0%	3	6	9	3	6	0	0
5:00 PM	6.7%	6.9%	0.0%	0.0%	3	7	10	3	7	0	0

LOVE'S DEVELOPMENT TRUCK GENERATED TRIPS

	Total		Total	
	primary		pass-by	
	inbound	outbound	inbound	outbound
6:00 AM	42	56	0	0
7:00 AM	38	55	0	0
8:00 AM	63	66	0	0
11:00 AM	66	60	0	0
12:00 PM	70	71	0	0
1:00 PM	67	66	0	0
2:00 PM	52	56	0	0
3:00 PM	64	58	0	0
4:00 PM	66	57	0	0
5:00 PM	64	69	0	0

LOVE'S DEVELOPMENT TRUCK GENERATED TRIPS W/ INTERNAL CAPTURE

	Total		Total	
	primary		pass-by	
	inbound	outbound	inbound	outbound
6:00 AM	37	48	0	0
7:00 AM	33	48	0	0
8:00 AM	55	57	0	0
11:00 AM	57	52	0	0
12:00 PM	57	58	0	0
1:00 PM	54	53	0	0
2:00 PM	42	45	0	0
3:00 PM	52	47	0	0
4:00 PM	53	46	0	0
5:00 PM	52	56	0	0

PRIMARY DIRECTIONAL DISTRIBUTION AT INTERSECTION (PASSENGER CAR)												
	SR 149			SR 149			RECO DRIVE			N/A		
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
In/Out →	Inbound					Inbound	Outbound		Outbound			
AM	45%					55%	55%		45%			
PM	30%					70%	70%		30%			

PASS-BY DIRECTIONAL DISTRIBUTION AT INTERSECTION (PASSENGER CAR)												
	SR 149			SR 149			RECO DRIVE			N/A		
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
In/Out →	Inbound	Inbound			Inbound	Inbound	Outbound		Outbound			
AM	25%	-25%			-25%	75%	75%		25%			
PM	15%	-15%			-20%	85%	80%		20%			

PRIMARY DIRECTIONAL DISTRIBUTION AT INTERSECTION (TRUCK)												
	SR 149			SR 149			RECO DRIVE			N/A		
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
In/Out →		Outbound			Inbound							
AM		75%			75%							
PM		85%			85%							

	LOVE'S DEVELOPMENT GENERATED TRAFFIC VOLUMES - SR 149						
	MAJOR STREET						
	NBL	NBT	NBR	SBL	SBT	SBR	TOTAL (Both Approaches)
6:00 AM	34	18			10	73	135
7:00 AM	44	13			2	95	154
8:00 AM	47	18			16	102	183
11:00 AM	82	12			16	149	258
12:00 PM	58	31			24	197	310
1:00 PM	46	30			26	159	261
2:00 PM	39	24			17	138	218
3:00 PM	44	24			24	154	245
4:00 PM	37	25			26	137	225
5:00 PM	39	31			23	143	236

	2023 BUILD TRAFFIC VOLUMES - SR 149						
	MAJOR						
	NBL	NBT	NBR	SBL	SBT	SBR	TOTAL (Both Approaches)
6:00 AM	37	375	0	0	182	82	676
7:00 AM	54	592	0	0	248	128	1023
8:00 AM	58	463	0	0	297	111	929
11:00 AM	84	286	0	0	309	159	837
12:00 PM	63	392	0	0	357	203	1015
1:00 PM	47	357	0	0	354	173	931
2:00 PM	44	380	0	0	433	143	1000
3:00 PM	46	389	0	0	543	158	1136
4:00 PM	41	434	0	0	492	151	1118
5:00 PM	43	430	0	0	532	156	1161

	2043 BUILD TRAFFIC VOLUMES - SR 149						
	MAJOR						
	NBL	NBT	NBR	SBL	SBT	SBR	TOTAL (Both Approaches)
6:00 AM	37	411	0	0	199	83	730
7:00 AM	55	650	0	0	273	132	1109
8:00 AM	59	507	0	0	325	112	1003
11:00 AM	84	313	0	0	338	160	895
12:00 PM	63	428	0	0	390	204	1085
1:00 PM	47	390	0	0	386	174	997
2:00 PM	45	415	0	0	474	144	1078
3:00 PM	46	425	0	0	594	159	1224
4:00 PM	41	474	0	0	539	153	1207
5:00 PM	44	470	0	0	583	157	1253

	LOVE'S DEVELOPMENT GENERATED TRAFFIC VOLUMES - RECO DRIVE						
	MINOR STREET						TOTAL (Highest Volume Approach)
	EBL	EBT	EBR	WBL	WBT	WBR	
6:00 AM	67		30				96
7:00 AM	92		43				135
8:00 AM	101		47				148
11:00 AM	133		72				205
12:00 PM	191		64				255
1:00 PM	153		51				203
2:00 PM	139		45				184
3:00 PM	147		48				195
4:00 PM	132		42				175
5:00 PM	143		46				189

	2023 BUILD TRAFFIC VOLUMES - RECO DRIVE						
	MINOR						TOTAL (Highest Volume Approach)
	EBL	EBT	EBR	WBL	WBT	WBR	
6:00 AM	78	0	35	0	0	0	113
7:00 AM	97	0	50	0	0	0	147
8:00 AM	115	0	57	0	0	0	172
11:00 AM	149	0	85	0	0	0	233
12:00 PM	205	0	74	0	0	0	279
1:00 PM	165	0	55	0	0	0	220
2:00 PM	153	0	50	0	0	0	202
3:00 PM	167	0	59	0	0	0	226
4:00 PM	158	0	54	0	0	0	213
5:00 PM	161	0	51	0	0	0	212

	2043 BUILD TRAFFIC VOLUMES - RECO DRIVE						
	MINOR						TOTAL (Highest Volume Approach)
	EBL	EBT	EBR	WBL	WBT	WBR	
6:00 AM	79	0	35	0	0	0	114
7:00 AM	98	0	50	0	0	0	148
8:00 AM	117	0	58	0	0	0	174
11:00 AM	150	0	86	0	0	0	236
12:00 PM	206	0	75	0	0	0	282
1:00 PM	166	0	56	0	0	0	222
2:00 PM	154	0	50	0	0	0	204
3:00 PM	169	0	60	0	0	0	229
4:00 PM	161	0	56	0	0	0	216
5:00 PM	163	0	51	0	0	0	215

	MINOR STREET RIGHT-TURN REDUCTION CALCULATIONS - 2023 BUILD							
	Right Turns	Approach	% RT out of Approach	Mainline Volume per lane	Base Right Turn Reduction	Mainline Congestion Factor	Adjusted Right Turns	Adj. Total Highest Vol. Approach
6:00 AM	35	113	31%	182	20%	0%	28	106
7:00 AM	50	147	34%	248	20%	0%	40	137
8:00 AM	57	172	33%	297	20%	0%	46	161
11:00 AM	85	233	36%	309	40%	0%	51	199
12:00 PM	74	279	27%	357	20%	0%	60	264
1:00 PM	55	220	25%	354	20%	0%	44	209
2:00 PM	50	202	25%	433	20%	5%	42	195
3:00 PM	59	226	26%	543	20%	10%	53	220
4:00 PM	54	213	26%	492	20%	5%	46	205
5:00 PM	51	212	24%	532	20%	10%	46	207

	MINOR STREET RIGHT-TURN REDUCTION CALCULATIONS - 2043 BUILD							
	Right Turns	Approach	% RT out of Approach	Mainline Volume per lane	Base Right Turn Reduction	Mainline Congestion Factor	Adjusted Right Turns	Adj. Total Highest Vol. Approach
6:00 AM	35	114	31%	199	20%	0%	28	107
7:00 AM	50	148	34%	273	20%	0%	40	138
8:00 AM	58	174	33%	325	20%	0%	46	163
11:00 AM	86	236	36%	338	40%	0%	52	202
12:00 PM	75	282	27%	390	20%	0%	60	266
1:00 PM	56	222	25%	386	20%	0%	45	211
2:00 PM	50	204	25%	474	20%	5%	43	197
3:00 PM	60	229	26%	594	20%	10%	54	223
4:00 PM	56	216	26%	539	20%	10%	50	211
5:00 PM	51	215	24%	583	20%	10%	46	209

	TRAFFIC SIGNAL WARRANT STUDY TRAFFIC VOLUMES							
	2023 NO-BUILD		2023 BUILD		2043 NO-BUILD		2043 BUILD	
	MAJOR	MINOR	MAJOR	MINOR	MAJOR	MINOR	MAJOR	MINOR
6:00 AM	542	15	676	106	596	17	730	107
7:00 AM	869	9	1023	137	955	10	1109	138
8:00 AM	746	20	929	161	820	22	1003	163
11:00 AM	579	23	837	199	637	25	895	202
12:00 PM	705	20	1015	264	775	22	1085	266
1:00 PM	670	16	931	209	737	18	997	211
2:00 PM	782	17	1000	195	860	19	1078	197
3:00 PM	890	30	1136	220	979	33	1224	223
4:00 PM	894	36	1118	205	983	41	1207	211
5:00 PM	924	23	1161	207	1016	25	1253	209

APPENDIX B
EXISTING TRAFFIC COUNT DATA

SR-149 & I-70 WB On/Off Ramps - TMC

Tue Sep 13, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984609, Location: 40.060645, -81.053175

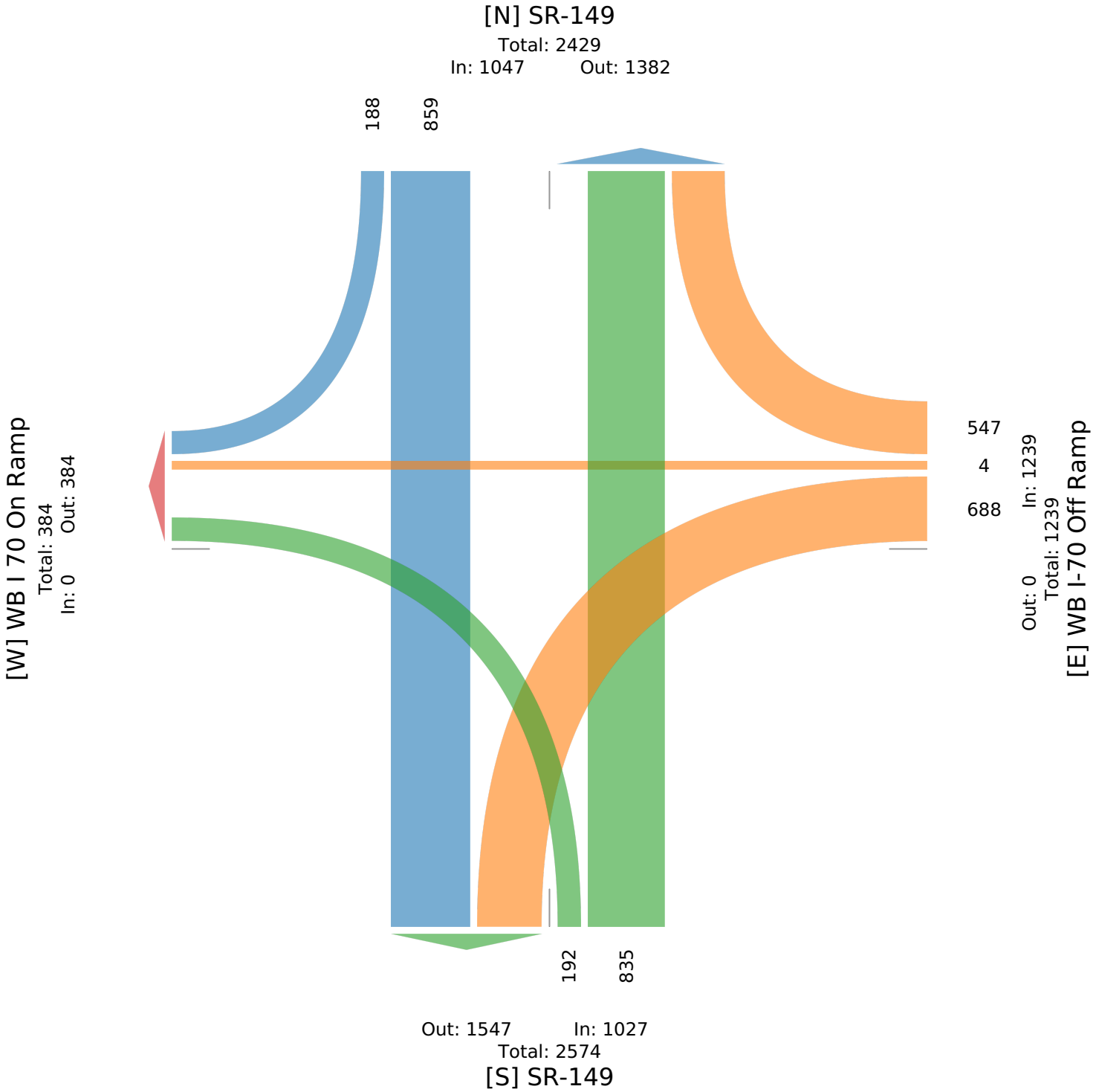
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	WB I 70 On Ramp					WB I-70 Off Ramp					SR-149					SR-149					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2022-09-13 7:00AM	0	0	0	0	**0**	22	0	49	0	**71**	12	93	0	0	**105**	0	53	5	0	**58**	**234**
7:15AM	0	0	0	0	**0**	29	0	32	0	**61**	18	58	0	0	**76**	0	84	10	0	**94**	**231**
7:30AM	0	0	0	0	**0**	24	0	25	0	**49**	12	41	0	0	**53**	0	35	11	0	**46**	**148**
7:45AM	0	0	0	0	**0**	34	0	25	0	**59**	9	29	0	0	**38**	0	30	17	0	**47**	**144**
Hourly Total	0	0	0	0	**0**	109	0	131	0	**240**	51	221	0	0	**272**	0	202	43	0	**245**	**757**
8:00AM	0	0	0	0	**0**	27	0	14	0	**41**	13	26	0	0	**39**	0	36	6	0	**42**	**122**
8:15AM	0	0	0	0	**0**	29	0	33	0	**62**	8	66	0	0	**74**	0	44	8	0	**52**	**188**
8:30AM	0	0	0	0	**0**	28	1	22	0	**51**	9	63	0	0	**72**	0	81	15	0	**96**	**219**
8:45AM	0	0	0	0	**0**	22	0	37	0	**59**	10	44	0	0	**54**	0	77	17	0	**94**	**207**
Hourly Total	0	0	0	0	**0**	106	1	106	0	**213**	40	199	0	0	**239**	0	238	46	0	**284**	**736**
4:00PM	0	0	0	0	**0**	52	0	28	0	**80**	18	37	0	0	**55**	0	48	17	0	**65**	**200**
4:15PM	0	0	0	0	**0**	61	0	38	0	**99**	13	39	0	0	**52**	0	47	11	0	**58**	**209**
4:30PM	0	0	0	0	**0**	66	1	41	0	**108**	11	50	0	0	**61**	0	64	8	0	**72**	**241**
4:45PM	0	0	0	0	**0**	46	0	37	0	**83**	11	70	0	0	**81**	0	48	17	0	**65**	**229**
Hourly Total	0	0	0	0	**0**	225	1	144	0	**370**	53	196	0	0	**249**	0	207	53	0	**260**	**879**
5:00PM	0	0	0	0	**0**	78	0	48	0	**126**	16	70	0	0	**86**	0	58	10	0	**68**	**280**
5:15PM	0	0	0	0	**0**	69	0	49	0	**118**	10	69	0	0	**79**	0	75	16	0	**91**	**288**
5:30PM	0	0	0	0	**0**	39	1	31	0	**71**	9	47	0	0	**56**	0	48	11	0	**59**	**186**
5:45PM	0	0	0	0	**0**	62	1	38	0	**101**	13	33	0	0	**46**	0	31	9	0	**40**	**187**
Hourly Total	0	0	0	0	**0**	248	2	166	0	**416**	48	219	0	0	**267**	0	212	46	0	**258**	**941**
Total	0	0	0	0	**0**	688	4	547	0	**1239**	192	835	0	0	**1027**	0	859	188	0	**1047**	**3313**
% Approach	0%	0%	0%	0%	**-**	55.5%	0.3%	44.1%	0%	**-**	18.7%	81.3%	0%	0%	**-**	0%	82.0%	18.0%	0%	**-**	-
% Total	0%	0%	0%	0%	**0%**	20.8%	0.1%	16.5%	0%	**37.4%**	5.8%	25.2%	0%	0%	**31.0%**	0%	25.9%	5.7%	0%	**31.6%**	-
Lights	0	0	0	0	**0**	583	0	511	0	**1094**	104	809	0	0	**913**	0	817	175	0	**992**	2999
% Lights	0%	0%	0%	0%	**-**	84.7%	0%	93.4%	0%	**88.3%**	54.2%	96.9%	0%	0%	**88.9%**	0%	95.1%	93.1%	0%	**94.7%**	90.5%
Articulated Trucks and Single-Unit Trucks	0	0	0	0	**0**	102	4	34	0	**140**	88	8	0	0	**96**	0	37	13	0	**50**	286
% Articulated Trucks and Single-Unit Trucks	0%	0%	0%	0%	**-**	14.8%	100%	6.2%	0%	**11.3%**	45.8%	1.0%	0%	0%	**9.3%**	0%	4.3%	6.9%	0%	**4.8%**	8.6%
Buses	0	0	0	0	**0**	3	0	2	0	**5**	0	18	0	0	**18**	0	5	0	0	**5**	28
% Buses	0%	0%	0%	0%	**-**	0.4%	0%	0.4%	0%	**0.4%**	0%	2.2%	0%	0%	**1.8%**	0%	0.6%	0%	0%	**0.5%**	0.8%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 & I-70 WB On/Off Ramps - TMC
Tue Sep 13, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984609, Location: 40.060645, -81.053175

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SR-149 & I-70 WB On/Off Ramps - TMC

Tue Sep 13, 2022
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984609, Location: 40.060645, -81.053175

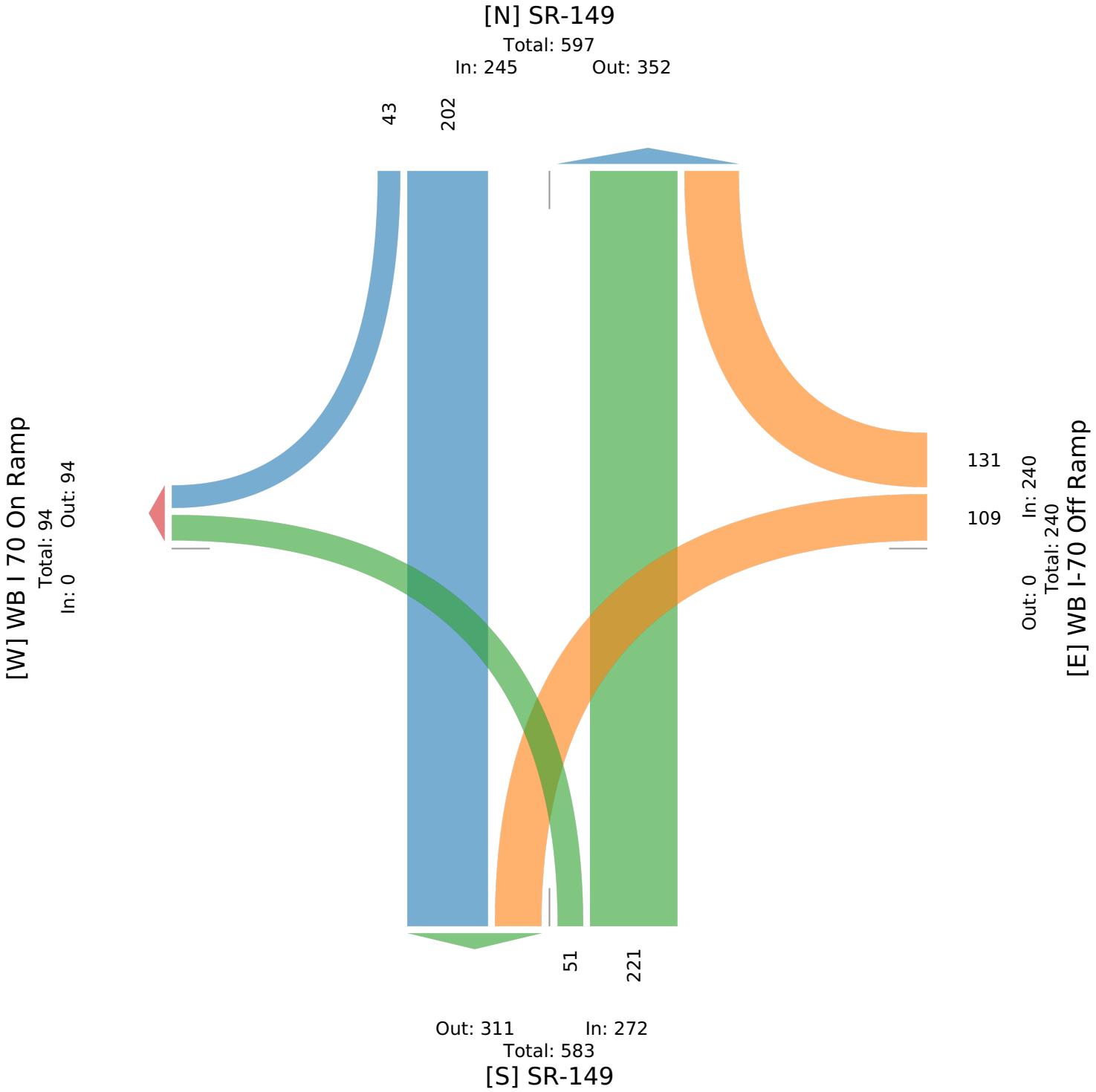
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	WB I 70 On Ramp					WB I-70 Off Ramp					SR-149					SR-149					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2022-09-13 7:00AM	0	0	0	0	**0**	22	0	49	0	**71**	12	93	0	0	**105**	0	53	5	0	**58**	**234**
7:15AM	0	0	0	0	**0**	29	0	32	0	**61**	18	58	0	0	**76**	0	84	10	0	**94**	**231**
7:30AM	0	0	0	0	**0**	24	0	25	0	**49**	12	41	0	0	**53**	0	35	11	0	**46**	**148**
7:45AM	0	0	0	0	**0**	34	0	25	0	**59**	9	29	0	0	**38**	0	30	17	0	**47**	**144**
Total	0	0	0	0	**0**	109	0	131	0	**240**	51	221	0	0	**272**	0	202	43	0	**245**	**757**
% Approach	0%	0%	0%	0%	**-**	45.4%	0%	54.6%	0%	**-**	18.8%	81.3%	0%	0%	**-**	0%	82.4%	17.6%	0%	**-**	-
% Total	0%	0%	0%	0%	**0%**	14.4%	0%	17.3%	0%	**31.7%**	6.7%	29.2%	0%	0%	**35.9%**	0%	26.7%	5.7%	0%	**32.4%**	-
PHF	-	-	-	-	**-**	0.801	-	0.668	-	**0.845**	0.708	0.594	-	-	**0.648**	-	0.601	0.632	-	**0.652**	0.809
Lights	0	0	0	0	**0**	89	0	116	0	**205**	34	216	0	0	**250**	0	184	39	0	**223**	678
% Lights	0%	0%	0%	0%	**-**	81.7%	0%	88.5%	0%	**85.4%**	66.7%	97.7%	0%	0%	**91.9%**	0%	91.1%	90.7%	0%	**91.0%**	89.6%
Articulated Trucks and Single-Unit Trucks	0	0	0	0	**0**	20	0	15	0	**35**	17	1	0	0	**18**	0	14	4	0	**18**	71
% Articulated Trucks and Single-Unit Trucks	0%	0%	0%	0%	**-**	18.3%	0%	11.5%	0%	**14.6%**	33.3%	0.5%	0%	0%	**6.6%**	0%	6.9%	9.3%	0%	**7.3%**	9.4%
Buses	0	0	0	0	**0**	0	0	0	0	**0**	0	4	0	0	**4**	0	4	0	0	**4**	8
% Buses	0%	0%	0%	0%	**-**	0%	0%	0%	0%	**0%**	0%	1.8%	0%	0%	**1.5%**	0%	2.0%	0%	0%	**1.6%**	1.1%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 & I-70 WB On/Off Ramps - TMC
Tue Sep 13, 2022
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984609, Location: 40.060645, -81.053175

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SR-149 & I-70 WB On/Off Ramps - TMC

Tue Sep 13, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984609, Location: 40.060645, -81.053175

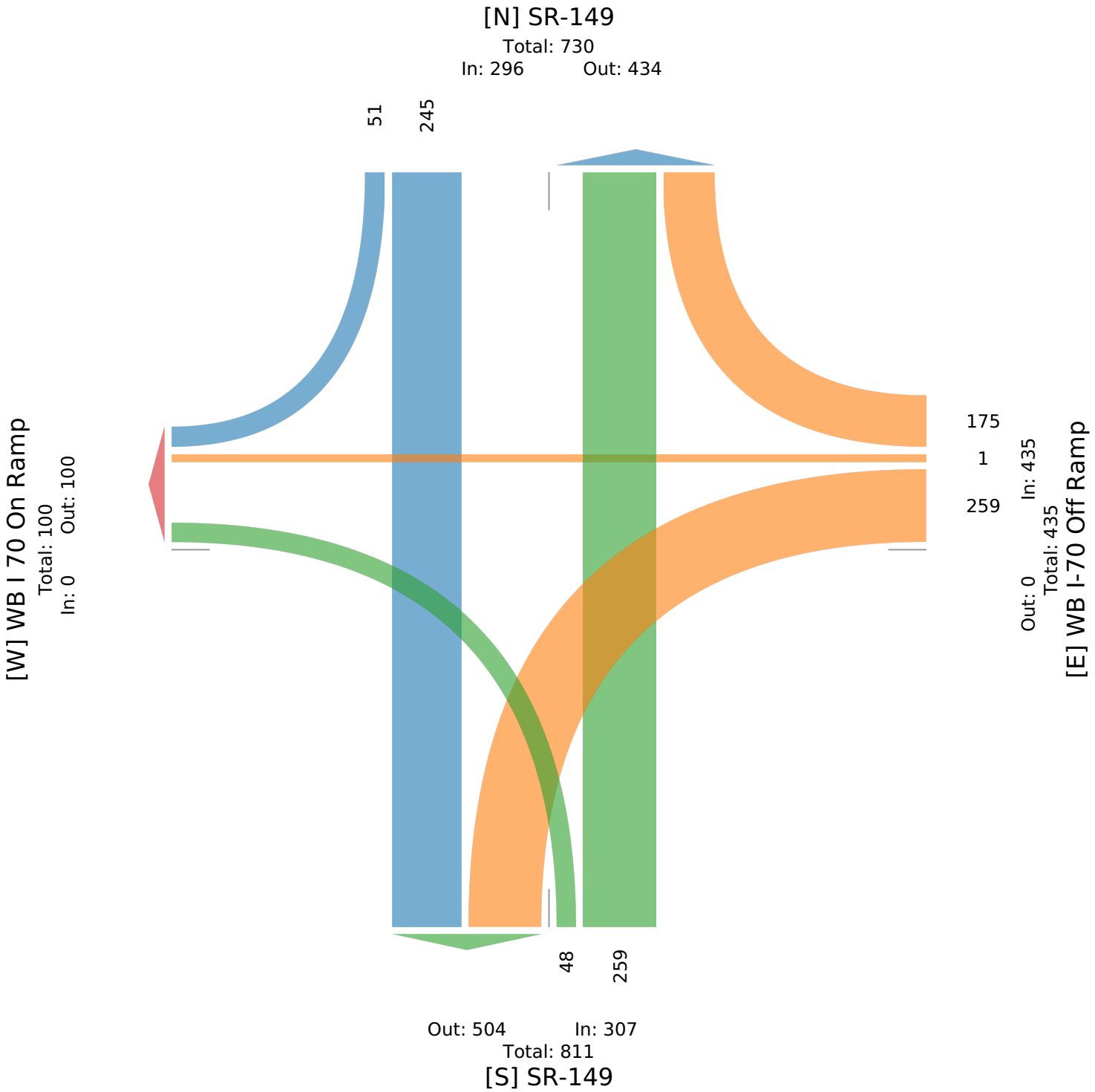
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	WB I 70 On Ramp					WB I-70 Off Ramp					SR-149					SR-149					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2022-09-13 4:30PM	0	0	0	0	**0**	66	1	41	0	**108**	11	50	0	0	**61**	0	64	8	0	**72**	**241**
4:45PM	0	0	0	0	**0**	46	0	37	0	**83**	11	70	0	0	**81**	0	48	17	0	**65**	**229**
5:00PM	0	0	0	0	**0**	78	0	48	0	**126**	16	70	0	0	**86**	0	58	10	0	**68**	**280**
5:15PM	0	0	0	0	**0**	69	0	49	0	**118**	10	69	0	0	**79**	0	75	16	0	**91**	**288**
Total	0	0	0	0	**0**	259	1	175	0	**435**	48	259	0	0	**307**	0	245	51	0	**296**	**1038**
% Approach	0%	0%	0%	0%	**-**	59.5%	0.2%	40.2%	0%	**-**	15.6%	84.4%	0%	0%	**-**	0%	82.8%	17.2%	0%	**-**	-
% Total	0%	0%	0%	0%	**0%**	25.0%	0.1%	16.9%	0%	**41.9%**	4.6%	25.0%	0%	0%	**29.6%**	0%	23.6%	4.9%	0%	**28.5%**	-
PHF	-	-	-	-	**-**	0.830	0.250	0.893	-	**0.863**	0.750	0.925	-	-	**0.892**	-	0.817	0.750	-	**0.813**	0.901
Lights	0	0	0	0	**0**	230	0	172	0	**402**	29	250	0	0	**279**	0	243	47	0	**290**	971
% Lights	0%	0%	0%	0%	**-**	88.8%	0%	98.3%	0%	**92.4%**	60.4%	96.5%	0%	0%	**90.9%**	0%	99.2%	92.2%	0%	**98.0%**	93.5%
Articulated Trucks and Single-Unit Trucks	0	0	0	0	**0**	29	1	2	0	**32**	19	3	0	0	**22**	0	2	4	0	**6**	60
% Articulated Trucks and Single-Unit Trucks	0%	0%	0%	0%	**-**	11.2%	100%	1.1%	0%	**7.4%**	39.6%	1.2%	0%	0%	**7.2%**	0%	0.8%	7.8%	0%	**2.0%**	5.8%
Buses	0	0	0	0	**0**	0	0	1	0	**1**	0	6	0	0	**6**	0	0	0	0	**0**	7
% Buses	0%	0%	0%	0%	**-**	0%	0%	0.6%	0%	**0.2%**	0%	2.3%	0%	0%	**2.0%**	0%	0%	0%	0%	**0%**	0.7%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 & I-70 WB On/Off Ramps - TMC
Tue Sep 13, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984609, Location: 40.060645, -81.053175

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SR-149 & I-70 EB On/Off Ramps - TMC

Tue Sep 13, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984610, Location: 40.059157, -81.052417

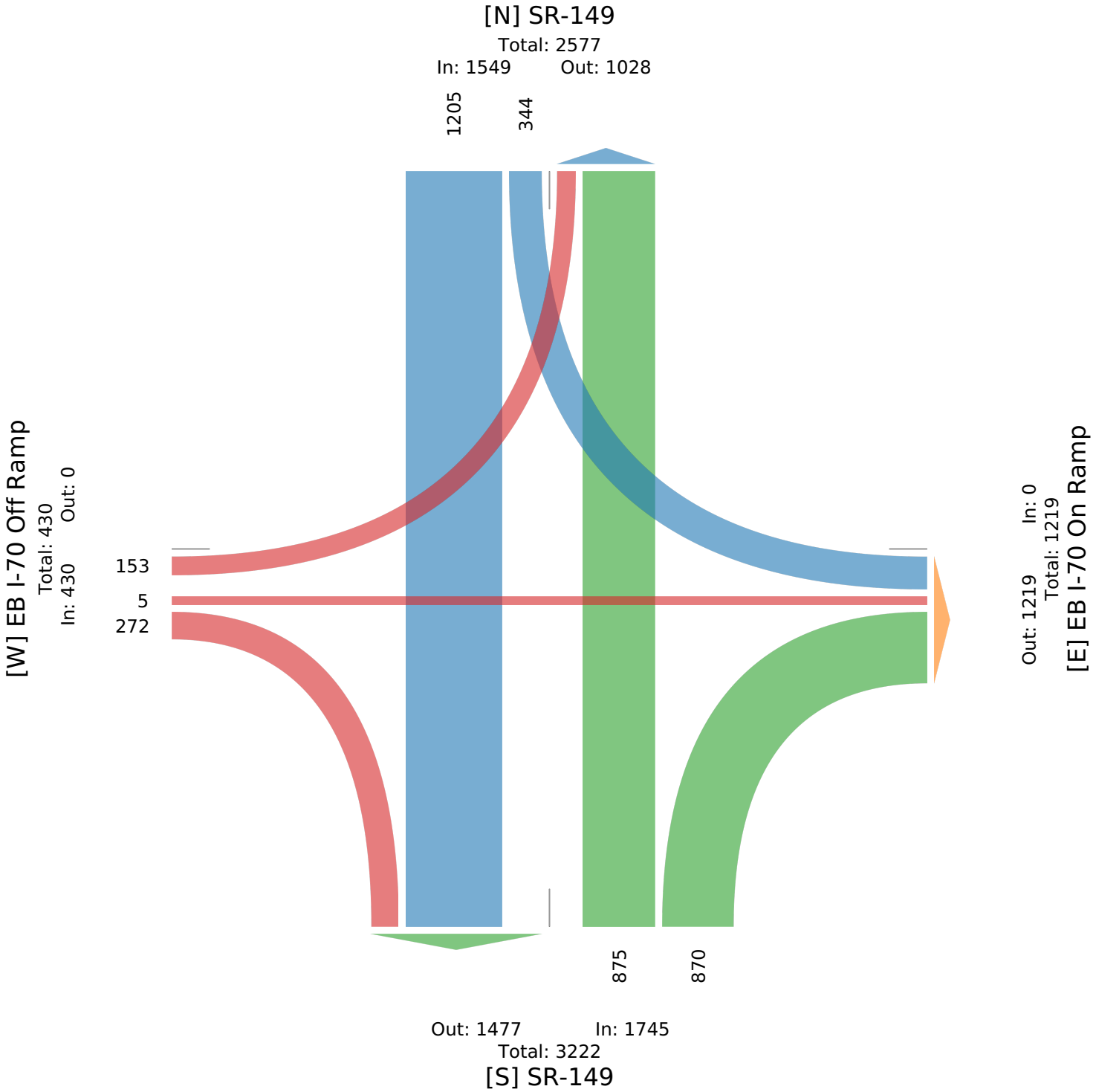
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	EB I-70 Off Ramp					EB I-70 On Ramp					SR-149					SR-149					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2022-09-13 7:00AM	9	0	17	0	**26**	0	0	0	0	**0**	0	96	59	0	**155**	24	53	0	0	**77**	**258**
7:15AM	12	1	13	0	**26**	0	0	0	0	**0**	0	62	55	0	**117**	40	74	0	0	**114**	**257**
7:30AM	5	1	8	0	**14**	0	0	0	0	**0**	0	50	87	0	**137**	21	37	0	0	**58**	**209**
7:45AM	11	0	13	0	**24**	0	0	0	0	**0**	0	28	81	0	**109**	17	45	0	0	**62**	**195**
Hourly Total	37	2	51	0	**90**	0	0	0	0	**0**	0	236	282	0	**518**	102	209	0	0	**311**	**919**
8:00AM	5	0	12	0	**17**	0	0	0	0	**0**	0	32	68	0	**100**	21	40	0	0	**61**	**178**
8:15AM	10	0	17	0	**27**	0	0	0	0	**0**	0	59	60	0	**119**	20	49	0	0	**69**	**215**
8:30AM	9	0	12	0	**21**	0	0	0	0	**0**	0	70	50	0	**120**	47	67	0	0	**114**	**255**
8:45AM	8	0	10	0	**18**	0	0	0	0	**0**	0	44	40	0	**84**	24	75	0	0	**99**	**201**
Hourly Total	32	0	51	0	**83**	0	0	0	0	**0**	0	205	218	0	**423**	112	231	0	0	**343**	**849**
4:00PM	7	0	15	0	**22**	0	0	0	0	**0**	0	48	48	0	**96**	19	85	0	0	**104**	**222**
4:15PM	11	0	27	0	**38**	0	0	0	0	**0**	0	43	50	0	**93**	11	96	0	0	**107**	**238**
4:30PM	4	1	20	0	**25**	0	0	0	0	**0**	0	57	48	0	**105**	19	105	0	0	**124**	**254**
4:45PM	13	2	24	0	**39**	0	0	0	0	**0**	0	67	48	0	**115**	14	85	0	0	**99**	**253**
Hourly Total	35	3	86	0	**124**	0	0	0	0	**0**	0	215	194	0	**409**	63	371	0	0	**434**	**967**
5:00PM	14	0	19	0	**33**	0	0	0	0	**0**	0	71	52	0	**123**	18	118	0	0	**136**	**292**
5:15PM	16	0	22	0	**38**	0	0	0	0	**0**	0	64	46	0	**110**	21	125	0	0	**146**	**294**
5:30PM	10	0	27	0	**37**	0	0	0	0	**0**	0	45	38	0	**83**	15	73	0	0	**88**	**208**
5:45PM	9	0	16	0	**25**	0	0	0	0	**0**	0	39	40	0	**79**	13	78	0	0	**91**	**195**
Hourly Total	49	0	84	0	**133**	0	0	0	0	**0**	0	219	176	0	**395**	67	394	0	0	**461**	**989**
Total	153	5	272	0	**430**	0	0	0	0	**0**	0	875	870	0	**1745**	344	1205	0	0	**1549**	**3724**
% Approach	35.6%	1.2%	63.3%	0%	**-**	0%	0%	0%	0%	**-**	0%	50.1%	49.9%	0%	**-**	22.2%	77.8%	0%	0%	**-**	-
% Total	4.1%	0.1%	7.3%	0%	**11.5%**	0%	0%	0%	0%	**0%**	0%	23.5%	23.4%	0%	**46.9%**	9.2%	32.4%	0%	0%	**41.6%**	-
Lights	149	1	146	0	**296**	0	0	0	0	**0**	0	765	762	0	**1527**	320	1081	0	0	**1401**	3224
% Lights	97.4%	20.0%	53.7%	0%	**68.8%**	0%	0%	0%	0%	**-**	0%	87.4%	87.6%	0%	**87.5%**	93.0%	89.7%	0%	0%	**90.4%**	86.6%
Articulated Trucks and Single-Unit Trucks	3	4	126	0	**133**	0	0	0	0	**0**	0	92	106	0	**198**	24	117	0	0	**141**	472
% Articulated Trucks and Single-Unit Trucks	2.0%	80.0%	46.3%	0%	**30.9%**	0%	0%	0%	0%	**-**	0%	10.5%	12.2%	0%	**11.3%**	7.0%	9.7%	0%	0%	**9.1%**	12.7%
Buses	1	0	0	0	**1**	0	0	0	0	**0**	0	18	2	0	**20**	0	7	0	0	**7**	28
% Buses	0.7%	0%	0%	0%	**0.2%**	0%	0%	0%	0%	**-**	0%	2.1%	0.2%	0%	**1.1%**	0%	0.6%	0%	0%	**0.5%**	0.8%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 & I-70 EB On/Off Ramps - TMC
Tue Sep 13, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984610, Location: 40.059157, -81.052417

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SR-149 & I-70 EB On/Off Ramps - TMC

Tue Sep 13, 2022
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984610, Location: 40.059157, -81.052417

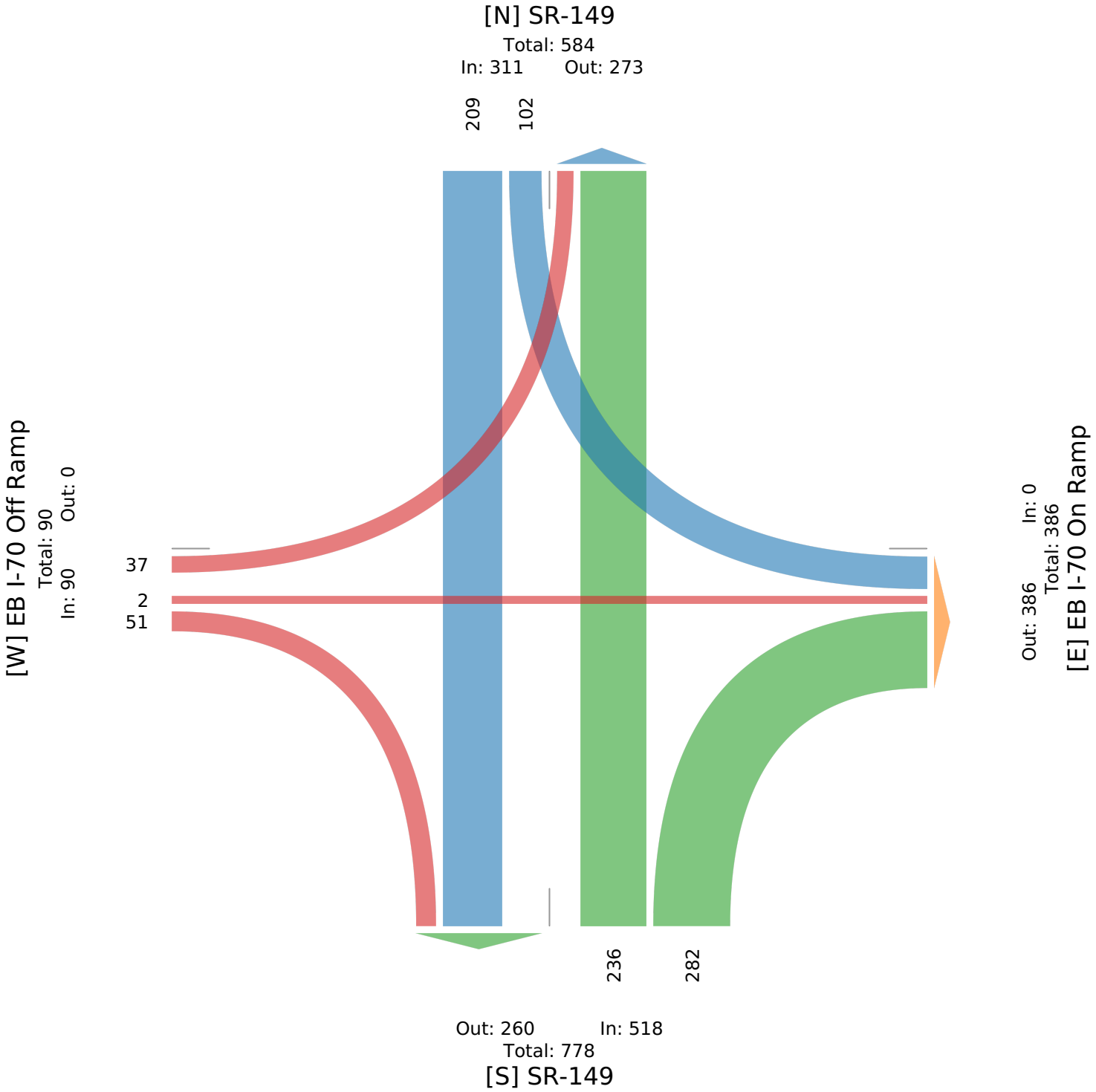
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	EB I-70 Off Ramp					EB I-70 On Ramp					SR-149					SR-149					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2022-09-13 7:00AM	9	0	17	0	**26**	0	0	0	0	**0**	0	96	59	0	**155**	24	53	0	0	**77**	**258**
7:15AM	12	1	13	0	**26**	0	0	0	0	**0**	0	62	55	0	**117**	40	74	0	0	**114**	**257**
7:30AM	5	1	8	0	**14**	0	0	0	0	**0**	0	50	87	0	**137**	21	37	0	0	**58**	**209**
7:45AM	11	0	13	0	**24**	0	0	0	0	**0**	0	28	81	0	**109**	17	45	0	0	**62**	**195**
Total	37	2	51	0	**90**	0	0	0	0	**0**	0	236	282	0	**518**	102	209	0	0	**311**	**919**
% Approach	41.1%	2.2%	56.7%	0%	**-**	0%	0%	0%	0%	**-**	0%	45.6%	54.4%	0%	**-**	32.8%	67.2%	0%	0%	**-**	-
% Total	4.0%	0.2%	5.5%	0%	**9.8%**	0%	0%	0%	0%	**0%**	0%	25.7%	30.7%	0%	**56.4%**	11.1%	22.7%	0%	0%	**33.8%**	-
PHF	0.771	0.500	0.750	-	**0.865**	-	-	-	-	**-**	-	0.615	0.810	-	**0.835**	0.638	0.706	-	-	**0.682**	0.891
Lights	37	0	35	0	**72**	0	0	0	0	**0**	0	215	260	0	**475**	92	180	0	0	**272**	819
% Lights	100%	0%	68.6%	0%	**80.0%**	0%	0%	0%	0%	**-**	0%	91.1%	92.2%	0%	**91.7%**	90.2%	86.1%	0%	0%	**87.5%**	89.1%
Articulated Trucks and Single-Unit Trucks	0	2	16	0	**18**	0	0	0	0	**0**	0	17	20	0	**37**	10	26	0	0	**36**	91
% Articulated Trucks and Single-Unit Trucks	0%	100%	31.4%	0%	**20.0%**	0%	0%	0%	0%	**-**	0%	7.2%	7.1%	0%	**7.1%**	9.8%	12.4%	0%	0%	**11.6%**	9.9%
Buses	0	0	0	0	**0**	0	0	0	0	**0**	0	4	2	0	**6**	0	3	0	0	**3**	9
% Buses	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**-**	0%	1.7%	0.7%	0%	**1.2%**	0%	1.4%	0%	0%	**1.0%**	1.0%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 & I-70 EB On/Off Ramps - TMC
Tue Sep 13, 2022
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984610, Location: 40.059157, -81.052417

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SR-149 & I-70 EB On/Off Ramps - TMC

Tue Sep 13, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984610, Location: 40.059157, -81.052417

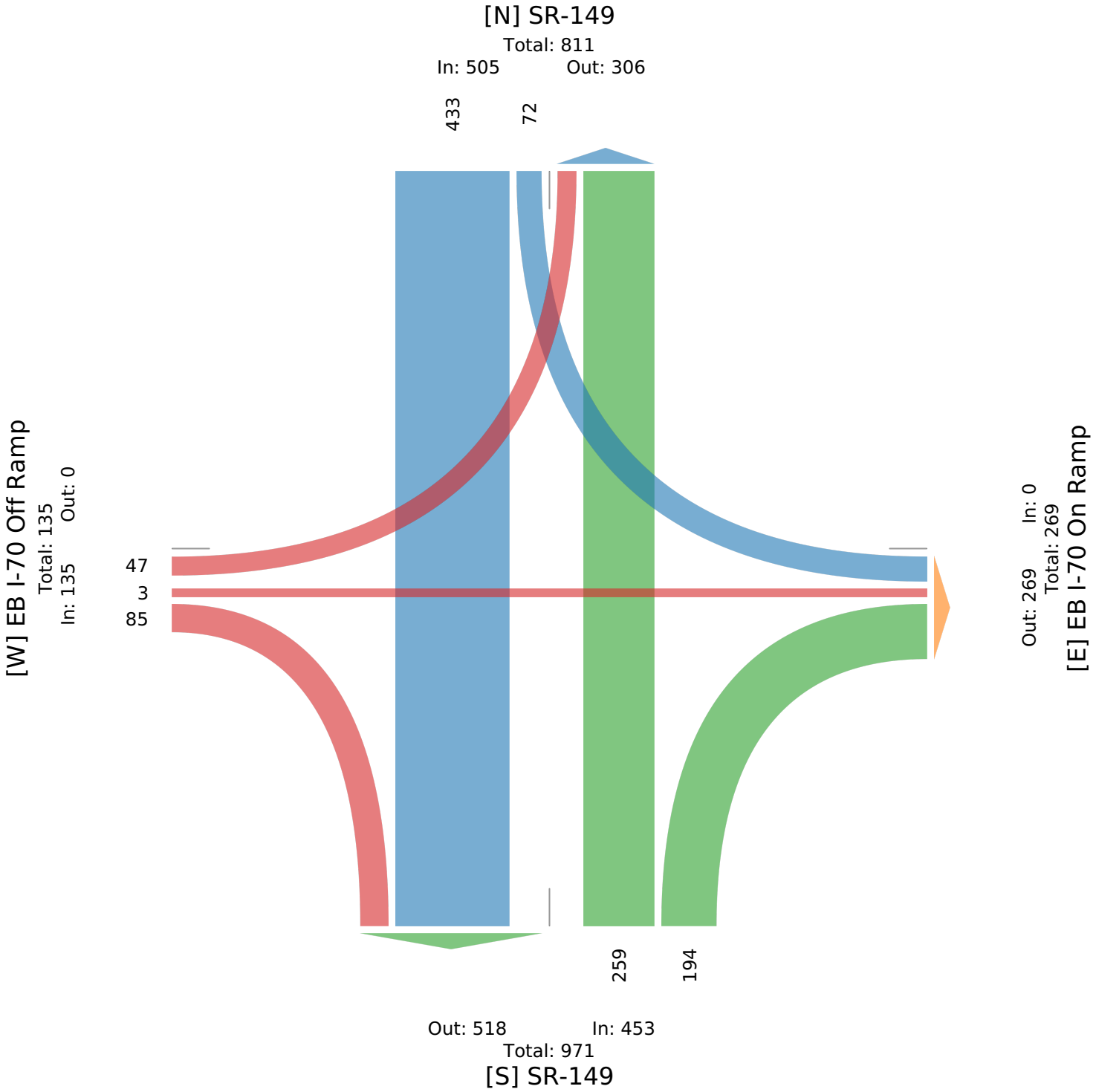
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	EB I-70 Off Ramp					EB I-70 On Ramp					SR-149					SR-149					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2022-09-13 4:30PM	4	1	20	0	**25**	0	0	0	0	**0**	0	57	48	0	**105**	19	105	0	0	**124**	**254**
4:45PM	13	2	24	0	**39**	0	0	0	0	**0**	0	67	48	0	**115**	14	85	0	0	**99**	**253**
5:00PM	14	0	19	0	**33**	0	0	0	0	**0**	0	71	52	0	**123**	18	118	0	0	**136**	**292**
5:15PM	16	0	22	0	**38**	0	0	0	0	**0**	0	64	46	0	**110**	21	125	0	0	**146**	**294**
Total	47	3	85	0	**135**	0	0	0	0	**0**	0	259	194	0	**453**	72	433	0	0	**505**	**1093**
% Approach	34.8%	2.2%	63.0%	0%	**-**	0%	0%	0%	0%	**-**	0%	57.2%	42.8%	0%	**-**	14.3%	85.7%	0%	0%	**-**	-
% Total	4.3%	0.3%	7.8%	0%	**12.4%**	0%	0%	0%	0%	**0%**	0%	23.7%	17.7%	0%	**41.4%**	6.6%	39.6%	0%	0%	**46.2%**	-
PHF	0.734	0.375	0.885	-	**0.865**	-	-	-	-	**-**	-	0.912	0.933	-	**0.921**	0.857	0.866	-	-	**0.865**	0.929
Lights	45	1	43	0	**89**	0	0	0	0	**0**	0	233	160	0	**393**	71	403	0	0	**474**	956
% Lights	95.7%	33.3%	50.6%	0%	**65.9%**	0%	0%	0%	0%	**-**	0%	90.0%	82.5%	0%	**86.8%**	98.6%	93.1%	0%	0%	**93.9%**	87.5%
Articulated Trucks and Single-Unit Trucks	1	2	42	0	**45**	0	0	0	0	**0**	0	21	34	0	**55**	1	30	0	0	**31**	131
% Articulated Trucks and Single-Unit Trucks	2.1%	66.7%	49.4%	0%	**33.3%**	0%	0%	0%	0%	**-**	0%	8.1%	17.5%	0%	**12.1%**	1.4%	6.9%	0%	0%	**6.1%**	12.0%
Buses	1	0	0	0	**1**	0	0	0	0	**0**	0	5	0	0	**5**	0	0	0	0	**0**	6
% Buses	2.1%	0%	0%	0%	**0.7%**	0%	0%	0%	0%	**-**	0%	1.9%	0%	0%	**1.1%**	0%	0%	0%	0%	**0%**	0.5%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 & I-70 EB On/Off Ramps - TMC
Tue Sep 13, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 984610, Location: 40.059157, -81.052417

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SR-149 and Reco Merge 3 studies - TMC

Tue Sep 13, 2022
Full Length ()
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 1014819, Location: 40.058186, -81.051976

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

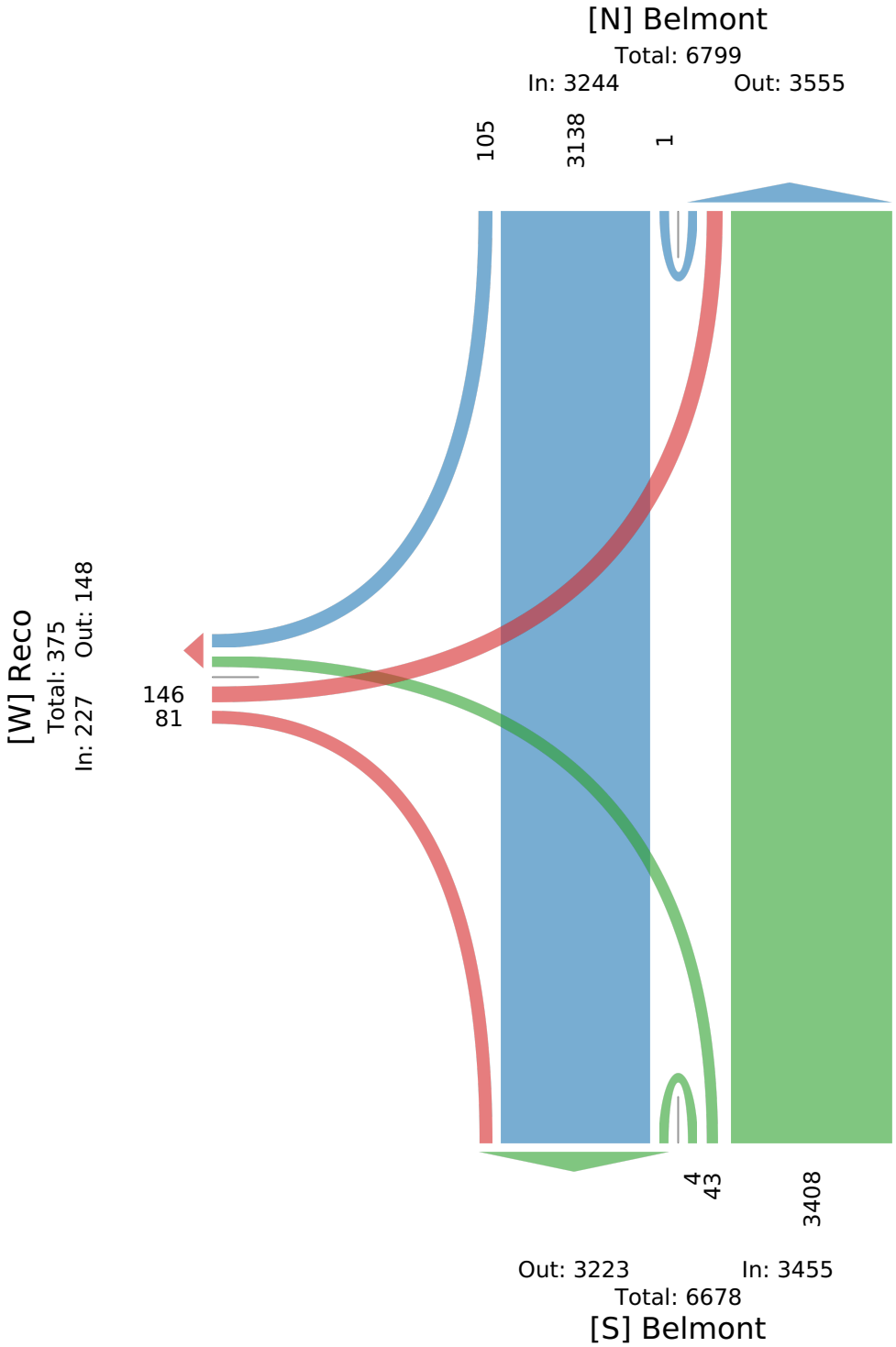
Leg	Reco				Belmont				Belmont				
Direction	Eastbound				Northbound				Southbound				
Time	L	R	U	App	L	T	U	App	T	R	U	App	Int
2022-09-13 6:00AM	0	1	0	**1**	1	63	0	**64**	26	2	0	**28**	**93**
6:15AM	4	1	0	**5**	1	77	0	**78**	35	2	0	**37**	**120**
6:30AM	2	0	0	**2**	0	89	0	**89**	45	3	0	**48**	**139**
6:45AM	5	3	0	**8**	1	85	0	**86**	46	1	0	**47**	**141**
Hourly Total	11	5	0	**16**	3	314	0	**317**	152	8	0	**160**	**493**
7:00AM	2	2	0	**4**	1	147	0	**148**	58	7	0	**65**	**217**
7:15AM	2	1	0	**3**	5	126	0	**131**	71	11	0	**82**	**216**
7:30AM	1	2	0	**3**	2	127	0	**129**	38	4	0	**42**	**174**
7:45AM	0	2	0	**2**	1	110	0	**111**	50	7	0	**57**	**170**
Hourly Total	5	7	0	**12**	9	510	0	**519**	217	29	0	**246**	**777**
8:00AM	1	2	0	**3**	2	99	0	**101**	45	1	0	**46**	**150**
8:15AM	3	2	0	**5**	2	114	0	**116**	56	1	0	**57**	**178**
8:30AM	3	2	0	**5**	2	107	0	**109**	71	3	0	**74**	**188**
8:45AM	7	4	0	**11**	4	72	0	**76**	75	3	0	**78**	**165**
Hourly Total	14	10	0	**24**	10	392	0	**402**	247	8	0	**255**	**681**
11:00AM	4	2	0	**6**	1	44	0	**45**	57	3	0	**60**	**111**
11:15AM	1	2	0	**3**	0	56	0	**56**	63	0	1	**64**	**123**
11:30AM	3	2	0	**5**	0	75	0	**75**	67	3	0	**70**	**150**
11:45AM	7	7	0	**14**	1	66	0	**67**	71	3	0	**74**	**155**
Hourly Total	15	13	0	**28**	2	241	0	**243**	258	9	1	**268**	**539**
12:00PM	3	2	0	**5**	0	83	0	**83**	63	3	0	**66**	**154**
12:15PM	8	3	0	**11**	1	77	0	**78**	75	2	0	**77**	**166**
12:30PM	2	0	0	**2**	1	81	0	**82**	76	0	0	**76**	**160**
12:45PM	1	5	0	**6**	2	77	0	**79**	79	1	0	**80**	**165**
Hourly Total	14	10	0	**24**	4	318	0	**322**	293	6	0	**299**	**645**
1:00PM	4	3	0	**7**	0	76	0	**76**	65	2	0	**67**	**150**
1:15PM	5	1	0	**6**	1	71	0	**72**	68	5	0	**73**	**151**
1:30PM	1	0	0	**1**	0	74	0	**74**	75	2	0	**77**	**152**
1:45PM	1	0	0	**1**	0	67	0	**67**	81	3	0	**84**	**152**
Hourly Total	11	4	0	**15**	1	288	0	**289**	289	12	0	**301**	**605**
2:00PM	5	2	0	**7**	1	66	0	**67**	74	0	0	**74**	**148**
2:15PM	3	2	0	**5**	1	83	0	**84**	133	2	0	**135**	**224**
2:30PM	0	0	0	**0**	2	76	0	**78**	84	1	0	**85**	**163**
2:45PM	4	0	0	**4**	1	88	0	**89**	75	2	0	**77**	**170**
Hourly Total	12	4	0	**16**	5	313	0	**318**	366	5	0	**371**	**705**
3:00PM	4	2	0	**6**	0	74	0	**74**	128	1	0	**129**	**209**
3:15PM	4	4	0	**8**	1	84	0	**85**	112	3	0	**115**	**208**
3:30PM	9	3	0	**12**	1	76	0	**77**	102	0	0	**102**	**191**
3:45PM	3	2	0	**5**	0	87	0	**87**	115	0	0	**115**	**207**
Hourly Total	20	11	0	**31**	2	321	0	**323**	457	4	0	**461**	**815**
4:00PM	11	7	0	**18**	0	78	1	**79**	89	4	0	**93**	**190**
4:15PM	7	1	0	**8**	1	77	0	**78**	111	7	0	**118**	**204**
4:30PM	3	3	0	**6**	1	100	3	**104**	109	0	0	**109**	**219**
4:45PM	5	1	0	**6**	1	105	0	**106**	102	2	0	**104**	**216**
Hourly Total	26	12	0	**38**	3	360	4	**367**	411	13	0	**424**	**829**
5:00PM	11	2	0	**13**	0	106	0	**106**	128	3	0	**131**	**250**
5:15PM	0	2	0	**2**	2	102	0	**104**	137	2	0	**139**	**245**
5:30PM	5	1	0	**6**	1	72	0	**73**	91	3	0	**94**	**173**
5:45PM	2	0	0	**2**	1	71	0	**72**	92	3	0	**95**	**169**
Hourly Total	18	5	0	**23**	4	351	0	**355**	448	11	0	**459**	**837**
Total	146	81	0	**227**	43	3408	4	**3455**	3138	105	1	**3244**	**6926**
% Approach	64.3%	35.7%	0%	**-**	1.2%	98.6%	0.1%	**-**	96.7%	3.2%	0%	**-**	-
% Total	2.1%	1.2%	0%	**3.3%**	0.6%	49.2%	0.1%	**49.9%**	45.3%	1.5%	0%	**46.8%**	-
Lights	121	63	0	**184**	35	2887	2	**2924**	2580	88	1	**2669**	5777

Leg	Reco				Belmont				Belmont				
Direction	Eastbound				Northbound				Southbound				
Time	L	R	U	**App**	L	T	U	**App**	T	R	U	**App**	**Int**
% Lights	82.9%	77.8%	0%	**81.1%**	81.4%	84.7%	50.0%	**84.6%**	82.2%	83.8%	100%	**82.3%**	83.4%
Articulated Trucks and Single-Unit Trucks	25	18	0	**43**	8	493	2	**503**	536	17	0	**553**	1099
% Articulated Trucks and Single-Unit Trucks	17.1%	22.2%	0%	**18.9%**	18.6%	14.5%	50.0%	**14.6%**	17.1%	16.2%	0%	**17.0%**	15.9%
Buses	0	0	0	**0**	0	28	0	**28**	22	0	0	**22**	50
% Buses	0%	0%	0%	**0%**	0%	0.8%	0%	**0.8%**	0.7%	0%	0%	**0.7%**	0.7%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 and Reco Merge 3 studies - TMC
Tue Sep 13, 2022
Full Length ()
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 1014819, Location: 40.058186, -81.051976

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SR-149 and Reco Merge 3 studies - TMC

Tue Sep 13, 2022
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 1014819, Location: 40.058186, -81.051976

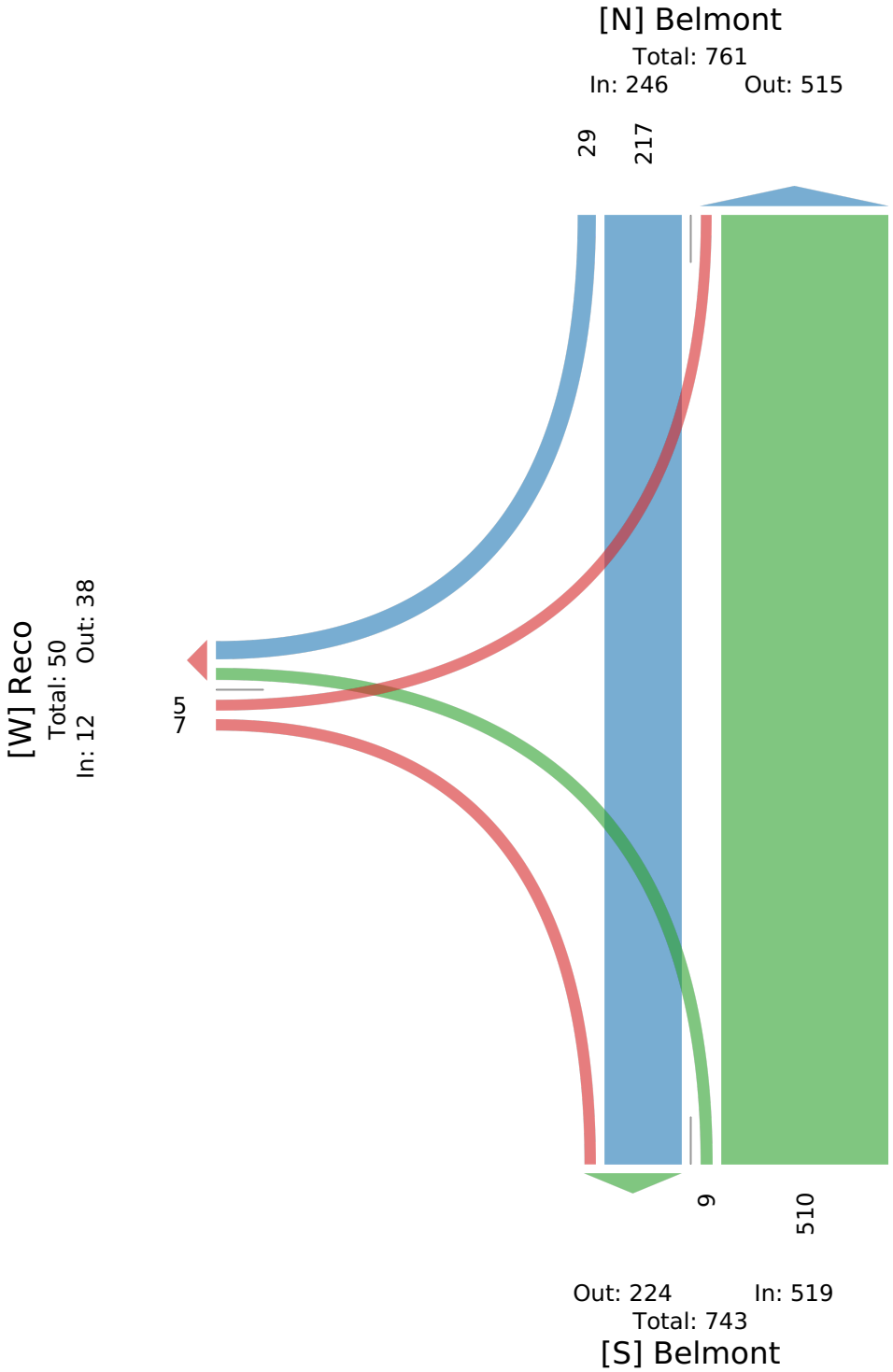
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Reco				Belmont				Belmont				
Direction	Eastbound				Northbound				Southbound				
Time	L	R	U	**App**	L	T	U	**App**	T	R	U	**App**	**Int**
2022-09-13 7:00AM	2	2	0	**4**	1	147	0	**148**	58	7	0	**65**	**217**
7:15AM	2	1	0	**3**	5	126	0	**131**	71	11	0	**82**	**216**
7:30AM	1	2	0	**3**	2	127	0	**129**	38	4	0	**42**	**174**
7:45AM	0	2	0	**2**	1	110	0	**111**	50	7	0	**57**	**170**
Total	5	7	0	**12**	9	510	0	**519**	217	29	0	**246**	**777**
% Approach	41.7%	58.3%	0%	**-**	1.7%	98.3%	0%	**-**	88.2%	11.8%	0%	**-**	-
% Total	0.6%	0.9%	0%	**1.5%**	1.2%	65.6%	0%	**66.8%**	27.9%	3.7%	0%	**31.7%**	-
PHF	0.625	0.875	-	**0.750**	0.450	0.867	-	**0.877**	0.764	0.659	-	**0.750**	0.895
Lights	4	7	0	**11**	5	469	0	**474**	178	27	0	**205**	690
% Lights	80.0%	100%	0%	**91.7%**	55.6%	92.0%	0%	**91.3%**	82.0%	93.1%	0%	**83.3%**	88.8%
Articulated Trucks and Single-Unit Trucks	1	0	0	**1**	4	36	0	**40**	35	2	0	**37**	78
% Articulated Trucks and Single-Unit Trucks	20.0%	0%	0%	**8.3%**	44.4%	7.1%	0%	**7.7%**	16.1%	6.9%	0%	**15.0%**	10.0%
Buses	0	0	0	**0**	0	5	0	**5**	4	0	0	**4**	9
% Buses	0%	0%	0%	**0%**	0%	1.0%	0%	**1.0%**	1.8%	0%	0%	**1.6%**	1.2%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 and Reco Merge 3 studies - TMC
Tue Sep 13, 2022
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 1014819, Location: 40.058186, -81.051976

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SR-149 and Reco Merge 3 studies - TMC

Tue Sep 13, 2022
Midday Peak (12 PM - 1 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 1014819, Location: 40.058186, -81.051976

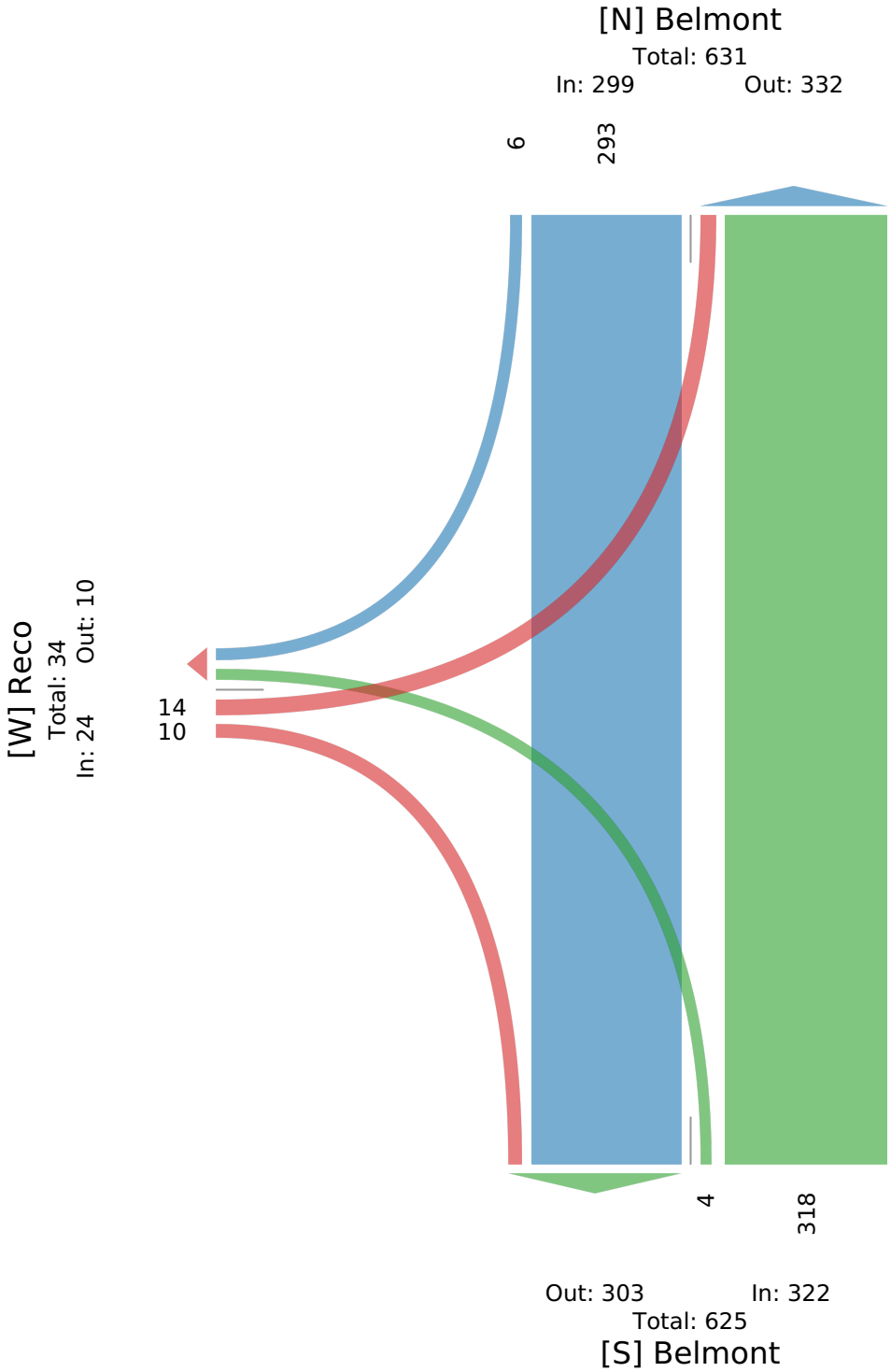
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Reco				Belmont				Belmont				
Direction	Eastbound				Northbound				Southbound				
Time	L	R	U	**App**	L	T	U	**App**	T	R	U	**App**	**Int**
2022-09-13 12:00PM	3	2	0	**5**	0	83	0	**83**	63	3	0	**66**	**154**
12:15PM	8	3	0	**11**	1	77	0	**78**	75	2	0	**77**	**166**
12:30PM	2	0	0	**2**	1	81	0	**82**	76	0	0	**76**	**160**
12:45PM	1	5	0	**6**	2	77	0	**79**	79	1	0	**80**	**165**
Total	14	10	0	**24**	4	318	0	**322**	293	6	0	**299**	**645**
% Approach	58.3%	41.7%	0%	**-**	1.2%	98.8%	0%	**-**	98.0%	2.0%	0%	**-**	-
% Total	2.2%	1.6%	0%	**3.7%**	0.6%	49.3%	0%	**49.9%**	45.4%	0.9%	0%	**46.4%**	-
PHF	0.438	0.500	-	**0.545**	0.500	0.958	-	**0.970**	0.927	0.500	-	**0.934**	0.971
Lights	10	9	0	**19**	3	261	0	**264**	226	5	0	**231**	514
% Lights	71.4%	90.0%	0%	**79.2%**	75.0%	82.1%	0%	**82.0%**	77.1%	83.3%	0%	**77.3%**	79.7%
Articulated Trucks and Single-Unit Trucks	4	1	0	**5**	1	57	0	**58**	66	1	0	**67**	130
% Articulated Trucks and Single-Unit Trucks	28.6%	10.0%	0%	**20.8%**	25.0%	17.9%	0%	**18.0%**	22.5%	16.7%	0%	**22.4%**	20.2%
Buses	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	1
% Buses	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0.3%	0%	0%	**0.3%**	0.2%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 and Reco Merge 3 studies - TMC
Tue Sep 13, 2022
Midday Peak (12 PM - 1 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 1014819, Location: 40.058186, -81.051976

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SR-149 and Reco Merge 3 studies - TMC

Tue Sep 13, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 1014819, Location: 40.058186, -81.051976

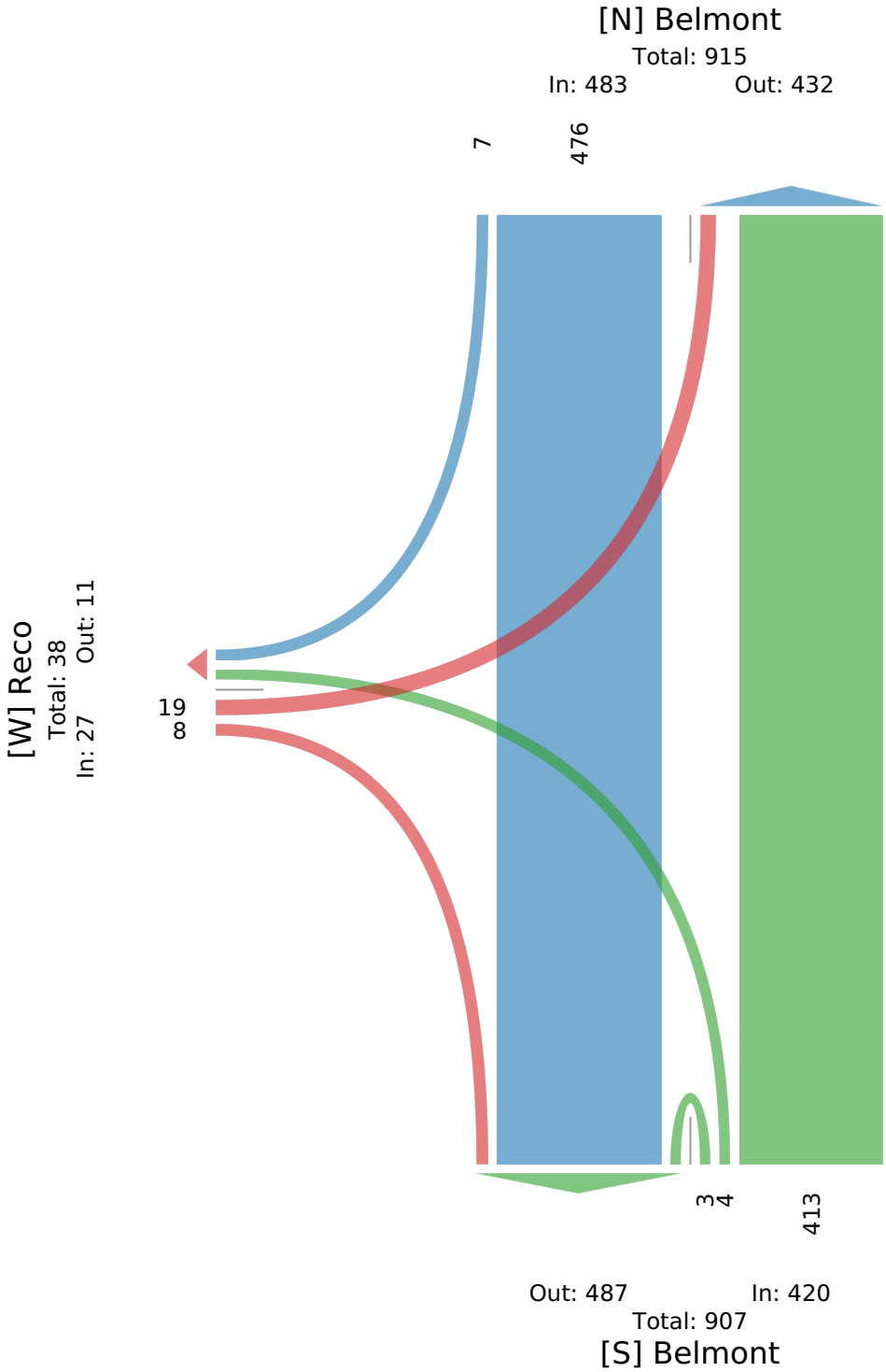
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Reco				Belmont				Belmont				
Direction	Eastbound				Northbound				Southbound				
Time	L	R	U	**App**	L	T	U	**App**	T	R	U	**App**	**Int**
2022-09-13 4:30PM	3	3	0	**6**	1	100	3	**104**	109	0	0	**109**	**219**
4:45PM	5	1	0	**6**	1	105	0	**106**	102	2	0	**104**	**216**
5:00PM	11	2	0	**13**	0	106	0	**106**	128	3	0	**131**	**250**
5:15PM	0	2	0	**2**	2	102	0	**104**	137	2	0	**139**	**245**
Total	19	8	0	**27**	4	413	3	**420**	476	7	0	**483**	**930**
% Approach	70.4%	29.6%	0%	**-**	1.0%	98.3%	0.7%	**-**	98.6%	1.4%	0%	**-**	-
% Total	2.0%	0.9%	0%	**2.9%**	0.4%	44.4%	0.3%	**45.2%**	51.2%	0.8%	0%	**51.9%**	-
PHF	0.432	0.667	-	**0.519**	0.500	0.974	0.250	**0.991**	0.869	0.583	-	**0.869**	0.930
Lights	17	8	0	**25**	3	359	2	**364**	414	7	0	**421**	810
% Lights	89.5%	100%	0%	**92.6%**	75.0%	86.9%	66.7%	**86.7%**	87.0%	100%	0%	**87.2%**	87.1%
Articulated Trucks and Single-Unit Trucks	2	0	0	**2**	1	49	1	**51**	62	0	0	**62**	115
% Articulated Trucks and Single-Unit Trucks	10.5%	0%	0%	**7.4%**	25.0%	11.9%	33.3%	**12.1%**	13.0%	0%	0%	**12.8%**	12.4%
Buses	0	0	0	**0**	0	5	0	**5**	0	0	0	**0**	5
% Buses	0%	0%	0%	**0%**	0%	1.2%	0%	**1.2%**	0%	0%	0%	**0%**	0.5%

*L: Left, R: Right, T: Thru, U: U-Turn

SR-149 and Reco Merge 3 studies - TMC
Tue Sep 13, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 1014819, Location: 40.058186, -81.051976

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



APPENDIX C
GROWTH RATE AND DHV FACTOR DOCUMENTATION

Years	SR-149 N of I-70	SR-149 S of I-70	WB On Ramp	WB Off Ramp	EB On Ramp	EB Off Ramp
	-9.48%	-4.64%	-6.29%	-8.64%	-7.22%	-9.53%
1	0.9052	0.9536	0.9371	0.9136	0.9278	0.9047
21	-0.9908	0.0256	-0.3209	-0.8144	-0.5162	-1.0013

* In an effort to be conservative, CESO applied a growth rate of 0.5% to the study volumes.

PEAK HOUR to DESIGN HOUR FACTORS

FUNCTIONAL CLASSIFICATION = 01r

(Rural Interstate)

Day / Month	Monthly Average by Day-of-Week							
	WEEKDAY MON-THUR	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
January	1.65	1.68	1.75	1.72	1.62	1.52	1.34	1.75
February	1.59	1.58	1.69	1.63	1.57	1.49	1.20	1.66
March	1.48	1.33	1.54	1.54	1.47	1.36	1.13	1.50
April	1.42	1.27	1.50	1.48	1.40	1.31	1.11	1.46
May	1.37	1.27	1.44	1.41	1.37	1.26	1.06	1.35
June	1.32	1.18	1.38	1.37	1.30	1.22	1.05	1.29
July	1.29	1.13	1.36	1.33	1.27	1.21	1.04	1.22
August	1.33	1.15	1.40	1.37	1.32	1.23	1.05	1.24
September	1.41	1.25	1.49	1.45	1.40	1.29	1.05	1.32
October	1.38	1.18	1.47	1.42	1.36	1.26	1.04	1.33
November	1.44	1.35	1.49	1.45	1.45	1.36	1.10	1.46
December	1.47	1.57	1.57	1.53	1.42	1.37	1.19	1.54

peak hour volume * factor = design hour volume

source: year 2016, 2017, & 2018 Automatic Traffic Recorders (ATR) Data

ATR Stations:

2018: 135, 596, 608, 616, 617, 715, 745, 775, 787
2017: 135, 159, 596, 616, 617, 715, 745, 775
2016: 50, 135, 155, 159, 507, 596, 608, 610, 616, 617, 715, 775

Ohio Department of Transportatio
Modeling & Forecasting Section
June 2019

NOTE: These are NOT seasonal adjustment factors!!!

See Appendix A1 thru A4 for ATR sample statistics

PEAK HOUR to DESIGN HOUR FACTORS

FUNCTIONAL CLASSIFICATION = 05, 06r

(Rural Major Collector & Rural Minor Collector)

Day / Month	Monthly Average by Day-of-Week							
	WEEKDAY MON-THUR	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
January	1.31	2.00	1.35	1.32	1.29	1.28	1.23	1.80
February	1.26	1.91	1.27	1.25	1.27	1.28	1.18	1.67
March	1.24	1.80	1.25	1.24	1.24	1.23	1.17	1.64
April	1.16	1.60	1.20	1.18	1.13	1.14	1.08	1.55
May	1.13	1.56	1.15	1.12	1.12	1.11	1.06	1.46
June	1.18	1.57	1.20	1.20	1.15	1.15	1.13	1.44
July	1.22	1.60	1.25	1.22	1.20	1.22	1.17	1.50
August	1.17	1.53	1.18	1.17	1.16	1.14	1.09	1.40
September	1.13	1.54	1.16	1.13	1.12	1.10	1.04	1.39
October	1.13	1.59	1.17	1.11	1.12	1.11	1.04	1.39
November	1.18	1.77	1.21	1.17	1.17	1.19	1.08	1.59
December	1.22	1.86	1.22	1.22	1.22	1.24	1.16	1.64

peak hour volume * factor = design hour volume

source: year 2016, 2017, & 2018 Automatic Traffic Recorders (ATR) Data

ATR Stations:

2018: 7, 67, 171, 516, 520, 548, 773, 774
2017: 7, 67, 171, 516, 520, 773, 774, 548, 549
2016: 7, 67, 516, 520, 773, 774, 548, 549

Ohio Department of Transportatio
Modeling & Forecasting Section
June 2019

NOTE: These are NOT seasonal adjustment factors!!!

Note: Insufficient data exists to produce factors for functional class 07 Rural.

APPENDIX D
ITE TRIP GENERATION RESOURCES AND CALCULATIONS

Land Use: 945
Convenience Store/Gas Station

Description

A convenience store/gas station is a facility with a co-located convenience store and gas station. The convenience store sells grocery and other everyday items that a person may need or want as a matter of convenience. The gas station sells automotive fuels such as gasoline and diesel.

A convenience store/gas station is typically located along a major thoroughfare to optimize motorist convenience. Extended hours of operation (with many open 24 hours, 7 days a week) are common at these facilities.

The convenience store product mix typically includes pre-packaged grocery items, beverages, dairy products, snack foods, confectionary, tobacco products, over-the-counter drugs, and toiletries. A convenience store may sell alcohol, often limited to beer and wine. Coffee and pre-made sandwiches are also commonly sold at a convenience store. Made-to-order food orders are sometimes offered. Some stores offer limited seating.

The sites in this land use include both self-pump and attendant-pumped fueling positions and both pre-pay and post-pay operations.

Convenience store (Land Use 851), gasoline/service station (Land Use 944), and truck stop (Land Use 950) are related uses.

Land Use Subcategory

Multiple subcategories were added to this land use to allow for multi-variable evaluation of sites with single-variable data plots. All study sites are assigned to one of three subcategories, based on the number of vehicle fueling positions (VFP) at the site: between 2 and 8 VFP, between 9 and 15 VFP, and between 16 and 24 VFP. For each VFP range subcategory, data plots are presented with GFA as the independent variable for all time periods and trip types for which data are available. The use of both GFA and VFP (as the independent variable and land use subcategory, respectively) provides a significant improvement in the reliability of a trip generation estimate when compared to the single-variable data plots in prior editions of *Trip Generation Manual*.

Further, the study sites were also assigned to one of three other subcategories, based on the gross floor area (GFA) of the convenience store at the site: between 2,000 and 4,000 square feet, between 4,000 and 5,500 square feet, and between 5,500 and 10,000 square feet. For each GFA subcategory range, data plots are presented with VFP as the independent variable for all time periods and trip types for which data are available. The use of both VFP and GFA (as the independent variable and land use subcategory, respectively) provides a significant improvement in the reliability of a trip generation estimate when compared to the single-variable data plots in prior editions of *Trip Generation Manual*.

When analyzing the convenience store/gas station land use with each combination of GFA and VFP values as described above, the two sets of data plots will produce two estimates of site-generated trips. Both values can be considered when determining a site trip generation estimate.

Data plots are also provided for three additional independent variables: AM peak hour traffic on adjacent street, PM peak hour traffic on adjacent street, and employees. These independent variables are intended to be analyzed as single independent variables and do not have sub-categories associated with them. Within the data plots and within the ITETripGen web app, these plots are found under the land use subcategory "none."

Additional Data

ITE recognizes there are existing convenience store/gas station sites throughout North America that are larger than the sites presented in the data plots. However, the ITE database does not include any site with more than 24 VFP or any site with gross floor area greater than 10,000 square feet. Submission of trip generation data for larger sites is encouraged.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), Arkansas, California, Connecticut, Delaware, Florida, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, Pennsylvania, Rhode Island, South Dakota, Texas, Utah, Vermont, Washington, and Wisconsin.

Source Numbers

221, 245, 274, 288, 300, 340, 350, 351, 352, 355, 359, 385, 440, 617, 718, 810, 813, 844, 850, 853, 864, 865, 867, 869, 882, 883, 888, 904, 926, 927, 936, 938, 954, 960, 962, 977, 1004, 1024, 1025, 1027, 1052

Convenience Store/Gas Station - GFA (4-5.5k) (945)

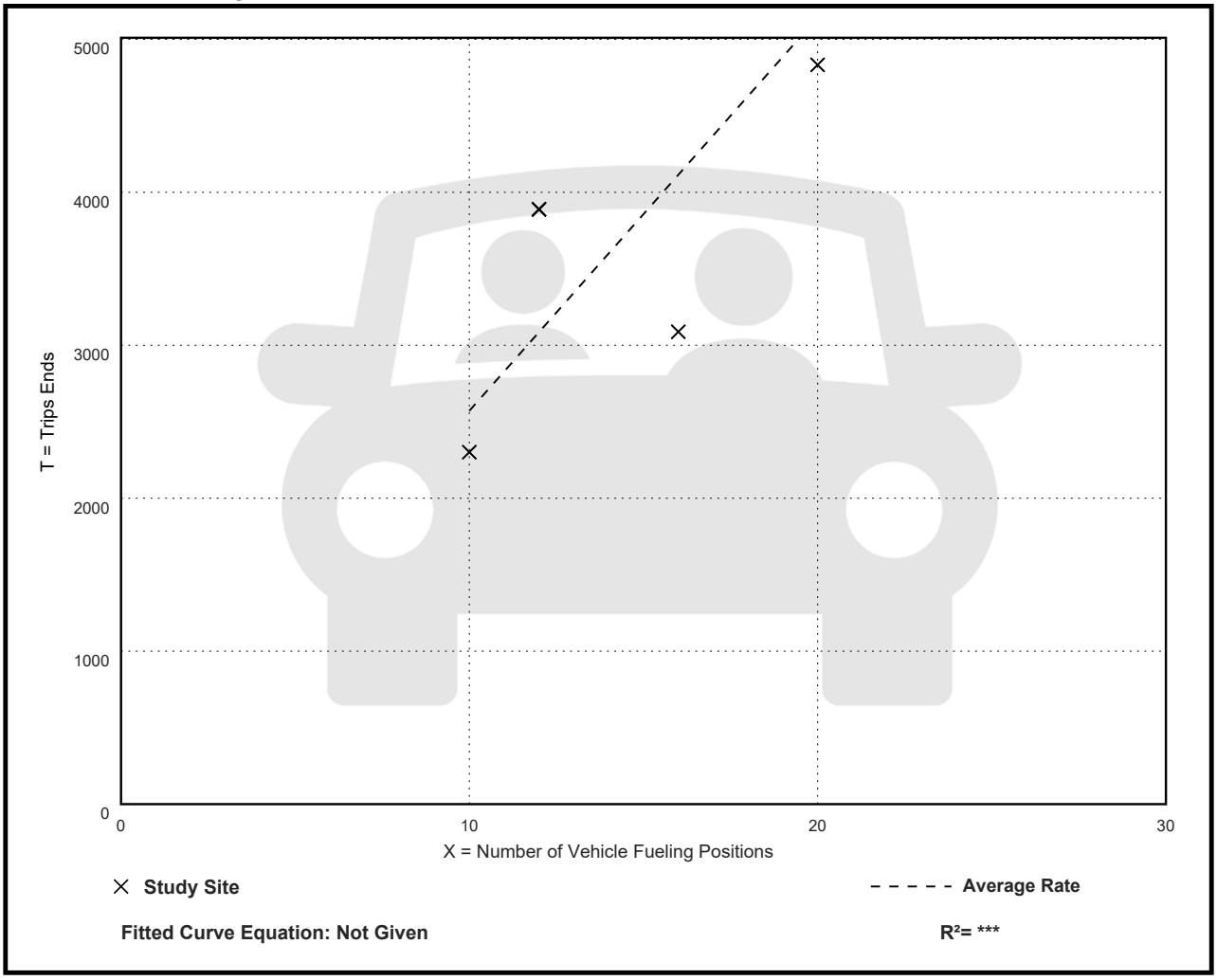
Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Vehicle Fueling Positions: 14
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
257.13	193.00 - 324.17	57.53

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

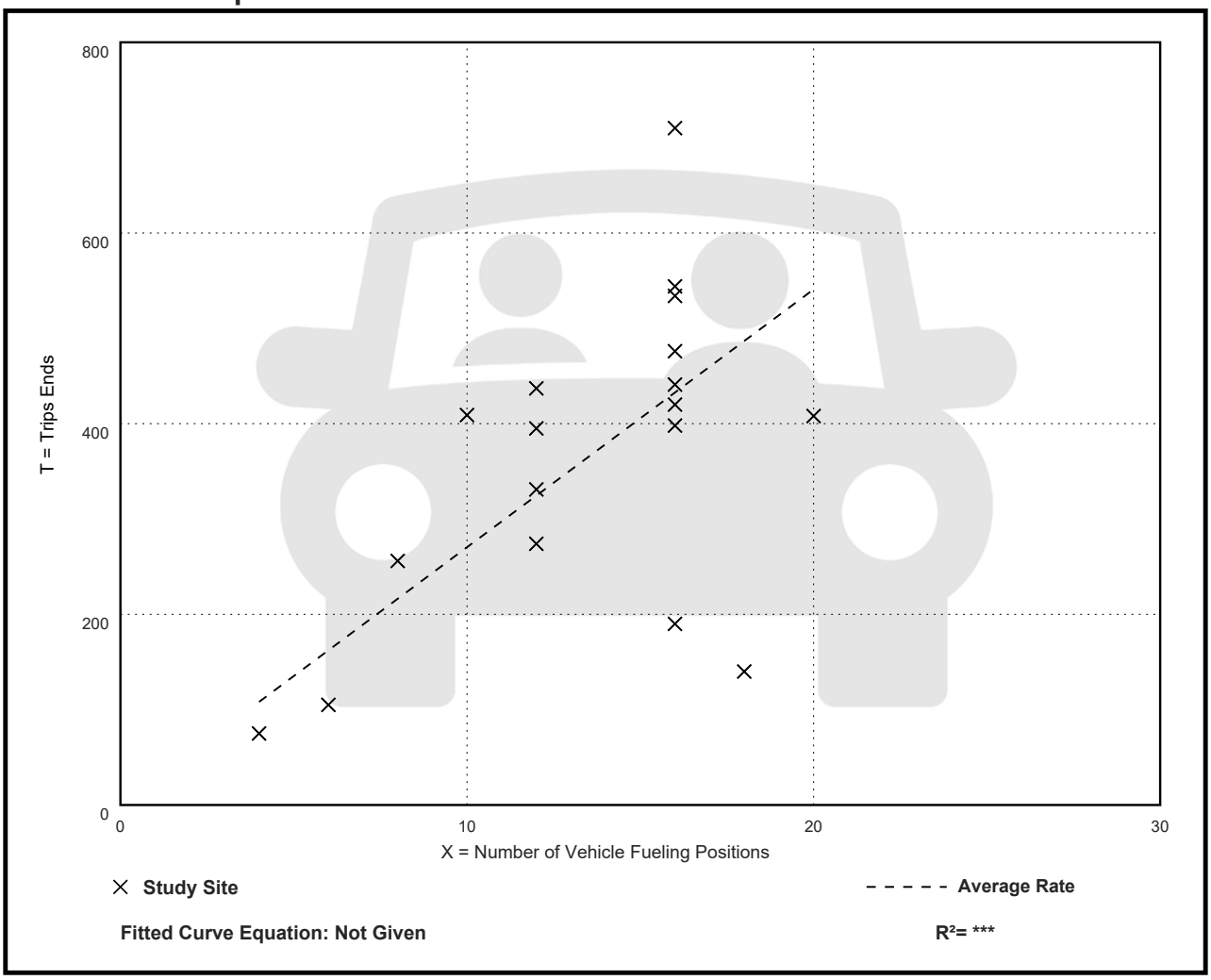
Convenience Store/Gas Station - GFA (4-5.5k) (945)

Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 18
Avg. Num. of Vehicle Fueling Positions: 13
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
27.04	7.78 - 44.38	9.88

Data Plot and Equation



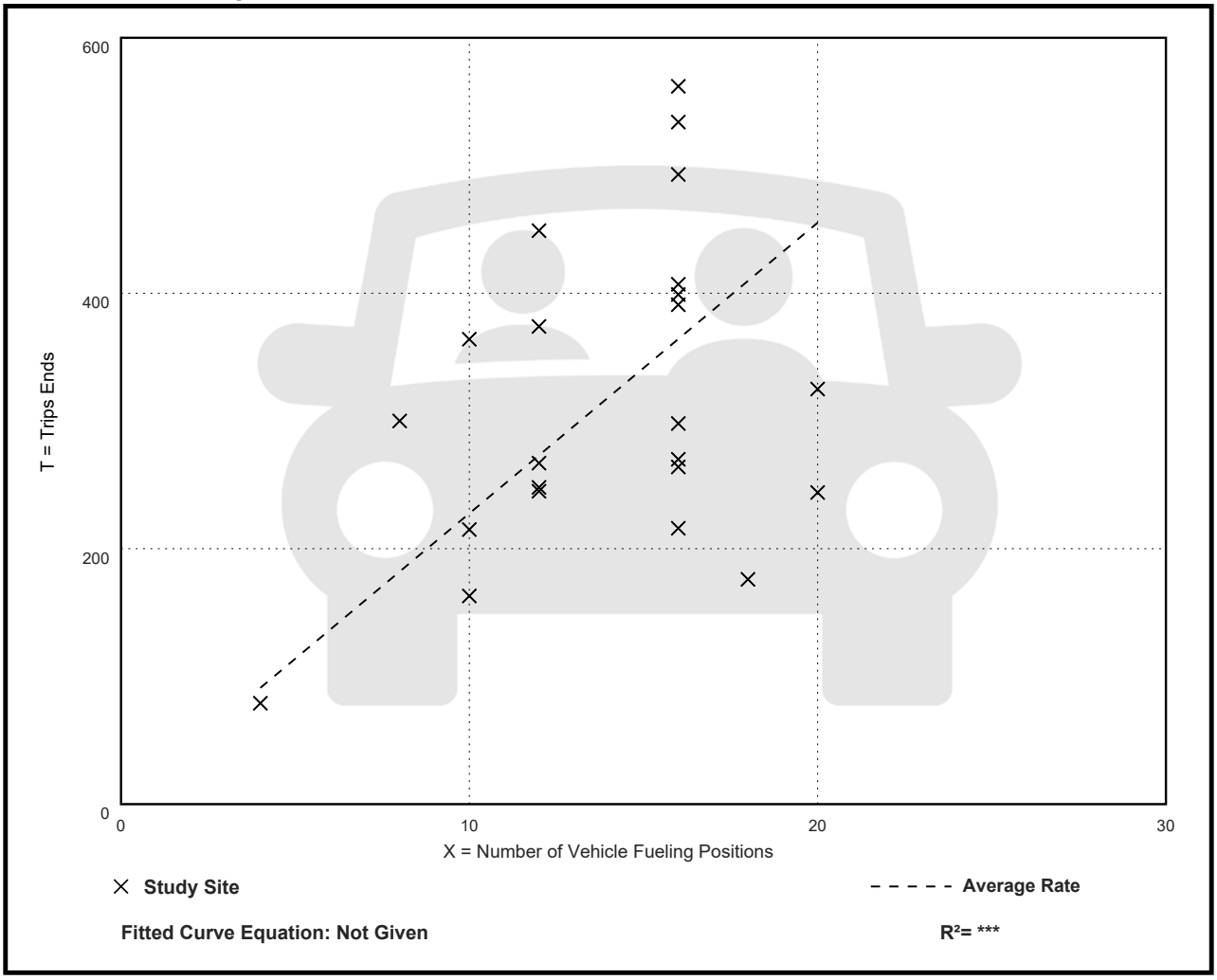
Convenience Store/Gas Station - GFA (4-5.5k) (945)

Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 23
Avg. Num. of Vehicle Fueling Positions: 14
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
22.76	9.78 - 37.50	8.49

Data Plot and Equation



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September 30, 2022

Traffic Impact Study – Proposed Love's Travel Stop

St. Clairsville, Ohio

CESO Trip Generation Calculations – 2023 and 2043 Build Traffic Scenarios:

ITE 945 – Gasoline/Service Station with Convenience Market

For Weekday → 50% Enter/50% Exit

257.13 x 16 Passenger Car Fueling Positions = 4,114.08 ≈ 4,114 Trips for Even Number

4,114 Trips x 0.50 (50%) = 2,057 Trips Enter/2,057 Trips Exit

For AM Peak Hour → 50% Enter/50% Exit

27.04 x 16 Passenger Car Fueling Positions = 432.64 ≈ 432 Trips for Even Number

Pass-by Trips = 432 Trips x 0.76 (76%) = 328 Trips

Pass-by Trips = 328 Trips x 0.50 (50%) = 164 Trips Enter/164 Trips Exit

Primary Trips = 432 – 328 = 104 Trips

Primary Trips = 104 x 0.50 = 52 Trips Enter/52 Trips Exit

For PM Peak Hour → 50% Enter/50% Exit

22.76 x 16 Passenger Car Fueling Positions = 364.16 ≈ 365 Trips for Even Number

Pass-by Trips = 365 Trips x 0.75 (75%) = 274 Trips

Pass-by Trips = 274 Trips x 0.50 (50%) = 137 Trips Enter/137 Trips Exit

Primary Trips = 365 – 274 = 91 Trips

Primary Trips = 91 x 0.50 (50%) = 46 Trips Enter/45 Trips Exit

Land Use: 934
Fast-Food Restaurant with Drive-Through Window

Description

This land use includes any fast-food restaurant with a drive-through window. This type of restaurant is characterized by a large drive-through and large carry-out clientele, long hours of service (some are open for breakfast, all are open for lunch and dinner, some are open late at night or 24 hours a day) and high turnover rates for eat-in customers. The restaurant does not provide table service. A patron generally orders from a menu board and pays before receiving the meal. A typical duration of stay for an eat-in patron is less than 30 minutes. Fast casual restaurant (Land Use 930), high-turnover (sit-down) restaurant (Land Use 932), fast-food restaurant without drive-through window (Land Use 933), and fast-food restaurant with drive-through window and no indoor seating (Land Use 935) are related uses.

Additional Data

Users should exercise caution when applying statistics during the AM peak periods, as the sites contained in the database for this land use may or may not be open for breakfast. In cases where it was confirmed that the sites were not open for breakfast, data for the AM peak hour of the adjacent street traffic were removed from the database.

If the restaurant has outdoor seating, its area is not included in the overall gross floor area. For a restaurant that has significant outdoor seating, the number of seats may be more reliable than GFA as an independent variable on which to establish a trip generation rate.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alaska, Alberta (CAN), California, Colorado, Florida, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Dakota, Texas, Vermont, Virginia, Washington, and Wisconsin.

Source Numbers

163, 164, 168, 180, 181, 241, 245, 278, 294, 300, 301, 319, 338, 340, 342, 358, 389, 438, 502, 552, 577, 583, 584, 617, 640, 641, 704, 715, 728, 810, 866, 867, 869, 885, 886, 927, 935, 962, 977, 1050, 1053, 1054

Fast-Food Restaurant with Drive-Through Window (934)

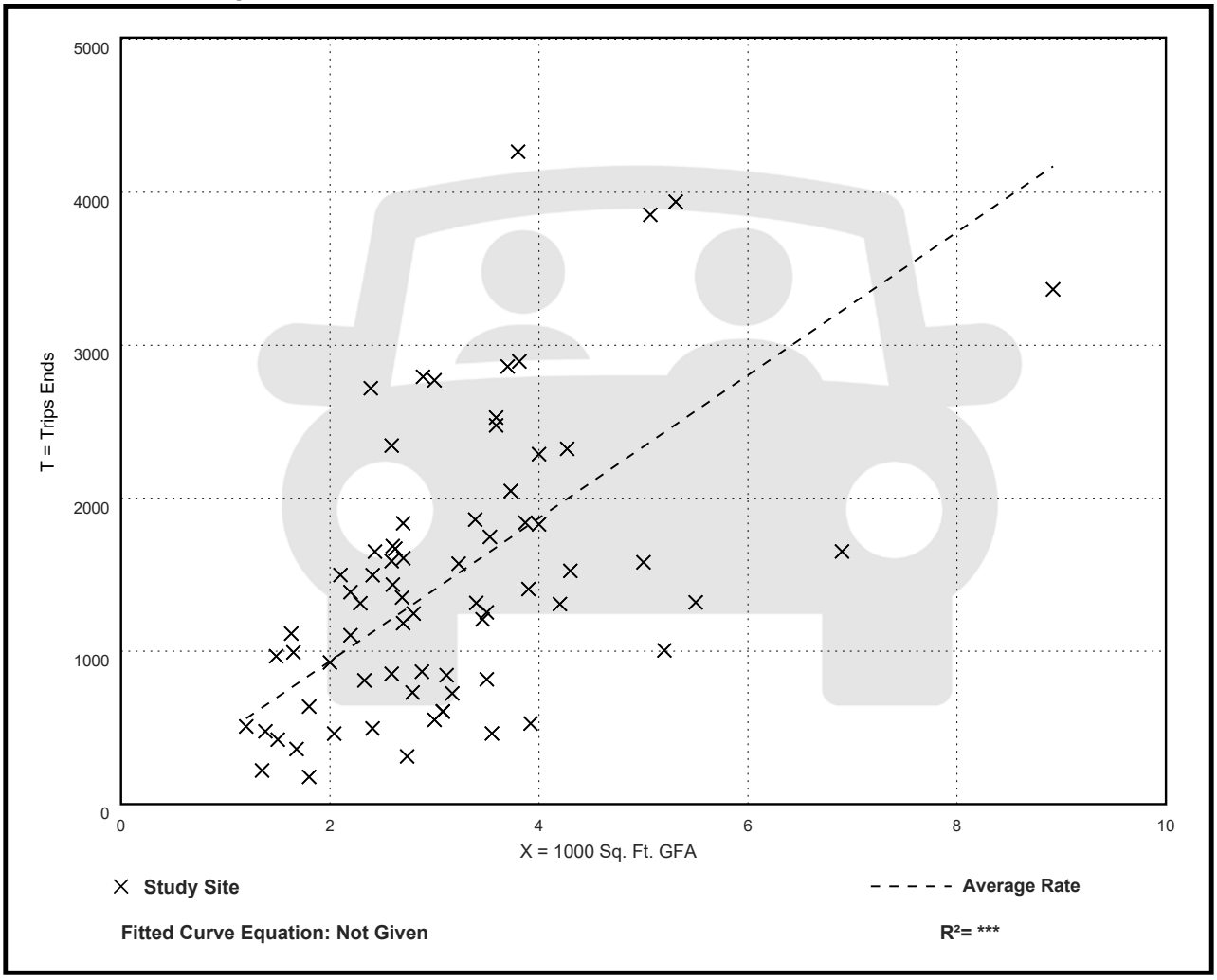
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 71
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
467.48	98.89 - 1137.66	238.62

Data Plot and Equation



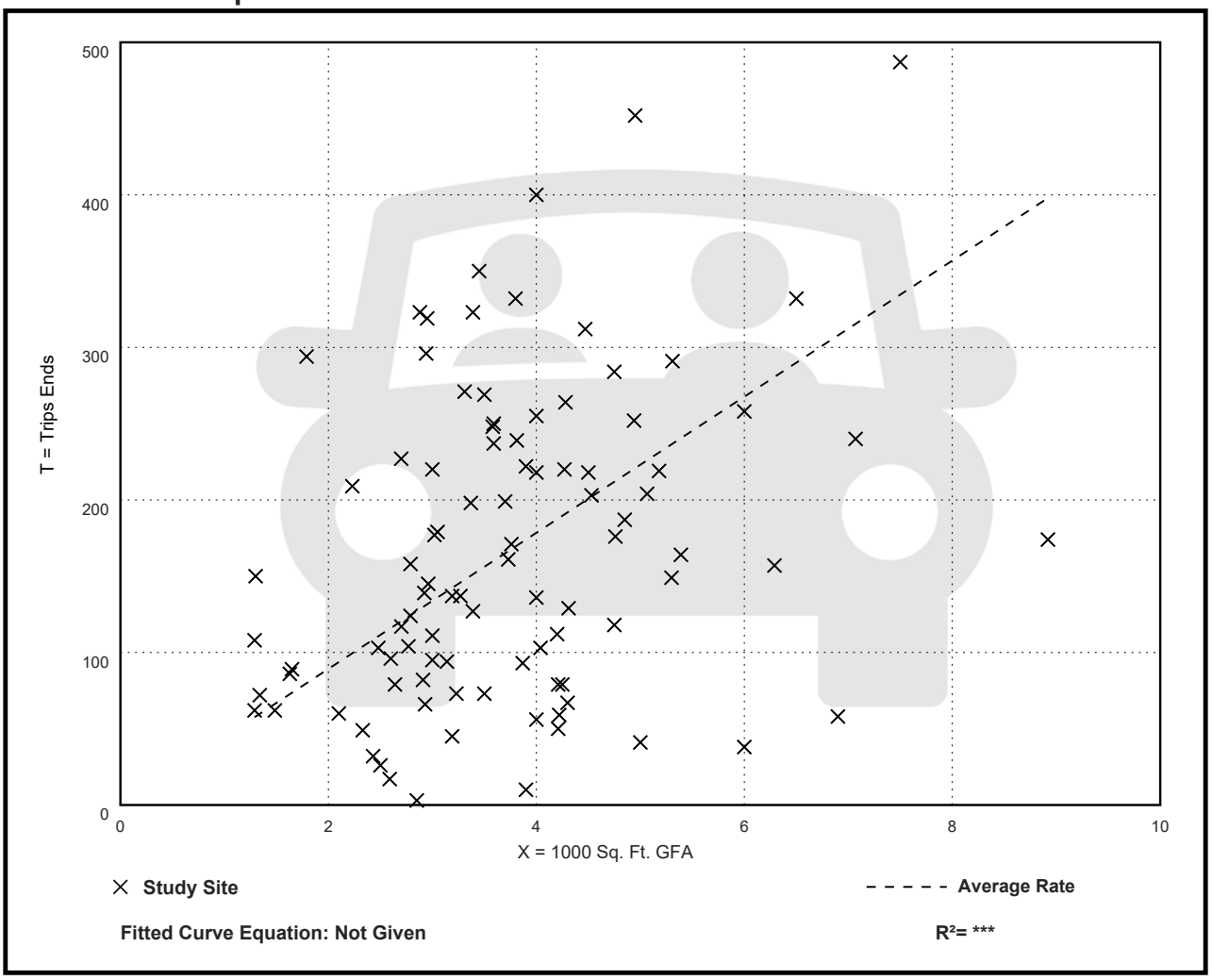
Fast-Food Restaurant with Drive-Through Window (934)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 96
Avg. 1000 Sq. Ft. GFA: 4
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
44.61	1.05 - 164.25	27.14

Data Plot and Equation



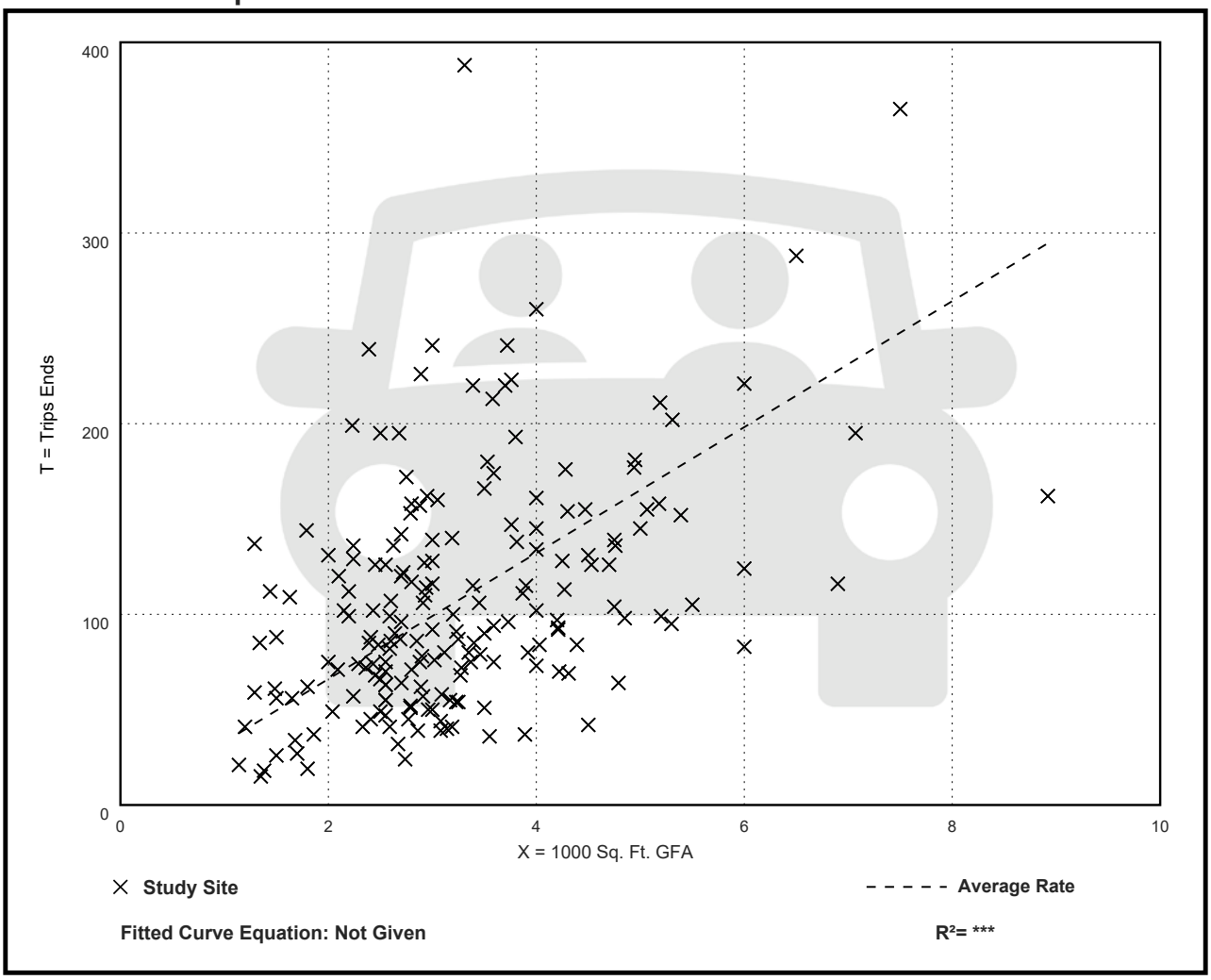
Fast-Food Restaurant with Drive-Through Window (934)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 190
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
33.03	8.77 - 117.22	17.59

Data Plot and Equation



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September 30, 2022

Traffic Impact Study – Proposed Love's Travel Stop

St. Clairsville, Ohio

CESO Trip Generation Calculations – 2023 and 2043 Build Traffic Scenarios:

ITE 934 – Fast-Food Restaurant with Drive-Through Window

For Weekday → 50% Enter/50% Exit

3.10 KSF x 467.48 = 1,449.18 ≈ 1,450 Trips for Even Number

1,450 Trips x 0.50 (50%) = 725 Trips Enter/725 Trips Exit

For AM Peak Hour → 51% Enter/49% Exit

3.10 KSF x 44.61 = 138.29 ≈ 138 Trips

Pass-by Trips = 138 Trips x 0.50 (50%) = 70 Trips for Even Number

Pass-by Trips = 70 Trips x 0.50 (50%) = 35 Trips Enter/35 Trips Exit

Primary Trips = 138 – 70 = 68 Trips

Primary Trips = 68 x 0.51 (51%) and 68 x 0.49 (49%) = 35 Trips Enter/33 Trips Exit

For PM Peak Hour → 52% Enter/48% Exit

3.10 KSF x 33.03 = 102.39 ≈ 102 Trips

Pass-by Trips = 102 Trips x 0.55 (55%) = 56 Trips for Even Number

Pass-by Trips = 56 Trips x 0.50 (50%) = 28 Trips Enter/28 Trips Exit

Primary Trips = 102 – 56 = 46 Trips

Primary Trips = 46 x 0.52 (52%) and 46 x 0.48 (48%) = 24 Trips Enter/22 Trips Exit

Land Use: 933
Fast-Food Restaurant without Drive-Through Window

Description

This land use includes any fast-food restaurant without a drive-through window. This type of restaurant is characterized by a large carry-out clientele, long hours of service (some are open for breakfast, all are open for lunch and dinner, some are open late at night or 24 hours a day) and high turnover rates for eat-in customers. These limited-service eating establishments do not provide table service. A patron generally orders from a menu board and pays before receiving the meal. A typical duration of stay for an eat-in customer is less than 30 minutes. Fast casual restaurant (Land Use 930), high-turnover (sit-down) restaurant (Land Use 932), and fast-food restaurant with drive-through window (Land Use 934) are related uses.

Additional Data

If the restaurant has outdoor seating, its area is not included in the overall gross floor area. For a restaurant that has significant outdoor seating, the number of seats may be more reliable than GFA as an independent variable on which to establish a trip generation rate.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s and the 2010s in Alberta (CAN), California, Colorado, Connecticut, Maryland, Montana, Pennsylvania, and Texas.

Source Numbers

163, 247, 278, 319, 342, 885, 977, 1020

Fast-Food Restaurant without Drive-Through Window (933)

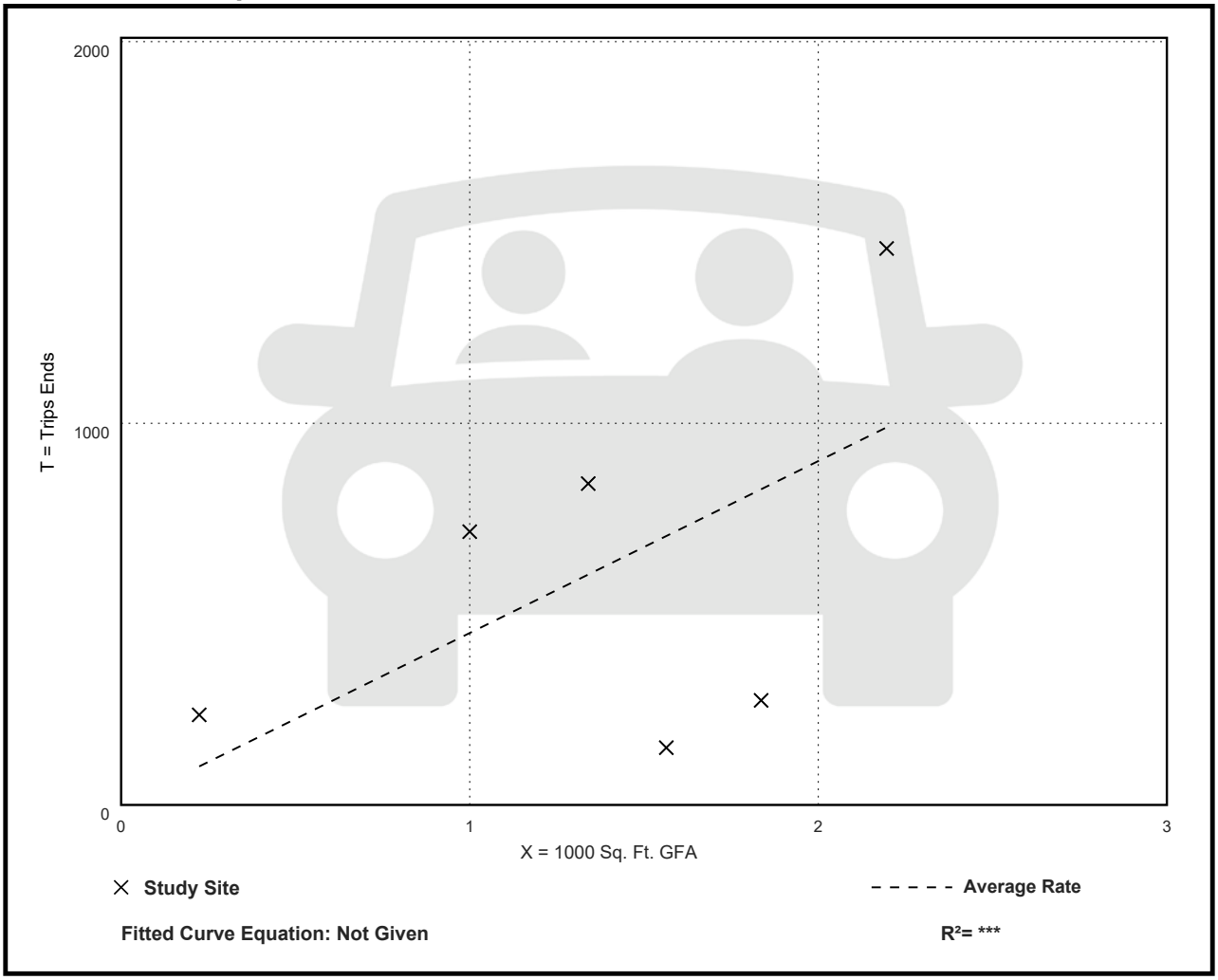
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. 1000 Sq. Ft. GFA: 1
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
450.49	95.91 - 1053.57	310.99

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

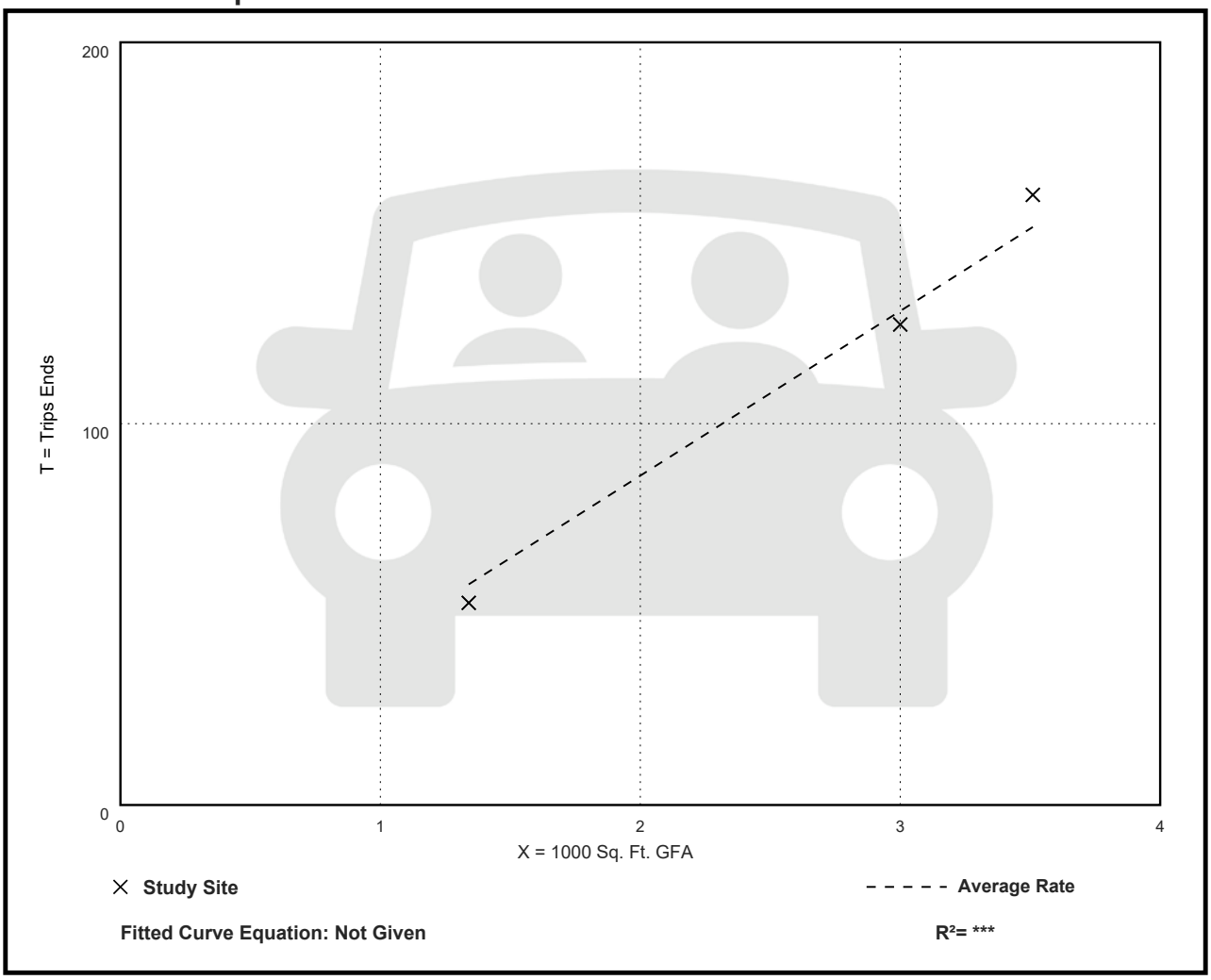
Fast-Food Restaurant without Drive-Through Window (933)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 3
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 58% entering, 42% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
43.18	39.55 - 45.58	2.84

Data Plot and Equation



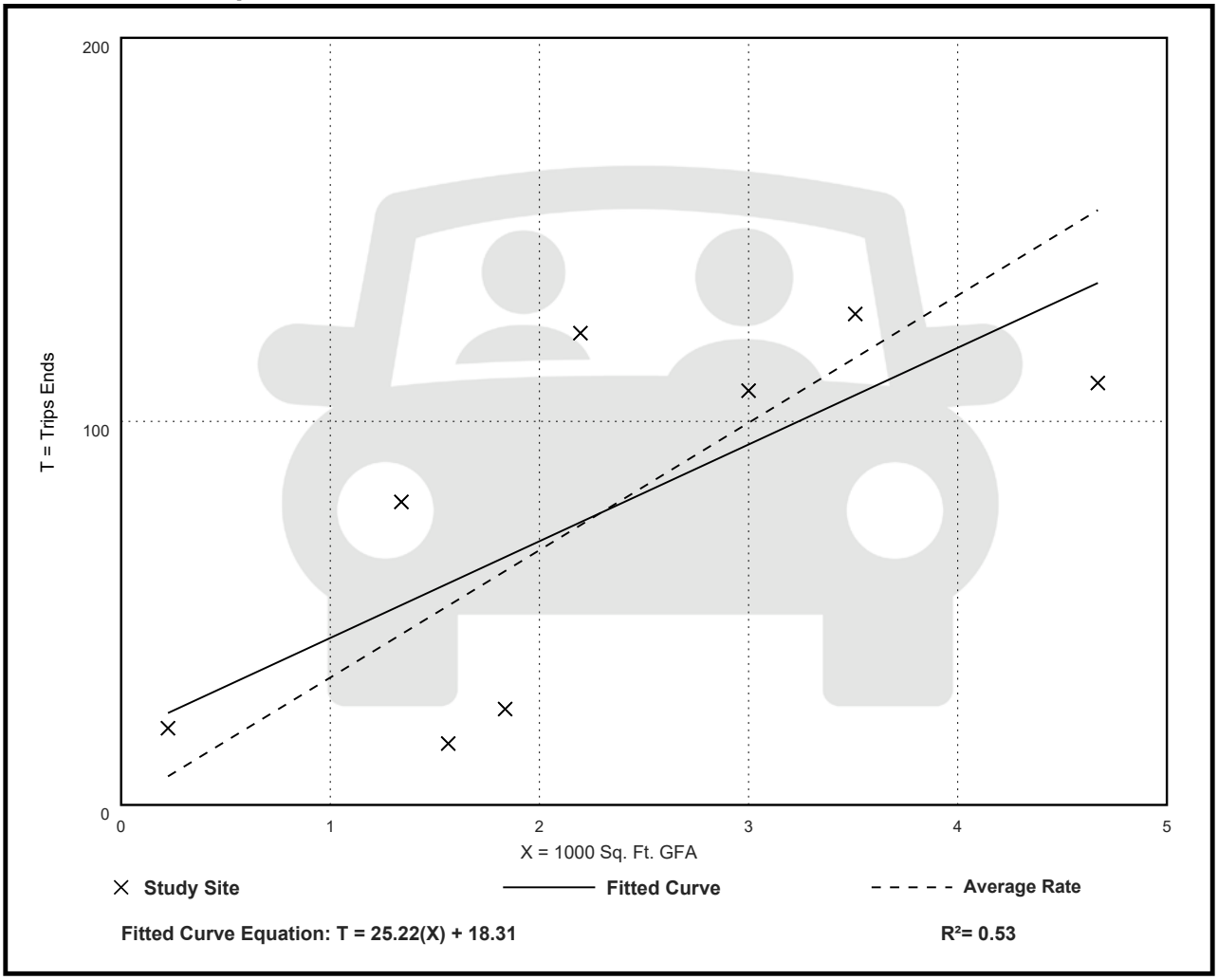
Fast-Food Restaurant without Drive-Through Window (933)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 8
Avg. 1000 Sq. Ft. GFA: 2
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
33.21	10.23 - 89.29	17.22

Data Plot and Equation



Fitted Curve Equation: T = 25.22(X) + 18.31

R^2= 0.53

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September 30, 2022

Traffic Impact Study – Proposed Love's Travel Stop

St. Clairsville, Ohio

CESO Trip Generation Calculations – 2023 and 2043 Build Traffic Scenarios:

ITE 933 – Fast-Food Restaurant without Drive-Through Window

For Weekday → 50% Enter/50% Exit

2.90 KSF x 450.49 = 1,306.42 ≈ 1,306 Trips for Even Number

1,306 Trips x 0.50 (50%) = 653 Trips Enter/653 Trips Exit

For AM Peak Hour → 58% Enter/42% Exit

2.90 KSF x 43.18 = 125.22 ≈ 125 Trips

Pass-by Trips = 125 Trips x 0.00 (0%) = 0 Trips for Even Number

Primary Trips = 125 – 0 = 125 Trips

Primary Trips = 125 x 0.58 (58%) and 125 x 0.42 (42%) = 73 Trips Enter/52 Trips Exit

For PM Peak Hour → 50% Enter/50% Exit

2.90 KSF x 33.21 = 96.31 ≈ 96 Trips

Pass-by Trips = 96 Trips x 0.00 (0%) = 96 Trips for Even Number

Primary Trips = 96 – 0 = 96 Trips

Primary Trips = 96 x 0.50 (50%) = 48 Trips Enter/48 Trips Exit

Land Use: 416
Campground/Recreational Vehicle Park

Description

A campground/recreational vehicle park is a recreational site that accommodates campers, trailers, tents, and recreational vehicles on a transient basis. They are found in a variety of locations and provide a variety of facilities, often including restrooms with showers and recreational facilities, such as a swimming pool, convenience store, and laundromat.

Additional Data

The sites were surveyed in the 1990s, the 2000s, and the 2010s in Rhode Island, Vermont, and Washington.

Source Numbers

401, 559, 728

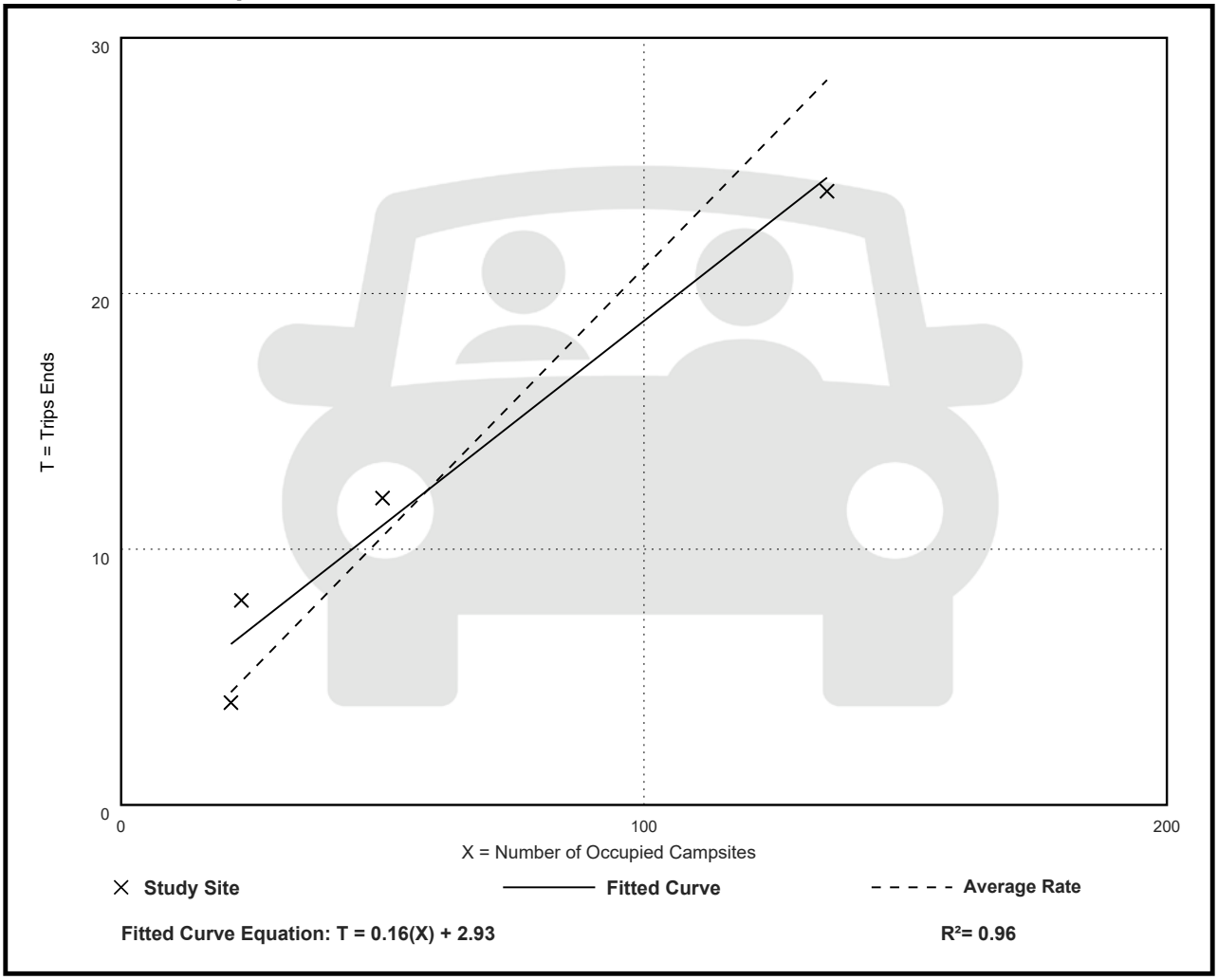
Campground/Recreational Vehicle Park
(416)

Vehicle Trip Ends vs: **Occupied Campsites**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. Num. of Occupied Campsites: 57
Directional Distribution: 36% entering, 64% exiting

Vehicle Trip Generation per Occupied Campsite

Average Rate	Range of Rates	Standard Deviation
0.21	0.18 - 0.35	0.06

Data Plot and Equation



Fitted Curve Equation: T = 0.16(X) + 2.93

R^2= 0.96

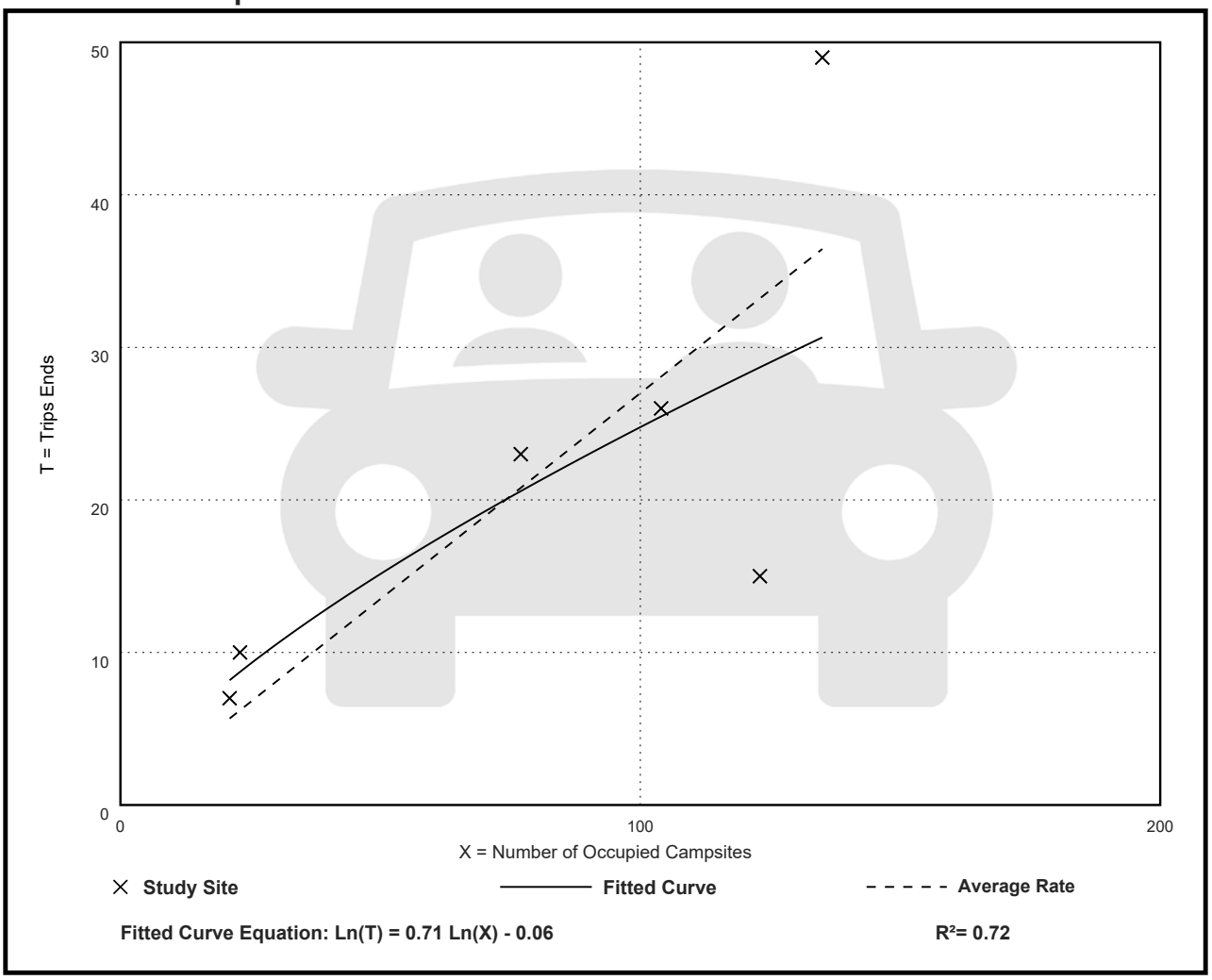
Campground/Recreational Vehicle Park
(416)

Vehicle Trip Ends vs: Occupied Campsites
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. Num. of Occupied Campsites: 81
Directional Distribution: 65% entering, 35% exiting

Vehicle Trip Generation per Occupied Campsite

Average Rate	Range of Rates	Standard Deviation
0.27	0.12 - 0.43	0.11

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.71 Ln(X) - 0.06

R^2= 0.72

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November 15, 2022

Traffic Impact Study – Proposed Love's Travel Stop

St. Clairsville, Ohio

CESO Trip Generation Calculations – 2023 and 2043 Build Traffic Scenarios:

ITE 416 – Campground/Recreational Vehicle Park

For Weekday → N/A

For AM Peak Hour → 36% Enter/64% Exit

70 Occupied Campsites x 0.21 = 14.7 ≈ 15 Trips

Pass-by Trips = 15 Trips x 0.00 (0%) = 0 Trips for Even Number

Primary Trips = 15 – 0 = 15 Trips

Primary Trips = 15 x 0.36 (36%) and 15 x 0.64 (64%) = 5 Trips Enter/10 Trips Exit

For PM Peak Hour → 65% Enter/35% Exit

70 Occupied Campsites x 0.27 = 18.9 ≈ 19 Trips

Pass-by Trips = 19 Trips x 0.00 (0%) = 0 Trips for Even Number

Primary Trips = 19 – 0 = 19 Trips

Primary Trips = 19 x 0.65 (65%) and 19 x 0.35 (35%) = 12 Trips Enter/7 Trips Exit

Land Use: 950
Truck Stop

Description

A truck stop is a facility located adjacent to an interstate highway interchange that provides commercial vehicle fueling, space and supplies for self-service vehicle maintenance, and other services specific to the needs of truckers (e.g., showers, on-site truck parking area). The facility typically contains a convenience store, restroom facilities, and one or more restaurants (either fast-food or high-turnover sit-down). Gasoline/service station (Land Use 944) and convenience store/gas station (Land Use 945) are related uses.

Additional Data

The trip generation data presented for this land use constitute commercial truck trips only.

The independent variable used in the data plots (vehicle fueling positions) refers to only the commercial fueling lanes at the truck stop.

The convenience store, restrooms, and restaurant(s) associated with a truck stop typically are also open to the general motoring public. The site often also includes vehicle fueling positions for the general motoring public. Additional information is needed in order to estimate non-truck vehicle trips generated by truck stops.

The truck trip generation rates per vehicle fueling position appear unreasonably high considering the length of time a trucker needs to fuel a vehicle. However, the detailed information provided in the data sources support the validity of the truck counts. It is apparent that not all trucks entering or exiting the truck stop are refueled. In those circumstances, the trucker could be using other services provided by the truck stop.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 2000s and the 2010s in Colorado, Florida, Tennessee, Vermont, and Virginia.

To assist in the future analysis of this land use, it is important that the number of gasoline and diesel pumps at the study site be reported. It is also important to collect additional information on the number of non-truck trips generated at these sites.

Source Numbers

721, 913, 920, 927

Truck Stop
(950)

Truck Trip Ends vs: Vehicle Fueling Positions
On a: Weekday

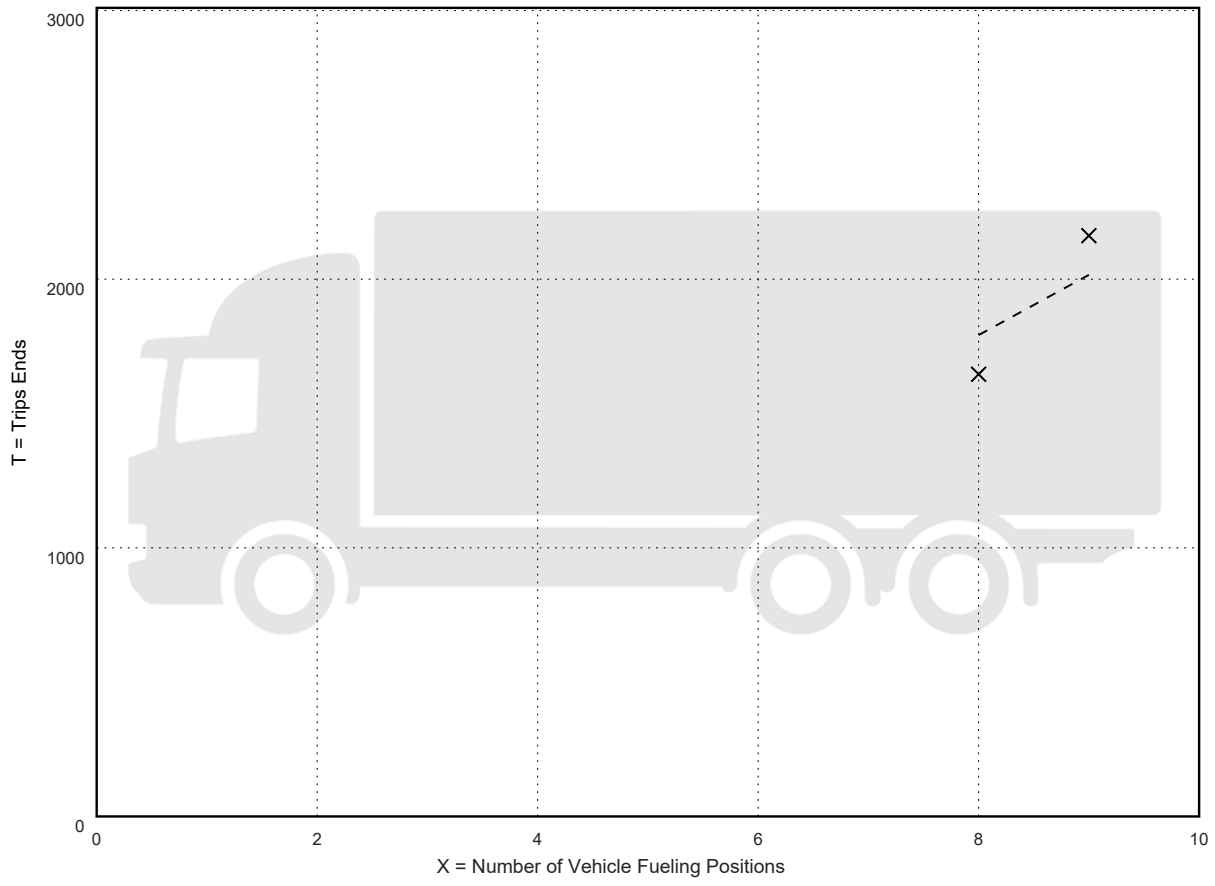
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Vehicle Fueling Positions: 9
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
224.00	205.75 - 240.22	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

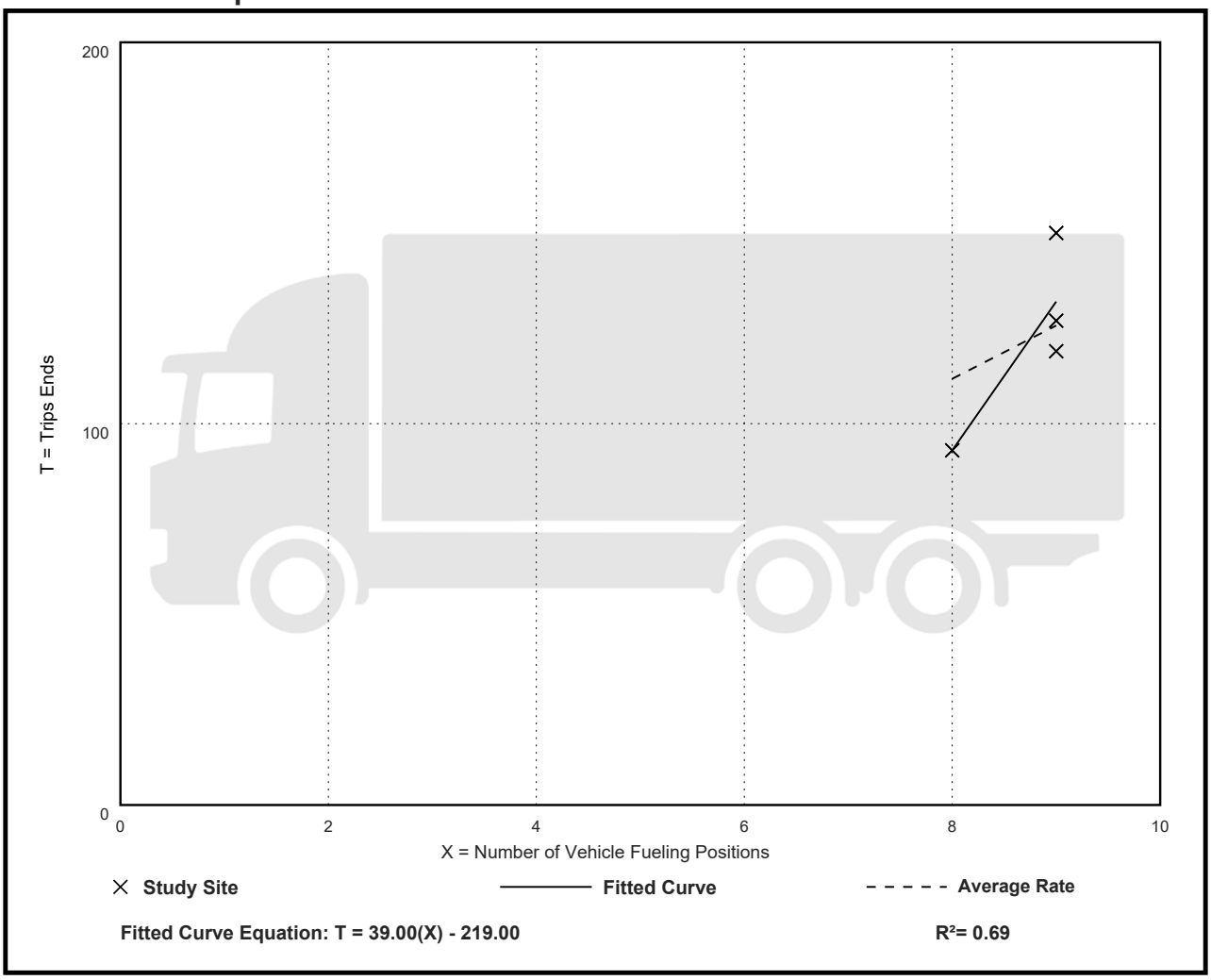
Truck Stop
(950)

Truck Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 4
Avg. Num. of Vehicle Fueling Positions: 9
Directional Distribution: 49% entering, 51% exiting

Truck Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
13.97	11.63 - 16.67	2.09

Data Plot and Equation



Fitted Curve Equation: T = 39.00(X) - 219.00

R^2= 0.69

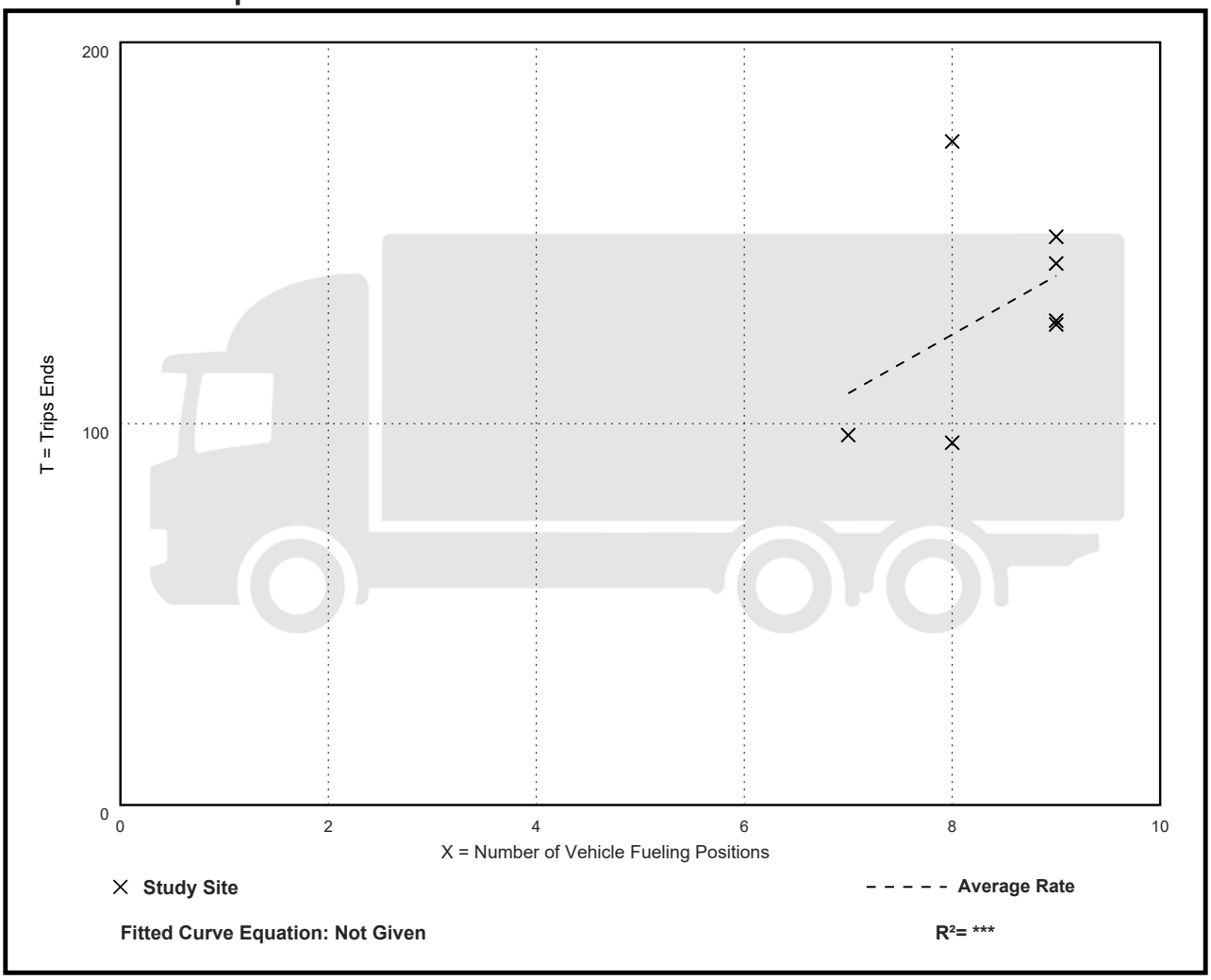
Truck Stop
(950)

Truck Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 7
Avg. Num. of Vehicle Fueling Positions: 8
Directional Distribution: 53% entering, 47% exiting

Truck Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
15.42	11.88 - 21.75	3.10

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

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September 30, 2022

Traffic Impact Study – Proposed Love's Travel Stop

St. Clairsville, Ohio

CESO Trip Generation Calculations – 2023 and 2043 Build Traffic Scenarios:

ITE 950 – Truck Stop

For Weekday → 50% Enter/50% Exit

224.0 x 9 Truck Fuel Position = 2,016 Trips

2,016 Trips x 0.50 (50%) = 1,008 Trips Enter/1,008 Trips Exit

For AM Peak Hour → 49% Enter/51% Exit

13.97 x 9 Truck Fuel Position = 125.73 ≈ 126 Trips for Even Number

Primary Trips = 126 x 0.49 (49%) and 126 x 0.51 (51%) = 62 Trips Enter/64 Trips Exit

For PM Peak Hour → 53% Enter/47% Exit

15.42 x 9 Truck Fuel Position = 138.78 ≈ 138 Trips for Even Number

Primary Trips = 138 x 0.53 (53%) and 138 x 0.47 (47%) = 73 Trips Enter/65 Trips Exit

Land Use: 848
Tire Store

Description

The primary business associated with a tire store is the sale of tires for automotive vehicles. Services offered by these stores usually include tire installation and repair, as well as other automotive maintenance or repair services and customer assistance. These stores generally do not contain large storage or warehouse areas. Automobile parts sales (Land Use 843), tire superstore (Land Use 849), and automobile parts and service center (Land Use 943) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Florida, Minnesota, New Jersey, New York, Oregon, Pennsylvania, South Dakota, Texas, and Wisconsin.

Source Numbers

328, 359, 438, 555, 571, 583, 599, 870, 886, 887, 959, 1049

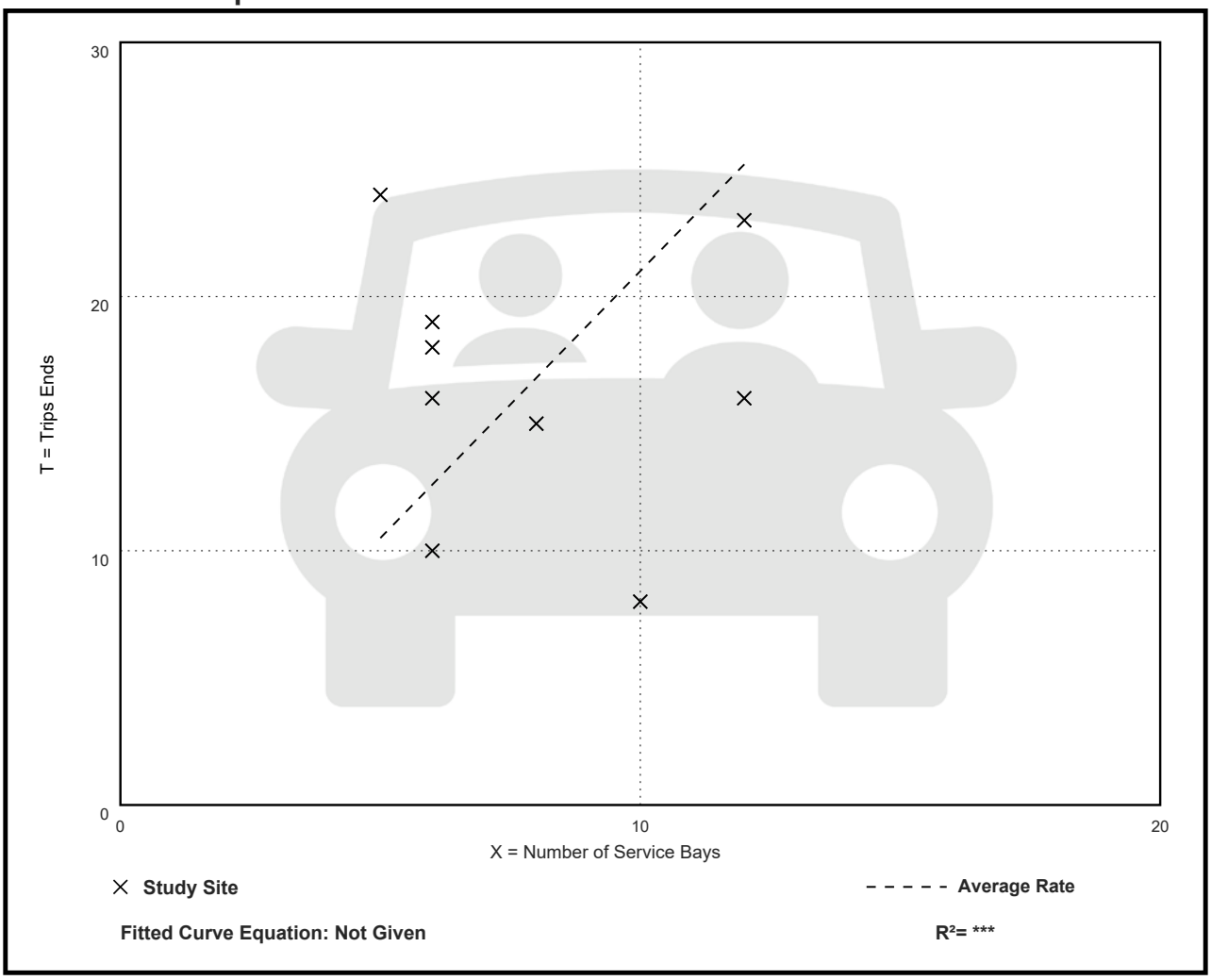
Tire Store
(848)

Vehicle Trip Ends vs: Service Bays
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 9
Avg. Num. of Service Bays: 8
Directional Distribution: 64% entering, 36% exiting

Vehicle Trip Generation per Service Bay

Average Rate	Range of Rates	Standard Deviation
2.10	0.80 - 4.80	1.10

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

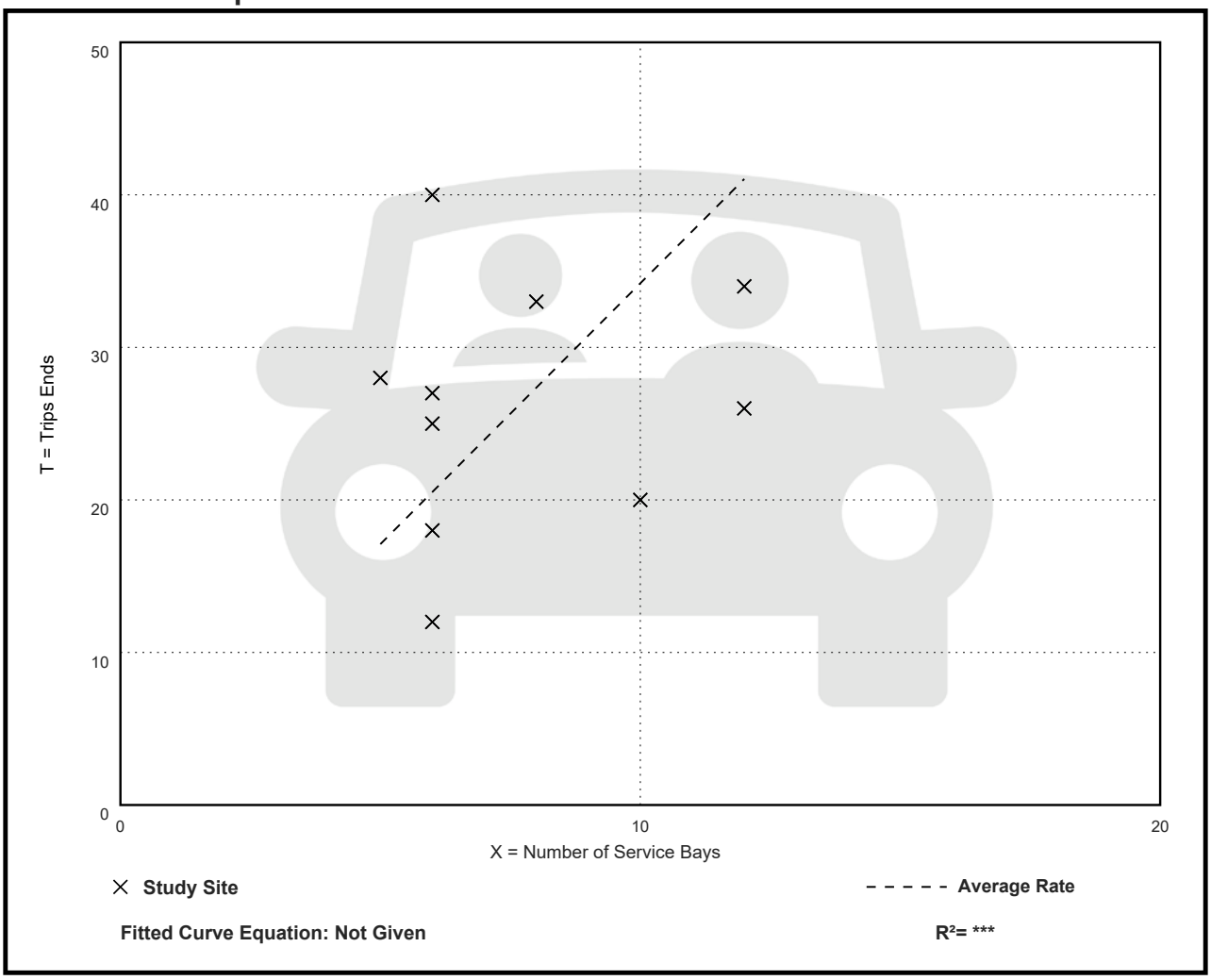
Tire Store
(848)

Vehicle Trip Ends vs: Service Bays
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 10
Avg. Num. of Service Bays: 8
Directional Distribution: 42% entering, 58% exiting

Vehicle Trip Generation per Service Bay

Average Rate	Range of Rates	Standard Deviation
3.42	2.00 - 6.67	1.51

Data Plot and Equation



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September 30, 2022

Traffic Impact Study – Proposed Love's Travel Stop

St. Clairsville, Ohio

CESO Trip Generation Calculations – 2023 and 2043 Build Traffic Scenarios:

ITE 848 – Tire Store

For Weekday → 50% Enter/50% Exit

Data N/A.

For AM Peak Hour → 64% Enter/36% Exit

2.10 x 3 Service Bays = 6.3 ≈ 6 Trips for Even Number

Primary Trips = 6 x 0.64 (64%) and 6 x 0.36 (36%) = 4 Trips Enter/2 Trips Exit

For PM Peak Hour → 42% Enter/58% Exit

3.42 x 3 Service Bays = 10.26 ≈ 10 Trips

Primary Trips = 10 x 0.42 (42%) and 10 x 0.58 (58%) = 4 Trips Enter/6 Trips Exit

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Love's - St. Clairsville, OH	**Organization:**	CESO, Inc.
Project Location:	St. Clairsville, OH	**Performed By:**	TMC
Scenario Description:	Build	**Date:**	9/29/2022
Analysis Year:	2023 and 2043	**Checked By:**	REM
Analysis Period:	**AM Street Peak Hour**	**Date:**	9/29/2022

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				564	282	282
Restaurant				263	143	120
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses[2]				0		
				827	425	402

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		37	0	0	0
Restaurant	0	17		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	827	425	402
Internal Capture Percentage	13%	13%	13%
External Vehicle-Trips[5]	719	371	348
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	6%	13%
Restaurant	26%	14%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Love's - St. Clairsville, OH	**Organization:**	CESO, Inc.
Project Location:	St. Clairsville, OH	**Performed By:**	TMC
Scenario Description:	Build	**Date:**	9/29/2022
Analysis Year:	2023 and 2043	**Checked By:**	REM
Analysis Period:	**PM Street Peak Hour**	**Date:**	9/29/2022

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				513	260	253
Restaurant				198	100	98
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses[2]				0		
				711	360	351

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		29	0	0	0
Restaurant	0	40		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	711	360	351
Internal Capture Percentage	19%	19%	20%
External Vehicle-Trips[5]	573	291	282
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	15%	11%
Restaurant	29%	41%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Love's Development - St. Clairsville, OH
AM PEAK

Passenger Cars

ITE CAT. 933	ENTER	EXIT	TOTAL
	73	52	125
INTERNAL CAPTURE	19	7	26
(26% Enter /14% Exit)			
	54	45	99
Pass-By (0%)	0	0	0
Primary	54	45	99
ITE CAT. 934	**ENTER**	**EXIT**	**TOTAL**
	70	68	138
INTERNAL CAPTURE	18	10	28
(26% Enter /14% Exit)			
	52	58	110
Pass-By (50%)	26	28	54
Primary	26	30	56
ITE CAT. 945	**ENTER**	**EXIT**	**TOTAL**
	216	216	432
INTERNAL CAPTURE	13	28	41
(6% Enter /13% Exit)			
	203	188	391
Pass-By (76%)	154	142	296
Primary	49	46	95

Trucks

ITE CAT. 848	ENTER	EXIT	TOTAL
	4	2	6
INTERNAL CAPTURE	0	0	0
(6% Enter /13% Exit)			
	4	2	6
Pass-By (0%)	0	0	0
Primary	4	2	6
ITE CAT. 950	**ENTER**	**EXIT**	**TOTAL**
	62	64	126
INTERNAL CAPTURE	4	8	12
(6% Enter /13% Exit)			
	58	56	114
Pass-By (0%)	0	0	0
Primary	58	56	114

Love's Development - St. Clairsville, OH
PM PEAK

Passenger Cars

ITE CAT. 933	ENTER	EXIT	TOTAL
	48	48	96
INTERNAL CAPTURE	14	20	34
(29% Enter /41% Exit)			
	34	28	62
Pass-By (0%)	0	0	0
Primary	34	28	62
ITE CAT. 934	**ENTER**	**EXIT**	**TOTAL**
	52	50	102
INTERNAL CAPTURE	15	21	36
(29% Enter /41% Exit)			
	37	29	66
Pass-By (55%)	20	16	36
Primary	17	13	30
ITE CAT. 945	**ENTER**	**EXIT**	**TOTAL**
	183	182	365
INTERNAL CAPTURE	27	20	47
(15% Enter /11% Exit)			
	156	162	318
Pass-By (75%)	118	122	240
Primary	38	40	78

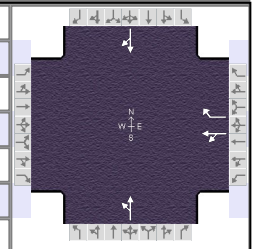
Trucks

ITE CAT. 848	ENTER	EXIT	TOTAL
	4	6	10
INTERNAL CAPTURE	1	1	2
(15% Enter /11% Exit)			
	3	5	8
Pass-By (0%)	0	0	0
Primary	3	5	8
ITE CAT. 950	**ENTER**	**EXIT**	**TOTAL**
	73	65	138
INTERNAL CAPTURE	11	8	19
(15% Enter /11% Exit)			
	62	57	119
Pass-By (0%)	0	0	0
Primary	62	57	119

APPENDIX E
2043 NO-BUILD TRAFFIC SCENARIO
CAPACITY ANALYSIS SUMMARY SHEETS

HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 NB AM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				175	1	210	63	294			252	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

								1	2	3	4	
Green	47.2	20.7	0.0	0.0	0.0	0.0						
Yellow	5.1	4.2	0.0	0.0	0.0	0.0		5	6	7	8	
Red	1.7	1.1	0.0	0.0	0.0	0.0						

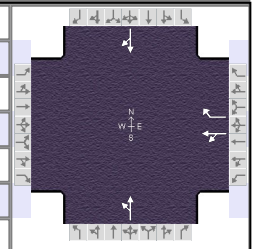
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				175	1	210	63	294			252	55
Initial Queue (Q_b), veh/h				0	0	0	0	0			0	0
Base Saturation Flow Rate (s_o), veh/h				1750	1750	1750	1750	1750			1750	1750
Parking (N_m), man/h					None			None			None	
Heavy Vehicles (P_{HV}), %					15	15		8			9	
Ped / Bike / RTOR, /h	0	0		0	0	0	0	0		0	0	0
Buses (N_b), buses/h				0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)				3	3	3	3	3			3	3
Upstream Filtering (*I*)				1.00	1.00	1.00	0.95	0.95			1.00	1.00
Lane Width (*W*), ft					12.0	12.0		12.0			12.0	
Turn Bay Length, ft					1145	350		400			635	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h				35	35	35	45	45			45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s				26.0		54.0		54.0
Yellow Change Interval (*Y*), s				4.2		5.1		5.1
Red Clearance Interval (R_c), s				1.1		1.7		1.7
Minimum Green (G_{min}), s				10		20		20
Start-Up Lost Time (*l*t), s			2.0	2.0	2.0	2.0		2.0
Extension of Effective Green (*e*), s			2.0	2.0	2.0	2.0		2.0
Passage (*PT*), s				2.0		2.0		2.0
Recall Mode				Off		Min		Min
Dual Entry				Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0	0.0	No	25.0			
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0	9.0	12.0	0.0			
Street Width / Island / Curb, ft		0		0.0	0	No	0.0	0	No	0.0		No
Width Outside / Bike Lane / Shoulder, ft				12.0	5.0	2.0	12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No			No		0.50	No		0.50			0.50

HCS Signalized Intersection Results Summary

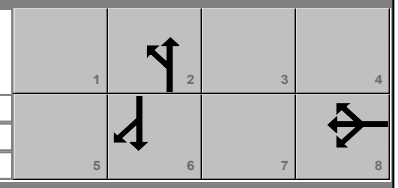
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 NB AM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				175	1	210	63	294			252	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	47.2	20.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



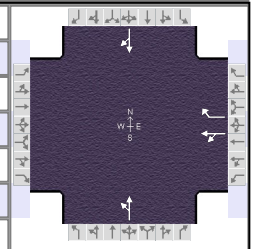
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2		6
Case Number				11.0		8.0		8.0
Phase Duration, s				26.0		54.0		54.0
Change Period, (*Y+R c*), s				5.3		6.8		6.8
Max Allow Headway (*MAH*), s				3.3		0.0		0.0
Queue Clearance Time (*g s*), s				16.6				
Green Extension Time (*g e*), s				0.5		0.0		0.0
Phase Call Probability				1.00				
Max Out Probability				0.63				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	5	2			6	16
Adjusted Flow Rate (*v*), veh/h					217	259		401			379	
Adjusted Saturation Flow Rate (*s*), veh/h/ln					1472	1310		1457			1576	
Queue Service Time (*g s*), s					10.3	14.6		4.8			10.4	
Cycle Queue Clearance Time (*g c*), s					10.3	14.6		15.2			10.4	
Green Ratio (*g/C*)					0.26	0.26		0.59			0.59	
Capacity (*c*), veh/h					381	339		913			930	
Volume-to-Capacity Ratio (*X*)					0.570	0.765		0.439			0.408	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					6.4	8.9		8.6			5.6	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.16	0.71		0.57			0.24	
Uniform Delay (*d 1*), s/veh					25.8	27.4		12.8			8.9	
Incremental Delay (*d 2*), s/veh					1.3	9.1		1.5			1.3	
Initial Queue Delay (*d 3*), s/veh					0.0	0.0		0.0			0.0	
Control Delay (*d*), s/veh					27.1	36.5		14.3			10.2	
Level of Service (LOS)					C	D		B			B	
Approach Delay, s/veh / LOS	0.0			32.2		C	14.3		B	10.2		B
Intersection Delay, s/veh / LOS	19.8						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.72	B	1.72	B	1.65	B	1.36	A
Bicycle LOS Score / LOS			1.27	A	1.21	A	1.11	A

HCS Signalized Intersection Intermediate Values

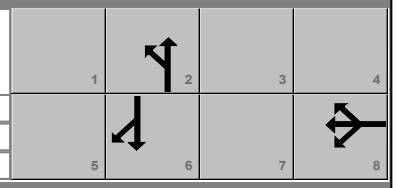
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 NB AM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				175	1	210	63	294			252	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	47.2	20.7	0.0	0.0	0.0	0.0						
Yellow	5.1	4.2	0.0	0.0	0.0	0.0						
Red	1.7	1.1	0.0	0.0	0.0	0.0						



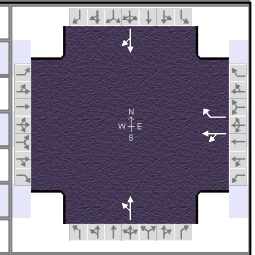
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})				0.953	0.953		0.888	0.888		1.000	0.969	
Right-Turn Adjustment Factor (f_{RT})					0.000	0.847		0.000	0.888		0.000	0.969
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})				1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})						1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h				1464	8	1310	257	1200	0	0	1294	282
Proportion of Vehicles Arriving on Green (P)	0.00	0.00	0.00	0.26	0.26	0.26	0.31	0.49	0.00	0.00	0.59	0.59
Incremental Delay Factor (k)					0.10	0.28		0.50			0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)				4.0		6.8		6.8
Green Ratio (g/C)				0.26		0.59		0.59
Permitted Saturation Flow Rate (s_p), veh/h/ln				0		1020		1066
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						0		1627
Permitted Effective Green Time (g_p), s				0.0		47.2		0.0
Permitted Service Time (g_u), s				0.0		36.8		0.0
Permitted Queue Service Time (g_{ps}), s						4.8		
Time to First Blockage (g_f), s				0.0		9.2		47.2
Queue Service Time Before Blockage (g_{fs}), s						9.2		
Protected Right Saturation Flow (s_R), veh/h/ln				0				
Protected Right Effective Green Time (g_R), s				0.0				

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	0.972	0.000	0.972	0.000	0.972	0.000	0.681	0.000
Pedestrian F_s / F_{delay}	0.000	0.148	0.000	0.148	0.000	0.076	0.000	0.076
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		45.16		46.55	1180.00	6.72	1180.00	6.72
Bicycle F_w / F_v	-3.64		-3.64	0.79	-3.64	0.73	-3.64	0.63

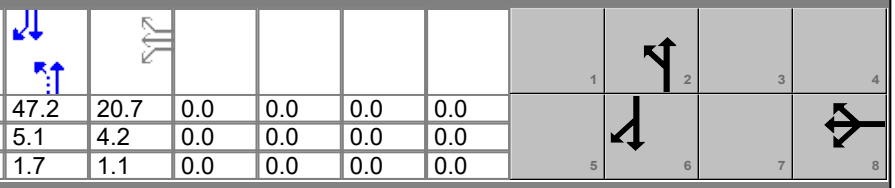
HCS Signalized Intersection Results Graphical Summary

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.81
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 NB AM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



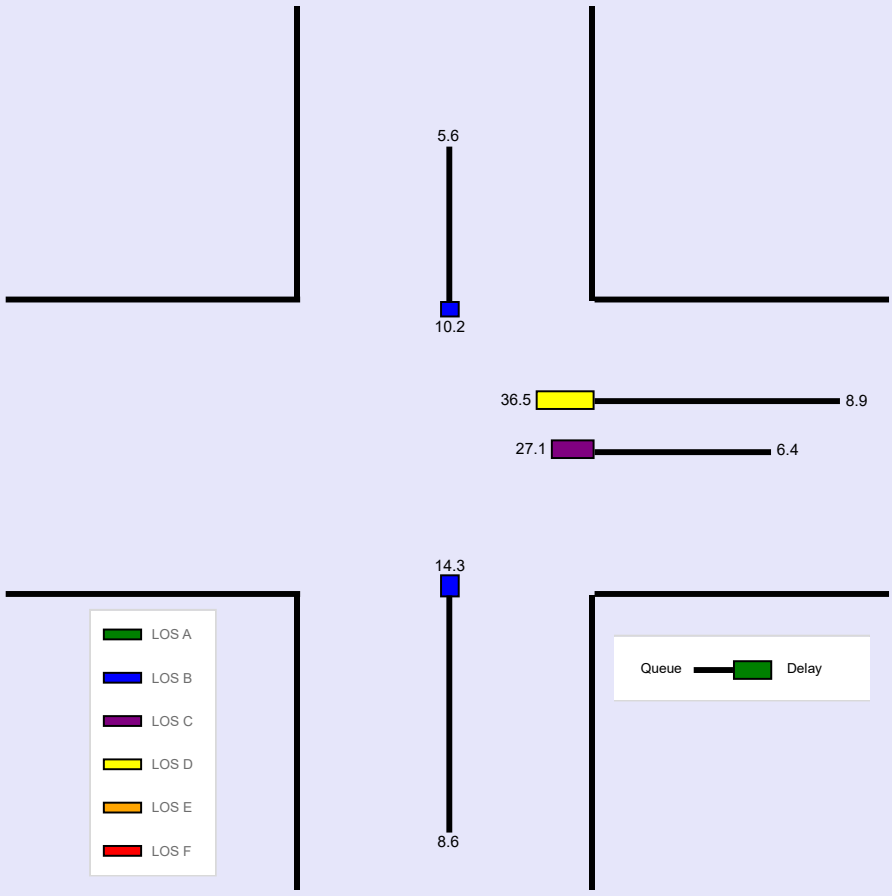
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				175	1	210	63	294			252	55

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	47.2	20.7		0.0	0.0	0.0	0.0					
Yellow	5.1	4.2		0.0	0.0	0.0	0.0					
Red	1.7	1.1		0.0	0.0	0.0	0.0					

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					6.4	8.9		8.6			5.6	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.16	0.71		0.57			0.24	
Control Delay (*d*), s/veh					27.1	36.5		14.3			10.2	
Level of Service (LOS)					C	D		B			B	
Approach Delay, s/veh / LOS	0.0			32.2		C	14.3		B	10.2		B
Intersection Delay, s/veh / LOS	19.8						B					



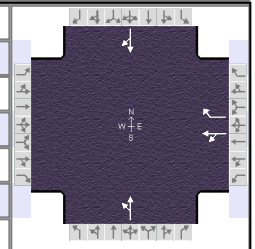
--- Messages ---

No errors or warnings exist.

--- Comments ---

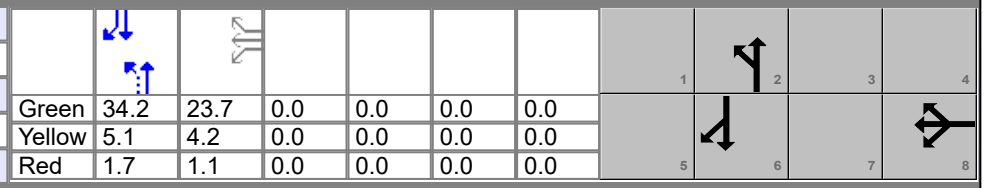
HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 NB PM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				415	1	279	59	339			307	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	34.2	23.7		0.0	0.0	0.0	0.0					
Yellow	5.1	4.2		0.0	0.0	0.0	0.0					
Red	1.7	1.1		0.0	0.0	0.0	0.0					

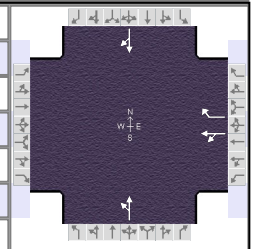
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				415	1	279	59	339			307	65
Initial Queue (Q_b), veh/h				0	0	0	0	0			0	0
Base Saturation Flow Rate (s_o), veh/h				1750	1750	1750	1750	1750			1750	1750
Parking (N_m), man/h					None			None			None	
Heavy Vehicles (P_{HV}), %					7	7		9			2	
Ped / Bike / RTOR, /h	0	0		0	0	0	0	0		0	0	0
Buses (N_b), buses/h				0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)				3	3	3	3	3			3	3
Upstream Filtering (*I*)				1.00	1.00	1.00	0.94	0.94			1.00	1.00
Lane Width (*W*), ft					12.0	12.0		12.0			12.0	
Turn Bay Length, ft					1145	350		400			635	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h				35	35	35	45	45			45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s				29.0		41.0		41.0
Yellow Change Interval (*Y*), s				4.2		5.1		5.1
Red Clearance Interval (R_c), s				1.1		1.7		1.7
Minimum Green (G_{min}), s				10		20		20
Start-Up Lost Time (*l*t), s			2.0	2.0	2.0	2.0		2.0
Extension of Effective Green (*e*), s			2.0	2.0	2.0	2.0		2.0
Passage (*PT*), s				2.0		2.0		2.0
Recall Mode				Off		Min		Min
Dual Entry				Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0	0.0	No	25.0			
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0	9.0	12.0	0.0			
Street Width / Island / Curb, ft		0		0.0	0	No	0.0	0	No	0.0		No
Width Outside / Bike Lane / Shoulder, ft				12.0	5.0	2.0	12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No			No		0.50	No		0.50			0.50

HCS Signalized Intersection Results Summary

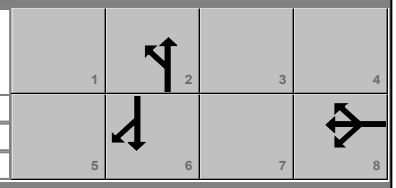
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 NB PM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				415	1	279	59	339			307	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	34.2	23.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	



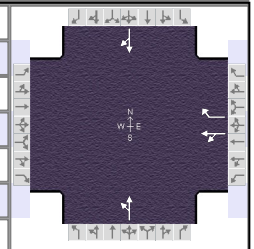
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2		6
Case Number				11.0		8.0		8.0
Phase Duration, s				29.0		41.0		41.0
Change Period, ($Y+R_c$), s				5.3		6.8		6.8
Max Allow Headway (*MAH*), s				3.2		0.0		0.0
Queue Clearance Time (g_s), s				21.2				
Green Extension Time (g_e), s				0.6		0.0		0.0
Phase Call Probability				1.00				
Max Out Probability				1.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	5	2			6	16
Adjusted Flow Rate (*v*), veh/h					462	310		428			413	
Adjusted Saturation Flow Rate (*s*), veh/h/ln					1576	1402		1469			1670	
Queue Service Time (g_s), s					19.2	13.1		2.6			11.8	
Cycle Queue Clearance Time (g_c), s					19.2	13.1		14.4			11.8	
Green Ratio (*g/C*)					0.34	0.34		0.49			0.49	
Capacity (*c*), veh/h					534	475		777			816	
Volume-to-Capacity Ratio (*X*)					0.866	0.653		0.551			0.507	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					13.1	7.6		7.4			7.2	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.30	0.57		0.50			0.29	
Uniform Delay (d_1), s/veh					21.7	19.7		12.3			12.2	
Incremental Delay (d_2), s/veh					13.5	2.5		2.6			2.2	
Initial Queue Delay (d_3), s/veh					0.0	0.0		0.0			0.0	
Control Delay (*d*), s/veh					35.1	22.2		14.9			14.4	
Level of Service (LOS)					D	C		B			B	
Approach Delay, s/veh / LOS	0.0			29.9		C	14.9		B	14.4		B
Intersection Delay, s/veh / LOS	22.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.71	B	1.71	B	1.66	B	1.37	A
Bicycle LOS Score / LOS			1.76	B	1.22	A	1.17	A

HCS Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 NB PM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				415	1	279	59	339			307	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

							1	2	3	4		
Green	34.2	23.7	0.0	0.0	0.0	0.0	5	6	7	8		
Yellow	5.1	4.2	0.0	0.0	0.0	0.0						
Red	1.7	1.1	0.0	0.0	0.0	0.0						

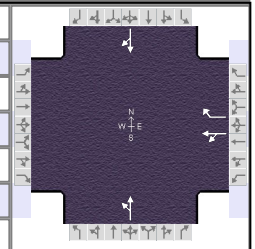
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})				0.952	0.952		0.903	0.903		1.000	0.970	
Right-Turn Adjustment Factor (f_{RT})					0.000	0.847		0.000	0.903		0.000	0.970
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})				1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})						1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h				1572	4	1402	218	1251	0	0	1378	292
Proportion of Vehicles Arriving on Green (P)	0.00	0.00	0.00	0.34	0.34	0.34	0.37	0.52	0.00	0.00	0.49	0.49
Incremental Delay Factor (k)					0.38	0.18		0.50			0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)				4.0		6.8		6.8
Green Ratio (g/C)				0.34		0.49		0.49
Permitted Saturation Flow Rate (s_p), veh/h/ln				0		988		1033
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						0		1723
Permitted Effective Green Time (g_p), s				0.0		34.2		0.0
Permitted Service Time (g_u), s				0.0		22.4		0.0
Permitted Queue Service Time (g_{ps}), s						2.6		
Time to First Blockage (g_f), s				0.0		10.8		34.2
Queue Service Time Before Blockage (g_{fs}), s						10.8		
Protected Right Saturation Flow (s_R), veh/h/ln				0				
Protected Right Effective Green Time (g_R), s				0.0				

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	0.972	0.000	0.972	0.000	0.972	0.000	0.681	0.000
Pedestrian F_s / F_{delay}	0.000	0.143	0.000	0.143	0.000	0.089	0.000	0.089
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		40.18		41.58	977.14	9.15	977.14	9.15
Bicycle F_w / F_v	-3.64		-3.64	1.27	-3.64	0.73	-3.64	0.68

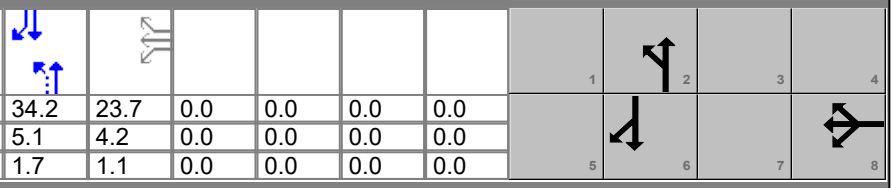
HCS Signalized Intersection Results Graphical Summary

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 WB On/O…	File Name	2043 NB PM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



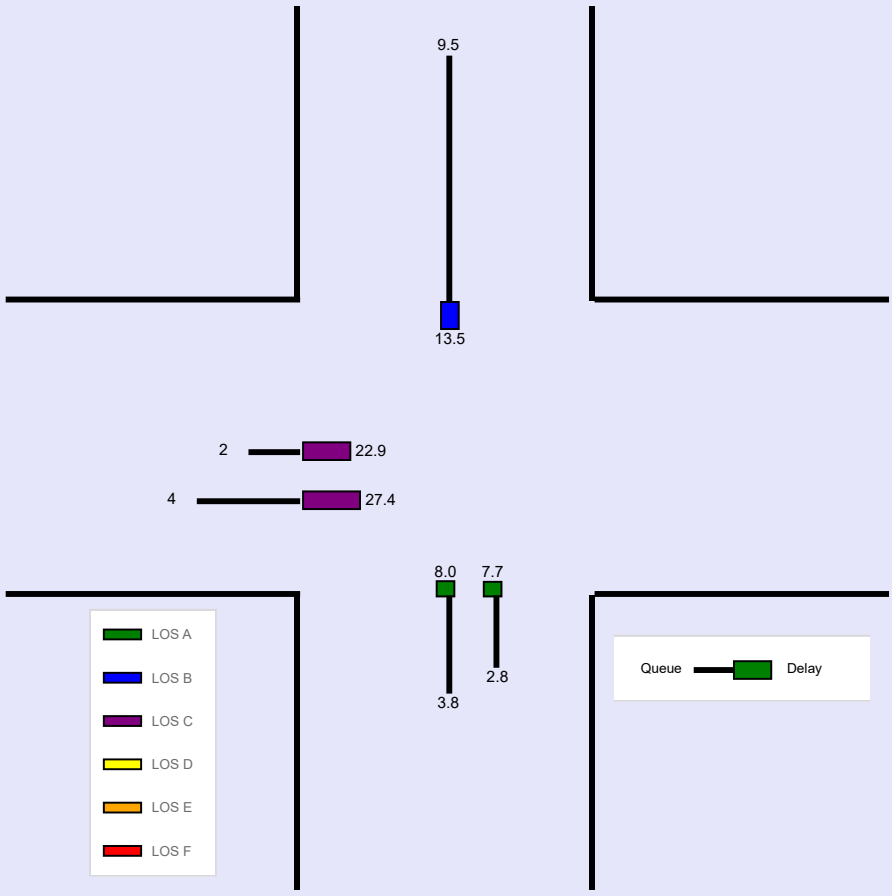
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				415	1	279	59	339			307	65

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	34.2	23.7	0.0	0.0	0.0	0.0	
Yellow	5.1	4.2	0.0	0.0	0.0	0.0	
Red	1.7	1.1	0.0	0.0	0.0	0.0	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)					13.1	7.6		7.4			7.2	
Queue Storage Ratio (*RQ*) (95 th percentile)					0.30	0.57		0.50			0.29	
Control Delay (*d*), s/veh					35.1	22.2		14.9			14.4	
Level of Service (LOS)					D	C		B			B	
Approach Delay, s/veh / LOS	0.0			29.9		C	14.9		B	14.4		B
Intersection Delay, s/veh / LOS	22.0						C					



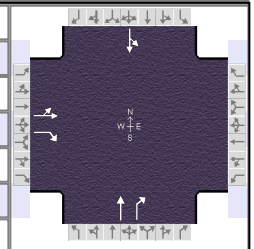
--- Messages ---

No errors or warnings exist.

--- Comments ---

HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 NB AM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	81					297	353	127	300	

Signal Information					EB		WB				NB				SB			
Cycle, s	80.0	Reference Phase	2															
Offset, s	28	Reference Point	End	Green	43.6	24.6	0.0	0.0	0.0	0.0								
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0								
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0								

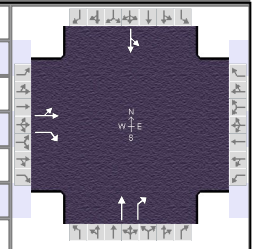
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	81					297	353	127	300	
Initial Queue (Q_b), veh/h	0	0	0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1750	1750	1750					1750	1750	1750	1750	
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %		19	19					9	9		13	
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3					3	3	3	3	
Upstream Filtering (*I*)	1.00	1.00	1.00					1.00	1.00	0.88	0.88	
Lane Width (*W*), ft		12.0	12.0					12.0	12.0		12.0	
Turn Bay Length, ft		1425	250					470	410		400	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35					45	45	45	45	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		30.0				50.0		50.0
Yellow Change Interval (*Y*), s		4.4				5.1		5.1
Red Clearance Interval (R_c), s		1.0				1.3		1.3
Minimum Green (G_{min}), s		10				20		20
Start-Up Lost Time (*lt*), s	2.0	2.0				2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0				2.0	2.0	2.0
Passage (*PT*), s		2.0				2.0		2.0
Recall Mode		Off				Min		Min
Dual Entry		Yes				Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0				0.0	No	25.0
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0				9.0	12.0	0.0
Street Width / Island / Curb, ft	0.0	0	No		0		0.0		No	0.0	0	No
Width Outside / Bike Lane / Shoulder, ft	12.0	5.0	2.0				12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

HCS Signalized Intersection Results Summary

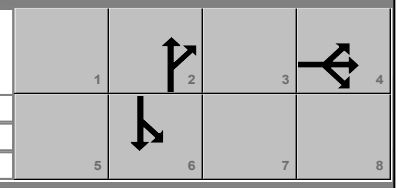
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 NB AM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	81					297	353	127	300	

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	28	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	43.6	24.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



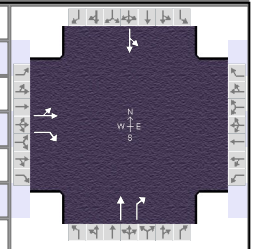
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2		6
Case Number		11.0				7.0		8.0
Phase Duration, s		30.0				50.0		50.0
Change Period, ($Y+R_c$), s		5.4				6.4		6.4
Max Allow Headway (*MAH*), s		3.3				0.0		0.0
Queue Clearance Time (g_s), s		6.3						
Green Extension Time (g_e), s		0.3				0.0		0.0
Phase Call Probability		1.00						
Max Out Probability		0.00						

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h		71	91					334	397		527	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1423	1263					1627	1379		1201	
Queue Service Time (g_s), s		2.9	4.3					9.4	14.7		21.8	
Cycle Queue Clearance Time (g_c), s		2.9	4.3					9.4	14.7		31.2	
Green Ratio (*g/C*)		0.31	0.31					0.55	0.55		0.55	
Capacity (*c*), veh/h		438	388					887	752		713	
Volume-to-Capacity Ratio (*X*)		0.162	0.234					0.376	0.528		0.739	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		1.7	2.2					5.5	7.5		12.6	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.03	0.25					0.31	0.49		0.87	
Uniform Delay (d_1), s/veh		20.2	20.7					10.4	11.6		17.4	
Incremental Delay (d_2), s/veh		0.1	0.1					1.2	2.6		6.0	
Initial Queue Delay (d_3), s/veh		0.0	0.0					0.0	0.0		0.0	
Control Delay (*d*), s/veh		20.3	20.8					11.6	14.3		23.4	
Level of Service (LOS)		C	C					B	B		C	
Approach Delay, s/veh / LOS	20.6	C		0.0			13.1	B		23.4	C	
Intersection Delay, s/veh / LOS	17.7						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.72	B	1.37	A	1.66	B
Bicycle LOS Score / LOS	0.75	A			1.69	B	1.28	A

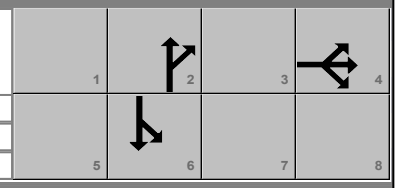
HCS Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 NB AM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	81					297	353	127	300	

Signal Information					EB		WB		NB		SB		
Cycle, s	80.0	Reference Phase	2										
Offset, s	28	Reference Point	End	Green	43.6	24.6	0.0	0.0	0.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0			



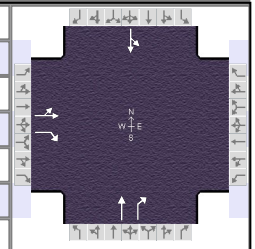
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.955	0.955					1.000	1.000		0.764	0.764	
Right-Turn Adjustment Factor (f_{RT})		0.000	0.847					0.000	0.847		0.000	0.764
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000						1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000						1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h	1355	68	1263				0	1627	1379	357	844	0
Proportion of Vehicles Arriving on Green (P)	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.55	0.55	0.62	0.47	0.00
Incremental Delay Factor (k)		0.04	0.04					0.50	0.50		0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		4.0				6.4		6.4
Green Ratio (g/C)		0.31				0.55		0.55
Permitted Saturation Flow Rate (s_p), veh/h/ln		0				1028		1063
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						1627		0
Permitted Effective Green Time (g_p), s		0.0				0.0		43.6
Permitted Service Time (g_u), s		0.0				0.0		34.2
Permitted Queue Service Time (g_{ps}), s								21.8
Time to First Blockage (g_f), s		0.0				43.6		4.6
Queue Service Time Before Blockage (g_{fs}), s								4.6
Protected Right Saturation Flow (s_R), veh/h/ln		0				0		
Protected Right Effective Green Time (g_R), s		0.0				0.0		

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.198	0.000	0.972	0.000	0.681	0.000	0.972	0.000
Pedestrian F_s / F_{delay}	0.000	0.148	0.000	0.148	0.000	0.085	0.000	0.085
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		46.66		45.16	1090.00	8.28	1090.00	8.28
Bicycle F_w / F_v	-3.64	0.27	-3.64		-3.64	1.21	-3.64	0.79

HCS Signalized Intersection Results Graphical Summary

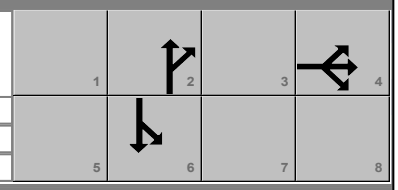
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	AM Peak Hour	PHF	0.89
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 7:00
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 NB AM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



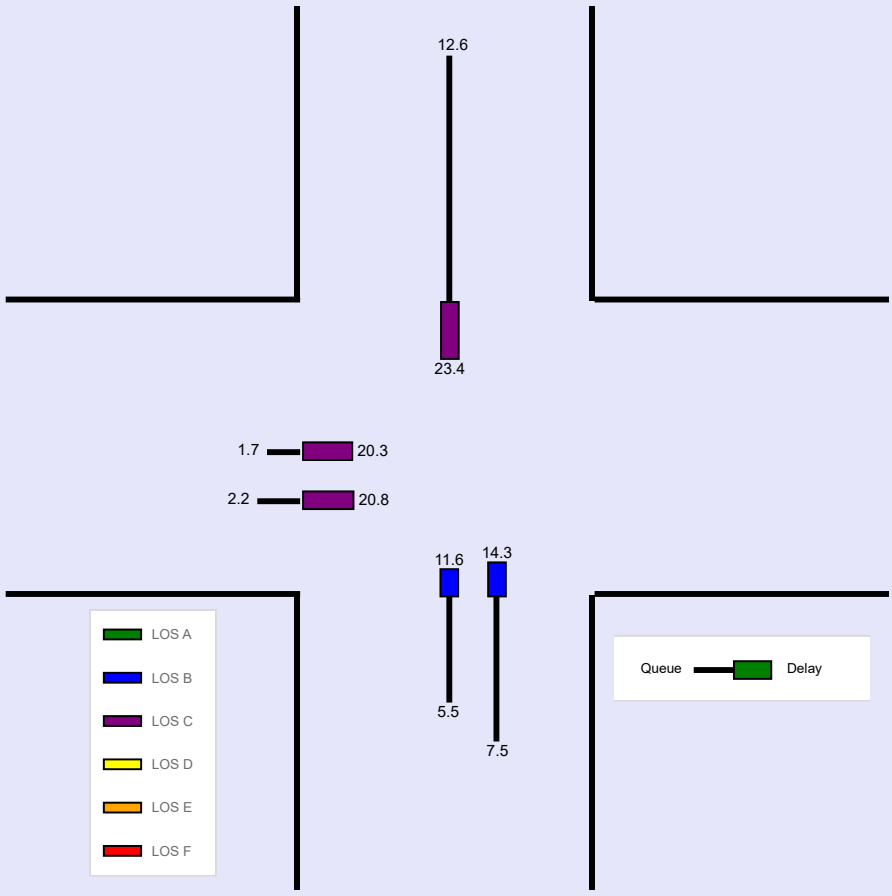
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	3	81					297	353	127	300	

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	28	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	43.6	24.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		1.7	2.2					5.5	7.5		12.6	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.03	0.25					0.31	0.49		0.87	
Control Delay (*d*), s/veh		20.3	20.8					11.6	14.3		23.4	
Level of Service (LOS)		C	C					B	B		C	
Approach Delay, s/veh / LOS	20.6		C	0.0			13.1		B	23.4		C
Intersection Delay, s/veh / LOS	17.7						B					



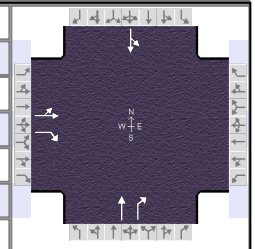
--- Messages ---

No errors or warnings exist.

--- Comments ---

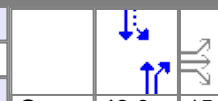
HCS Signalized Intersection Input Data

General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 NB PM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				

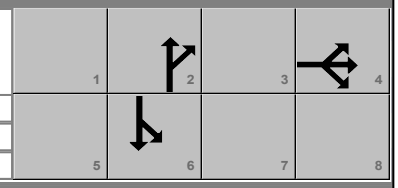


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	136					323	242	89	633	

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	38	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	42.6	15.6		0.0	0.0		0.0	0.0				
Yellow	5.1	4.4		0.0	0.0		0.0	0.0				
Red	1.3	1.0		0.0	0.0		0.0	0.0				



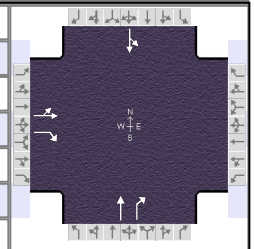
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	136					323	242	89	633	
Initial Queue (Q_b), veh/h	0	0	0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1750	1750	1750					1750	1750	1750	1750	
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %		34	34					13	13		7	
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3					3	3	3	3	
Upstream Filtering (*I*)	1.00	1.00	1.00					1.00	1.00	0.63	0.63	
Lane Width (*W*), ft		12.0	12.0					12.0	12.0		12.0	
Turn Bay Length, ft		1425	250					470	410		400	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35					45	45	45	45	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		21.0				49.0		49.0
Yellow Change Interval (*Y*), s		4.4				5.1		5.1
Red Clearance Interval (R_c), s		1.0				1.3		1.3
Minimum Green (G_{min}), s		10				20		20
Start-Up Lost Time (*l*t), s	2.0	2.0				2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0				2.0	2.0	2.0
Passage (*PT*), s		2.0				2.0		2.0
Recall Mode		Off				Min		Min
Dual Entry		Yes				Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0.0	No	25.0	0.0	No	25.0				0.0	No	25.0
Walkway / Crosswalk Width / Length, ft	9.0	12.0	0.0	9.0	12.0	0.0				9.0	12.0	0.0
Street Width / Island / Curb, ft	0.0	0	No		0		0.0		No	0.0	0	No
Width Outside / Bike Lane / Shoulder, ft	12.0	5.0	2.0				12.0	5.0	2.0	12.0	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

HCS Signalized Intersection Results Summary

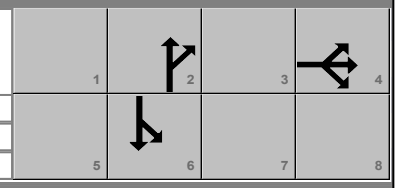
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 NB PM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	136					323	242	89	633	

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	38	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	42.6	15.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



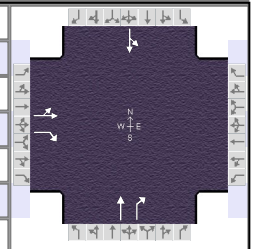
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2		6
Case Number		11.0				7.0		8.0
Phase Duration, s		21.0				49.0		49.0
Change Period, ($Y+R_c$), s		5.4				6.4		6.4
Max Allow Headway (*MAH*), s		3.3				0.0		0.0
Queue Clearance Time (g_s), s		10.4						
Green Extension Time (g_e), s		0.2				0.0		0.0
Phase Call Probability		1.00						
Max Out Probability		0.19						

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h		85	146					347	260		802	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1228	1090					1573	1333		1557	
Queue Service Time (g_s), s		4.0	8.4					7.8	6.6		17.7	
Cycle Queue Clearance Time (g_c), s		4.0	8.4					7.8	6.6		27.3	
Green Ratio (*g/C*)		0.22	0.22					0.61	0.61		0.61	
Capacity (*c*), veh/h		274	243					957	811		1005	
Volume-to-Capacity Ratio (*X*)		0.310	0.602					0.363	0.321		0.798	
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		2.0	4.0					3.8	2.8		9.5	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.04	0.51					0.22	0.19		0.63	
Uniform Delay (d_1), s/veh		22.7	24.4					6.9	6.7		9.3	
Incremental Delay (d_2), s/veh		0.2	3.0					1.1	1.0		4.3	
Initial Queue Delay (d_3), s/veh		0.0	0.0					0.0	0.0		0.0	
Control Delay (*d*), s/veh		22.9	27.4					8.0	7.7		13.5	
Level of Service (LOS)		C	C					A	A		B	
Approach Delay, s/veh / LOS	25.7	C		0.0			7.8	A		13.5	B	
Intersection Delay, s/veh / LOS	13.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.71	B	1.35	A	1.64	B
Bicycle LOS Score / LOS	0.87	A			1.49	A	1.77	B

HCS Signalized Intersection Intermediate Values

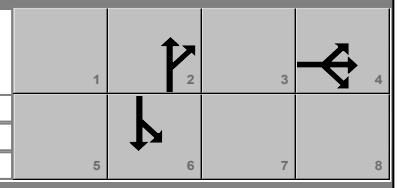
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 NB PM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	136					323	242	89	633	

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	38	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	42.6	15.6	0.0	0.0	0.0	0.0	
Yellow	5.1	4.4	0.0	0.0	0.0	0.0	
Red	1.3	1.0	0.0	0.0	0.0	0.0	



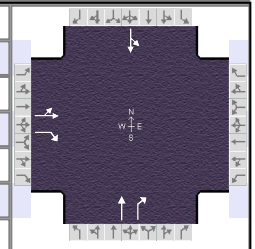
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)												
Heavy Vehicles and Grade Factor (f_{HVg})												
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)												
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.955	0.955					1.000	1.000		0.941	0.941	
Right-Turn Adjustment Factor (f_{RT})		0.000	0.847					0.000	0.847		0.000	0.941
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000						1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000						1.000			1.000
Work Zone Adjustment Factor (f_{wz})												
DDI Factor (f_{DDI})												
Movement Saturation Flow Rate (s), veh/h	1165	62	1090				0	1573	1333	192	1365	0
Proportion of Vehicles Arriving on Green (P)	0.22	0.22	0.22	0.00	0.00	0.00	0.00	0.61	0.61	0.66	0.65	0.00
Incremental Delay Factor (k)		0.04	0.13					0.50	0.50		0.50	

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		4.0				6.4		6.4
Green Ratio (g/C)		0.22				0.61		0.61
Permitted Saturation Flow Rate (s_p), veh/h/ln		0				756		1050
Shared Saturation Flow Rate (s_{sh}), veh/h/ln						1573		0
Permitted Effective Green Time (g_p), s		0.0				0.0		42.6
Permitted Service Time (g_u), s		0.0				0.0		34.8
Permitted Queue Service Time (g_{ps}), s								17.7
Time to First Blockage (g_f), s		0.0				42.6		9.6
Queue Service Time Before Blockage (g_{fs}), s								9.6
Protected Right Saturation Flow (s_R), veh/h/ln		0				0		
Protected Right Effective Green Time (g_R), s		0.0				0.0		

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.198	0.000	0.972	0.000	0.681	0.000	0.972	0.000
Pedestrian F_s / F_{delay}	0.000	0.143	0.000	0.143	0.000	0.067	0.000	0.067
Pedestrian M_{corner} / M_{cw}	0.00		0.00		0.00		0.00	
Bicycle c_b / d_b		41.69		40.18	1217.14	5.36	1217.14	5.36
Bicycle F_w / F_v	-3.64	0.38	-3.64		-3.64	1.00	-3.64	1.28

HCS Signalized Intersection Results Graphical Summary

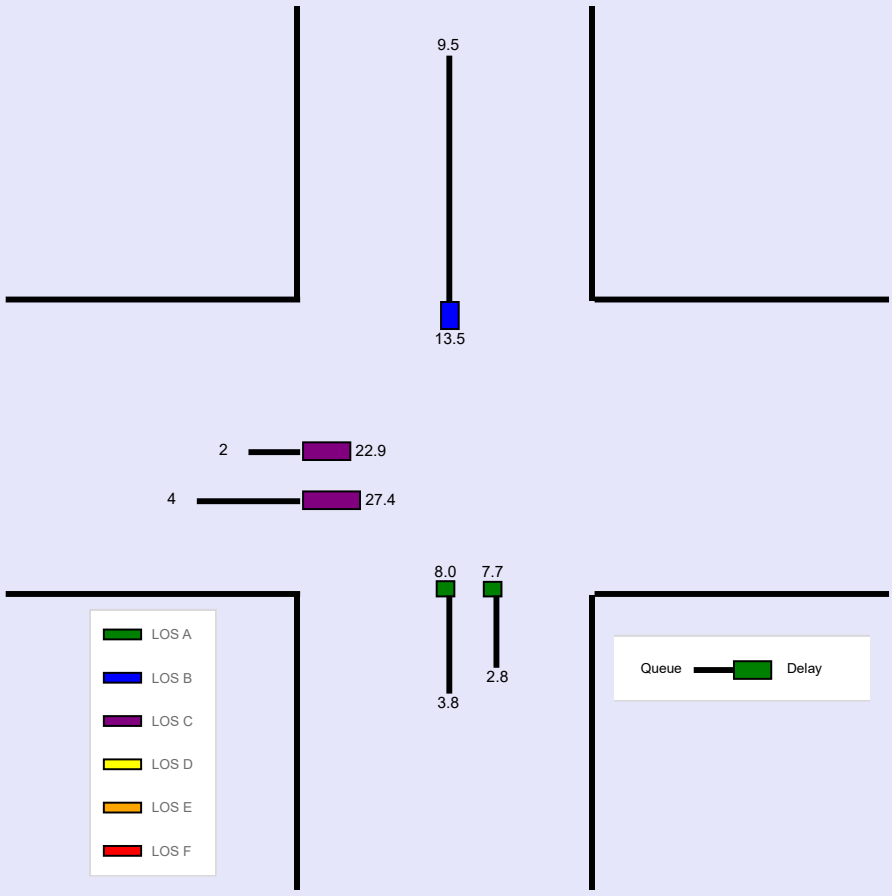
General Information				Intersection Information	
Agency	CESO			Duration, h	0.250
Analyst	JMP	Analysis Date	Sep 29, 2022	Area Type	Other
Jurisdiction	ODOT	Time Period	PM Peak Hour	PHF	0.93
Urban Street	SR-149	Analysis Year	2043	Analysis Period	1> 4:30
Intersection	SR-149 & I-70 EB On/Of…	File Name	2043 NB PM Peak - Int 1 & Int 2.xus		
Project Description	2043 No-Build Traffic Scenario				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	75	4	136					323	242	89	633	

Signal Information					EB		WB				NB				SB			
Cycle, s	70.0	Reference Phase	2															
Offset, s	38	Reference Point	End	Green	42.6	15.6	0.0	0.0	0.0	0.0								
Uncoordinated	No	Simult. Gap E/W	On	Yellow	5.1	4.4	0.0	0.0	0.0	0.0								
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.3	1.0	0.0	0.0	0.0	0.0								

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)		2.0	4.0					3.8	2.8		9.5	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.04	0.51					0.22	0.19		0.63	
Control Delay (*d*), s/veh		22.9	27.4					8.0	7.7		13.5	
Level of Service (LOS)		C	C					A	A		B	
Approach Delay, s/veh / LOS	25.7	C		0.0			7.8	A		13.5	B	
Intersection Delay, s/veh / LOS	13.1						B					



--- Messages ---

No errors or warnings exist.

--- Comments ---

HCS Two-Way Stop-Control Report

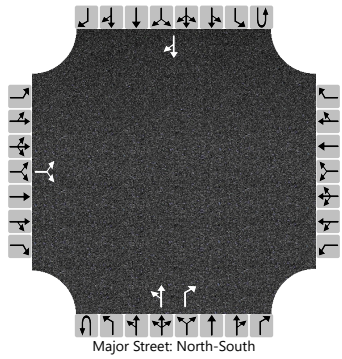
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/18/2022
Analysis Year	2043
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	No-Build

Site Information

Intersection	SR-149 & Reco Drive
Jurisdiction	ODOT
East/West Street	Reco Drive
North/South Street	SR-149
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	1	0	0	1	0
Configuration			LR							LT		R				TR
Volume (veh/h)		7		9						13	290	353			345	36
Percent Heavy Vehicles (%)		6		6						9						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized										No						
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		7.16		6.26						4.19						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.55		3.35						2.28						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			18							14						
Capacity, c (veh/h)			441							1099						
v/c Ratio			0.04							0.01						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			13.5							8.3	0.1					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)		13.5								0.2						
Approach LOS		B								A						

HCS Two-Way Stop-Control Report

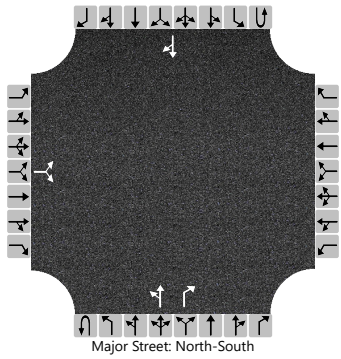
General Information

Analyst	JMP
Agency/Co.	CESO
Date Performed	10/18/2022
Analysis Year	2043
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	No-Build

Site Information

Intersection	SR-149 & Reco Drive
Jurisdiction	ODOT
East/West Street	Reco Drive
North/South Street	SR-149
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	1	0	0	1	0
Configuration			LR							LT		R				TR
Volume (veh/h)		23		10						9	300	242			760	9
Percent Heavy Vehicles (%)		6		6						13						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized										No						
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		7.16		6.26						4.23						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.55		3.35						2.32						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			35							10						
Capacity, c (veh/h)			199							758						
v/c Ratio			0.18							0.01						
95% Queue Length, Q_{95} (veh)			0.6							0.0						
Control Delay (s/veh)			27.0							9.8	0.1					
Level of Service (LOS)			D							A	A					
Approach Delay (s/veh)		27.0								0.2						
Approach LOS		D								A						

CESO

11.21.2022
Revised: 01.09.2023

Traffic Impact Study

Proposed Love's Development

On behalf of:

Love's

Contact:

Love's Travel Stops
Rick Shuffield
10601 N. Pennsylvania Ave.
Oklahoma City, OK 73120

Preparation Date:

01/09/2023

Traffic Study

CLIENT	Love's Travel Stops & Country Stores
STORE #	
LOCATION:	Union Township, Ohio
ADDRESS	Southwest Corner of Reco Drive & SR-149
COUNTY	Belmont
CITY, STATE	Union Township, OH

PREPARED BY	Taylor Cline
	CESO, Inc.
ADDRESS	175 Montrose West Ave, Suite 400
CITY, STATE	Akron, OH 44321
PHONE	330.665.0660

DATE	January 9, 2023

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Appendix **Page**

1. Executive Summary

1.1. Summary

This report is submitted on behalf of Love's Travel Stops in connection with its application to Union Township, Ohio (OH) for Site Plan approval. The Traffic Impact Study (TIS) conducted by CESO, Inc. addresses the traffic related impacts associated with the proposed Love's Travel Stop; referred to herein as "Love's Development."

The proposed Love's Development is to be located in the southwest corner of SR-149 and Reco Drive, within Union Township, Belmont County, OH. The full buildout of the Love's Development is projected to have a 11,300 S.F. convenience market with 25 fueling stations (16 passenger car and 9 truck), a 3,100 S.F. fast-food restaurant with a drive-through window, a 2,900 S.F. fast-food restaurant without a drive-through window, a 3-bay tire store, and Campground/Recreational Vehicle Park with 70 campsites. The Love's Development is projected to have approximately 104 parking spaces for passenger cars, 97 parking spaces for semi-trucks and 70 total RV parking spaces.

Love's Site Plan application requests approval of the following access points:

- Full access auto driveway connection to Reco Drive (referred to as "Love's Site Driveway #1") approximately 340' west of SR-149 (centerline-to-centerline).

- Full access RV and truck driveway connection to SR-149 (referred to as "Love's Site Driveway #2") approximately 670' south of Reco Drive (centerline-to-centerline).

The Traffic Impact Study focused on evaluating the 2043 No-Build and 2043 Design Year Condition 1/Condition 2 traffic conditions near the site.

1.2. Conclusions

The full buildout of the Love's Travel Stop is estimated to generate 8,886 trips per day on a typical weekday (4,443 inbound and 4,443 outbound), of which 735 trips will be generated during the Weekday AM Peak Hour (371 inbound and 364 outbound), and 592 trips will be generated during the Weekday PM Peak Hour (304 inbound and 288 outbound). ***Pass-by trips were included in the analysis. Internal Capture Rates were deducted in the analysis.***

Trips for the proposed Love's Development are anticipated to approach and depart the Site following the distribution patterns illustrated on Figures 7.A-7.C (see pg. 30-32).

Highway Capacity Software (HCS) Version 8.1 methodology was used to analyze the current level of service at the key study intersections. *Note: According to the ODOT Analysis and Traffic Simulation Manual (OATS), Section 5.9, the operational goals for intersection analyses (TWSC and Signalized) are to operate at overall LOS D or better conditions and for each movement to operate at LOS E or better conditions.*

Under the **2043 No-Build Traffic Scenario**, the signal-controlled intersections operate at overall level of service (LOS) "C" or better conditions. In addition, the individual movements of the stop-controlled intersection operate at level of service (LOS) "D" or better conditions.

Under the **2043 Design Year Traffic Scenario Build Condition 1**, the signal-controlled intersections operate at overall level of service (LOS) "E" or better conditions. In addition, the individual movements of the stop-controlled intersections operate at level of service (LOS) "B" or better conditions with the exception of the following:

- The EBLR movement at the SR-149 & Reco Drive intersection which operates at LOS "F" during both the AM and PM Peak Hours.
- The EBLR movement at the SR-149 & Love's Site Driveway #2 intersection which operates at LOS "F" during both the AM and PM Peak Hours.

Under the **2043 Design Year Traffic Scenario Build Condition 2**, the signal-controlled intersections operate at overall level of service (LOS) "D" or better conditions. In addition, the individual movements of the stop-controlled intersection operate at level of service (LOS) "B" or better conditions with the exception of the following:

- The EBLR movement at the SR-149 & Love's Site Driveway #2 intersection which operates at LOS "F" during both the AM and PM Peak Hours.

The recommended improvements include the following:

- The installation of a traffic signal at the intersection of SR-149 & Reco Drive, coordinated with the signal-controlled intersections of SR-149 & I-70 WB On/Off Ramps, SR-149 & I-70 EB On/Off Ramps, and SR-149 & Bond Drive.

- Restripe the existing inside through lane on SR-149 to reflect a continuous two-way left-turn lane back to Pilot's South Driveway.

- Construction of a NB to WB left-turn lane at the intersection of SR-149 & Love's Site Driveway #2.

- Construction of a SB to WB right-turn lane at both intersections of SR-149 & Reco Drive and SR-149 & Love's Site Driveway #2.

- Signal timing splits and offsets were optimized at the signal-controlled intersections.

CESO conducted turn lane analyses for the study network and reached the following conclusions:

- According to ODOT Chart 401-5b, a NB to WB left-turn lane **is warranted** at the intersections of SR-149 & Reco Drive, and SR-149 & Love's Site Driveway #2 under the 2023 Build Traffic Scenario. According to capacity analysis results, a NB to WB left-turn lane **is warranted** at the intersection of SR-149 & I-70 WB On/Off Ramps during the 2023 Build Traffic Scenario and a SB to EB left-turn lane **is warranted** at the intersection of SR-149 & I-70 EB On/Off Ramps during the 2023 Build Traffic Scenario. However, due to the existing overpass and location of the existing bridge piers, there are physical limitations to being able to widen SR-149 and provide the additional turn lanes needed.

- According to ODOT Chart 401-6b a SB to WB right-turn lane **is warranted** at the intersections of SR-149 & Reco Drive and SR-149 & Love's Site Driveway #2 under the 2023 Build Traffic Scenario.

CESO conducted queue length analyses for the study network and reached the following conclusions:

- The ODOT required storage length for the NBL turn lane at the SR-149 & Reco Drive intersection is 525' of storage plus a 50' taper. However, CESO recommends restriping the existing inside through lane on SR-149 to reflect a continuous two-way left-turn lane.

- The ODOT required storage length for the SBR turn lane at the SR-149 & Reco Drive intersection is 550' of storage plus a 50' taper. However, due to close proximity to the existing I-70 EB Off Ramp, CESO recommends constructing the turn lane to accommodate 200' of storage plus a 50' taper.

- The ODOT required storage length for the NBL turn lane at the SR-149 & Love's Site Driveway #2 intersection is 175' of storage plus a 50' taper. CESO recommends constructing the turn lane to accommodate 175' of storage plus a 50' taper.

- The ODOT required storage length for the SBR turn lane at the SR-149 & Love's Site Driveway #2 intersection is 175' of storage plus a 50' taper. CESO recommends constructing the turn lane to accommodate 175' of storage plus a 50' taper.

CESO conducted a traffic signal warrant study for the intersection of SR-149 & Reco Drive and reached the following conclusions:

SR-149 & Reco Drive:

- Warrant 1 – Eight-Hour Vehicular Volume **is satisfied** at the intersection under the 2023 Build and 2043 Design Year Traffic Scenarios.

- Warrant 2 – Four-Hour Vehicular Volume **is satisfied** at the intersection under the 2023 Build and 2043 Design Year Traffic Scenarios.

- Warrant 3 – Peak Hour Vehicular Volume **is satisfied** at the intersection under the 2043 Design Year Traffic Scenarios.

- Based on Warrants 1, 2, and 3 being satisfied CESO recommends the installation of a traffic signal.

1.3. Summary of Recommendations

The following summary of recommendations was generated based upon the findings in the Traffic Impact Study.

2023 No-Build Traffic Scenario (Responsibility – Others):

- No improvements are recommended or required.

2023 Build Traffic Scenario (Responsibility – Love's):

SR-149 and Reco Drive:

- Signalize the intersection with an 80 second cycle length during the AM Peak Hour and 70 second cycle length during the PM Peak Hour. Coordinate this signal with the existing signals at the SR-149 & I-70 WB On/Off Ramps, SR-149 & I-70 EB On/Off Ramps, and SR-149 & Bond Drive intersections.
- Restripe the existing inside through lane on SR-149 to reflect a continuous two-way left-turn lane back to Pilot's South Driveway.
- Construct a SBR turn lane to provide 200' of storage plus a 50' taper.

Reco Drive and Love's Site Driveway #1

- Construct Love's Site Driveway #1 to permit left-in, left-out, right-in, and right-out (full access) movements of passenger cars. Control this driveway with one (1) stop sign.

SR-149 and Love's Site Driveway #2

- Construct Love's Site Driveway #2 to permit left-in, left-out, right-in, and right-out (full access) movements of trucks and RVs. Control this driveway with one (1) stop sign.
- Construct a NBL turn lane to provide 175' of storage plus a 50' taper.
- Construct a SBR turn lane to provide 175' of storage plus a 50' taper.

2043 No-Build Traffic Scenario (Responsibility – Others):

- No improvements are recommended or required.

2043 Design Year Traffic Scenario (Responsibility – Love's):

- No improvements are recommended or required.

Figure 12 illustrates the Love's Development recommended improvements.

2. Introduction

This report is submitted on behalf of Love's Travel Stops in connection with its application to Union Township, Ohio (OH) for Site Plan approval. The Traffic Impact Study (TIS) conducted by CESO, Inc. addresses the traffic related impacts associated with the proposed Love's Travel Stop; referred to herein as "Love's Development."

The proposed Love's Development is to be located in the southwest corner of SR-149 and Reco Drive, within Union Township, Belmont County, OH. The full buildout of the Love's Development is projected to have a 11,300 S.F. convenience market with 25 fueling stations (16 passenger car and 9 truck), a 3,100 S.F. fast-food restaurant with a drive-through window, a 2,900 S.F. fast-food restaurant without a drive-through window, a 3-bay tire store, and Campground/Recreational Vehicle Park with 70 campsites. The Love's Development is projected to have approximately 104 parking spaces for passenger cars, 97 parking spaces for semi-trucks and 70 total RV parking spaces.

Love's Site Plan application requests approval of the following access points:

- Full access auto driveway connection to Reco Drive (referred to as "Love's Site Driveway #1") approximately 340' west of the SR-149 & Reco Drive intersection (centerline-to-centerline).

- Full access RV and truck driveway connection to SR-149 (referred to as "Love's Site Driveway #2") approximately 670' south of Reco Drive (centerline-to-centerline).

In addition, the Love's Site Plan application also requests approval to conduct work within the right-of-way to construct the proposed access driveways along with the recommended roadway improvements. SR-149 is under jurisdiction of the Ohio Department of Transportation (ODOT, District 11), I-70 is under jurisdiction of the Ohio Department of Transportation (ODOT, District 11), and Reco Drive is under jurisdiction of Belmont County.

This report presents the methodologies, analyses, and results of the Traffic Impact Study (TIS) for traffic generated by the proposed Love's Development. The purpose of the TIS was to identify the traffic related impacts, if any, during typical weekday AM and PM peak hours of the adjacent street traffic corresponding with the weekday hours of operation for the proposed Love's Development. The study parameters of this report were generated based upon a recent concept site plan, a Memorandum of Understanding (MOU) dated August 26th, 2022, between CESO and the Ohio Department of Transportation (District 11) outlining the TIS scope of services (see Appendix A).

The following intersections were analyzed in the Traffic Impact Study:

- SR-149 & I-70 WB On/Off Ramps (Signal Controlled).
- SR-149 & I-70 EB On/Off Ramps (Signal Controlled).
- SR-149 & Reco Drive (Stop Sign Controlled).

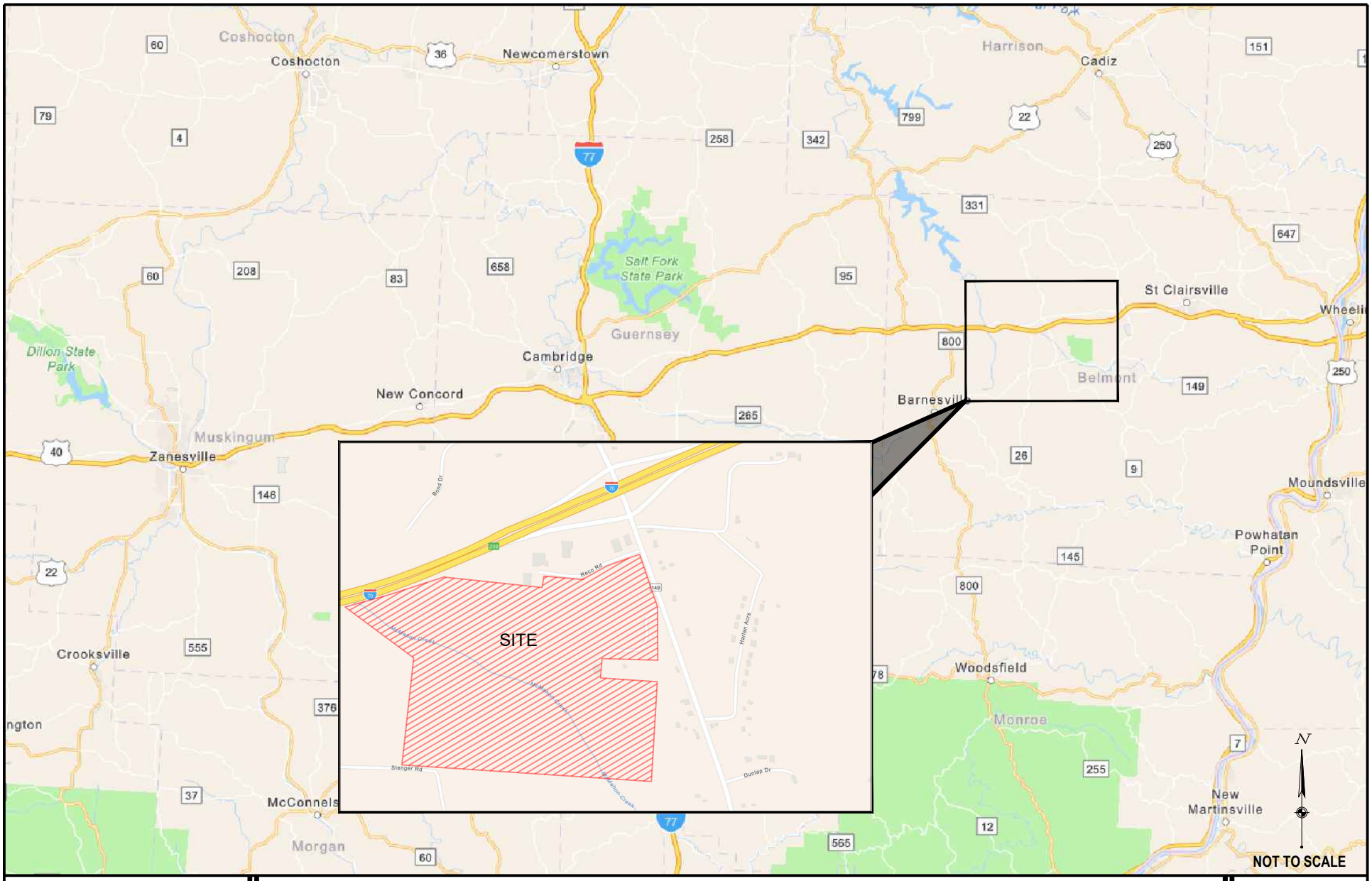
The following traffic scenarios were included in the analysis:

2043 No-Build Traffic Scenario – Represents traffic conditions during the weekday AM and PM Peak Hours of the adjacent roadway network that would exist during year 2043, without the proposed Love's Development.

2043 Design Year Traffic Scenario Build Condition 1– Represents traffic conditions during the weekday AM and PM Peak Hours of the adjacent roadway network that would exist during year 2043, with the proposed Love's Development. This analysis includes the existing roadway geometry (i.e. number/types of lanes) and existing traffic control (i.e. signalized/unsignalized).

2043 Design Year Traffic Scenario Build Condition 2– Represents traffic conditions during the weekday AM and PM Peak Hours of the adjacent roadway network that would exist during year 2043, with the proposed Love's Development. This analysis includes the proposed roadway geometry (i.e. number/types of lanes) and proposed traffic control (i.e. signalized/unsignalized).

Figure 1 illustrates the Site location with respect to the study area and Figure 2 illustrates the Site Plan for the proposed Love's Development.



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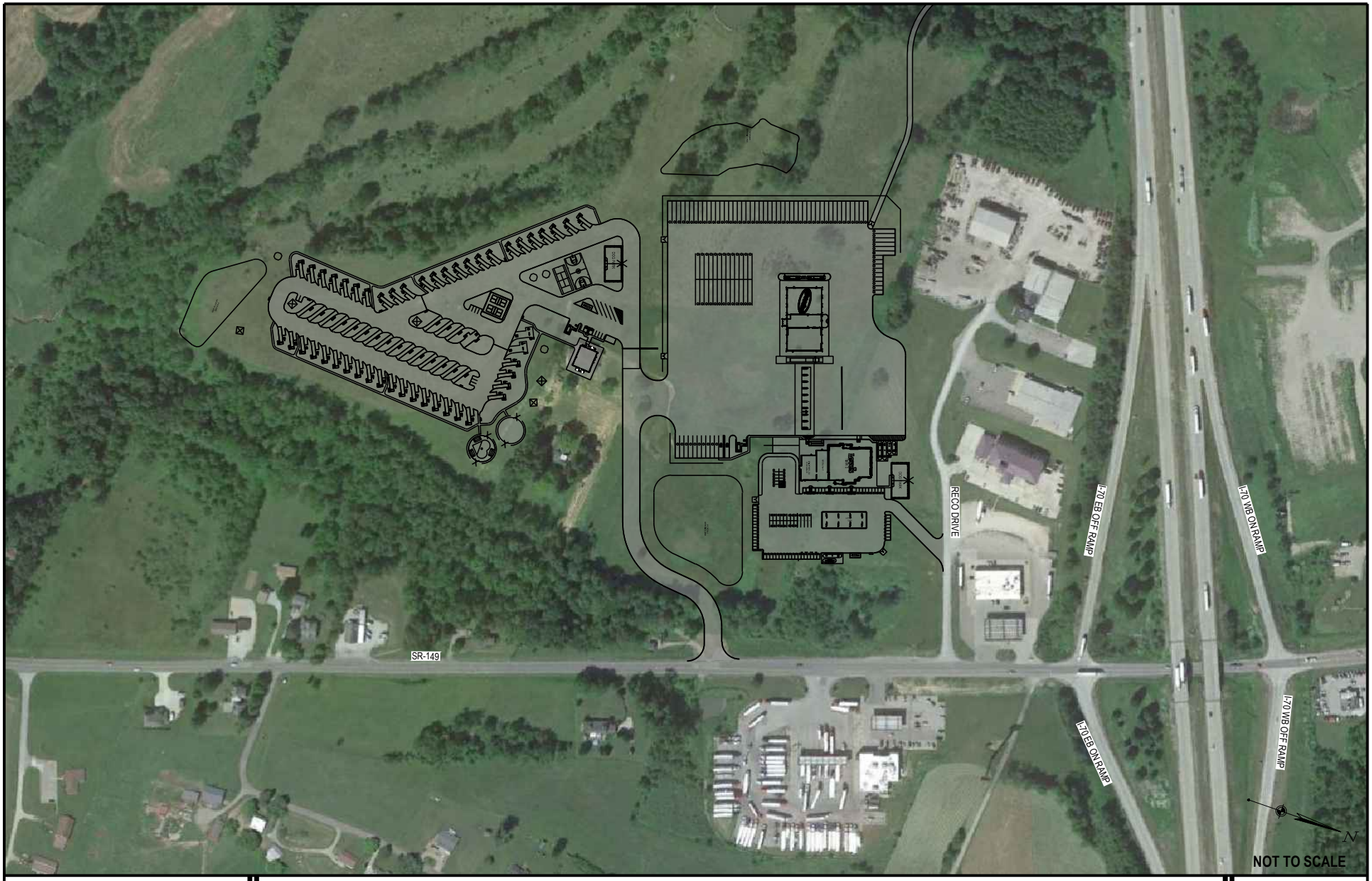
SITE LOCATION

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 1

DATE:	11/21/2022
JOB NO.:	759267-02
DESIGNED BY:	JMP
DRAWN BY:	JMP
CHECKED BY:	TMC
PAGE:	11



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SITE PLAN

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 2	
DATE:	11/21/2022
JOB NO.:	759267-02
DESIGNED BY:	JMP
DRAWN BY:	JMP
CHECKED BY:	TMC
PAGE:	12

2.1. Study Procedure

The following studies and analyses were undertaken:

1. Traffic turning movement counts were conducted by Gewalt Hamilton Associates, Inc. (GHA) on Tuesday, September 13th, 2022, between the morning hours of 7:00 AM to 9:00 AM and evening hours of 4:00 PM to 6:00 PM at the following intersections:

   - SR-149 & I-70 WB On/Off Ramps (Signal Controlled).
   - SR-149 & I-70 EB On/Off Ramps (Signal Controlled).

   In addition, 10-hour traffic counts were conducted between 6:00 AM to 9:00 AM and 11:00 AM to 6:00 PM at the following intersection:

   - SR-149 & Reco Drive (Stop Sign Controlled).

2. The Existing Traffic Volumes (Year 2022) – Cars and Trucks (Figure 4.A) were reviewed and balanced. The car and truck volumes listed in Figure 4.A were combined to form the Existing Traffic Volumes (Year 2022) – Total Volumes (Figure 4.B) for simplicity.

3. Based on Hourly Count Method 1 from the *State Highway Access Management Manual (SHAMM)*, the Existing Traffic Volumes (Year 2022) were converted to Design Hour Volumes (DHV's). The Design Hour Volumes were calculated using the following factors determined from the Peak Hour to Design Hour Factor tables from the Ohio Department of Transportation, Modeling and Forecasting Section:

   I-70 EB/WB On/Off Ramps: 1.45
   SR 149: 1.13

   Refer to Appendix C for Peak Hour to Design Hour Factors table used provided from Section 7.21.c of the *State Highway Access Management Manual (SHAMM)*. The 2022 Design Hour Traffic Volumes – Cars and Trucks (Figure 5.A) were combined to form the 2022 Design Hour Traffic Volumes – Total Volumes (Figure 5.B) for simplicity.

4. The 2023 No-Build Traffic Volumes – Cars and Trucks (Figure 6.A) were calculated by applying growth rates to the 2022 Design Hour Traffic Volumes (Figure 5.A). The growth rates were calculated using the linear regression method referenced in the *Ohio Traffic Forecasting Manual, Volume 2, Section 4.2* for all study roadways. A linear growth rate of 0.5 percent (%) was applied for one (1) year to the study roadways (growth factor of 1.005). The car and truck volumes shown on Figure 6.A were combined to form the 2023 No-Build Traffic Volumes – Total Volumes (Figure 6.B) for simplicity. The growth rate documentation is included in Appendix C of the report.

5. Directional distribution analyses were conducted to determine the potential distribution of patrons for the proposed Love's Development under the 2023 Build and 2043 Design Year Traffic Scenarios (see Figures 7.A-7.C).

6. Analyses were conducted to determine the potential traffic volumes generated by the proposed Love's Development under the 2023 Build and 2043 Design Year Traffic Scenarios utilizing data provided in the Institute of Transportation Engineers' *Trip Generation Manual, 11th Edition* (see Table 1).

7. Addition of the Site Generated Traffic Volumes (Figures 8.A-8.C) to the 2023 and 2043 No-Build Traffic Volumes (Figures 6.A-6.B and Figures 10.A-10.B) to reflect the 2023 Build and 2043 Design Year Traffic Volumes (Figures 9.A-9.B and Figures 11.A-11.B).

8. The 2043 No-Build Traffic Volumes – Cars and Trucks (Figure 10.A) were calculated by applying growth rates to the 2022 Design Hour Traffic Volumes (Figure 5.A). The growth rates were calculated using the linear regression method referenced in the *Ohio Traffic Forecasting Manual, Volume 2, Section 4.2* for all study roadways. A linear growth rate of 0.5 percent (%) was applied for twenty-one (21) years to the study roadways (growth factor of 1.105). The car and truck volumes shown on Figure 10.A were combined to form the 2043 No-Build Traffic Volumes – Total Volumes (Figure 10.B) for simplicity. The growth rate documentation is included in Appendix C of the report.

9. Capacity analyses of the 2043 No-Build Traffic Volumes (Figures 10.A-10.B) were completed to determine the capacity of the key study intersections during AM and PM Peak Hours using Highway Capacity Software (HCS) Version 8.1 methodology.

10. Capacity analyses of the 2043 Design Year Traffic Volumes Build Condition 1 (Figures 11.A-11.B) were completed to determine the capacity of the key study intersections during AM and PM Peak Hours using HCS Version 8.1 methodology.

11. Capacity analyses of the 2043 Design Year Traffic Volumes Build Condition 2 (Figures 11.A-11.B) were completed to determine the capacity of the key study intersections (with improvements) during AM and PM Peak Hours using HCS Version 8.1 methodology.

12. Turn lane analyses were completed to determine if left-turn lanes or right-turn lanes were required as a result of the Love's Development. Turn-lane analyses utilized ODOT charts for unsignalized free-flowing approaches and capacity analyses results for signal-controlled intersections.

13. Queue Length Analyses were completed using the 95th percentile queue lengths provided from the HCS capacity results.

14. CESO conducted a Signal Warrant Study at the intersection of SR-149 and Reco Drive.

15. Recommendations for roadway improvements were generated under the 2043 Design Year Condition 2 Traffic Scenario based upon the capacity/queue length analyses of the surrounding roadway network. Application of the recommendations and evaluation of the capacity at the key study intersections under the applicable traffic scenarios, during AM and PM Peak Hours, were completed using HCS Version 8.1 methodology.

2.2. References

This report utilizes information provided by the following sources:

1. *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis.* Transportation Research Board, Washington, D.C., 2016.

2. *Trip Generation Manual*. 11th ed. Washington, DC: Institute of Transportation Engineers, 2022.

3. Most recent Site Plan obtained from Love's.

4. *Ohio Manual of Uniform Traffic Control Devices (OMUTCD)*. Ohio Department of Transportation (ODOT).

5. "St. Clairsville, OH." 40°03'20.60" N and 81°03'15.36" W, *Google Earth*. June 3rd, 2022.

6. *Location & Design Manual – Volume I (July 2022*). Ohio Department of Transportation (ODOT).

7. *State Highway Access Management Manual (July 2021).* Ohio Department of Transportation – Office of Roadway Engineering.

8. *ODOT Analysis and Traffic Simulation Manual (OATS, July 2021)*. Ohio Department of Transportation (ODOT).

3. Roadway and Traffic Conditions in the Vicinity of the Site

An inventory of existing transportation conditions in the vicinity of the Site was created to form a database for use in projecting Build conditions.

3.1. Study Location and Area Land Use

The proposed Love's Development is to be located in the southwest corner of SR-149 and Reco Drive, within Union Township, Belmont County, OH. Land use in the direct vicinity of the Site is primarily commercial, residential, and agricultural.

Access to the proposed Love's Development is projected via two (2) access points on the adjacent roadway; one full access auto driveway connection to Reco Drive (referred to as "Love's Site Driveway #1") approximately 340' west of SR-149 (centerline-to-centerline) and one full access RV and truck driveway connection to SR-149 (referred to as "Love's Site Driveway #2") approximately 670' south of Reco Drive (centerline-to-centerline).

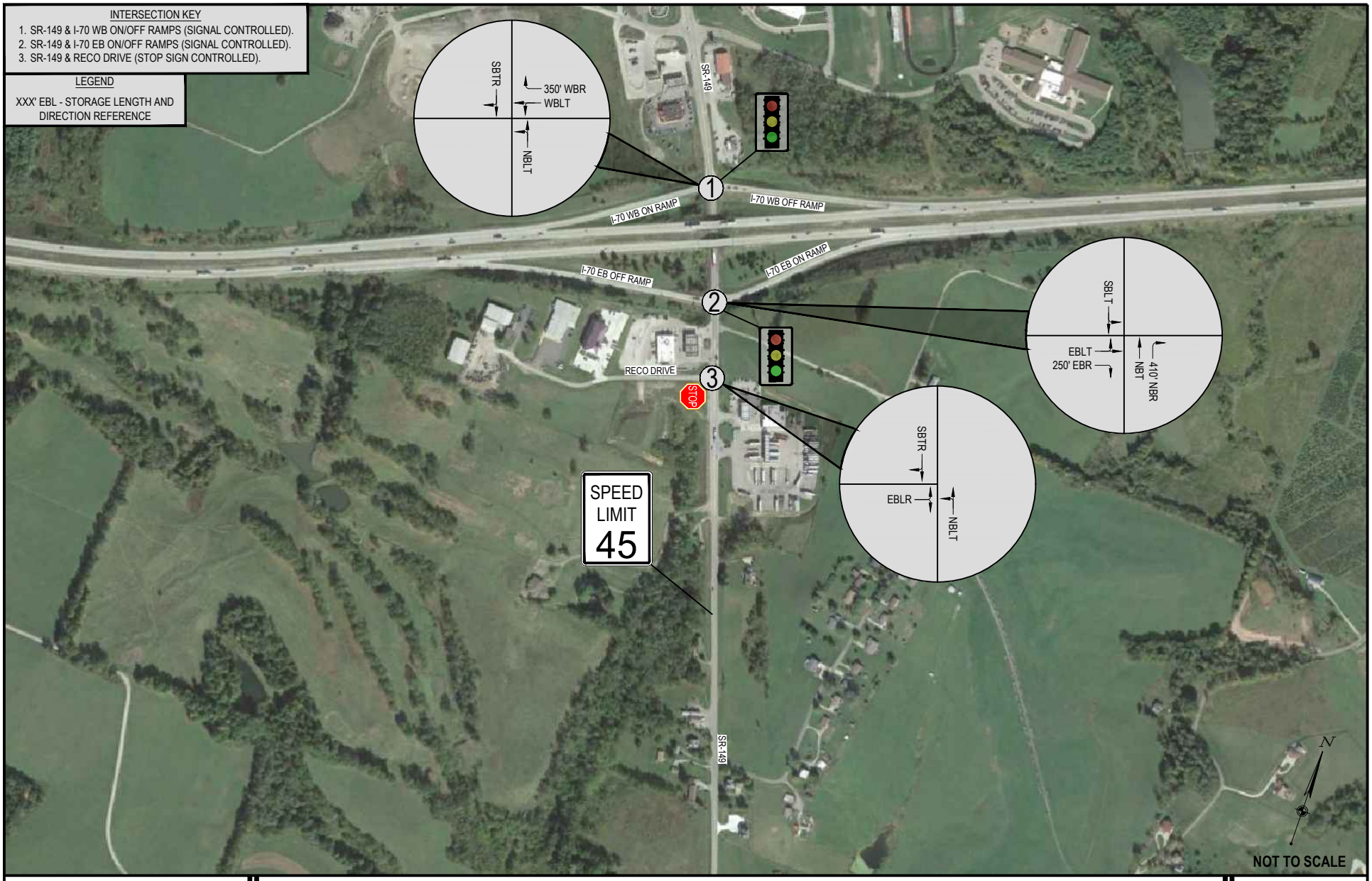
3.2. Area Roadway Characteristics

SR-149 – SR-149 runs in the north/southbound direction in the vicinity of the Site. SR-149 is a two-way roadway with one lane in each direction. SR-149 is classified as a Major Collector according to the *ODOT Transportation Information Mapping System*. SR-149 is under jurisdiction of the Ohio Department of Transportation (ODOT, District 11). The posted speed limit on SR-149 is 45 mph.

I-70 On/Off Ramps – I-70 runs in the east/westbound direction in the vicinity of the Site. I-70 is a two-lane divided highway. I-70 is classified as a Principal Arterial Interstate according to the *ODOT Transportation Information Mapping System*. I-70 is under jurisdiction of the Ohio Department of Transportation (ODOT, District 11). The speed limit on I-70 is unposted and assumed to be 70 mph.

Reco Drive – Reco Drive runs in the east/westbound direction in the vicinity of the Site. Reco Drive is a two-way roadway with one lane in each direction. Reco Drive is classified as a Local Road according to the *ODOT Transportation Information Mapping System*. Reco Drive is under jurisdiction of Belmont County. The speed limit on Reco Drive is unposted and assumed to be 25 mph.

The Existing Transportation System is shown on Figure 3 of the report.



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EXISTING TRANSPORTATION SYSTEM

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 3

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3.3. Existing Traffic Volumes

Traffic turning movement counts were conducted by Gewalt Hamilton Associates, Inc. (GHA) on Tuesday, September 13th, 2022, between the morning hours of 7:00 AM to 9:00 AM and evening hours of 4:00 PM to 6:00 PM at the following intersections:

- SR-149 & I-70 WB On/Off Ramps (Signal Controlled).
- SR-149 & I-70 EB On/Off Ramp (Signal Controlled).

In addition, 10-hour traffic counts were conducted between 6:00 AM to 9:00 AM and 11:00 AM to 6:00 PM at the following intersection:

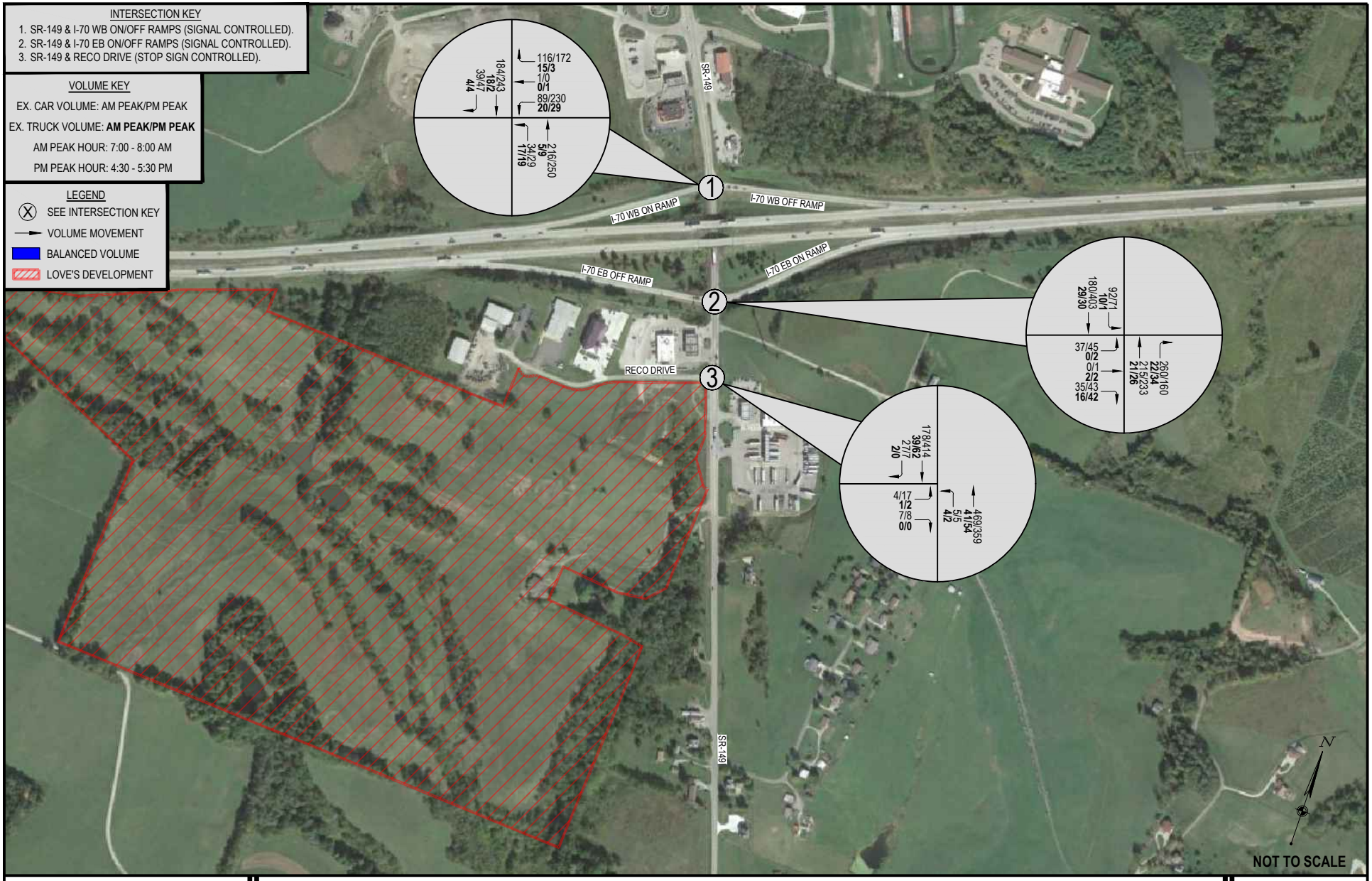
- SR-149 & Reco Drive (Stop Sign Controlled).

The weekday peak hours of the Traffic Impact Study roadway network were determined to occur between the hours of:

- 7:00 AM – 8:00 AM (AM Peak Hour).
- 4:30 PM – 5:30 PM (PM Peak Hour).

Count data collected consists of turning movement counts with classification breakouts of lights, buses, single-unit trucks, and articulated trucks.

The Existing Traffic Count Data and Signal Timing Sheets are located in Appendix B of the report. The Existing Weekday Peak Hour Traffic Volumes (Year 2021) are illustrated on Figure 4.A (Cars and Trucks) and Figure 4.B (Total Volumes).



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EXISTING TRAFFIC VOLUMES (YEAR 2022) - CARS & TRUCKS

LOVE'S DEVELOPMENT

UNION TOWNSHIP — BELMONT, OHIO

FIGURE 4.A

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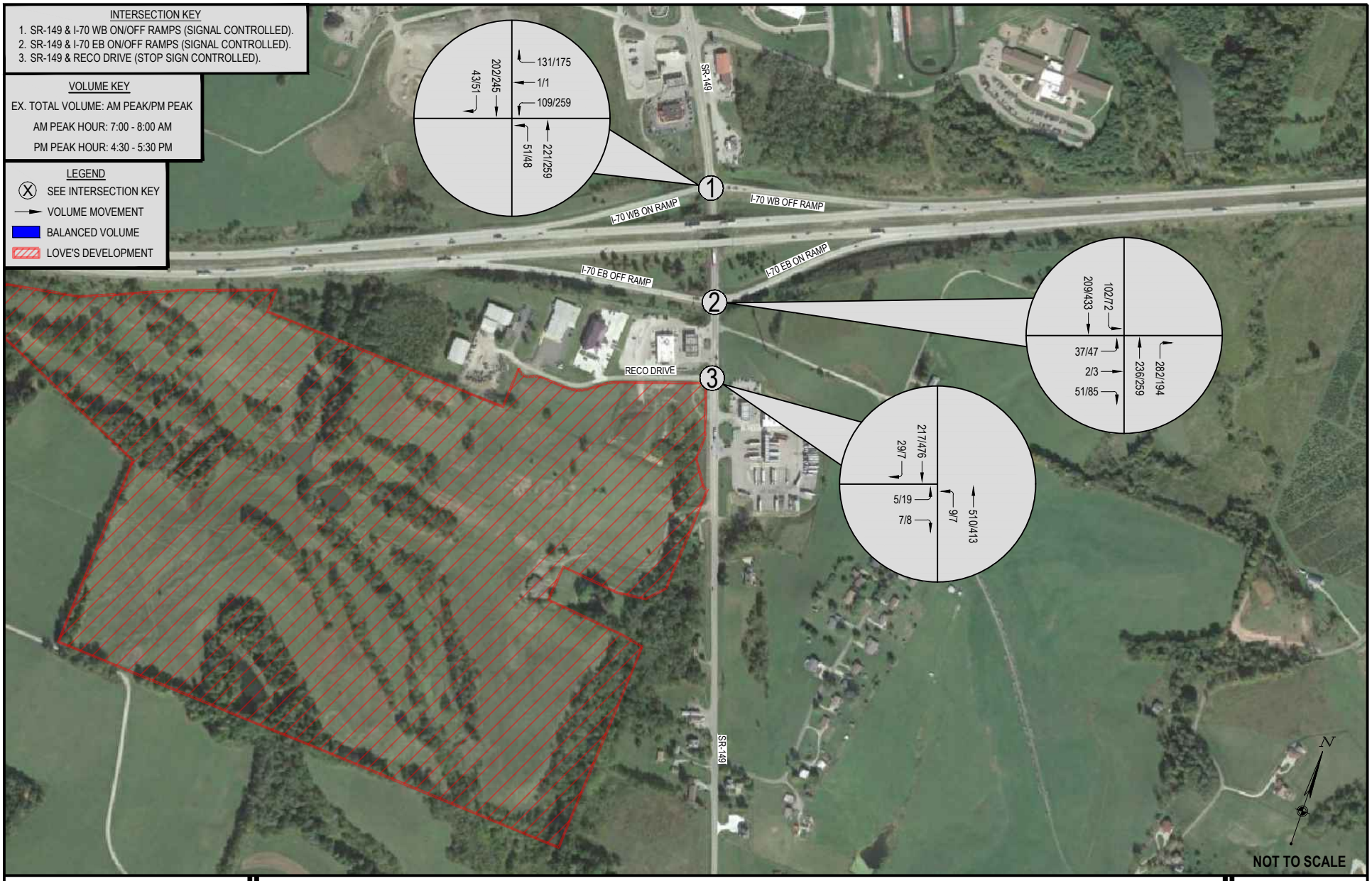

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EXISTING TRAFFIC VOLUMES (YEAR 2022) - TOTAL VOLUMES

LOVE'S DEVELOPMENT

UNION TOWNSHIP — BELMONT, OHIO

FIGURE	4.B
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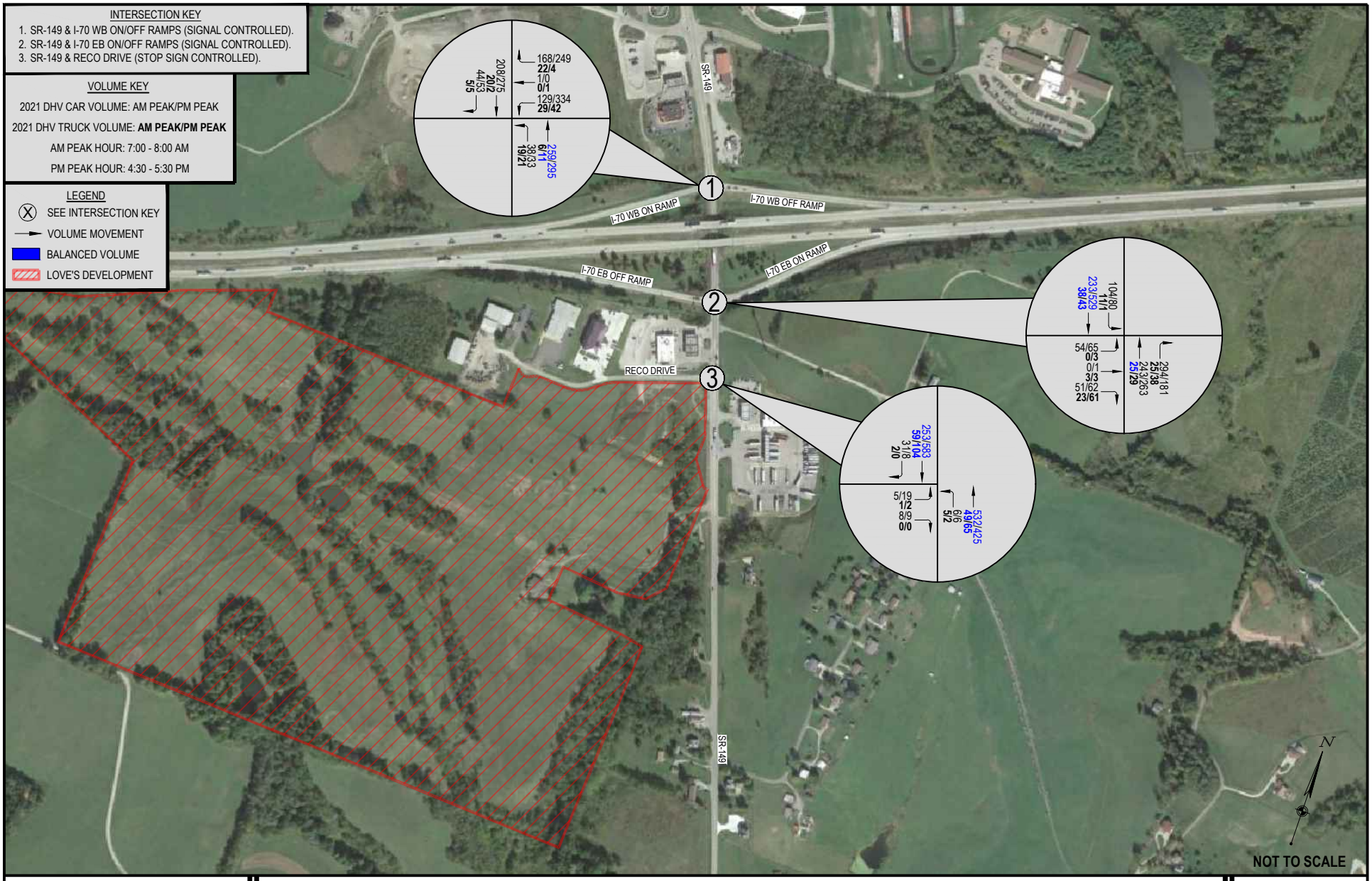
3.4. Design Hour Volumes

According to the *Ohio Certified Traffic Manual*, "Design Hour Volumes are the number of vehicles that travel through a segment of roadway during the design hour. The DHV is the volume unit which is used for making roadway structural and capacity design decisions". Traffic volumes vary considerably during different hours of the day. Design Hour Volumes include applying a design hour factor to existing volumes.

Based on the Hourly Count Method 1 from the ODOT *State Highway Access Management Manual*, the Existing Weekday Peak Hour Traffic Volumes (Year 2022) – Cars and Trucks (Figure 4.A) were multiplied by a DHV factor of 1.45 to the I-70 EB and WB On/Off Ramps, and 1.13 to SR-149 volumes to obtain the 2022 Design Hour Weekday Peak Hour Traffic Volumes – Cars and Trucks (Figure 5.A). The DHV factors were acquired from the Office of Statewide Planning & Research's website, Modeling & Forecasting section. Refer to Appendix C of the report for further documentation.

For simplicity, the traffic volumes listed on Figure 5.A were combined to form the 2022 Design Hour Weekday Peak Hour Traffic Volumes – Total Volumes shown on Figure 5.B.



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2022 DESIGN HOUR TRAFFIC VOLUMES - CARS & TRUCKS

LOVE'S DEVELOPMENT

UNION TOWNSHIP — BELMONT, OHIO

FIGURE	5.A
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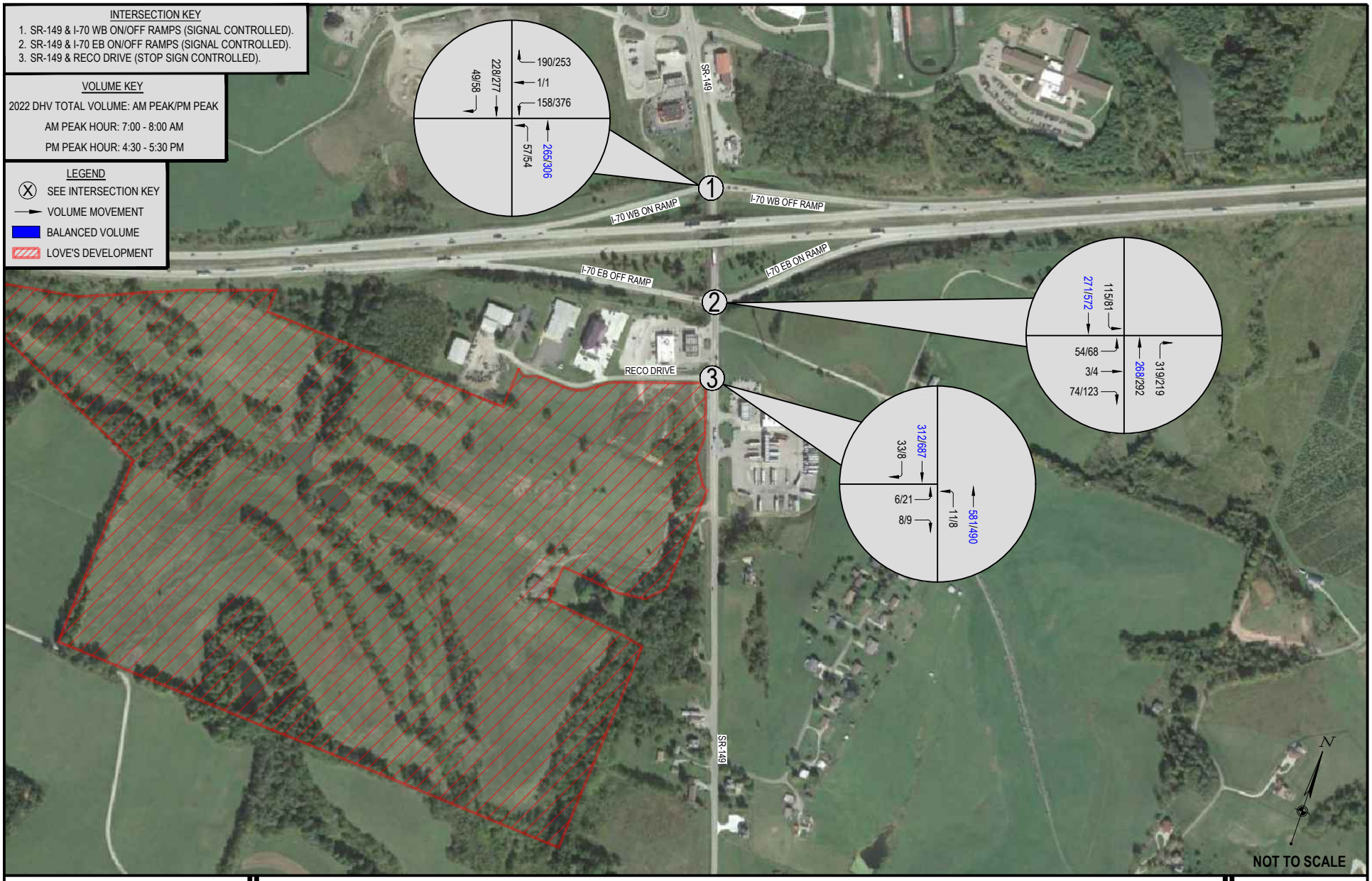

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2022 DESIGN HOUR TRAFFIC VOLUMES - TOTAL VOLUMES

LOVE'S DEVELOPMENT

UNION TOWNSHIP — BELMONT, OHIO

FIGURE	5.B
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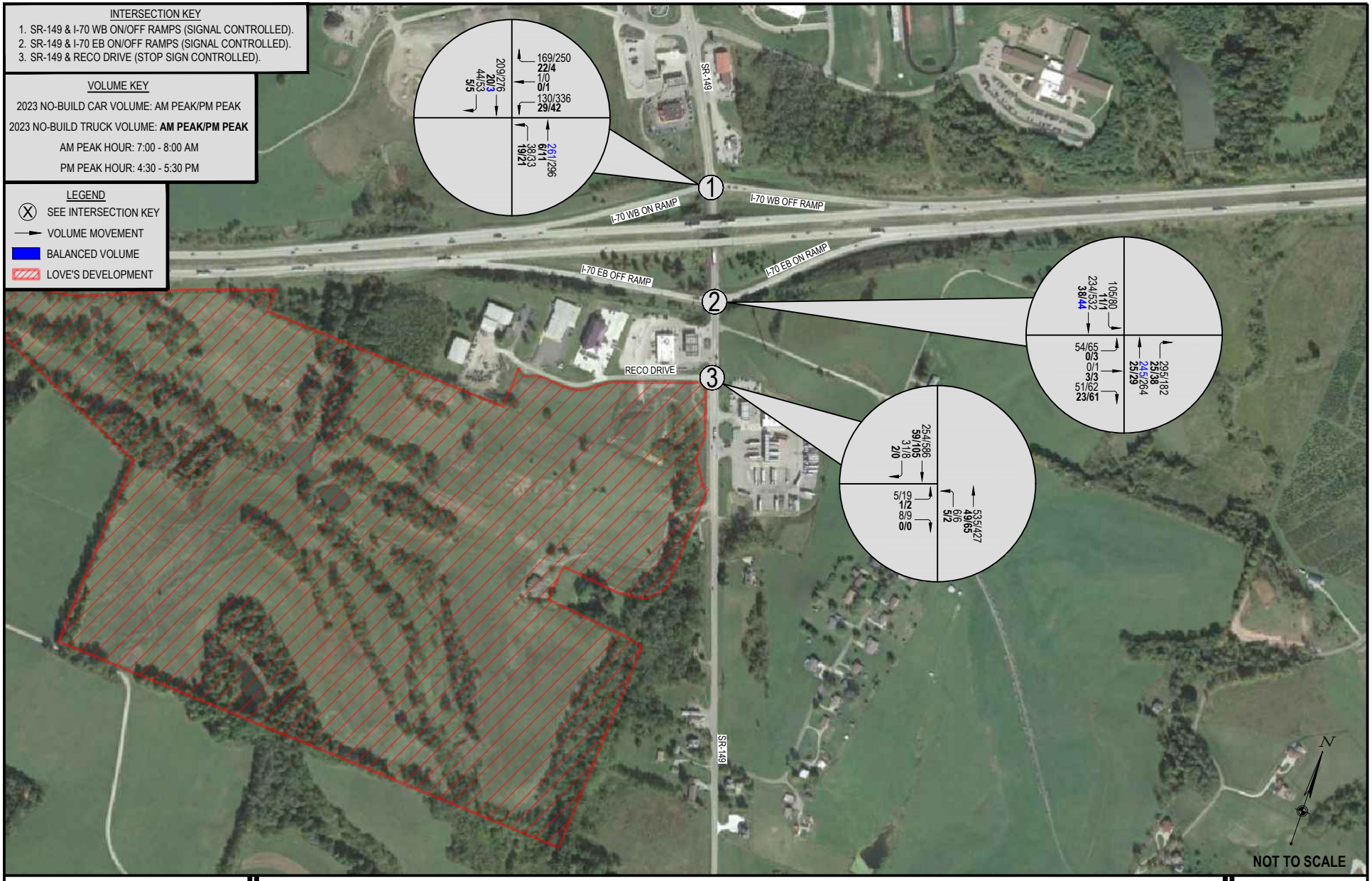
4. Estimates of 2023 No-Build Traffic in the Vicinity of the Site

4.1. 2023 No-Build Traffic Volumes

The 2023 No-Build Traffic Volumes – Cars and Trucks (Figure 6.A) were calculated by applying growth rates to the 2022 Design Hour Traffic Volumes (Figure 5.A). The growth rates were calculated using the linear regression method referenced in the *Ohio Traffic Forecasting Manual, Volume 2, Section 4.2* for all study roadways. A linear growth rate of 0.5 percent (%) was applied for one (1) year to the study roadways (growth factor of 1.005). The car and truck volumes shown on Figure 6.A were combined to form the 2023 No-Build Traffic Volumes – Total Volumes (Figure 6.B) for simplicity. The growth rate documentation is included in Appendix C of the report.



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2023 NO-BUILD TRAFFIC VOLUMES - CARS & TRUCKS

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 6.A

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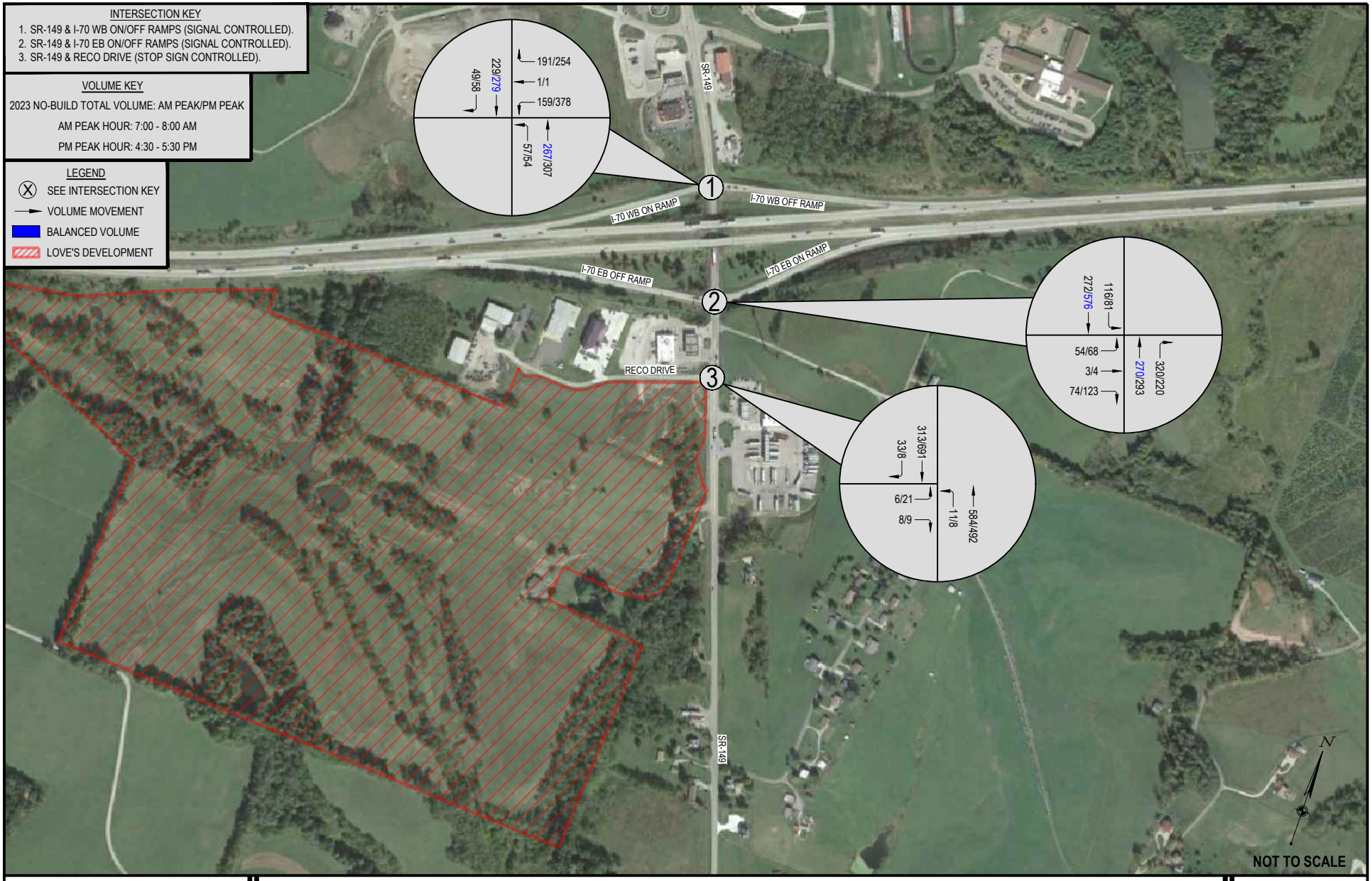

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2023 NO-BUILD TRAFFIC VOLUMES - TOTAL VOLUMES

LOVE'S DEVELOPMENT

UNION TOWNSHIP — BELMONT, OHIO

FIGURE	6.B
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5. Trip Generation

5.1. Site Generated Traffic Volumes

Studies of similar developments throughout North America have shown that the amount of traffic generated will be functionally related to some unit of activity (i.e., number of fueling stations, gross floor area, service bays, etc.). In development, site traffic fluctuates substantially on different days and hours throughout the year. Therefore, it is imperative to select an appropriate hourly volume on which to base the design of the external roadway and site access facilities. The Weekday AM and PM Peak Hours were selected based on the adjacent street traffic during this hour.

The 2023 Build and 2043 Design Year Traffic Scenarios include the proposed use of the Site as a Love's Development that consists of:

- Gasoline Service Station with a 11,300 S.F. Convenience Market consisting of 25 fueling positions (16 passenger car and 9 truck).
- Fast-Food Restaurant with Drive-through Window occupying approximately 3,100 S.F.
- Fast-Food Restaurant without Drive-through Window occupying approximately 2,900 S.F.
- Tire Store with 3 service bays.
- Campground/Recreational Vehicle Park with 70 campsites.

In addition, the Love's Development is projected to have approximately 104 parking spaces for passenger cars, 97 parking spaces for semi-trucks and 70 total RV parking spaces.

For analysis purposes, the base variable units for the trip-generation rates were fueling positions, KSF (Ex. 3.24 KSF = 3,240 S.F.), service-bays, and campsites. The Site Generated Traffic Volumes (Table 1) were calculated by utilizing data contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition,* in combination with methods outlined in the (ITE) Trip Generation Handbook.

Internal Capture Rates were calculated using the methodology contained in the (ITE) *Trip Generation Handbook, 3rd Edition* and using the NCHRP 684 Internal Trip Capture Estimation Tool spreadsheet. For the AM Peak Hour, the internal capture rate was calculated as 13%; for the PM Peak Hour, the internal capture rate was calculated as 19%. The estimation tool also provided internal capture percentages for the entering and exiting traffic based on land use and peak hour. The corresponding internal capture percentage was applied to each land use. In addition, pass-by trips were applied and based on percentages found in the (ITE) *Trip Generation Manual, 11th Edition*. The NCHRP Summary Sheets and ITE Land Use Calculations are located in Appendix D of the report.

The Site Generated Traffic Volumes are presented below in Table 1.

Table 1
Site Generated Traffic Volumes

ITE Land Use Description	ITE Cat.	Size	Unit	Total Generated Trips										
				Weekday			Weekday AM Peak Hour				Weekday PM Peak Hour			
				Tot	In	Out	[A]Tot	In	Out	[B]PB	[A]Tot	In	Out	[B]PB
Passenger Car														
Gasoline/Service Station with Convenience Market	945	16	Fuel Pos.	4,114	2,057	2,057	432	52	52	328	365	46	45	274
ITE Cat. 945 Entering (%)/Exiting (%)				*100%*	*50%*	*50%*	*100%*	*50%*	*50%*	*[C]76%*	*100%*	*50%*	*50%*	*[C]75%*
Internal Capture Applied				-------	-------	-------	391	49	46	296	318	38	40	240
Internal Capture Rates				-------	-------	-------	-------	*6%*	*13%*	-------	-------	*15%*	*11%*	-------
Fast-Food Restaurant with Drive-Through Window	934	3,100	S.F.	1,450	725	725	138	35	33	70	102	24	22	56
ITE Cat. 934 Entering (%)/Exiting (%)				*100%*	*50%*	*50%*	*100%*	*51%*	*49%*	*[C]50%*	*100%*	*52%*	*48%*	*[C]55%*
Internal Capture Applied				-------	-------	-------	110	26	30	54	66	17	13	36
Internal Capture Rates				-------	-------	-------	-------	*26%*	*14%*	-------	-------	*29%*	*41%*	-------
Fast-Food Restaurant without Drive-Through Window	933	2,900	S.F.	1,306	653	653	125	73	52	0	96	48	48	0
ITE Cat. 933 Entering (%)/Exiting (%)				*100%*	*50%*	*50%*	*100%*	*58%*	*42%*	*[C]0%*	*100%*	*50%*	*50%*	*[C]0%*
Internal Capture Applied				-------	-------	-------	99	54	45	0	62	34	28	0
Internal Capture Rates				-------	-------	-------	-------	*26%*	*14%*	-------	-------	*29%*	*41%*	-------
Total (No Internal Capture Applied)				6,870	3,435	3,435	695	160	137	398	563	118	115	330
Total (Internal Capture Subtracted)				6,870	3,435	3,435	600	129	121	350	446	89	81	276
RV/Truck/Semi-Trailer														
Campground/ Recreational Vehicle Park	416	70	Camp-sites	N/A	N/A	N/A	15	5	10	0	19	12	7	0
ITE Cat. 416 Entering (%)/Exiting (%)				-------	-------	-------	*100%*	*36%*	*64%*	*[C]0%*	*100%*	*65%*	*35%*	*[C]0%*
Internal Capture Applied				-------	-------	-------	15	5	10	0	19	12	7	0
Internal Capture Rates				-------	-------	-------	-------	*N/A*	*N/A*	-------	-------	*N/A*	*N/A*	-------
Truck Stop	950	9	Fuel Pos.	2,016	1,008	1,008	126	62	64	0	138	73	65	0
ITE Cat. 945 Entering (%)/Exiting (%)				*100%*	*50%*	*50%*	*100%*	*49%*	*51%*	*[C]0%*	*100%*	*53%*	*47%*	*[C]0%*
Internal Capture Applied				-------	-------	-------	114	58	56	0	119	62	57	0
Internal Capture Rates				-------	-------	-------	-------	*6%*	*13%*	-------	-------	*15%*	*11%*	-------
Tire Store	848	3	Srv. Bay	-------	-------	-------	6	4	2	0	10	4	6	0
ITE Cat. 848 Entering (%)/Exiting (%)				-------	-------	-------	*100%*	*64%*	*36%*	*[C]0%*	*100%*	*42%*	*58%*	*[C]0%*
Internal Capture Applied				-------	-------	-------	6	4	2	0	8	3	5	0
Internal Capture Rates				-------	-------	-------	-------	*6%*	*13%*	-------	-------	*15%*	*11%*	-------
Total (No Internal Capture Applied)				2,016	1,008	1,008	147	71	76	0	167	89	78	0
Total (Internal Capture Subtracted)				2,016	1,008	1,008	135	67	68	0	146	77	69	0
Net Trip Generation Summary				8,886	4,443	4,443	735	196	189	350	592	166	150	276

[A] – Primary Trips + Pass-by Trips, [B] – Pass-by Trips Generated, [C] – Percent (%) of [A]Tot, * - Volume rounded to even number

The full buildout of the Love's Travel Stop is estimated to generate 8,886 trips per day on a typical weekday (4,443 inbound and 4,443 outbound), of which 735 trips will be generated during the Weekday AM Peak Hour (371 inbound and 364 outbound) and 592 trips will be generated during the Weekday PM Peak Hour (304 inbound and 288 outbound).

Appendix D includes trip generation calculations and ITE Trip Generation Category 416, 848, 933, 934, 945, and 950 Sheets utilized to calculate the values presented in Table 1.

5.2. Directional Distribution of Site Generated Traffic Volumes

The directional distribution of the development-generated traffic is a function of several variables. The assumptions and methods used in estimating the direction in which traffic will approach and depart the Site varies with several location-specific conditions such as:

- Size and type of the proposed development.
- Population distribution within the defined area of influence.
- Prevailing operating conditions on the existing street system.

The analysis of directional distribution is based on the observation that drivers normally will choose the fastest (not necessarily the most direct) routes to and from a given traffic generator.

The internal trip assignment was based upon the proposed Site Plan and the understanding of the Love's Development operation. The traffic entering and exiting the development will not always travel the most direct route.

The anticipated directional distribution of trips generated by the proposed Love's Development is summarized in Table 2. Additionally, Figures 7.A-7.B illustrate the primary and pass-by/diverted directional distribution for passenger cars and Figure 7.C illustrates the primary/diverted directional distribution for trucks.

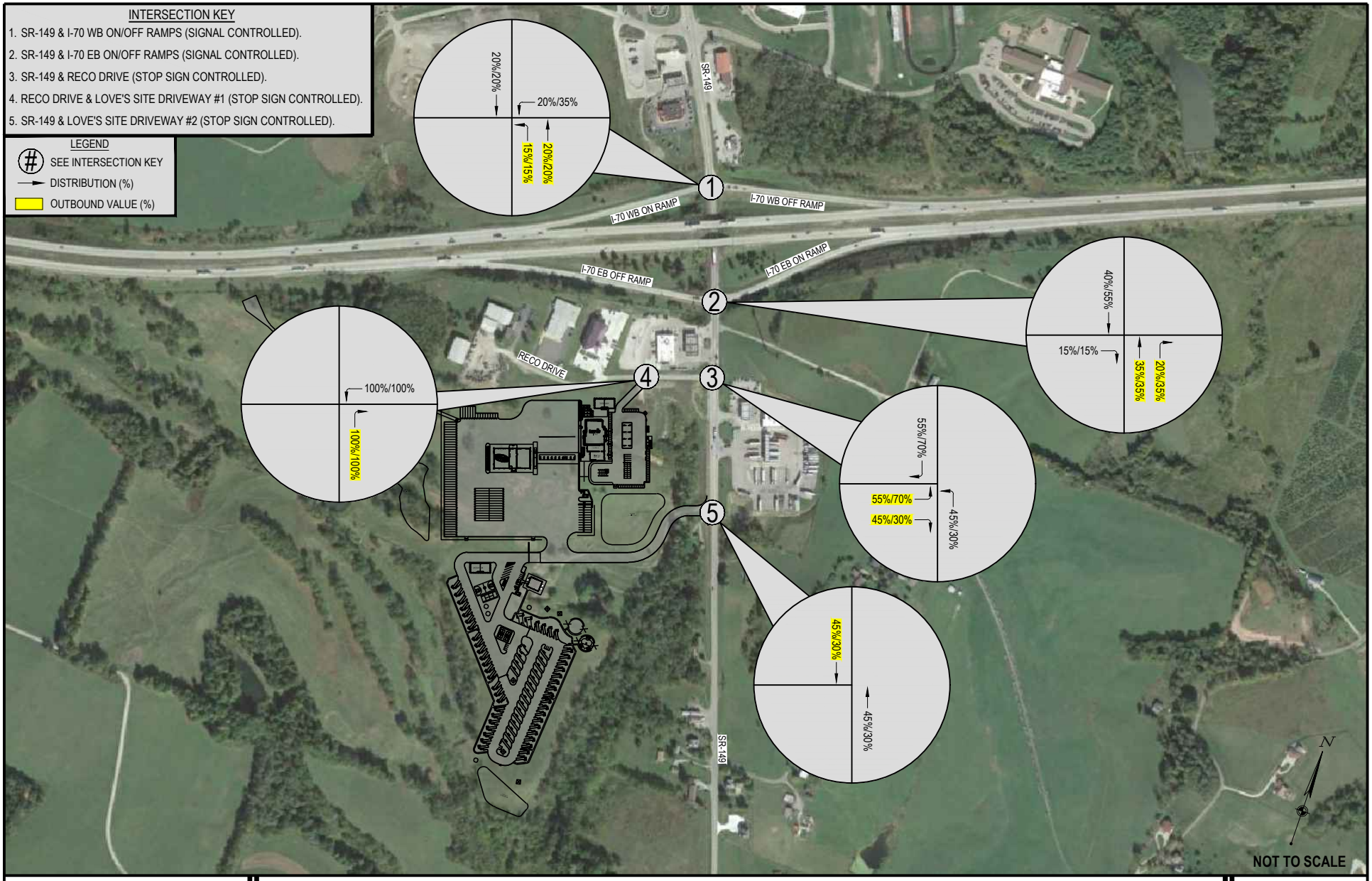
Table 2
Directional Distribution of Site Generated Traffic Volumes

Route	Distribution Approach/Departure	
	Passenger Cars	
	AM Peak Hour	PM Peak Hour
Primary Trip Distribution - Cars (Figure 7.A)		
To/From the East via I-70	20%/20%	35%/35%
To/From the West via I-70	15%/15%	15%/15%
To/From the North via SR-149	20%/20%	20%/20%
To/From the South via SR-149	45%/45%	30%/30%
TOTAL	**100%/100%**	**100%/100%**
Pass-by/Diverted Trip Distribution – Cars (Figure 7.B)		
Pass-by from the North/To the South via SR-149	25%/25%	20%/20%
Pass-by from the South/To the North via SR-149	25%/25%	15%/15%
Diverted from the East/To the West via I-70	30%/30%	45%/45%
Diverted from the West/To the East via I-70	20%/20%	20%/20%
TOTAL	**100%/100%**	**100%/100%**

Table 2 – Continued.
Directional Distribution of Site Generated Traffic Volumes

Route	Distribution Approach/Departure	
	Trucks	
	AM Peak Hour	PM Peak Hour
Primary/Diverted Trip Distribution - Trucks (Figure 7.C)		
To/From the North via SR-149	15%/15%	5%/5%
To/From the South via SR-149	25%/25%	15%/15%
Diverted from the East/To the West via I-70	40%/40%	35%/35%
Diverted from the West/To the East via I-70	20%/20%	45%/45%
TOTAL	**100%/100%**	**100%/100%**

Based upon the directional distributions listed in Table 2 and illustrated on Figures 7.A-7.C, the estimated Site Generated Traffic Volumes shown in Table 1 were distributed to the adjacent roadway system. The Site Generated Traffic Volumes are illustrated on Figures 8.A-8.C.



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DIRECTIONAL DISTRIBUTION OF SITE GENERATED TRAFFIC VOLUMES (CARS - PRIMARY)

LOVE'S DEVELOPMENT

UNION TOWNSHIP — BELMONT, OHIO

FIGURE	7.A
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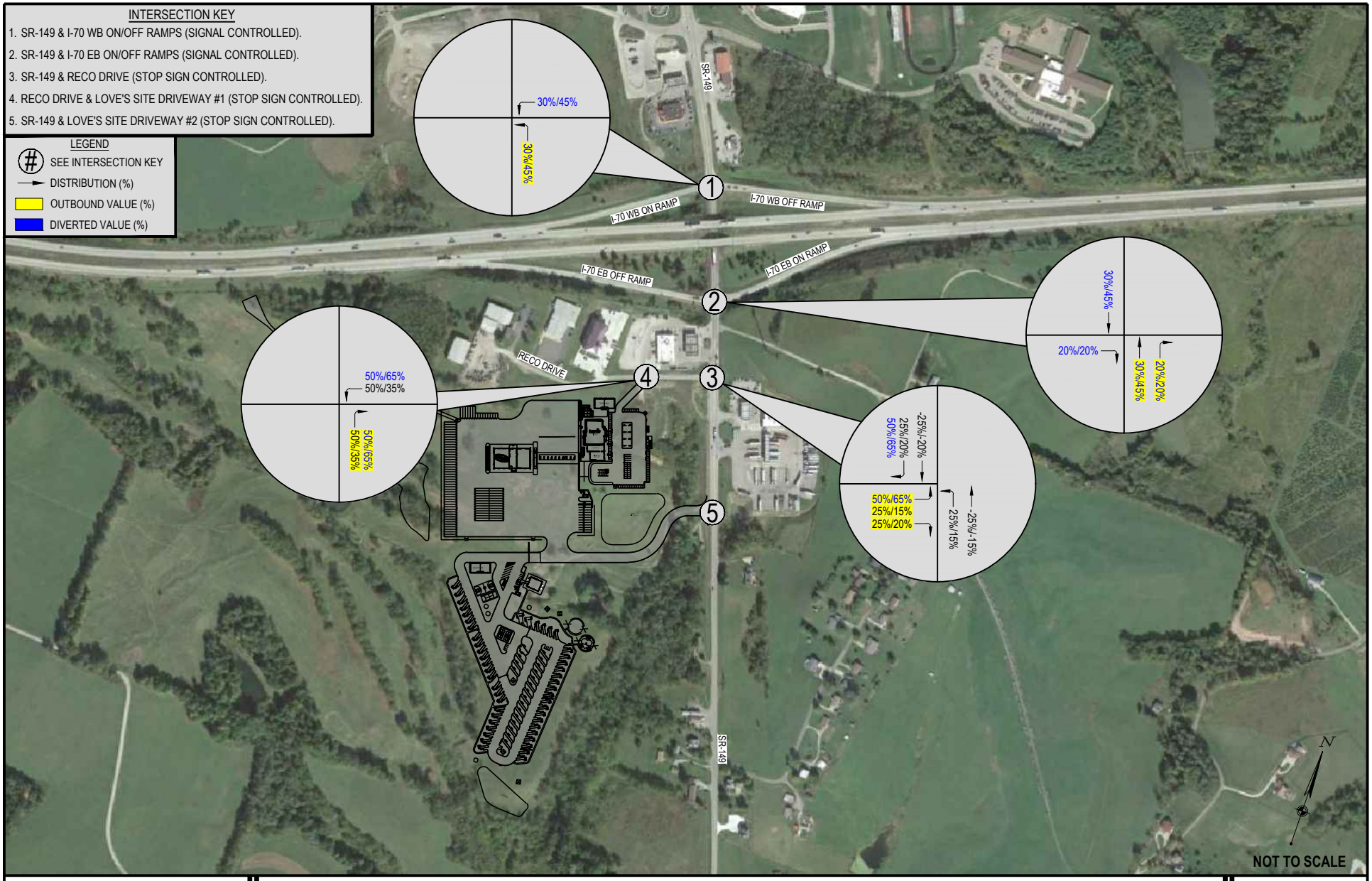

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DIRECTIONAL DISTRIBUTION OF SITE GENERATED TRAFFIC VOLUMES (CARS - PASS-BY/DIVERTED)

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE	7.B
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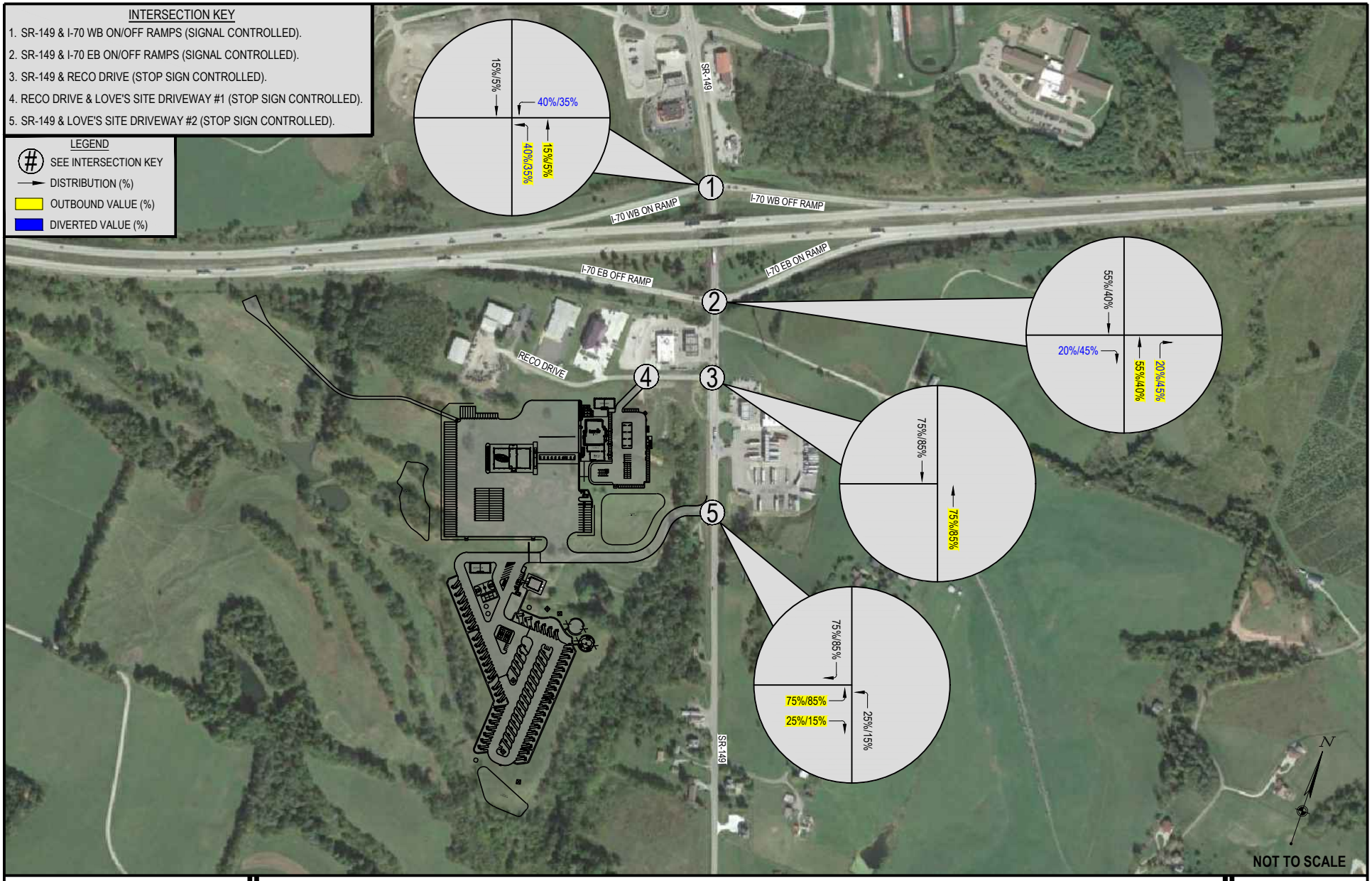

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DIRECTIONAL DISTRIBUTION OF SITE GENERATED TRAFFIC VOLUMES (TRUCKS - PRIMARY/DIVERTED)

LOVE'S DEVELOPMENT

UNION TOWNSHIP — BELMONT, OHIO

FIGURE	7.C
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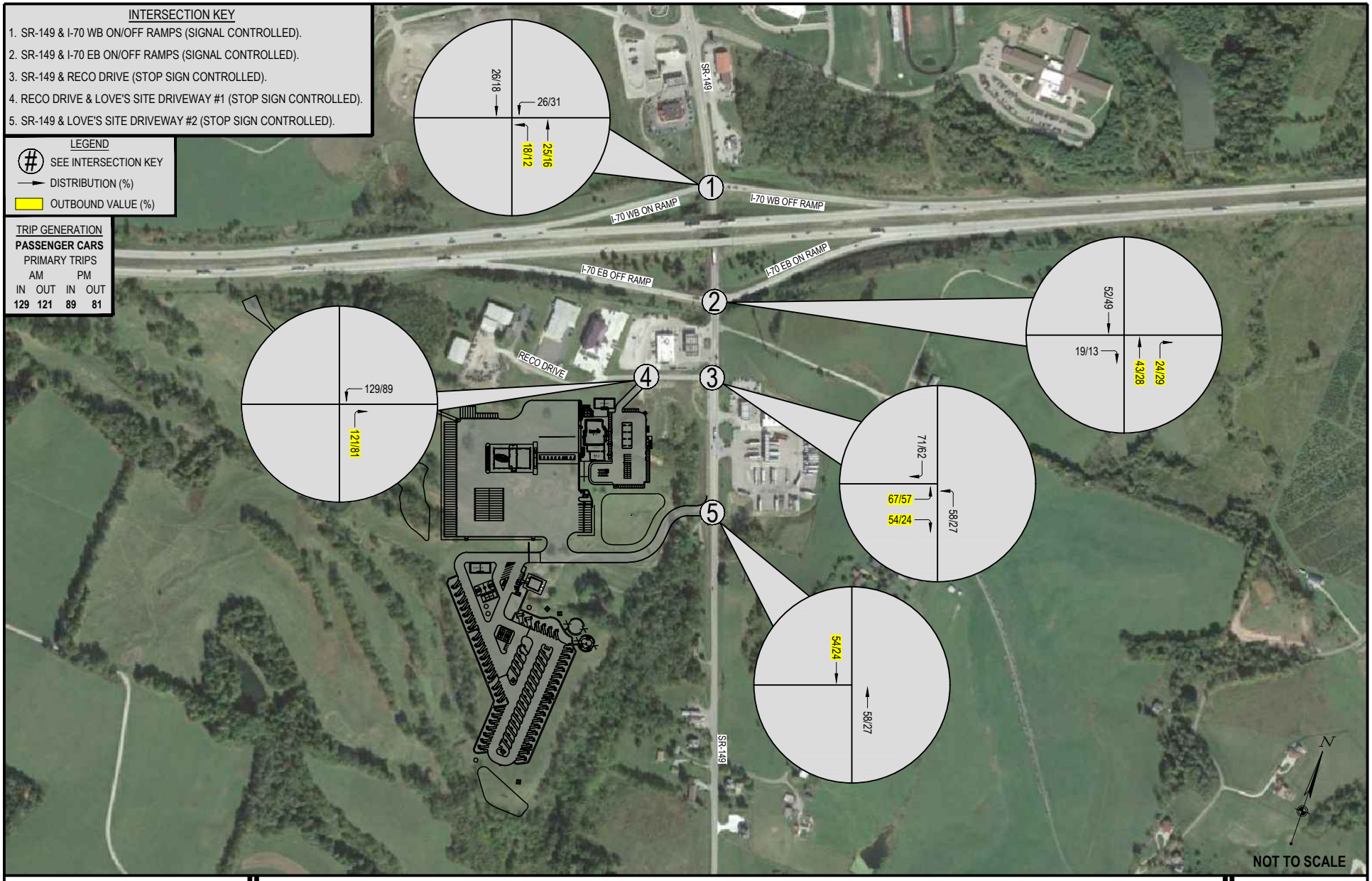

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SITE GENERATED TRAFFIC VOLUMES (CARS - PRIMARY)

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 8.A

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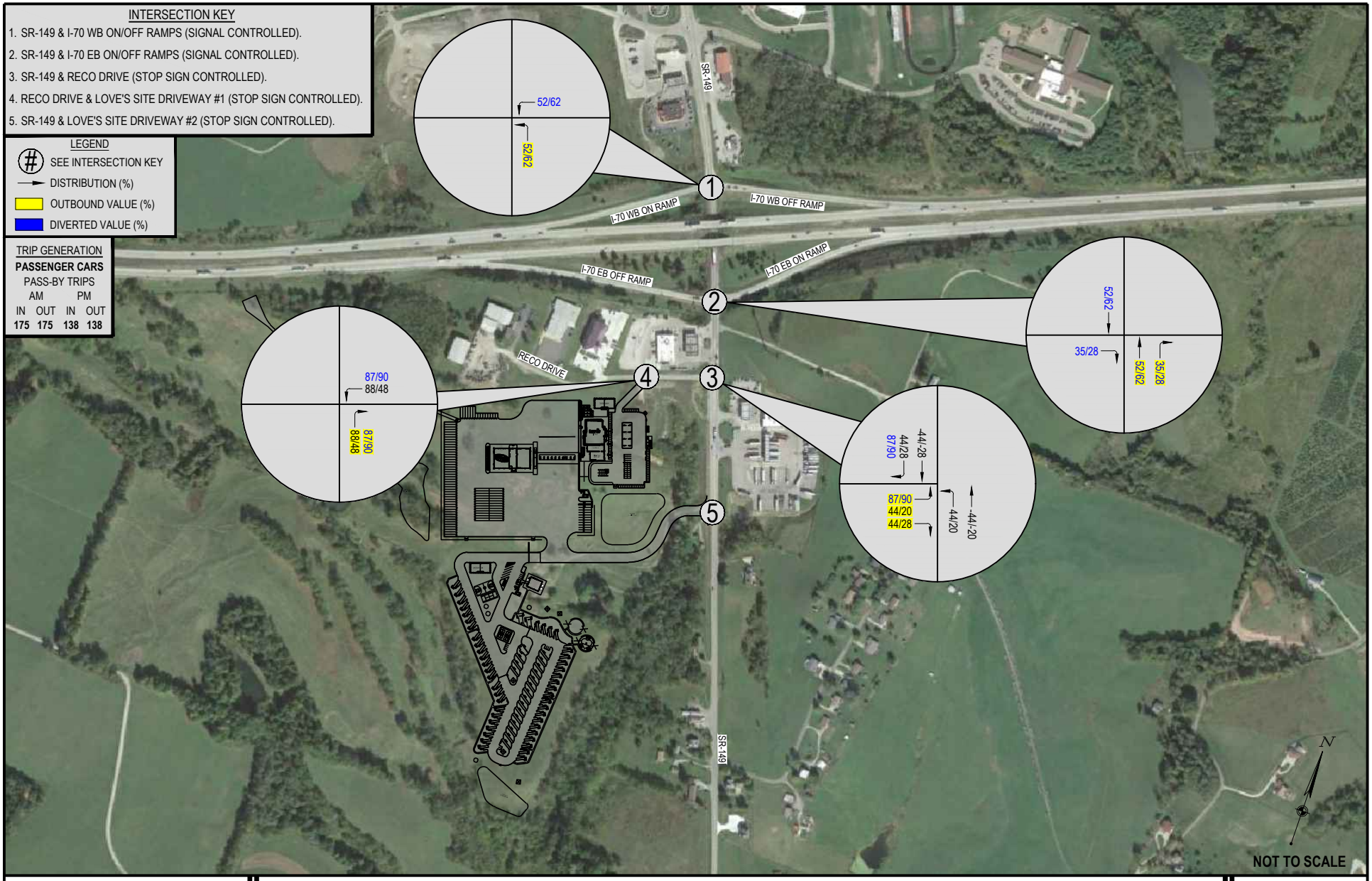

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SITE GENERATED TRAFFIC VOLUMES (CARS - PASS-BY/DIVERTED)

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 8.B

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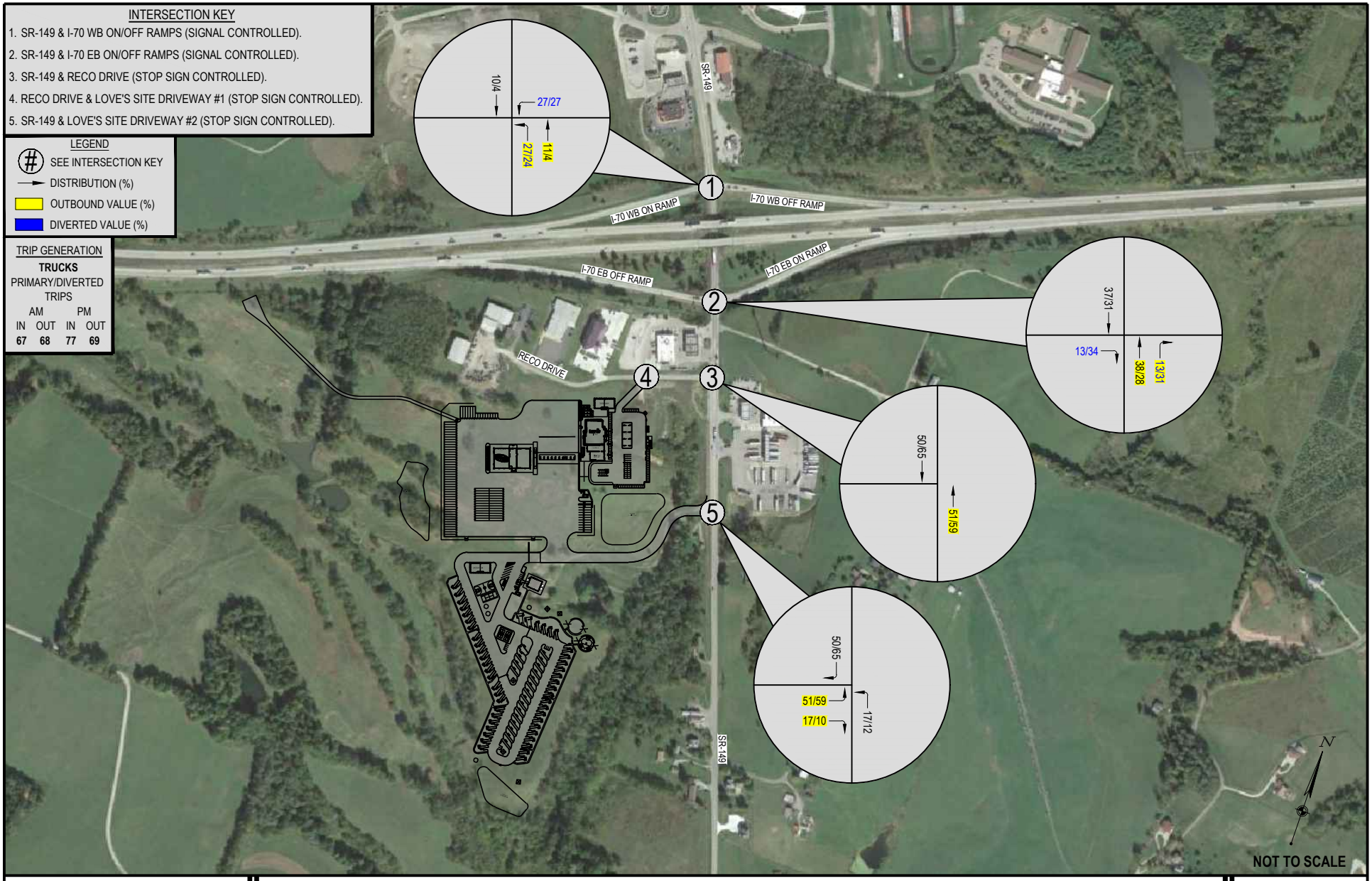

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SITE GENERATED TRAFFIC VOLUMES (TRUCKS - PRIMARY/DIVERTED)

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 8.C

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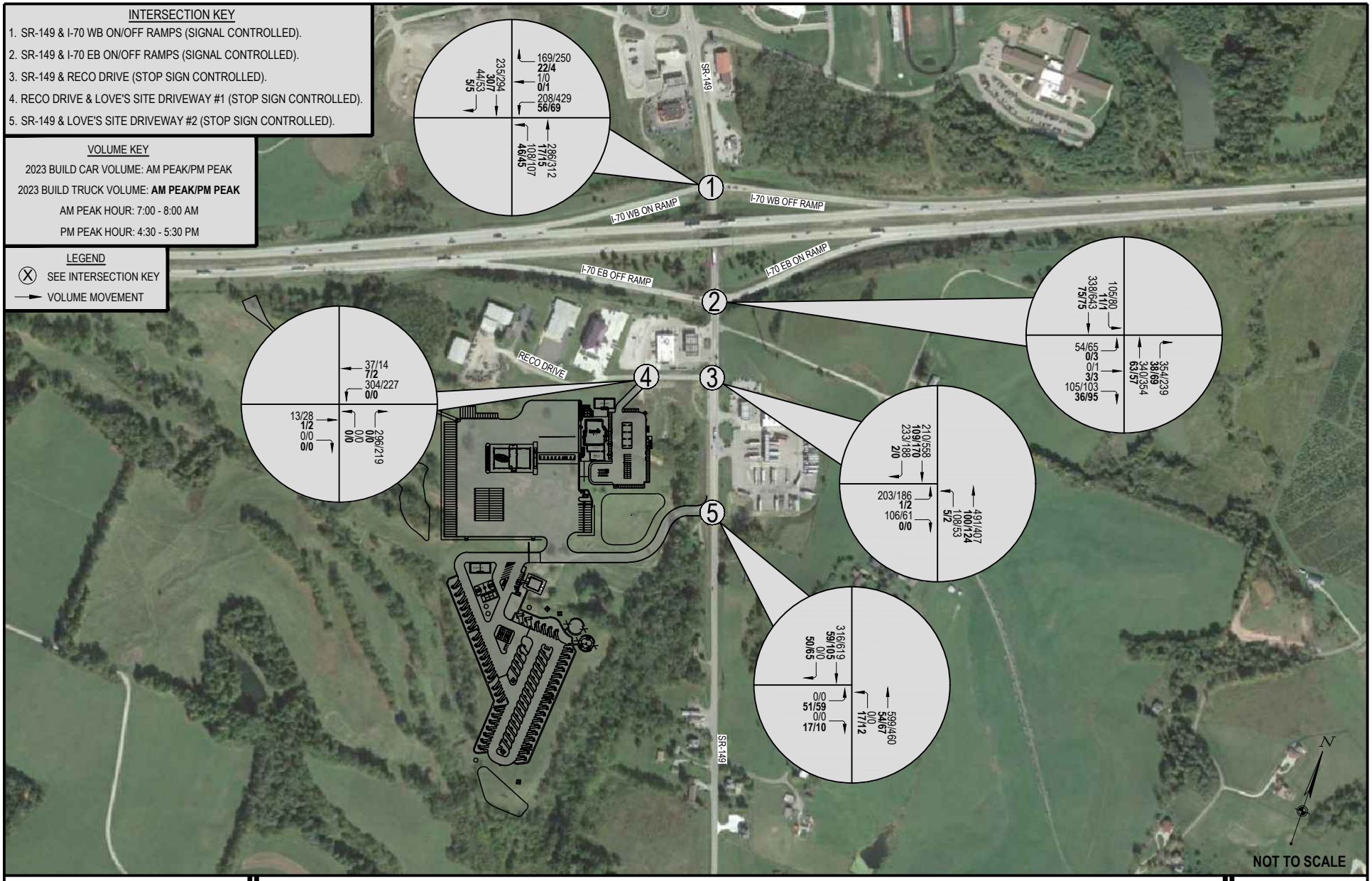
6. Estimates of 2023 Build Traffic in the Vicinity of the Site

6.1. 2023 Build Traffic Volumes

The 2023 Build Traffic Volumes (Figures 9.A-9.B) were calculated by adding the Site Generated Traffic Volumes (Figures 8.A-8.C) to the 2023 No-Build Traffic Volumes – Cars and Trucks (Figure 6.A). The car and truck volumes shown on Figure 9.A were combined to form the 2023 Build Traffic Volumes – Total Volumes (Figure 9.B) for simplicity.



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2023 BUILD TRAFFIC VOLUMES - CARS & TRUCKS

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 9.A

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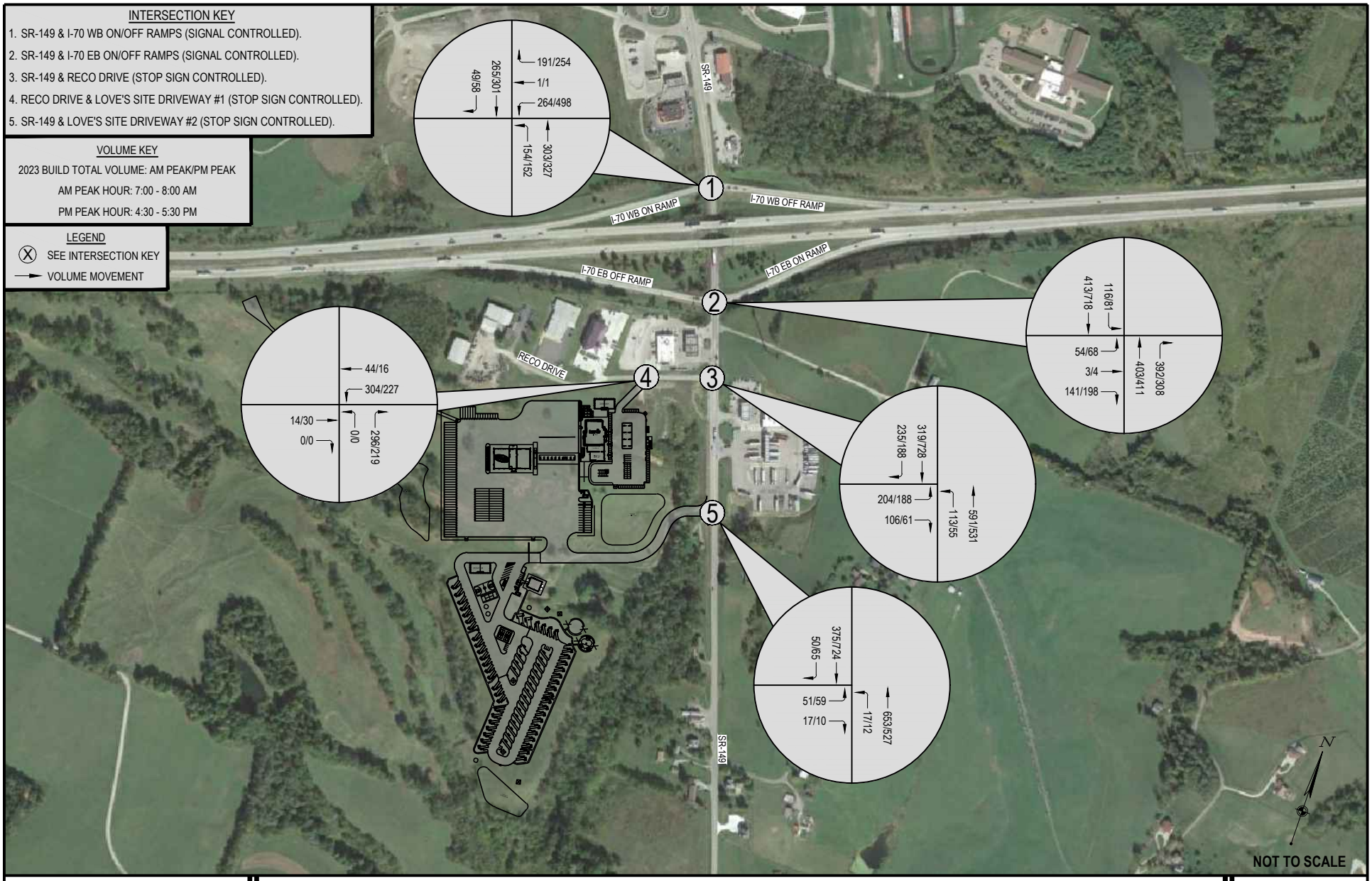

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2023 BUILD TRAFFIC VOLUMES - TOTAL VOLUMES

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 9.B

DATE:	11/21/2022
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7. Estimates of 2043 No-Build Traffic in the Vicinity of the Site

7.1. 2043 No-Build Traffic Volumes

The 2043 No-Build Traffic Volumes – Cars and Trucks (Figure 10.A) were calculated by applying growth rates to the 2022 Design Hour Traffic Volumes (Figure 5.A). The growth rates were calculated using the linear regression method referenced in the *Ohio Traffic Forecasting Manual, Volume 2, Section 4.2* for all study roadways. A linear growth rate of 0.5 percent (%) was applied for twenty-one (21) years to the study roadways (growth factor of 1.105). The car and truck volumes shown on Figure 10.A were combined to form the 2043 No-Build Traffic Volumes – Total Volumes (Figure 10.B) for simplicity. The growth rate documentation is included in Appendix C of the report.

7.2. Capacity Analysis Parameters

The capacity of an intersection (signalized or unsignalized) can best be described by its corresponding Level of Service (LOS). The level of service of an intersection is a qualitative measure of the various attributes of an intersection. There are six levels of service ranging from "ideal" free flow conditions at LOS "A," to forced or "breakdown" conditions at LOS "F." The level of service for signalized intersections is based upon the average stopped delay per vehicle for various movements within the intersection. Although volume capacity ratio (v/c) affects delay, there are other parameters that more strongly affect it, such as the quality of progression, length of green phases, cycle lengths, and others. Thus, for any given v/c ratio, a range of delay values may result, and vice versa.

The level of service for unsignalized intersections is based upon total delay. Total delay is defined in the *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis,* as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. Table 3 summarizes the LOS definitions for unsignalized intersections. Throughout the report "unsignalized intersections" are commonly referred to as "stop sign controlled."

Table 3
Level of Service Criteria (Unsignalized Intersections)

Level of Service	Delay per Vehicle (Sec.)	Description
A	≤ 10.0	Little or no delay.
B	> 10.0 and ≤ 15.0	Short traffic delays.
C	> 15.0 and ≤ 25.0	Average traffic delays.
D	> 25.0 and ≤ 35.0	Long traffic delays.
E	> 35.0 and ≤ 50.0	Very long traffic delays.
F	≥ 50.0	Extreme traffic delays.

Source: *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis*. Transportation Research Board.

Highway Capacity Manual 2016 (HCM 6th Edition) methodology was used in the Traffic Impact Study to remain consistent with "state-of-the-practice" professional standards. It is important to note that the Level of Service Criteria for unsignalized intersections is different than for signalized intersections. For example, a delay of 18 seconds yields level of service C under the unsignalized LOS criteria (see Table 3) while yielding level of service B under the signalized intersection LOS criteria (see Table 4). Table 4 summarizes the LOS definitions for signalized intersections.

Table 4
Level of Service Criteria (Signalized Intersections)

Level of Service	Delay per Vehicle (Sec.)	Description
A	< 10.0	Most vehicles do not stop at all.
B	> 10.0 and ≤ 20.0	More vehicles stop than with LOS A.
C	> 20.0 and ≤ 35.0	The number of vehicles stopping is significant, although many pass through without stopping.
D	> 35.0 and ≤ 55.0	Many Vehicles stop. Individual cycle failures are noticeable.
E	> 55.0 and ≤ 80.0	Considered to be the limit of acceptable delay. Individual cycle failures are frequent.
F	> 80.0	Unacceptable delay.

Source: *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis*. Transportation Research Board.

Highway Capacity Software (HCS) Version 8.1 was utilized to calculate delay and level of service values. *ODOT Analysis and Traffic Simulation Manual (OATS)*, Section 6.2.2.1 was used for default saturation flow rate, arrival type, upstream filtering, initial queue, right turn on red value, and queue length percentile for all HCS intersection analyses. HCS Version 8.1 model parameters include traffic volumes, movements, heavy vehicle percentage, intersection traffic control, storage length, and lane widths. Per Section 5.2 of the OATS Manual, the peak hour factors (PHF) from the intersection TMCs were used and a PHF of 0.92 was used for the proposed site driveway intersections.

Per Section 8.1.1 of the OATS Manual, the capacity results presented in the tables below should be highlighted using the following color scheme:

- LOS D = Yellow
- LOS E = Orange
- LOS F = Red
- v/c ratio > 0.93 = Orange
- v/c ratio ≥ 1.0 = Red
- Queue-Storage Ratio (QSR) ≥ 1.0 = Red

Note: According to the ODOT Analysis and Traffic Simulation Manual (OATS), Section 5.9, the operational goals for intersection analyses (TWSC and Signalized) are to operate at overall LOS D or better conditions and for each movement to operate at LOS E or better conditions.

7.3. 2043 No-Build Traffic Scenario Capacity Analysis

Utilizing the 2043 No-Build Traffic Volumes illustrated on Figures 10.A-10.B, capacity calculations were performed for the key study intersections. Capacity calculations followed procedures documented in the *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016). All study intersections were analyzed with HCS Version 8.1 methodology.

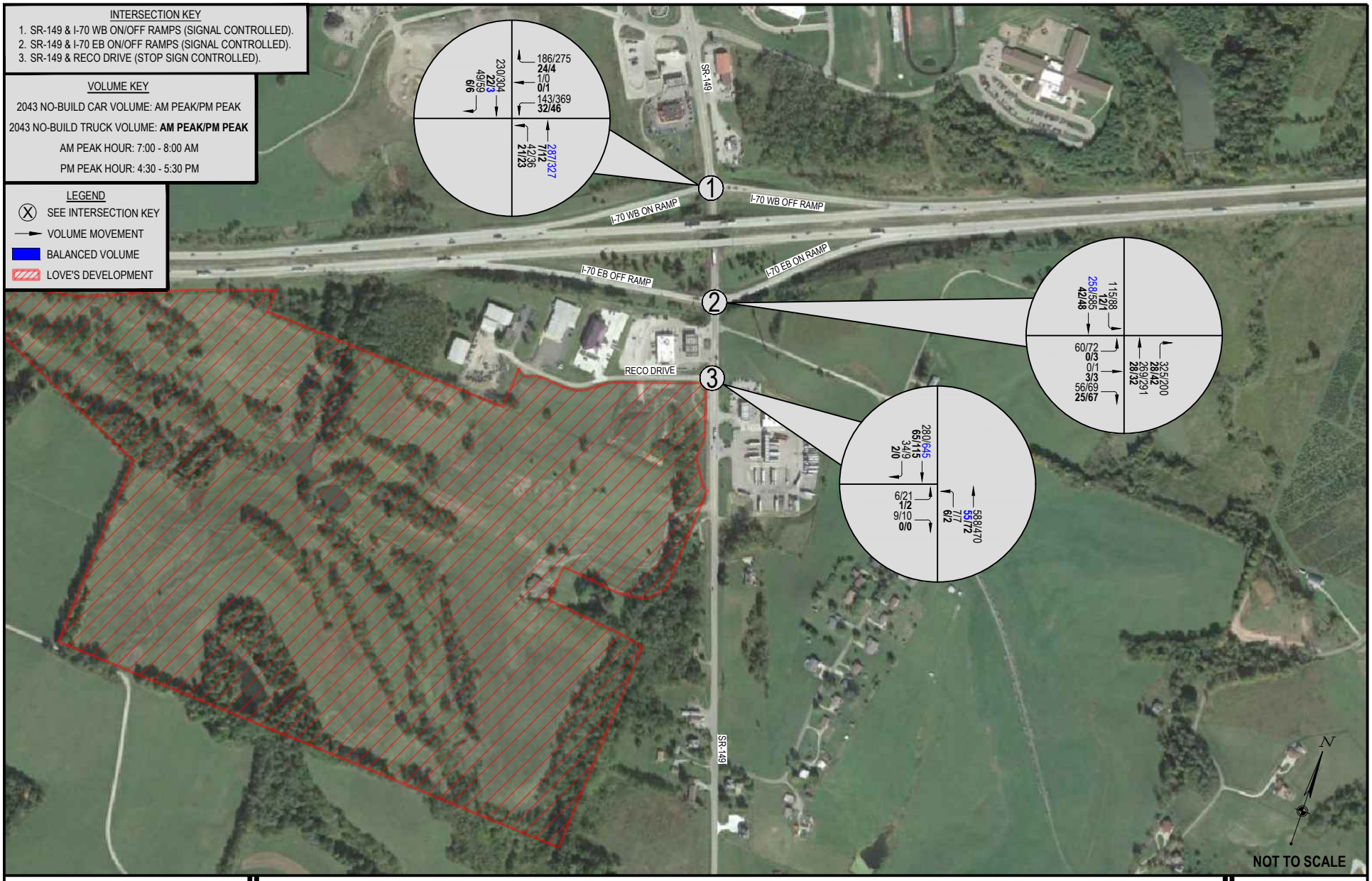
Table 5 summarizes the capacity analyses results for the 2043 No-Build Traffic Scenario.

Table 5
Summary of 2043 No-Build Traffic Scenario Capacity Analysis

Lane	2043 AM Peak Hour No-Build					2043 PM Peak Hour No-Build				
	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)
SR-149 & I-70 WB On/Off Ramps										
Intersection	**B**	**19.8**	--	--	--	**C**	**22.0**	--	--	--
WBLT	C	27.1	0.570	0.16	183.2	D	35.1	0.866	0.30	343.5
WBR	D	36.5	0.765	0.71	248.5	C	22.2	0.653	0.57	199.5
WB Approach	**C**	**32.2**	--	--	--	**C**	**29.9**	--	--	--
NBLT	B	14.3	0.439	0.57	228.0	B	14.9	0.551	0.50	200.0
NB Approach	**B**	**14.3**	--	--	--	**B**	**14.9**	--	--	--
SBTR	B	10.2	0.408	0.24	152.4	B	14.4	0.507	0.29	184.2
SB Approach	**B**	**10.2**	--	--	--	**B**	**14.4**	--	--	--
SR-149 & I-70 EB On/Off Ramps										
Intersection	**B**	**17.7**	--	--	--	**B**	**13.1**	--	--	--
EBLT	C	20.3	0.162	0.03	42.8	C	22.9	0.310	0.04	57.0
EBR	C	20.8	0.234	0.25	62.5	C	27.4	0.602	0.51	127.5
EB Approach	**C**	**20.6**	--	--	--	**C**	**25.7**	--	--	--
NBT	B	11.6	0.376	0.31	145.7	A	8.0	0.363	0.22	103.4
NBR	B	14.3	0.528	0.49	200.9	A	7.7	0.321	0.19	77.9
NB Approach	**B**	**13.1**	--	--	--	**A**	**7.8**	--	--	--
SBLT	C	23.4	0.739	0.87	348.0	B	13.5	0.798	0.63	252.0
SB Approach	**C**	**23.4**	--	--	--	**B**	**13.5**	--	--	--
SR-149 & Reco Drive										
Intersection	--	--	--	--	--	--	--	--	--	--
EBLR	B	13.5	0.040	--	2.5	D	27.0	0.180	--	15.0
NBLT	A	8.3	0.010	--	0.0	A	9.8	0.010	--	0.0
L – Left T – Through R – Right										

Under the **2043 No-Build Traffic Scenario**, the signal-controlled intersections operate at overall level of service (LOS) "C" or better conditions. In addition, the individual movements of the stop-controlled intersection operate at level of service (LOS) "D" or better conditions.

The 2043 No-Build Traffic Scenario Capacity Analysis Summary Sheets are contained in Appendix E of the report.



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2043 NO-BUILD TRAFFIC VOLUMES - CARS & TRUCKS

LOVE'S DEVELOPMENT

UNION TOWNSHIP — BELMONT, OHIO

FIGURE	10.A
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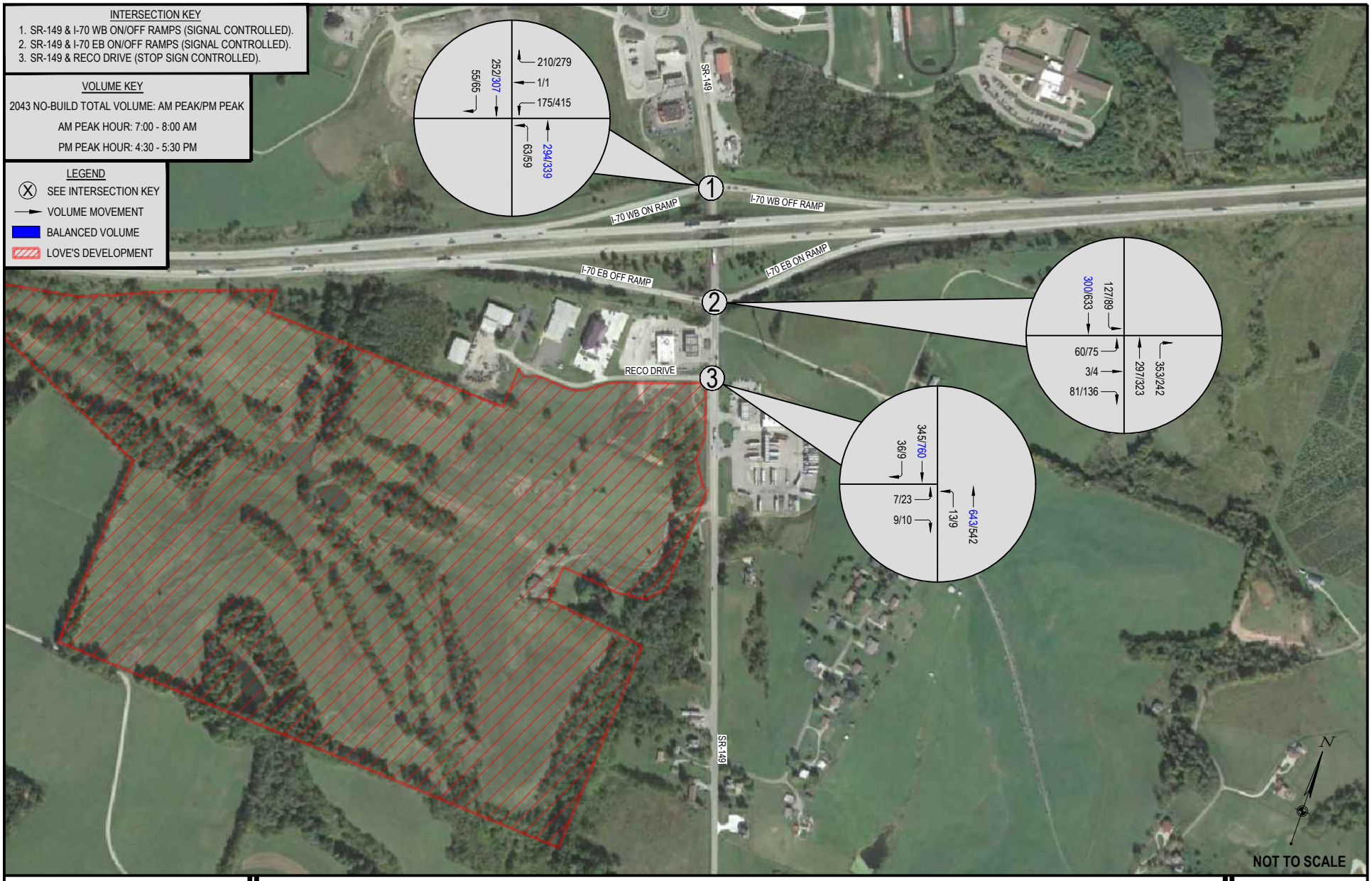

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2043 NO-BUILD TRAFFIC VOLUMES - TOTAL VOLUMES

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 10.B

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8. Estimates of 2043 Design Year Traffic in the Vicinity of the Site

8.1. 2043 Design Year Traffic Volumes

The 2043 Design Year Traffic Volumes (Figures 11.A-11.B) were calculated by adding the Site Generated Traffic Volumes (Figures 8.A-8.C) to the 2043 No-Build Traffic Volumes – Cars and Trucks (Figure 10.A). The car and truck volumes shown on Figure 11.A were combined to form the 2043 Design Year Traffic Volumes – Total Volumes (Figure 11.B) for simplicity.

8.2. 2043 Design Year Traffic Scenario Capacity Analysis – Build Condition 1 and Build Condition 2

Utilizing the 2043 Design Year Traffic Volumes illustrated on Figures 11.A-11.B, capacity calculations were performed for the Site driveways and key study intersections. Capacity calculations followed procedures documented in the *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016). All study intersections were analyzed with HCS Version 8.1 methodology. Tables 6 and 7 summarize the capacity analyses results for the 2043 Design Year Traffic Scenario Condition 1 (existing geometry) and Condition 2 (with improvements). *NOTE: Table 7 only shows the capacity analysis results for the intersections that were impacted by the recommended improvements.*

Table 6
Summary of 2043 Design Year Traffic Scenario Capacity Analysis – Build Condition 1

Lane	2043 AM Peak Hour Design Year					2043 PM Peak Hour Design Year				
	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)
SR-149 & I-70 WB On/Off Ramps										
Intersection	**C**	**33.0**	--	--	--	**E**	**61.3**	--	--	--
WBLT	E	57.3	0.927	0.35	400.8	F	109.0	1.145	0.70	801.5
WBR	D	37.8	0.779	0.74	259.0	C	22.8	0.670	0.59	206.5
WB Approach	**D**	**49.0**	--	--	--	**E**	**79.5**	--	--	--
NBLT	C	32.4	0.803	1.11	444.0	F	68.2	1.035	1.45	580.0
NB Approach	**C**	**32.4**	--	--	--	**E**	**68.2**	--	--	--
SBTR	B	10.9	0.462	0.28	177.8	B	15.0	0.540	0.32	203.2
SB Approach	**B**	**10.9**	--	--	--	**B**	**15.0**	--	--	--
SR-149 & I-70 EB On/Off Ramps										
Intersection	**E**	**59.7**	--	--	--	**C**	**22.5**	--	--	--
EBLT	C	20.3	0.162	0.03	42.8	C	23.0	0.321	0.05	71.3
EBR	C	22.4	0.428	0.49	122.5	E	75.4	0.965	1.41	352.5
EB Approach	**C**	**21.7**	--	--	--	**E**	**61.1**	--	--	--
NBT	B	14.6	0.564	0.53	249.1	A	9.8	0.513	0.36	169.2
NBR	B	17.5	0.657	0.66	270.6	A	9.3	0.453	0.30	123.0
NB Approach	**B**	**16.1**	--	--	--	**A**	**9.6**	--	--	--
SBLT	F	132.3	1.205	2.81	1124.0	C	21.0	0.939	0.97	388.0
SB Approach	**F**	**132.3**	--	--	--	**C**	**21.0**	--	--	--
SR-149 & Reco Drive										
Intersection	--	--	--	--	--	--	--	--	--	--
EBLR	F	356.3	1.660	--	572.5	F	630.5	2.220	--	575.0
NBLT	A	9.8	0.150	--	12.5	B	11.8	0.100	--	7.5
L – Left T – Through R – Right										

Table 6 – Continued.
Summary of 2043 Design Year Traffic Scenario Capacity Analysis – Build Condition 1

Lane	2043 AM Peak Hour Design Year					2043 PM Peak Hour Design Year				
	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)
Reco Drive & Love's Site Driveway #1										
Intersection	--	--	--	--	--	--	--	--	--	--
WBLT	A	7.8	0.210	--	20.0	A	7.7	0.160	--	15.0
NBLR	A	9.8	0.300	--	32.5	A	9.5	0.230	--	22.5
SR-149 & Love's Site Driveway #2										
Intersection	--	--	--	--	--	--	--	--	--	--
EBLR	F	58.0	0.540	--	65.0	F	170.6	0.930	--	125.0
NBLT	A	8.6	0.020	--	2.5	B	10.4	0.020	--	2.5
L – Left T – Through R – Right										

Under the **2043 Design Year Traffic Scenario Build Condition 1**, the signal-controlled intersections operate at overall level of service (LOS) "E" or better conditions. In addition, the individual movements of the stop-controlled intersections operate at level of service (LOS) "B" or better conditions with the exception of the following:

- The EBLR movement at the SR-149 & Reco Drive intersection which operates at LOS "F" during both the AM and PM Peak Hours.
- The EBLR movement at the SR-149 & Love's Site Driveway #2 intersection which operates at LOS "F" during both the AM and PM Peak Hours.

Table 7
Summary of 2043 Design Year Traffic Scenario Capacity Analysis – Build Condition 2

Lane	2043 AM Peak Hour Design Year					2043 PM Peak Hour Design Year				
	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)
SR-149 & I-70 WB On/Off Ramps										
Intersection	**C**	**20.1**	--	--	--	**C**	**32.7**	--	--	--
WBLT	C	30.7	0.885	0.26	297.7	D	42.2	0.947	0.42	480.9
WBR	C	27.8	0.743	0.63	220.5	B	16.4	0.554	0.48	168.0
WB Approach	**C**	**29.4**	--	--	--	**C**	**33.3**	--	--	--
NBLT	B	14.0	0.512	0.47	188.0	D	45.2	0.886	0.89	356.0
NB Approach	**B**	**14.0**	--	--	--	**D**	**45.2**	--	--	--
SBTR	B	11.6	0.471	0.30	190.5	C	20.4	0.631	0.37	235.0
SB Approach	**B**	**11.6**	--	--	--	**C**	**20.4**	--	--	--
SR-149 & I-70 EB On/Off Ramps										
Intersection	**B**	**18.0**	--	--	--	**C**	**28.6**	--	--	--
EBLT	C	30.1	0.315	0.04	57.0	C	21.8	0.293	0.04	57.0
EBR	D	36.1	0.834	0.66	165.0	C	29.4	0.883	0.85	212.5
EB Approach	**C**	**34.4**	--	--	--	**C**	**27.4**	--	--	--
NBT	A	8.7	0.250	0.44	110.0	B	14.9	0.343	0.75	187.5
NBR	A	5.5	0.292	0.26	65.0	B	12.1	0.303	0.45	112.5
NB Approach	**A**	**7.1**	--	--	--	**B**	**13.7**	--	--	--
SBLT	C	20.9	0.711	1.17	468.0	F	37.3	1.032	0.95	380.0
SB Approach	**C**	**20.9**	--	--	--	**D**	**37.3**	--	--	--
L – Left T – Through R – Right										

Table 7 – Continued.
Summary of 2043 Design Year Traffic Scenario Capacity Analysis – Build Condition 2

Lane	2043 AM Peak Hour Design Year					2043 PM Peak Hour Design Year				
	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft)
SR-149 & Reco Drive										
Intersection	**C**	**21.3**	--	--	--	**D**	**54.6**	--	--	--
EBLTR	D	48.8	0.907	0.65	325.0	D	49.1	0.878	0.51	255.0
EB Approach	**D**	**48.8**	--	--	--	**D**	**49.1**	--	--	--
NBL	B	12.3	0.330	0.26	45.5	B	15.9	0.302	0.12	21.0
NBT	A	8.8	0.337	0.67	117.3	A	7.3	0.359	0.55	96.3
NBR	B	11.4	0.513	1.03	180.3	A	7.6	0.375	0.51	89.3
NB Approach	**B**	**10.6**	--	--	--	**A**	**8.2**	--	--	--
SBT	C	24.3	0.647	1.25	312.5	F	103.3	1.179	3.87	967.5
SBR	B	15.6	0.517	0.78	156.0	B	17.1	0.330	0.51	102.0
SB Approach	**C**	**20.8**	--	--	--	**F**	**86.8**	--	--	--
SR-149 & Love's Site Driveway #2										
Intersection	--	--	--	--	--	--	--	--	--	--
EBLR	F	52.8	0.510	--	60.0	F	147.7	0.870	--	115.0
NBL	A	8.6	0.020	--	2.5	B	10.4	0.020	--	2.5
L – Left T – Through R – Right										

Under the **2043 Design Year Traffic Scenario Build Condition 2**, the signal-controlled intersections operate at overall level of service (LOS) "D" or better conditions. In addition, the individual movements of the stop-controlled intersection operate at level of service (LOS) "B" or better conditions with the exception of the following:

- The EBLR movement at the SR-149 & Love's Site Driveway #2 intersection which operates at LOS "F" during both the AM and PM Peak Hours.

The recommended improvements include the following:

- The installation of a traffic signal at the intersection of SR-149 & Reco Drive, coordinated with the signal-controlled intersections of SR-149 & I-70 WB On/Off Ramps, SR-149 & I-70 EB On/Off Ramps, and SR-149 & Bond Drive.

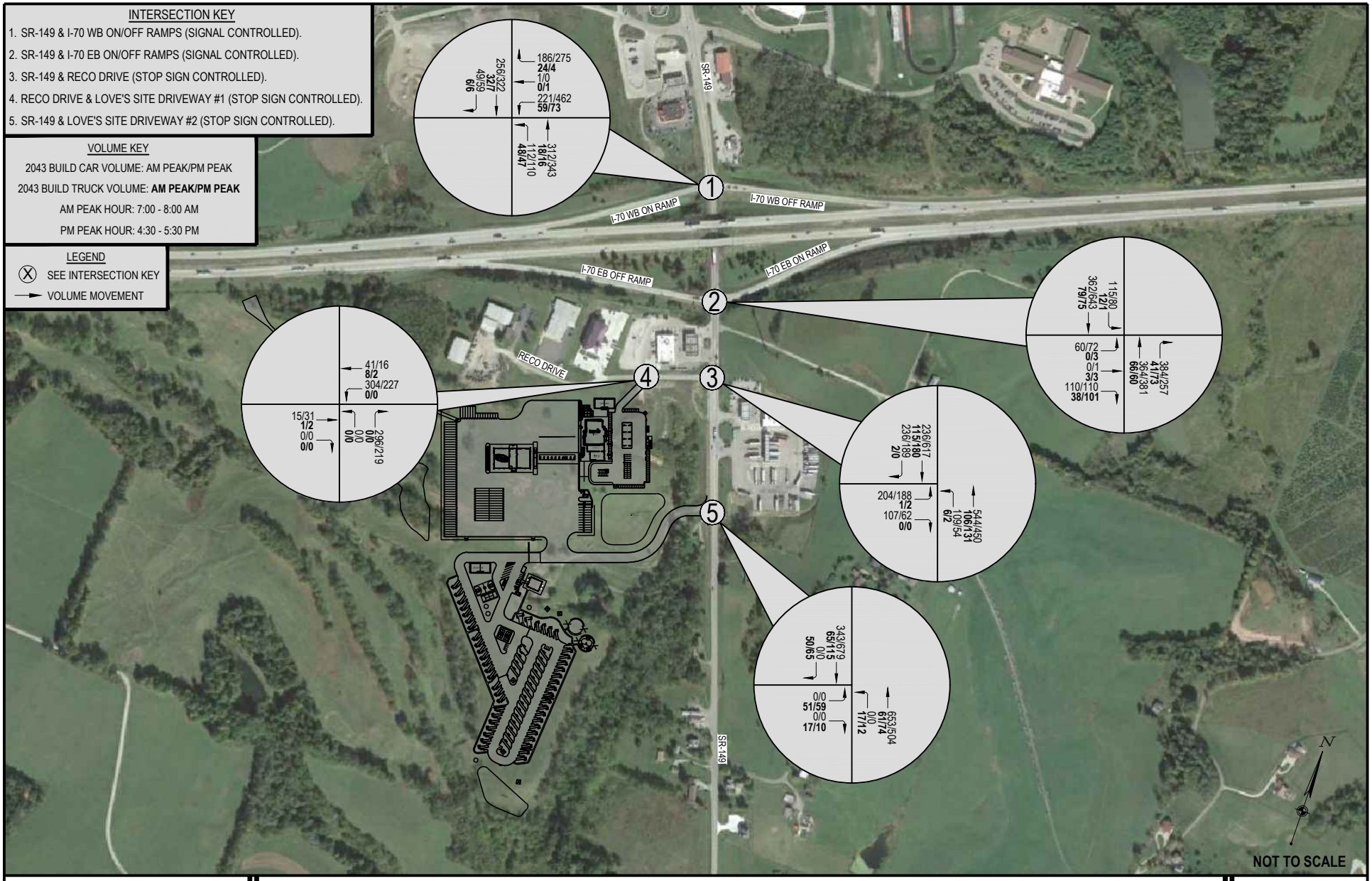
- Restripe the existing inside through lane on SR-149 to reflect a continuous two-way left-turn lane back to Pilot's South Driveway.

- Construction of a NB to WB left-turn lane at the intersection of SR-149 & Love's Site Driveway #2.

- Construction of a SB to WB right-turn lane at both intersections of SR-149 & Reco Drive and SR-149 & Love's Site Driveway #2.

- Signal timing splits and offsets were optimized at the signal-controlled intersections.

The 2043 Design Year Traffic Scenario Capacity Analysis Summary Sheets (Build Condition 1 and Build Condition 2) are contained in Appendix F of the report.



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2043 DESIGN YEAR TRAFFIC VOLUMES - CARS & TRUCKS

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE	11.A
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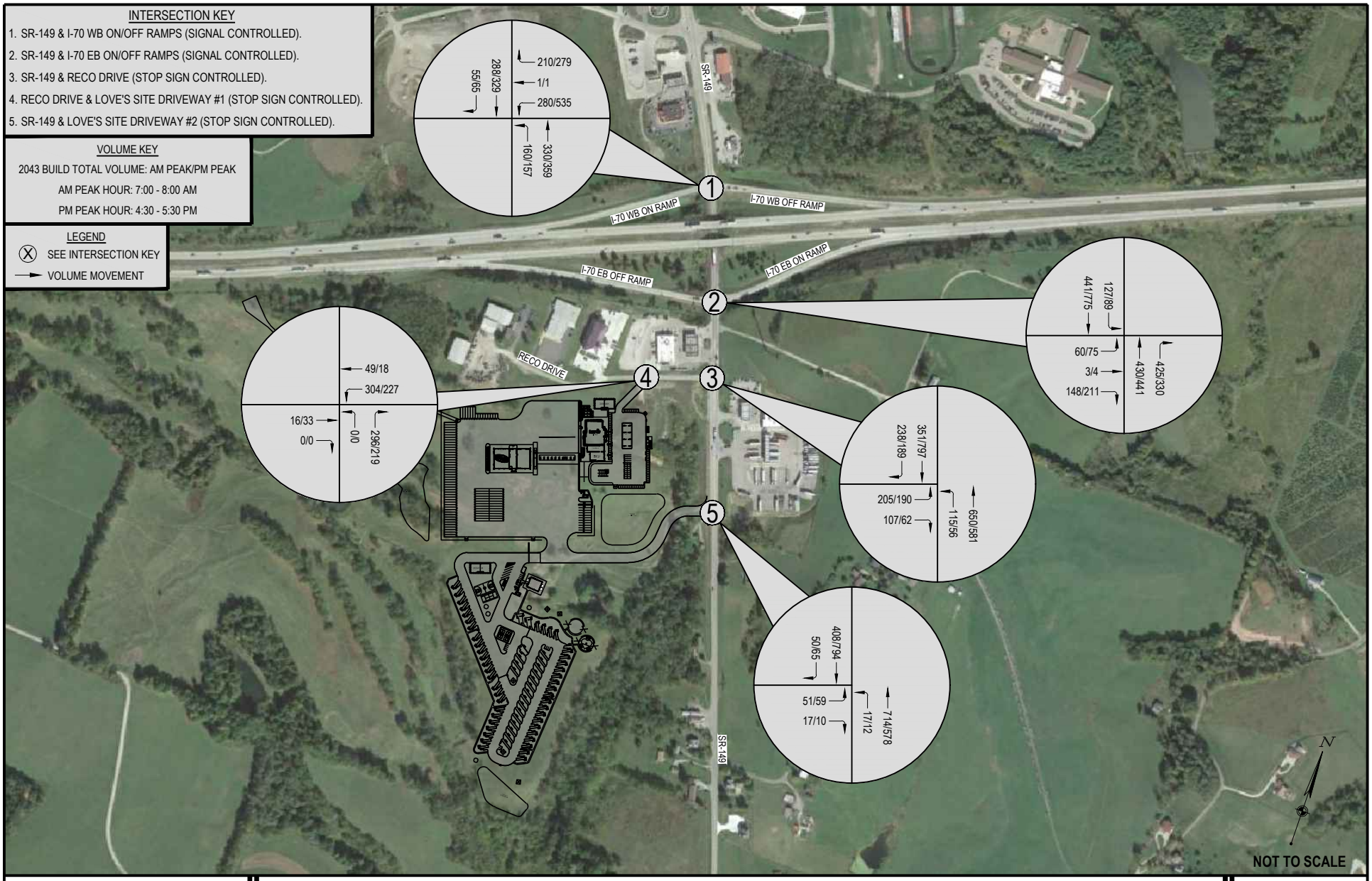

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2043 DESIGN YEAR TRAFFIC VOLUMES - TOTAL VOLUMES

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FIGURE 11.B

DATE:	11/21/2022
JOB NO.:	759267-02
DESIGNED BY:	JMP
DRAWN BY:	JMP
CHECKED BY:	TMC
PAGE:	49

9. Turn Lane Analysis

Left and right-turn lane analyses were completed using the turn lane warrant charts from the ODOT *Location & Design Manual – Volume I (July 2022)* and capacity analysis results. Based on a speed limit of 45 mph (50 mph Design Speed) on SR-149, the high-speed turn lane warrant charts were used for the analysis.

9.1. Left-Turn Lane Analysis

Table 8 provides a summary of the data and results utilized in the review of each study location for a left-turn lane. ODOT Chart 401-5b and capacity analysis results were used to determine if left-turn lanes were warranted at the applicable study locations.

Table 8
Left-Turn Lane Warrant Review

Intersection and Traffic Scenario	Lane	*Advancing Traffic (am/pm)	Opposing Traffic (am/pm)	Left-Turn (am/pm)	% Left	Method or Chart Used	Warranted
2023 No-Build Traffic Scenario							
SR-149 & I-70 WB On/Off Ramps	NBL	324/361	278/337	57/54	17.6%/15.0%	Capacity	**No/No**
SR-149 & I-70 EB On/Off Ramps	SBL	388/657	590/513	116/81	29.9%/12.3%	Capacity	**No/No**
2023 Build Traffic Scenario							
SR-149 & I-70 WB On/Off Ramps	NBL	457/479	314/359	154/152	33.7%/31.7%	Capacity	**No/Yes**
SR-149 & I-70 EB On/Off Ramps	SBL	529/799	795/719	116/81	21.9%/10.1%	Capacity	**Yes/No**
SR-149 & Reco Drive	NBL	704/586	554/916	113/55	16.1%/9.4%	401-5b	**Yes/Yes**
SR-149 & Love's Site Driveway #2	NBL	670/539	425/789	17/12	2.5%/2.2%	401-5b	**Yes/Yes**
2043 No-Build Traffic Scenario							
SR-149 & I-70 WB On/Off Ramps	NBL	357/398	307/372	63/59	17.7%/14.8%	Capacity	**No/No**
SR-149 & I-70 EB On/Off Ramps	SBL	427/722	650/565	127/89	29.7%/12.3%	Capacity	**No/No**
2043 Design Year Traffic Scenario							
SR-149 & I-70 WB On/Off Ramps	NBL	490/516	343/394	160/157	32.7%/30.4%	Capacity	**Yes/Yes**
SR-149 & I-70 EB On/Off Ramps	SBL	568/864	855/771	127/89	22.4%/10.3%	Capacity	**Yes/No**
SR-149 & Reco Drive	NBL	765/637	589/986	115/56	15.0%/8.8%	401-5b	**Yes/Yes**
SR-149 & Love's Site Driveway #2	NBL	731/590	458/859	17/12	2.3%/2.0%	401-5b	**Yes/Yes**

* Includes Left Turns

9.2. Left-Turn Lane Warrant Review Summary

According to ODOT Chart 401-5b, a NB to WB left-turn lane **is warranted** at the intersections of SR-149 & Reco Drive, and SR-149 & Love's Site Driveway #2 under the 2023 Build Traffic Scenario. According to capacity analysis results, a NB to WB left-turn lane **is warranted** at the intersection of SR-149 & I-70 WB On/Off Ramps during the 2023 Build Traffic Scenario and a SB to EB left-turn lane **is warranted** at the intersection of SR-149 & I-70 EB On/Off Ramps during the 2023 Build Traffic Scenario. However, due to the existing overpass and location of the existing bridge piers, there are physical limitations to being able to widen SR-149 and provide the additional turn lanes needed.

9.3. Right-Turn Lane Analysis

Table 9 provides a summary of the data and results utilized in the review of each study location for a right-turn lane. ODOT Chart 401-6b was used to determine if right-turn lanes were warranted at the applicable study locations.

Table 9
Right-Turn Lane Warrant Review

Intersection and Traffic Scenario	Direction	*Advancing Traffic (am/pm)	Right-Turn (am/pm)	Method or Chart Used	Warranted
2023 Build Traffic Scenario					
SR-149 & Reco Drive	SBR	554/916	235/188	401-6b	**Yes/Yes**
SR-149 & Love's Site Driveway #2	SBR	425/789	50/65	401-6b	**Yes/Yes**
2043 Design Year Traffic Scenario					
SR-149 & Reco Drive	SBR	589/986	238/189	401-6b	**Yes/Yes**
SR-149 & Love's Site Driveway #2	SBR	458/859	50/65	401-6b	**Yes/Yes**

* Includes Right Turns

9.4. Right-Turn Lane Warrant Review Summary

According to ODOT Chart 401-6b a SB to WB right-turn lane **is warranted** at the intersections of SR-149 & Reco Drive and SR-149 & Love's Site Driveway #2 under the 2023 Build Traffic Scenario.

ODOT Turn Lane Resources are located in Appendix G of the report.

9.5. Turn Lane Storage Lengths

Turn lane storage length calculations were completed based upon procedures in the ODOT *Location & Design Manual – Volume I, Section 400 (July 2022)*. Specifically, ODOT sheet 401-9 – Basis for Computing Length of Turn Lanes and sheet 401-10 – Storage Length at Intersections were used. The turn lane length analysis was conducted to provide the final design length of existing/proposed turn lanes under the 2043 Design Year Traffic Scenario. Table 10 summarizes the storage lengths required for the AM Peak Hour while Table 11 summarizes the storage lengths required for the PM Peak Hour. ODOT Storage Length Calculation Sheets are located in Appendix G of the report.

Table 10
Storage Length Analysis - AM Peak Hour

Intersection	Direction	DHV	No. of Lanes	Cycles/ Hour	Avg. Veh/ Cycle/ Lane	Design Speed (mph)	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition			Backup Length (ft)	Required Turn Lane Length* (ft)	Proposed Storage Length* (ft)	Turn Lane Length Ex/Prop < Required	HCS 95th % Queue Length** (ft)
								A*	B*	C*					
2043 Design Year Traffic Scenario															
SR-149 & I-70 WB On/Off Ramps	NBL	160	1	45	4.0	50	175	--	225	320	--	320	375	Yes	188.0
	NBT	330	1	45	8.0	50	325	--	--	--	325	--	--	--	188.0
SR-149 & I-70 EB On/Off Ramps	SBL	127	1	45	3.0	50	150	--	225	295	--	295	425	Yes	468.0
	SBT	441	1	45	10.0	50	375	--	--	--	375	--	--	--	468.0
SR-149 & Reco Drive	NBL	115	1	45	3.0	50	150	--	225	295	--	295	575	Yes	45.5
	NBT	650	1	45	15.0	50	525	--	--	--	525	--	--	--	117.3
	SBT	351	1	45	8.0	50	325	--	--	--	325	--	--	--	312.5
	SBR	238	1	45	6.0	50	250	--	225	395	--	395	395	Yes	156.0
SR-149 & Love's Site Driveway #2	NBL	17	1	60	1.0	50	50	--	225	--	--	225	225	No	2.5
	SBR	50	1	60	1.0	50	50	--	225	195	--	225	225	No	0.0

* Includes 50' Diverging Taper.

Table 11
Storage Length Analysis - PM Peak Hour

Intersection	Direction	DHV	No. of Lanes	Cycles/ Hour	Avg. Veh/ Cycle/ Lane	Design Speed (mph)	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition			Backup Length (ft)	Required Turn Lane Length* (ft)	Proposed Storage Length* (ft)	Turn Lane Length Ex/Prop < Required	HCS 95th % Queue Length** (ft)
								A*	B*	C*					
2043 Design Year Traffic Scenario															
SR-149 & I-70 WB On/Off Ramps	NBL	157	1	51	4.0	50	175	--	225	320	--	320	375	Yes	356.0
	NBT	359	1	51	8.0	50	325	--	--	--	325	--	--	--	356.0
SR-149 & I-70 EB On/Off Ramps	SBL	89	1	51	2.0	50	100	--	225	245	--	245	600	Yes	380.0
	SBT	775	1	51	16.0	50	550	--	--	--	550	--	--	--	380.0
SR-149 & Reco Drive	NBL	56	1	51	2.0	50	100	--	225	245	--	245	500	Yes	21.0
	NBT	581	1	51	12.0	50	450	--	--	--	450	--	--	--	96.3
	SBT	797	1	51	16.0	50	550	--	--	--	550	--	--	--	967.5
	SBR	189	1	51	4.0	50	175	--	225	320	--	320	600	Yes	102.0
SR-149 & Love's Site Driveway #2	NBL	12	1	60	1.0	50	50	--	225	--	--	225	225	No	2.5
	SBR	65	1	60	2.0	50	100	--	225	--	--	225	225	No	0.0

* Includes 50' Diverging Taper.

10. Queue Length Analysis

10.1. Queue Length Analysis Procedure and Results

The 95th percentile queue lengths were calculated using Highway Capacity Software (HCS) Version 8.1. CESO reviewed the 2043 No-Build and 2043 Design Year Build Traffic Scenarios. The results of the analyses are listed below in Tables 12.A-12.B. The 95th percentile queue length analysis summary sheets are located in Appendix H of the report.

Table 12.A
Queue Length Analysis – 2043 No-Build and Design Year Traffic Scenarios – AM Peak Hour

Location	Movement	*Existing* [Proposed] Storage Length	2043 No-Build/Design Year Traffic Scenario Comparison		
			95th Percentile Queue Lengths		
			AM Peak Hour		
Traffic Scenario →			2043 NB	2043 BD Cond 1	2043 BD Cond 2
SR-149 & I-70 WB On/Off Ramps[2]	WBLT	---	183.2	400.8	297.7
	WBR	*350'*	248.5	259.0	220.5
	NBLT	---	228.0	444.0	188.0
	SBTR	---	152.4	177.8	190.5
SR-149 & I-70 EB On/Off Ramps[2]	EBLT	---	42.8	42.8	57.0
	EBR	*250'*	62.5	122.5	165.0
	NBT	---	145.7	249.1	110.0
	NBR	*410'*	200.9	270.6	65.0
	SBLT	---	348.0	1124.0	468.0
SR-149 & Reco Drive[1]	EBLR	---	2.5	572.5	
	EBLTR	---			325.0
	NBLT	---	0.0	12.5	
	[NBL]	[TWLTL]			45.5
	[NBT]	---			117.3
	NBR	---			180.3
	[SBT]	---			312.5
	[SBR]	[200']			156.0
Reco Drive & Love's Site Driveway #1[1]	WBLT	---		20.0	
	NBLR	---		32.5	
SR-149 & Love's Site Driveway #2[1]	EBLR	---		65.0	60.0
	NBLT	---		2.5	
	[NBL]	[175']			2.5

[1] – Value calculated by multiplying value by an average car length of 25 feet to provide a more accurate result.

[2] – Value calculated by multiplying the Queue-Storage Ratio by the storage length.

Table 12.B
Queue Length Analysis – 2043 No-Build and Design Year Traffic Scenarios – PM Peak Hour

Location	Movement	*Existing* [Proposed] Storage Length	2043 No-Build/Design Year Traffic Scenario Comparison		
			95th Percentile Queue Lengths		
			PM Peak Hour		
Traffic Scenario →			2043 NB	2043 BD Cond 1	2043 BD Cond 2
SR-149 & I-70 WB On/Off Ramps[2]	WBLT	---	343.5	801.5	480.9
	WBR	*350'*	199.5	206.5	168.0
	NBLT	*400'*	200.0	580.0	356.0
	SBTR	---	184.2	203.2	235.0
SR-149 & I-70 EB On/Off Ramps[2]	EBLT	---	57.0	71.3	57.0
	EBR	*250'*	127.5	352.5	212.5
	NBT	---	103.4	169.2	187.5
	NBR	*410'*	77.9	123.0	112.5
	SBLT	*400'*	252.0	388.0	380.0
SR-149 & Reco Drive[1]	EBLR	---	15.0	575.0	
	EBLTR	---			255.0
	NBLT	---	0.0	7.5	
	[NBL]	[TWLTL]			21.0
	[NBT]	---			96.3
	NBR	---			89.3
	[SBT]	---			967.5
	[SBR]	[200']			102.0
Reco Drive & Love's Site Driveway #1[1]	WBLT	---		15.0	
	NBLR	---		22.5	
SR-149 & Love's Site Driveway #2[1]	EBLR	---		125.0	115.0
	NBLT	---		2.5	
	[NBL]	[175']			2.5

[1] – Value calculated by multiplying value by an average car length of 25 feet to provide a more accurate result.

[2] – Value calculated by multiplying the Queue-Storage Ratio by the storage length.

10.2. Queue Length Analysis Summary

Based on Tables 12.A-12.B, the following conclusions were found:

- The ODOT required storage length for the NBL turn lane at the SR-149 & Reco Drive intersection is 525' of storage plus a 50' taper. However, CESO recommends restriping the existing inside through lane on SR-149 to reflect a continuous two-way left-turn lane (TWLTL).

- The ODOT required storage length for the SBR turn lane at the SR-149 & Reco Drive intersection is 550' of storage plus a 50' taper. However, due to close proximity to the existing I-70 EB Off Ramp, CESO recommends constructing the turn lane to accommodate 200' of storage plus a 50' taper.

- The ODOT required storage length for the NBL turn lane at the SR-149 & Love's Site Driveway #2 intersection is 175' of storage plus a 50' taper. CESO recommends constructing the turn lane to accommodate 175' of storage plus a 50' taper.

- The ODOT required storage length for the SBR turn lane at the SR-149 & Love's Site Driveway #2 intersection is 175' of storage plus a 50' taper. CESO recommends constructing the turn lane to accommodate 175' of storage plus a 50' taper.

11. Traffic Signal Warrant Study

The following Traffic Signal Warrant Study was performed according to the specifications stated in the *Ohio Manual of Uniform Traffic Control Devices (OMUTCD)*, Section 4C, for the intersection of SR-149 & Reco Drive.

11.1. Traffic Signal Warrants

In accordance with the OMUTCD, Chapter 4C, the study intersections were tested against the following nine (9) warrants:

- Warrant 1 – Eight-Hour Vehicular Volume.
- Warrant 2 – Four-Hour Vehicular Volume.
- Warrant 3 – Peak Hour.
- Warrant 4 – Pedestrian Volume.
- Warrant 5 – School Crossing.
- Warrant 6 – Coordinated Signal System.
- Warrant 7 – Crash Experience.
- Warrant 8 – Roadway Network.
- Warrant 9 – Intersection near a Grade Crossing.

While meeting one or more warrants is not considered sufficient justification for the installation of a traffic signal, it is necessary to do so before a signal can be considered.

Examination of the 9 warrants shows that not all warrants are appropriate for consideration at the studied locations. For example, it would not be appropriate to consider Warrant 4 – Pedestrian Volume or Warrant 9 – Intersection near a Grade Crossing at this location. **The specific warrants that were analyzed include Warrants 1, 2, and 3**. These warrants are discussed in the sections below.

The volumes used in the Traffic Signal Warrant Study were generated utilizing data contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition,* in combination with methods outlined in the (ITE) *Trip Generation Handbook*. The generated trips exiting at Reco Drive are distributed based on the percentages on Figures 7.A-7.C. The right-turn volumes exiting Reco Drive were reduced based on ODOT *Traffic Engineering Manual* (Section 402-5) methodologies. The signal warrant volumes are listed below in Table 13.

Table 13
Signal Warrant Volumes (Major and Minor Street)

Time	2023 No-Build		2023 Build		2043 No-Build		2043 Design Year	
	Major	Minor	Major	Minor	Major	Minor	Major	Minor
Intersection →	SR-149 & Reco Drive							
6:00 am – 7:00 am	542	15	676	106	596	17	730	107
7:00 am – 8:00 am	869	9	1023	137	955	10	1109	138
8:00 am – 9:00 am	746	20	929	161	820	22	1003	163
11:00 am – 12:00 pm	579	23	837	199	637	25	895	202
12:00 pm – 1:00 pm	705	20	1015	264	775	22	1085	266
1:00 pm – 2:00 pm	670	16	931	209	737	18	997	211
2:00 pm – 3:00 pm	782	17	1000	195	860	19	1078	197
3:00 pm – 4:00 pm	890	30	1136	220	979	33	1224	223
4:00 pm – 5:00 pm	894	36	1118	205	983	41	1207	211
5:00 pm – 6:00 pm	924	23	1161	207	1016	25	1253	209

It should be noted that according to the ODOT TEM Section 402-3.2, for new ODOT signals, Warrants 1, 2, and 3 shall be based on the 100 percent (%) values (OMUTCD Chapter 4C) and right-turn reduction factors applied.

11.2. Warrant 1 – Eight Hour Vehicular Volume

According to the OMUTCD, two conditions need to be examined to determine if this warrant is satisfied. The Minimum Vehicular Volume condition (Condition A) "... is intended for application where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal." The Interruption of Continuous Traffic condition (Condition B) "… is intended for application where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street."

It is intended that Warrant 1 be treated as a single warrant. If Condition A is satisfied, then Warrant 1 is satisfied and analyses of Condition B and the combination of Conditions A and B are not needed. Similarly, if Condition B is satisfied, then Warrant 1 is satisfied and an analysis of the combination of Conditions A and B is not needed.

The following conditions must exist for any eight (8) hours of an average day for a traffic control signal to be considered:

2023 and 2043 No-Build – SR-149 and Reco Drive (1 Lane Major/1 Lane Minor):

- Condition A: The major street traffic volume must exceed 500 vehicles (total of both approaches) per hour, while the minor street traffic volume must exceed 150 vehicles (higher volume approach) for the same eight (8) hours.

- Condition B: The major street traffic volume must exceed 750 vehicles (total of both approaches) per hour, while the minor street traffic volume must exceed 75 vehicles (higher volume approach) for the same eight (8) hours.

- Conditions A and B can be combined for locations where neither Condition A nor Condition B is satisfied. However, this combination should only be applied after a trial of other alternatives has failed to solve the traffic problems.

2023 Build and 2043 Design Year – SR-149 and Reco Drive (2 Lanes Major/1 Lane Minor):

- Condition A: The major street traffic volume must exceed 600 vehicles (total of both approaches) per hour, while the minor street traffic volume must exceed 150 vehicles (higher volume approach) for the same eight (8) hours.

- Condition B: The major street traffic volume must exceed 900 vehicles (total of both approaches) per hour, while the minor street traffic volume must exceed 75 vehicles (higher volume approach) for the same eight (8) hours.

- Conditions A and B can be combined for locations where neither Condition A nor Condition B is satisfied. However, this combination should only be applied after a trial of other alternatives has failed to solve the traffic problems.

Table 14 lists the Minimum Vehicular Volumes for Warrant 1 (Table 4C-1 from the OMUTCD).

Table 14
Minimum Vehicular Volumes for Warrant 1 (Table 4C-1 from the OMUTCD)

Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

[a] Basic minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

The traffic volumes in Table 13 were tested against the volume thresholds listed in Table 14 Minimum Vehicular Volumes for Warrant 1 (Table 4C-1 from the OMUTCD). Table 15 presents the results for the analysis of Warrant 1 – Eight-Hour Vehicular Volume.

Table 15
Summary of Warrant 1 – Eight-Hour Vehicular Volume

Traffic Scenario	Study Year	Condition A			Condition B		
		Hours Satisfied		Condition Satisfied	Hours Satisfied		Condition Satisfied
		Major Street	Minor Street		Major Street	Minor Street	
SR-149 & Reco Drive							
2023 No-Build Traffic Scenario	2023	10	0	**No**	5	0	**No**
2023 Build Traffic Scenario	2023	10	8	**Yes**	8	10	**Yes**
2043 No-Build Traffic Scenario	2043	10	0	**No**	7	0	**No**
2043 Design Year Traffic Scenario	2043	10	8	**Yes**	8	10	**Yes**

11.3. Warrant 2 – Four Hour Vehicular Volume

According to the OMUTCD, this warrant is "…intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal." Warrant 2 is satisfied when the vehicular volumes (summarized in Table 13) in each of four (4) hours of an average day fall above the appropriate curve of the graphs labeled as Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume. Table 16 presents the results for the analysis of Warrant 2 – Four-Hour Vehicular Volume.

Table 16
Summary of Warrant 2 – Four-Hour Vehicular Volume

Traffic Scenario	Study Year	No. of Plotted Points That Fall Above the Appropriate Line	Warrant Satisfied
SR-149 & Reco Drive			
2023 No-Build	2023	0	**No**
2023 Build	2023	7	**Yes**
2043 No-Build	2043	0	**No**
2043 Design Year	2043	9	**Yes**

11.4. Warrant 3 – Peak Hour Volume

According to the OMUTCD, this warrant is "…intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street."

A traffic control signal shall be considered if the criteria in either of the following two conditions are met:

A. If all three of the following conditions exist for the same one (1) hour (any four consecutive 15-minute periods) of an average day:

- The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a stop sign equals or exceeds 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach, and;

- The volume on the same minor-street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes, and;

- The total entering volume serviced during the hour equals or exceeds 650 vph for intersections with three approaches or 800 vph for intersections with four or more approaches.

B. For one hour of an average day, the vehicular volumes fall above the appropriate curve of the graphs labeled as Figure 4C-4. Warrant 3, Peak Hour.

Table 17 presents the results for the analysis of Warrant 3 – Peak Hour Volume.

Table 17
Summary of Warrant 3 – Peak Hour Volume

Traffic Scenario	Study Year	No. of Plotted Points That Fall Above the Appropriate Line	Warrant Satisfied
SR-149 & Reco Drive			
2023 No-Build	2023	0	**No**
2023 Build	2023	0	**No**
2043 No-Build	2043	0	**No**
2043 Design Year	2043	3	**Yes**

11.5. Traffic Signal Warrant Study Summary

The following summary was generated based upon the findings in the Traffic Signal Warrant Study.

SR-149 & Reco Drive:

- Warrant 1 – Eight-Hour Vehicular Volume **is satisfied** at the intersection under the 2023 Build and 2043 Design Year Traffic Scenarios.
- Warrant 2 – Four-Hour Vehicular Volume **is satisfied** at the intersection under the 2023 Build and 2043 Design Year Traffic Scenarios.
- Warrant 3 – Peak Hour Vehicular Volume **is satisfied** at the intersection under the 2043 Design Year Traffic Scenarios.
- Based on Warrants 1, 2, and 3 being satisfied CESO recommends the installation of a traffic signal.

Detailed Signal Warrant Study calculations are located in Appendix I of the report.

12. Summary of Recommendations

12.1. Recommendations

The following summary of recommendations was generated based upon the findings in the Traffic Impact Study.

2023 No-Build Traffic Scenario (Responsibility – Others):

- No improvements are recommended or required.

2023 Build Traffic Scenario (Responsibility – Love's):

SR-149 and Reco Drive:

- Signalize the intersection with an 80 second cycle length during the AM Peak Hour and 70 second cycle length during the PM Peak Hour. Coordinate this signal with the existing signals at the SR-149 & I-70 WB On/Off Ramps, SR-149 & I-70 EB On/Off Ramps, and SR-149 & Bond Drive intersections.
- Restripe the existing inside through lane on SR-149 to reflect a continuous two-way left-turn lane back to Pilot's South Driveway.
- Construct a SBR turn lane to provide 200' of storage plus a 50' taper.

Reco Drive and Love's Site Driveway #1

- Construct Love's Site Driveway #1 to permit left-in, left-out, right-in, and right-out (full access) movements of passenger cars. Control this driveway with one (1) stop sign.

SR-149 and Love's Site Driveway #2

- Construct Love's Site Driveway #2 to permit left-in, left-out, right-in, and right-out (full access) movements of trucks and RVs. Control this driveway with one (1) stop sign.
- Construct a NBL turn lane to provide 175' of storage plus a 50' taper.
- Construct a SBR turn lane to provide 175' of storage plus a 50' taper.

2043 No-Build Traffic Scenario (Responsibility – Others):

- No improvements are recommended or required.

2043 Design Year Traffic Scenario (Responsibility – Love's):

- No improvements are recommended or required.

Figure 12 illustrates the Love's Development recommended improvements.

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RECOMMENDED IMPROVEMENTS

LOVE'S DEVELOPMENT

UNION TOWNSHIP BELMONT, OHIO

FIGURE 12	
DATE:	01/09/2023
JOB NO.:	759267
DESIGNED BY:	JMP
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PAGE:	63

APPENDIX A
MEMORANDUM OF UNDERSTANDING BETWEEN
CESO & ODOT DISTRICT 11

CESO
Supporting Your Vision Seamlessly

MEMORANDUM OF UNDERSTANDING

TO: Jeremy Cessna, ODOT District 11 District Utility/Permit Supervisor
Chris Varcolla, ODOT District 11 Highway Safety District Coordinator

CC: Robert Matko, PE, PS, PTOE, CESO Engineering Manager
Kimberly Cooper, P.E., CESO Project Manager

FROM: Taylor Cline, P.E., CESO Lead Project Engineer

DATE: August 26, 2022

SUBJECT: Traffic Impact Study Scope
Love's Travel Stop Development
Southwest quadrant of the SR-149 and Reco Drive intersection
St. Clairsville, Ohio

The scope of services has been generated based on prior Traffic Study experience with ODOT District 11 and guidance from the most recent ODOT Traffic Impact Study (TIS) requirements. The site is located in the southwest corner of SR-149 and Reco Drive in Union Township, Belmont County, Ohio.

Traffic Study Scope – TIS Level 1 (follows ODOT requirements for TIS found in the State Highway Access Management Manual (SHAMM) Access Management Regulations

Level 1 traffic impact studies will require a full TIS as detailed in Chapter 9 of the SHAMM. According to section 9.41, a Level 1 TIS is required if the total number of trip ends (entering and exiting vehicles) ranges from 200-499.

According to the Ohio Traffic Forecasting Manual, Volume 1 (outline) and Volume 2 (procedures): Traffic Forecasting Background, the TIS must analyze two Build conditions (existing roadway and proposed roadway with background traffic plus site traffic) and No Build (existing roadway with background traffic) in the Design Year, which is Opening Year + 10 years for Level 1.

1. **Conduct weekday (Tuesday – Thursday) peak hour (7:00 – 9:00 am and 4:00 – 6:00 pm) traffic counts at the following study intersections:**
   - **Traffic counts will be collected by our sub-consultant (Gewalt Hamilton Associates, Inc.) and will be video collected.**

     1. SR-149 & I-70 WB On/Off Ramps (Signal Controlled).
     2. SR-149 & I-70 EB On/Off Ramps (Signal Controlled).
     3. SR-149 & Reco Drive (Stop Sign Controlled).

2. **Inventory the existing roadway system (existing traffic controls, signage, and lane geometry).**

3. **Calculate the DHV's (Design Hourly Volumes).**
   The 2022 Existing Traffic Volumes will be converted to Design Hourly Volumes (DHV's). DHV's will be calculated using factors determined using the date of traffic count and the Peak Hour to Design Hour Factor tables for the Ohio Department of Transportation, *Modeling and Forecasting Section.*

4. **Growth Rates**
   Determine growth rates for each study roadway from historical traffic data obtained from ODOT TIMS.
   This growth rate will be applied to the 2022 Design Hour Traffic Volumes to arrive at 2023 and 2033 No-Build Traffic Volumes.

5. **2023 No-Build Traffic Volumes**
   Apply growth rate from #4 to the 2022 Existing DHV Traffic Volumes for one (1) year to arrive at 2023 No-Build Traffic Volumes.

6. **Prepare trip generation**
   Prepare trip generation for the proposed development using the *Institute of Transportation Engineers Trip Generation Manual, 11th Edition.* CESO will look to use ITE Land Use Category 950 (Truck Stop), ITE Land Use Category 945 (Gasoline Service Station with Convenience Market), ITE Land Use Category 934 (Fast

Food Restaurant with Drive-Through Window), ITE Land Use Category 848 (Tire Store), and ITE Land Use Category 416 (Campground/Recreational Vehicle Park) for the proposed development.

Pass-By
Pass-By will be applied and will be based on percentages found in the *ITE Trip Generation Manual, 11th Edition.* In addition, diverted trips will be accounted for.

Internal Trip Reduction
Internal trip reduction will be applied and will be based on ITE procedures (NCHRP Report 684 Table 6-A and 6-P Internal Capture).

Note: Projections will be broken down into passenger cars and semi-truck traffic.

7. **Determine directional distribution of development traffic**
   The directional distribution site traffic will be based on population and existing traffic patterns within the study area.

8. **Assign project traffic to surrounding road network.**
   Based on the traffic projections, the development generated traffic volumes will be assigned to the adjacent street network.

9. **2023 Build Traffic Volumes**
   Add the 2023 No-Build Traffic Volumes to the Site Generated Traffic Volumes to arrive at 2023 Build Traffic Volumes.

10. **2033 No-Build Traffic Volumes**
    Apply growth rate from #4 to the 2022 Existing DHV Traffic Volumes for eleven (11) years to arrive at 2033 No-Build Traffic Volumes.

11. **Perform capacity analysis (No-Build Traffic Scenario ~ 2033) at the key study intersections during the peak study hours.**
    Perform capacity analyses using procedures documented in the most recent edition of the *Highway Capacity Manual* and using Highway Capacity Software (HCS) Version 8.1 at the key study intersections utilizing 2033 No-Build Traffic Volumes during the study peak hour time periods.

    Note: ODOT *Analysis and Traffic Simulation Manual (OATS)* format will be used for all capacity analysis.

15. **2033 Design Year Traffic Volumes**
    Add the 2033 No-Build Traffic Volumes to the Site Generated Traffic Volumes to arrive at 2033 Design Year Traffic Volumes.

16. **Perform capacity analysis (Design Year Traffic Scenario ~ 2033) at the key study intersections and Site Driveway(s) during the peak study hours (Build Condition #1 per the updated SHAMM).**
    Perform capacity analyses using procedures documented in the most recent edition of the *Highway Capacity Manual* and using Highway Capacity Software (HCS) Version 8.1 at the key study intersections and site driveway(s) utilizing 2033 Design Year Traffic Volumes during the study peak hour time periods. Per the updated SHAMM, this analysis will analyze existing roadway geometry (i.e. number/types of

lanes) and existing traffic control (i.e. signalized/unsignalized) using the 2033 Design Year Traffic Volumes.

Note: The ODOT *OATS Manual* format will be used for all capacity analysis.

17. **Perform capacity analysis (Design Year Traffic Scenario ~ 2033) at the key study intersections and Site Driveway(s) during the peak study hours (Build Condition #2 per the updated SHAMM).**
Perform capacity analyses using procedures documented in the most recent edition of the *Highway Capacity Manual* and using Highway Capacity Software (HCS) Version 8.1 at the key study intersections and site driveway(s) utilizing 2033 Design Year Traffic Volumes during the study peak hour time periods (only if there is degradation when comparing Build Condition 1 to the 2033 No-Build Condition). Per the updated SHAMM, this analysis will analyze proposed roadway geometry (i.e. number/types of lanes) and proposed traffic control (i.e. signalized/unsignalized) using the 2033 Design Year Traffic Volumes.

Note: The ODOT *OATS Manual* format will be used for all capacity analysis.

18. **Perform turn lane/queuing analysis.**
Perform turn lane warrant/queuing analysis to determine if turn lanes or turn lane extensions are required at the study intersections. ODOT methodology (L&D Vol. 1, Figures 401-5a-5c and 401-6a-6d) will be used. ODOT L&D Vol. 1, Figure 401-9 and 401-10 will be used for turn lane storage lengths at the key study intersections and site driveway(s).

20. **Based on Projected traffic volumes, recommend geometry for the proposed Love's Development Project.**
Based on the projected volumes from the analysis, CESO will recommend the geometry for the proposed Love's Development including turn lane length calculations at the key study intersections and site driveway(s) per the L&D Vol. 1, Figure 401-9 and 401-10. A figure showing the conceptual geometry will be included.

21. **Traffic Volume Submittal**
CESO will submit all volumes including the trip generation summary for ODOT District 11 to review prior to commencing with the analysis portion of the study. The following information will be submitted for review and approval in a memorandum type format:

- Location map
- Site Plan
- Original raw traffic counts
- Growth rate documentation or calculations
- Existing Background Peak Hour Volume Plates (for each analysis period)
- Design Year Background (No-Build) Volume Plates (for each analysis period)
- Trip Generation worksheets or table
- Site Generated Volumes Plates (with Primary, Pass-by, and Diverted Link Trips delineated, for each analysis period)
- Design Year Final (Build) Volume Plates (for each analysis period)
- Documented assumptions including detailed sources and computations behind proprietary trip generation rates.

22. Prepare a written report summarizing the study process, conclusions, and recommendations.
Prepare a detailed report and submit to the ODOT District 11 office for review and approval.

Report shall include the following:

a. Title Page
b. Table of Contents including a list of figures, tables, and appendices.
c. Introduction, which includes the description of the project, purpose of the report and executive summary.
d. Proposed development description, including location, land use, and proposed use. This section will also include a regional map, vicinity map and site plan.
e. Description of the study area.
f. Existing conditions, including study site lane use, adjacent roadway description and traffic volumes. This section will also include a summary of existing traffic counts, graphic of existing daily and peak hour traffic and roadway condition diagram.
g. Project traffic, including site traffic generation, distribution and assignment and non-site traffic for each time period to be analyzed. Graphics will be included showing the peak hour traffic volumes for each analysis time period and project phase for both the on and off-site traffic.
h. Site traffic and total traffic volumes will be shown for each analysis time period.
i. Traffic analysis showing tabular and graphic result of the analyses.
j. Turn lane Analysis.
k. Site Access Review.
l. Summary of findings with conclusions and recommendations, including a graphic illustration of the recommendation/conclusion.
m. Appendix including all computer-run data as well as any material related to the traffic study data collection and results.

CESO will submit all analysis files along with the written report.

If the above MOU is acceptable, please sign below. Thank you for your coordination and continued communication.

Jeremy Cessna, ODOT District 11, District Utility/Permit Supervisor Date