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Project Number 17-3000

PID 96833

PROJECT SCOPE

State of Ohio
Department of Transportation
Jerry Wray, Director

Opportunity Corridor
Section 3 (OC3)

Approved _____

Date _____ District Deputy Director

Approved _____

Date _____ Director, Department of Transportation

Contents

1 GENERAL

1.1 PROJECT CONTEXT and INTRODUCTION

Opportunity Corridor was first conceived as part of the Cleveland Innerbelt Strategic Plan (2004). Originally known as University Circle Access Boulevard, it proposed a connection from I-490 to University Circle in response to surveys indicating that many motorists using the Innerbelt corridor to reach that area would benefit from a more direct route.

The Opportunity Corridor project was split into a separate study and developed through Phase 8 of the Department's Project Development Process (PDP) for Major Projects under PID 77333. The selected alternative creates a two- to three-lane boulevard that passes under East 55th Street on a new alignment, continues north and east until the Quincy Avenue and East 105th Street intersection, and follows the existing alignment of East 105th Street north to Park Lane.

The final design, Right-of-Way, and construction of the Opportunity Corridor is divided into three separate projects:

- Section 1 (PID 96832): East 105th Street from Norman Avenue to Park Lane
- Section 2 (PID 98695): New alignment from East 93rd Street to Norman Avenue
- **Section 3 (PID 96833): New alignment from I-490 to East 93rd Street**

OC3 primarily involves the construction of a new roadway from I-490 to the west project limit of OC2 (98695) and reconstruction of portions of the following streets:

- I-490 approach to E. 55th Street
- E. 55th Street
- Kinsman Road
- E. 75th Street
- E 79th Street
- Rawlings Avenue
- Lisbon Road
- Buckeye Road
- Woodland Avenue
- Removal of various local streets
- Resurfacing and sidewalk improvements along various local streets

The project also involves the following bridges:

- E. 55th Street over OH-10 (new structure)
- Pedestrian Bridge over OH-10 at E. 59th Street (new structure)
- OH-10 over Kingsbury Run ravine (new structure)
- Kinsman Road Bridge over GCRTA (minor deck and parapet work)
- OH-10 over GCRTA Blue and Green Lines (new structure)
- NS Railroad over OH-10 (new structure)
- NS Railroad over vacated Grand Avenue (remove structure)
- E. 89th Street Pedestrian Bridge (remove existing and replace with new pedestrian structure)

In addition, the project includes NS track phasing and permanent track relocation, building demolitions, storm sewers and retention basins, sanitary sewers, combined sewer regulators, waterlines, power distribution systems, roadway lighting, traffic signals, traffic control and other miscellaneous work items, all within the City of Cleveland. The substantial completion date for the project is November 1, 2021. The Project completion date is June 30, 2022.

The DBT shall not rely solely on the physical description contained in this Section 1.1 to identify all Project components. The DBT shall determine the full scope of the Project through thorough examination of the RFP and the Project Site, or as may be reasonably inferred from such examination.

1.2 PROJECT GOALS

The Department's goals for the Project are:

A. Demolish existing residences and commercial structures as soon as possible.
B. Deliver the Project at or below budget.
C. Maximize quality, meeting or exceeding applicable standards in all areas.
D. Minimize duration of traffic impacts and open all roadways to traffic on the date of Substantial Completion no later than November 1, 2021.
E. Meet or exceed aesthetics and sustainability guidelines.
F. Deliver the Project with zero lost-time incidents.
G. Deliver a positive economic impact to the community through Diversity and Inclusion efforts.
H. Maximize team diversity (quantity and type) for project specific goals by the inclusion of the maximum available firms usefully utilized on the project.

1.3 COMPATIBILITY REQUIREMENT

This Project is the third of multiple contracts to construct the Opportunity Corridor. The DBT shall design and construct OC3 to be compatible with previous sections, especially at the eastern project terminus at the E. 93rd Street intersection. Construction of Opportunity Corridor Section 2 (OC2) will be under construction at the start of OC3. The DBT shall coordinate construction and maintenance of traffic with the Great Lakes Construction DBT.

1.4 COMPATIBILITY WITH ENVIRONMENTAL DOCUMENTS

The Draft Environmental Impact Statement (DEIS), published on August 30, 2013, included several environmental commitments and mitigation measures. After updates to reflect input from the public hearing and comment period, a joint Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) were issued for the selected alternative on May 1, 2014. The FEIS/ROD and FEIS Reevaluation established environmental commitments for the entire corridor. Those that apply to this project are included in this RFP.

1.5 BASIC CONFIGURATION

Certain appendices of the Scope of Services are indicated as Basic Configuration documents. Only those elements of the appendices indicated below are considered part of the Basic Configuration. All other elements shown in the appendices indicated as Basic Configuration shall be considered Reference Documents. All Work shall be consistent with the Basic Configuration.

The elements listed below as shown in Appendix LD-01 (Section 3 Conceptual Plans) and ST-05 (Bridge Typical Sections) are also part of the Basic Configuration:

A. Centerline horizontal and vertical alignments.
B. Typical section elements with widths indicated
    1. Number of lanes
    2. Lane and shoulder widths
    3. Median width and type
    4. Sidewalk and multi-use path width and relative locations
    5. Buffer area widths and relative locations including tree lawns and border areas with no walks. The DBT may modify the horizontal and vertical alignments within the Project Limits providing that all of the following conditions are met:

A. The modifications do not result in the need to acquire additional Right-Of-Way.
B. The modifications do not result in permanent impacts that compromise the operation and function of existing roadways, bridges, driveways, pedestrian facilities and railroads intended to remain.
C. The modifications are compatible with infrastructure constructed as part of PID 98695.
D. Any revisions to the horizontal and vertical alignments meet all requirements of the Contract, including vertical clearances.
E. The adjustments do not require a new design exception.
F. The vertical alignment grades of OH-10 shall not exceed 5%.

1.6 DESIGN DESIGNATIONS and MAINTAINING AGENCIES

Table 1-1 below indicates the functional classification, design speeds, legal speeds, and maintaining agencies of roadways and trails that are designed and constructed as part of this Project or will be crossed by a new bridge or other structure as part of this Project. Work shall be done in accordance with the standards of the designated maintaining agency.

Table 1-1: Design Designations and Maintaining Agencies

Roadway	Functional Classification	Other Designations	Design Speed (MPH)	Legal Speed (MPH)	Maintaining Agency
I-490 (Begin Project to 600 feet west of Quadrant Roadway)	Urban Principle Arterial	OH-10	45	45	Ohio Department of Transportation (ODOT)
I-77 Ramp to OH-10 East	Low Speed Urban Ramp/Low Speed C-D Roadway		40	N/A	Ohio Department of Transportation (ODOT)
OH-10 Ramp to I-77	Low Speed Urban Ramp		40	N/A	Ohio Department of Transportation (ODOT)
E. 55th Street	Urban Minor Arterial		35	35	City of Cleveland

Roadway	Functional Classification	Other Designations	Design Speed (MPH)	Legal Speed (MPH)	Maintaining Agency
Quadrant Roadway	Urban Local		25	25	City of Cleveland
OH-10 (From 600 feet west of Quadrant Roadway to End Project)	Urban Principle Arterial	OH-10	40	35	City of Cleveland
Kinsman Road	Urban Minor Arterial	US 422	35	35	City of Cleveland
E. 75th Street	Urban Local		25	25	City of Cleveland
E. 79th Street	Urban Minor Arterial		25	25	City of Cleveland
Buckeye Road	Urban Principle Arterial	OH-87	35	35	City of Cleveland
Woodland Avenue	Urban Major Collector		35	35	City of Cleveland
Berwick Road, Bragg Avenue, Bower Avenue, Bragg Avenue, Evarts Road, E. 59th Street, E.73rd Street, E.89th Street, Francis Avenue, Grand Avenue, Kennedy Avenue, Lisbon Road, Rawlings Avenue	Urban Local		25	25	City of Cleveland

1.7 PROJECT DATUM, SURVEY CONTROL, and MAPPING

The Department previously collected survey for the Project. Survey control information including elevations used to develop the aerial and ground mapping used in the development of the Preliminary Roadway Plans is available in Appendix SU-01 (Survey Control Monuments). The DBT shall document all forms of data verification. If the DBT identifies any discrepancy, the discrepancy shall be reported in writing to the Department for review. The Department will respond to the discrepancy within 10 Workdays.

The DBT shall collect and process all additional survey data needed to complete the Project. All survey data shall be submitted using ODOT's standard field codes and GEOPAK's standard mapping codes. Reduced point data, in comma delimited ASCII text format, will be provided for all surveyed points. This data will include: point number, x coordinate, y coordinate, elevation, and point ID. Customized GEOPAK information is available on the Department's CADD website.

The DBT shall set and document all necessary control points and monuments including but not limited to all roadway monuments and Right-of-Way of monuments. Existing monumentation should not be disturbed. If the DBT does disturb any monumentation, then it shall be replaced, in-kind, by a Registered

Surveyor with a current registration recognized by the Ohio State Board of Registration for Professional Engineers and Surveyors. Documentation of all new or replaced monumentation shall be forwarded to the District Real Estate Administrator.

All control points, provided by the Department, shall be included in the ASCII file supplied by the DBT to the Department. They should retain the original point numbers and coordinate values as assigned by the Department.

The DBT shall provide the following items prior to Final Acceptance of the As-Built plans:

A. Copies of all field notes (written or electronic), which shall include the following information:
    1. Date
    2. Crew member names
    3. Weather conditions, including temperature, barometric pressure, and any precipitation
    4. Instrument(s) used with serial number for each
    5. Raw observation field data
    6. Other notes as needed
B. Copies of all deeds, plats, maps and other written evidence used to establish points related to the project including summaries of all parole evidence acquired as a part of the survey operation.
C. List of all found monumentation (horizontal and vertical).
D. List of all monumentation set as part of the project (horizontal and vertical) including reference ties for recovery.
E. All monumentation and survey information shall be located utilizing North American Datum (NAD) 83 (horizontal data), North American Vertical Datum (NAVD) 88 (vertical data).
F. Short report indicating adjustment factors and methods, signed and certified by Registered Surveyor (State of Ohio). The Registered Surveyor shall include in the report the datum used and all associated adjustments used.

1.8 AIRWAY/HIGHWAY CLEARANCE FOR AIRPORTS and HELIPORTS

The DBT shall perform an airway/highway clearance study. Additional FAA coordination and permitting may be required depending on DBT design and construction. The DBT is responsible for this coordination and permitting.

1.9 SUSTAINABILITY

The DBT shall obtain a “Silver” sustainability rating using FHWA INVEST or Institute for Sustainable Infrastructure Envision rating criteria, based on a joint DBT/Department scoring workshop. In addition, the DBT shall demonstrate a commitment to sustainability and shall provide additional efforts to maximize the implementation of sustainable practices in all aspects of the Project.

The DBT shall prepare quarterly sustainability reports that document the Project’s progress attaining the “Silver” rating.

1.10 GOVERNING REGULATIONS

It is the responsibility of the DBT to acquire and use the necessary manuals that apply to the design and construction work required to complete this Project.

The Standard Specifications of the State of Ohio, Department of Transportation (2016 Construction and Materials Specifications [C&MS]), Supplements, and Supplemental Specifications shall govern this Project. Interpret all references to guidelines, recommendations and considerations in the Manuals and Guidelines as minimum requirements except when specifically precluded within the Scope of Services. Perform recommended evaluations if not provided by the Department.

Perform an analysis and submit to the Department for review and concurrence if a recommendation in any of the Manuals and Guidelines cannot be met. This analysis shall indicate the reasons for a deviation from design recommendation guidance and shall propose an acceptable solution. Cost or an incorrect design assumption shall not be a reason for a deviation. A deviation from a design recommendation shall not be included in the design without the ODOT Design Project Manager's concurrence.

The DBT shall design and construct Interstate and NHS elements of the construction Project in conformance with the standards, policies, and standard specification cited in 23 CFR 625.4, and use the latest edition of each enumerated provision.

The following listing of governing regulations is alphabetical. Utility and railroad work shall comply with appropriate governing regulation. The Department Standards and Manuals take precedence over others listed unless noted otherwise in the Contract Documents. The current edition, including updates released on or before October 20, 2016, of the following shall be met or exceeded in the performance of the design and construction work required to complete this Project (except as noted below). Any references to other standards, codes, or criteria, or to the latest version of other standards, codes, or criteria shall mean the published version by the date as mentioned above.

A. American Association of State Highway and Transportation Officials (AASHTO) Publications:
    1. A Policy on Design Standards - Interstate System
    2. A Policy on Geometric Design of Highways and Streets
    3. Bridge Welding Code
    4. Guide Design Specifications for Bridge Temporary Works
    5. Guide for the Development of Bicycle Facilities
    6. Guide Specifications for Design and Construction of Segmental Concrete Bridges
    7. Guide Specifications for Thermal Effects in Concrete Bridge Superstructures
    8. Laboratory Specifications
    9. LRFD Bridge Construction Specifications
    10. LRFD Bridge Design Specifications
    11. Manual for Bridge Evaluation
    12. Manual on Subsurface Investigations
    13. Roadside Design Guide
    14. Roadway Lighting Design Guide
    15. Standard Specifications for Highway Bridges, 17th Edition (for existing structures only)
    16. Manual for Assessing Safety Hardware (MASH)
B. American Concrete Institute (ACI) 318 Appendix D – Anchoring to Concrete
C. ADA Accessibility Guideline US Access Board (http://www.access-board.gov/adaag /)

D. American Traffic Safety Services Association (ATSSA) Portable Changeable Message Sign (PCMS) Handbook
E. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering
F. CEB/fip Model Code for Concrete Structures, Appendix E, Time Dependent Behavior of Concrete, Creep and Shrinkage
G. City of Cleveland Publications:
    1. Cleveland Water Standards at: (http://www.clevelandwater.com/construction/design-construction-specifications)
    2. Standard Construction Drawings (including Drainage Design Standards) at: (http://www.city.cleveland.oh.us/CityofCleveland/Home/Government/CityAgencies/PublicService/Public%20Service%20Publications)
H. Cleveland Public Power (CPP) Street Light Standards and General Construction Notes
I. Federal Highway Administration (FHWA) Publications:
    1. Design and Construction of Driven Pile Foundations
    2. Distress Identification Manual for the Long-Term Pavement Performance Project
    3. GEC-10 Drilled Shafts: Construction Procedures and LRFD Design Methods
    4. Ground Improvement Methods
    5. HEC-21 Design of Bridge Deck Drainage
    6. HEC-22 Urban Drainage Design Manual
    7. Manual of Uniform Traffic Control Devices (MUTCD)
    8. Soils and Foundations Reference Manual
J. ICC Evaluation Service – AC308 Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements
K. Illuminating Engineering Society of North America (IESNA)
    1. Roadway Lighting RP-8-00 (Reaffirmed 2005)
    2. Lighting for Parking Facilities (Parking Lots)
    3. Recommended Practice for Tunnel Lighting (Underpass Lighting)
L. National Cooperative Highway Research Program (NCHRP) Publications:
    1. 350 Hardware Report
    2. 529 Guideline and Recommended Standard for Geofoam Applications in Highway Embankments
    3. Web Document 65 Geofoam Applications in the Design and Construction of Highway Embankments
M. National Electric Code (NEC)
N. National Electric Safety Code (NESC)
O. Norfolk Southern (NS) Public Projects Manual for Projects Which May Impact Norfolk Southern Railway Company
P. ODOT (Department) Publications:
    1. Aesthetic Design Guidelines
    2. Bridge Design Manual (2007 edition for new structures and 2004 edition for existing structures) (BDM)

3. CADD Engineering Standards
4. Construction Inspection Manual of Procedures (MOP)
5. 2016 Construction and Material Specifications
6. Design Guidance for Independent Bicycle Facilities
7. Design Guidance for Roadway-Based Bicycle Facilities
8. Ecological Manual
9. Ecological Resources and Permits - Technical Guidance Documents
10. Environmental Services Handbooks and Guidelines
11. Geotechnical Bulletins
12. Geotechnical Engineering Checklists
13. Location and Design Manuals
    a. Volume One - Roadway Design
    b. Volume One - Roadway Design, Section 603.1.2 (Semi Rigid Barriers), Release Date July 19, 2013
    c. Volume Two - Drainage Design
    d. Volume Three - Plan Preparation
14. Ohio Manual of Uniform Traffic Control Devices (OMUTCD)
15. Pavement Design Manual
16. Plan Insert Sheets
17. Qualified Products List (QPL)
    (http://www.dot.state.oh.us/divisions/constructionmgt/materials/pages/qpl.aspx)
18. Real Estate Policies and Procedures Manuals
19. Roadway Safety Landscaping Guidelines
20. Sampling and Testing Manual (STM)
21. Sign Design and Markings Manual (SDMM)
22. Specifications for Geotechnical Explorations (SGE)
23. Standard Bridge Drawings
24. Standard Construction Drawings – All Series (SCD)
25. State Highway Access Management Manual Survey and Mapping Specifications
26. Survey Manual
27. Traffic Engineering Manual (TEM)
28. Quality Standards for Temporary Traffic Control Devices and Acceptable Delineation Methods for Vehicles
29. Wireless Communication Tower Manual
30. Waterway Permit Manual

Q. Transportation Research Board (TRB)
    1. Highway Capacity Manual

1.11 PROJECT PERMITTING REQUIREMENTS

The DBT shall ensure that the Project is constructed and maintained in accordance with all requirements, regulations, and applicable permits required for the Project. This includes the permits described herein and any additional permits not specifically identified in the Contract Documents.

Unless noted otherwise in the Contract Documents, the DBT shall obtain all necessary permits and pay all charges, fees and taxes associated with these permits (for example: City street opening permits, street crossing (equipment moving) permit, water department fees, NEORSD permits, Norfolk Southern temporary track crossing permits and fees, etc). The DBT shall be responsible for any fines levied by regulatory agencies as a result of their construction activities or non-compliance with any permit special or general conditions.

The DBT shall obtain permits from the State or local governments having jurisdiction, to perform any non-construction work within the existing Right-of-Way and/or limited access.

1.12 CO-LOCATION FACILITIES FOR DBT and DEPARTMENT FORCES

1.12.1 Project Management Office

The DBT shall co-locate with Department personnel for the duration of the Project, except the DB Design Project Manager and Design IQF Project Manager, who shall co-locate during Design. The DBT shall provide ADA-compliant, Class C office space to accommodate co-located personnel meeting the requirements of this section. The office space shall be within 2 miles of the Project Limits in a location acceptable to the Engineer.

Although located in the same facility as the DBT, Department staff workspaces shall be adjacent to the extent possible. If the facility has multiple floors, the Department workspaces should be placed together on its own floor while DBT workspaces shall be located on a separate floor.

The following personnel, at a minimum, shall be co-located in the project management office:

A. DB Project Manager
B. DB Utilities/Rail/City Coordinator
C. DB Design Project Manager
D. DB Construction Project Manager
E. Design IQF Project Manager
F. Public Information Point of Contact

In addition to the requirements of C&MS 619, the DBT shall provide the following items and features for the required office space and facilities for Department forces within 30 days after Notice to Proceed. The DBT shall provide maintenance for all items provided by the DBT. The DBT is responsible for determining office requirements to accommodate the DBT's forces.

A. Office furniture for the entire office space
B. A copier, printer, fax and scanner system per the specifications listed below. The DBT shall provide paper and printing supplies and maintenance for all specified equipment.
C. The Department will provide IP Phones via the Department's network. The Department will provide two dedicated phone lines, one for facsimile and one for a land line back-up in case of network disruption.

D. All rooms, cubicles, conference rooms shall be capable of having network jacks installed for use by the Department's staff.
E. The DBT will obtain and pay for two separate internet connections for the Department, each with a minimum 50/5 Mbps download/upload speed. The DBT will provide the necessary network equipment and communication circuits to connect the field office to the Department network. The DBT will install the following equipment:
    1. Locked cabinet w/UPS
    2. Network switch
    3. Network drops in the office
F. The DBT shall provide two licensed copies of Primavera (P6) and the appropriate contract management software compatible with the Department's project document management system.
G. Office space for the Department's staff that has, at a minimum, the following:
    1. Twelve offices (100 square feet, each enclosed office space with individual locking door)
    2. Twelve cubicles (80 square feet each)
    3. An enclosed conference room (600 square feet) with doors, provided with a computer projector and minimum 7-foot-wide screen
    4. Break room with sink (150 square feet, with 12 square feet of counter space, microwave oven and a 20-cubic-foot refrigerator)
    5. Lockable filing space (400 square feet) with six four-drawer filing cabinets
    6. Two lockable closets (25 square feet each)
    7. An appropriate number of desks, chairs and filing cabinets
    8. Hard-surfaced (paved) parking, with one space per office and one space per cubicle, plus 10 visitor spaces. The parking area shall be well lit, secured, and maintained, with slopes not exceeding 1 percent in any direction. Parking shall be at no cost to the Department. A separate, fenced, lockable area shall be provided for 10 vehicles within the provided parking area.
    9. Include potable hot and cold water. Toilet/washroom facilities must be appropriately sized for this size office space. Furnish all lavatory and sanitary supplies. Provide daily janitorial service.
H. Public meeting space for meetings with public officials, key stakeholders, media and others that has at a minimum:
    1. Separate entrance from main hallway or foyer so that Project staff is not disrupted by the meetings.
    2. 800 square feet of space
    3. Tables and chairs
    4. Six floor-standing easels for Project boards
    5. Computer projector and minimum 7-foot-wide wide screen

1.12.2 Copier, Printer, Fax, and Scanning System Specifications

A. Automatic document feeder with 80-sheet ARDF

B. Equipped to handle paper up to and including 11-inch x 17-inch (originals and copies) including mixed originals
C. Reduction and enlargement features
D. Unlimited duplexing for all size originals 8.5-inch x 11-inch through 11-inch x 17-inch
E. Manual and selectable automatic exposure settings
F. Operate on standard voltage with no special or dedicated lines
G. Stapler/finisher support with the following features:
    1. Paper size support for 5.5-inch x 8.5-inch to 11-inch x 17-inch/A6 to A3
    2. Paper Weight support from 16 to 42 lb. Bond/ 60 to 157g/m2
    3. Staple position three positions (1 staple/2 positions; 2 staples/1 position)
    4. Staple capacity: 50 sheets (8.5-inch x 11-inch); 30 sheets (8.5-inch x 14-inch or larger)
H. 1 to 999 sort capacity
I. Paper capacity: 500 sheets x four trays, 50-sheet bypass tray
J. Paper weight support: 20- to 28-pound Bond/64 to 105g/m2 (Trays 1,2,3, & 4) 16- to 44-pound Bond/52 to 163g/m^2 (bypass) 20- to 28-pound Bond/64 to 105g/m^2 (duplex)
K. Energy Star compliant
L. Network printer capability with 10BASET/100BASETx network card
M. Printer speed 35 ppm
N. Network protocol support for TCP/IP
O. Network operating system for Windows 7 Professional
P. Client Print driver support for Windows 8 (Both PCL/PS drivers)
Q. Minimum print resolution of 600 x 600 dpi
R. Secure printing with password or pin
S. Network scanning that supports the following:
    1. Scan speed: 52 ipm @200 dpi
    2. Scan area: up to 11-inch x 17-inch
    3. Grayscale: 256 levels (Color Required)
    4. Scanning resolution: 600 dpi
    5. Scanning protocol support: TCP/IP, SMTP, SMB, FTP, POP3, NCP
    6. Scanning support for scan-to-email, HDD, folder, URL, and TWAIN
    7. File formats: Single-page TIFF, JPEG, PDF, multi-page TIFF, PDF
    8. Address book support for multiple items
    9. OCR software that supports TIFF, PDF, multi-page TIFF, and multi-page PDF
    10. OCR software must support batch workflow processing of documents
T. Minimum shared memory capacity for all options: 384 MB
U. Hard disk drive: 40 GB drive for internal storage and network scanning
V. Analog fax support for PSTN, PBX that supports the following:
    1. Resolution: 200 x 200/100 dpi 400 x 400 dpi (optional)
    2. 33.6 Kbps with auto fallback
    3. Address book and auto-dial number storage
W. Black & white and color capable

1.13 BUILDABLE UNITS

Buildable Units (BU) are portions of the Project that can be designed, reviewed, and built with only limited controls and assumptions coming from the design of other portions of the Project. Often a Buildable Unit will be defined by a geographic area, but it may also be defined by type of work or construction stage, which may in turn require or permit similar, nearby work to be divided into separate Buildable Units.

The DBT shall summarize and submit for Approval the quantities and materials in each BU in tabular format to facilitate testing and inspection during construction. The summary shall include the C&MS Item Number, and a description of the materials to be used.

For the interim BU submittals, the DBT may break the remaining project work into two or more additional BUs that can progress through design and construction with minimal or known effect on each other and/or can be dealt with sequentially such that sufficient data is available for design and review of each BU. In order for the design and construction of one BU to proceed without significant Approved information from an associated BU, the DBT may develop and propose assumptions that will allow for the first BU to proceed through design and/or construction. These assumptions shall be submitted for review and comment but their accuracy and effect on the final design are the sole responsibility of the DBT. Should error in these assumptions result in additional work, remedial work, or other changes to assure an acceptable design, or should they result in the need to remove work and substitute additional work, the DBT shall be responsible for all schedule delays and related costs including removal of unacceptable materials from the site, modification, additional work, repairs, as necessary.

The DBT shall prepare, for review by the Department, a table of Buildable Units for the Project with each BU described in detail. The DBT shall develop the Progress Schedule to show a separate group of activities for each BU, with the activities encompassing all design and construction work. Activities in the Progress Schedule shall be sufficiently detailed to allow completion status to be monitored. For example, activities comprising the placement of a bridge deck on steel beams shall describe shoring, form building, steel placement, placement of conduit and joints, pouring concrete, forming parapets, provision of membranes, provision of wearing surfaces, curing, repair, form removal, and cleaning, among other items.

The Final Review Submission and construction plans shall specifically be identified by Buildable Unit identification codes determined by the DBT. The nomenclature of the BU shall be consistent throughout the design and construction process, clearly identifying to which BU plans or other submissions refer. If the design of a BU requires input information from an adjacent or related BU, the source for that information in previously Approved plans shall be cited or the DBT shall provide an estimated value for that data. The input data shall also be carefully identified. Any assumption, calculations, or results from the stage and BU used as input to another BU shall be similarly identified and, where appropriate, compared back to the original BU to verify previous assumptions. Should assumptions not match values calculated later, the DBT shall re-analyze all affected components and determine appropriate changes. Should those elements have already been constructed, the DBT shall recommend repairs, adjustments, modifications, or replacement of the existing work as necessary to comply with the Scope of Work. All

costs for re-design, re-submissions, modifications, removals, disposal of materials and new work needed to remedy the project and bring it to compliance shall be borne by the DBT. No time extensions shall be Approved for this Work.

1.14 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Table of Buildable Units	Approval	0	1	Prior to Interim Submittal	1.13

2 QUALITY MANAGEMENT

2.1 GENERAL

The DBT has the responsibility for the quality of the Work, including the Work and products of the Lead Designer, Subcontractors, Subconsultants, fabricators, suppliers, and vendors.

The DBT's Quality Management Plan shall be a major component of the Project Management Plan.

2.2 INDEPENDENT QUALITY FIRM

The DBT shall employ an Independent Quality Firm (IQF) who shall be responsible for verifying that all design work meets the requirements of the Contract Documents, facilitating continuous improvement of the design process, and meeting the requirements of this Section 2 that are assigned to the IQF.

The IQF shall owe a duty of care to the Department in carrying out its obligations in relation to the Project. The IQF shall have authority independent of and be equivalent (or higher) authority than the DBT Construction Project Manager and DBT Design Project Manager.

The DBT shall not terminate or seek the termination or removal of any IQF personnel performing quality functions or with a judgment in the quality of the design work without the expressed written permission of the Department.

The IQF shall be the following:

A. An independent entity, not owned by or affiliated with the DBT or any of its members, partners, or affiliated entities
B. A direct report to the DB Project Manager

2.3 ALLOCATION OF QUALITY MANAGEMENT RESPONSIBILITIES

The DBT will be responsible for the professional quality, technical accuracy and adherence to the Governing Regulations as described in Section 1.10 of this document for all plan submittals required under the Contract Documents.

2.3.1 DBT Responsibilities

The DBT shall:

A. Perform all quality control functions, including production necessary to meet requirements of the Contract Documents for design, construction, administration, etc.; with the exception of DBT QC testing, which shall be carried out by DBT personnel who are not part of production as required per the applicable QC/QA specification. DBT production QC inspection may be performed by production personnel.
B. Have the authority to stop any Work if requirements of the Contract Documents are not being met.
C. Identify and recommend measures to prevent quality problems or to improve quality.
D. Provide 24-hour notice of, and invite the Department to: over-the-shoulder review, and interim/final design review.

E. Provide access to all facilities, offices and locations on and off-site where Work occurs. To facilitate access to sites where aerial access is necessary, the DBT shall make available a man-lift for the directed use of Department personnel. The man-lift shall be capable of lifting a minimum of two people, in addition to the DBT provided operator, and shall be capable of providing access to the bridge superstructures from ground level. The man-lift shall be available for use at all times during structural steel erection. The DBT shall provide access by either providing a man-lift, as described above, or stair tower access at each work location for each substructure pour.
F. Allow the Department to copy any books or records, or provide copies, as the Department reasonably deems necessary for purposes of verifying compliance with the Contract Documents.
G. Build into its Project Schedule sufficient time for reviews, Approvals, quality assurance, and for the DBT's subsequent revisions.
H. Stop Work when directed in order to correct conditions that are unsafe for Project personnel or the general public, or to correct unacceptable design or construction practices.
I. Have no Design IQF responsibilities.

2.3.2 Design IQF Responsibilities

The Design IQF shall:

A. Perform all quality assurance functions related to design components ensuring that all design work meets applicable requirements of the Contract Documents. Design work may be verified by qualified individuals who are employees of or retained by manufacturers, vendors, or Suppliers, if approved in writing by the Department.
B. Identify and recommend measures to prevent quality problems or to improve design quality.
C. Have the authority and requirement to stop any design work if requirements of the Contract Documents are not being met.
D. Review and approve all design deliverables (including Working Drawings and Engineered Drawings) prior to delivery to the Department. IQF approval shall indicate that the IQF believes the deliverable meets requirements of the Contract Documents.
E. Have no DBT Quality Control responsibilities

2.3.3 ODOT Responsibilities

ODOT or agents acting on behalf of ODOT will provide construction quality assurance and independent assurance functions including: Inspection and documentation in accordance with the Construction Inspection Manual of Procedures and verification sampling and testing. The Department will perform independent assurance focused on verifying that all material sampling and testing is carried out by qualified, certified personnel, and using proper equipment, procedures, and techniques in accordance with Department requirements.

2.4 PROJECT MANAGEMENT PLAN

2.4.1 Purpose and Format of the PMP

In accordance with the requirements of the Contract Documents, the DBT shall develop and implement a written Project Management Plan (PMP) for all elements of the Project, including, but not limited to, management, administration, design, geotechnical investigations, construction, testing, and environmental monitoring and compliance.

The DBT shall engage the Department in the PMP development process to facilitate the process and ensure understanding. The Department's participation in the development of the PMP does not waive the DBT's responsibility for the quality of the Work, nor does it ascribe any responsibility to the Department for the Work. Further, this involvement does not preclude subsequent rejection of the PMP by the Department.

The implemented PMP shall accomplish the following quality functions and objectives:

A. Successfully deliver the Project within the accepted Critical Path Method (CPM) schedule for the Project
B. Construct a high quality Project as described in the contract documents
C. Provide a complete quality program that uses quality control, verification and quality assurance principals to eliminate non-conforming items and ensure that any non-conforming items are detected and corrected

The PMP shall address the responsibilities for each of the following quality components:

A. Procedures for Design Quality Control performed by the DBT Designer
B. Procedures for Design Quality Assurance performed by the IQF
C. On-site Process Quality Control Inspection and Process Quality Control Testing as required by all applicable QC/QA specifications.
D. Verification procedures to be performed.

The PMP will delineate how the DBT will ensure that all disciplines, aspects and elements of the Work will comply with the requirements of the Contract Documents and that all materials incorporated into the Work will perform satisfactorily for the purpose intended and conform to the contract requirements. The DBT may use any nationally accepted format for the PMP.

The construction portions of the PMP shall be a compilation of all required QC Plans that are required for the applicable QC/QA specification.

2.4.2 Personnel

The PMP shall describe the roles of those involved in quality management and the interactions between them. As Quality is the responsibility of all team members, at a minimum, the roles of Key Personnel in the quality process shall be delineated.

The quality management organization of the DBT and shall include the following:

A. An organizational chart showing lines of authority and reporting responsibilities for all Project disciplines
B. The name, position, qualifications/resume, duties, responsibilities, and authorities of each person proposed for a quality management function, including the following minimum named persons:
    1. DB Project Manager
    2. Design IQF Project Manager
    3. IQF Roadway Lead
    4. IQF Structural Lead
    5. DB Design Project Manager
    6. DB Design QC Manager
    7. DB Construction Project Manager
    8. DB Lead Structural Engineer
    9. DB Lead Roadway Engineer
    10. Construction QC Manager

DB Project Manager: Ultimately responsible for the DBT's performance. Ensures that personnel and other resources are made available. Responsible for contractual matters. Shall be co-located on a full-time basis for the duration of applicable activities unless modification to the commitment is requested in writing by the DBT and approved by ODOT in its sole discretion

Design IQF Project Manager (DIQFPM): Actively manages the Design Quality Assurance. Must be an employee of the IQF. Responsible for ensuring that the requirements of the Design Quality portions of the Project Management Plan are being met and to manage any other matters related to design quality. Must be an Ohio P.E. at the time of Award. The Design IQF Project Manager shall have no less than 8 years of experience in quality management. Shall be co-located on a full-time basis for the duration of applicable activities unless modification to the commitment is requested in writing by the DBT and approved by ODOT in its sole discretion

IQF Roadway Lead: The IQF Roadway Lead shall report to the DIQFPM and be responsible for the review and verification of the quality of all non-structural design Work. The IQF Roadway Lead shall have no less than five years of experience in the design and review of major highway projects of similar size and complexity. The IQF Roadway Lead must be an Ohio P.E. at the time of Award.

IQF Structural Lead: The IQF Structural Lead shall report to the DIQFPM and be responsible for the review and verification of the quality of all structural design Work. The IQF Structural Lead shall have no less than five years of experience in the design and review of complex bridges for major highway projects of similar size and complexity. The IQF Structural Lead must be an Ohio P.E. at the time of Award.

DB Design Project Manager: Actively manages the overall design of the project. Must be an employee of the Lead Designer. Responsible for overall design of the project inclusive of all structures and structural elements (bridge substructures and superstructures, retaining walls) and roadway items (alignment, drainage, pavement, lighting, traffic signals, maintenance of traffic, etc.) Must be an Ohio P.E. at the

time of Award. Shall be co-located on a full-time basis for the duration of applicable activities unless modification to the commitment is requested in writing by the DBT and approved by ODOT in its sole discretion

DB Design QC Manager: The DB Design QC Manager shall be responsible for the control of the design production processes and resulting work products. The DB Design QC Manager shall have no less than eight years of experience in design Quality Control, including design reviews and verifications. The DB Design QC Manager must be an Ohio P.E. at the time of Award. This position is required for the duration of all design-related activities on the Project.

DB Construction Project Manager: Actively manages the overall construction of the project. Must be an employee of the Lead Contractor. Responsible for overall construction inclusive of all structures and structural elements (bridge substructure and superstructure, retaining walls,) and roadway items (alignment, drainage, pavement, lighting, traffic signals, maintenance of traffic, etc). Shall be co-located on a full-time basis for the duration of applicable activities unless modification to the commitment is requested in writing by the DBT and approved by ODOT in its sole discretion.

DB Lead Structural Engineer: Actively manages and serves as point of contact for all structural designs. Responsible to ensure that all requirements of the design for all structural elements on the Project, including bridges, box culverts, walls, and foundations are met. Must be an employee of the Lead Designer. Must be an Ohio P.E. at the time of Award.

DB Lead Roadway Engineer: Actively manages and serves as point of contact for all roadway and drainage designs. Responsible to ensure that all requirements of the design for all roadway and drainage elements on the Project are met. Must be an employee of the Lead Designer. Must be an Ohio P.E. at the time of Award.

Construction QC Manager (CQCM): Construction QC Manager shall be responsible for the control of the construction production processes and resulting work products including DBT QC personnel. The Construction QC Manager shall have no less than five years of experience in construction Quality Control, including inspection and testing. The Construction QC Manager shall be responsible for coordinating all QC Testing per QC/QA Specifications. The CQCM shall also manage document control of all construction related DBT documents including material tickets, QPL material invoices, TE-24s, material certifications, DLS reports, Hiperpav data, surface smoothness data, approved JMFs, mass concrete data, WTS reports and reporting daily construction schedules. Shall be co-located on a full-time basis for the duration of applicable activities unless modification to the commitment is requested in writing by the DBT and approved by ODOT in its sole discretion

The personnel listed in this Section shall comply with the following:

A. Be an employee or Subcontractor of the DBT for DBT positions. Positions listed as "Independent" shall be an employee or Subcontractor of the IQF.
B. Have sufficient authority and organizational freedom to prevent and resolve quality problems, and to implement continuous improvement measures.

The DBT and IQF shall comply with the following:

A. Determine the necessary competence and qualifications for all personnel performing Work affecting quality and ensure they are competent on the basis of appropriate education, training, skills, experience, and certifications.
B. Provide training to all personnel performing Work affecting quality to ensure they understand the relevance and importance of their activities, the expectations and requirements of their Work, and their specific roles and responsibilities.
C. Provide training, where necessary to achieve necessary competence.
D. Maintain records of education, training, certifications, skills and experience.

The PMP shall describe the procedures for coordinating and ensuring the consistency and quality of all Work performed or provided for the Project by all participants. DBT management shall review the quality program, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness.

This review shall include assessing Opportunities for Improvement and the need for changes to the quality program, including the quality policy and quality objectives. Records from management reviews shall be maintained.

The processes to ensure DBT management's commitments shall be included within the PMP by containing descriptions of the quality policies and objectives that will be implemented throughout its organization. The policy shall demonstrate the DBT's senior management's commitment to implement and continually improve the quality management system for the Work.

2.4.2.1 Document Control

The PMP shall describe the means by which all documents required are:

A. Controlled in accordance with Department's document management systems and the Construction Inspection Manual of Procedures.
B. Created and retained in the Department's SharePoint IT system.
C. Approved for adequacy prior to release.
D. Reviewed and updated as necessary and re-approved by the same personnel that performed the original approval.
E. Identified to ensure that changes and revision status are known.
F. Available at all points of use, including the IQF and the Department.
G. Distributed.
H. Prevented from unintended use, if obsolete.
I. Organized, indexed and delivered to the Department for final acceptance.

The Department will partner with the DBT to establish a format within the SharePoint site and grant needed access for the DBT's personnel to assist in the management of the site. The Department's SharePoint site will be the official project record for the project.

The PMP shall describe the means by which records established to provide evidence of conformity to requirements and the effective operation of the quality program are identified, stored, protected, readily retrieved, retained according to the Department's Record Retention Policy, and disposed of.

The PMP shall describe the procedures for meeting documentation requirements and document control of all Design Documents.

Copies of all correspondence between the DBT and other agencies, including the City of Cleveland, regulatory agencies, Railroads, and Utility Owners, shall be provided to the Department via the Department's document management system at the time of submittal to the applicable agency.

The DBT shall collect, retain, and upload to the Department's document management systems, within five Business Days of the activity to which the document pertains, the following, all of which shall be in a format acceptable to the Department:

A. Evidence that all required activities have been performed.
B. Type, number, and results of all current quality management activities, including reviews, verifications, audits, Nonconformances, Corrections, Opportunities For Improvement, Corrective Actions, Preventive Actions and monitoring of Work performance and progress.
C. Documentation used and created by the IQF for review of design submittals, including all Design Documents included with interim and final design submittals, review comments, and disposition of comments.
D. Engineered, Shop and Working drawings
E. Minutes of all DBT and IQF meetings (distribute draft minutes within 48 hours).
F. For railroad and utility work, documentation of the design as well as documentation of utility and railroad personnel on-site performing Work, including inspection and flagging. The documents shall be maintained separately for each individual utility and railroad facility.
G. Any other document not listed above provided by the DBT Documentation Lead.

2.4.3 Quality Planning

The DBT shall plan, develop, and document in the PMP the processes needed to deliver the Work in accordance with the requirements of the Contract Documents, including:

A. Geotechnical investigations and testing.
B. Field survey verification.
C. Control of monitoring and measurement devices, to ensure that tools, gages, instruments, and other measuring and testing devices used in activities affecting quality are properly maintained, controlled, calibrated, certified, and adjusted at specified periods to maintain accuracy within necessary limits.

D. Design planning, to establish the responsibilities, checks, reviews, timing, procedure or reference standard, and resulting records for all design submittals.
E. Design requirements definition, to ensure that all users have the current and complete set of requirements applicable to their work.
F. Deviations from the requirements of the Contract Documents, to ensure that general or specific variances from requirements occur only with the Department's Approval.
G. Validation of computer programs and checking of inputs.
H. Cross-discipline reviews, to ensure consistency and prevention of coordination errors.
I. Conformance checking, to ensure the right requirements are being utilized.
J. Fitness for use reviews, to ensure that Work will meet generally implied expectations.
K. Accuracy checking, to ensure requirements are designed right.
L. Style checking, to ensure compliance with appearance needs, i.e. CADD, file type, spelling, etc.
M. Constructability reviews, to ensure the implementability, accessibility, and maintainability of the Work.
N. Over-the-shoulder reviews.
O. Scope checking to verify the completeness of submittals.
P. External (Third Party) reviews, to obtain input and buy-in.
Q. Design change notices, to ensure that revisions to design are controlled by the Engineer of Record and communicated clearly to all points of use.
R. Field design change requests, to ensure that all and any changes to design occur only under the direction or approval of the Engineer of Record.
S. Construction planning, to establish the responsibilities, timing, procedure or reference standard, and resulting records for all incoming, in-process and final products.
T. Pre-activity construction meetings, to ensure all parties responsible for the quality of the Work have a common understanding of the requirements, the design intent, the applicable Design Documents, procedures, laws, regulations related to the Work. Pre-activity meetings shall be held for all significant activities and repeated whenever there are significant changes in personnel or working conditions, and when there has been a significant lapse of time since the activity was last undertaken.
U. As-Built Documents, to ensure accurate and timely documentation of the constructed Project
V. Project closeout
W. Warranty Work, to control the identification and resolution of warranty issues.

2.4.4 Design

2.4.4.1 Design-Related Investigations and Testing

The PMP shall:

A. Describe and define the procedures for ensuring the quality and documentation of project geotechnical investigations and testing.
B. Describe and define the procedures for ensuring the quality and documentation of field surveying for the project mapping coordinate system.

C. Provide assurance of qualifications of all laboratories performing any testing as part of the Design process.

2.4.4.2 Design Quality Management

The PMP shall describe design quality management practices and processes that are intended to:

A. Place responsibility for design quality on the DBT.
B. Ensure that Work is designed and built in accordance with the contract.
C. Ensure that all design documents are prepared in accordance with Department practices and meet all the requirements of the contract.
D. Ensure reviews are in compliance with the contract requirements and the accepted PMP.
E. Ensure that reviews of all design elements are completed and include all involved agencies (e.g., Department [District and Central office], City of Cleveland, NEORSD, GCRTA, Norfolk Southern, utilities, etc.).
F. Allow the Department to fulfill its responsibility of exercising due diligence in overseeing the overall design process and design of individual buildable unit segments as defined by the CPM schedule.

2.4.4.3 IQF Design Reviews

The DIQFPM shall review all design submittals to verify they are in accordance with the requirements of the Contract Documents and that their development was in accordance with the PMP. All designs shall be reviewed and verified by members of the IQF who are Professional Engineers licensed in the State of Ohio with experience in the design discipline being reviewed and verified.

2.4.5 Construction

2.4.5.1 Construction Quality Management

The PMP shall describe construction quality management requirements that are intended to:

A. Place responsibility for construction quality on the DBT.
B. Ensure that Work is constructed in accordance with the contract, plans, and specifications
C. Allow the Department to fulfill its responsibilities of exercising due diligence in overseeing the construction

2.4.5.2 Materials Testing

DBT Quality Control shall sample and test materials in accordance with the requirements (location, frequency, lot sizes, test methods, etc.) specified in the applicable QC/QA specifications within the C&MS, Supplemental Specifications, and Contract Documents. The DBT shall ensure that all transports and distributers hauling asphalt material are equipped with Approved submerged asphalt material sampling devices. DBT QC testing shall include:

A. QC testing for all QC/QA specifications, including C&MS 455 and Supplemental Specifications 840 and 878. C&MS 455 shall be required for items 305, 451, 452, 511, 524, 526, and 622.
B. QC testing necessary to assure proper process control for non-QC/QA specifications

2.4.6 Environmental Monitoring and Compliance

The DBT shall describe in the PMP the methods, processes and procedures to provide for the effective implementation and documentation of the environmental protection, training, compliance and monitoring program. This includes the tracking of New, Small, Local, Edge (NSLE) participation and OJT training requirements. The DBT may reference their Diversity, Inclusion, and Outreach Plan (DIOP) as appropriate.

2.5 QUALITY PROGRAM ACTIVITIES AND SUBMITTALS

2.5.1 Initial Project Activities

Except for preliminary meetings, development of the Project Schedule and the development of the Project Management Plan (PMP), no Work shall begin on the Project until the Department has Approved the PMP.

At the Department's sole discretion, the Department may approve portions of the PMP to allow certain Work (e.g., design) to proceed as defined by the applicable portion of the PMP.

2.5.2 PMP Approval

The DBT shall submit a draft PMP no more than 30 Days after the Project is awarded, then allow 15 Workdays for the Department to approve or reject initial PMP submittals. For subsequent revisions to the PMP, the Department requires 10 Workdays to approve or reject the submission. The DBT shall submit each PMP revision to the Department during a submission meeting, in which the DBT shall provide an overview of the PMP revision.

2.5.3 Design Submittals

2.5.3.1 Over-the-Shoulder Reviews

Over-the-shoulder reviews are informal examinations performed by the IQF and the Department of Design Documents during the design process. Over-the-shoulder reviews will mainly assess whether the requirements and design criteria of the Contract Documents are being followed and whether design PMP processes and procedures are being followed. The DBT shall schedule over-the-shoulder reviews with the IQF and invite the Department during the course of the development of each design package, prior to interim and final submittals. The DBT shall invite affected Utilities, Railroads, and City Departments to each over-the-shoulder review to provide opportunity to comment as requested or as otherwise deemed necessary by the Department. The PMP shall define the frequency and timing of over-the-shoulder reviews.

Over-the-shoulder reviews shall be conducted in the Project office of the Department, the DBT or its design engineer and in the presence of the design personnel, with the intent of minimizing

disruption of ongoing design Work. The DIQFPM, design staff, and the Department will jointly determine the materials to be compiled for each review. Formal assembly and submittal of drawings or other documents will not be required; however, the DBT is encouraged to provide informal submittals to facilitate reviews. The over-the-shoulder review may be of progress prints, computer images, draft documents, working calculations, draft specifications or reports, or other Design Documents. If mutually agreed upon for specific review items, the over-the-shoulder review may be facilitated by the transfer of electronic files. The IQF shall document the outcome of each over-the-shoulder review. It shall be the DBT's responsibility to confirm whether comments made are in conformance with the Contract Document requirements.

2.5.3.2 Interim and Final Design Submittals

The DBT shall schedule a submission meeting with the IQF to present each design submittal. Other agencies, (i.e., FHWA, City departments, Railroads, and Utilities as applicable to the submission) including the Department, shall be notified in advance of each submission meeting, and shall be accommodated to attend each meeting at its sole discretion. At submission meetings, the DBT shall provide an overview of the submittal, including a summary of all included information. The IQF shall not accept submissions with missing information.

Each formal IQF review shall be a complete review of all Design Documents, to ensure that Contract Document requirements and design criteria are being met. The DIQFPM shall not release any design submittal that does not meet Contract Document requirements or was not developed in accordance with the PMP. The IQF does not have the authority to waive Contract Document requirements. In addition, the DIQFPM shall verify that there are no conflicts between the Buildable Unit being reviewed and any previously approved designs. All deviations from these requirements shall be noted and corrected.

Upon IQF approval and verification that a design submittal is in compliance with the Contract Documents, the IQF shall submit Design Documents to all applicable agencies requiring review and upload electronic copies to the Department's document management system. Submission requirements, beyond those stated in the Contract Documents, to agencies other than the Department shall be determined by and complied with by the DBT.

The durations listed in the table below shall be in the CPM Schedule for interim and final reviews and comments/ approvals as follows. The DBT shall supply an electronic version (in PDF format) along with a full size (22" x 34") and/or half size (11" x 17") paper prints of each plan submission simultaneously to the parties indicated below:

Submittal	Review Times	Half size (full size)
ODOT	10 Workdays	0
City of Cleveland Engineering & Construction	10 Workdays	4
GCRTA	As stated in Railroad Agreement	2
Norfolk Southern	As stated in Railroad Agreement	3
NEORSD	20 Workdays	2
City of Cleveland owned utility	20 Workdays	1
Each affected utility	20 Workdays	1 (1)

Review times begin upon receipt of submittal following IQF approval. The Department will not provide formal review of design submittals; however, design submittals are subject to Department audit over the course of design development. Department design audits may be limited to scope compliance; however, the depth, magnitude, type, and timing of the Department's audit of design submittals will be at the Department's sole discretion. As necessary, the DBT shall schedule comment resolution meetings with the Department to resolve comments received as a result of Department audit.

The DIQFPM shall prepare and distribute minutes of each submission and comment resolution meeting and shall ensure that all review comments are addressed by the Design-Build Designer and verified by the IQF. Final design submittals shall include a written disposition of all comments made during formal interim design submittals.

2.5.3.3 Major Design Decisions

Separate submittals for concurrence with major design decisions made after the interim design submittal are required. Major design decisions involve significant utility relocation, unforeseen acquisition of ROW, traffic operation or geometric decisions that involve two or more viable solutions, and any other decision that impacts the public, operation of the facility or future maintenance.

When the DBT becomes aware of additional decisions during the course of the design, they must advise the Department Project Manager in writing.

2.5.3.4 Released for Construction

Following review of final design submittals, the DBT shall resolve all outstanding issues and comments and prepare a full set of Design Documents stamped "Checked and Ready for Review." The DBT shall schedule a submission meeting with the IQF to present the submittal. Other agencies, (i.e., FHWA, City departments, Railroads, and Utilities as applicable to the submission) including the Department, shall be notified in advance of the submission meeting, and shall be accommodated to attend each meeting at its sole discretion. The DBT shall provide an overview of the submittal, including a summary of all included information. The IQF shall not accept submissions with missing information.

Plans Distribution Table: The DBT shall supply an electronic version (in PDF format) along with a full size (22" x 34") and/or half size (11" x 17") paper prints of each plan submission simultaneously to the parties indicated below:

Submittal	# of full sets	# of half sets
ODOT District Planning and Engineering	1	5
ODOT District Construction	1	1
City of Cleveland (Traffic, Engineering & Construction, and Planning)		4
NEORSD		1
GCRTA		1
Norfolk Southern		1
Each affected utility (including City of Cleveland Divisions)	1	1

The IQF shall verify compliance with all Contract Document requirements and design procedures, and ensure that all comments from final reviews have been resolved. If upon IQF review it is determined that it is questionable as to whether comments received from the Department or other agencies have been resolved or addressed appropriately, the DIQFPM may consult with the commenter to resolve such comments.

The DIQFPM shall sign and stamp on the Design Documents “Released for Construction” after the following requirements have been met:

A. All IQF, Department, and other agency comments and Nonconformances have been resolved.
B. Design Documents have been designed in accordance with the requirements of the Contract Documents and are consistent with the overall design.
C. Design Documents have been checked in accordance with the PMP.
D. All deviations have been Approved by the Department.
E. Design Documents have been signed and sealed by the Engineer of Record.

The DBT shall provide detailed quantity estimates for all Work that requires quality sampling or testing and all materials subject to price adjustments (e.g., structural steel). The units shall be consistent with the units used to determine frequency of sampling and testing. For example, if the number of compaction tests to be taken is based on a specific number of cubic yards of embankment, then the quantity estimate shall also be in cubic yards. Quantities may be provided after Design Documents are Released for Construction; however, quantities shall be provided prior to any construction commencing for the Work covered by the applicable Released for Construction Documents.

2.5.3.5 Supplemental Plan Sheets

Concurrent with the RFC plan submittal, the DBT shall provide the Department with supplemental plan sheet plots (PDF only) depicting existing utilities in color. Independent colors

shall be used for each utility type. Plots shall be consistent with RFC drawings, however, only plan view sheets are required.

2.5.3.6 As-Built Submittals

As-Built Documents shall be produced as the Project progresses and each Buildable Unit is completed. As-Built Documents shall be prepared in conformance with the *Location and Design Manual*, Volume 3 and be submitted in both hardcopy and electronic (PDF, TIFF, and CADD) format, including MicroStation and Geopak files, conforming to Department CADD standards. As-Built Documents shall include quantities for the Work associated with each Buildable Unit. Quantities shall be grouped in accordance with *Location and Design Manual*, Volume 3, Section 1307, and shall be provided in Microsoft Excel or similar tabular format, as Approved by the Department. A set of instructions shall also be provided with each table of quantities, providing information that enables Department personnel to properly identify all quantities.

The DBT shall prepare formal As-Built submittals for each Buildable Unit that incorporate all updates to the Released for Construction Documents including any design changes, actual field as-built changes, actual survey info; and up-to-date copies of all other Design Documents including Project reports, calculations, design files, etc.

Utility relocations performed by others, in conjunction with the Project (e.g., telecom, gas, private electric, other private utilities), do not need to be incorporated in the As-Built CADD files and plan sheets, however, the utility relocation plans shall be included as an attachment to the As-Built submittal.

As-built Documents shall be reviewed and verified by the IQF for completeness, accuracy, and compliance with the Contract Documents prior to submission to the Department.

2.5.3.7 Design Changes

All design changes shall be identified, received, tracked, reviewed, responded to, approved by authorized personnel, and distributed prior to their implementation in accordance with a defined procedure. All design changes shall follow the same process for checking and review as the original design.

In all cases, the DIQFPM shall certify in writing that the design change:

A. Has been designed in accordance with Contract Document requirements.
B. Has been checked in accordance with the PMP.
C. Is consistent with other elements of the original design.
D. Has been reviewed by the IQF.
E. Is fully compatible with the design of related elements.

2.5.3.8 General Review Timeframe

For any submittal not specifically named in the Project Scope, the DBT shall anticipate 10 Workdays for Department and City of Cleveland (Engineering & Construction) review, and 20 Workdays for review by utility owners, if applicable.

2.5.4 Construction Activities

Construction Work shall not begin until the Design Documents for that portion of the Work are complete, have been signed and sealed by an Ohio-licensed Professional Engineer in conformance with the Ohio Revised Code, have been accepted through the PMP process, and have been Released for Construction in accordance with the Contract Documents.

2.6 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Project Management Plan (PMP)	Approval	7	1	Refer to Section 2.5.2	
Interim and Final Design Submittals	Submittal	N/A	1	Refer to Section 2.5.3.2	
Released for Construction Documents	Submittal	7	1	Prior to construction Work covered by the Released for Construction Documents	2.5.3.4
Supplemental Plan Sheets	Submittal	N/A	1	With RFC Documents	2.5.3.5
As-Built Submittals	Acceptance	2	1	Within 90 Business Days of completion of each Buildable Unit	2.5.3.6

3 DOCUMENT MANAGEMENT

The DBT shall coordinate the various reporting and submission activities related to the requirements of the Contract Documents and work within the framework established by the Department for document management.

The Department's OC3 Microsoft SharePoint site shall be used by the DBT to support the electronic submission of all Project-related documentation and shall serve as the single point of reference for all documentation related to the Project, unless otherwise stated in the Contract Documents. The Department will provide access and levels of security to the SharePoint site for mutual use between the Department and DBT.

The DBT shall conform to these software systems, incorporating Project tasks in planned processes to ensure all required Project documentation and submissions to the Department are compatible. The Department requires customized data fields, electronic file structure, templates, and documentation according to the ODOT District 12 structure for all electronic submissions to the Department. Electronic submissions shall be uploaded into the proper file folders on the Department's SharePoint site by the appropriate DBT personnel. The DBT shall obtain Department Approval of all proposed fields, templates, and electronic formats prior to the submission of any documentation to the Department.

4 PUBLIC INFORMATION AND COMMUNICATION

4.1 GENERAL

Providing clear, consistent, and timely messaging is an essential element to successful Project delivery. The public information role consists of many tasks including responding to public inquiries and complaints; coordination with the media; preparing regular traffic updates, press releases, web updates and photo and video documentation; and coordinating with local jurisdictions, transit providers, emergency service providers, and local neighborhood, community, and business groups. To support this effort, the Department will share clear, concise, and timely information with the public, elected officials, community leaders, businesses, and the news media.

The DBT shall work with the Department to achieve the following public information and community relations goals:

A. Support the successful delivery of the Project by presenting the Project in a positive light to the public
B. Provide information to individuals and entities directly affected by construction in a proactive, responsive, and complete manner.
C. Reinforce positive Department relationships with associated agencies, individuals, and community and business groups.
D. Communicate to the public the importance of the Project to the mobility and economic vitality of the local community, region, and State.

General requirements of the Public Involvement, Communication, for the Project are included herein, along with a definition of the respective responsibilities of the DBT and the Department. The requirements described in Section 4 are the minimum requirements of the Contract Documents. The DBT shall work with the Department to ensure that all Public Involvement and Communications requirements are addressed by all parties to the Contract.

4.2 COMMUNICATIONS REQUIREMENTS

4.2.1 Joint Communications Effort

Development and dissemination of public information for the Project requires the integration of resources and labor between the Department and the DBT. Joint communications will educate and inform the public, establish expectations, and play a significant role in delivering a successful Project.

4.2.2 Communications Planning Workshop and Construction Communications Public Information Plan (PIP)

The DBT's Point of Contact (POC), as described later in this Section 4, shall work closely with the Department to cooperatively prepare a Draft Construction Communications Public Information Plan (PIP). The content of the Draft PIP will be the subject of a communications planning workshop held within 30 Calendar Days of completion of the Draft PIP. The Department will organize the workshop. The Department and the POC will present the Draft PIP to the DBT's Project Manager, the Department's Project personnel and communications staff, and anyone else necessary to ensure proper content of the Final PIP. This may include representatives from the City of Cleveland and other local stakeholders. The

Department and the POC will co-develop a draft agenda for the workshop. The location of the workshop shall be determined jointly by the Department and the DBT.

The Draft PIP shall serve as the basis for the discussion at the workshop. The Draft PIP shall describe the Project's Communications Plan and the critical role of the Communications Plan to the overall success of the Project. The Draft PIP shall also describe the Department's approach to public involvement, public outreach, communications goals, and significant public relations risks and benefits. The PIP shall outline a process for managing the review and resolution of comments for all communications materials, both within the DBT's team and within the Department. The Draft PIP shall also include a Crisis Communications Plan detailing the Department's approach to communicating major crises with the media. This shall be separate from the Crisis Management Plan described later in this Section 4.

The Department will work with the POC to incorporate any agreed-upon revisions to the PIP discussed at the workshop and distribute the Final PIP to all participants of the workshop within 30 Calendar Days after the workshop. The Final PIP shall provide the framework for communicating and disseminating information, and for responding to public inquiries, comments, and requests. The Final PIP shall also include performance-monitoring processes and tools to be used by the Department to assess the progress and measure the success of the overall communications efforts.

4.3 DBT'S ROLE IN PUBLIC INFORMATION EFFORTS

The DBT shall assist the Department in identifying and implementing ways of informing the public, individual property owners, and broader communities about design and construction activities that directly affect them. The Department will be responsible for responding to all public information requests, with support from the DBT.

The DBT shall assist the Department by providing draft responses to correspond to Project-specific information requests; however, the Department will be responsible for responding to all correspondence. The DBT shall maintain a copy of such responses in a Public Comment Database.

4.3.1 Public Information Point of Contact

The DBT shall identify a POC for all public information issues to support the Department. The POC shall work with the Department to maintain public satisfaction with the Project. The POC shall have at least three years of recent experience coordinating information on highway improvement projects. The POC's professional experience shall include the following:

A. Developing, providing, and presenting information to the public.
B. Developing and implementing public involvement and community relations programs.

The POC shall be co-located at the Project Management Office. The POC shall be readily available by telephone during all business hours with immediate computer and email access. During critical construction activities and emergencies, the POC shall be available 24 hours per day, seven days per week.

The POC shall have full access to all of the DBT's Project details that may be relevant to the public, public agencies, emergency service providers, businesses, media, and other interested parties. The POC shall be able to provide to the Department information related to the Project continually throughout the Project.

4.3.2 Project Contacts

The DBT shall provide the Department with a prioritized after-hours Project Contact List. The list shall include, at a minimum, the contact information for the DBT's POC and Project Manager, including home and mobile phone numbers and email addresses. The DBT shall provide any changes to the list to the Department immediately.

4.4 DBT PUBLIC INFORMATION SPECIFICATIONS

4.4.1 Meetings

The POC shall meet with the Department weekly, at a minimum, to maintain coordination and communication with the Department on all public information goals and activities including all items identified in the PIP. Meetings may include key stakeholders.

The POC shall meet with Department staff more frequently, as directed by the Department, in the initial months of the Project to learn about Project specifics and expectations.

The DBT shall be available to attend and participate in meetings held by Community Development Corporations (CDCs) or community groups, as well as an annual Public Meeting/Open House.

4.4.2 External Messaging for Traffic Mitigation

The Department will collaborate with the DBT on opportunities to work with transportation coordinators, transit agencies, local chambers of commerce, sports teams, retail centers, businesses, communities, and others to encourage more efficient use of highways and roadways. The DBT shall provide information to the designated Department Public Involvement Team for the Department's development of marketing plans to contact these entities, and to keep them informed of construction activities. This information will be discussed during the Project's weekly communications meeting.

The DBT shall provide information to the Department for outreach messages to businesses, motorists, event attendees, and others through an external media and promotions program aimed at informing these entities of upcoming construction activities. The Department will draft messages based on construction activities that will impacts large amounts of people.

The DBT shall be responsible for direct fees up to $10,000 per year of the contract for advertising with local agencies and publications regarding Project information. The DBT shall provide the Department with draft script content suiting the allotted advertisement time for audio advertisements as directed by the Department.

4.4.3 Weekly Progress Reports

The POC shall provide a Weekly Progress Report to the Department summarizing progress made the previous week and listing activities to be performed within the next two weeks. The Weekly Progress

Report, intended to describe the Project to individuals outside the industry, shall describe the work in an "executive summary" fashion that communicates the high points of the Project.

The report shall include:

A. Major work completed
B. Major impacts to the project (weather, unexpected issues encountered, accidents, for example)
C. Explanations of highly visible work impacting motorists and stakeholders
D. General progression of major work items (e.g., estimates of quantities of concrete and asphalt placed, estimates of steel used)
E. General crew counts and equipment being employed, including estimated status of Diversity & Inclusion and OJT goals
F. Upcoming traffic pattern changes and weekly lane closures (temporary and permanent on local routes and interstate routes)
G. Upcoming major components of work and other items of general public interest
H. Past and anticipated utility conflicts and interruptions
I. Impacts to bus stop locations
J. Impacts to on-street parking
K. Other impacts as identified by the DBT, Department, and City

Each report shall include a minimum of 10 digital high resolution photos showing major work described in the report with specific photo location and orientation.

The report shall also describe contact with project stakeholders and contact information if they were engaged for the first time on this Project. The DBT shall submit the report by email every Monday to the designated Department Public Information Lead for the Project.

4.4.4 Construction Information Dissemination

The DBT shall provide Project-related information to the Department so that the information may be disseminated by the Department via the Project Web site and other outlets. The DBT shall provide the Department with reader-friendly, clear, and concise information. The DBT shall communicate with the designated Department Public Information Team as needed regarding planned and current construction activities, such as location, estimated duration of activity, type of Work being performed, physical impacts (e.g., permanent and temporary road closures, lane closures, narrowed lanes, and commercial vehicle restrictions) and planned construction detours.

4.4.5 Opportunity Corridor Quarterly Newsletter

The DBT shall be responsible for providing information, layout, edit and printing for quarterly newsletters. The Department will provide content as necessary, edit and have final approval of quarterly newsletters. Quarterly newsletters must be published in January, April, July, and October of each year while the project is active. The DBT shall be responsible for direct fees up to $30,000 per year of the contract for printing of and postage of direct mailings to individuals and organizations on an established mailing list. These mailings may include special updates and/or quarterly newsletters.

4.4.6 Crisis Management Plan

The DBT shall prepare a Crisis Management Plan (emergency response protocol) for responding to emergencies and incidents during the Project. The DBT shall coordinate this approach with the Department and the DBT's overall Traffic Management Plan. The DBT's Crisis Management Plan shall address the following:

A. Communicating to the Department how the DBT will handle and respond to emergencies such as fires, gas line strikes, injured employees, auto accidents in work zones, and environmental spills
B. Staff designated to respond to emergencies
C. The cause of specific disruptions, such as construction-related disruptions and weather
D. Actions that could be taken to mitigate the crisis
E. Procedures for notifying the Department, the public, and DBT personnel
F. Any corrective procedures that will be put in place as a result of the crisis
G. Procedures for referring victims of construction-related auto damage to appropriate staff

In the event of a crisis, the DBT shall summarize the emergency protocol used in an Emergency Incident Report and submit that report to the Department within three Calendar Days of the crisis.

Within 30 Calendar Days of Award, the DBT shall schedule a crisis management workshop with the Department to discuss protocols and potential emergency situations. The Department will be responsible for inviting the necessary staff from the City of Cleveland and other agreed-upon stakeholders. The Department shall attend the workshop and provide feedback and plan revisions as needed. Follow-up workshops will be held following any crisis situations and/or at the Department's discretion.

As part of the Crisis Management Plan, the DBT shall identify protocol for communicating information to the emergency service providers regarding access to the Project area for emergency vehicles. The DBT shall work with the Department to ensure proper outreach of this information to all pertinent emergency service providers.

4.4.6.1 Dissemination of Emergency Information

As part of the Crisis Management Plan, the DBT shall establish and manage an emergency response call list. All appropriate personnel shall be included on the call list for immediate response in the event of an emergency. The call list shall be divided into areas of expertise, so the proper people are contacted for specific emergency situations.

The following Department personnel shall be included on the call list for notification of all emergencies:

A. The Department Project Manager
B. Public information staff
C. Traffic Management Center

The following DBT personnel shall be included on the call list for notification of all emergencies:

A. DB Contractor Project Manager/Engineer
B. DBT Project Manager
C. Work Zone Traffic Engineering Manager
D. DBT's POC

The personnel on the call list shall be agreed upon at the crisis management workshop between the Department and the DBT. At the crisis management workshop, the Department and the DBT shall also agree upon appropriate staff from the City of Cleveland and other stakeholders to be included on the call list for notification of all emergencies. In addition, the DBT shall provide prompt information and assistance as requested by the Department during an emergency. The DBT shall provide the Department with updated emergency call list promptly when changes are made to the list.

4.4.7 Coordination with Traffic Management Plan (TMP)

The DBT's POC shall coordinate with the Department to communicate construction traffic information to the public and other affected parties. In addition, the DBT shall be responsible for coordinating with the Department to provide traffic communications with neighboring construction projects, as part of the PIP and TMP. Refer to Section 20 (Maintenance of Traffic) for additional traffic coordination requirements.

4.4.7.1 Maintenance of Traffic and Access

In addition to the notification requirements in Section 20 (Maintenance of Traffic), the POC shall provide construction updates to the Department Public Information Office every Thursday by noon during construction regarding planned and current construction activities for the upcoming week, such as:

- Location
- Estimated duration, and type of Work being performed
- Physical impacts (e.g., lane closures, narrowed lanes, commercial vehicle restrictions)
- Planned construction detours

The POC shall provide construction updates to GCRTA by noon each Thursday during construction when regarding planned and current construction activities when those activities may or will necessitate temporary bus stops, modification of an existing or planned transit service, including buses and passenger rail, or any other construction activity that may impact GCRTA's day-to-day operations for the following week.

The DBT shall assist the Department in providing maintenance of traffic and access information for the entire Project to affected commuters, residents, and businesses at least two weeks prior to any revision to access in the area affected. Notifications shall include the following:

A. Purpose of the change
B. Area affected and dates/times of impact
C. Alternate routes and detours

D. A contact person for further information (The contact person shall be coordinated in advance with the Department.)

4.4.7.2 Traffic Conditions

The DBT shall inform the Department Project Manager of any unusual traffic conditions, such as road obstructions, within 15 minutes of detection.

4.4.7.3 Commercial Vehicle Access and Restriction Information

At least 14 Calendar Days prior to any activity that may restrict or impede the movement of commercial vehicles due to reduced lane widths, reduced height clearances, or lower weight limits, the DBT shall coordinate with the Department and assist the Department in providing the following agencies with a description, start date, and end date of the event:

A. City of Cleveland Police Department
B. Department District 12 – Permits
C. Other – City of Cleveland Fire Department, City school transportation, Greater Cleveland Regional Transit Authority (GCRTA), etc., as deemed appropriate by the Department.

4.5 METHODS and TOOLS FOR DISSEMINATION OF INFORMATION

The methods and tools listed in this section shall be employed by the DBT to disseminate information to the public in a timely fashion.

4.5.1 Highway Advisory Radio (HAR)

The DBT shall provide timely and accurate information daily or as requested by the Department for HAR messages. The DBT shall prepare draft messages for advance notice of traffic restrictions due to planned construction activities, for the Department to record.

4.5.2 Portable Changeable Message Signs (PCMS)

The DBT shall prepare draft messages for advance notice of traffic restrictions due to planned construction activities. The process for preparing and submitting these to the Department will be covered in the PIP.

4.5.3 Correspondence and Email

The Department will forward e-mail, letters, Facebook posts, and other forms of communication from the public regarding design and construction issues or questions to the DBT for draft responses. The DBT shall provide draft responses to the Department within two Workdays. The DBT shall forward to the Department all correspondence or requests for Project-related information received via telephone, e-mail, and U.S. mail within two Workdays of receipt. The DBT shall provide draft responses, as required or as requested by the Department, within two Workdays.

The questions, comments, and responses shall be recorded in the Public Comment Database and provided to the Department at Project completion.

4.5.4 Open Houses, Special Events, Public Meetings, and Speaking Engagements

The DBT shall assist the Department with outreach to community groups, including local jurisdictions, neighborhoods, businesses, truckers, shippers, transit agencies, employee transportation coordinators, and environmental groups. The DBT shall be available to attend public and community meetings or to make presentations at the Department's request. The DBT shall attend at least 12 public or community meetings per year for the duration of the Project, and shall assist the Department in coordinating and presenting information at 10 additional community meetings per year. These meetings may include OCIAC meetings and other meetings organized for diversity, outreach, and inclusion efforts. For meetings that the DBT organizes, whether to fulfill the requirements of this Section 4 or Section 5 (Diversity, Inclusion, and Outreach), the DBT shall begin advertisement of the meeting at least three weeks prior to the event.

4.5.5 Photographs and Video

The DBT shall provide the Department with access to the entire construction site for obtaining photos and video. The Department will document the construction, public outreach meetings, and other Project-related events using photographs and video. The photographs and videos will be used for public communications, media relations, and Department archival purposes. Any additional photographs and video taken by the DBT during construction of the Project shall be provided to the Department when requested.

4.5.6 Events

The Department will develop and maintain a list of public events, which will be updated monthly and communicated with the DBT. Examples of public events include Cleveland Indians, Cavaliers, and Browns sporting events; Quicken Loans Arena Concerts; and CSU Wolstein Center events. The DBT shall coordinate, communicate, and provide a plan to minimize construction impacts for public events held by public and private entities. All of this information will be included in the PIP.

4.5.7 Media Relations

The Department will be the media spokesperson. The DBT shall provide the Department with information and access to key Project staff for press interviews, as requested.

At the request of the Department, the DBT shall participate in media interviews or other media information support activities. When participating in media inquiries and interviews, the DBT shall provide information that complies with Department messaging and other standards, including requirements for advance Project information, Project progress and accountability, and timely response to media inquiries.

The DBT shall provide information and materials that meet local broadcast and print media requirements and deadlines. The Department will release information to the news media.

If the DBT is contacted to participate in media interviews, the DBT shall coordinate the media requests with the Department.

4.5.8 Ribbon Cutting Event

The DBT shall assist the Department with planning a ribbon cutting event. The DBT will be responsible for all rental costs including chairs, tents, press risers, stages, skirting, sound equipment, and other equipment needed, up to $10,000. The DBT's POC shall assist the Department with the planning of these events, including the design of web content, advertisements, maps and directions, posters, banners, ceremonial ribbons, determining the location and time, and procuring seats and shelter, subject to the Approval of the Department. The Department will organize and invite any political figures or speakers.

The DBT shall be responsible for direct fees up to $1,000 per year of the contract for printing maps, logos, flyers, handouts, and other information distributed at events.

4.5.9 Project Tours

The DBT POC shall work with the Department's Project staff to develop a plan, at the outset of the Project, to co-lead and coordinate up to 12 public walking tours of the Project per year. The DBT shall provide and maintain required safety gear for up to 20 people. The plan shall include consideration for appropriate public safety and shall be designed to result in minimal impact to the contractor's field activities. The plan shall be revised if the Department deems that demand during construction is substantially different from what was anticipated in the original plan. The plan shall also include how the DBT and the Department will work together to provide tours of the Project site for media, local, or State government officials, or Department management. Details of the project tour plans shall be included in the PIP.

4.5.10 Introductory Briefing with Stakeholders

Within 30 Calendar Days of NTP, the DBT shall conduct an introductory briefing with City of Cleveland Staff, the Department, and key stakeholders to present major aspects of the Project such as scope, estimated schedule, impacts, contacts, construction phasing, maintenance of traffic, public involvement and communications, aesthetics and enhancements, demolitions, and bridge construction. The list of attendees to be invited to this briefing will be provided by the Department to the DBT, and the Department will be responsible for inviting all attendees.

4.6 UTILITY INTERRUPTIONS

The DBT shall conduct regular communication with local residents and businesses affected by Utility interruptions. The DBT shall provide written notification to all affected residents and businesses 48 hours in advance of a Utility interruption, and shall maintain a record of each notification. The DBT shall issue Utility interruption notices to businesses and residents. Notices shall indicate the purpose and expected duration of the interruption, and provide information indicating how those affected by the interruption can contact the DBT. Notices shall meet the Department's communications style and be Approved by the Department before dissemination. Such notices shall also be provided by the Department. This applies only to Utility interruptions that are a result of DBT work activities. It does not apply to interruptions conducted by and coordinated by the Utility Owners.

In the event of an emergency involving a Utility interruption, the DBT shall notify the Utility Owner in accordance with Utility company standards and local emergency services.

4.7 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
PIP	Approval	0	1	Draft within 30 Days after NTP. Final within 30 Days after workshop.	4.2.2
Project Contact List	Submittal	0	1	Within 30 Days of NTP Update monthly	4.3.2
Weekly Progress Reports	Acceptance	0	1	Weekly starting one month prior to construction activity	4.4.3
Quarterly Newsletter	Approval	0	1	January, April, July, and October of each year	4.4.5
Crisis Management Plan (including the Emergency Response list, and Emergency Response Protocol)	Acceptance	0	1	Within 30 Days of NTP	4.4.6
Maintenance of Traffic Summaries	Submittal	0	1	Weekly during construction	4.4.7.1
HAR information	Submittal	0	1	At least 7 Days prior to posting message	4.5.1
Messages for PCMS	Submittal	0	1	At least 7 Days prior to posting message	4.5.2

5 DIVERSITY, INCLUSION, AND OUTREACH

5.1 DIVERSITY, INCLUSION, AND OUTREACH CONSULTANT (DIOC)

The DBT shall identify and employ a Diversity Inclusion & Outreach Consultant (DIOC) who shall work with the Department to actively manage the submitted and Department Approved project specific Diversity, Inclusion, and Outreach Plan (DIOP), described later in this section. The DIOC shall coordinate outreach and OJT activities with the Department's staff, consultants, and the Opportunity Corridor Inclusion & Advisory Committee (OCIAC).

The DIOC will perform outreach efforts to the disparaged community identified in the 2015-2016 ODOT Disparity Study and to assist the DBT in reaching their required goals. A link to the 2015-2016 ODOT Disparity Study summary document is available here:

http://www.dot.state.oh.us/groups/DisparityStudies/Documents/Final%20Study%20Documents/Disparity%20Study%20Summary.pdf

The DBT Diversity/Outreach Lead Manager shall be an employee of the DIOC. The DIOC shall be experienced in providing and coordinating successful outreach programs, shall be knowledgeable of the needs of the disparaged local community, with specific experience in the Project's local community preferred. The DIOC shall possess experience working with the local, small, and disadvantaged construction and design business communities and connecting those businesses with opportunities. The DIOC shall have experience in identifying barriers in which local, small, and disadvantaged businesses face in the heavy highway industry along with developing solutions for overcoming those barriers.

The DIOC is employed by the DBT and will work with the DBT, but acts independently of the DBT, to fully ensure the project will provide a workforce which is representative of and from the local community, specifically in regard to meeting the residency, low income, and OJT requirements. The DIOC shall work with local workforce development agencies to identify residents eligible for OJT hours to work on the project in addition to their own efforts.

The DIOC will be the Project's lead contact and liaison with the Opportunity Corridor Inclusion & Advisory Committee (OCIAC). This existing committee has already engaged a broad base of constituents and stakeholders around the design, construction, and development of the Opportunity Corridor attempting to achieve maximum measurable and sustainable diversity and inclusion. The Advisory Committee works with the various entities that are working on, and around the Opportunity Corridor, to collaborate, coordinate, communicate, and support them in achieving their diversity and inclusion objectives. They address diversity and inclusion for approximately 1,300 acres to be developed: 300 for the actual road, and 1,000 for all the surrounding area. Specifically, this includes diversity and inclusion around:

- Road Construction
- Neighborhood Development
- Contracts and Jobs
- Training

The DIOC shall meet with the OCIAC monthly to evaluate and, if needed, adjust the Project efforts to establish a contiguous and continuous approach to outreach.

While employed by the DBT, the DIOC will be responsive to and answer to the Department in regards to project Diversity and Outreach. Although the DIOC is employed by the DBT, the DBT is not permitted to terminate or seek the termination or removal of DIOC (or any DIOC personnel) without the expressed written permission from the Department.

The DIOC will throughout the life of the Contract:

A. Be a direct report to the DBT Project Manager. The DIOC will have the authority to review, provide feedback and recommendations for all DBT's subcontracts to evaluate and ensure compliance with the DBT's commitments.
B. Be required to report to the Department any actions by the DBT which could or could be perceived as limiting opportunity for NSLE businesses and make recommendations for potential resolutions.
C. Mentor, with the support of the DBT, any utilized NSLE business to develop business practices which will enable long term viability for future construction projects.
D. Monitor the progress of NSLE firm participation, residency and low income requirements (per PN 98), and OJT. The DIOC shall work with the public information POC, providing periodic updates as described in Section 4.4.3 (Weekly Progress Reports).
E. Work closely with prospective NSLE firms to assist them in overcoming challenges for being included on the project. Examples would be utilizing local small business assistance resources to help with finding bonding, insurance, loans, access to capital, etc. Assisting in any additional challenges as is relates to working on an ODOT project (i.e. certified payrolls, etc.)
F. Monitor and report that the commitments included in the DIOP are being executed.
G. Regularly schedule, attend, and participate in meetings with the NSLE firms.

The DIOC shall work within the DBT's organization to ensure all of the New Businesses; Small Businesses; Local Business participation requirement, and goals for all other EDGE businesses are met.

Upon verification of the DBT meeting all project NSLE goals, the DIOC shall continue to work with the NSLE business. The DIOC shall provide assistance in the company's ongoing understanding of contracting with ODOT.

5.2 OUTREACH DATABASE

The DIOC shall maintain a database of all contacts and communication related to business development, workforce development, and community outreach.

For business development information, the database shall include contacts made, inquiries made, inquiries received, for all identified potential NSLE business. At a minimum, the database shall include the company name, contact information, date of initial inquiry, date of every inquiry after, how the inquiries were made (phone, email, etc.), nature of potential viable work to be performed, efforts made by the DIOC in mentoring the potential business, any identified barriers for the business and suggested

solution to barriers, and whether the business is ultimately included in the project. If a company is not being considered for the project, the reasons must be documented along with proof that the company was notified of the decision including feedback so the firm can learn for future projects. If a firm is utilized on another project as a result of coordination with the DIOC, provide the project owner and identification number.

For workforce development, this database shall include interactions with individuals who are seeking work on OC3, guidance on certification or training, or otherwise contact the DBT through meetings, phone, email, or in person. The DBT shall describe the interaction, what steps the DIOC takes to assist the individual, and any additional relevant information. Interaction with other agencies shall also be included.

For community outreach, the database shall include individual interactions with community residents or groups, any meetings or events held along with methods of advertisements, and other outreach events.

Supporting data including, but not limited to, emails, faxes and thoroughly documented phone calls, for each entry shall be included in this database. This information shall be shared with the Department as a part of the final Diversity, Inclusion, and Outreach Plan (DIOP), with updates submitted monthly thereafter.

5.3 DIVERSITY, INCLUSION, & OUTREACH REPORTING

The DIOC shall prepare a monthly report to be presented to the Department and to the Opportunity Corridor Inclusion Advisory Committee addressing:

A. Number of DBT employees from within the local geographic region directly working on the project, must include names, gender, ethnicity and home address. A second version with confidential information redacted shall also be provided.
B. Percentage of hours worked by residents of the City of Cleveland
C. Percentage of hours worked by City of Cleveland resident construction workers that were worked by Low-Income Persons
D. Breakdown of progress payments made to firms identified to meet the required NSLE Goals.
E. Anticipated upcoming work of the firms including contract dollar amount identified to meet the remaining diversity and inclusion goals.
F. Trends depicting any shown disparity between overall Payments to the DBT and payments or non-payments made to NSLE businesses identified to meet the goals.
G. A report including all companies being used on the project, including type of company (New, Small, Local, or EDGE), what type of work they will be performing, and contract dollar amount.
H. Affidavits of payment to NSLE subcontractors for services performed per PN 99.
I. An updated Outreach Database including contacts made regarding business development, workforce development, and community outreach.
J. Any identified barriers the firms are experiencing.

The DBT shall submit the components of the monthly reports electronically in the original source format used for each document.

5.4 DIVERSITY, INCLUSION, AND OUTREACH PLAN (DIOP)

The DBT shall prepare and finalize a Diversity, Inclusion, & Outreach Plan (DIOP) for the Department's review and Approval. The DIOP shall provide a comprehensive description of elements required in this Section 5 (Diversity, Inclusion, and Outreach), as well as establishing metrics for measuring the successes of the DIOP. The DIOP shall address a plan for including and executing the following elements:

A. Business Development
B. Workforce Development
C. Community Outreach

The DIOP shall be considered a "living" document throughout the life of the project and will need revisions in response to feedback from local stakeholders. Any needed facilities, presentation materials, rentals, or any other support material or staff shall be considered incidental to the DIOP.

The content of a Draft DIOP will be the subject of a planning meeting to be held within 60 Days following Award. The DBT shall organize and implement the meeting to include participation from the DBT's Project Manager, DIOC, Opportunity Corridor Inclusion & Advisory Committee, representatives of the ODOT Division of Opportunity Diversity & Inclusion, community liaisons (to be identified by the Department), and the Department's Project personnel. The Department shall invite staff from the City of Cleveland, using a contact list developed and maintained by the Department. The DBT shall develop a draft meeting format and agenda for the workshop, and submit it to the Department for review at least seven Days before the workshop. The location of the workshop shall be determined jointly by the Department and the DBT, at a location Approved by the Department. The Department shall pay for the venue (if there is a cost) via Change Order. The DIOC will present the Draft DIOP to the DBT's Project Manager, the Department's Project personnel and others at the discretion of the Department to ensure proper review of the content in the DIOP.

The DIOC, in cooperation with the Department shall make agreed-upon revisions to the Draft DIOP discussed at the meeting and distribute the Final DIOP, upon Approval from the Department, to all participants of the meeting within 30 Days after the meeting. The Final DIOP shall include a schedule identifying at minimum, the month and locations of all planned outreach events. The DBT shall submit additional revisions in response to further Department comments, if any, within 10 Days of receipt of the comments. Any DBT initiated revisions to the DIOP after Approval must be agreed by the Department. If the DIOP is not completed and Approved within 90 Days following Contract Execution, the Department will not process progress payments. The DIOC shall ensure the DIOP is current and accurate based on the DBT's most recent activities.

No later than twelve (12) months after the final DIOP Approval and annually thereafter, the DIOC shall update the DIOP to cover the next 12-month period of the project and submit it for review and Approval until the project is completed.

5.4.1 Business Development

This section of the DIOP shall address:

A. Present strategies to mentor NSLE businesses, including work types conducive to mentoring to groups that have been impacted by disparity, as described in the 2015-2016 ODOT Disparity Study Report Summary http://www.dot.state.oh.us/groups/DisparityStudies/Documents/Final%20Study%20Documents/Disparity%20Study%20Summary.pdf.
B. Present the planned efforts to mentor minimum of one construction and one design firm in New, Small, Local or Edge businesses in an effort to combat disparity. In addition to providing a commercially useful function, these firms shall receive beneficial instruction that increases the capability, efficiency, or skills transferable to other projects. The DBT shall establish in the DIOP measurable goals for each mentorship relationship, such as ODOT prequalification or application of new or improved skills to other projects.
C. Present strategies to expand NSLE businesses, including work types conducive to developing; improving their long-term development; increasing their abilities to handle increasingly significant projects including prequalification (in a new category for consultants or worktype addition); developing their capability to utilize emerging technology and conduct business through electronic media; achieving eventual self-sufficiency.
D. Present the commitments to meet the goals for:

    1. New Business
    2. Small Business
    3. Local Business
    4. Other socially and economically disadvantaged businesses as defined under R.C. 123.152 (aka, the EDGE program).

E. Present a planned effort to ensure progress payments made to firms intended to meet the NSLE goals are proportional to the overall progress of the Work.
F. Present plan to provide developmental workshops for disparaged NSLE businesses in the following areas, but not limited to bonding; Estimating/quoting scope packages; construction schedule; understanding cost of work; prequalification; project close out; contract requirements; extra force account work; invoicing; and payment cycle.
G. Present plan for ongoing efforts to engage NSLE businesses throughout the life of the project including the number, frequency and execution of outreach events, networking sessions, consulting opportunities, contracting opportunities, and materials supply opportunities to local socially and economically disadvantaged business enterprises.
H. Present the barriers identified and solutions to those barriers for the NSLE firms.

5.4.2 Workforce Development

This section of the DIOP shall address:

A. Present in detail the planned efforts to specifically communicate employment opportunities, including on the job training opportunities.
B. Present the plan to provide 20,000 hours of Type 1 OJT for eligible positions, as described in PN 98.
C. Present the plan to provide 10,000 hours of Type 2 OJT for residents of City of Cleveland Wards 4, 5, and 6 for Professional Services opportunities, as described in PN 98.

D. Present the plan to meet the 20% City of Cleveland residency requirement from the Fannie M. Lewis Cleveland Resident Employment Law.
E. Present the plan to meet the 4% Low Income Persons requirement from the Fannie M. Lewis Cleveland Resident Employment Law.
F. The DBT shall describe the process it will use to verify that the persons submitted to meet the Residency and Low Income Persons requirement meet the definitions under Section 188.01 of the Fannie M. Lewis Cleveland Resident Employment Law.
G. The DBT shall develop a plan for continuing workforce development, focusing on new methods and approaches to expanding the skills of workforce outside of traditional OJT methods. Efforts shall be required throughout the duration of the project regardless of the status of OJT goal attainment; including but not limited to providing staff mentors.

5.4.3 Community Outreach

This section of the DIOP shall address:

A. Describe the approach to meet and work with the OCIAC
B. Describe efforts to engage local youth and students, beyond efforts related to employment.
C. Present a clear approach to community engagement identifying community partners.
D. Describe the approach to address language barrier for community and business development events and methods to engage those in the project area, which includes the neighborhoods adjacent to the Project.

5.5 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in the format specified in the table below. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Outreach Database	Submittal	0	1	Monthly	5.2
Status Reporting	Submittal	0	1 (source format)	Monthly	5.3
Revised DIOP	Approval	0	1	Within 14 Days after Anticipated Award Date	5.4
Final DIOP	Approval	0	1	Within 90 Days after Contract Execution	5.4

6 ENVIRONMENTAL

The DBT shall ensure that the Project is designed, constructed and maintained in accordance with all environmental requirements, regulations, and applicable permits required for this Project.

6.1 EROSION CONTROL

The Project will discharge storm water flow into both existing storm only and combined sewer systems; A Notice of Intent (NOI) is required for areas that discharge into storm only systems. An NOI may not be required for areas that discharge into combined sewer systems. The DBT shall submit to the Department the total number of acres of earth disturbing activities as well as a breakdown of project earth disturbing activities and Contractor (DBT) earth disturbing activities as defined SS832 in a timely manner. The DBT shall also submit to the Department all outfall information and other project information needed to complete an NOI for each construction phase. The Department will review the information and, if required, develop an NOI. The Department will submit the NOI to the Ohio Environmental Protection Agency (OEPA) within 10 days after all required information is received from the DBT. The project schedule shall account for 31 days for the issuance of the NPDES permit per each required occurrence based on construction phasing. This time period is inclusive of 10 days for the Department to file the NOI and 21 days for OEPA to approve the permit.

A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared by the DBT for all portions of the Project, including areas that may not require an NOI. The SWPPP shall be submitted to the Department for coordination with the OEPA per each required occurrence based on construction phasing. The DBT shall include and address all comments. Earth disturbing activity is not permitted prior to Approval of the SWPPP(s) and the NPDES permit(s), if required. Temporary sediment and erosion control as described in the approved SWPPP shall be furnished and installed by the DBT prior to the initiation of any earth disturbing activity. All temporary sediment and erosion control work and the SWPPP shall be per SS832 and Appendix EN-16 (SWPP Inspections). For information about OEPA's NPDES permit requirements, see http://epa.ohio.gov/dsw/permits/index.aspx. All temporary erosion control is the responsibility of the DBT.

Items used to implement the DBT's temporary sediment and erosion control requirements shall be paid from an encumbered amount included in the proposal. The proposal shall specify the unit prices for the temporary sediment and erosion control items in accordance with SS832. Payments for erosion control items that exceed the encumbered amount will be made by an Extra Work Change Order using the specified unit prices. The specified unit prices shall be fixed for the contract and shall not be negotiated or adjusted for inflation or claimed changed condition.

6.2 REMOVAL OF TEMPORARY SEDIMENT AND EROSION CONTROL ITEMS

All temporary sediment and erosion control items shall be removed before the Project is accepted. Removed materials shall become the property of the DBT and shall be disposed in accordance with the C&MS.

6.3 THREATENED AND ENDANGERED SPECIES

This Project is located within the known habitat ranges of the federally listed and protected Indiana bat and northern long-eared bat. No trees shall be removed under this project from April 1 through September 30. The DBT shall conduct tree removal specified in the Contract Documents between October 1 and March 31. This requirement is necessary to avoid and minimize impacts to the Indiana bat and northern long-earned bat, as required by the Endangered Species Act. For the purposes of this Project, a tree is defined as a live, dying or dead woody plant, with a trunk three (3) inches or greater in diameter at a height of 4.5 feet above the ground surface, and with a minimum height of 13 feet.

6.4 NOISE

In addition to the requirements of C&MS 105.13, the Progress Schedule shall account for 30 Days for the Department to secure approval for haul routes. The DBT shall acquire required noise permits and/or variances from the City of Cleveland.

6.4.1 Noise Analysis and Noise Barriers

The Department has completed public involvement regarding noise walls. Based on those results, noise walls shall not be included in the Project. The results of the noise wall public involvement are included in Appendix EN-11 (Noise Public Involvement Summary).

6.5 AIR QUALITY

The DBT shall follow Department and local regulations regarding dust control, adhering to dust control measures outlined in C&MS 616.

The DBT shall adhere to local City of Cleveland ordinances for vehicle idling and all current U.S. Environmental Protection Agency (EPA) air quality regulations.

6.6 KENNETH L. JOHNSON RECREATION CENTER

6.6.1 Section 6(f)

Portions of the Kenneth L. Johnson Recreation Center (Rec Center), 9206 Woodland Ave., are protected under Section 6(f) of the Land and Water Conservation Fund (LWCF) Act. The Section 6(f) boundary for the Rec Center property is shown in Appendix EN-02 (Recreation Center Documentation). The Project shall not result in permanent impacts to the Rec Center property. Only temporary impacts of less than six months duration shall be permitted. The National Park Service (NPS) must approve a temporary non-conforming use for impacts within the Section 6(f) boundary. The ODNR manages the LWCF program in the state of Ohio for the NPS.

The DBT shall provide the Department with drawings delineating and quantifying temporary impacts within the Section 6(f) boundary a minimum of one year in advance of construction activities that will impact the Rec Center. The Department will coordinate with NPS via ODNR for any anticipated Section 6(f) impacts. NPS approval of the temporary non-conforming use must be received prior to initiating any construction activities that will impact the Rec Center property.

6.6.2 Section 4(f)

The Rec Center and any approved new or expanded areas are also protected under Section 4(f) of the USDOT Act of 1966. The Project shall not result in permanent impacts to the Rec Center property. Only temporary impacts of less than six month duration shall be permitted, which would not result in a Section 4(f) use. The following measures shall be incorporated into the Project to protect the Rec Center property, see Appendix EN-02 (Recreation Center Documentation):

- The DBT shall protect the Rec Center areas and users with warnings signs, gates, barricades, and/or fences during construction;
- Rec Center access shall be maintained at all times. The DBT shall notify the City of Cleveland, in writing, of the occupation dates two weeks before construction starts;
- Any disturbed areas shall be restored to a condition at least as good as or better than what existed before construction started;
- Staging and storage of construction equipment shall not take place on the Rec Center property; and
- If unexpected work on the Rec Center property is needed, advance notice shall be given to the Department and the City of Cleveland to determine if additional coordination is needed.

6.7 REGULATED MATERIALS

The DBT shall meet all regulatory conditions imposed at properties with Regulated Materials associated with the Project. Regulated Materials are defined as follows:

- Any substance, product, refuse, discarded material, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to any Environmental Law,
- Any substance, product, waste or other material of any nature whatsoever that exceeds maximum allowable concentrations for elemental metals, organic compounds or inorganic compounds, as defined by any Governmental Rule,
- Any substance, product, waste or other material of any nature whatsoever which may give rise to liability under the second bullet item above or under any statutory or common law theory based on negligence, trespass, intentional tort, nuisance or strict liability or under any reported decisions of a state or federal court,
- Petroleum hydrocarbons excluding petroleum hydrocarbon products contained within regularly operated motor vehicles,
- Lead or lead-containing materials in Structures and/or other improvements on or in the site,
- Asbestos or asbestos-containing materials in Structures and/or other improvements on or in the Site (other than mineral asbestos naturally occurring in the ground), and
- The term “Regulated Materials” includes Solid Waste and Hazardous Waste.

These conditions include ensuring that the surrounding properties and populations are not exposed to the Regulated Materials on the site. The DBT shall characterize, collect, contain, and properly dispose of all waste generated or encountered during the work. The DBT shall ensure that the site is properly contained during construction so that Regulated Materials do not migrate off-site. The DBT shall prepare

and implement a Spill Prevention Control and Countermeasures (SPCC) Plan per the requirements of 40 CFR Part 112 that provides specific guidance for managing, handling, and disposing of Regulated Materials that may be encountered within the Right-of-Way and for protecting the health and safety of all on-site personnel and the general public.

6.7.1 Known and Unknown Regulated Materials

6.7.1.1 Known Regulated Materials

Abatement, excavation, and handling activities associated with Known Regulated Materials shall be included in the Proposal price. Known Regulated Materials are defined as the following:

- All Regulated Materials identified in Appendix EN-03 (Regulated Materials Investigation for Buildings) and Appendix EN-08 (Regulated Materials Investigation for Bridges). A list of property acquisitions and their status is available in Appendix RW-02 (Right-of-Way Status Chart).
- All Regulated Materials identified in Department-completed Phase II Environmental Site Assessments (ESAs) presented in Appendix EN-01 (Section 3 ESA Phase II Reports).
- All Regulated Materials identified in Appendix EN-14 (Section 3 Supplemental ESA Phase II Report).
- All Regulated Materials identified in Appendix EN-12 (Building Survey Reports).
- All Regulated Materials that can be readily observed during the mandatory walk through of buildings to be demolished.
- All Regulated Materials identified in Appendix EN-15 (Miscellaneous Superficial Waste Mapping).
- Dominion East Ohio Gas owned pipes are anticipated to have asbestos on the exterior coating.
- Transformers on overhead Cleveland Public Power (CPP) lines.
- Underground storage tanks (USTs) on the following properties, as identified in Appendix EN-01 (Section 3 ESA Phase II Reports) and Appendix EN-14 (Section 3 Supplemental ESA Phase II Report):
  - Property #69 – City Block Bounded by Kinsman Road, East 68th Street, East 69th Street & Colfax Road.
  - Property #243 – 2742 Grand Avenue.
  - Property #147 – 8107 Grand Avenue.

6.7.1.2 Unknown Regulated Materials

Unknown Regulated Materials are Regulated Materials that are not identified as Known Regulated Materials per Section 6.7.1.1 (Known Regulated Materials).

If any Unknown Regulated Materials are discovered through work on the Project, the DBT shall notify the Department immediately and shall follow the SPCC Plan described in Section 6.7 (Regulated Materials), as well as all appropriate regulations. With respect to liabilities, costs,

expenses and losses related to Unknown Regulated Materials, the DBT shall follow C&MS 109.05 - Force Account. The DBT shall be reimbursed out of the following pay item:

Item 690E98000 Special – Misc.: Unknown Regulated Materials Removal & Disposal, Each ($1,000,000).

If the liabilities, costs, expenses and losses related to Unknown Regulated Materials exceed $1,000,000, the Department will pay in accordance with the Contract Documents.

Work involving the removal and disposal of existing pavements, foundations, utility appurtenances and other site furnishings that are not discoverable from site investigations, analysis, and historic mapping review per Section 13.2.7.1 (Total Site Clearing) would not be considered Unknown Regulated Materials but would be compensated in accordance with PN 97 (Differing Site Conditions).

6.7.2 Asbestos on Bridges

An asbestos survey of the bridges to be demolished is included in Appendix EN-08 (Regulated Materials Investigations for Bridges). No Known Regulated Materials or asbestos containing materials (ACM) were identified on the bridges. Partially completed OEPA Notification of Demolition and Renovation forms are included in Appendix EN-08 (Regulated Materials Investigations for Bridges). The DBT shall complete the forms and submit the completed form to the OEPA at least 10 Days before demolition. Demolition is defined as the wrecking or taking out of any load-supporting structural member at a bridge. The DBT shall provide a copy of the completed forms to the Department and comply with all requirements stipulated in the forms. The forms may be submitted in hard copy format to the address below.

Asbestos Program
Ohio EPA, DAPC
P.O. Box 1049
Columbus, OH 43216-1049

The forms may also be submitted online via the OEPA eBusiness Center: Air Services (http://www.epa.state.oh.us/dapc/airservices.aspx).

The DBT shall provide an individual trained in the provisions of the National Emissions Standard for Hazardous Air Pollutants (NESHAP, 40 CFR Part 61, Subpart M) who will be on site during the demolition or renovation of any bridge. This individual shall be certified by the OEPA as an Asbestos Hazard Evaluation Specialist (Ohio Administrative Code 3745-22). The DBT shall be able to provide evidence during normal business hours that the required training has been accomplished by this person.

6.7.3 Building Demolition

The DBT shall perform all Regulated Materials management required for the buildings determined to contain Regulated Materials. The Department shall schedule mandatory walk-throughs of buildings to be demolished to aid in the identification of Known Regulated Materials. The first walk-throughs were conducted on January 24 and 25, 2017 for eleven commercial buildings to be demolished. It is expected

that the Department will not have acquired or will not have provided the opportunity for a walk-through or an inspection report for certain buildings. Any Regulated Materials located within buildings where the Department has not provided an opportunity for a walk-through or an inspection report are considered Unknown Regulated Materials. Before demolition operations begin, the Department will conduct Regulated Materials inspections of all buildings subject to renovation or demolition. The results of these inspections will be made available to the DBT.

The historic building use in the Project area has been extensively industrial in nature. The DBT's Proposal price shall assume that all DBT generated demolition debris are categorized as no better than construction and demolition debris, unless otherwise indicated in Section 6.7.1.1 (Known Regulated Materials).

The DBT shall remove and dispose of all Regulated Materials associated with the Project in accordance with all applicable regulatory conditions. The DBT shall ensure that all ACM are removed and properly disposed of by individuals certified in accordance with Ohio Administrative Code 3745-22. The DBT shall provide an individual trained in the provisions of NESHAP (40 CFR Part 61, Subpart M) who will be on site during the demolition or renovation of any structure with ACM. This individual shall be certified by the OEPA as an Asbestos Hazard Evaluation Specialist (Ohio Administrative Code 3745-22). The DBT shall be able to provide evidence during normal business hours that the required training has been accomplished by this person.

The DBT shall complete the OEPA Notification of Demolition and Renovation forms for buildings and submit the completed form to the OEPA at least 10 Days before the demolition. The DBT shall provide a copy of the completed forms to the Department and comply with all requirements stipulated in the forms. The forms may be submitted in hard copy format to the address below.

Asbestos Program
Ohio EPA, DAPC
P.O. Box 1049
Columbus, OH 43216-1049

The forms may also be submitted online via the OEPA eBusiness Center: Air Services (http://www.epa.state.oh.us/dapc/airservices.aspx).

6.7.4 Utility Relocations

The DBT shall perform all Regulated Materials management required for the relocation of overhead Cleveland Public Power (CPP) lines and/or appurtenances that contain Regulated Materials. It is expected that the Department will not have provided inspection reports for overhead CPP utilities. Any Regulated Materials associated with relocated overhead CPP utilities, except transformers, are considered Unknown Regulated Materials. The DBT shall identify, remove and dispose of all Regulated Materials associated with overhead CPP utility relocations in accordance with all applicable regulatory conditions.

6.7.5 Contaminated Soils and Water

The DBT shall conduct all excavation, dewatering, temporary stockpiling and/or containerization, handling, transport and disposal of all Regulated Materials in accordance with all applicable federal, state and local laws, rules and regulations. Known areas of contamination shall be based on the data, results and conclusions presented in Appendix EN-01 (Section 3 ESA Phase II Reports) and EN-14 (Section 3 Supplemental ESA Phase II Report). The DBT may conduct additional sampling to further delineate areas of Regulated Materials. Where material is excavated between two adjacent sample locations shown in Appendix EN-01 (Section 3 ESA Phase II Reports) and EN-14 (Section 3 Supplemental ESA Phase II Report) or conducted by the DBT, the greater concentration each chemical of concern shall be assumed for the entire area between the sample locations. Contaminated soils and/or water not identified in documents cited in Section 6.7.1.1 (Known Regulated Materials) are considered Unknown Regulated Materials.

The removal and/or remediation of Regulated Materials shall be limited to only those materials that are disturbed as part of the DBT's construction activities or indicated elsewhere in the Contract Documents. Further corrective measures or remedial action shall not be required.

All transport vehicles used for the movement of regulated soils and/or water shall meet applicable federal, state and local regulations. The DBT shall maintain records (such as daily logs, landfill tickets, manifests, etc.) that document the source, movement and destination of each truck load of Regulated Materials. One copy of each of these records shall be submitted to the Department.

6.7.6 Underground Storage Tanks

If the DBT encounters an underground storage tank (UST) within the Right-of-Way, the DBT shall decommission and remove the UST. The DBT shall follow all applicable rules and regulations associated with UST removal activities. Underground storage tanks not identified in documents cited in Section 6.7.1.1 (Known Regulated Materials) are considered Unknown Regulated Materials.

6.7.7 Miscellaneous Superficial Wastes

Superficial wastes containing Regulated Materials are present within the project limits due to illegal dumping activities and previous land use. Appendix EN-15 (Miscellaneous Superficial Waste Mapping) presents mapping and indexed photographs of known locations and types of superficial wastes as of 10/26/2017. Known Regulated Materials present in superficial waste include – but are not limited to – scrap tires; refuse; household furniture, furnishings, and appliances; construction waste (brick, block, asphalt and concrete pavements, lumber, shingle, excavation); parcel 125-02-002 blended scrap waste soil; car parts; asphalt pavers (two); and a boat (one). The DBT's Price Proposal shall assume that all miscellaneous superficial wastes shown in Appendix EN-15 (Miscellaneous Superficial Waste Mapping) are categorized as solid waste, unless otherwise indicated in Section 6.7.1.1 (Known Regulated Materials).

The DBT shall collect, characterize, contain and dispose of known miscellaneous superficial wastes within 90 days of either Award or Right-of-Way availability, whichever comes later. The DBT shall conduct all excavation, handling, transport and disposal of all solid waste in accordance with all

applicable federal, state and local laws, rules and regulations. This work shall be included in the DBT's base bid.

If additional miscellaneous wastes become present in the project limits after the initial disposal activities, the DBT shall notify the Department immediately and shall follow all appropriate regulations for removal and disposal. The DBT's Proposal price shall include the following pay items and estimated quantities to reimburse for removal of additional wastes, as directed by the Department:

Item 690E98000 – Special Misc.: Disposal of Solid Waste (Tire), 1,000 Each (includes tires on or off the rim).

Item 690E98700 – Special Misc: Disposal of Solid Waste (General), 500 Cubic Yards (includes general refuse, furniture, appliances and similar items)

Item 690E98800 – Special Misc: Disposal of Solid Waste (Construction), 10,000 Tons (includes solid waste soils and pavements)

If additional miscellaneous superficial wastes exceed the quantities listed above, the DBT would be compensated in accordance with PN 97 (Differing Site Conditions).

6.7.8 Disposal of Construction Waste

The DBT shall dispose of construction waste material at approved sites in accordance with all appropriate regulations. The DBT shall reuse as much of the excavated materials as allowed by applicable regulations.

6.8 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Acres of Earth Disturbing Activities, outfall and other NOI information	Submittal	0	1	At least 31 Days prior to earth disturbing activities per required occurrence based on construction phasing	6.1
SWPPP(s)	Approval	0	1	At least 31 Days prior to earth disturbing activities per required	6.1

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies Hardcopy	Number of Copies Electronic	Submittal Schedule	Reference Section
				occurrence based on construction phasing	
Written notification of specific roads or streets on haul routes	Approval	0	1	At least 30 Days prior to construction	6.4
City of Cleveland Noise Permit and/or Variance	Submittal	0	1	As required	6.4
Section 6(f) mapping and temporary impact areas	Approval	0	1	At least 1 year prior to construction	6.6.1
Written notice of Rec Center occupation dates	Approval by the City of Cleveland	1	1	At least 2 weeks prior construction activities	6.6.2
Spill Prevention Control and Countermeasures Plan	Submittal	0	1	Within 30 Days of NTP	6.7
OEPA Notification of Demolition and Renovation Forms	Submittal	1	1	At least 10 Days prior to demolition	6.7.2 6.7.3
Regulated Materials Daily Logs	Submittal	0	1	Weekly	6.7.4

7 UTILITIES

The utilities requirements described in this section are in addition to Section 153.64 of the Ohio Revised Code.

7.1 GENERAL

The DBT shall be responsible for coordination with the owners of all utility facilities affected by the Project. The resolution of any conflicts between utility facilities and the construction of the project shall be the responsibility of the DBT. The DBT shall coordinate with affected railroad and owners of the utility facilities for utility relocations over, under, or in railroad Right-of-Way.

A. The DBT shall be responsible for any required relocation of public utility facilities. This work includes relocation of Cleveland Public Power (CPP), City of Cleveland Division of Water (CWD), City of Cleveland - Division of Water Pollution Control (CDWPC), and Northeast Ohio Regional Sewer District (NEORSD) facilities.
B. The Department has initiated coordination efforts with specific private owned utility companies having known conflicts and utilities desiring to construct new facilities with the project. The DBT shall be responsible for coordination with the private owned utility facility owners as described in the Scope of Services.
C. Unless otherwise noted in the Contract Documents the DBT is responsible for all coordination and schedule risk for relocation of private owned utility facilities, except as described in Section 7.4.3 (Deadlines and Delays).
D. The DBT shall submit a listing of all utility facilities required to be relocated by the DBT's proposed work as part of each Buildable Unit submission.

The Department will make all determinations of compensable rights related to utility facility design, relocation, modification, and construction. Except as specifically indicated in the Contract Documents, no additional compensation or time will be granted for any delays, inconveniences, or damages sustained by the DBT due to interference from utility facilities or utility facility relocations.

7.2 GOVERNING REGULATIONS FOR UTILITY DESIGN and CONSTRUCTION

Any utility relocation work performed by the DBT shall be consistent with the Department's utility relocation process. This work shall also be consistent with the utility owner's reasonable, written specifications, standards of practice, and construction methods, as well as any applicable Department and City of Cleveland permit requirements.

The plans for the design of the utility work shall show at the minimum the following information: existing topography, Right-of-Way, lanes of travel, and the three-dimensional location of the utilities. When the DBT develops utility relocation plans, these plans shall be subject to review by the Department, the City of Cleveland, and the involved utility, as applicable.

All utility design, relocation, modification, and construction shall be performed in accordance with the standards identified in the Contract Documents or accepted industry standards as applicable. In the event of a conflict among the standards related to design, construction, modification or relocation of public utilities [Cleveland Public Power (CPP), City of Cleveland Division of Water (CWD), City of

Cleveland – Division of Water Pollution Control (CDWPC), and Northeast Ohio Regional Sewer District (NEORSD)], the most restrictive standard released on or before October 6, 2016, shall take precedence. In the event of a conflict related to design, construction, modification, or relocation of private owned utilities and accepted industry standards, the most restrictive standard shall take precedence.

7.3 UTILITY CONTACTS

The Department, in concurrence with the registered Underground Utility Protection Service (OUPS), Oil and Gas Producers Underground Protection Service (OGPUPS), and other Utility Owners that are non-members of any Utility protection services, has established the following list of contacts for certain Utilities located in the Project area:

Electric:

Cleveland Public Power (CPP)
(Public Utility)
Attn: Chris Hirzel
1300 Lakeside Avenue
Cleveland, OH 44114
216-664-3922, Ext. 115
chirzel@cpp.org

Cleveland Electric Illuminating Company (CEI)
(Private Utility)
Attn: Ted Rader
6896 Miller Road
Brecksville, OH 44141
440-546-8738
radert@firstenergycorp.com

Natural Gas:

Dominion East Ohio Gas Company (DEOG)
(Private Utility)
Attn: K. Aaron Conant
320 Springside Drive, Suite 320
Akron, OH 44333
330-664-2451
k.aaron.conant@dom.com

Water:

City of Cleveland, Division of Water (CWD)
(Public Utility)
Attn: Fred Roberts
1201 Lakeside Avenue
Cleveland, OH 44114

216-664-2444 x 5590
fred_roberts@ClevelandWater.com

CATV:

Charter Communications
(Private Utility)
Attn: Paul Silverstro
8179 Dow Circle
Strongsville, OH 44136
216-575-8016 Ext. 2165555034
Paul.Silvestro@charter.com

Sewer:

Northeast Ohio Regional Sewer District (NEORSD)
(Public Utility)
Attn: Charles D. Cofield
4747 East 49th Street
Cuyahoga Heights, Ohio 44125
216-641-6000 x 2415
cofieldc@neorsd.org

City of Cleveland, Division of Water Pollution Control (CDWPC)
(Public Utility)
Attn: Elie Ramy
12302 Kirby Ave.
Cleveland, OH 44108
216-644-3785
eramy@clevelandWPC.com

Signals:

City of Cleveland, Division of Traffic Engineering
(Public Utility)
Attn: Dimitri Szynal
601 Lakeside Ave.
Cleveland, Ohio 44114
216-402-9278
Dszynal@City.Cleveland.Oh.Us

ODOT District-12
(Public Utility)
Attn: Tony Toth
5500 Transportation Blvd.
Garfield Heights, OH 44125

216-584-2220

Lighting:

Cleveland Public Power (CPP)
(Public Utility)
Attn: Steve Holland
1300 Lakeside Avenue
Cleveland, OH 44114
216-664-6807
sholland@cpp.org

Telephone:

XO Communications
(Private Utility)
Attn: Dale Ferguson
6900 Southpointe Parkway
Brecksville, Ohio 44141
216-619-3492
dale.ferguson@xo.com

AT&T
(Private Utility)
Attn: James Janis
13630 Lorain Ave, 2nd Floor
Cleveland, OH 44111
216-476-6142
pj8191@att.com

AT&T Corp.
(Private Utility)
Attn: Greg Belew
5980-G Wilcox Place
Dublin, Ohio 43016
614-760-8320
gbelew@hlgengineering.com

Verizon
(Private Utility)
Attn: Al Guest
120 Ravine Street
Akron, OH 44303
330-253-8267
allan.guest@verizonbusiness.com

G4 Technology LLC
(Private Utility)
Attn: Charlie (Dragan) Kordich
4 Walker Way, Suite 1
Albany, NY 12205
518-869-5053
Dragan.Kordich@USA.G4S.COM

CenturyLink
(Private Utility)
Attn: Chris Strayer
441 W. Broad Street
Pataskala, Ohio 43062
303-886-1299
christopher.strayer@centruylink.com

Level 3 Communications, LLC
(Private Utility)
Attn: Michael Clifford and Doug Holloway
4000 Chester Avenue
Cleveland, Ohio 44103
513-615-2250
mike.clifford@level3.com
doug.holloway@level3.com

Spread Networks, LLC
(Private Utility)
Attn: John P. Bruce
800 Woodlands Parkway, Suite 102
Ridgeland, MS 39157
769-216-8095
John.bruce@spreadnetworks.com

One Community
(Private Utility)
Attn: Ernie Mumford
1228 Euclid Avenue Suite 250
Cleveland, Ohio 44113
216-633-5591
emumford@onecommunity.org

Windstream
(Private Utility)
Attn: Geoffrey P. Hamm
560 Ternes Ave.
Elyria, Ohio 44035
440-329-4245
geoffrey.p.hamm@windstream.com

Railroad:

Norfolk Southern Corporation
(Private Utility)
Attn: Douglas Shawn Starling
1200 Peachtree Street, N.E.
Atlanta, Georgia 30309
Tel: (404)529-1436
Cell: (912)390-9192
Douglas.starling@nscorp.com

Norfolk Southern Corporation – Thoroughbred Technology and Telecommunications, Inc. (T-Cubed)
(Private Utility)
Attn: Michael Borem
1200 Peachtree Street, N.E.
Atlanta, Georgia 30309
Tel: 404-582-6207
Cell: 770-344-8802
michael.borem@nscorp.com

Greater Cleveland Regional Transit Authority
(Public Utility)
Attn: Michael Schipper, P.E.
1240 West 6th Street
Cleveland, OH 44113-1331
216-566-5084
mschipper@gcrta.org

7.4 UTILITY COORDINATION

As soon as it is feasible, the DBT shall stake the Right-of-Way (ROW) in the field and shall perform clearing and grubbing and grading within that ROW as required by the specifications and Contract Documents, in order to allow utility relocation and reduce potential delays. ROW stakes shall be maintained and updated as needed throughout the project duration.

The DBT shall be cognizant of the project's impact on utility facilities. In the event utility rearrangements are required, the project shall not be designed to preclude legal occupancy of the highway ROW by the rearranged utility facilities.

The DBT shall coordinate all existing utilities with construction activities on this project. The DBT shall coordinate with all proposed public and private utility installations within the project limits, as identified in Section 7.9 (Utility Facilities along New Roadway Alignment). The DBT shall ensure that potential delays in coordination and relocation of the affected utilities and installation of proposed utilities are minimized. The DBT shall copy the Department Project Manager and the District Utility Coordinator on all correspondence or phone calls between the DBT and each utility. This shall include the submittal of plans to each utility.

A meeting at or near the time of the preliminary review shall be held between the DBT, the Department's Utility Coordinator and the utility owners to determine if any significant utility relocations can be eliminated or mitigated. Notify the Department's Utility Coordinator 7 Workdays in advance of the meeting.

Only those utility facilities immediately affected by the proposed construction shall be relocated or adjusted. If the DBT desires the temporary or permanent adjustment of the utilities for its sole benefit, the DBT shall conduct all negotiations with the utility owners and pay all costs associated with the adjustment. The DBT shall assume all schedule impacts from these relocations or adjustments.

The DBT shall:

A. Identify and contact the owners of all utilities within the project area to verify the nature, extent and location of their existing facilities
B. Identify and contact the owners of all proposed utilities to be within the project area to verify the nature, extent and proposed location of their proposed facilities
C. Identify all impacted utility facilities
D. Provide project construction plans, SUE and geotechnical information to these utility providers
E. Coordinate all work with the affected and proposed utility owners
F. Ensure all proposed utilities have sufficient and reasonable opportunity to design and construct the necessary installations to reduce or eliminate roadway impacts to the DBT's completed construction
G. Schedule and conduct coordination meetings during design and construction
H. Provide the Progress Schedule and any revisions throughout the design and construction phases to affected and proposed utility owners within 10 Workdays of Approval.

The DBT shall be responsible for maintaining and updating the Utility Impacts Matrix to reflect the project design and construction. The Utility Impact Matrix shall be updated, at least monthly, by the DBT as necessary during the course of plan development. The DBT shall make its updated matrix available to affected utility owners and the Department.

The DBT is responsible for establishing a schedule of utility coordination meetings commensurate with the complexity of each utility's relocation issues. The DBT shall notify the Department's District Utility Coordinator and Project Manager at least five (5) Workdays in advance of each of the meetings. The Department's District Utility Coordinator and Project Manager will participate as necessary. The DBT is responsible for keeping meeting minutes and providing this documentation to the Department within two (2) Workdays following each meeting. The DBT shall copy the Department's District Utility Coordinator and Project Manager on all correspondence related to utility facilities.

The following flowcharts provide guidance on new and relocated utility facilities processes:

Figure 7-1: Utility Flowchart – New and Relocated Facilities

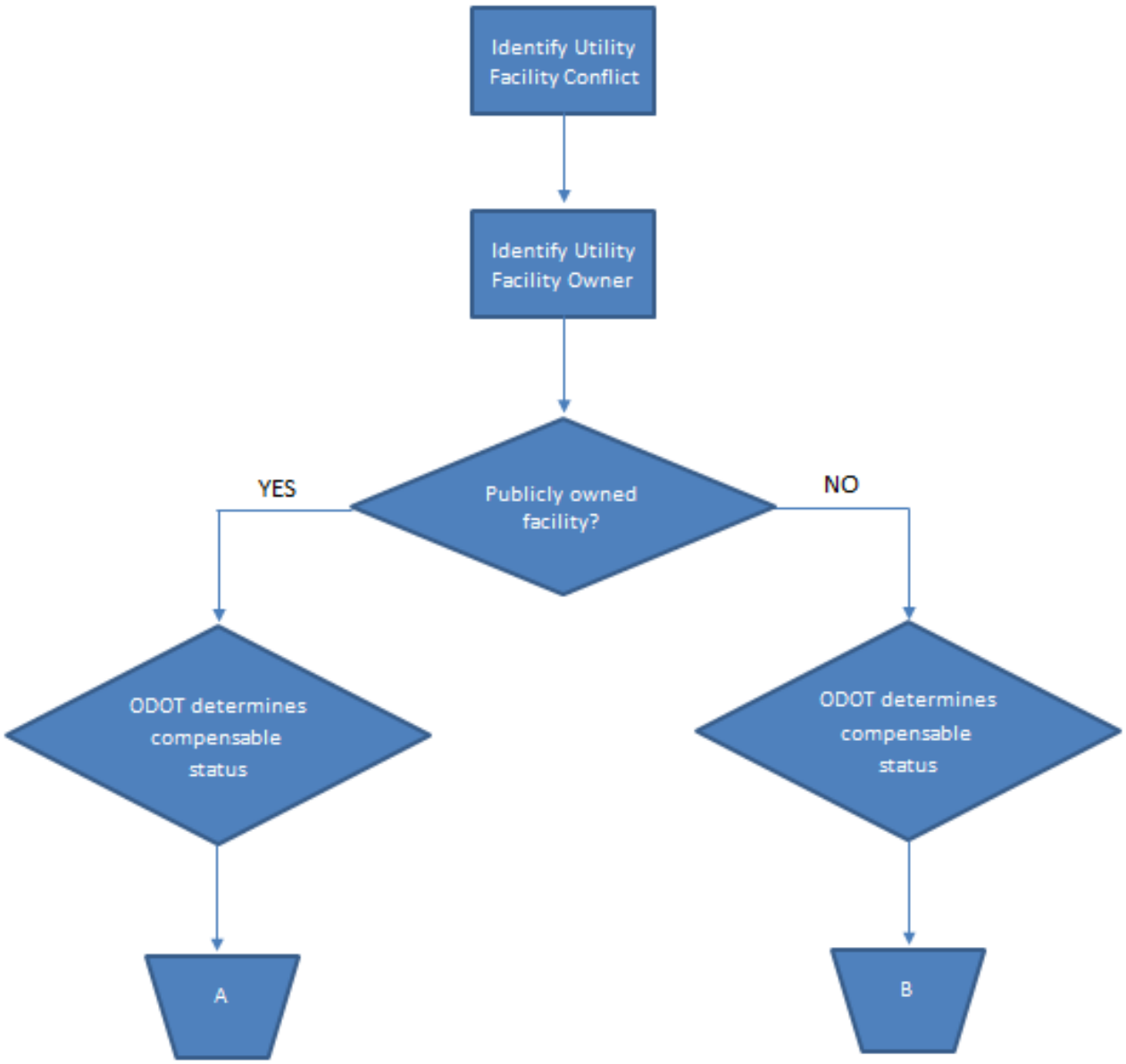


Figure 7-2: Utility Flowchart – New and Relocated Public Facilities

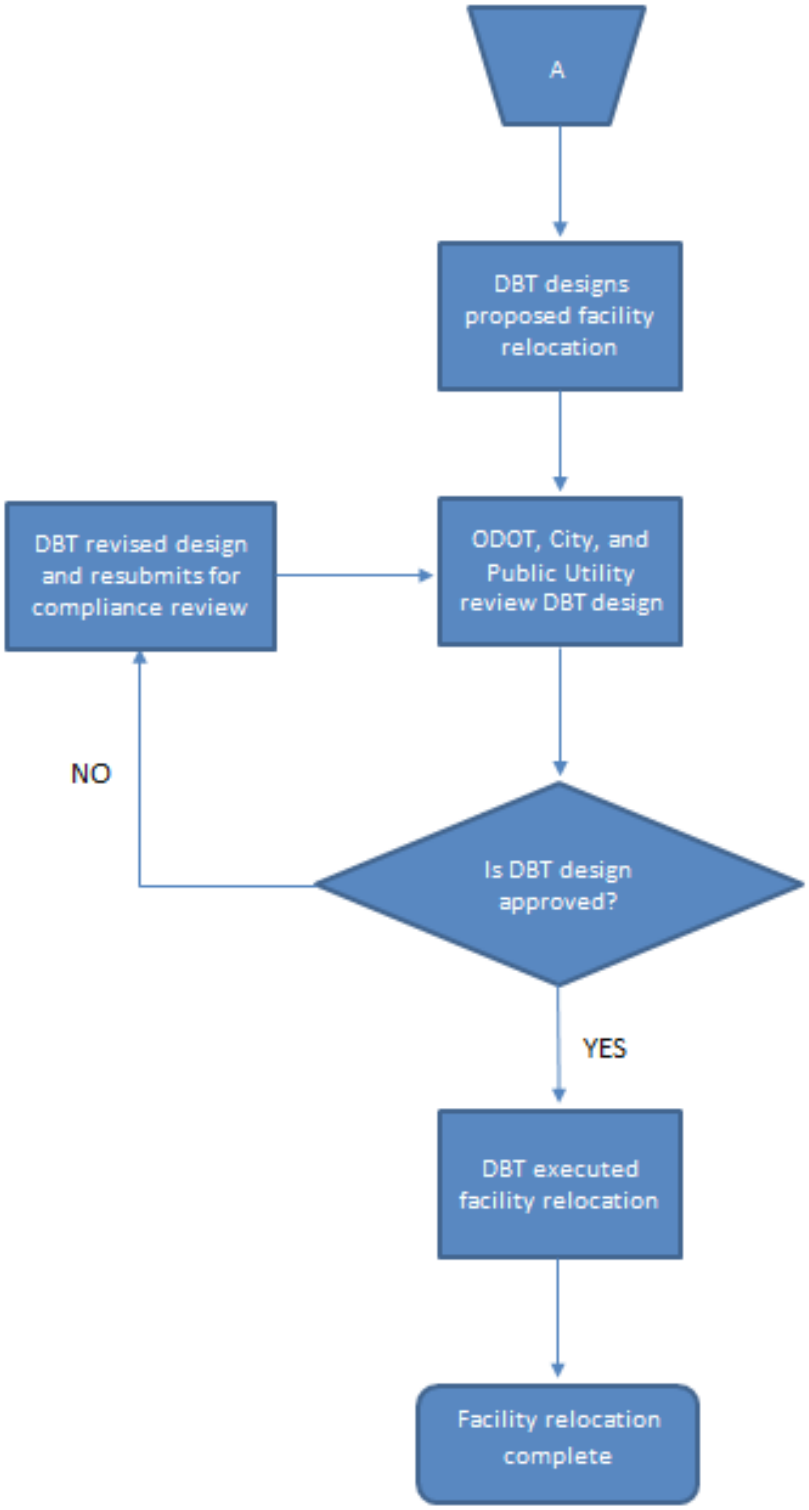
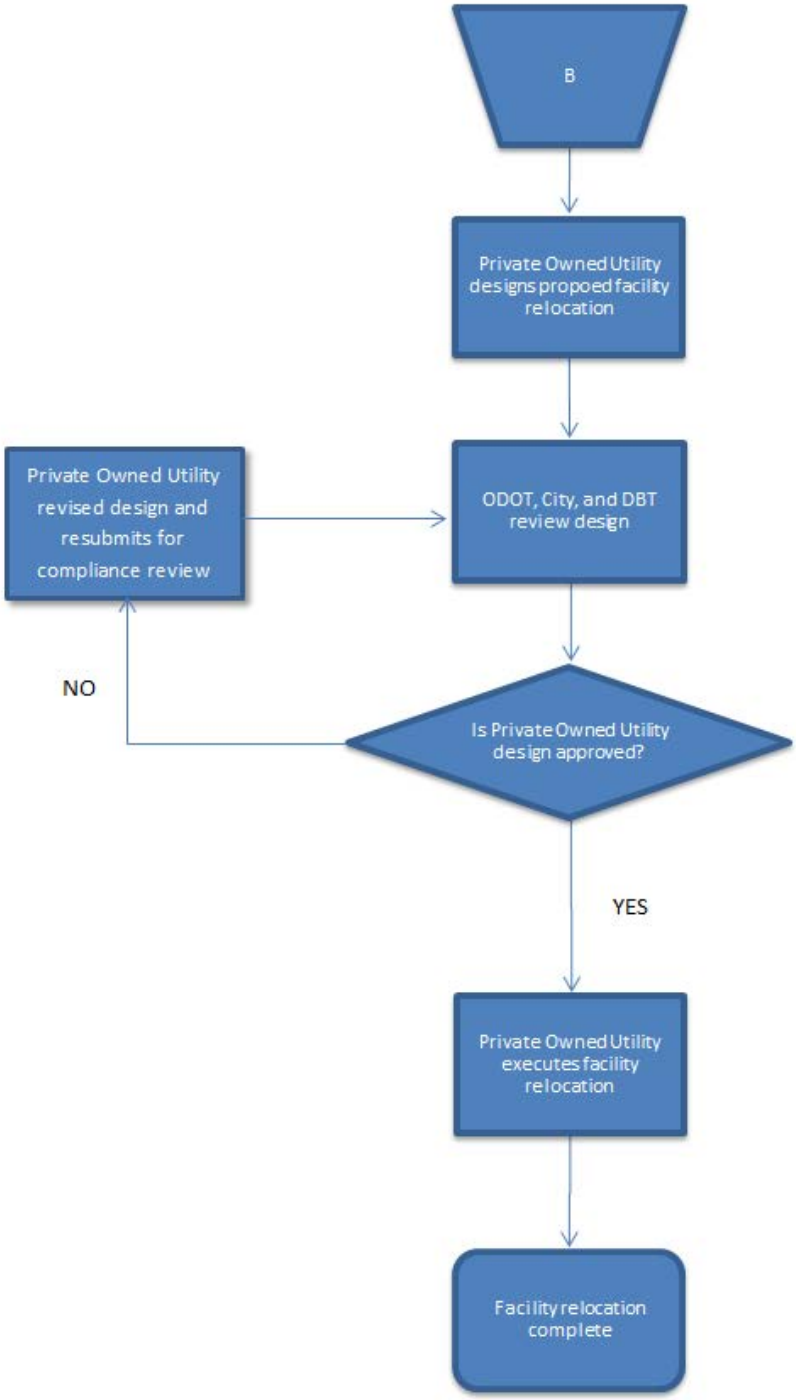


Figure 7-3: Utility Flowchart – New and Relocated Private Facilities



7.4.1 Notification

According to ORC 153.64 and at least two Days prior to commencing construction operations in an area that may affect underground Utilities, the DBT shall notify the Department, the registered utility protection service, and the Utility Owners that are not members of the registered utility protection service.

7.4.2 Scheduling of Utility Work

The DBT shall confirm the relocation design and construction timeframes required by the utility owner and incorporate these timeframes into the project's Progress Schedule.

The DBT shall consider special scheduling requirements of utilities, such as peak load periods (e.g., winter gas loads, summer electric loads, etc.) and utility easement or Right-of-Way acquisitions when developing their Progress Schedule.

The DBT shall pay all costs incurred by the utility owner associated with the use of DBT proposed construction acceleration methods (e.g., the use of overtime, subcontractors, etc.) These acceleration costs are NOT eligible for reimbursement by the Department.

When the DBT prepares a utility facility relocation plan, the utility owner will review and approve/reject the design prepared by the DBT no later than 20 Workdays after its submission to the utility owner, unless a different time-period is agreed to by both parties. If a utility owner rejects any design work, the DBT shall immediately notify the Department, in writing, of the grounds for rejection and suggestions for correcting the problem. The DBT shall correct the design and resubmit to the utility owner for review. This compliance review shall take no more than 10 Workdays.

When the utility owner prepares a utility facility relocation plan, the Department and the DBT will review the design and/or permit application to ensure that the relocation does not interfere with other proposed construction activities, including relocations of other utility facilities. This review shall be completed no later than 10 Workdays after its submission, unless a different time-period is expressly agreed to by both parties. The DBT shall compile and provide written review comments to the Department and the utility owner.

The DBT shall be responsible for keeping abreast of privately owned utility relocation and new installations to ensure that the relocation does not interfere with other proposed construction activities, including relocations of other utility facilities.

All publicly and privately owned utility adjustments and/or relocations performed within the permanent and temporary Right-of-Way limits shown in the RW-01 (Section 3 Right-of-Way Map) will require a City of Cleveland permit. Restoration within the ROW must be per the City of Cleveland and the Department standard with the most restrictive standard released on or before the date of advertisement taking precedence.

Any privately owned utility or DBT utility adjustments/relocations performed outside of the proposed permanent and temporary ROW limits shown in the Right-of-Way plans will need a permit from the City of Cleveland.

7.4.3 Deadlines and Delays

The DBT shall be responsible for monitoring utility facility relocations including plan development, plan review, and construction. In accordance with PN 97, Section 105.07, the DBT shall promptly notify the Department if a utility facility owner is not complying with the agreed upon time frames indicated in Section 7.4.2 (Scheduling of Utility Work). If the DBT provides documentation confirming that a utility has failed to relocate their facilities or construct new facilities in a timely manner, an Obstruction Removal Notice may be issued by the Department or the City of Cleveland, as appropriate.

7.4.4 Changes to the Utility Work

Once utility construction has begun, the DBT shall not make any changes to the proposed project design, which would necessitate an additional relocation of the utility facility. However, the DBT may make changes if they agree to absorb the schedule impact and provide full compensation for 100 percent of all costs (design and construction) associated with the second relocation to the utility company. If this is the case, the DBT shall provide the Department with documentation of their agreement with the involved utility.

7.4.5 Utility Owner Inspections

The utility owner may perform inspections of construction of any utility work that is performed by the DBT on their facility. The DBT shall notify the Department of any such inspections. The DBT shall provide the Department with written documentation of all utility comments and their resolution. The DBT shall provide safe access and any necessary traffic control for any utility work inspections performed by the utility owner.

7.4.6 Reimbursement Process

If a utility company notifies the DBT that they believe any utility work is reimbursable (to the utility), the DBT shall immediately notify the Department. The Department will determine compensable interest for reimbursement. Unless stated otherwise, costs for utility work shall be paid for by the Department if the work is determined to be reimbursable per the Department Utilities Manual or by the utility company if the work is non-reimbursable.

7.4.7 Continuity of Utility Service

The DBT shall ensure that all utilities remain operational during all phases of project construction to the greatest extent practicable. Necessary interruptions of service, including proposals for shutdowns and temporary diversions of affected utilities, shall be approved by the involved utility. The DBT is directed to Section 7.6 (Known Utility Conflicts) for notification requirements of disruptions in service.

Where the DBT is responsible for the performance of utility work, in order to maintain the service continuity of the utility owner's facilities to the extent practicable during that performance of work, the DBT, at its cost, shall:

A. Keep the utility owner fully informed of schedules, including coordinating with the utility owner with regard to their design, construction and inspection of utility work performed by the DBT
B. Keep the utility owner fully informed of changes that affect their facilities
C. Keep the utility owner involved in making the decisions that affect their facilities so the utility owner is able to provide uninterrupted service to its customers, or be subject to the least interruption practicable

All the utility owner's facilities shall remain fully operational during all phases of project construction, except as specifically allowed and approved by the utility owner. The DBT is responsible for maintaining CWD, CPP, NEORSD, and GCRTA facilities throughout construction, which includes all necessary temporary bypass provisions.

7.5 EXISTING UTILITY LOCATIONS

Existing utility facilities to be abandoned, including but not limited to service connections for buildings to be demolished as part of the project, must be disconnected and removed or abandoned to ground (abandoned in place). Utility conduits 10 inches in diameter or larger which are being abandoned in place must be filled with Item 613 (Low Strength Mortar Backfill) so that, after settlement, at least 90 percent of the cross-sectional area of the conduit, for the entire length is filled. Wooden poles shall be removed in their entirety. Utility removal trenches shall be backfilled in accordance with Section 13.2.9 (Trench Backfilling).

7.5.1 Underground Utilities

The Department has initiated coordination with existing public and private owned underground utility owners within the project area. Locations, sizes, and depths (when indicated), excluding service laterals and facilities within structures, have been compiled by a combination of efforts including reviewing existing facility plans, field survey and subsurface utility engineering (SUE) efforts.

Information collected is provided in Appendix UT-02 (Section 3 SUE LEVEL B-D—Mapping). The SUE Level completed is indicated within each file and for each utility line. SUE Levels are defined as follows:

A. SUE Level D (QL–D) – Information derived from existing records or oral recollections.
B. SUE Level C (QL–C) – Information obtained by surveying and plotting visible above ground utility features and by using professional judgment in correlating this information to SUE Level D information.
C. SUE Level B – Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities. SUE Level B data should be reproducible by surface geophysics at any point of their depiction. This information is surveyed to applicable tolerances with accuracy of 2 feet from the location identified.
D. SUE Level A (QL–A) – Precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of subsurface utilities, usually at a specific point. Accuracy is set to 15mm

(vertically) and to applicable horizontal survey and mapping accuracy as defined or expected by the Department.

The SUE Level of each utility and CAD drawing varies between utility and file, as indicated in Appendix UT-02 (Section 3 SUE Level B-D—Mapping). The Department does not guarantee the accuracy, presence or measurements concerning any utility facility identified as SUE Level C or SUE Level D, even when the utility is identified in this Contract or its appendices. The DBT shall not rely on the locations, sizes and depths to a greater extent than that indicated in the utility drawings or report.

7.5.2 Overhead Utilities

The Department has initiated coordination with existing public and private owned overhead utility owners within the project area. Locations have been compiled by a combination of efforts including reviewing existing facility plans and field survey. However, the DBT is advised that the locations should be considered tentative. The DBT is responsible for final verification of all overhead utility facility locations including type, number and elevation of lines, and related aboveground facilities, both public and private owned, within the confines of its work.

7.6 KNOWN UTILITY CONFLICTS

Currently identified utility facility conflicts and who is responsible for its relocation within the project limits are tabulated in Appendix UT-01 (Section 3 Utility Matrix). The matrix will be maintained and updated by the Department through the bidding process until Award.

The DBT shall be responsible for discovering and addressing additional utility conflicts that arise as a result of chosen substructure unit locations; retaining wall construction; building demolition; roadway and pavement construction; excavation and embankment limits; DBT selected construction means and methods; and other construction.

7.7 PROTECTION OF UTILITIES

The DBT shall coordinate project construction with utility adjustments and take all necessary precautions to prevent disturbance to utility facilities.

The DBT shall perform work in a manner that will cause the least reasonable inconvenience to the utility owner and those being served by the utility owner. Existing, adjusted, or new utility facilities that are to remain within the Right-of-Way of the project shall be properly protected by the DBT to prevent disturbance or damage resulting from project construction operations. If the DBT encounters a previously unknown utility that requires adjustment, they shall not interfere with the utility but shall take the proper precautions to protect the facility or take appropriate actions, per the contract documents, to coordinate the adjustment of the facilities.

7.7.1 Existing Utility Facilities that Cannot Be Impacted by the Proposed Work

Several existing utility facilities have been identified by their respective owners as unable to be relocated or modified in any fashion as a result of the proposed construction. Currently known facilities falling into this category are identified in Appendix UT-01 (Section 3 Utility Matrix).

7.7.2 City of Cleveland Division of Water – 48-inch Waterline

Located under the north side of Woodland Avenue is a 48-inch waterline, which cannot be impacted as a result of the proposed construction or utility relocations. This waterline runs from the west project limit to the east project limit on Woodland Avenue and includes a cathodic protection system.

7.7.3 FirstEnergy Transmission Facilities

Located to the northeast side of the Norfolk Southern Corporation tracks are high energy, 138,000 Volts Nominal (144,900 Volts Maximum), transmission facilities owned by FirstEnergy, which cannot be impacted as a result of the proposed construction. The structures and overhead lines run the length of the Norfolk Southern Corporation tracks.

7.8 KNOWN UTILITY RELOCATIONS

Currently identified utility facility conflicts and who is responsible for its relocation within the project limits are tabulated in Appendix UT-01 (Section 3 Utility Matrix). The matrix will be maintained and updated by the Department through the bidding process until Award.

The DBT shall be responsible for discovering and addressing additional utility conflicts that arise as a result of chosen substructure unit locations; retaining wall construction; building demolition; roadway and pavement construction; excavation and embankment limits; DBT selected construction means and methods; and other construction.

7.8.1 City of Cleveland Division of Water (CWD) Relocations

CWD presently owns, maintains and operates underground waterlines along I-490, East 55th Street, East 57th Street, East 59th Street, Bower Avenue, Butler Avenue, Francis Avenue, East 54th Street, Bragg Road, East 64th Street, Berwick Road, East 66th Street, East 68th Street, Colfax Road, East 71st Place, East 73rd Street, East 75th Street, Rawlings Avenue, East 79th Street, Grand Avenue, Lisbon Road, Tennyson Road, Evarts Road, Evins Avenue, Buckeye Road, East 87th Street, Kennedy Avenue, East 89th Street, Woodland Avenue, and East 93rd Street.

Along I-490, an existing 6-inch waterline affected by the DBT's proposed construction shall be removed.

Along East 55th Street, the DBT shall remove existing 6 inch, 8 inch, and 30 inch waterlines and replace with new 12 inch and 30 inch waterlines from the northern pavement replacement limit to the southern pavement replacement. 30-inch waterline replacement also includes reconfiguration of cathodic protection system.

Along East 57th Street, an existing 6-inch waterline shall be removed by the DBT between Bower Avenue and Francis Avenue.

Along Bower Avenue, the DBT shall remove an existing 6-inch waterline between East 55th Street and East 59th Street.

Along East 64th Street, an existing 6-inch waterline shall be removed from Butler Avenue to the north.

Along Berwick Road the DBT shall connect the existing 6-inch waterline to a proposed 8-inch waterline on the south side of OH-10 and remove the portion of 6-inch waterline north of that connection.

Along East 66th Street, an existing 6-inch waterline shall be removed by the DBT from Berwick Road to Kinsman Road and replaced with a new 8-inch waterline on the south side of OH-10

Along Kinsman Road the DBT shall remove an existing 8-inch waterline and replace with a new 12-inch waterline from a minimum of 10 feet beyond the outside westbound OH-10 lane to a minimum of 10 feet beyond the outside eastbound OH-10 lane. The new 12-inch waterline shall connect to a new 8-inch waterline along the south side of OH-10.

Along East 68th Street, an existing 6-inch waterline shall be removed by the DBT from Kinsman Road to Colfax Road and replaced with a new 8-inch waterline on the south side of OH-10. The new waterline shall be located between the roadway curb and the near side right-of-way.

Along Colfax Road the DBT shall connect the existing 6-inch waterline to a new 8-inch waterline on the south side of OH-10 and remove the portion of 6-inch waterline north of that connection to East 68th Street.

Along East 71st Place, an existing 6-inch waterline shall be removed by the DBT and replaced by a new 12-inch waterline within the limits of OH-10. The new waterline shall be located between the roadway curb and the near side right-of-way.

Along East 73rd Street the DBT shall remove an existing 6 inch and replace with a new 12-inch waterline within the limits of OH-10. The new waterline shall be located between the roadway curb and the near side right-of-way.

Along East 75th Street, existing 6 inch and 16 inch waterlines shall be removed by the DBT and replaced with new 12 inch and 16 inch waterlines from a minimum of 10 feet beyond the outside westbound OH-10 lane to a minimum of 10 feet beyond the outside eastbound OH-10 lane. The new 16-inch waterline shall connect to a new 16-inch waterline along the south side of OH-10.

Along Rawlings Avenue, the DBT shall remove an existing 6-inch waterline from East 75th Street to East 79th Street.

Along East 79th Street, existing 8-inch waterline shall be removed by the DBT and replaced with a new 12-inch waterline from a minimum of 10 feet beyond the outside westbound OH-10 lane to a minimum of 10 feet beyond the outside eastbound OH-10 lane. The new waterline shall connect to a new 16-inch waterline along the south side of OH-10.

Along Grand Avenue, existing 6 inch, 8 inch, and 16 inch waterlines shall be removed from East 79th Street to Evarts Road with a portion of new 8-inch waterline installed between OH-10 to the Norfolk Southern Corporation tracks. The DBT shall also remove an existing network of 4 inch, 6 inch, 8 inch, 10 inch, and 16 inch waterlines along with an existing pump house between the Norfolk Southern Corporation tracks and Evins Avenue. The DBT shall construct a new 16-inch waterline on the south side

of OH-10 from East 79th Street to Evarts Road. The new watermain shall be located between the roadway curb and the near side right-of-way. A new 12-inch connection shall be made between Evarts Avenue and the existing 8-inch waterline on Grand Avenue south of Buckeye Road.

Along Tennyson Road the DBT shall remove an existing 6-inch waterline from Evarts Road to Buckeye Road.

Along Evarts Road, an existing 6-inch waterline shall be removed by the DBT from Grand Avenue to Tennyson Road. The existing 16-inch waterline shall be removed from Grand Avenue to the eastern pavement replacement limit and replaced with a new 16-inch waterline from the eastern pavement replacement limit to a connection to the new 16-inch waterline on the south side of OH-10.

Along Evins Avenue the DBT shall remove the existing 8-inch waterline and replace with a new 12-inch waterline along relocated Lisbon Road connecting to a new 16-inch waterline on the south side of OH-10.

Along Buckeye Road, an existing 8-inch waterline shall be removed by the DBT and replaced with a 12-inch waterline from a minimum of 10 feet beyond the outside westbound OH-10 lane to a minimum of 10 feet beyond the outside eastbound OH-10 lane. The new waterline shall connect to a new 16-inch waterline along the south side of OH-10.

Along East 87th Street the existing 6-inch waterline shall remain in service from Buckeye Road to Woodland Ave.

Along East 89th Street, the existing 8-inch waterline shall be removed by the DBT and replaced with a new 12-inch waterline from Kennedy Avenue to the north side of the bridge replacement. The existing 16-inch waterline shall be removed and replaced from the new 16-inch waterline on from Kennedy Avenue to the north side of the bridge replacement.

Along Woodland Avenue the DBT shall remove the existing 8-inch waterline and replace with a 12-inch waterline from a minimum of 10 feet beyond the outside westbound OH-10 lane to a minimum of 10 feet beyond the outside the eastbound OH-10 lane. The new waterline shall connect to the new 16-inch waterline along OH-10.

New valves shall be constructed onto existing watermains as necessary for isolating portions of existing watermains to be removed. New valves, of sizes matching the mains, shall be constructed on each leg of tee and cross branches of new watermains. New water valves shall be installed on each end of structure mounted watermains.

Abandoned and active water service connections exist within the project limits. The DBT shall remove abandoned service connections that fall within the pavement replacement limits to the water main. The DBT is responsible for the relocation and replacement of active water service connections within the limits of proposed work. Active water service connections are anticipated at, but not limited to:

A. GCRTA East 55th Street Transit Station

B. 8100 Grand Avenue, Cleveland Oh 44104
C. Buildings between Norfolk Southern track and relocated Lisbon Road

Where the waterline to be removed is connected to a crossing waterline to remain, the DBT is responsible for removing the waterline, fittings, and a portion of the connected waterline in order to replace the fitting with one appropriate for the waterlines to remain. The DBT shall use the following for different removal scenarios:

A. Where there is a cross connection between waterlines and one leg of the connection is being permanently removed the DBT is responsible for replacing that cross connection with a tee joint.
B. Where there is an existing cross connection between waterlines and two legs of the connection are being permanently removed the DBT is responsible for replacing that cross connection with the appropriate bends and/or spool pieces as necessary to connect the waterlines to remain. Maximum allowable bends are 45 degrees.
C. Where there is an existing tee connection between waterlines and one leg of the connection is being permanently removed the DBT shall replace that existing tee connection with the appropriate bends and/or spool pieces as necessary to connect the waterlines to remain in that location. Maximum allowable bends are 45 degrees.

The DBT is also responsible for replacement of all waterlines and service connections required by reduction in cover (cover reduced by 6 inches or more) and as necessitated by other work performed by the DBT.

The DBT shall replace all fire hydrants (including tee's, branches, and valve boxes) impacted by roadway widening and other DBT performed work. New fire hydrants shall be placed on at least one side of the road at a spacing required by the CWD standards for commercial and industrial streets.

The DBT shall adjust to grade all valve boxes, service boxes, and other waterline appurtenances within the project limits.

The DBT is responsible for maintaining water service (mains and service connections) throughout the project using existing, proposed, and temporary waterlines and connections. Water outages shall be permitted only if approved by CWD.

The DBT is responsible for the design and construction of the CWD facilities that are impacted by the project. The DBT is to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work). All work shall be in accordance to the City of Cleveland Division of Water standards provided in the link in Section 1.10 (Governing Regulations) and Appendix UT-06 (City of Cleveland Water Department Specifications). For additional information regarding CWD owned facilities on reconstructed and new bridges, see Section 16 (Structures).

7.8.2 Cleveland Public Power (CPP) Relocations

CPP Presently owns, maintains, and operates overhead and underground electrical facilities within the project limits. The DBT is responsible for the design and construction of the CPP facilities that are

impacted by the project, as designed by the DBT. The DBT is to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work). All work shall be in accordance with Appendix UT-07 (Cleveland Public Power Specifications). For additional information regarding CPP owned facilities on reconstructed and new bridges, see Section 16 (Structures).

The DBT is responsible for relocating CPP owned overhead and underground electrical systems, and streetlights that are within the project limits. All relocations shall be in accordance with CPP standards. Existing CPP facilities shall remain in service until the new facilities have been constructed.

Along the south side of I-490, the DBT shall relocate existing underground conduits with three 5-inch concrete encased PVC conduits from a pole between Bragg Road and East 55th Street to a new manhole on East 55th Street. The DBT shall install six 4/0-1C-CU-15kV cables within the new conduits along I-490 for the relocation of CPP circuits 302C and 309C.

Along the west side of East 55th Street, the DBT shall replace the existing underground conduits with six 5-inch concrete encased PVC conduits from an existing manhole close to the northern pavement replacement limits to a new replacement manhole close to the southern pavement replacement limits. Conduits shall be structure mounted fiber reinforced epoxy. A new manhole shall be installed along East 55th Street that will connect conduits along East 55th Street and OH-10. The DBT shall install six 4/0-1C-CU-15kV cables within the new conduits along East 55th Street for the relocation of CPP circuits 302C and 309C.

Along the west side of East 79th Street, the DBT shall replace the existing underground conduits with eight 5-inch concrete encased PVC conduits from a new replacement manhole near the northern pavement replacement limits to a new manhole on East 79th Street. The new manhole shall be installed along East 79th Street and connect conduits along East 79th Street and OH-10. From the new manhole on East 79th Street to the southern pavement replacement limits the DBT shall replace the existing underground conduits with six 5-inch concrete encased PVC conduits and replace the existing manhole near the southern pavement replacement limit.

Along the south side of Buckeye Road, the DBT shall remove the existing underground conduits from the western pavement replacement limits to just east of Grand Avenue.

Along the south side of Woodland Avenue, the DBT shall remove the existing underground ducts within the pavement replacement limits.

Along the east side of East 89th Street north of Woodland Avenue, the DBT shall replace existing underground ducts with four 5-inch concrete encased PVC conduits from Woodland Avenue to a new manhole just south of the East 89th Street Bridge. From the new manhole the DBT shall replace the bridge mounted CPP conduits with four structure mounted fiber reinforced epoxy (0.095 inch minimum wall thickness) conduits across the new pedestrian bridge to a new manhole north of the bridge tying the new conduits to the existing conduits.

Aerial CPP lines shall not cross over OH-10. The DBT is responsible for reconfiguring CPP owned aerial lines to underground at OH-10 crossings. All aerial relocations shall be in accordance with CPP standards. Existing CPP facilities shall remain in service until the new facilities have been constructed.

Along the south side of Bragg Road, the DBT shall relocate existing aerial electrical facilities and associated poles affected by the DBT's proposed work.

Along the east side of East 75th Street, the DBT shall relocate and replace existing aerial CPP circuit SE-1333 and associated poles from the southern pavement replacement limit to the northern pavement replacement limit with 636-26/7-ACSR conductors. The DBT shall convert the aerial circuit to underground at the OH-10 crossing by installing four 5-inch concrete encased PVC conduits on East 75th Street from the nearest pole north of OH-10 to the nearest pole south of OH-10. Within one conduit the DBT shall construct three 750kcmil-1C-CU-15kV cables to connect to aerial cables on each side of OH-10. A new manhole shall be installed on East 75th Street and connect conduits along East 75th Street and OH-10.

Along the south side of Rawlings Avenue, the DBT shall remove existing aerial electrical facilities and associated poles from East 75th Street to East 79th Street. To relocate the existing aerial CPP circuit SE-1333 the DBT shall install three 750kcmil-1C-CU-15kv cables within one of the new conduits along OH-10 from the new manhole on East 75th Street to a new manhole on East 79th Street.

Along East 79th Street, the DBT shall relocate and replace existing aerial CPP circuit SE-1333 and associated poles from the southern pavement replacement limit to the south side of OH-10 with three 750kcmil-1C-CU-15kV in one conduit from the new manhole on East 79th Street to the first pole south of OH-10. The DBT shall install 4/0-ACSR conductors for aerial relocations along East 79th Street south of the first pole south of OH-10.

Along the south side of Evarts Road and the west side of Grand Avenue, the DBT shall remove existing aerial CPP circuit ET-1325and associated poles from a pole near the eastern pavement replacement limit to a point on Grand Avenue approximately 600 feet south of Evarts Road. The DBT shall construct three 5-inch concrete encased PVC conduits along Evarts Road from a manhole in OH-10 to the first pole on Evarts Road. The DBT shall install three 500kcmil-1C-CU-15kV cables within these new conduits to connect to aerial cables east of the Evarts Road eastern pavement replacement limit. The manhole in OH-10 shall connect the conduits along Evarts Road and OH-10.

Along the west side of Tennyson Road, the DBT shall remove existing aerial electrical facilities and associated poles from Evarts Road to Buckeye Road.

Along the north side of Buckeye Road, the DBT shall relocate and replace existing aerial CPP circuit ET-1325 and associated poles from the western pavement replacement limit to the eastern pavement replacement limit with 336-ACSR conductors. The DBT shall convert the aerial circuits to underground at the OH-10 crossing by installing four 5-inch concrete encased PVC conduits from the nearest pole west of OH-10 to the nearest pole east of OH-10. Within one conduit the DBT shall construct three 500kcmil-

1C-CU-15kV cables to connect to aerial cables on each side of OH-10. A new manhole on the north side of Buckeye Road shall be installed and connect conduits along Buckeye Road and OH-10.

Along the west side of East 89th Street, the DBT shall remove and replace existing aerial CPP circuit ET-1325 and associated poles from Kennedy Avenue to the north side of Woodland Avenue with three 5-inch concrete encased PVC conduits from Kennedy Avenue to OH-10. A new manhole shall be installed on the east side of OH-10 and connect conduits along East 89th Street and OH-10. Within one conduit the DBT shall construct three 500kcmil-1C-CU-15kV cables from Kennedy Avenue to the new manhole on OH-10. From the new manhole on the OH-10 to a new manhole on Woodland Avenue the DBT shall construct three 750kcmil-1C-CU-15kV cables within one of the new conduits along OH-10.

Along the north side of Woodland Avenue, the DBT shall relocate and replace the existing aerial CPP circuit ET-1325 and associated poles from the western pavement widening limit to the eastern pavement widening limit with 636-26/7-ACSR conductors. The DBT shall convert the aerial facilities to underground at the OH-10 crossing by installing six 5-inch concrete encased PVC conduits from a new manhole near the western pavement replacement limits to a new manhole east of the eastern pavement replacement limits. Within one conduit the DBT shall construct three 750kcmil-1C-CU-15kV cables to connect to aerial cables on each side of OH-10. A new manhole shall be installed on the north side of Woodland Avenue and connect conduits along Woodland Avenue and OH-10. The new manhole near the western pavement replacement limits shall have six 5-inch lateral conduits connecting to an existing manhole near south side of the western pavement replacement limits. The new manhole near the eastern pavement replacement limits shall have three 5-inch lateral conduits connecting to an existing manhole near south side of the eastern pavement replacement limits.

Other miscellaneous CPP service poles and aerial electrical facilities within the project limits that are affected by the DBT's proposed work are the responsibility of the DBT to coordinate and relocate.

The DBT shall install CPP supplied pole mounted transformers for lighting and electric facilities required by construction.

All new duct banks shall be concrete encased. A minimum cover of 36 inches shall be provided from finished grade to top of concrete encasement. Relocation of the utility includes procuring, fabricating, constructing, and installing the duct bank, new manholes, modification of existing manholes, new junction chambers, and new riser poles; installing the feeder lines; procuring splice and terminal kits; and other ancillary appurtenances necessary to provide a complete installation. Design, details, and construction of CPP duct banks shall conform to applicable CPP standards. CPP or a CPP-approved contractor shall make all splices and terminations of the new feeder lines installed by the DBT to the existing feeder lines in the finished facilities.

The DBT shall provide CPP with a minimum of four weeks advance notification of the need to splice or terminate new lines. Each splice or termination in a line will require eight hours effort for CPP crews to complete. Note that the advanced notification to CPP is required whether CPP or a CPP pre-approved contractor is completing a splice or termination.

7.8.3 Dominion East Ohio Relocations

Dominion East Ohio presently owns, maintains, and operates underground gas lines along East 55th Street, Bower Avenue, East 57th Street, East 64th Street, Berwick Road, Kinsman Road, East 68th Street, Colfax Road, East 71 Place, East 73rd Street, East 75th Street, Rawlings Avenue, East 79th Street, Grand Avenue, Lisbon Road, Tennyson Road, Buckeye Road, East 87th Street, East 89th Street, and Woodland Avenue.

Dominion East Ohio is responsible for the design and construction of their facilities that are impacted by the project, as designed by the DBT. Dominion and the DBT are to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work).

Existing and abandoned facilities within the project limits are believed to be asbestos coated. Where required due to other project work, removal of these facilities by the DBT shall be in accordance with Section 6.7 (Regulated Materials). For additional information regarding Dominion owned facilities on reconstructed and new bridges, see Section 16 (Structures).

7.8.4 AT&T Relocations

AT&T presently owns, maintains, and operates overhead and underground phone lines within the project limits.

AT&T is responsible for the design and construction of their facilities that are impacted by the project, as designed by the DBT. AT&T and the DBT are to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work). For additional information regarding AT&T owned facilities on reconstructed and new bridges, see Section 16 (Structures).

7.8.5 Cleveland Electric Illuminating Company (CEI) Relocations

CEI presently owns, maintains, and operates overhead and underground electric lines along I-490, East 55th Street, Bower Avenue, Butler Avenue, Francis Avenue, Berwick Avenue, East 66th Street, Kinsman Road, East 68th Street, Colfax Road, East 73rd Street, East 75th Street, Rawlings Avenue, East 79th Street, Grand Avenue, Evins Avenue, Lisbon Road, Evarts Road, Tennyson Road, Buckeye Road, East 87th Street, East 89th Street, and Woodland Avenue.

CEI is responsible for the design and construction of their facilities that are impacted by the project, as designed by the DBT. CEI and the DBT are to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work). For additional information regarding CEI owned facilities on reconstructed and new bridges, see Section 16 (Structures).

Along Bower Avenue, Berwick Avenue, Kinsman Road, East 68th Street, Colfax Road, East 73rd Street, East 75th Street, Rawlings Avenue, East 79th Street, Grand Avenue, Evins Avenue, Tennyson Road, Buckeye Road, East 87th Street, East 89th Street, and Woodland Avenue overhead electric lines and associated poles that are affected by the DBT's proposed construction shall be relocated by others.

7.8.6 Level 3 Communications, LLC

Level 3 Communications presently owns, maintains, and operates underground phone lines along the Norfolk Southern Corporation mainline tracks within a T-Cubed owned duct located along the Norfolk Southern corridor.

Norfolk Southern Corporation is responsible for the design and construction of the T-Cubed duct that the Level 3 facilities are located in that is impacted by the project, as designed by the DBT. Norfolk Southern, Level 3 Communications, and the DBT are to follow the guidelines for relocation plan reviews as discussed in Section 7.4.2 (Scheduling of Utility Work).

In the twelve T-Cubed ducts along the east side of the Norfolk Southern tracks Level 3 Communications occupies three ducts and shall be relocated upon relocation of the T-Cubed duct bank.

7.8.7 Thoroughbred Technology and Telecommunications, Inc. (T-Cubed)

T-Cubed presently owns and maintains underground conduits along the Norfolk Southern Corporation mainline track corridor.

Norfolk Southern Corporation is responsible for the design and construction of the T-Cubed facilities that are impacted by the project, as designed by the DBT. Norfolk Southern, T-Cubed, and the DBT are to follow guidelines for relocation plan reviews as discussed in Section 7.4.2 (Scheduling of Utility Work).

Along the east side of the Norfolk Southern tracks an existing underground duct bank with twelve conduits shall be relocated with the construction of the new Norfolk Southern Bridge.

7.8.8 Spread Networks, LLC

Spread Networks, LLC presently owns, maintains, and operates underground phone lines along the Norfolk Southern Corporation mainline tracks within a T-Cubed owned duct located along the Norfolk Southern corridor.

Norfolk Southern Corporation is responsible for the design and construction of the T-Cubed duct the Spread Networks facilities are located in that are impacted by the project, as designed by the DBT. Norfolk Southern, Spread Networks, LLC and the DBT are to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work).

In the twelve T-Cubed ducts along the east side of the Norfolk Southern tracks Spread Networks facilities shall be relocated upon relocation of the T-Cubed duct bank.

7.8.9 CenturyLink

CenturyLink presently owns, maintains, and operates underground phone lines along the Norfolk Southern Corporation mainline track corridor.

CenturyLink is responsible for the design and construction of their facilities that are impacted by the project, as designed by the DBT. CenturyLink and the DBT are to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work).

Along the west side of the Norfolk Southern tracks (2) 2 inch conduits shall be relocated with the construction of the new Norfolk Southern Bridge.

7.8.10 Verizon

Verizon presently owns, maintains, and operates underground phone lines along the Norfolk Southern Corporation mainline tack corridor.

Verizon is responsible for the design and construction of their facilities that are impacted by the project, as designed by the DBT. Verizon and the DBT are to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work).

Along the west side of the Norfolk Southern tracks an existing duct bank shall be relocated with the construction of the new Norfolk Southern Bridge.

7.8.11 Windstream

Windstream presently owns, maintains, and operates underground phone lines along the Norfolk Southern Corporation mainline tracks within a T-Cubed owned duct located along the Norfolk Southern corridor.

Norfolk Southern Corporation is responsible for the design and construction of the T-Cubed duct the Windstream facilities are located in that are impacted by the project, as designed by the DBT. Norfolk Southern, Windsteam, and the DBT are to follow the guidelines for relocation plan reviews as discussed in Section 7.4.2 (Scheduling of Utility Work).

In the twelve T-Cubed ducts along the east side of the Norfolk Southern tracks Windstream facilities shall be relocated upon relocation of the T-Cubed duct bank.

7.8.12 City of Cleveland Division of Water Pollution Control (CDWPC) Relocations

The DBT is responsible for the design and construction of the CDWPC facilities that are impacted by the project, as designed by the DBT. The DBT is to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work). All work shall be in accordance to the City of Cleveland Division of Water Pollution Control standards. For additional information for CDWPC facilities, see Section 14 (Drainage).

7.8.13 Northeast Ohio Regional Sewer District (NEORSD) Relocations

NEORSD presently owns, maintains, and operates underground sludge force mains under East 55th Street and East 75th Street. The DBT shall replace the 16-inch sludge force main and existing cathodic protection system along East 55th Street with the installation of the new East 55th Bridge structure over OH-10.

The DBT is responsible for the design and construction of the NEORSD facilities that are impacted by the project, as designed by the DBT. The DBT is to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work). All work shall be in accordance to the Northeast Ohio Regional Sewer District standards and Appendix UT-06 (City of Cleveland Water Department

Specifications) for design, construction, and testing. For additional information for NEORSD facilities, see Section 14 (Drainage) and Section 15 (Sanitary Sewers). For additional information regarding NEORSD owned facilities on reconstructed and new bridges, see Section 16 (Structures).

7.9 UTILITY FACILITIES ALONG NEW ROADWAY ALIGNMENT

Any utility facility along the new alignment portion of the roadway shall be coordinated with the Department and City of Cleveland.

The DBT shall make contact with, coordinate with, and provide all reasonable opportunity for the identified privately designed and constructed utilities to install facilities within the limits of the new roadway alignment. The DBT shall reasonably coordinate design and construction operations so that the private utilities may design and install infrastructure within the duration of the project so to eliminate and avoid future permanent roadway impacts. This shall include the consideration of private utility comments during the design so to not preclude potential private utility infrastructure. The DBT shall provide notice to utility owners a minimum of 45 days and again provide notice 15 days in advance regarding site availability for private utility construction. Site availability includes completion of clearing, grubbing, removals, rough grading, and other incidentals. The Progress Schedule shall include minimum 30 day duration for private utility construction following site availability and plan approvals.

Payment for any ineligible, unnecessary, or betterment to the utility will be the responsibility of the utility and not the DBT or Department. Determination of eligibility shall be coordinated through the Department. Payment for betterments or ineligibility costs shall be made by the appropriate utility through the Department to the utility contractor. Betterment procedures shall follow the department Utilities Relocation Manual.

7.9.1 New Cleveland Public Power (CPP)

The DBT shall design and construct six 5-inch concrete encased PVC conduits along the new alignment of OH-10 at a manhole in East 55th Street then extending eastward along OH-10 connecting to new conduits at East 93rd Street constructed as part of OC2. New CPP manholes shall be located at a maximum spacing of 400 feet with lateral crossings of the roadway from each manhole consisting of three 5-inch concrete encased PVC conduits. The lateral crossing shall terminate 18 inches beyond the edge of the sidewalk on each side of the road with the conduits capped at their terminus. Conduits across structures shall be fiber reinforced epoxy (0.095 inch minimum thickness), supported below the deck, with required expansion devices. Where structure length exceeds 400 feet, manholes shall be placed immediately beyond the limits of the structure. The new conduit installation shall be located between the roadway curb line and the adjacent right of way line. The conduit system along OH-10 shall tie to existing/proposed conduits at intersecting roadways with new manholes and shall also include new concrete encased PVC conduits on intersecting roads as required to tie together existing and proposed conduit systems and bury aerial CPP facilities under OH-10.

On the north side of Kinsman Road, the DBT shall design and construct four 5-inch concrete encased PVC conduits from the western curb return to the eastern curb return of the intersection of Kinsman Road and OH-10 for future use by CPP. The stubbed conduits shall terminate under sidewalk/treelawn areas

outside the roadway pavement limits. A new manhole shall be installed on Kinsman Road connecting conduits along Kinsman Road and OH-10.

On relocated Rawlings Avenue, the DBT shall design and construct three 5-inch concrete encased PVC conduits from OH-10 to the eastern pavement replacement limit. A new manhole shall be installed on OH-10 at relocated Rawlings Avenue and connect conduits along Rawlings Avenue and OH-10.

The DBT shall design and construct two 4-inch concrete encased PVC conduits with one 18 inch pull box in locations of future public plazas as listed in Section 18 (Aesthetics and Enhancements). The electrical conduits shall extend to the nearest adjacent CPP manhole or power pole. The conduits shall be capped in the manhole or 10 feet above grade on the pole riser. The DBT shall coordinate exact conduit locations with the Department and CPP.

All new duct banks and laterals shall be concrete encased. A minimum cover of 36 inches shall be provided from finished grade to top of concrete encasement. The new utility includes procuring, fabricating, constructing, and installing the duct bank, new manholes; and other ancillary appurtenances necessary to provide a complete installation. Design, details, and construction of the duct bank shall conform to applicable CPP standards. The DBT shall install pull cable within each conduit. Electrical conductors shall not be installed under this contract for the new duct run along OH-10 except where noted in Section 7.8.2.

The DBT is to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work) for the new utility. All work shall be in accordance with Appendix UT-07 (Cleveland Public Power Specifications).

7.9.2 New City of Cleveland Division of Water (CWD)

From East 71st Place to East 75th Street the DBT shall design and construct a new 12-inch ductile iron waterline along the new alignment of road. Along the new alignment of road, the DBT shall design and construct a new 16-inch ductile iron waterline from East 75th Street to East 89th Street. The new watermains shall be located between the roadway curb and the near side right-of-way and shall connect to relocated watermains at East 71st Place, East 73rd Street, East 75th Street, East 79th Street, Vacated Grand Avenue, Grand Avenue, Evarts Road, Buckeye Road, Kennedy Avenue, and Woodland Avenue.

New fire hydrants shall be placed on at least one side of the road at a spacing required by the CWD standards for commercial and industrial streets. New waterlines shall not be constructed along the new alignment of roadway from East 89th Street to East 93rd Street, however a hydrant assembly shall be located at the northeast quadrant of the OH-10/Woodland Avenue intersection.

The DBT shall design and construct a 1-inch service line with curb shut off valve in locations of future public plaza locations as listed in Section 18 (Aesthetics and Enhancements). The DBT shall coordinate exact locations with the Department and CWD.

The DBT is to follow the guidelines for relocation plan review as discussed in Section 7.4.2 (Scheduling of Utility Work). All work shall be in accordance to the City of Cleveland Division of Water standards

provided in the link in Section 1.10 (Governing Regulations) and Appendix UT-06 (City of Cleveland Water Department Specifications).

7.9.3 Additional Conduit for Utility Crossings

To facilitate the future conversion from overhead to underground utilities, additional conduits shall be installed by the DBT. The DBT shall design and construct four 4-inch concrete encased PVC conduits crossing the new alignment of roadway at East 55th Street, Kinsman Road, East 75th Street, East 79th Street, Evarts Road, Buckeye Road, and Woodland Avenue. A 3'x3' pullbox shall be constructed at each end of the crossings. A minimum cover of 36 inches shall be provided from finished grade to top of concrete encasement.

7.10 PROJECT ELIGIBLE VS. LOCAL PAY ITEMS

The project includes public utility relocations necessitated by the roadway improvements for CPP, CWD and CDWPC facilities. These generally include relocation of existing public power, waterline and sanitary sewer facilities along existing roadways. The project also includes additional betterment power, water and sanitary sewer improvements intended to facilitate future development along OH-10. These betterment improvements generally include new CPP ducts and vaults, new CWD waterlines, and new CDWPC sanitary sewers along the new alignment portions of the project. Separate funding sources are anticipated to be utilized for betterment public utilities; therefore, the Department has established "LOCAL" pay items for each betterment item. The Department intends to construct all of the public utility improvements within the contract, however for accounting purposes requires the DBT to segregate his bid between the project eligible and local pay items as listed below:

Item 611E97910 Special – Sanitary Sewer
Item 611E97910 Special – Sanitary Sewer (Local)

Item 638E99000 Special – Water Works
Item 638E99000 Special – Water Works (Local)

Item 690E21010 Special – CPP Power Distribution
Item 690E21010 Special – CPP Power Distribution (Local)

7.11 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Utility Conflict Matrix	Submittal	0	1	Monthly	Section 7.4, UT-01

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
					(Section 3 Utility Matrix)
Utility Coordination Meeting Minutes	Submittal	0	1	2 Days after meeting	7.4
Third Party Approval of Utility Relocation Plan	Submittal	0	1	Prior to RFC	7.4

8 RAILROADS

The DBT is responsible for all coordination with affected Railroads. The DBT shall not charge or submit a claim against either the State or the Railroad Company for hindrance or delay due to railway traffic, any work done by the Railroad Company, or other delay incident to or necessary for safe maintenance or normal operation of railway traffic, or for any delays due to compliance with Railroad Agreements.

8.1 RAILROAD AGREEMENTS

The Department has entered into, or is in the process of entering into, Standard Construction Agreements with each of the affected Railroads. Railroad Agreements are included in Appendices RR-01 (Norfolk Southern Rail Agreement – OC3), RR-02 (Norfolk Southern Rail Agreement – 89th Street Bridge), RR-03 (GCRTA Rail Agreement & Special Clauses – Kingsbury and Blue-Green Bridges) and RR-04 (GCRTA Rail Agreement & Special Clauses – 89th Street Bridge). Technical coordination is handled through the District Railroad Coordinator.

The DBT shall coordinate with the State Rail Coordinator prior to contacting the railroads to verify the lines in question, necessary clearances for rail operations (both permanent and temporary), and/or to acquire the milepost and line identification information, etc.

8.2 GENERAL

The Project will require the DBT to perform Work in the immediate vicinity of, under, or over several active rail lines during execution of the Work. The affected Railroads include the Norfolk Southern Corporation (NS) and the Greater Cleveland Regional Transit Authority (GCRTA). All Railroads have indicated that rail operations will continue during construction of the Project. The DBT shall coordinate demolition and construction activities with each Railroad and/or the Railroad's General Engineering Consultant to ensure there will be no impacts to Railroad operations, property, or right-of-way. The Department will enter into Standard Construction Agreements with each of these Railroads. The DBT's operations shall be conducted in accordance with these agreements and any applicable special provisions, special clauses, construction requirements, and demolition requirements. The DBT shall be responsible for making application for and acquiring all necessary pipeline crossing permits from the affected Railroad for execution of the Work. This includes payment of all applicable fees.

This Section 8 identifies anticipated crossings of Railroad facilities. The Project may require the DBT to conduct construction operations above, under, or around Railroad facilities in addition to the items described in this Section 8. The DBT shall comply with all applicable requirements of this Section 8, regardless of whether specific crossings or other items are identified in this Section 8.

8.2.1 Norfolk Southern Corporation

Two NS railroad lines are in the vicinity of the Project. The two-track Dearborn Division, Lake Erie District B-Line (Nickel Plate) roughly parallels the Project alignment to the north of proposed OH-10. The two-track Dearborn Division Cleveland Line intersects proposed OH-10 near Grand Avenue.

8.2.1.1 Cleveland Line

The DBT shall construct a new NS structure over proposed OH-10 approximately 290 feet north of Grand Avenue (approximate MP RD-118.26± of the Dearborn Division Cleveland Line). The new NS structure shall accommodate the existing configuration of two tracks with an unpaved vehicular access roadway as well as a future configuration of four tracks in accordance to Section 16 (Structures).

A. The DBT shall maintain uninterrupted service on both tracks on the Cleveland Line throughout construction.
B. The limits of the track realignment are the NS Cleveland Line bridge over the NS B-Line and GCRTA Red Line on the north and the NS Cleveland Line bridge over Holton Avenue on the south. The DBT shall not disturb the bridges at the north and south realignment limits in the performance of this contract.
C. The DBT shall construct all necessary embankment up to and including placement of the subballast.
D. The DBT shall meet the following track geometric criteria in addition to the requirements found in Section 1.10 (Governing Regulations) related to railroads:
    a. Design speed for all curves is 45 mph
    b. Minimum tangent distance between reverse curves is 220 feet
E. Site drainage shall be designed in accordance with Section 14 (Drainage).
F. Fencing for impacted adjacent properties and for NS Right-of-Way shall be placed in accordance with Appendix LD-08 (Site Specific Requirements).
G. The DBT shall remove the Grand Avenue Bridge in accordance with Section 16 (Structures)

8.2.1.2 Lake Erie District

The DBT shall construct a new pedestrian structure over NS facilities at E. 89th Street (approximate MP B-180.79± of the Dearborn Division, Lake Erie District) in accordance to Section 16 (Structures). The pedestrian structure will replace an existing defunct roadway bridge that crosses the NS Lake Erie District tracks inside roadway right-of-way. The new structure crosses over two NS tracks. The new structure also crosses two GCRTA Red Line tracks as described in Section 8.2.2 (Greater Cleveland Regional Transit Authority).

The DBT shall remove the existing E. 89th Street bridge superstructure. The substructure shall be removed 2'-0" below final ground elevation and abandoned and the cavity backfilled.

A drainage crossing of the NS Lake Erie District tracks is anticipated between the E. 79th Street and NS Cleveland Line overhead structures at approximately MP B-181.27. The proposed storm sewer pipe would be constructed under the entire NS Lake Erie District tracks right-of-way and a connection made to the Kingsbury Sewer A-Branch in accordance with Section 14 (Drainage).

8.2.2 Greater Cleveland Regional Transit Authority

The DBT shall construct three new structures over GCRTA facilities, install a storm sewer under GCRTA facilities, and modify the E. 55 Rapid Station site.

8.2.2.1 Kingsbury Run / Loop Test Track Bridge

The DBT shall construct a new roadway structure over Kingsbury Run between East 64th Street and Berwick Road in accordance with Section 16 (Structures). The bridge will carry the OH-10 over a GCRTA Loop Test Track. The Test Loop Track is connected to a GCRTA maintenance facility that borders the Project to the north.

8.2.2.2 Blue-Green Line Bridge

The DBT shall construct new roadway structures over the GCRTA Blue and Green Lines, which run together, between the E. 55th Street and E. 79th Street GCRTA stations in accordance with Section 16 (Structures). The roadway crossing spans over the two GCRTA tracks and third test track near Colfax Road and E. 73rd Street.

8.2.2.3 E. 89th Street Pedestrian Bridge

The DBT shall demolish the existing vehicular structure and construct a new pedestrian structure over the two tracks of the GCRTA Red Line at E. 89th Street in accordance with Section 16 (Structures). The new structure also crosses two NS B-Line tracks as described in Section 8.2.1 (Norfolk Southern Corporation).

8.2.2.4 Red Line drainage crossing

A drainage crossing of the GCRTA Red Line is anticipated between the E. 79th Street and NS Cleveland Line overhead structures. The proposed storm sewer pipe would be constructed under the entire GCRTA right-of-way and a connection made to the Kingsbury Sewer A-Branch in accordance with Section 14 (Drainage).

8.2.2.5 E. 55 Rapid Station

The DBT shall coordinate impacts to the E. 55 Rapid Station, bus loop, and parking lot located at 2890 E. 55th Street with GCRTA. Access including full bus ingress and egress to the bus loop and circulation through the passenger loading and unloading area, ADA-accessible pedestrian access to the station, and both ADA-accessible pedestrian and vehicular access to the parking lot shall be maintained by the DBT at all times throughout construction unless otherwise approved by GCRTA and The Department. Maintenance of Traffic shall meet all the requirements of Section 20 (Maintenance of Traffic).

The DBT shall design and construct a permanent two-way traffic access to the existing bus circulation loop from E. 55th Street to allow full bus ingress and egress and circulation through the passenger loading and unloading area by a City-Bus (Vehicle Length = 40 feet) and an A-Bus (Vehicle Length = 60 Feet). The DBT shall account for bus layovers within the circulation loop. The DBT shall design and construct a reconfiguration of the existing parking lot, bus loop and driveway to accommodate the new permanent access and other project work.

The DBT shall also restore all features disturbed by project work including disturbances from maintenance of traffic and other work that are not otherwise reconstructed with the project. Materials for restoration items shall match the material type of the original feature and have a minimum material quality/grade as the original specified construction material for each specific feature. If the original material specification cannot be determined or is obsolete Department Standards will take precedence.

Reconfiguration and Restoration work includes construction of new pavements, curbs, sidewalks, traffic islands, traffic control, lighting facilities, drainage and utilities. The parking lot reconfiguration shall keep the same number of total parking spaces and accessible spaces as the existing condition. No decrease in the effective parking aisle width will be permitted. All reconstructed pavement shall have a build-up that matches the original pavement material types and at a minimum the thickness shall match the thickness of the original pavements. Material Quality/Grade shall follow the same guidance as restoration work.

Americans with Disabilities Act accessible sidewalks shall be constructed to accommodate pedestrian access to the station from E. 55th Street and the proposed E. 59th Street pedestrian bridge. The sidewalks shall have a minimum width of 8 feet and materials shall be as shown in Section 12 (Pavements).

Storm sewer, sanitary sewer, water, electric, communications, and any other impacted utility service connections or lines to the GCRTA E. 55 Rapid Station at 2890 E. 55th Street or within the vicinity of this work shall be restored.

The design of the parking lot, driveway, parking stalls, sidewalks, and other impacted facilities shall follow the requirements found in Section 1.10 (Governing Regulations). All modifications to the E. 55 Rapid Station, bus loop and parking lot shall be approved by GCRTA and The Department.

8.2.3 Utilities

The DBT shall coordinate impacts to utilities affected by the scope of work as described in Section 8 (Railroads). Impacts to utilities within railroad rights-of-way shall be coordinated by the DBT in accordance to Section 7 (Utilities). Utilities include but are not limited to:

A. Underground and overhead Electric and telecommunications lines parallel to the NS Cleveland Line and NS B-Line.
B. Combined sewer, catch basins, and other utilities under the Grand Avenue underpass.
C. Overhead catenary, signal, and communication lines along the GCRTA Red, Blue, and Green Line tracks. The DBT is responsible for any temporary or permanent impacts to GCRTA owned facilities.

8.3 RAILROAD PROVISIONS

8.3.1 Norfolk Southern Corporation

Norfolk Southern will assign a General Engineering Consultant (GEC) to the Project that will be responsible for all technical reviews and construction administration. The DBT shall be responsible for all technical coordination, drawing reviews, and obtaining approvals from NS, as well as construction and flagging scheduling during construction. The DBT shall comply with the requirements of Appendices RR-01 (Norfolk Southern Rail Agreement – OC3), RR-02 (Norfolk Southern Rail Agreement – 89th Street Bridge) in execution of the Work.

The primary contact for NS as stated in RR-01 (NS Railroad Agreement) is:

Eldridge W. Chambers
Engineer Public Improvements
Norfolk Southern Corporation
1200 Peachtree Street, N.E.
Atlanta, Georgia 30309
Tel: (404)529-1436
Cell: (470) 728-5546
Eldridge.Chambers@nscorp.com

The DBT shall send copies of all correspondence with NS to the following:

Rich Behrendt
Program Manager/State Rail Coordinator
Ohio Department of Transportation
1980 W. Broad Street
Columbus, OH 43223
Tel: (614) 387-3097
Richard.behrendt@dot.state.oh.us

8.3.2 Greater Cleveland Regional Transit Authority

The DBT shall be responsible for all technical coordination and drawing reviews, and obtaining approvals from GCRTA, as well as construction, flagging payment, and scheduling during construction. The costs for the flagging will not be compensated separately and shall be included in the Proposal price. The DBT shall comply with the requirements of Appendices RR-03 (GCRTA Rail Agreement & Special Clauses – Kingsbury and Blue-Green Bridges) and RR-04 (GCRTA Rail Agreement & Special Clauses – 89th Street Bridge) in execution of the Work. Section 015010 (Maintenance of Rail Traffic and Resumption of Revenue Service) limits the track availability periods, especially complete weekend closure periods. The DBT shall coordinate with the GCRTA prior to planning weeknight and weekend outages.

8.4 RAILROAD PIPELINE CROSSING PERMITS

All permits for the underground crossing of the NS B-Line and the GCRTA Red Line associated with the storm sewer outfall to the 48-inch Kingsbury Run Sewer A-Branch shall be acquired and paid for by the DBT and shall identify the Department as the Owner. The DBT shall provide copies of the permit application form and all associated documents to the Engineer and the Department District 12 Utility

Coordinator. The DBT shall account for the NS permit application processing time in the Project Schedule.

The Norfolk Southern permit process can be found at the following location:

http://realestate.nscorp.com. On the website, select the Wireline/Pipeline and Fiber Optics link.

8.5 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. In addition to bridge and track design plan submittals required by NS, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	**Electronic**		
Pipeline Crossing Permits	Submittal	1	1	Prior to submittal to railroad	8.4

9 RIGHT OF WAY

9.1 GENERAL

The Department will acquire all temporary and permanent Right-of-Way to encompass the proposed construction limits shown in Appendix RW-01 (Section 3 Right-of-Way Map). Appendix RW-01 indicates the existing Right-of-Way lines and any permanent and/or temporary easements being acquired by the Department for the Project.

Right of possession of all Department, GCRTA, and Norfolk Southern (NS) Right-of-Way and improvements made thereon by the DBT shall remain at all times with the Department. The DBT's right to entry and use of this Right-of-Way arises solely from permission granted by the Department, GCRTA, and NS. All permanent infrastructure and drainage features shall be located within the proposed Right-of-Way or other permanent easement and not within the temporary Right-of-Way. Temporary or permanent use of properties outside the Right-of-Way is prohibited except with the Approval of the Department and property owner.

The DBT will be provided access to each parcel identified in RW-03 (Right-of-Way Tracing Legal Descriptions) as the parcel title is cleared. The access date is indicated in Appendix RW-02 (Right-of-Way Status Chart), which the DBT shall include in the Progress Schedule. The Department will provide written notification to the DBT when each required parcel is available and of any applicable access restrictions. The DBT shall not access any parcel until such written notification is provided.

9.2 TEMPORARY EASEMENTS

Temporary easements being acquired by the Department for the Project are to be used project construction activities, as described in Appendix RW-03 (Right-of-Way Tracing Legal Descriptions). Notwithstanding the durations indicated in Appendix RW-03, the DBT will be provided access to each temporary easement for a forty-eight-month duration, beginning on the date on which physical Work commences within the temporary easement site. The DBT shall provide written notice to the Department indicating the Day the DBT will commence Work within a temporary easement. The DBT will not be granted access to perform Work within a temporary easement prior to the date indicated by the DBT's written notice. Availability dates listed in the Right-of-Way Status Chart for temporary easements are subject to the access date indicated by the DBT. All Work that necessitates the use of the temporary easements shall be completed within the temporary easement access duration. The DBT will not be granted access to the temporary easement sites after the temporary easement access duration. See Appendix LD-08 (Site Specific Requirements) for additional limitations regarding temporary easements.

9.3 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Notice of Intent to Access Temporary Easement	Submittal	0	1	Five Business Days prior to Work commencing within each individual temporary easement	9.2

10 GEOTECHNICAL

10.1 GOVERNING REGULATIONS

The DBT shall conduct all Work necessary in accordance with current practices and with due diligence in all areas, including geotechnical exploration, analysis, design, and construction.

Governing regulations and supplemental specifications are listed in Section 1 (General). In the event of a conflict among the standards listed in Section 1 (General) related to geotechnical engineering, the Department's standards shall take precedence.

10.2 DESIGN REQUIREMENTS

10.2.1 Subsurface Exploration

Boring logs obtained for the project are included in Appendix GE-01 (Section 3 Geotechnical Reports). The DBT shall obtain additional test borings as needed per the Department's Specifications for Geotechnical Exploration (SGE) to establish all geotechnical design parameters. Per Ohio Revised Code 163.03, the DBT will be able to obtain soil borings prior to a parcel being available for construction. The DBT shall prepare the property owner letter(s) (which will require the Department's signature and letterhead). Notice (said letter) of such proposed entry shall be given to the owner or the person in possession by such means as are reasonably available not less than 48 hours or more than 30 Days prior to the date of such entry.

Based on the presence of deleterious and organic fill materials identified within the Project soil borings, the Department does not guarantee the suitability of excavated material for reuse as embankment within the Project limits.

10.2.2 Geotechnical Exploration Reports

All geotechnical design and explorations performed by the DBT shall be completed and submitted to the Department in a report format following the guidelines of Section 700 of the SGE. The DBT shall combine all new geotechnical exploration and historical information in accordance with the SGE.

10.2.3 Foundation Analysis and Design

The DBT shall use the geotechnical exploration information provided, along with any additional information gathered by the DBT, to design foundations for each structure. The DBT shall perform all foundation analyses and designs using the Load Resistance Factor Design (LRFD) method. The Allowable Stress Design (ASD) method shall only be used where LRFD methods do not yet exist in the governing regulations.

As part of the Geotechnical Exploration Reports, the DBT shall prepare a Foundation Report (as defined in the BDM and SGE) for each structure. Foundation Reports shall include all engineering analyses and design recommendations and shall be prepared in accordance with the Project Management Plan.

10.2.4 Retaining Wall Analysis and Design

The DBT shall use the geotechnical exploration information provided, along with any additional information gathered by the DBT, to design retaining walls. The DBT shall perform all retaining wall analyses and designs using the Load Resistance Factor Design (LRFD) method. The Allowable Stress Design (ASD) method shall only be used where LRFD methods do not yet exist in the governing regulations.

As part of the Geotechnical Exploration Reports, the DBT shall prepare a retaining wall analysis report (as defined in the BDM and SGE) for each wall. Analysis shall include all engineering analyses and design recommendations and shall be prepared in accordance with the Project Management Plan.

10.2.5 Monitoring and Control Requirements

The DBT is responsible for all damage resulting from construction activities. The DBT shall control vibration and ground settlement and monitor all buildings, structures, Utilities, critical locations, and other areas that may be subject to damage from construction-induced vibration or settlement within embankment fills or zones of influence for construction.

Vibration control and monitoring shall conform to C&MS 208.15, except as modified below:

A. All references to blasting shall instead apply to construction activities.
B. The vibration specialist's experience requirement shall apply for vibration monitoring and need not be specific to rock blasting projects.

Blasting and explosives are prohibited on this Project.

The DBT shall prepare a Settlement and Vibration Monitoring Plan that identifies critical locations within the zone of influence of embankment fills or construction equipment loads and within limits determined by the vibration specialist. The Settlement and Vibration Monitoring Plan shall establish proposed instrument locations, installation procedures and requirements, critical or limiting readings, frequency of readings, threshold settlement or other movement criteria, and procedures to modify construction methods should threshold criteria be exceeded. The DBT shall prepare vibration-related deliverables in accordance with C&MS 208.

At the following locations, construction vibration could affect commercial machining operations:

A. The Brost Foundry Company, 2934 E. 55th Street (Auditor P/N 123-15-053/056)
B. Quality Stamping Products, 5322 Bragg Road (Auditor P/N 123-15-024/025/026, 123-10-001)

The Settlement and Vibration Monitoring Plan shall specifically address procedures to ensure that construction induced vibration does not impact business operations.

The DBT shall conduct a pre-construction survey of all buildings, structures, Utilities, and critical locations within the zone of influence and limits determined by the vibration specialist. The DBT shall use a survey method acceptable to its insurance company. If owners or occupants fail to allow access to a property for the pre-construction survey, the DBT shall send a certified letter to the owner or

occupant, and shall make the notification effort and the certified letter part of the pre-construction survey records. The DBT shall deliver a copy of the pre-construction survey to the Department before beginning construction operations at critical locations.

The DBT shall perform two (2) video inspections of all sewers within influence zones in addition to the continuous monitoring described previously. The video inspections limits shall at a minimum include the portion of the sewer within the zone of influence and extend 50 feet beyond those limits on each side. The videos shall be performed pre-construction and post construction once construction is substantially complete. All videos shall be provided to The Department and the maintaining agency of the sewer for review. See Section 14 (Drainage) for more details of the video requirements.

10.2.6 Subgrade Stabilization

The DBT shall prepare suitable subgrade in conformance with C&MS 204.

Beneath all proposed full depth pavement the DBT shall complete the following subgrade stabilization method per C&MS 204, and per The Department's Geotechnical Bulletin GB-1:

A. Perform Item 204 - Excavation of Subgrade and replacement with Item 204 – Granular Material, Type B (undercut) for a depth to be determined by the DBT and Approved by the Department. In areas where bedrock is encountered or will be within 2 feet of the bottom of pavement, the bedrock shall be removed to the 2-foot limit and the cavity backfilled with Granular Material Type B per C&MS 204. In areas where Unsuitable Subgrade, as defined by OGE Geotechnical Bulletin GB-1, are encountered within 3-feet of the bottom of pavement the unsuitable material shall be removed to the 3-foot limit and the cavity backfilled with Granular Material Type B per C&MS 204. The DBT shall assume a 3-foot undercut for 20-percent of the non-bedrock subgrade area. The DBT shall assume a 12-inch undercut for remaining unstable non-bedrock subgrade area. The actual depth of undercut for unstable areas may be varied by the DBT during final design, and by doing so, the DBT assumes all subgrade risk. Some locations may not require stabilization, but the DBT then assumes all subgrade risk if this assumption is followed. For bidding purposes, the DBT is also to assume that 5% of the undercut areas will fail upon proof rolling and require re-stabilization, which shall be considered incidental. The 5% assumption does not apply to undercut variations utilized by the DBT.

All subgrade stabilization areas shall extend 18 inches beyond the back of proposed curbs. The DBT shall perform Subgrade Compaction and Proof Rolling per C&MS 204 on all stabilizations. The DBT shall account for underdrain installation within and adjacent to the stabilization work and stage the work accordingly.

Geogrid will be used at the direction of the Department and shall be placed from back of curb to back of curb. The DBT shall assume use of geogrid for 20 percent of the proposed project subgrade stabilization area.

The DBT shall locate and verify the depth of all existing underground utilities and sewers present in areas of subgrade stabilization to ensure no impacts or damage during construction. Stabilization

depths may be adjusted or non-performed with Approval of the Department to accommodate utilities. Specific attention is directed to all existing waterlines. An 18-inch depth of undisturbed earth shall be kept above all water lines during subgrade construction. Static rollers shall be used for subgrade and subbase compaction in areas of existing water lines. Vibratory equipment over water lines is strictly prohibited.

10.2.7 Slope Stabilization

The DBT shall use the geotechnical exploration information provided, along with any additional information gathered by the DBT, to design and construct embankments and slope stabilizations per the Governing Regulations.

10.3 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Geotechnical Exploration Reports	Submittal	1	1	Submit each report with the interim design submittal for Buildable Unit	10.2.2
Final Project Soil Profile	Submittal	1	1	Submit within 180 days of the final Buildable Unit being Released for Construction	10.2.2

11 BUILDING DEMOLITION

11.1 BUILDING REMOVALS

The DBT shall remove the existing buildings identified in Appendix RW-02 (Right-of-Way Status Chart).

11.2 ASSESSMENT/INSPECTION

The Department will perform Regulated Materials assessment/inspection of buildings to be removed on the Project in accordance with Section 6 (Environmental). The DBT shall perform Regulated Materials management in accordance with Section 6 (Environmental).

11.3 DEMOLITION

The DBT shall not disturb any building prior to receiving the Notice of Possession and the Approval to proceed from the Department. Building demolition shall not commence until the DBT completes all abatement activities. To maximize public safety and minimize complaints from the public regarding abandoned buildings, the DBT shall commence abatement activities and complete building demolition activities as soon as reasonably possible.

All applicable demolition requirements will be followed as stipulated in C&MS 202, except as modified in this Section 11 (Building Demolition). All existing features encountered on the building removal parcels within permanent and temporary easement limits not otherwise designated in the Contract Documents as to remain for salvage or for reuse shall be removed and disposed of, except as directed by the Department, including but not limited to pavements, sidewalks, driveways, minor structures and obstructions, fencing, pipes, drainage structures, railing steps, debris, vehicles, Regulated Materials and underground storage tanks. The DBT shall ensure that all improvements associated with each demolished building/property are removed including all abandoned personal property found within or outside the building, and that only a bare grass lot remains, unless otherwise specified in the Contract Documents. The burning of buildings/building material is forbidden. The use of explosives is forbidden.

Payment shall include all labor, tools, equipment and materials necessary to complete the work associated with the removal and disposal of the structures demolished and site features. Clearing & grubbing, grading, mulching, water, excavation and backfill of resulting cavities and seeding shall be incidental to the removal.

The Department is coordinating the shut-off of all utilities through the real estate acquisition process. The DBT shall coordinate the removal of all utility services and pay all utility disconnect fees. For additional information, see Section 7 (Utilities).

11.4 DELIVERABLES

Not applicable.

12 PAVEMENTS

The DBT shall construct pavements as required by this Section 12. Subgrade requirements are indicated in Section 10 (Geotechnical). For drainage requirements, including underdrains, see Section 14 (Drainage).

12.1 PAVEMENT DESIGN

Pavement compositions for the Project shall be as described in this Section 12.

The DBT may select from either a full depth flexible or rigid pavement buildup as defined below for the limits of proposed OH-10 as shown in Appendix PA-01 (Pavement Limits). The pavement type selected for OH-10 shall be uniform for the project limits and both the eastbound and westbound directions of traffic. No fluctuation between rigid and flexible buildups will be permitted without Approval of the Department. The OH-10 pavement buildup shall extend to the back of curb returns on intersecting roadways. The DBT may also select either a full depth flexible or full depth rigid pavement for all sidestreet pavements in areas indicated in Appendix PA-01 (Pavement Limits) as full depth pavement replacement. In areas of full depth pavement work immediately adjacent existing pavement to be resurfaced (widening and resurfacing), the DBT shall install full depth pavement per the buildups in this section, of a type such that the surface material of the widening area matches the surface material of the adjacent existing pavement. No composite pavements will be permitted in the widening areas. Appendix PA-01 (Pavement Limits) shows minimum limits of pavement work the DBT is responsible for. Any changes to the alignment, profile or configuration of project elements, which result in pavement work beyond what is shown in Appendix PA-01 (Pavement Limits) are the responsibility of the DBT as well. See Appendix LD-08 (Site Specific Requirements) for additional pavement requirements of the DBT.

The DBT will be responsible for maintaining all pavements used as alternate routes or detour routes during the construction of the Project, making any necessary pavement repairs and resurfacing to all disintegrated areas including delamination, potholes, raveling, and alligator cracked pavement to keep the routes in satisfactory condition. At the end of the Project, the DBT will be responsible for performing any final pavement repairs to all disintegrated areas, including delamination, potholes, raveling and alligator cracked pavement. The DBT will also be responsible for sealing cracks in accordance with the requirements of C&MS 423 Cracksealing, Type IV.

12.1.1 Full-Depth Rigid Pavement for OH-10 and Sidestreets

New rigid pavement for the Project including all crossing streets and all interchange ramps with Interstate 77 shall consist of:

Thickness (Inches)	C&MS	Description
10	451	Reinforced Concrete Pavement, Class QC1 with QC/QA
6	304	Aggregate Base

(Note: Shoulder composition shall be the same as mainline pavement.)

12.1.2 Full Depth Flexible Pavement for OH-10

New flexible pavement for OH-10 including all interchange ramps with Interstate 77 shall consist of:

Thickness (Inches)	C&MS	Description
1.5	442	Asphalt Concrete Surface Course, 12.5MM, Type A (448), PG70-22M
	407	Non-Tracking Tack Coat
1.75	442	Asphalt Concrete Intermediate Course, 19MM, Type A (448)
8.75	302	Asphalt Concrete Base, PG64-22
6	304	Aggregate Base

(Note: Shoulder composition shall be the same as mainline pavement.)

12.1.3 Full Depth Flexible Pavement for Sidestreets

For all collector and arterial streets beyond OH-10 as described above that will be constructed as part of this project the DBT shall provide the following minimum compositions.

For streets with ADTT less than 1500 vehicles per day:

Thickness (Inches)	C&MS	Description
1.25	441	Asphalt Concrete Surface Course, Type 1 (448), PG70-22M
	407	Non-Tracking Tack Coat
1.75	441	Asphalt Concrete Intermediate Course, Type 2 (448), PG64-22
9	301	Asphalt Concrete Base, PG64-22
6	304	Aggregate Base

For Local streets the surface course above may be replaced with 1.25 inches of Item 441 – Asphalt Concrete Surface Course, Type 1 (448), PG64-22. For sidestreets with ADTT greater than 1500 vehicles per day use the flexible pavement buildup prescribed above for OH-10 Section 12.1.2 (Full Depth Flexible Pavement for OH-10). Six percent Average Daily Truck Traffic shall be used for pavement design purposes.

12.1.4 Resurfacing

For roadways utilized as detour routes that are to be resurfaced, roadways to be resurfaced as identified in Appendix PA-01 (Pavement Limits), and Maurice Avenue and Belford Avenue the following minimum compositions shall be provided dependent upon roadway classification. On all resurfacings, the DBT shall assume 10% of the planed surface area will require partial depth pavement repairs and 5% of the planed surface area will require full depth pavement repairs per the applicable specifications.

For Interstates and interchange ramps the following resurfacing build up shall be applied:

Thickness (Inches)	C&MS	Description
1.5	442	Asphalt Concrete Surface Course, 12.5MM, Type A (448), PG70-22M
	407	Non-Tracking Tack Coat
1.75	442	Asphalt Concrete Intermediate Course, 19MM, Type A (448)
	407	Non-Tracking Tack Coat
	250	Pavement Repairs (C&MS 251, 252 or 253)
3.25	254	Pavement Planing

For the I-90 Westbound lane reconfiguration, the I-90 Westbound entrance ramp from Prospect Avenue, the mainline I-90 Westbound, the E. 21st Street Entrance Ramp, and the Southbound I-77 exit ramp, the following resurfacing build up shall be applied:

Thickness (Inches)	C&MS	Description
1.5	441	Asphalt Concrete Surface Course, 12.5MM, Type A (446), PG76-22M
	407	Non-Tracking Tack Coat
1.5	254	Pavement Planing

For Arterial, Collector and non-local roadways the following resurfacing build up shall be applied:

Thickness (Inches)	C&MS	Description
1.25	441	Asphalt Concrete Surface Course, Type 1 (448), PG70-22
	407	Non-Tracking Tack Coat
1.75	441	Asphalt Concrete Intermediate Course, Type 2 (448), PG64-22
	407	Non-Tracking Tack Coat
	250	Pavement Repairs (C&MS 251, 252 or 253)
3	254	Pavement Planing

For local roads the following buildup shall be applied:

Thickness (Inches)	C&MS	Description
1.25	441	Asphalt Concrete Surface Course, Type 1 (448), PG64-22
	407	Non-Tracking Tack Coat
1	441	Asphalt Concrete Intermediate Course, Type 1 (448), PG64-22
	407	Non-Tracking Tack Coat
	250	Pavement Repairs (C&MS 251, 252 or 253)
2.25	254	Pavement Planing

12.1.5 Shared-Use Paths

For shared-use paths, the DBT shall provide the following minimum composition.

Thickness (Inches)	C&MS	Description
1.25	441	Asphalt Concrete Surface Course, Type 1, (448), PG 64-22
	407	Non-Tracking Tack Coat
1.75	441	Asphalt Concrete Intermediate Course, Type 2, (448), PG 64-22
8	304	Aggregate Base

12.1.6 Sidewalks (Concrete)

For sidewalks, the DBT shall provide the following minimum compositions.

Along local streets the following shall apply.

Thickness (Inches)	C&MS	Description
4 (sidewalks)	608	Concrete Walk
2	703.10	Crushed Stone Compacted Screenings Bed

Along arterial and collector streets the following shall apply.

Thickness (Inches)	C&MS	Description
6 (sidewalks)	608	Concrete Walk
2	703.10	Crushed Stone Compacted Screenings Bed

12.1.7 Driveways

For commercial drives the DBT shall provide one of the following compositions. Driveway pavement type shall match that of existing abutting driveway. All drive aprons, including sidewalk crossings, shall be concrete.

Thickness (Inches)	C&MS	Description
1.25	441	Asphalt Concrete Surface Course, Type 1, (448), PG64-22
	407	Non-Tracking Tack Coat
1.75	441	Asphalt Concrete Intermediate Course, Type 2, (448), PG64-22
8	304	Aggregate Base

Thickness (Inches)	C&MS	Description
8	452	Non-Reinforced Concrete Pavement, Class QC1

For residential drives the DBT shall provide one of the following compositions. Driveway pavement type shall match the existing abutting driveway. All aprons shall be concrete.

Thickness (Inches)	C&MS	Description
1.25	441	Asphalt Concrete Surface Course, Type 1, (448), PG64-22 (Driveways)
	407	Non-Tracking Tack Coat
3.5	301	Asphalt Concrete Base, PG64-22

Thickness (Inches)	C&MS	Description
6	452	Non-Reinforced Concrete Pavement, Class QC1

12.1.8 Post Construction BMP Access Drives

The access drives to post construction BMPs the DBT shall provide a driveway with the following composition. The driveway apron shall be concrete conforming to the commercial requirements included above.

Thickness (Inches)	C&MS	Description
8	304	Aggregate Base

12.1.9 City of Cleveland Bus Pads

The DBT shall install Bus Pads conforming to City of Cleveland Standard Construction Drawing BP-1 (4-8-08) with a minimum length of 120 feet at Project bus stop locations. If rigid pavement is utilized by the DBT adjacent to the bus stop the requirement for a bus pad may be waved at that location. The following locations have been identified as bus stop locations on the project:

A. E.55th Street northbound at GCRTA E.55th Rapid Transit Station
B. Kinsman Road southbound at OH-10

C. Kinsman Road northbound at OH-10
D. E.79th Street southbound at OH-10
E. E.79th Street northbound at OH-10

Adjacent to bus pads the DBT shall install sidewalk per 12.1.6 within tree lawn areas, if present, so access between the sidewalk and bus pad are ADA accessible. The DBT shall coordinate the locations of the sidewalk with GCRTA.

12.1.10 Parking Lots

The pavement buildup for parking lots is as shown below; see LD-08 (Site Specific Requirements) for more information on locations of parking lot work:

12.1.10.1 Flexible Pavement

Thickness (Inches)	C&MS	Description
1.5	448	Asphalt Concrete Surface Course, Type 1, PG 64-22
	407	Non-Tracking Tack Coat
6	301	Asphalt Concrete Base
6	304	Aggregate Base

12.1.10.2 Rigid Pavement

Thickness (Inches)	C&MS	Description
8	452	Non-Reinforced Concrete Pavement, Class QC1
6	304	Aggregate Base

12.1.11 Curbs

The DBT shall use Type 2A curb or Type 6 curb for all concrete pavements.

The DBT shall use Type 2B curb or Type 6 curb for all composite pavements.

The DBT shall use Type 6 curb for all other locations.

12.2 PAVEMENT NOTES

12.2.1 C&MS 204 Granular Material and 304 Aggregate Base

All aggregate base shall be crushed carbonate stone or crushed gravel. Granular Material and Aggregate Base shall contain no slag of any kind.

12.2.2 C&MS 441 Asphalt Concrete

Asphalt concrete shall comply with C&MS 441 unless otherwise specified in the Contract.

Recycled material shall be limited to wearing course maximum of 10%, unless otherwise specified in the Contract.

12.2.3 C&MS 441 – Asphalt Concrete Surface Course, Type 1, (448), PG64-22

The use of gravel is not permitted for this item. RAP used in this mix shall be limited to a maximum of 10%.

12.2.4 C&MS 441 – Asphalt Concrete Surface Course, Type 1, (448), PG70-22M

The coarse virgin aggregate for this item shall consist of a blend of 60% minimum air cooled blast furnace slag (ACBFS) or Trap Rock from Ontario with limestone comprising the remaining percentage.

12.2.5 C&MS 442 – Asphalt Concrete Surface Course, 12.5MM, Type A (448), PG70-22M

The coarse virgin aggregate for this item shall be limited to a blend of air-cooled blast furnace (ACBFS) or Trap Rock from Ontario and limestone. The contractor shall use a minimum 60% of ACBFS or Trap Rock from Ontario, with limestone comprising the remaining percentage. At least 50% of fine virgin aggregate for this item shall be limited to ACBFS or Trap Rock from Ontario.

Table 442.02-2 applies except No. 4 sieve requirements are 52 to 62 Total Percent Passing.

When ACBFS is used for a fraction of the coarse aggregate, all requirements of C&MS 442 apply, except provide a total asphalt binder content greater than or equal to 6.2 percent. If ACBFS makes up 100% of the coarse aggregate, the binder requirements of C&MS 442 apply.

12.2.6 Asphalt Concrete Surface Course Sealing Requirements

The DBT shall seal all gutters and locations mentioned below per the governing regulations with a certified PG Binder per C&MS 702.01. The sealant shall be applied at a uniform rate and uniform width of 3 inches, without excess material left on the surface. The sealant shall be applied at a temperature between 300 and 350 degrees Fahrenheit immediately upon completion of the surface course.

In addition to gutter sealing the DBT shall seal all castings within pavement including monuments, manholes, valves, catch basins and curb inlets. The DBT shall also seal all butt and feather joints, and the perimeter of all pavement repairs or other pavement inlays when pavement repairs /inlays are not overlaid with an asphalt concrete surface course.

12.2.7 Planed Surfaces

The DBT shall schedule their operations such that the proposed asphalt intermediate course is placed within seven (7) calendar days of pavement planing on interstate, arterial and collector roads and within fourteen (14) calendar days on local roads.

12.2.8 Concrete Design Mix (Cleveland 650)

All cast-in-place concrete for the project not associated with structures shall be provided in accordance with the C&MS, except the minimum cement content of the mix shall be 650 lbs. per cubic yard.

12.2.9 C&MS Item 451 –Reinforced Concrete Pavement

All reinforced concrete pavement shall follow the City of Cleveland Standard Drawing, CONC 1, located in Appendix LD-03 (City of Cleveland Standard Construction Drawings).

12.2.10 Contraction Joints in Concrete Pavement or Base Widening

Where new concrete is placed adjacent to existing concrete, provide contraction joints in the new concrete to form continuous joints with those in the existing concrete.

Multiple joints with equal intervals shall be placed when joint spacing in existing concrete exceeds the maximum joint spacing.

12.2.11 Supplemental Specification 875

All longitudinal cold joints in flexible pavements shall receive hot applied asphaltic joint adhesive per Supplemental Specification 875.

12.2.12 C&MS 608 Concrete Sidewalk

All sidewalks shall conform to the following:

Per 608.03(C), it is required that ½ inch thick expansion joint material (C&MS 703.05) is installed between the walk and the back of curb or any other fixed object. In addition to the locations specified under C&MS 608.03(C), transverse expansion joints shall be constructed at intervals of not more than 25 to 30 feet unless otherwise directed. The expansion joint filler C&MS 705.03 shall be placed at the transverse expansion joints for the full depth/width of the concrete walk and shall be truly normal to grade. The top ½ inch of the expansion joint placed between the walk and back of curb shall be sealed with C&MS 705.04 joint sealer.

Final surface finish of walks shall be in accordance with applicable municipal standards/ordinances.

12.2.13 C&MS 608 Curb Ramps

All curb ramps provided by the DBT shall meet all ADA requirements and the following:

- Truncated dome tiles tinted red as manufactured by Engineered Plastics, Inc., Truncated Dome Tactile Systems as manufactured by ADA Solutions Inc., or Approved equal shall be installed at all curb ramps.
- Curb ramps shall conform to the City of Cleveland Curb Ramps Standard Drawings.
- Thickness of the curb ramp walk and concrete base beneath the truncated domes shall be a minimum of 2 inches thicker than the adjacent sidewalk. In addition, a 2 inch compacted screenings bed that meets the requirements of C&MS 703.10 (limited to crushed stone) shall be furnished and placed beneath all curb ramp areas.

The DBT shall provide curb ramps at the following locations:

- Signalized intersections – on all approaches
- Unsignalized intersections – at continuation of sidewalk and multiuse path crossing of local roadway intersections (i.e., no unsignalized pedestrian crossings of OH-10 or other arterial roadways)

12.2.14 C&MS 442 - Asphalt Concrete Surface Course, 12.5MM, Type A (446),PG76-22M

The coarse virgin aggregate and at least 50% of fine virgin aggregate for this item shall be limited to air cooled blast furnace slag (ACBFS).

Table 442.02-2 applies except No. 4 sieve requirements are 52 to 62 Total Percent Passing.

12.3 DELIVERABLES

Not applicable.

13 ROADWAY

The DBT shall design and construct all roadways, parking lots, and associated roadway items including earthwork, pavements, curbs, pedestrian facilities, medians, islands, barriers, fence, incidentals and other roadside items. This Section 13 describes the roadway and parking lot requirements for the Project, including the governing regulations and Project-specific requirements. This Section 13 also defines the approximate Project Limits and Work Limits as well as the limits for removal of existing roadways and structures.

13.1 GOVERNING REGULATIONS

The governing regulations for Department and local facilities are indicated in Section 13.1.1 (Department and Local Facilities). The DBT has the ability to modify the design of the Project with regard to adjustments to the physical design and/or function within the limitations provided in Section 1.5 (Basic Configuration). Table 13-1 indicates changes to the Department *Location and Design Manual (L&D)*, Volume 1 that govern this Project.

Table 13-1: Location and Design, Volume 1 Revisions

Section	Subject	Revised Language
105.1	Design Exceptions	The designer ~~should~~ ***shall*** call attention to any substandard design feature as soon as possible…
105.1	General	Other design values, policies, practices, etc. that are mentioned in this Manual are guidelines intended to promote uniformity and good design. Deviation from these guidelines does not require a formal design exception; however it ~~may still~~ ***shall*** be necessary ~~to justify or otherwise seek~~ ***to receive*** approval from ODOT of the proposed design when deviations are necessary.
201.3	Intersection Sight Distance	If intersections sight distance cannot be provided due to environmental or right-of-way constraints, then as a minimum, the stopping sight distance for vehicles on the major road ~~should~~ ***shall*** be provided.
201.3.1.1	Intersection Sight Distance	In making this determination, it ~~should~~ ***shall*** be assumed that the driver's eye is 3.5 ft. above the roadway surface and the object to be seen is 3.5 ft. above the surface of the roadway.
201.5	Decision Sight Distance (DSD)	The following are examples of locations where decision sight distance ~~should~~ ***shall*** be provided:
301.1.3	Traveled Way Widening on Highway Curves	Additional widening ~~may be necessary~~ ***shall be provided*** on curves depending on the design speed, curvature and traveled way width. The Traveled Way Widening values in ***Figure 301-5c***

Section	Subject	Revised Language
		are based on the WB-62 [WB-19] vehicle, and are applicable to either one-way or two-way, two-lane traveled ways, and other similar type facilities. A WB-62 [WB-19] design vehicle is to be used on state maintained roadways. The design vehicle for other than state maintained roadways shall be determined by the maintaining authority. Note that widening less than 2.0 ft. is not required. Curve widening ~~should~~ ***shall*** be placed on the inside edge of the curve. Where spirals are used, the widening ~~should~~ ***shall*** begin at the TS and reach maximum width at the SC. On alignments without spirals, the widening ~~should~~ ***shall*** be developed over the same distance as the superelevation transition. See ***Section 202.4*** and ***Figure 301-5a***. The transition ends ~~should~~ ***shall*** be rounded to avoid an angular break at the travel way edge and intermediate points ~~should~~ ***shall*** be widened proportionately. The longitudinal center joint and the centerline marking ~~should~~ ***shall*** be placed equidistant from the traveled way edges.
301.1.4	Pavement Transitions/Taper Rates	Where traveled way widths decrease, the length of transition ~~should~~ ***shall*** be calculated using the following:
301.2.3.1	Right Turn Lane Shoulder Width	The normal mainline shoulder width ~~should~~ ***shall*** still be maintained in advance of the diverging taper for the turn lane. The transition between the mainline shoulder width and the reduced shoulder width ~~should~~ ***shall*** take place during the span of the right turn taper.
301.2.3.2	Shoulder Taper Rate	A 25:1 taper ~~should~~ ***shall*** be used to transition to a reduced shoulder width.
301.2.5	Lateral Clearance	As a minimum, the designer ~~should~~ ***shall*** provide a shy line offset of at least 4 ft.
305.3.2	Position of Curb – Urban and Rural High Speed Areas	When it is necessary to use curbs on roads where the design speed is 50 mph or greater, they ~~should~~ ***shall*** not be closer to the traffic than 4 ft. or the edge of the treated shoulder, whichever is greater and their height ~~should~~ **shall** not exceed 4 inches.

Section	Subject	Revised Language
305.4.2	Curbed to Uncurbed Transitions	When an urban type section with curbs at the edge of traveled way changes to a rural type section without curbs, the curb ~~should~~ ***shall*** be transitioned laterally at a 4:1 (longitudinal: lateral) rate to the outside edge of the treated shoulder or 3 ft., whichever is greater.
305.4.3	Curbed Approach to Uncurbed Mainline	When a curbed side road intersects a mainline that is not curbed, the curb ~~should~~ ***shall*** be terminated no closer to the mainline edge of traveled way than 8 ft. or the edge of the treated shoulder, whichever is greater.
306.2.5	Sidewalk – Grade and Cross Slope	Sidewalks ~~should~~ ***shall*** be constructed with a maximum cross slope of 2 percent.
306.3.4	Curb Ramp Types	In all cases curb ramps ~~should~~ ***shall*** be located entirely within the marked crosswalks (where they exist).
306.3.4	Curb Ramp Types	Drainage grates or inlets ~~should~~ ***shall*** not be located within the crosswalk area, where wheelchair casters or canes tips may be caught.
306.3.5	Detectable Warnings	Detectable warnings ~~should~~ ***shall*** be used at the following locations:
307.5.1	Interchange Grading – Cross Roads	At a road crossing within an interchange area, bridge spill-through slopes ~~should~~ ***shall*** be 2:1, unless otherwise required by structure design. They ~~should~~ ***shall*** be flattened to 3:1 or flatter in each corner cone and maintained at 3:1 or flatter if within the interior of an interchange. Elsewhere in interchange interiors, fill slopes ~~should~~ ***shall*** not exceed 3:1.
307.5.2	Interchange Grading – Ramps	Roadside design for ramps ~~should~~ ***shall*** be based on the mainline grading concept.
307.5.3	Gore Area	Gore areas of trumpets, diamonds and exteriors of loops adjacent to the exit point ~~should~~ ***shall*** be graded to obtain slopes (6:1 or flatter) which will not endanger a vehicle which is unable to negotiate the curvature because of excessive speed.
401.1	Intersection Locations	The alignment and grade on the mainline roadway ~~should~~ ***shall***, as a minimum, provide stopping sight distance as discussed in ***Section 201.2.***

Section	Subject	Revised Language
401.4.1	Intersection Area	The pavement surface within this "intersection area" ~~should~~ ***shall*** be visible to drivers within the limits of the minimum stopping sight distance shown on ***Figure 201-1***.
401.4.1	Intersection Area	For this reason, edge of traveled way profiles ~~should~~ ***shall*** be plotted and graphically graded to provide a smooth profile.
401.4.3	Profile at Stop Intersections	If these grade breaks are exceeded, they ~~should~~ ***shall*** be treated according to Note 3 on ***Figure 401-3.***
401.5.2	Approach Radii	Radii of 40 ft. or more, three centered compound curves or simple curves with tapers to fit truck paths ~~should~~ ***shall*** be provided at intersection used frequently by buses or large trucks.
401.6.3	Right Turn Lanes	Additional lane width ~~should~~ ***shall*** be provided when the right turn lane is adjacent to a curb.
505.1.3	Inside Merges	For the above reasons, inside merges are ~~not desireable~~ ***prohibited***.
502.2.2	Approaches to the Structure – Sight Distance	Sight distance on the roadways through an interchange ~~should~~ ***shall*** be at a minimum the required stopping sight distance and preferably should be Decision Sight Distance ***(Figure 201-6)***, particularly along entrances and exits.
503.6.4	Superelevation at Terminals	Superelevation at ramp terminals ~~should~~ ***shall*** be developed using the following guidelines:
600.2.3	Operational Offsets of Urban Streets	A minimum operational offset of 1.5 feet ~~should~~ ***shall*** always be provided from the face of curb (3 feet at intersections) to accommodate turning trucks and improve sight distance.
601.1.1 (1.)	Obstacles	At bridges, piers and abutments. ***The ends of bridge/approach slab parapets and pylons located behind curb at a distance of 8 feet or greater, as measured from the face of curb to the roadway side face of the parapet, may be omitted as a warranting feature in determining if barrier protection is needed. Parapets and pylons with offsets less than 8 feet shall be considered a warranting feature and protection shall be added.***

Section	Subject	Revised Language
601.1.2	Roadside Barrier Warrants – Slopes	***Figure 601-1*** ~~should~~ ***shall*** be used to determine roadside barrier warrants for embankments.
602.1.1	Roadside protection – Location/Offset	Although variations from these offsets may occur as a result of reduced graded shoulder width, the face of guardrail ~~should~~ ***shall*** not be located closer than 4 ft. to the edge of the traveled lane.
602.1.5	Guardrail with Curbs	If guardrail is warranted and curbs are present, then the face of Type MGS guardrail ~~should~~ ***shall*** be located within 6 inches behind the face of curb. Because of the vehicle vaulting potential, if the guardrail cannot be placed as described above, then the guardrail ~~should~~ ***shall*** be installed well behind the curb to allow the vehicle suspension to return to a normal state as shown in the following table.
602.1.5.1	Guardrail with Curb (High Speed)	The curb height ~~should~~ ***shall*** be limited to 4 inches or less when used in conjunction with guardrail on high speed roadways.
603.1.2	Semi Rigid Barriers	For guardrail installations to perform properly during an impact, adequate soil support must be provided for the posts in the guardrail run. To ensure this support is provided, longer posts ~~should~~ ***shall*** be specified at locations where the distance behind the post to the breakpoint is less than one foot. These locations ~~should~~ ***shall*** be specifically identified in the plans.
603.1.4	Rigid Concrete Barrier	At locations where a standard barrier cannot be installed, the face of fixed objects within the clear zone ~~should~~ ***shall*** be designed with the concrete barrier shape.
702.2.1	Width and Clearance	At a minimum, a 2 foot graded area with a maximum slope of 6:1 ~~should~~ ***shall*** be provided for clearance from lateral obstructions such as bushes, large rocks, bridge piers, abutments, and poles.
702.2.5	Cross Slope	Shared use paths ~~should~~ ***shall*** have a maximum cross slope of 2 percent, to accommodate people with disabilities.
702.2.8	Surface Structures	Utility covers and bicycle compatible grates ~~should~~ ***shall*** be flush with the surface of the pavement on all sides.

Section	Subject	Revised Language
702.3	Shared Use Path Intersection Design	Curb ramps with detectable warnings ~~should~~ ***shall*** be provided at intersections. The curb ramps and detectable warnings ~~should~~ ***shall*** extend the full width of the shared use path.
802.2.9	Location of High Volume Drives	A new driveway ~~should~~ ***shall*** not be located where it will create an offset intersection opposite an existing street, highway, or major commercial driveway.

13.1.1 Department and Local Facilities

In the event of a conflict among the standards listed in Section 1.10 (Governing Regulations) related to roadways, the Department's standards shall take precedence.

13.2 PROJECT REQUIREMENTS

13.2.1 Work Limits and Project Limits

Project Limits define the minimum limits of full-depth pavement replacement or new pavement, as applicable. Work Limits define the minimum limits of the DBT's responsibility, encompassing the Project Limits and including all temporary and incidental construction, except temporary traffic control devices. Pavement limits represent the Project Limits plus the areas of resurfacing, excluding alternate and detour routes which are the DBT's responsibility. See Appendix PA-01 (Pavement Limits) for a plan view of the Pavement Limits which delineates the minimum full-depth pavement limits, widening and resurfacing limits and resurfacing only limits to be completed by the DBT. The DBT shall construct all roadways in accordance with Section 12 (Pavements) and in accordance with Appendix PA-01 (Pavement Limits).

13.2.2 Maurice Avenue and Belford Avenue

In addition to the required work in 13.2.1 Maurice Avenue and Belford Avenue from E.55th Street to E.61st Street shall be resurfaced by the DBT per Section 12 (Pavements). Sidewalk, curb ramp and curb removal and replacement will also be required on both streets. The limits of these removal and replacements shall be as directed by the Department. All removals shall be per C&MS 202. New walk, curb ramps and curb shall be per Section 12 (Pavements). The DBT shall assume and include 5000 sq. ft. of sidewalk removal and subsequent replacement with new sidewalk on each street. The DBT shall also assume 1000 feet of curb removal and subsequent replacement with new curb, as well as a quantity of 4 each for curb ramp removals and subsequent replacements on each street. Any linear grading, seeding and other restoration work that results from the above work shall be considered incidental to the removal and replacement work and no separate payment will be made.

13.2.3 Curb Return Radii

The curb return radii at intersecting roadways shall accommodate a WB-62 design vehicle from the approach curb lane to the receiving roadway without impeding on opposing traffic movements except as noted below:

A. Kinsman Road/East 69th Street – SU-30

B. Lisbon Road/Grand Avenue Connector - SU-30

C. Lisbon Road/Buckeye Road - SU-30

D. Grand Avenue/Buckeye Road - SU-30

E. OH-10/Kennedy Avenue/East 89th Street – WB-62 shall be accommodated but may impede on opposing traffic movements

F. Buckeye Road/East 89th Street – WB-62 shall be accommodated but may impede on opposing traffic movements at the northeast, northwest, and southeast quadrants. The southwest quadrant shall accommodate WB-62 without impeding on opposing traffic movements.

13.2.4 Dead-End Turnarounds

The DBT shall construct Branch Type Dead-End Turnarounds on the following streets adjacent where OH-10 crosses the existing street which shall not be continued to OH-10:

Berwick Road (south of OH-10)
East 73rd Street (south of OH-10)

The turnaround shall accommodate an SU-30 design vehicle making only one reverse movement. The turnaround shall have its perimeter completely curbed and the pavement buildup shall be per Section 12.1.3 (Full Depth Flexible Pavement for Sidestreets). The DBT shall maintain positive drainage within and in the vicinity of the turnaround area. The DBT shall provide all necessary drainage infrastructure so that drainage is conveyed to the existing or proposed drainage systems available within public right-of-way. Existing sidewalks shall be replaced with proposed sidewalks along the proposed turnaround and shall extend and connect to the proposed pedestrian facilities along OH-10.

Beyond the roadways listed above other existing roadways which cross OH-10's footprint are to be left unconnected to OH-10 and remain as no outlet streets. The limit of such streets to remain shall allow local access to any driveways which utilize that roadway and shall allow maintenance access to all sewer manholes on active sewers to remain within the right of way and other utility facilities to remain. See Appendix LD-10 (Removals Exhibit) for pavement removal limits and Appendix PA-01 (Pavement Limits) for pavement and sidewalk work near these no outlet streets. The drainage requirements above also apply to these locations. The pavement terminus of each road shall be clearly delineated per OMUTCD and applicable curbing and or barriers shall be installed by the DBT. The following locations are to be left unconnected to OH-10:

G. East 64th Street (north of Butler Avenue)
H. Colfax Road (west of East 69th Street)
I. East 71st Place

J. East 73rd Street (north of OH-10)
K. Tennyson Road
L. 89th Street (south of Fredrick Avenue)

13.2.5 Woodland Avenue Pedestrian Island

At the northeast quadrant of the Woodland Avenue/OH-10 intersection The DBT shall construct a pedestrian "pork chop" island to create a turning roadway between OH-10 and Woodland Avenue and also create two stage pedestrian crossings across both OH-10 (northeast quadrant to northwest quadrant) and Woodland Avenue (northeast quadrant to southeast quadrant). The island shall be bounded by the outer northbound thru lane of OH-10, the outer westbound thru lane of Woodland Avenue and the turning roadway connection between those two lanes. The island shall be ADA compliant and contain both pedestrian signals and actuation. The island shall be raised and the perimeter shall be curbed. All pavement and curb for the island shall be concrete.

13.2.6 Removal of Existing Roadway and Appurtenances

The DBT shall remove all existing objects and obstructions within the Work Limits necessary to construct the Project per C&MS 202, including existing pavement and sidewalk, curb and gutter, unused pavement and unused sidewalk, steps, drainage facilities, soil, road barriers, walls, railings, fencing, and signs. The DBT shall remove unused pavement and sidewalk on existing facilities, and pavement for detour routes that are not part of the final pavement or sidewalk configuration of the Project. The DBT shall remove all existing objects and obstructions down to a minimum of 2 feet below the existing surrounding ground elevation or to the elevation necessary to construct the Work, whichever is greater. The DBT shall remove all embankment material associated with unused pavements to match the surrounding areas. In removal areas abutting existing facilities to remain removals shall be completed in a manner that creates a neat edge per C&MS 202 and does not damage or compromise the portions of items to remain. Negligence on the part of the DBT as determined by the Department that results in damage to existing items to remain shall be repaired or replaced by the DBT to the satisfaction of the Department at the cost of the DBT. Appendix LD-10 (Removals Exhibit) shows minimum limits of pavement and sidewalk removal within the existing right-of-way the DBT is responsible for. Any changes to the alignment, profile or configuration of project elements, which results in removals beyond what are shown in Appendix LD-10 (Removals Exhibit), shall also be the responsibility of the DBT. See Section 13.2.7 (Site Specific Requirements) for additional removal requirements of the DBT. In addition, the DBT shall, throughout the duration of the project, perform roadside clean up in accordance with C&MS 656.01 and 656.05 and perform routine mowing in accordance with C&MS 659.19 within permanent and temporary right of ways to maintain the project in a presentable condition.

The following exceptions apply to the previous requirements in this Section 13.2.6. In the case of existing roadways and appurtenances that will no longer be utilized after completion of this Project, affected roadway pavements and appurtenances shall be removed leaving no visible evidence of their previous existence beyond existing tie-in points. In areas of roadway removal, this shall include pavement and base course removal; fill as necessary, at least 4 inches of topsoil, and seeding. The DBT shall grade areas to drain and not create new ponding areas. Removal of existing tie-ins shall include

design and construction of pavement, walk, curb, guardrail, and potential drainage elements as necessary to restore the site to a continuous, consistent facility.

13.2.7 Site Specific Requirements

The DBT shall perform site specific work requirements in accordance with Appendix LD-08 (Site Specific Requirements). The intent of the requirements is to detail specific major tasks and parties responsible for those tasks at each site. The requirements do not constitute an all-inclusive list of all work to be performed in the execution of the contract.

Site clearing shall be performed per C&MS 201 and as specified in Appendix LD-08 (Site Specific Requirements) and in the following Sections 13.2.7.1 (Total Site Clearing) and 13.2.7.2 (Partial Site Clearing). Section 11.3 (Demolition) includes additional requirements for site clearing where existing structures shall be demolished. Site clearing on all parcels within permanent and temporary easement limits shall be defined as follows:

13.2.7.1 Total Site Clearing

Where indicated in Appendix LD-08 (Site Specific Requirements), Total Site Clearing shall require removal from the parcel all site improvements, including but not limited to building and foundation remnants; walls and fencing; drives, walks, and other pavement; and utilities.

Historic mapping identifying previous buildings is found here: http://peoplemaps.esri.com/cleveland/.

Portions of building foundation systems, site utilities, and other site improvements may still be present and could be impacted by the DBT's work, and therefore shall be considered in the DBT's Price Proposal. The Department will not provide separate payment for removal of these items, unless they involve regulated materials.

The DBT shall also remove all trees, shrubs, plants, brush, undergrowth, stumps, and other vegetation as part of clearing and grubbing. The removal and proper disposal of debris, rubbish, and other abandoned personal property found within buildings or on the parcel within permanent easement limits shall be the responsibility of the DBT and shall be compensated in accordance with Section 6.

The DBT shall restore the parcel to a bare grass lot in mowable condition with topsoil and seeding to facilitate ODOT maintenance.

13.2.7.2 Partial Site Clearing

Where Appendix LD-08 (Site Specific Requirements) indicates Partial Site Clearing, the Total Site Clearing requirements shall apply to the parcel with the following exceptions:

A. Outside the limits of proposed work, the DBT shall remove all dead or dying trees and limbs; all shrubs, plants, brush, undergrowth, and stumps.

B. Outside the limits of proposed work, the DBT shall salvage living trees 6-inch and larger.

C. Within temporary easements, the DBT shall avoid impact to any items indicated not to be disturbed by the DBT in Appendix LD-08 (Site Specific Requirements).

The DBT shall restore the parcel to a mowable condition with topsoil and seeding to facilitate ODOT maintenance.

13.2.8 Access Drives to BMPs

The DBT shall provide an access drive(s) to all BMPs constructed as part of this project. In addition to the governing regulations of this section the drive(s) shall be in accordance with the following requirements:

A. Drive width shall be at least 15 feet
B. Grade shall not exceed 8 percent
C. Pavement shall be in accordance with Section 12 (Pavements)

13.2.9 Trench Backfilling

Unless otherwise specified, all backfilling of trenches within pavement limits, with the exception of underdrains, shall be backfilled to the top of the trench or bottom of subgrade, whichever is lower, with Low Strength Mortar (LSM) per City of Cleveland specifications. LSM shall consist of the following proportions per cubic yard:

Cement (ASTM C-150, Type 1): 50 LBS

Sand (Per C&MS 703.03, SSD): 2475 LBS

Water: 25 Gallons

Admixture (Air): 3 OZ.

Approved Admixtures: Master Builders-Rheofill, Axim-Flow Air, W.R. Grace-Darafill (An equal may be used only with Department Approval)

Use of fly ash, spent foundry sand or core sand is strictly prohibited.

All trenches in pavement areas shall be backfilled by the DBT to the intended travel surface using temporary pavements per Section 20 (Maintenance of Traffic) and or permanent pavements per Section 12 (Pavements). Temporary pavements are only permitted in areas that will be replaced with full depth pavement or resurfaced by the DBT with this project after the trench is opened. The depth of temporary pavement in resurfacing areas shall be limited to 3 inches below the existing surface. Pavement below this depth shall conform to the requirements for permanent pavements.

13.2.10 Driveways

The DBT shall design and construct driveways in accordance with L&D, Volume 1 for drives that enter/exit Department facilities. The more restrictive requirements of L&D, Volume 1 or City of Cleveland regulations shall govern drives that enter/exit City of Cleveland facilities. The DBT shall reconstruct all driveways impacted by the Project.

13.2.11 Providing Electronic Instrumentation

The DBT shall provide The Department with electronic instrumentation per C&MS 623.09 including all equipment, software, training, technical assistance and three dimensional models. Two sets of field equipment including receivers and data collectors shall be provided.

13.2.12 Fence

The DBT shall replace all right-of-way fencing along limited access highways disturbed within the project work limits per the governing regulations.

The DBT shall construct right of way fencing in accordance with Norfolk Southern standards as indicated in Appendix LD-08 (Site Specific Requirements) to secure the NS corridor.

The DBT shall remove the existing retaining wall railing and parapet from the E. 89th Street Bridge to Frederick Avenue on the west and to the brick abandoned drive apron on the east. The DBT shall install new right-of-way fencing from the new E. 89th Street Pedestrian Bridge to Fredrick Avenue on the west and to the brick abandoned drive apron on the east. The fencing shall be located immediately adjacent to the walls.

See Appendix LD-08 (Site Specific Requirements) for additional fencing requirements of the DBT.

13.2.13 Quadrant Roadway Infield

When not adjacent to bridge abutment or retaining walls, a maximum allowable slope of 6:1 shall be utilized in the infield between OH-10, E. 55th Street, and the Quadrant Roadway. Excluding sidewalks, drainage swales, and other required elements, the infield area shall be uniformly graded between roadways. The DBT shall not use the infield area for wasting of materials.

13.3 SEEDING

The DBT shall seed all disturbed areas that are not paved or otherwise covered in non-erodible surface, in accordance with C&MS Item 659, and as specified below, except for areas identified for specific aesthetic treatments in Appendix AE-02 (Enhancement Plans) and below. For slopes 3:1 or steeper (H:V), the DBT shall provide slope erosion protection in accordance with C&MS 670.

The DBT shall place a minimum of 4 inches of topsoil prior to seeding operations. Class I seed shall be used except in locations where side slopes are 3:1 or steeper, where Class 3B shall be used. Soil analysis testing, water, lime, commercial fertilizer, repair seeding and mulching, inter-seeding, and mowing shall be provided to promote the growth and care of permanent seeded areas.

The DBT shall install sidewalk per section 12.1.6 from the back of curb to the face of abutment/retaining wall on the outsides of the road and from back of curb to back of curb in median areas where OH-10 passes under the proposed structures at E.55th Street and Norfolk Southern. No seeded area shall be placed under the bridges.

13.4 DELIVERABLES

Not applicable.

14 DRAINAGE

The DBT shall design and construct drainage and storm water management facilities and systems, including catch basins, inlets, manholes, conduit, culverts, underdrains, ditches, outfalls, storm water best management practices (BMPs), and associated items for the project drainage area as defined in Section 14.2 (Requirements), below. The storm sewer system shall be designed to convey storm water only as a system separate from the sanitary sewer system.

14.1 GOVERNING REGULATIONS

The drainage design for the mainline and side roads shall follow the Location and Design Manual, Volume 2, Drainage Design, and the Pavement Design Manual, current revisions, except as noted in Tables 14-1 and 14-2, respectively. Provide all drainage calculations to the Department concurrent with the review of the associated Buildable Unit(s).

Sewer profiles shall be developed in accordance with Location and Design Manual, Volume 3, however, separate profiles shall be developed for each sewer run so that utility conflicts and separation requirements can be determined.

In the event of a conflict among the standards listed related to drainage, the Department's standards shall take precedence. For drainage components not addressed by the standards listed, other guidelines or specifications that reflect currently accepted industry practice shall be considered by the Department.

Table 14-1*: Location and Design Manual*, Volume 2 Revisions

Section	Subject	Revised Language
1007.1	**Pipe removal criteria**	Use the following guidelines to determine whether an existing pipe, regardless of type, being taken out of service shall be abandoned or removed.
1007.1.B	**Pipe removal criteria**	Pipes 10 inches through 24 inches in diameter or rise with less than 3 feet of final cover shall be removed; with more than 3 feet of final cover they may be abandoned in place.
1007.1.C	**Pipe removal criteria**	Pipes over 24 inches in diameter or rise shall be removed.
1102.1	**Open water carriers, general**	As a guideline, the relative minimum roadway ditch grades shall be 0.50% with a recommended absolute minimum of 0.25%.
1102.3.2	**Ditch protection**	A concrete lining shall be considered only as a last resort. Contact the Office of Hydraulic Engineering, before using a concrete lining.

Section	Subject	Revised Language
1102.3.4	**Catch basin types**	Standard No. 2-2-B shall be used where minor, non-clogging flows are involved such as yard sections and the small triangular area created by the guardrail treatment for a depressed median at bridge terminals. Standard No. 2-3 through No. 2-6 catch basins shall be provided where a larger base is required to accommodate pipes larger than 21 inches in span or sewer junctions, or where a No. 2-2-B catch basin will not provide adequate access to the sewer.
1103.2	**Design frequency**	Pavement catch basins shall be spaced to limit the spread of flow on the traveled lane (considered to be 11 feet wide) based on a total allowable spread of 10 feet. The 10 foot maximum allowable spread of flow on roadway and bridge pavement applies to mainline OH-10 and other roads with multiple lanes in each direction. For roadways and bridges with single lanes in each direction, the allowable spread shall be determined based on Section 1103.2 standards.
1103.5	**Flanking basins Pavement flow charts**	The above is prevalent in long flat sag vertical curves, where a flanking inlet (or catch basin) shall arbitrarily be provided on both sides of the low point in a pavement sag.
1003.5	**Pavement flow charts**	Usually a City of Cleveland Standard CB-1 catch basin will be adequate, and they ~~should~~ shall be placed where the grade elevation is approximately 0.20 feet higher than at the low point. Furnish **City of Cleveland Standard CB-3** at the sump.
1103.5	**Pavement flow charts**	Catch basins shall be placed upstream of all intersections, bridges and pedestrian ramps. When justified, catch basins shall be located a minimum of 10 feet off drive aprons, intersection return radii, pedestrian ramps or curb termini.
1103.7	**Grate catch basins and curb opening inlets in pavement sags**	The spread in the sag shall be determined from the depth of flow at the edge of grate using Figure 1103-3 and shall include the total flow (contributions from each side of the sag vertical curve) reaching the inlet or catch basin.
1103.7	**Grate catch basins and curb opening inlets in pavement sags**	City of Cleveland Standard CB-3 catch basins shall be used in pavement sags.

Section	Subject	Revised Language
1104.1	**Storm sewers, general**	With a decrease in grade of not more than 6 inches or an increase in grade of not more than 12 inches the existing structure shall be Adjusted to Grade. Where grade elevation changes are greater, the existing structure shall be Reconstructed to Grade.
1104.2.2	**Storm sewer access**	Small sewers (36 inches in diameter and less) shall be accessible at intervals not to exceed 300 feet. For sewers sized 42 inches in diameter and over manholes shall be spaced every 500 feet maximum.
1104.4.2	**Hydraulic grade line**	Starting at the storm sewer system outlet and working upstream, the elevation of the hydraulic grade line at the upper end of each sewer run shall be determined using a 25-year frequency.
1104.4.2	**Hydraulic grade line**	One directional lane of a multiple lane highway or one-half of a lane on a 2-lane highway shall be passable when the sewer system is discharging the 50-year storm.
1106.1	**End treatments, general**	Headwalls shall also be provided for Type D conduits greater than 24 inches in diameter or rise.
1112.1	**Notice of Intent (NOI)**	The NOI application shall reflect the Project and Contractor EDA for all project sites that exceed the threshold.

Table 14-2*: Pavement Design Manual*, Revisions

Section	Subject	Revised Language
205.1.1	**Pipe Underdrains**	When a pipe underdrain spans the trench of a lower conduit (utility, storm sewer, culvert, etc.) and the vertical distance between the lower conduit and the underdrain is less than or equal to 12 inches, a Type F conduit shall be used to span the lower trench.
205.1.1	**Pipe Underdrains**	A filter fabric wrap shall be used when the surrounding soil consists of a sandy or sand-silt composition
205.1.3	**Underdrain Outlets**	Underdrains which outlet to a slope **shall** be provided with an outlet per SCD DM-1.1.

Section	Subject	Revised Language
205.1.3	**Underdrain Outlets**	Underdrain outlets shall be provided at a desirable interval of 500 feet with a maximum interval of 1000 feet.
205.1.3	**Underdrain Outlets**	Underdrain outlet pipes flowing into a roadway ditch or fill slope shall maintain a minimum slope of 1%.
205.1.3	**Underdrain Outlets**	Outlets shall not be located at the top of high (over 20 feet) 2:1 fill slopes.

14.1.1 Alternate Bid

The DBT shall provide two bids.

Alternate 1 Drainage Work shall include all materials and specifications per C&MS 611.

Alternate 2 Drainage Work shall include the following modifications to C&MS 611 for all City of Cleveland maintained roadways per Table 1.1 (Design Designations and Maintaining Agencies). Drainage conduit 18-inch diameter and less shall be vitrified clay pipe, extra strength; C-700 with premium joints (C&MS 706.08 and 706.12 respectively). Drainage conduit 21-inch diameter and more shall be reinforced concrete pipe with premium joints (C&MS 706.02 and 706.11 respectively). Pipe bedding shall be per City of Cleveland standard construction drawing 146-ME. Pipe backfill under pavement shall be LSM per City of Cleveland specifications (See 13.2.9 for LSM construction and material requirements).

14.2 REQUIREMENTS

14.2.1 General Drainage Requirements

A. The DBT shall design facilities compatible with existing and proposed drainage systems in adjacent properties and shall preserve existing drainage patterns wherever possible unless directed otherwise in this section. Where drainage patterns must be changed from the existing, the DBT shall secure all permits and drainage easements.
B. Trunk sewer conduits shall be placed under roadways within the limits of pavement. Manhole castings shall be located and oriented so the lid is not within the normal wheel path of vehicles traveling in that lane.
C. In order to facilitate drainage capacity for future development along the corridor the DBT shall upon establishment of the required trunk sewer size(s) for the project increase the sewer one nominal pipe size per the sizes listed on Figure 1008-11 of the Location and Design Manual, Volume 2. The limits for trunk line upsizing shall be from approximately 130' west of Berwick Road to E. 79th Street, and from approximately 950' west of Buckeye Road to the eastern project limits near E. 93rd Street. No upsizing for future development is required between the western project limits and the Kingsbury Valley or for the area contributing to the proposed NS Cleveland Line grade separation.
D. In order to facilitate future service connections from development the DBT shall design and construct service branches to the trunk sewer. A service branch shall consist of 12" conduit

extending at a 0.5% minimum upgrade from the trunk sewer manhole invert rising to a cleanout located beyond the sidewalk near the Right-of-Way. The service branch shall be plugged at a tee and the cleanout shall be located to avoid conflicts with other facilities. The branches shall be set on both sides of the roadway and spaced so the maximum spacing between branches on each respective side of the road does not exceed 600'. The service branches shall be provided only between the Kingsbury Valley bridge at approximately 150 feet west of Berwick Road and the east project limits at the west approach to E. 93rd Street.

E. The City of Cleveland Standard CB-3 catch basin shall be used in place of the Department Standard CB-3 catch basin for all City of Cleveland maintained roadways per Table 1.1 (Design Designations and Maintaining Agencies), and shall be used at all sag locations. The City of Cleveland Standard CB-1 catch basin shall be used in place of the Department Standard CB-3A catch basin and shall be placed at all on-grade locations where needed to satisfy the spread requirements.
F. All catch basins, including those that outlet to a combined sewer or directly to a storm only sewer shall have a sump and trap per City of Cleveland Standards.
G. Catch basins shall not be placed within the limits of an ADA ramp.
H. The City of Cleveland Standard MH 1 manhole shall be used in place of the Department Standard Manhole No. 3 for all City of Cleveland maintained roadways per Table 1.1 (Design Designations and Maintaining Agencies).
I. All drainage conduit crossing under any railroad, including any drainage conduit crossing under any elevated railroad, shall be in accordance with railroad governing regulations.
J. Adjusting rings are not permitted for casting adjustments in pavement. The DBT shall adjust the height of supporting walls per the C&MS.
K. Existing conduit to be abandoned shall be filled and plugged for the full extent of the project right of way limit. The DBT shall construct a bulkhead at the limits of pipe to be filled. Bulkheads shall be brick or concrete masonry with a minimum thickness of 12 inches. The DBT shall fill the pipe with C&MS Item 613 or sand so that after settlement at least 90 percent of the cross-sectional area for its entire length shall be filled. Prior to filling and plugging, conduit shall be videotaped to ensure that unknown connections are not impacted.
L. The DBT shall remove sediment and debris from existing drainage conduits (mainline and lateral storm and combined sewers) and drainage structures as follows:
    1. Any drainage structure to which the DBT connects
    2. Any drainage structure receiving runoff during construction from areas disturbed by the Work.
    3. The adjacent drainage conduit extending from the structure identified in conditions (1) or (2) to the next downstream drainage structure.
    4. All materials removed shall be disposed of as per C&MS 105.16 and 105.17.
M. Premium (water-tight) joints shall be used for submerged outfalls, extending from the outlet to the nearest upstream drainage structure.
N. All final drainage calculations and drainage area mapping shall be provided to the Department with Design Documents, including both PDF and source files.

O. Outlets for underdrains, vertical, horizontal, and wick drains shall connect to a storm manhole or catch basin
P. All underdrains shall have filter fabric wrap and shall be a minimum of 6-inch diameter. No 4 inch underdrains will be permitted.
Q. Underdrain design shall follow the Location and Design Manual, Volume 2
R. All roadway catch basin castings shall have "bicycle safe" grates.
S. The Department shall determine the necessary amounts of adjustments and/or replacements of the castings on existing drainage structures to be retained in roadways. The DBT shall include a contingency quantity of 25,000 pounds of Miscellaneous Metal per C&MS 611 within the lump sum bid for drainage work for the drainage structures in the roadway which will remain and will require replacement. If the quantity of Miscellaneous Metal per C&MS 611 exceeds 25,000 pounds, the Department will pay for additional quantities in accordance with the Contract Documents. This shall include, but is not limited, to any structure located within the proposed roadway that is not already being modified or addressed within the proposed drainage work or a structure which is within the resurfacing limits, which is not being affected by any proposed drainage work.
T. Provide storm sewer inlets in parking lots and connect to storm sewer system. Inlets to be located in parking lots, which will not be maintained by the City of Cleveland, shall not be connected to other roadway catch basins. Only direct connection to storm sewer manholes will be permitted.
U. No more than two roadway catch basins can be tied in series.
V. Flanking inlets shall include a pavement grate and a window opening.
W. For structures to be replaced, the DBT shall also replace 5 feet of all intersecting conduit. Where a new structure is placed on an existing conduit, the DBT shall replace 5 feet of all intersecting conduit of the new structure.
X. The DBT shall adjust or reconstruct catch basins, inlets, manholes, and other castings as necessary to accommodate resurfacing.
Y. New connections to reinforced concrete or vitrified clay pipe shall have a manufactured boot that makes a watertight connection.
Z. New connections to Brick sewers shall be per DR-03 (Drainage Details).
AA. All service connections shall receive a test tee per DR-03 (Drainage Details).
BB. Provide a continuance to unrecorded storm and sanitary laterals and obtain all required permits as needed.
CC. A minimum horizontal clearance of 10 feet is required between the main sewer and waterlines per the Ohio EPA. The minimum horizontal clearance between the main sewer and any other underground utility line is 8 feet. Where the above clearances cannot be provided, the DBT shall submit justification for use of reduced clearances for approval by regulatory and maintaining agencies. Ductile iron pipe shall be utilized for the entire pipe run (structure to structure) for any approved clearances of 18" or less.
DD. No horizontal bends are allowed in trunk sewers.
EE. Use a minimum slope of 0.50% for trunk sewers (where possible).
FF. Use a minimum slope of 1.0% for all proposed catch basin connections (where possible).

GG. The storm sewer system shall be designed as a gravity system. The use of siphons or pumping facilities is prohibited.

14.2.2 Structure Drainage

All drainage from bridge decks shall be collected and conveyed to the storm or combined sewer system.

14.2.3 Storm Sewer

14.2.3.1 General Design for Storm Sewers

Existing storm sewer laterals, manholes, catch basins and inlets may remain in service for proposed conditions only when proposed drainage design does not exceed their hydraulic capacity and the condition of the existing drainage element is Approved by the Department. All existing drainage elements to remain shall be video inspected per C&MS 611. For sewer laterals to catch basins with a trap, the DBT shall use a snake type video to fulfill the C&MS 611 requirement. A DVD copy of the inspection video/report shall be provided to the Department for review and Approval prior to any existing drainage element being Approved as eligible to remain.

14.2.3.2 Storm Sewer Inspection

Existing trunk sewers impacted by the zone of influence of construction activity shall be video inspected per C&MS 611 twice in the course of this project: first, before construction begins; and second, after construction is completed and prior to final Acceptance of the Work. Construction activity as it relates to storm sewer inspection shall be defined as retaining wall, bridge, or roadway construction activity crossing or adjacent to an existing storm or combined sewer. The zone of influence areas shall be determined by the DBT and approved by the governing agency. The video inspection requirement shall apply to all impacted trunk sewers regardless of size, depth, or type.

Unless otherwise specified in this scope document, video inspection limits shall include the length of sewer within the influence area and extend 50 feet upstream and downstream beyond the influence area limits. Video inspection limits shall be approved by the Department and the maintaining agency of the sewer prior to commencement of Work. The DBT shall provide DVD copies of all video/inspection reports to the Department of all inspections performed.

Sewers to be video inspected shall be cleaned to facilitate the video inspection. Field surveys and historic video indicate various levels of debris, silt, and sedimentation within impacted sewers that the DBT shall consider in evaluation of proposed connections and video and cleaning requirements. The cleaning limits may exceed the video inspection limits based upon point of access for inspection equipment. The DBT shall also bypass pump any flow as necessary to access the sewer to perform the video inspection.

If the impacted sewer includes a connection from a proposed storm sewer, the pre- and post-construction video inspection and cleaning limits for said existing storm sewer shall extend to the next accessible downstream manhole.

14.2.3.3 Drainage Areas

The project drainage area is defined as follows: All area within the construction limits and any additional area draining to the construction limits of the Project as determined by the DBT's work and agreed to by the Department. This includes areas outside Department Right-of-Way, including local streets.

The existing drainage within the Project area is primarily conveyed through various combined sewer systems. The DBT shall coordinate with NEORSD concerning any new connection to the combined sewer systems.

14.2.3.4 Allowable Storm Sewer Outfalls

All storm sewers shall outfall to an existing combined or storm-only sewer.

The DBT shall obtain approvals of appropriate agencies for outfall locations. For connections to existing sewers owned by agencies other than the Department, the DBT shall obtain approval of the governing agency and meet applicable permit requirements.

For outfalls to storm-only sewer systems, the DBT shall perform flow rate analyses. The allowable design discharge shall be calculated to the satisfaction of NEORSD and the Department. Detention facilities shall be provided where discharges would exceed allowable discharge rates.

A storm-only sewer outfall was identified for the drainage area contributory to the grade separation of OH-10 at the NS Cleveland Line. The pavement elevation at this grade separation is lower than adjacent existing combined sewer crowns but the nearby A-Branch of the Kingsbury Run Sewer is of sufficient depth to drain the roadway sag. NEORSD is replacing portions of the A-Branch from approximately E. 79th Street to Kinsman Road. If the storm-only outfall is utilized, the following apply:

A. Easements were obtained for an outfall sewer west of and parallel to the NS Cleveland Line to the 48-inch A-Branch of the Kingsbury Run Sewer.
B. The outfall sewer requires boring/jacking/tunneling under the GCRTA Red Line / NS Nickel Plate Line and construction of an access manhole at the Kingsbury Run Sewer.
C. The existing Kingsbury Run Sewer A-Branch requires cleaning and video inspection. The cleaning and video limits are upstream 50 feet from the proposed outfall and downstream to the existing offset access manhole under the E. 79th Street bridge.

For outfalls to combined sewer systems, the DBT shall comply with NEORSD submittal requirements as stated in Appendix DR-04 (NEORSD Requirements): No net increase in peak flows and no peak volume increase shall occur to any point on the existing combined sewer systems adjacent to the project area, including but not limited to combined sewers under Woodland Avenue, E. 89th Street, Kennedy Avenue, Buckeye Avenue, Lisbon Avenue, Grand Avenue, E. 79th Street, E. 75th Street, Kinsman Road, and E. 55th Street, and at the downstream regulators, as a result of this Project. The DBT shall provide calculations documenting no

increase in peak flow and peak volume for all proposed connections to existing combined sewers and at the downstream regulators. If such a balance is not feasible and/or cannot be met to the satisfaction of NEORSD and the Department, detention facilities shall be provided.

If detention facilities are necessary, the DBT shall coordinate with NEORSD and City of Cleveland Water Pollution Control to develop existing flow rates and applicable design storm sizing/release requirements for specific outfall points. All detention facilities, if required, shall be located within the proposed permanent Right-of-Way. Detention facilities shall be designed to avoid conflicts with other underground utilities. The facility layout, methodology and physical properties of the facility including type of system, materials, outlet structure and access points shall be approved by the Department, NEORSD, and the City of Cleveland Water Pollution Control prior to ordering and installation. Mechanically operated detention facilities shall not be permitted.

The existing Grand Avenue underpass at the NS Cleveland Line will be abandoned in accordance with Section 8 (Railroads). The existing combined sewer impacted by the bridge abandonment, proposed railroad embankment, and roadway removal shall be removed/abandoned. Storm runoff from the impacted private parcel at 8100 Grand Avenue shall be restored to the remaining Grand Avenue combined sewer. The proposed OH-10 drainage system shall be designed to accommodate the redirection of storm runoff from the area impacted by the proposed NS Cleveland Line embankment, track, and bridge work within the project area detailed in Section 8 (Railroads).

14.2.4 Storm Water Best Management Practices (BMP)

14.2.4.1 General BMP Requirements

As stated in L&D Volume 2, Sections 1112 and 1115, post-construction BMPs are not required if all runoff is collected in a combined sewer provided design flow to the combined sewer meet the requirements of maintaining agency. Drainage areas contributory to combined sewers shall not be credited toward project treatment percentages for quantity or quality.

Post-construction BMPs shall be provided for runoff collected directly into a storm sewer system meeting the thresholds as stated in L&D Volume 2, Section 1115. Treatment design for post-construction BMPs shall follow the procedures described in L&D Volume 2, Sections 1115, 1116, and 1117. The ODOT L&D Volume 2 water quality treatment percentage determination procedure shall be used for this project, taking precedence over the quality treatment requirements detailed in Appendix DR-04 Section 3.1. The Earth Disturbed Area (EDA) used for calculating the project water quality treatment percentage shall be the total area contributory to storm-only sewers; any area directly contributory to combined sewers shall be removed from the EDA calculation.

14.2.5 Drainage Report

The DBT shall prepare Preliminary and Final Drainage Reports and plans to address all applicable items in Location and Design manual, Volume 2, including all applicable storm sewer, BMPs, and other

drainage items and requirements of the City of Cleveland and NEORSD. At a minimum the reports shall include:

A. Separate map/drawing for each drainage area, clearly showing the details within each drainage area.
B. Maps showing the local water collection system to identify drainage boundaries, longest flow path, and point of inlet. Separate maps shall be provided for existing and proposed conditions.
C. Location of all detention facilities, if required, including points of inlet and outlet for these.
D. Detailed drainage computations supporting net decreases in flow to existing combined sewers in the project area, including but not limited to Woodland Avenue, E. 89th Street, Kennedy Avenue, Buckeye Avenue, Lisbon Avenue, Grand Avenue, E. 79th Street, E. 75th Street, Kinsman Road, and E. 55th Street.
E. Detailed drainage computations supporting attainment of water quality and water quantity requirements for all outlets to existing storm sewers.

14.2.6 Design Computations Submittals

In addition to the submittals defined in Section 2 (Quality Management), the DBT shall include the following with each submittal:

A. Detailed drainage computations.
B. Analysis of existing and proposed flow rates in accordance with Appendix DR-04 (NEORSD Requirements).
C. Summary of results from detention basin calculations.
D. Plots of inflow and outflow hydrographs at each treatment device, along with depth plots provided for the 25-year event, at a minimum.
E. If only a portion of a drainage area is to be diverted to a detention basin, the area tributary to the basin shall be clearly identified.
F. Calculations of earth disturbance, percent treatments, WQv calculations, and WQf calculations for BMPs
G. Description of detention basin geometry, including the following:
    1. Depth
    2. Outlet structure
    3. Volume
    4. Depth vs. volume plot
    5. Depth vs. outlet flow plot
    6. Description of methodology used for hydrograph routing

14.3 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. For drainage computations, submit electronically in their source format such as HY-8, CDSS. The DBT shall provide updated drainage computations with each submittal cited in Section 2 (Quality Management). At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Preliminary Drainage Report	Acceptance	0	1		14.2.6
Final Drainage Report	Acceptance	0	1		14.2.6

15 SANITARY AND COMBINED SEWERS

The DBT shall design and construct sanitary sewer facilities and systems, including manholes, conduit and service laterals along the project corridor in locations as described herein. The sanitary sewer system shall be designed to convey sanitary flow only as a system separate from the storm sewer system.

Sewer profiles shall be developed in accordance with Location and Design Manual, Volume 3, however, separate profiles shall be developed for each sewer run so that utility conflicts and separation requirements can be determined.

15.1 GOVERNING REGULATIONS

In addition to C&MS 611, the DBT shall perform testing in accordance with Ohio EPA requirements.

The DBT shall obtain the Ohio EPA Permit To Install (PTI) and all required City/NEORSD permits.

Ownership of existing sewers within the project limits is as follows:

A. Northeast Ohio Regional Sewer District (NEORSD):
    1. Regulator S-10 at E. 55th Street and Bower Avenue
    2. E. 55th Street combined sewer, 96-inch brick, from Regulator S-10 at Bower Avenue downstream to Kingsbury Storm Relief Sewer (KSRS) under Francis Avenue
    3. Kingsbury Storm Relief Sewer (KSRS), Kingsbury Run Branch E under Francis Avenue
    4. E. 55th Street Sludge Force Main, 16-inch
    5. Kingsbury Run Branch A, 48-inch brick; dry weather stream sewer paralleling the NS Nickel Plate Line / GCRTA Red Line from E. 79th Street downstream to connection with 108-inch Kingsbury Run Branch C in the Kingsbury Valley west of Kinsman Road.
    6. Regulator S-14 combined sewer overflow sewer, 48-inch
    7. Kingsbury Run Branch D, 72-inch box culvert; dry weather stream sewer under GCRTA Blue-Green Line between 48-inch Regulator S-14 combined sewer overflow sewer to Kingsbury Run Branch A
    8. E. 75th Street Sludge Force Main, 12-inch
    9. Buckeye Avenue combined sewer interceptor, 60-inch brick
    10. E. 79th Street combined sewer interceptor, 77-inch brick, from flow divider S-20A at Grand Avenue and Ewald Avenue
    11. Woodland combined sewer interceptor, 24-inch brick
B. Cleveland Division of Water Pollution Control: All other public sewers not listed with NEORSD.

15.2 GENERAL SANITATION SEWER REQUIREMENTS

A. The trunk sewer shall be constructed underneath the driving surface of the new roadway for the limits specified in Section 15.3 (New Sanitary Sewer Facilities along New Roadway Alignment). Manhole castings shall be located and oriented so the lid is not within the normal wheel path of vehicles within traveled lanes.

B. The trunk sewer and service branches shall be vitrified clay pipe extra strength; C-700 with premium joints (C&MS 706.08 and 706.12 respectively) and minimum nominal pipe size shall be 15-inch.
C. All proposed sewer pipe 21-inch and larger shall be reinforced concrete pipe with premium joints (C&MS 706.02 and 706.11 respectively).
D. The minimum slope of the trunk sewer shall be 0.50 percent.
E. Sewer sizing and capacity shall be determined in accordance with Section 3.2 (Design of Sanitary Sewers) of the Cuyahoga County Uniform Standards For Sewerage Improvements.
F. The minimum depth of trunk sewer shall be 9 feet measured from the pavement surface to the invert of the sewer.
G. A minimum cover of 3 feet is required for all proposed trunk sewers
H. A ten-foot minimum horizontal clearance is required between new sewers and waterlines per Ohio EPA, while an eight-foot minimum horizontal clearance is required with any other underground utility. Where the above clearances cannot be provided, the DBT shall submit justification for use of reduced clearances for approval by regulatory and maintaining agencies. Ductile iron pipe shall be utilized for the entire pipe run (structure to structure) for any approved clearances of 18" or less.
I. No horizontal bends are allowed in trunk sewers or sanitary sewer connections.
J. Manholes on trunk lines shall be spaced at 300 feet maximum. All manholes shall be per details provided in DR-05 (Sanitary Sewer Details).
K. Bedding and Backfill shall be details provided in DR-05 (Sanitary Sewer Details).
L. Connections of the sanitary sewer to existing combined sewers shall follow the requirements in Appendix DR-04 (NEORSD Requirements). Where blind connections are made to existing combined sewers a new manhole shall be constructed on the proposed sewer immediately adjacent to the blind connection.
M. In order to facilitate future service connections from development the DBT shall design and construct service branches to the trunk sewer. A service branch shall consist of 12-inch conduit extending at a 1.0 percent upgrade from the trunk sewer manhole invert rising to a cleanout located beyond the outer roadway curb and within the Right-of-Way. The service branch shall be plugged at a tee and the cleanout shall be located to avoid conflicts with other facilities. The branches shall be set on both sides of the roadway and spaced so the maximum spacing between branches on each respective side of the road does not exceed 600 feet and only provided within the limits of the proposed trunk sewer.
N. The difference of invert elevation between a sanitary manhole and a sanitary or combined sewer connection that ties to this manhole should not exceed 2 feet.
O. Proposing a drop pipe inside a manhole is prohibited.
P. The sewer system shall be designed as a gravity system. The use of siphons or pumping facilities is prohibited.
Q. Existing trunk sewers impacted by construction activity shall be video inspected in accordance with Section 14.2.3.2 (Storm Sewer Inspection).
R. Masonry bulkheads shall be constructed for all existing sewers to be cut and abandoned.
S. Abandoned sewers shall be sandfilled or grouted in place.

The DBT shall segregate project eligible and local pay items for sanitary and combined sewer work in accordance with Section 7.10 (Project Eligible vs. Local Pay Items).

15.3 NEW SANITARY SEWER FACILITIES ALONG NEW ROADWAY ALIGNMENT

The DBT shall design and construct new sanitary sewer facilities along the new roadway alignment in areas where adjacent properties are not served by existing sanitary sewers under the existing roadway network. The limits of new sanitary sewer facilities include the following:

A. From E. 79th Street eastward to where the existing vacated Grand Avenue crosses OH-10. The new sewer shall connect to the existing 77-inch brick combined sewer under E. 79th Street.
B. From a new manhole between Evins Avenue and Evarts Avenue, then northeast under OH-10 to the existing 60-inch brick combined sewer under Buckeye Road.
C. From a new manhole on OH-10, approximately 350 feet west of E. 93rd Street along OH-10 to the existing 24-inch brick combined sewer under Woodland Avenue.

Payment for any ineligible, unnecessary, or betterment to the facilities will be the responsibility of the owner and not the DBT or Department. Determination of eligibility shall be coordinated through the Department. Payment for betterments or ineligibility costs shall be made by the appropriate facility through the Department to the utility contractor. Betterment procedures shall follow the department Utilities Relocation Manual.

15.4 SANITARY SEWER FACILITIES ALONG EXISTING ROADWAYS

The DBT shall design and construct modifications to existing sanitary/combined sewers and appurtenances required to accommodate construction of the proposed roadway, bridges, retaining walls, and other project elements.

15.5 SLUDGE FORCE MAIN

The grade separation of OH-10 at E. 55th Street will require the permanent relocation and temporary maintenance of the existing 16-inch sludge force main under E. 55th Street. The design and construction of this relocation shall be in accordance with Section 7.8.13 (NEORSD Relocations).

15.6 REGULATOR S-10 RELOCATION

The grade separation of OH-10 at E. 55th Street will require the permanent relocation of NEORSD Regulator S-10 and associated piping. The DBT shall design and construct a new regulator and piping in accordance with the criteria and design guidelines described herein and with Appendices DR-08 (NEORSD Material Specifications for Regulator S-10), DR-09 (NEORSD Flow and Rainfall Monitoring for Regulator S-10), and DR-10 (NEORSD Hydrologic and Hydraulic Modeling for Regulator S-10).

15.6.1 Performance Criteria

The NEORSD standard measurement of performance is based on combined sewer outfall (CSO) control and conveyance of the 5-year, 6-hour design event.

15.6.1.1 CSO Control

The first NEORSD performance objective that shall be met is control of the frequency and volume of combined sewer overflows. The DBT shall design relocated Regulator S-10 (Regulator S-10A) to maintain current baseline condition CSO performance as modeled by NEORSD (Near-Term performance criteria) and shown in the following table. Storm 91 has been identified as the 14th largest event in the NEORSD's Typical Year through previous modeling efforts and represents the basis of CSO control performance for the relocated S-10A regulator. DBTs should design the new regulator based on the peak inflow associated with this control storm so that only 13 overflow activations are estimated in the Typical Year at this structure.

Regulator ID (Existing / Relocated)	Level of Control Under Baseline Conditions		Typical Year Control Storm	Level of Control Under Near-Term Conditions	
	Volume (MG)	**No. of Overflows**		**Volume (MG)**	**No. of Overflows**
S-10 / S-10A	76	58	Storm 91	13	13

Regulator S-10A shall also be designed to allow for future modifications that achieve compatibility with planned future tunnel system designs and meet pending combined sewer overflow requirements. In conjunction with other upstream system improvements to be implemented outside of this scope, Regulator S-10A shall have the capacity and flexibility to meet performance criteria to control Typical Year Storm 60 (Long-Term performance criteria).

15.6.1.2 5-Year, 6-Hour Level of Service

The second performance objective that shall be met is to provide combined sewer performance for the 5-year, 6-hour rainfall event.

A. The rainfall interval shall be 1-hour for a peak intensity of 1.43 inches per hour.
B. The hydraulic grade line (HGL) shall be maintained at least 10 feet below grade at each manhole, or within the pipe if the pipe crown is shallower than 10 feet.
C. The regulator shall not cause significant hydraulic losses that would impact upstream 5-year, 6-hour conveyance into the regulator.

The storm weather outlet (SWO) weirs shall be designed to relieve the 5-year, 6-hour peak flows without causing significant backwater conditions. The weir design shall not allow the design peak flows conveyed downstream though the dry weather outlet (DWO) to exceed 15 percent of the Typical Year control storm peak flow rate.

15.6.2 Regulator System Design

The Regulator S-10 relocation shall include the following infrastructure improvements:

A. Replace existing Regulator S-10 with Regulator S-10A in a new location south of the OH-10 and E. 55th Street grade separation and north of the Francis Avenue intersection with E. 55th Street.
    1. The proposed regulator shall include a 16-foot long weir on the SWO to regulate Typical Year Storm 91. The weir height above DWO invert shall be 3.4 feet. The weir shall be

field adjustable to control peak flows up to Typical Year Storm 60 and overflow for larger wet weather flow conditions for future NEORSD needs.

2. The restrictor plate on the DWO shall be designed to limit Typical Year Storm 91 peak flows downstream during larger wet weather flow conditions and be field adjustable to limit Typical Year Storm 60 downstream for future NEORSD needs.

B. Construct a 48-inch diameter DWO sewer and a DWO drop structure. The 48-inch DWO sewer shall connect Regulator S-10A to a proposed drop connection on the existing 60-foot deep, 60-inch DWO in I-490 at E. 55th Street.

C. Construct a 30-inch diameter local sewer from the existing No. 3 Egg combined sewer on I-490 between E. 54th Street and E. 55th Street to the proposed drop connection on the 60-inch sewer in I-490 at E. 55th Street. Existing conditions flows from this sewer are regulated at existing Regulator S-10, but hydraulic conditions were evaluated to confirm that bypassing Regulator S-10A with this structure is acceptable.

D. Construct a 54-inch diameter sewer to the Kingsbury Storm Relief Sewer (KSRS) and a drop structure. The 54-inch sewer will convey overflow from Regulator S-10A to the proposed drop connection on the 50-foot deep 78-inch branch of the KSRS.

The conceptual proposed regulator, drop structure, and pipe dimensions detailed above are provided for bidding purposes. The DBT shall be responsible to calculate all capacities, flows, pipe sizes, and slopes. If any portions of existing structures are to be maintained, the DBT shall determine to the satisfaction of the NEORSD that the structures are structurally sound, provide sufficient hydraulic capacity and maintain accessibility and functionality, including baffle wall and step configuration. The configuration and location of connections to the existing system shall also be determined by the DBT and reflected in the design calculations.

15.7 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Permit to Install Form	Submittal	1	1	Must have Approval prior to Interim design submittal	15.1

16 STRUCTURES

The DBT shall design and construct all structures within the project limits in accordance with the Contract Documents.

16.1 GOVERNING REGULATIONS

Governing regulations and supplemental specifications are listed in Section 1 (General). For cases where American Association of State Highway and Transportation Officials (AASHTO) Specifications conflict with ODOT standards, ODOT standards shall take precedence. For structural components not addressed by the standards listed in Section 1 (General), other guidelines or specifications that reflect currently accepted industry practice shall be submitted for approval by the Department prior to use.

The DBT may disregard all instructions to consult the Office of Structural Engineering in the ODOT Bridge Design Manual (BDM).

16.2 BRIDGES

The following bridges shall be constructed as part of the Project:

- E. 55th Street over OH-10 (new bridge)
- Pedestrian Bridge over OH-10 at E. 59th Street (new bridge)
- OH-10 over Kingsbury Run ravine (new bridge)
- Kinsman Road over GCRTA (minor deck and parapet work)
- OH-10 Eastbound over GCRTA Blue and Green Lines (new bridge)
- OH-10 Westbound over GCRTA Blue and Green Lines (new bridge)
- Norfolk Southern Railroad over OH-10 (new bridge)
- Norfolk Southern Railroad over vacated Grand Avenue (remove bridge)
- E. 89th Street Bridge (remove existing and replace with new pedestrian bridge)

The existing bridges to be removed are listed in section 16.3.2 (Bridge Removals). These bridges shall be entirely removed in accordance with the governing regulations. No parts of the existing bridges shall be salvaged and used as part of the new replacement bridges.

16.3 BRIDGE CRITERIA

16.3.1 Geometrics

The DBT shall design and construct new bridges in accordance with Table 16-1.

Table 16-1: New Bridge Geometric Requirements

Bridge Location No.	Location	Minimum Vertical Clearance	Width and Location of Shoulders
1	E. 55th Street over OH-10	16.5 feet	See ST-05 (Bridge Typical Sections)

Bridge Location No.	Location	Minimum Vertical Clearance	Width and Location of Shoulders
2	Pedestrian Bridge over OH-10 at E. 59th Street	17.5 feet	See ST-05 (Bridge Typical Sections)
3	OH-10 over Kingsbury Run ravine	17.0 feet (Over GCRTA tracks)	See ST-05 (Bridge Typical Sections)
4	OH-10 Eastbound over GCRTA Blue and Green Lines	17.0 feet (Over GCRTA tracks)	See ST-05 (Bridge Typical Sections)
5	OH-10 Westbound over GCRTA Blue and Green Lines	17.0 feet (Over GCRTA tracks)	See ST-05 (Bridge Typical Sections)
6	Norfolk Southern Railroad over OH-10	16.5 feet	See ST-05 (Bridge Typical Sections)
7	E. 89th Street Pedestrian Bridge	17.0 feet (Over GCRTA tracks), 23.0 feet (Over Norfolk Southern tracks)	See ST-05 (Bridge Typical Sections)

Additional head room over GCRTA tracks may be required to facilitate clearance to catenary supports and catenary power systems. Clearance to bridges shall be per AREMA and NESC requirements. The DBT is responsible for all modifications to the GCRTA catenary system in accordance with GCRTA requirements, as necessitated by the DBT's design.

16.3.2 Bridge Removals

The DBT shall remove the 2 bridges listed below. The Department performed Regulated Materials assessment/inspection of bridges to be removed on the Project and findings are included in EN-08 (Asbestos on Bridges). The DBT shall perform Regulated Materials management in accordance with Section 6 (Environmental).

Table 16-2: Bridge Removals

Structure File No.	Location
N/A	Norfolk Southern Railroad over vacated Grand Avenue
1812440	E. 89th Street Bridge over NS and GCRTA

The DBT shall be responsible for bridge removal in a sequence and manner that maintains the stability of the remaining members until all members have been removed. The DBT shall maintain the stability of the bridge under all conditions. The DBT shall remain solely responsible for all aspects of safety, structural capacity, structural stability, applicable regulations, and permits associated with bridge removal work.

The DBT shall prepare demolition plans for the removal of bridges in accordance with C&MS 501.05. Demolition plans shall demonstrate the feasibility of all operations proposed to safely remove bridges and shall include the following:

A. Details for all temporary supports and falsework
B. Detailed procedures and plans for the protection of traffic adjacent to and under the bridge, including vehicular, pedestrian, and railroad traffic
C. Details for all devices and structures necessary to ensure such protection

For bridges being removed over or immediately adjacent to railways, the demolition plans shall indicate the method of protection for the track structure. Prior to commencing work, demolition plans shall be reviewed and approved by the railroad.

The use of explosives is prohibited. Wrecking balls are prohibited for demolition of bridge substructures. With exception of the NS Railroad over vacated Grand Avenue, deck concrete shall be removed only by lift methods.

No debris shall be allowed to fall onto railroad property. No staging of equipment or material is allowed on railroad property without the express written permission of the railroad.

16.3.3 Bridge Type and Limitations

The Department has not completed Type Studies for the bridges on this Project. The DBT must propose bridge types that comply with the requirements of the Contract Documents, in addition to the following restrictions.

A. Lateral clearance to railroad infrastructure shall be approved by NS and GCRTA. The DBT shall coordinate and obtain approval from NS and GCRTA on any deviations from their design criteria.
   - For OH-10 over Kingsbury Run ravine, the DBT shall provide a minimum of 15 feet (25 feet preferred) lateral clearance to the centerline of GCRTA's loop track.
   - For OH-10 Eastbound over GCRTA Blue and Green Lines, the DBT shall provide a minimum of 12 feet of lateral clearance from the centerline of GCRTA's Blue/Green and test track.
   - For OH-10 Westbound over GCRTA Blue and Green Lines, the DBT shall provide a minimum of 12 feet of lateral clearance from the centerline of GCRTA's Blue/Green and test track.
B. Minimum vertical clearance to the GCRTA tracks shall be 17'-0".
C. Catenary Supports shall not be mounted to bridge elements.
D. Minimum vertical clearance to the Norfolk Southern tracks shall be 23'-0".
E. Non-redundant designs, fracture critical members, and hinged joints are not permitted.

F. Expansion joints shall not be located over piers. This requirement shall be waived for the Norfolk Southern Railroad Bridge.
G. Non-composite prestressed box beam, thru girder and truss type bridges are prohibited.
H. Prestressed composite concrete box beam type bridges are permitted only for E. 59th Street Pedestrian Bridge.
I. Bifurcation of the vertical profiles of the Eastbound and Westbound OH-10 Bridges over GCRTA Blue and Green lines is not permitted.
J. Timber shall not be permanently incorporated into any structure.
K. The bridge type selected for an individual bridge shall remain consistent across all spans and beam/girder lines.
L. Minimum rebar cover shall be measured to shallowest cover, including aesthetic reveals.
M. Bridge parapets not placed behind curb and sidewalk shall have a height of 42 inches measured from the bridge deck surface at the toe to the top of parapet.
N. Crash walls shall be designed and constructed in accordance with AREMA requirements when adjacent to GCRTA tracks.

The DBT shall use the traffic data below for fatigue calculations:

Location	Opening Day / Design Year (ADT 2020)	Truck (24-Hour B & C)
E. 55th Street over OH-10	13,410	6%
OH-10 over Kingsbury Run ravine	45,580	6%
OH-10 over GCRTA Blue and Green Lines	40,630	6%

16.3.4 Foundations

Bridge foundations shall conform to provisions of Section 10 (Geotechnical), in addition to the following requirements.

The following foundation types shall not be permitted:

A. Underreams or belled shafts.
B. Augercast piles and continuous flight auger (CFA) piles.
C. Timber piles.
D. Open-ended pipe piles.

16.3.4.1 Drilled Shaft Foundations

A. Prior to commencing work, the DBT shall prepare and submit to the Department for review and approval, drilled shaft installation plan in accordance with the C&MS 524.03.
B. The DBT shall determine the need to use slurry, to prevent soil cave-ins during drilling, based on the soil assessment and design requirements for each location.
C. If drilled shafts will be constructed by the "Wet Construction Method," per ODOT 2016 Construction and Material Specifications Item 524.04.B, then one demonstration drilled

shaft shall be provided for each bridge or retaining wall structure utilizing drilled shafts constructed by the same method. Installation of production drilled shafts shall not begin until the successful construction, testing, and acceptance of the demonstration drilled shaft at the subject structure.

D. Demonstration drilled shafts shall be constructed in accordance with the approved drilled shaft installation plan.

E. A demonstration drilled shaft may be utilized as a production drilled shaft, provided that it is demonstrated to have no construction defects, and that it has not been displaced more than 10 percent of the drilled shaft diameter during load testing.

F. All drilled shafts, including production and demonstration, shall be tested with thermal integrity profiling (TIP). All demonstration drilled shafts, one production drilled shaft per bridge substructure unit, and a minimum of five percent of production drilled shafts per retaining wall, that are 4 feet or larger in diameter shall also be tested by crosshole sonic logging (CSL). Drilled shafts tested by CSL shall use the probe option for TIP testing. CSL and TIP shall be performed per the procedures specified in Appendix ST-04 (Drilled Shaft Testing).

G. Drilled shafts, founded on bedrock, shall be socketed into bedrock a minimum depth of 1.5 times the drilled shaft diameter.

H. The minimum clear distance between longitudinal and lateral reinforcement shall not be less than five times the maximum aggregate size.

I. With exception of pedestrian structures, a single substructure foundation shall have no less than four drilled shafts.

J. For each bridge structure utilizing drilled shaft foundations not founded in bedrock, a minimum of one drilled shaft per structure shall be static load tested per ASTM D1143, Procedure A: Quick Test, and per ODOT 2016 Construction and Material Specifications (CMS) Item 506 Static Load Test procedures ignoring, where appropriate, references to driven piles. The requirement is to apply the identical Driven Pile Static Load testing procedures to Drilled Shafts. All demonstration drilled shafts not founded on bedrock shall be load tested. When using a static load test to verify the nominal axial resistance of the drilled shaft, all other drilled shafts in the same substructure unit (or the nearest substructure unit, in the case of testing on a demonstration drilled shaft within 100 feet of the structure) may be designed using a resistance factor of $\varphi_{load} = 0.70$ (for Axial Geotechnical Compression).

K. Drilled shaft foundations for soldier pile walls that include an embedded soldier pile rolled steel beam extending the full length to the tip of the drilled shaft, may be excluded from the requirements for testing by thermal integrity profiling (TIP) and by crosshole sonic logging (CSL). Drilled shaft foundations that do not include an embedded soldier pile rolled steel beam extending the full length to the tip of the drilled shaft shall still fall under the requirement of testing by TIP and CSL per Section 16.3.4.1, Paragraph F.

16.3.4.2 Spread footing Foundations

All spread footings at all substructure units, not founded on bedrock, are to have elevation reference monuments constructed in the footings as per the BDM 202.2.3.1.

16.3.4.3 Pile Foundations

A. For installation of driven piles, the DBT shall perform a drivability analysis using the wave equation method to select the impact hammer and pile driving system required in accordance with the ODOT BDM and AASHTO *LRFD Bridge Design Specifications* Articles 10.7.3.8.4 and 10.7.8. The DBT shall use a hammer that will achieve the required ultimate bearing value for the pile and shall be large enough to permit a dynamic load test to verify that the ultimate bearing capacity shown on the Design Documents can be achieved.
B. Dynamic load test shall be performed with the same hammer used during installation of piles. Dynamic testing shall be performed in accordance with ASTM D4945. Signal matching analysis shall be performed to determine the ultimate bearing value in order to establish production pile driving criteria.
C. The DBT shall use a saximeter or equivalent method, as Approved by the Department, to accurately measure and record the average stroke for each unit of length driven.
D. Downdrag forces shall be accounted for in the pile design in accordance with AASHTO LRFD Bridge Design Specifications Article 3.11.8. and the BDM Section 202.2.3.2.c.

16.3.5 Substructures

All substructure units shall be cast-in-place concrete.

Substructures shall be designed to transfer all loads to new foundations. In a situation where a substructure is to span or to be constructed adjacent to an existing sewer, the new foundation shall not induce any additional loads on such sewer. The substructure load influence from the bottom of the footing shall be projected down and out at a rate of 1:1. See Section 10.2.5 (Monitoring and Control Requirements) for information on required video inspection and vibration monitoring at sewers and other locations.

Substructure locations shall adhere to the restrictions shown in Appendix RW-01 (Right-Of-Way Map) and LD-09 (No Build Zones). No above grade substructure elements are permitted in No Build Zones.

Beam seat pedestals are not permitted.

Cap and column piers shall have a minimum of three columns per unit.

Hollow piers shall have all internal forms removed. The bottom of voids for hollow piers shall not extend below the ground line.

Deep foundations shall support abutments behind MSE walls. Spread footings are prohibited for this scenario.

The limitations specified in BDM Section 205.8 for integral design and BDM Section 205.9 for semi-integral design shall be considered maximums for both steel and concrete superstructures.

Railway crash walls shall be provided for substructure units per RR regulations and governing regulations. RR regulation shall take precedence where conflicts exist between RR regulations and governing regulations.

16.3.5.1 E. 89th Street Pedestrian Bridge

The Northern Abutment shall keep an offset from NS tracks that is greater than or equal to the offset of the existing abutment to the NS tracks. The existing ground elevation shall be maintained south of the face of the northern abutment therefore no embankment is permitted in this location under the proposed structure. An existing retaining wall extends north from the northern abutment along the west side of E. 89th Street. Any work required to restore the connection of the existing wall to the proposed northern abutment shall occur with existing right-of-way.

The southern abutment may be relocated to the face of the existing southernmost pier. The existing ground elevation shall be maintained north of the face of the southern abutment therefore no embankment is permitted in this location under the proposed structure.

16.3.6 Superstructure

All bridge expansion joints shall be sealed with elastomeric strip seal type. Compression seal type maybe used for pre-stressed concrete box beam bridges with the limitations provided in the BDM Section 306.2.5. Modular expansion joints and open-type joints, such as finger joints and sliding plates, are not permitted.

Steel rolled beams and steel girder bridges shall have a minimum of four stringer lines.

A588/A709 weathering steel shall not be used unless noted otherwise elsewhere in this document.

Prestressed concrete I-beams shall have a minimum of four beam lines.

The concrete deck shall have a minimum design haunch depth of 2 inches, except at splice plate locations. At splice plate locations, the minimum design haunch depth shall be either 1 inch as measured from the top of the splice plate or 2 inches as measured from the top of the top flange, whichever provides for the greater depth of concrete above the splice plate.

Design and construction of concrete end diaphragms shall adhere to the table and applicable notes in Section 702.6.2 of the 2007 BDM.

Exterior mounting of utilities on fascia beams/girders is prohibited. Utilities shall not be located in outermost beam bays.

Any utility within a bay of a steel beam/girder bridge shall be located above either a crossframe member or a utility support at each crossframe and utility support location. Utility supports shall not be attached to or supported on beam/girder flanges.

Any utility within a bay of a prestressed concrete I-beam bridge shall be located either above a steel intermediate diaphragm member or a utility support at each steel intermediate diaphragm and utility support location. Utility supports shall not be attached to or supported on beam flanges. Utilities may pass through concrete diaphragms if the concrete diaphragms are designs for all applicable loads.

No portion of a utility or a utility support, excluding concrete diaphragms, shall be located below the bottom of the adjacent beam/girder bottom flange.

Structural steel shall be coated with a three-coat paint system in accordance with C&MS 514. For color, refer to AE-02 (Enhancement Plans). Paint system prime coating shall be shop applied and the remaining coatings shall be field applied.

In addition to the requirements of Section 302.1.4.3 of the 2007 BDM, all exposed concrete surfaces of beams, diaphragms, and end diaphragms of prestressed concrete I-beam bridges shall be sealed per Item 512.

For all superstructures when the girder depth is 5'-0" or greater an inspection handrail system shall be installed at each girder face except the exterior fascia. The centerline of the inspection handrail system shall be placed at 3'-8" from the top of bottom flange. The inspection handrail system shall be designed per applicable OSHA and ANSI requirements including OSHA 1926 and ANSI/ASSE-Z539. In lieu of the 5000 pound design load specified in OSHA 1926.502(d)(15), the inspection handrail system shall be designed for a 620 pound point load (310 pound service load times a factor of safety of 2) placed on the inspection handrail system to produce maximum stress. This maximum stress shall not exceed the material's allowable stress. The material's allowable stress shall be as defined in AASHTO's Standard Specifications for Highway Bridges, 17th Edition. An inspection handrail system is not required on prestressed concrete girder superstructures.

Shear studs shall be of sufficient length to satisfy the requirements of the Contract Documents. Two or more shear studs shall not be welded together.

If used, elastomeric bearings with internal laminates shall be designed based on a selected durometer of either 50 or 60. Field welding of beam or girder to the load plate shall be controlled so that the elastomer is not damaged. In addition, the elastomer shall not be subjected to a temperature greater than 300 degrees Fahrenheit.

Plain elastomeric bearings and rocker bearings are prohibited unless noted elsewhere within the Contract Documents.

Deck slab overhangs shall not exceed 4 feet.

To facilitate future bridge maintenance, the DBT shall provide a minimum of 20 inches of clear distance between flanges.

For a superstructure analysis that uses the distribution factors from LRFD 4.6.2.2, the differential deflection between adjacent steel beams/girders measured at the opposite ends of each crossframe

location due to the placement of the deck concrete shall be less than S/100, where S equals the distance between the centerlines of the beams/girders at the point of analysis. When a refined analysis is used to design a superstructure, out-of-plane beam/girder rotation due to placement of the deck concrete shall be less than 1/8" per foot.

16.3.6.1 E. 55th Street over OH-10

Unless indicated elsewhere within the Contract Documents, the DBT shall accommodate all existing utilities within the public right-of-way along E. 55th Street on the proposed bridge unless otherwise directed by the utility company. The new bridge shall be designed to support any additional loading induced by such utilities.

16.3.6.2 Pedestrian Bridge over OH-10 at E. 59th Street

The four stringer line requirement above may be waived for this bridge.

Plain elastomeric bearings are permitted only when installed with a composite prestressed concrete box beam bridge and all other provisions of the Contract Documents are met, other than the above prohibition.

This bridge is intended to be used by maintenance vehicles. Therefore, the bridge shall be designed for an H15-44 vehicle as specified in Section 301.4.2 of the 2007 BDM.

16.3.6.3 OH-10 over Kingsbury Run Ravine

The restriction on A588/A709 weathering steel is waived for this bridge only. If weathering steel is used all portions of steel within 10 feet of expansion joints shall be painted per Item 514. The prime coat shall be per C&MS 708.01. The top coat color shall closely approach Federal Standard No. 595B - 20045 or 20059 (the color of weathering steel).

Refined analysis with ODOT approved software shall be used for superstructure design and Bridge Rating.

16.3.6.4 OH-10 Eastbound over GCRTA Blue and Green Lines

Refined analysis with ODOT approved software shall be used for superstructure design and Bridge Rating.

16.3.6.5 OH-10 Westbound over GCRTA Blue and Green Lines

Refined analysis with ODOT approved software shall be used for superstructure design and Bridge Rating.

16.3.6.6 NS Railroad over OH-10

Unless indicated elsewhere within the Contract Documents, the DBT shall accommodate all existing utilities within the NS right-of-way on the proposed bridge unless otherwise directed by the utility company. The new bridge shall be designed to support any additional loading induced by such utilities. The bridge shall accommodate a 4 track configuration on one continuous superstructure.

16.3.6.7 E. 89th Street Pedestrian Bridge

The four stringer line requirement above may be waived for this bridge. If only three stringer lines are used, utilities may be located in the outermost beam bays.

This bridge is intended to be used by maintenance vehicles. Therefore, the bridge shall be designed for an H15-44 vehicle as specified in Section 301.4.2 of the 2007 BDM.

16.3.7 Deck

The deck shall be designed in accordance with BDM Section 302.2.

All bridge decks shall be full-depth, composite, cast-in-place concrete with 1" monolithic wearing surface. The requirement of 1-inch monolithic concrete wearing surface shall be waived for the Norfolk Southern Railroad Bridge.

Bituminous wearing surfaces are prohibited for permanent bridge decks. Precast concrete deck panels are prohibited.

Stay-in-place forms are prohibited.

Longitudinal construction joints on bridge decks shall not be placed along wheel paths in travel lanes. For purposes of this requirement, the wheel path shall be defined as the area banded by two parallel lines placed 1 foot and 4 foot from each lane line. The DBT shall seal all deck construction joints in accordance with C&MS 511.19.

The Project shall be designed and constructed such that permanent impact attenuators are not required on bridge decks.

16.3.7.1 OH-10 over Kingsbury Run Ravine

The eastbound and westbound traffic on this bridge shall be accommodated on one continuous bridge deck. Open longitudinal joints are prohibited.

16.3.8 Approach Slabs

Approach slabs shall be provided for all vehicular bridges in accordance with the BDM Section 209.5. All approach slabs shall be constructed with cast-in-place concrete in accordance with BDM Section 209.5, the standard drawings AS-1-15 and AS-2-15. The joint between the approach slab and adjoining pavement shall be installed and sealed in accordance with the Standards Drawings AS-2-15 and the supplement to these standards. Parapets on the bridges shall be continued across the entire length of approach slabs.

Backfill material placed beneath approach slabs shall conform to C&MS 703.17 and meet the compaction requirements of C&MS 304.05. In addition, the backfill material shall be placed and compacted in 6" lifts.

For slab bridges and bridges with semi-integral or integral abutments, approach slab concrete shall be installed a minimum of 24 hours after the adjacent deck concrete has been installed.

16.4 BARRIERS and SIDEWALKS

A. Barrier and sidewalk shall not be considered part of the cross section for the calculation of structural capacity.
B. Barrier reinforcing steel shall be cast into the bridge deck and approach slabs.
C. The barrier shall meet BDM 304.1. For more details, refer to Section 18 (Aesthetics and Enhancements) and AE-02 (Enhancement Plans).

16.5 METAL RAILING and FENCING

The DBT shall furnish all necessary labor, materials and equipment to fabricate, galvanize, clean, apply a two coat shop paint system (epoxy/urethane) and install the railing. All fence and railing materials shall be galvanized and painted per this Section 16.5.

A. Fabrication of the railing shall be in accordance with C&MS 513, UF Level. Coating of the railing shall be in accordance with C&MS 514, except as noted below.
B. The architectural fencing shall satisfy the minimum design requirements for posts and anchorages as specified in Standard Bridge Drawing VPF-1-90, "Vandal Protection Fence."
C. The fencing shall be constructed using welded wire fabric with 10.5 gage core wire, galvanized after welding.
D. Steel plates and shapes shall be ASTM A709 Grade 36 or 50. All other materials shall be in accordance with C&MS 707.10 or 711.09.
E. The galvanized coating system may be applied by a galvanizer not pre-qualified as a fabrication shop under Supplement 1078, but the pre-qualified fabricator of the structural steel shall be responsible for the quality of the applied galvanized coating system and any repairs, re-fabrication and additional assemblies required to assure the fabricated steel meets the plan requirements.
F. The two shop coats shall be applied in a structural steel fabrication shop having permanent buildings per 513.04 and prequalified at the UF Level. The Paint Quality Control Specialist (QCS) shall be qualified as specified in 514.04.
G. Prior to galvanizing, all corners of thermally cut or sheared edges shall have a 1/16-inch radius or equivalent flat surface at a suitable angle.
H. Galvanize the fabricated railing and hardware according to C&MS 711.02, except that fabricated railing elements shall not be post treated with water quenching or chromate conversion coated.
I. After galvanization, remove zinc high spots such as metal drip line and others that would detract from the paint appearance by SSPC SP2 or SP3. Take care that the base galvanized coating is not removed. Check repaired areas for required coating thickness.
J. Repair galvanized coatings damaged in the shop according to ASTM A780 method A3. Repair galvanized coatings damaged in the field according to ASTM A780 method A1.
K. After removing high spots, clean the galvanized coating according to SSPC SP-1. The cleaning solution shall be an alkaline solution with a PH ranging from a minimum of 11 to a maximum of 12. This solution can be applied by immersion, spray or soft nylon brush. Follow cleaning with a hot water or hot pressure washer rinse. Separate individual pieces and position to facilitate drainage and drying. The pieces shall be completely dry before proceeding.

L. After cleaning, abrasive blast the pieces according to SSPC-SP7 Brush-off Blast Cleaning. The blasting operation shall roughen the galvanized surface to an angular surface profile of 0.75 to 1.00 mils. Select the Blasting equipment, technique and abrasive material to provide for the specified surface profile without removal of excessive zinc layers. The final zinc millage shall not be less than 4.0 mils. Remove all abrasive residue with clean compressed air or other methods acceptable to the department.

M. After obtaining surface profile, shop apply a two coat paint system consisting of Epoxy Intermediate coat and a Urethane Finish coat meeting the requirements of C&MS 708.02. The Finish coat shall match Federal Color Standard FS 595C-17038 Black. Apply the epoxy coating within 24 hours of the brush-off blasting.

N. Prior to fabrication of the railing system, fabricate a sample railing panel of a length agreeable to the Project Engineer which includes two post, all hardware, incidentals and coatings. The Project Engineer will use this sample panel to judge acceptance of the fabrication, coatings and quality control program. After the review of this sample, the Department and the Contractor may agree upon any fabrication, coating, quality control or installation changes as a modification to these notes. The fabrication can proceed any time after the acceptance of this sample panel. The sample panel may be incorporated into the finished work at the discretion of the Engineer.

O. Repair damage to the paint system caused during storage, transportation, erection, according to C&MS 514.22. Exercise extreme care while handling the steel during erection, and during subsequent construction of the railing and fence. Insulate the steel from the binding chains by softeners and pad all hooks and slings that are used to hoist/erect the members.

P. All fence anchors shall be cast into the parapet. A washer and nut shall be tack welded to the bottom of the threaded rod to avoid the anchors pulling loose when the templates for the baseplates are stripped. Fence anchorage shall be stainless steel per C&MS 730.10.

Q. The DBT shall design the fence for dead load, in addition to wind load in accordance with AASHTO LRFD Section 3.8. The wind area shall include the area of the welded wire fabric within a given panel.

R. Restraint cables shall be installed to tie the fence posts, fence panels, ornamental lights, and the welded wire fabric panels, such that, if a post breaks off in a vehicle impact, the post on the opposite ends of the failed one will support the suspended panels and post. The suspension cable shall be designed for four (4) times the dead load of the fence section suspended to avoid parts of the fence breaking away and falling on the traffic below the bridge in case of a crash.

16.6 DRAINAGE SYSTEM

Bridge deck drainage shall be designed in accordance with the BDM Section 209.3 and Section 14 (Drainage). The allowable spread of flow along bridge gutter lines shall be per Table 14-1. The minimum longitudinal grade of roadway and pedestrian bridge deck surfaces shall not be less than 0.3%.

The drainage collection system shall be sloped as steep as practical, but not less than 15 degrees. Minimum bend radius shall be 18 inches. Bridge scuppers shall be minimized or eliminated when possible. Deck drainage and Scuppers shall be conveyed directly to a closed storm or combined sewer system. Catch basins and manholes shall be located outside the limits of approach slabs where possible.

No sag points shall be located within the bridge limits. Over the side drainage shall not be permitted. No transverse deck drains are permitted. Scupper conduits shall be hidden above the bottom flange, except at substructure units where they can be tied to allowable sewer outfalls. Clean outs shall be provided upstream of each bend, on vertical downspouts accessible from the ground, and at the end of each horizontal segment. Conduit enclosed in substructures is not permitted. Conduit enclosed in box type structures is not permitted. Welding of scuppers, downspouts, or drainage supports shall not be allowed in tension areas of main structural steel members.

16.7 MATERIAL PROPERTIES

Concrete shall be designated as QC/QA Concrete and shall satisfy the requirements of C&MS 455. The design compressive strengths listed in ODOT BDM shall be considered minimum values.

All reinforcing steel shall be epoxy coated.

All coarse aggregate shall have an absorption of 1 percent or greater as defined by the American Society of Testing Materials (ASTM) C127. This requirement shall be included as a note in Released for Construction Plans.

16.8 SEALING OF CONCRETE SURFACES

For rolled steel beams or welded steel plate girders, the limits of sealing on the superstructure shall be per ODOT BDM (2007 Edition) Figure 302.1.4.3-2, except that the limits at the bottom of the slab shall extend to the edge of the top flange of the fascia beam/girder.

For prestressed concrete beam bridges, the limits of sealing on the superstructure shall be per ODOT BDM (2007 Edition) Figure 302.1.4.3-1.

All exposed concrete surfaces of substructure units, wingwalls, and retaining walls shall be sealed per C&MS Item 512.

All sealing shall utilize epoxy-urethane sealer, except pedestrian surfaces which shall use clear non-epoxy sealer.

The color of the sealer shall be as specified in Appendix AE-02 (Enhancement Plans).

Graffiti protection shall be applied to all abutments, piers, pylons, parapets, and retaining wall surfaces. The protection shall be applied from the ground line level to a minimum of 8 feet in height. The DBT shall apply a permanent graffiti coating qualified according to Supplement 1083 that is compatible with the concrete sealer over which it is applied. Apply the graffiti coating in accordance with the manufacturer's printed instructions.

The DBT shall provide a silicone based anti-graffiti coating that meets the following requirements:

A. The material shall be a single component, RTV (room temperature vulcanized), neutral moisture cure, permanent (non-sacrificial), Type III (water cleanable) polysiloxane (silicone) anti-graffiti coating.
B. The coating shall be permanent (non-sacrificial), Type III (water cleanable).
C. The material shall be a single component, RTV (room temperature vulcanized), neutral moisture cure pure polysiloxane (silicone) coating (free of any waxes, epoxies, or polyurethane components).
D. The coating shall be a one coat system (no primer) capable of being spray applied to a dry film thickness of 15 mils (375 microns) without runs of sags (multiple coat application acceptable for brush/roller usage and primer usage acceptable for specialty substrates such as galvanized metal).
E. The coating shall emit less than 300 G/L (2.5 pounds per gallon) of volatile organize compounds (EPA Method 24).
F. The coating shall meet the following performance requirements:
    1. Cleanability Level 1 (graffiti completely removed with cold water power wash) as per ASTM D7089 with low pressure (1200 psi) cold water wash after 2000 hours accelerated UV-condensation exposure in accordance with ASTM D4587.
    2. Graffiti resistance less than 7.5 as per ASTM D6578 after 2000 hours accelerated UV-condensation exposure in accordance with ASTM 4578.
    3. No signs of graffiti or graffiti staining and must be intact and exhibit no signs of streaking, cracking, pinholing, discoloring, or other visible coating degradation upon casual observation when tested in accordance with TXDOT TEX 890-B, Type III Method.
    4. Breathability of 10 perms (+/- 3) per ASTM D1653 using “wet cup method”.
    5. Elongation at break greater than 100% as per ASTM D412 (using die “D”).
    6. Adhesion rating of “8” – Difficult to remove” as per ASTM D6677 (Adhesion by knife).

16.8.1 Bridge Load Ratings

A load rating shall be performed for each vehicular bridge by the DBT per Section 900 of the ODOT BDM and per the “Proposed Plan to Include Special Hauling Vehicle in the ODOT Load Rating Process (Version 2.1)” available at the following location:

AASHTO BrR (formerly Virtis) or Bentley LARS Bridge shall be used to load rate bridges that are compatible with these programs. Programs listed in Section 920.2 of the 2007 BDM may be used to load rate bridges if Department preapproval is obtained. The DBT shall provide a rating manual for any bridge type that is not compatible with AASHTO BrR, Bentley LARS Bridge, or a program that has been preapproved by the Department for use on the associated bridge. The rating manual shall include a Microsoft Excel compatible spreadsheet in electronic format to load-rate the bridge for future permit vehicles (e.g., overweight or superload vehicles). The spreadsheet shall be capable of performing the analysis with the permit vehicle isolated and included with legal loads. Such vehicles may weigh up to 600,000 pounds, have as many as 25 axles with two to eight tires per axle, and have a width of 20 feet and a length of 200 feet.

Each bridge load rating submission shall include an electronic copy of the input and output files.

The bridge load rating report shall be submitted to the Department with the final Design Submittal.

16.9 PERMANENT RETAINING WALL CRITERIA

Cast-in-place or precast concrete fascia walls are required for all wall types not already consisting of Cast-In-Place or precast concrete exposed surface including soil nail walls, soldier pile walls, tangent pile walls and secant pile walls. Cast-in-place concrete facings shall have a minimum thickness of 12 inches and precast concrete facing shall have a minimum thickness of 5.5". The minimum front concrete to reinforcing steel cover shall be 2 ½ inches and back concrete cover shall be 2 inches. All concrete facing shall meet the aesthetic requirements included in Appendix AE-02 (Enhancement Plans). The Cast-in-Place Fascia wall requirement may be omitted on any exposed wall face that is not facing I-490, OH-10 or the Quadrant Roadway. The retaining walls may also be "conventional cast-in-place reinforced concrete" or "precast stem with cast-in-place concrete footing". The following requirements shall apply to the precast stem with cast-in-place concrete footing:

1. Footing shall be cast-in-place reinforced concrete
2. Precast wall units shall be integrated with the cast-in-place footing by the use of regular reinforcing steel.
3. The main reinforcing steel on the back face of a sloped counterfort shall be placed in two rows with a 6-inch clearance between rows.
4. Where fencing and/or parapets are required, wall thickness at the top shall be a minimum of 15 inches.
5. All reinforcing steel shall be epoxy coated or concrete should meet the requirement of section 515.15 of the Construction and Material Specifications.

All coarse aggregate shall have an absorption of 1 percent or greater as defined per ASTM C127. This requirement shall be included as a note in the Released for Construction Plans.

Permanent timber retaining walls are prohibited.

Modular block walls are prohibited for walls greater than 3 feet of exposed height. Units shall be produced by a licensed manufacturer. MSE walls with modular block facings are prohibited.

Timber lagging used as permanent structural element is prohibited.

Utilities shall not be placed within the reinforced soil mass of MSE walls, with the exception of roadway/storm drainage systems in Type B conduits in accordance with ODOT L&D Volume 2, Section 1002.3.2. Utilities shall be encased in casing pipe per BDM Section 301.7.

Drainage for overland flow shall be provided at the top of retaining walls preventing water from flowing across vertical faces of walls.

Slipform construction of concrete barrier on bridges, top of retaining walls or moment slabs shall be in accordance with C&MS Section 511.08 (Slipform Construction of Bridge Railing).

Retaining walls with an unprotected drop off of more than four (4) feet anywhere along its length shall have fencing for the entire length of the wall.

A. Fencing shall be mounted to wall with cast-in place anchors.
B. Fence anchors shall not be doweled.
C. Fence posts shall be installed vertical.
D. Fence shall per VPF-1-90 and posts, plates, tie wires, caulk and additional visual hardware shall be color black. In addition, the fence fabric shall be black vinyl-coated, chain link style.

For all retaining walls along OH-10 from begin work to the Kingsbury Run Bridge and retaining walls along the Quadrant roadway shall utilize the parapet and fence details from AE-02 (Enhancement Plans) and shall have a parapet and fence extended over the entire length of the retaining walls. Concrete barrier extending from the termination of retaining walls shall also adhere to the details in AE-02 (Enhancement Plans) and give a consistent appearance.

16.10 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	Number of Copies		Submittal Schedule	Reference Section
	Hardcopy	Electronic		
Demolition Plans	7	1	50 days before construction for bridges with railroad involvement, and 7 days before construction otherwise	16.3.2
Bridge Load Rating Reports	1	1	Submit each report with the final design submittal for each bridge. For bridges with multiple final design submittals, submit with the last submittal.	16.8.1
Bridge Load Rating Manuals	1	1	Submit each manual with the Released for Construction design submittal for each bridge	16.8.1

17 VEGETATIVE SCREENING

The DBT shall construct vegetative screening (landscaping) in the areas described below.

- The area bounded by the Quadrant Roadway to the north, E. 55th Street to the west, Francis Avenue to the south, and E. 59th Street to the east;
- The area bounded by OH-10 to the north, E. 59th Street to the west, Bower Avenue to the south, and E. 61st Street to the east;
- The area bounded by OH-10 to the north, E. 61st Street to the west, Butler Avenue to the south, and the GCRTA Kingsbury Run western property line to the east; and
- The area by OH-10 to the north, the GCRTA Blue/Green eastern property line to the west, 130 feet south of the OH-10 centerline, and E. 75th Street in the east.

The following requirements apply to the vegetative screening:

A. All portions of the areas defined above shall be planted with trees.
B. Trees shall be placed in an offset pattern with rows 15-foot apart and trees 15-foot on center in each row. Trees shall be planted in single species masses of at least 15 trees. Tree layout shall be established to entirely fill each of the areas designated above, with a minimum of one row of trees in each area. Where possible, both deciduous and evergreen species shall be provided.
C. Where possible, one or two rows of ornamental shrubs shall be placed in areas that abut residential properties. Ornamental shrubs shall be placed in an offset pattern with rows 7.5-foot apart and shrubs 7.5-foot on center in each row.
D. Trees shall be planted a minimum of 15 feet behind guardrail adjacent to roadway. The maximum distance between trees and guardrail shall be 20 feet, unless placement is otherwise preluded due to other constraints.
E. Trees shall be planted a minimum of 10 feet behind retaining walls, curbs, sidewalks or shared-use paths. The maximum distance between trees and retaining walls, curbs, sidewalks or shared-use paths shall be 15 feet unless placement is otherwise precluded due to other constraints.
F. No trees shall be planted within drainage ditches.
G. Tree and shrub layout shall allow for required intersection sight distances.
H. Only trees and ornamental shrubs from the list provided in Table 17-1 (Acceptable Plantings) shall be planted.

Table 17-1: Acceptable Plantings

Species	Common Name	Size	Comments
Deciduous Species			
Crataegus laevigata	Hawthorn	2-inch caliper	Balled and Burlapped (B&B)
Malus sp	Crabapple	2-inch caliper	B&B

Species	Common Name	Size	Comments
Gleditsia Triacanthos var. inermis	Honey Locust "Sunburst"	2-inch caliper	B&B
Acer saccharum	Sugar Maple	2-inch caliper	B&B
Tilia cordata	Little Leaf Linden	2-inch caliper	B&B
Koelreuteria paniculata	Golden Rain Tree	2-inch caliper	B&B
Quercus sp.	Oak species	2-inch caliper	B&B
Evergreen Species			
Pinus nigra	Austrian Pine	4-foot to 5-foot height	B&B
Picea pungens	Blue spruce	4-foot to 5-foot height	B&B
Ornamental Shrubs			
Syringa x prestoniae 'Donald Wyman'	Donald Wyman Lilac	5 Gallon	Container
Viburnum sp.	Viburnum species	5 Gallon	Container

18 AESTHETICS AND ENHANCEMENTS

The DBT shall design and build all aesthetics and enhancement elements of the Project following the principles and requirements of this Section 18 and the AE Appendices.

18.1 Bridge/Wall Enhancements

Aesthetic treatments on bridges and retaining walls are an important component of the Project. The DBT shall incorporate the following aesthetic details at all locations, except where noted within the Contract Documents, in accordance with Appendix AE-02 (Enhancement Plans) and Section 16 (Structures).

A. Architectural fencing and parapets
    1. The vertical fence dimension shall be eight feet on the E. 89th Street Pedestrian Bridge and the Norfolk Southern Bridge over OH-10. The vertical fence dimension shall be six feet at all other bridge and wall locations.
B. Four pylons per bridge
C. Architectural lighting for pylons (including all infrastructure for lights to function).
    1. In-ground flush mounted wall wash spotlights (2 required per pylon - 8 total).
    2. Perimeter LED lighting for artwork panels. LED lighting shall surround artwork panel on 4 sides as indicated in AE-02 (Enhancement Plans). Artwork to be provided and installed by others. Two sets per pylon are required.
D. Light columns and all infrastructure for lights to function. Light columns shall be installed on each bridge parapet and spaced at approximate 40 feet centers located approximately 40 feet from adjacent pylons and roadway light poles.
E. Bump-outs at street light locations
F. Pedestrian lighting on pedestrian bridges and pathways as needed to meet illumination standards in accordance with Section 19.5 (Lighting) and Appendix AE-02 (Enhancement Plans).
G. Architectural pier details
H. Architectural abutment, wingwall, and retaining wall treatments

18.1.1 Location Specific Enhancements

The DBT shall incorporate all requirements included in Section 18.1 except where noted below:

18.1.1.1 OH-10 over Kingsbury Run ravine

Architectural pier details, abutment, wingwall, and retaining wall treatments do not apply.

The pylon on the north side of the bridge at the westbound approach shall be modified to accommodate a concrete barrier wall transition section for roadside safety per Appendix AE-02 (Enhancement Plans).

18.1.1.2 Kinsman Road over GCRTA

Requirements included in Section 18.1 are not applicable to this structure.

18.1.1.3 OH-10 Eastbound over GCRTA Blue and Green Lines

Architectural pier details, abutment, wingwall, and retaining wall treatments do not apply.

Pylons, architectural parapet, and architectural lighting shall only apply to the south side of the structure. The DBT shall construct 42" single slope barrier with architectural fencing for inner parapet.

18.1.1.4 OH-10 Westbound over GCRTA Blue and Green Lines

Architectural pier details, abutment, wingwall, and retaining wall treatments do not apply.

Pylons, architectural parapet, and architectural lighting shall only apply to the north side of the structure. The DBT shall construct 42" single slope barrier with architectural fencing for inner parapet.

18.1.1.5 Norfolk Southern Railroad over OH-10

The DBT shall construct architectural pier details, abutment, fence, and wingwall treatments.

Fencing shall be provided per Appendix AE-02 (Enhancement Plans) with the following additions:

A. Fencing shall be installed on bridge parapet (curbing) per Norfolk Southern requirements.

B. Handrail shall be attached to the fence per Norfolk Southern requirements.

Other requirements included in Section 18.1 do not apply.

18.1.1.6 E. 89th Street Pedestrian Bridge

Architectural pier details, abutment, wingwall, and retaining wall treatments do not apply.

18.1.1.7 Retaining Walls

Retaining walls west of Kingsbury Run Bridge shall utilize architectural fencing, parapets, and retaining wall treatments. Other requirements included in Section 18.1 do not apply.

Retaining walls required at Norfolk Southern Railroad over OH-10 shall utilize architectural retaining wall treatments. Other requirements included in Section 18.1 do not apply.

For all other retaining wall locations, requirements included Section 18.1 do not apply unless visible by vehicular traffic on OH-10.

18.2 LANDSCAPE / STREETSCAPE ENHANCEMENTS

The DBT shall design and construct landscape enhancements as follows:

A. Trees shall be planted in all buffer areas including tree lawns, border areas with no walks, and curbed median islands along OH-10 and the Quadrant Roadway. Trees shall be omitted along OH-10 and interchange ramps from begin project to 1000 feet east of the begin project limit.
B. Site lines for safety shall be the responsibility of the DBT. Tree setbacks from curbs shall meet ODOT Standards.

C. Tree planting design shall be coordinated with street lighting design. Center of trees shall be offset from center of light pole a minimum of 25 feet.
D. Trees on opposite sides of road shall be symmetrical whenever possible. In certain cases, utilities may interrupt symmetrical alignment.
E. Tree species and spacing shall be as listed below, except when variation is required to achieve a symmetrical appearance on curved roadways or to avoid utilities.
    1. Platanus x acer 'Bloodgood' (20 feet on center)
    2. Cladarastis Kentuckea (20 feet on center)
    3. Ginkgo biloba 'Autumn Gold' (20 feet on center)
    4. Quercus macrocarpa (40 feet on center)
    5. Ulmus Americana 'Valley Forge' (20 feet on center)
F. Spacing for all species except Quercus macrocarpa may be increased to a maximum of 25 feet where variation is required based on the above criteria. Spacing may not be less than 20 feet on center. Quercus macrocarpa may be spaced as close as 35 feet on center if necessary to improve spacing and provide a more even distribution between light fixtures.
G. Trees shall be 2-inch caliper, or larger, size.
H. Trees of the same species shall be placed in groups of 3 to 8, with light fixtures used to determine breaks between species. Each species shall be distributed throughout the Project area. No planting area 200 feet or longer shall exhibit fewer than two species.
I. Refer to Appendix AE-01 (Landscaping Standard Construction Drawing Planting and Bracing) for required planting and staking details.
J. 2016 C&MS shall be modified as follows: Section 661.10 B shall be followed for all areas to be planted and/or mulched without regard to current vegetation, and with a non-selective herbicide followed by a pre-emergent herbicide, according to manufacturer's instructions. All herbicides used must be safe for trees that will be planted after treatment.

The DBT shall submit the landscape plans to the City of Cleveland for approval.

18.2.1 Maurice and Bellford Avenues

A row of ten (10) deciduous trees shall be planted on both the north and south sides of Maurice Avenue and Bellford Avenue between E. 55th Street and E. 61st Street. The trees shall be evenly spaced along the roadways to the greatest extent possible. Trees shall be of a single species and size according to Section 18.2 (Landscape/Streetscape Enhancements).

18.3 PUBLIC PLAZAS

Public Plazas at the following locations are anticipated as a separate contract:

- E55th Street/Quadrant Roadway intersection – northeast quadrant and southeast quadrant
- Kinsman/OH-10 – southeast quadrant and southwest quadrant
- E79th/OH-10 – northeast quadrant and southwest quadrant
- Buckeye/OH-10 Intersection – southeast quadrant
- Woodland/OH-10 Intersection – northwest quadrant and southeast quadrant

The DBT shall construct utility infrastructure to facilitate the future construction of all public plaza locations at intersections along in accordance with Section 7 (Utilities).

19 TRAFFIC CONTROL

The DBT shall design and construct traffic and pedestrian signals, signing, pavement markings, lighting, and other traffic control in accordance with the requirements in this Section 19 (Traffic Control).

19.1 GOVERNING REGULATIONS

Governing regulations are listed in Section 1.10 (Governing Regulations). For cases where guidance provided in the MUTCD conflicts with the OMUTCD, the OMUTCD shall govern unless specifically directed otherwise. For cases where City of Cleveland Specifications and Standards as shown in Appendix TC-01 (Traffic Control Provisions) conflict with Department standards, the City of Cleveland's Specifications and Standards shall govern.

All supplied items shall be listed on the Department's Qualified Products List (QPL) or Approved Lists, as applicable. Fabricators shall be on the Department's Certified Fabricators list.

19.2 TRAFFIC SIGNALS

A general overview of the anticipated Work required for each intersection is described in Section 19.2.1 (General Description of Work by Intersection). All traffic signal materials and equipment shall be new. Requirements that apply to all intersections are provided in subsequent sections, including specific equipment requirements. Section 7 (Utilities) includes utility requirements.

A. E. 55th Street & Quadrant Roadway (existing intersection with Francis Avenue, remove existing signal and construct new signal)
B. OH-10 & Quadrant Roadway (new intersection, construct new signal)
C. OH-10 & Kinsman Road (new intersection, construct new signal)
D. OH-10 & E. 75th Street (new intersection, construct new signal)
E. OH-10 & E. 79th Street (new intersection, construct new signal)
F. OH-10 & Buckeye Road (new intersection, construct new signal)
G. Woodland Avenue & E. 89th Street (remove signalized intersection)
H. OH-10 & Woodland Avenue (new intersection, construct new signal)
I. OH-10 & E. 93rd Street (reconfigure signal)
J. Buckeye Road & E. 89th Street (remove signalized intersection)
K. E. 55th Street & I-490 (remove signalized intersection)

19.2.1 General Description of Work by Intersection

19.2.1.1 E. 55th Street & Quadrant Roadway

A. Remove existing traffic signal installation.
B. Provide new mast arm signal installation. Provide crosswalks, pedestrian signals, and push buttons on all three approaches. Signalization of this intersection will require at least three mast arm structures with one mast arm mounted on each pole. The DBT is responsible for signal layout and design of the intersection in accordance with applicable Department and City of Cleveland design standards.
C. Furnish and install new controller, cabinet, and cabinet hardware.

D. All signal wiring shall be underground.
E. Coordinate power supply with CPP.
F. Furnish and install all necessary materials and equipment for fully functioning traffic signals, including loop detectors, pull boxes, and other equipment in accordance with Department and City of Cleveland design standards.
G. This intersection shall be interconnected with the OH-10 system.
H. Optimized intersection signal timing and phasing shall be coordinated with the City of Cleveland Division of Traffic Engineering prior to implementation.

19.2.1.2 OH-10 & Quadrant Roadway

A. Provide new mast arm signal installation. Signalization of this intersection will require at least three mast arm structures with one mast arm mounted on each pole. The DBT is responsible for signal layout and design of the intersection in accordance with applicable Department and City of Cleveland design standards.
B. Furnish and install new controller, cabinet, and cabinet hardware.
C. All signal wiring shall be underground.
D. Coordinate power supply with CPP.
E. Furnish and install all necessary materials and equipment for fully functioning traffic signals, including loop detectors, pull boxes, and other equipment in accordance with Department and City of Cleveland design standards.
F. This intersection shall be interconnected with the OH-10 system.
G. Optimized intersection signal timing and phasing shall be coordinated with the City of Cleveland Division of Traffic Engineering prior to implementation.

19.2.1.3 OH-10 & Kinsman Road

A. Provide new mast arm signal installation. Provide crosswalks, pedestrian signals, and push buttons on all four approaches. Signalization of this intersection will require at least four mast arm structures with one mast arm mounted on each pole. The DBT is responsible for signal layout and design of the intersection in accordance with applicable Department and City of Cleveland design standards.
B. Furnish and install new controller, cabinet, and cabinet hardware.
C. All signal wiring shall be underground.
D. Coordinate power supply with CPP.
E. Furnish and install all necessary materials and equipment for fully functioning traffic signals, including loop detectors, pull boxes, and other equipment in accordance with Department and City of Cleveland design standards.
F. This intersection shall be the master controller of the OH-10 system and shall be interconnected with the OH-10 system.
G. Optimized intersection signal timing and phasing shall be coordinated with the City of Cleveland Division of Traffic Engineering prior to implementation.

19.2.1.4 OH-10 & E. 75th Street

A. Provide new mast arm signal installation. Provide crosswalks, pedestrian signals, and push buttons on all four approaches. Signalization of this intersection will require at least four mast arm structures with one mast arm mounted on each pole. The DBT is responsible for signal layout and design of the intersection in accordance with applicable Department and City of Cleveland design standards.
B. Furnish and install new controller, cabinet, and cabinet hardware.
C. All signal wiring shall be underground.
D. Coordinate power supply with CPP.
E. Furnish and install all necessary materials and equipment for fully functioning traffic signals, including loop detectors, pull boxes, and other equipment in accordance with Department and City of Cleveland design standards.
F. This intersection shall be interconnected with the OH-10 system.
G. Optimized intersection signal timing and phasing shall be coordinated with the City of Cleveland Division of Traffic Engineering prior to implementation.

19.2.1.5 OH-10 & E. 79th Street

A. Provide new mast arm signal installation. Provide crosswalks, pedestrian signals, and push buttons on all four approaches. Signalization of this intersection will require at least four mast arm structures with one mast arm mounted on each pole. The DBT is responsible for signal layout and design of the intersection in accordance with applicable Department and City of Cleveland design standards.
B. Furnish and install new controller, cabinet, and cabinet hardware.
C. All signal wiring shall be underground.
D. Coordinate power supply with CPP.
E. Furnish and install all necessary materials and equipment for fully functioning traffic signals, including loop detectors, pull boxes, and other equipment in accordance with Department and City of Cleveland design standards.
F. This intersection shall be interconnected with the OH-10 system.
G. Optimized intersection signal timing and phasing shall be coordinated with the City of Cleveland Division of Traffic Engineering prior to implementation.

19.2.1.6 OH-10 & Buckeye Road

A. Provide new mast arm signal installation. Provide crosswalks, pedestrian signals, and push buttons on all four approaches. Signalization of this intersection will require at least four mast arm structures with one mast arm mounted on each pole. The DBT is responsible for signal layout and design of the intersection in accordance with applicable Department and City of Cleveland design standards.
B. Furnish and install new controller, cabinet, and cabinet hardware.
C. All signal wiring shall be underground.
D. Coordinate power supply with CPP.

E. Furnish and install all necessary materials and equipment for fully functioning traffic signals, including loop detectors, pull boxes, and other equipment in accordance with Department and City of Cleveland design standards.
F. This intersection shall be interconnected with the OH-10 system.
G. Optimized intersection signal timing and phasing shall be coordinated with the City of Cleveland Division of Traffic Engineering prior to implementation.

19.2.1.7 Woodland Avenue & E. 89th Street

A. Remove the existing traffic signal installation.

19.2.1.8 OH-10 & Woodland Avenue

A. Provide new mast arm signal installation. Provide crosswalks, pedestrian signals, and push buttons on all approaches including the pedestrian crossing across the WB right turn slip lane. Signalization of this intersection will require at least four mast arm structures with one mast arm mounted on each pole. The DBT is responsible for signal layout and design of the intersection in accordance with applicable Department and City of Cleveland design standards.
B. Furnish and install new controller, cabinet, and cabinet hardware.
C. All signal wiring shall be underground.
D. Coordinate power supply with CPP.
E. Furnish and install all necessary materials and equipment for fully functioning traffic signals, including loop detectors, pull boxes, and other equipment in accordance with Department and City of Cleveland design standards.
F. This intersection shall be interconnected with the OH-10 system.
G. Optimized intersection signal timing and phasing shall be coordinated with the City of Cleveland Division of Traffic Engineering prior to implementation.

19.2.1.9 OH-10 & E. 93rd Street

A. This signal installation is currently under construction by others as part of the Opportunity Corridor Section 2 project, including signal heads on all four approaches.
B. Furnish and Install loop detectors on the eastbound approach. Furnish and install pull boxes and conduit to connect the loops to the existing controller.
C. All signal wiring shall be underground.
D. This intersection shall be interconnected with the OH-10 system.
E. Optimized intersection signal timing and phasing shall be coordinated with the City of Cleveland Division of Traffic Engineering prior to implementation.

19.2.1.10 Buckeye Road & E. 89th Street

A. Remove the existing traffic signal installation.
B. Remove and do not replace stop lines and crosswalks on Buckeye Road at E. 89th Street.
C. Install stop signs, stop bars and crosswalks on both approaches of E. 89th Street at Buckeye Road.

D. Convert the E.89th Street to 2-way traffic between Buckeye Road and Evarts Road: allow on street parking on the east side of E.89th Street where feasible; install all pavement markings and proposed signs including stop line and stop sign at Evarts Road and E.89th Street intersection; remove all conflicting signs and pavement markings.

19.2.1.11 E. 55th Street & I-490

E. Remove the existing traffic signal installation.

19.2.2 System Requirements

The signalized intersections built in this Project and described in Section 19.2.1 (General Description of Work by Intersection) shall function as a new coordinated network. As such, signal interconnects shall be provided to those signals; the signal master is located at the OH-10 & Kinsman Road intersection. In addition, the equipment used to run the network shall be compatible with the City's system, as defined in Section 19.2.8 (Traffic Control Equipment).

The signalized intersections shall function with three signal timing patterns: AM peak, PM peak, and Average (non-peak). AM and PM peaks shall run during weekdays only. Signal timing for weekends shall run with the Average signal timing plan. The DBT shall optimize the signal timing for each intersection in the network and for the network as a whole for the three timing plans. Cycle lengths for the signalized intersections in the Project Limits are shown in Table 19-1. Additional information requirements are included in Section 19.2.17 (Intersection Analysis and Signal Timing).

Table 19-1: Cycle Lengths

Intersection	AM Plan	PM Plan	Average Plan
E. 55th & Quadrant Roadway	120	100	100
OH-10 & Quadrant Roadway	120	100	100
OH-10 & Kinsman Road	120	100	100
OH-10 & E. 75th Street	120	100	100
OH-10 & E. 79th Street	120	100	100
OH-10 & Buckeye Road	120	100	100
OH-10 & Woodland Avenue	120	100	100
OH-10 & E. 93rd Street	120	100	100

19.2.3 Points of Contact for Traffic Signals

Points of contact for coordination of traffic signal Work are:

Andy Cross

City of Cleveland
Division of Traffic Engineering
601 Lakeside Avenue
Cleveland, Ohio 44114
(216) 664-3197
ACross@city.cleveland.oh.us

Chris Hirzel
Department of Public Utilities
Cleveland Public Power
1300 Lakeside Avenue
Cleveland, OH 44114
(216) 664-3922
chirzel@cpp.prg

Ted Rader
Cleveland Electric Illuminating Company
6896 Miller Road
Brecksville, OH 44141
(440) 546-8738
radert@firstenergycorp.com

19.2.4 Signal Supports

A. Signal supports shall be galvanized steel mast arm design (SCD TC-81.21). A structure that diagonally spans the intersection and carries signal heads for multiple approaches is not allowed.
B. Signal supports shall comply with Appendix TC-01 (Traffic Control Provisions). The signal supports shall not consist of straight sections with a tapered effect accomplished by the use of reducers. Signal supports shall be constructed of single section true continuous tapered tubes and mast arms shall be constructed of one or two section true continuous tapered tubes. Signal supports shall be painted Dark Bronze. All supports shall be hot-dip galvanized prior to painting. Refer to Appendix TC-01 (Traffic Control Provisions) for additional information on the City of Cleveland paint specification.
C. Location of the mast arm signal supports shall be per the TEM and shall conform to ADA requirements for clearance and placement. Signal equipment locations shall be designed to minimize Utility conflicts.
D. Clearance from overhead electric wires shall comply with requirements of the National Electric Safety Code, Rule 232, and the requirements of the local power companies providing electrical service, whichever is more stringent.
E. Mast arm signal supports shall not include luminaire extensions.
F. Signal supports shall comply with C&MS 632.15 and 732.11.

G. Signal supports shall be grounded in accordance with C&MS 625.16. In addition, the DBT shall furnish and run a seven-strand #4 copper wire from the top of the ground rod and attach it to the neutral bar in the cabinet for each of the signalized intersections in the Project.
H. Pedestal-mounted traffic signal supports are not allowed, except for those needed for pedestrian heads at the intersections. Pedestals shall be painted Dark Bronze. Pedestals shall comply with C&MS 632.19 and 732.15.

19.2.5 Vehicle Signal Heads

A. LED signal lamp units shall meet the requirements of C&MS 632.06 and 732.04.
B. All lamp units shall be the 12-inch size. LED signal lamp units shall be provided for all circular red, circular yellow, circular green, red arrow, yellow arrow, and green arrow indications.
C. All lamp units shall have a five-year minimum warranty. The warranty shall be transferred to the City of Cleveland at the completion of the Project.
D. Signal heads and visors shall be constructed of polycarbonate plastic. The signal head housing and outside of visor shall be yellow, and the inside of the visors shall be flat black. All visors shall be cowl visors (cut-away).
E. The entrance fitting shall be of the tri-stud design with serrated rings in order to achieve positive locking.
F. Pipe, spacers, and fittings constructed of polycarbonate plastic may be used in lieu of galvanized steel or aluminum.
G. Proper exterior colors shall be obtained by use of colored plastic material rather than painting.
H. Back plates shall be provided on all mast arm-mounted signal heads, in accordance with C&MS 732.22 and Department's SCDs.
I. All signal heads shall be rigidly mounted to the mast arm. The signal head mounted on the highest portion of the mast arm (closest to the roadway centerline, highest vertical clearance) shall center the red lens in front of and in line with the mast arm. The other signal heads shall be placed so that the red balls of all signal heads are horizontally aligned with the signal head on the highest portion of the mast arm. Mast-arm-mounted signal heads shall comply with Department's vertical clearance requirements, per SCD TC 85.20.
J. All straps, hardware, nuts, and bolts shall be galvanized steel or stainless steel.
K. Drop pipes shall not be used.
L. Signal heads shall be mounted vertically. Horizontally mounted signals are not allowed.
M. The number, type, and placement of signal heads shall be per the OMUTCD (i.e., one head per lane for primary movements; red arrow lamp unit for protected-left and protected-right signal heads). A minimum of 2 signal faces per approach shall be required. On approaches with two or more primary through lanes, one overhead signal head shall be required for each through lane. Through lanes may share signal heads with adjacent turn lanes.
N. Optically programmed lenses shall not be used.
O. Near-side signal heads shall only be used as supplemental indications for far-side signal heads.
P. Supplemental signals shall be provided if the distance between the stop bar and the signal heads on the mast arm is greater than 120 feet.

Q. Supplemental signal heads mounted to pedestals or poles shall be attached to the side of the pedestal/pole (as shown in the Steel Pole Detail of Standard Construction Drawing TC-85.10). Mounting on the top of the pedestal/pole is not permitted. All vertical clearance requirements shall be maintained.
R. For protected/permissive operation of five-section signal heads (either left- or right-turn), the location of the signal head shall be over an extension of the channelizing line. In the event that a painted buffer separates the through lane from the turn lane, the signal head shall be located at the midpoint of the buffer.
S. Five-section cluster signal heads shall be provided for all approaches containing left turn lanes.

19.2.6 Pedestrian Heads, Features, and Accommodations

A. Pedestrian accommodations shall be provided on all approaches of signalized intersections within the Project limits, to include sidewalks, curb ramps, crosswalks, and pedestrian heads with countdown timers. Pedestal-mounted pedestrian heads shall be used where signal support locations do not meet ADA requirements. Pedestrian accommodations shall not be provided at the OH-10 & Quadrant Roadway intersection.
B. All pedestrian accommodations shall be ADA-compliant.
C. Pedestrian heads with countdown timer displays (single-unit hand/man overlay, countdown, LED, Type D [filled indication], 16-inch by 18-inch) shall be provided for all pedestrian movements, in accordance with C&MS 632.08 and 732.05 and the TEM. The following requirements shall also apply:
    1. The LED lamp unit shall display the symbols for the upraised hand or the walking person. A count-down timer shall be displayed during the clearance interval.
    2. Signal heads and visors shall be constructed of polycarbonate plastic.
    3. Pipe, spacers, and fittings constructed of polycarbonate plastic may be used in lieu of galvanized steel or aluminum.
    4. Housings shall be black. Proper exterior colors shall be obtained by use of colored plastic material rather than painting.
    5. All lamp units shall have a five-year minimum warranty. The warranty shall be transferred to the City of Cleveland at the completion of the Project.
    6. All pedestrian heads shall be installed with half-blind couplings.
    7. Pedestrian heads with audible signals shall not be provided or installed.
D. Pedestrian push buttons (PPBs) shall be provided for all pedestrian crossings.
E. PPBs shall comply with C&MS 632.09 and 732.06.
F. Signing for PPBs shall comply with the OMUTCD. These shall be R10-3e (R or L) signs, one for each PPB, with Type G sheeting and all mounting hardware.

19.2.7 Street Name Signs

A. Mast-arm-mounted street name signs shall be provided on new mast arm structures. See 19.3.2 (Signing Design).

19.2.8 Traffic Control Equipment

A. The DBT shall furnish and install an actuated, eight-phase, solid-state digital microprocessor type controller with secondary coordinator, menu-driven prompts, internal time-based coordination (TBC), telemetry unit, and all other accessories necessary to make the controller completely functional and operational at each of the signalized intersections where a new controller is required. The controllers shall be Siemen's Eagle EPAC M52 TS-2 Type 1 controllers. The controllers shall conform to C&MS 633.07 and 733.02. The controllers shall be installed in Eagle TS-2 Type 1 M-36 cabinets (ground-mounted). The controllers shall be shelf-mounted. The cabinets shall conform to C&MS 633.08 and 733.03. The DBT shall provide all necessary equipment within the controller cabinets to comply with the Department's standards and provide a fully functional cabinet capable of controlling the intersection as required. A Proprietary Waiver Request for the controller and cabinet has been included as Appendix TC-09 (Proprietary Waiver Request).

B. Controllers and cabinets shall include the following features:
    1. The following switches shall be mounted on the switch panel in the cabinet:
        a. Run/stop time
        b. Controller time power
        c. Coordination/free
        d. Detector test
        e. Flash control
    2. The following switches shall be accessible via a police panel door:
        a. Signal shutdown
        b. Flash control
        c. Manual pushbutton and 10-foot extension cord
        d. Automatic/manual transfer
    3. A service lamp with door-activated on/off switch shall be installed in the controller cabinet.
    4. A riser with a minimum height of 12 inches shall be installed at the base of the controller cabinet in accordance with C&MS 733.04, Part A.

C. Cabinets and risers shall be painted Dark Bronze and comply with Appendix TC-01 (Traffic Control Provisions).

D. Controller cabinet placement requirements:
    1. Adhere to ADA space requirements.
    2. Locate cabinet as far back from the curb as possible for technician access, while still being within the Right-of-Way.
    3. Allow for maximum visibility of signal heads.
    4. Allow for logical cable routing.
    5. The area in front of the cabinet door shall provide sufficient work space for technicians to access the equipment and remain within the Right-of-Way.
    6. Provide sidewalk and/or work pads for cabinet access. Work pad/access area shall be at least 6 feet by 4 feet.
    7. Do not mount within 2 feet of a shared-use path.

E. All signal installations shall be designed and equipped for "approach monitoring." If a two phase signal is used, a dual ring controller and cabinet wiring utilizing phases 2+6 and 4+8 will be furnished and installed.
F. An eight-phase controller cabinet shall be provided at all intersections.
G. Two-channel, rack-mounted detector units shall be provided for each loop detector.
H. The controller cabinet shall have lightning protection.
I. The controllers shall be pre-programmed with all current settings.
J. All controllers shall be capable of running a minimum of eight vehicle phases with four pedestrian phases and four overlaps with a minimum of 16 load switch bays.

19.2.9 Foundations

A. Provide foundations for all mast arms, pedestals, and cabinets. Foundations shall comply with C&MS, 632.14, and 633.10, SCDs, and the TEM.
B. Mast-arm structure foundations shall be installed prior to ordering the mast arm structures to ensure appropriate sizing of mast arms.
C. In accordance with C&MS 633.10, SCD TC-83.20 and the TEM, a new cabinet foundation shall be constructed at each signalized intersection with a reconstructed signal.

19.2.10 Signal Interconnect (Hard Wire)

Signal interconnect shall be provided between the intersections listed below, with the signal master at OH-10 & Kinsman Road. Signal interconnect shall run east-west along OH-10 and the Quadrant Roadway.

A. E. 55th St. & Quadrant Roadway (connect to OH-10 & Quadrant Roadway)
B. OH-10 & Quadrant Roadway (connect to E. 55th St. & Quadrant Roadway and OH-10 & Kinsman Rd.)
C. OH-10 & Kinsman Rd. (connect to OH-10 & Quadrant Roadway and OH-10 & E. 75th St.)
D. OH-10 & E. 75th St. (connect to OH-10 & Kinsman Rd. and OH-10 & E. 79th St.)
E. OH-10 & E. 79th St. (connect to OH-10 & E. 75th St. and OH-10 & Buckeye Rd.)
F. OH-10 & Buckeye Rd. (connect to OH-10 & E. 79th St. and OH-10 & Woodland Ave.)
G. OH-10 & Woodland Ave. (connect to OH-10 & Buckeye Rd and OH-10 & E. 93rd St.)
H. OH-10 & E. 93rd St. (connect to OH-10 & Woodland Ave)
I. OH-10 & Quincy Ave. (connect to OH-10 & E. 93rd Ave) (Proposed interconnect cable in existing conduit)

All interconnect shall be underground.

Interconnect shall be provided by continuous, twisted-pair cable between controllers; splicing is not allowed. Only shielded, six-pair, twisted-pair, interconnect cable shall be used. Alternate means of providing signal interconnect, including fiber optic, shall not be allowed within this defined network.

Interconnect for underground connections shall be provided in one of the two conduits in the conduit bank designated for traffic use. Conduit shall include a tone/wire and/or pull cord. Interconnect

conduit shall not be shared with other types of cable. Pull Boxes (17" x 30") shall be provided for the interconnect conduit. The maximum distance between signal interconnect pull boxes shall be 250 feet.

In areas where the conduit bank is not present, interconnect for underground connections shall be provided in a separate 3-inch conduit located in the right of way. Interconnect conduit shall be placed under unpaved areas, the shared-use path, or the sidewalk rather than the roadway, where possible.

19.2.11 Power Service

A. The DBT shall obtain electric power from CPP.
B. Power supply shall be 120 Volts Alternating Current (VAC).
C. The DBT shall be responsible for requesting and scheduling any inspections Cleveland Public Power may require for the power service hook-up. The DBT shall be responsible for contacting CPP for the electrical service connection. Under no circumstances shall the DBT splice power cable into the CPP's circuits. The DBT is responsible for obtaining any necessary permits and the paying of all fees. The DBT shall pay all power charges until the signals are accepted by the City of Cleveland.
D. Location and use of the power sources shall be confirmed with CPP, as appropriate.
E. Power service shall comply with C&MS 632.24.
F. Disconnect switches shall not be mounted to controller cabinets and shall be capable of being locked in the on and off position.
G. Aerial power service and/or service cables shall not be attached to mast arms.
H. The DBT shall furnish and install the foundations, signal support structures, cables, and other necessary equipment at intersection locations. The DBT shall supply all materials and labor for power source tie-ins except for final splice. The final splice shall be performed by CPP.
I. All new or relocated electric service enclosures shall be inspected by a licensed inspector prior to connection to a utility distribution line. The DBT shall apply for all inspections, pay the appropriate fees, and advise the Department and the City of Cleveland of the time of inspections so those agencies may have a representative in attendance. This inspection is not a substitute for final inspection by the Department and the City of Cleveland.

19.2.12 Loop Detectors and Loop Detector Units

A. Loop detectors shall be used for vehicle detection. Alternate means of detection are not allowed. Existing loop detectors shall not be reused.
B. Loop detector units shall comply with C&MS 632.10, 732.07, and 732.08, SCDs and the TEM. In addition, loop detector units shall have the following features:
    1. The output device shall be a relay, and all contacts shall be in the wiring harness.
    2. The unit shall be self-tuning.
    3. The unit shall be a two-channel amplifier.
    4. Each unit shall be labeled to correspond to its phase and direction.
    5. Delay inhibit shall be connected on all detector harnesses for their respective phase greens.
C. Loop detectors shall be installed in compliance with the TEM, SCDs, and C&MS 632.11 and 632.23. In addition, the following requirements shall be met:

1. Loop detectors shall be installed in the surface course of all pavement types.
2. Loop detectors shall be centered in the lane.

D. Loop detectors shall be used in all approach lanes at the new and reconstructed signalized intersections, with the exception of the OH-10 through lanes.

E. Two loops shall be installed per lane, one located immediately behind the other, to provide system redundancy. One 20' powerhead loop shall be constructed at the stop bar. A second 10' powerhead loop shall be constructed 10' behind the first loop. The width of the loop shall be determined by the lane width. A typical detail is included in Appendix TC-01 (Traffic Control Provisions). Each loop detector shall be connected to its own detector unit.

19.2.13 Emergency Vehicle Preemption

Emergency vehicle preemption shall not be provided.

19.2.14 Pull Boxes

A. Pull boxes shall comply with the City of Cleveland Pull Box Specification, provided in Appendix TC-01 (Traffic Control Provisions), C&MS 625.11, SCDs, and the TEM.

B. Pull boxes shall be appropriately sized for the number of conduit entrances, with a minimum size of 17 inches by 30 inches (nominal). Pull boxes with a size of 13 inches by 24 inches (nominal) are permitted for loop lead-in cable.

C. Pull boxes located adjacent to controller cabinets shall be 24 inches by 30 inches (nominal) fiberglass reinforced polymer.

D. Pull boxes shall not be located in curb ramp areas or in areas subject to vehicular traffic.

E. Pull box lids shall have the word "TRAFFIC," in capital letters, attached or embossed into the lid.

F. Existing pull boxes shall not be reused.

19.2.15 Conduit

A. Conduit shall be furnished and installed in accordance with the requirements of C&MS 625.12 and 725.051, SCDs, and the TEM.

B. All conduits shall be PVC. Conduit run lengths between pull boxes and/or signal poles shall not exceed 200 feet. Interim pull boxes, appropriately sized, shall be provided to connect intersections or features that are separated by distances greater than 200 feet.

C. Conduit shall be used for all signal wiring. Direct burial of cables is not allowed.

D. Existing conduit shall not be reused.

E. Conduit under roadway pavement shall be at least 3-inch diameter.

F. Conduit shall be sized for the number and size of the conductors contained in the conduit. Cable fill shall meet the requirements of the National Electric Code and the TEM.

G. All conduits shall be buried at a minimum depth of 3 feet below the pavement or ground surface.

H. All conduits shall be installed with open trenching, in accordance with C&MS Item 625.13. Jacking and boring are not allowed.

I. The location of underground conduit and buried electrical cables shall be marked by the use of continuous identifying tape buried in the trench above the conduit. The identifying tape shall be an inert material, approximately 6 inches wide composed of polyethylene plastic highly resistant

to alkalis, acids, and other chemical components likely to be encountered in soils. The tape shall be bright red with the words "TRAFFIC – ELECTRIC" in black capital letters, one side only. The tape shall be supplied in continuous rolls with the identifying lettering repeated continuously the full length of the tape. Identifying tape shall be buried over the conduit with one strip 6 to 10 inches below the finished grade. The tape shall be placed in the trench with the printed side up and shall be essentially parallel with the finished surface. The DBT shall take necessary precautions to ensure that the tape is not pulled, distorted, or otherwise misplaced in completing the trench backfill.

19.2.16 Cable and Wire

A. Cable and wire shall be furnished and installed in compliance with C&MS 632.23 and 732.19, SCDs, and the TEM.
B. Unswitched power cable shall not be run inside conduit, poles, or pull boxes containing other signal cables; power cable shall be run in its own individual conduit run. Pedestrian push button cables and signal cables may be run within the same conduit.
C. Lighting cables operating at voltages higher than 120 volts to ground shall not be run inside conduit, poles, or pull boxes with signal cables. Lighting circuit conductors shall be kept physically separated from signal cables if the lighting circuit does not originate in the signal switchgear. Lighting structures shall be separate from signal structures, as noted in Section 19.5 (Lighting).
D. All abandoned cables shall be removed from aerial spans, conduit, and pull boxes. Direct buried cables may be abandoned in place. Removed cables shall be disposed of by the DBT.
E. Signal cable connecting vehicle signal heads to the controller shall have a minimum of nine conductors.
F. Lead-in cable shall be provided in conduit. A minimum length of 4-foot slack shall be provided for all cable ends in pull boxes.

19.2.17 Intersection Analysis and Signal Timing

Traffic volume data is provided Appendix TC-05 (Opportunity Corridor Certified Traffic). Certified Opening Day/Design Year 2020 traffic volumes for the preferred (build) alternative shall be used for the development of signal timing and phasing.

The DBT shall perform system timing and analysis in accordance with the TEM. The current version of Synchro shall be used for signal timing plan analysis and development. Final timing plans and Synchro files shall be provided to the City of Cleveland for future use.

The DBT shall provide signal timing plans for AM Peak, PM Peak, and Average periods. Cycle lengths at the intersections in the Project limits are provided in 19.2.2 (System Requirements). The DBT shall optimize signal timing and phasing within the network cycle lengths shown in Table 19 1 (Cycle Lengths). The DBT shall provide signal phasing, timing, clearance intervals, min/max green, yellow interval, and other parameters necessary to optimize signalized intersection performance. The DBT shall field-verify the timing plans and make necessary in-field adjustments.

The signal timing plans for each intersection and for the network as a whole shall be optimized. The signals shall always be coordinated within the system and shall never run free or on flash.

The DBT shall notify the City of Cleveland Division of Traffic Engineering 24 hours prior to implementing signal timing and phasing plans or performing in-field adjustments.

23 CFR 940 documentation will not be required.

Provision of protected and protected/permissive left turns shall be based upon safety and/or capacity. Lead versus lag phasing shall be based on optimization of signal network coordination. Lagging left turns shall not be permitted where a left-turn trap (yellow-trap) would be created.

19.2.18 Final System Timing Adjustment and System Testing

The DBT shall field-verify operational effectiveness and efficiency of the traffic signals and the signal system network and provide final signal system timing adjustments as necessary. The DBT shall complete testing in accordance with C&MS 632.28 and 633.06.

19.2.19 Equipment Removal, Salvage, and Disposal

A. Existing traffic signal installations, including signal heads, cable, messenger wire, strain poles, pedestrian poles, luminaires, cabinet, controller, pull boxes, signs, and other equipment, shall be removed in accordance with C&MS 625.21, 630.12, and 632.26.
B. The DBT shall notify the Department and the City of Cleveland 48 hours prior to the removal of any existing traffic signal equipment. All removals shall be performed in the presence of a designated representative of the Department. Items shall not be removed until a new installation is in operation.
C. Removed items as indicated by City staff shall be returned to the City of Cleveland to the following location:

    Traffic Signal Unit
    4150 East 49th Street Bldg. #4
    Cleveland, OH 44105

D. Items to be returned shall include traffic signal heads, controllers, pedestrian pushbuttons, pedestrian signal heads, cabinets, pedestrian poles, and luminaires. Other materials shall be disposed of by the DBT. The DBT shall notify City of Cleveland Traffic Signal Unit and store the materials on Site, suitably protected, at a designated location for inspection by City staff within five Business Days of notification by the DBT. City staff will indicate which removed items shall be returned to their facility. The DBT shall deliver these removed items to the City facility. The DBT may dispose of materials not indicated for return within the five-day timeframe.

19.2.20 Final Acceptance and Guarantee

A. The DBT shall guarantee that the traffic control systems installed as part of this Project shall operate satisfactorily for a period of 90 Days following completion of the 10-Day performance test per C&MS 632.28. In the event of unsatisfactory operation, the DBT 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 DBT.

B. The guarantee shall cover the following items of the traffic control system: controllers, cabinet and associated equipment, detector units, and interconnect items. Customary manufacturers' guarantees and/or warrantees for the foregoing items and all traffic control equipment shall be turned over to the City of Cleveland following acceptance of the equipment.

19.2.21 Continuous Intersection Signalization

Signalized traffic control operations shall be maintained at all times by use of existing, temporary, or new traffic signals.

19.3 SIGNING

The DBT shall design, furnish and construct signing, sign supports and incidentals for all roadways within the Project Limits, to include informational, guide, regulatory, warning, wayfinding, shared-use path, and any other required signs. The DBT shall make all necessary modifications to signing outside the Project Limits rendered inaccurate by the Project. The DBT shall determine sign sizing, placement, and layout and include this information in the Design Documents.

19.3.1 Points of Contact for Signing

Points of contact for coordination of signing Work are:

Frank Konopka
Sign Coordinator
ODOT District 12
5500 Transportation Blvd
Garfield Heights, OH 44125
(216) 584-2105
Frank.Konopka@dot.ohio.gov

Andy Cross
City of Cleveland
Division of Traffic Engineering
601 Lakeside Avenue
Cleveland, Ohio 44114
(216) 664-3197
ACross@city.cleveland.oh.us

19.3.2 Signing Design

A. The DBT shall furnish and install all signs required by the OMUTCD.

B. The DBT shall remove and dispose of any signs rendered inaccurate or unnecessary by the Project. Specific attention is directed to major overhead guide signage along I-77, I-490, Ontario Street and Orange Avenue. See Appendix TC-07 (OH-10 Extension Schematic Layout) for a schematic plan of existing overhead signs to be modified by the DBT. Sign locations "N" and

"O", as shown on Appendix TC-07, are structure mounted guide signs and may not be in conformance with the current TEM with respect to lateral placement, exit distance, and pull through signage. The Department does not intend to modify these structure mounted sign foundation systems, therefore, will accept maintaining existing TEM deviations.

C. The DBT shall design, furnish and install replacement major overhead guide signage for all major overhead guide signage removed. All signs shall include the same level of information as the existing and also include updated destination information as well as SR-10 route shields and cardinal direction information. E. 55th Street will no longer be the primary destination to be included on the signage. The DBT shall assume "Opportunity Corridor Blvd" as the destination signage in their bid when determining required sign sizes. No overlaying of existing signage shall be permitted. Also, supplemental route shield signs and cardinal direction signs mounted to existing overhead signage or other sign supports shall not be used in lieu of new overhead signage. Along E.55th Street the DBT shall construct new level 3 overhead guide signage at the following locations. At locations "U" and "X", as shown on Appendix TC-07, the DBT shall construct new overhead signage on cantilever supports at the existing locations that direct the driver to OH-10 and I-490 via the Quadrant Roadway. See 19.3.2.J for considerations on reuse of the existing overhead sign supports. The DBT shall construct a new cantilever overhead support(s) with new level 3 overhead signage similar to locations "V" and "W" of Appendix TC-07, facing both directions of E.55th Street traffic to direct traffic to OH-10 and I-490 via the Quadrant Roadway. The new overhead support(s) and signage shall be located as near as practical to the Quadrant Roadway intersection with E.55th Street. The support(s) and foundation(s) shall be located on the east side of E.55th Street north of the Quadrant Roadway intersection and shall be located outside of the roadway clear zone and not be a hazard to bicycle/pedestrian traffic. On OH-10 eastbound, just west of the intersection of the Quadrant Roadway and on OH-10 westbound, just east of the Quadrant Roadway intersection, ground mounted major guide signs with level 1 signing shall be constructed on the right hand side of the road directing traffic to E.55th Street via the Quadrant Roadway.

D. The DBT shall remove and replace any signs and supports that are impacted due to the construction of the Project.

E. All freeway mainline major guide signs shall be overhead-mounted using standard Department support designs.

F. The mounting of overhead sign supports on bridges and other structures shall be minimized. For overhead sign supports mounted on bridges or other structures, where practicable, they shall be mounted directly to piers. If that is not possible, they shall be mounted to the barrier over the piers. No overhead sign supports shall be mounted mid-span.

G. SCD TC-18.26 structure-mounted signs shall not be used; signs that fall into this category must be placed off the structure on an independent support.

H. Beam supports of sizes larger than S4 x 7.7 that are subject to multidirectional impacts at intersections shall use the alternate connection described in SCD TC-41.10. Support assemblies shall comply with TEM Section 240.

I. A minimum vertical clearance of 17 feet shall be maintained between the bottom of the sign and the highest pavement elevation at all new overhead sign locations, to include all interstate

and non-interstate roadways. Where existing overhead sign supports are reused, the existing vertical clearance shall be maintained or improved. If an existing overhead sign support is reused, the centroid of the sign may be offset a maximum of one foot vertically from the center of the support to meet the minimum clearance requirement.

J. All signs shall be new. No reuse of existing ground-mounted supports shall be allowed. Re-use of overhead sign supports is permitted. The DBT shall provide design calculations showing the existing overhead sign supports are not overloaded by the proposed signage. If these calculations show the existing sign supports are inadequate, the DBT shall remove and replace the sign support and foundation to meet the design requirements. The DBT shall also remove and re-erect all other signs attached to the existing support and transfer to the new support. Signs and supports shall conform to the C&MS, the OMUTCD, the TEM, and the SDMM.

K. Sign post reflectors shall be provided on applicable post-mounted signs. See C&MS 630.04 for signs that require reflectors. All listed post-mounted signs in 630.04 shall have reflector strips.

L. Mast-arm-mounted street name signs shall be provided on new mast arm signal supports for intersections in the Project limits. Street name signs shall comply with the City of Cleveland Specifications and Standards provided in Appendix TC-01 (Traffic Control Provisions). Street name signs on the OH-10 shall be sized for the legend “Opportunity Corridor Blvd” and any potential sponsorship text as provided by the Department.

M. Stop and “Pedestrians Use Sidewalk” signs shall be located adjacent to shared-use paths where they intersect crossing streets. These signs shall be sized in accordance with Section 9 of the OMUTCD.

N. All roadways within the Project Limits shall be signed with “No Parking” regulatory signs unless otherwise directed by the City of Cleveland. The DBT shall coordinate with the City of Cleveland for specifics of regulatory zones and parking restrictions. “No Parking” signs shall be spaced at a maximum of 300’ and mounted on street light/utility poles where possible.

O. The DBT shall coordinate with GCRTA for bus stop sign design requirements and provide and install required signage at the anticipated bus stop locations identified in Section 12.1.9, per Appendix TC-01 (Traffic Control Provisions).

P. Regulatory lane use signage at intersections where required shall be ground mounted. Note, the City of Cleveland limits the use of lane use control signs to non-standard conditions (i.e., double left, exclusive right, and trap conditions).

19.3.3 Trailblazing Signage

Trailblazing signage shall be installed along the extension of OH-10. The OH-10 extension begins where existing OH-10 terminates at the intersection of Carnegie Avenue & Ontario Street in the City of Cleveland. The OH-10 extension overlaps portions of existing Orange Avenue, United States Route 422, Interstate Route 77, and Interstate Route 490; OC3 within the Project Limits; and the previously constructed OC2 and OC1 (which includes portions of E. 105th Street). See Appendix TC-07 (OH-10 Extension Schematic Layout) for a schematic plan of the proposed OH-10 extension.

19.3.4 Segregated Shared-Use Paths

The DBT shall design, furnish and install regulatory mode specific signage along the shared-use path/sidewalk located in the Project Limits where pedestrian traffic is segregated from bicycle traffic and other wheeled users. Two signs, one facing each direction of path traffic shall be placed at all locations where the path intersects adjacent pedestrian facilities from crossing streets. The spacing between sign in any direction shall not exceed 500 feet. The DBT shall submit designs of the signage to the Department for Approval prior to ordering and installation. The signs are intended to convey the operation of the segregated shared-use path and direct users to their appropriate paths. These signs shall be sized in accordance with Section 9 of the OMUTCD. Speed limit and "pass with care" signs shall not be used.

19.3.5 Sign Lighting

Sign lighting shall not be provided.

19.3.6 Removal and Disposal

The DBT shall remove and dispose of existing signs and supports. This applies to both the Department and City of Cleveland signs that are to be eliminated or replaced. Removed signs and supports shall become the property of the DBT.

19.4 PAVEMENT MARKINGS, DELINEATION, and RELATED ITEMS

19.4.1 Pavement Marking and Delineation Requirements

The DBT shall design, furnish, and construct all pavement markings and delineations within the Work Limits. Pavement marking and delineations shall be in conformance with the TEM, C&MS, SCDs, and the OMUTCD. Where pavement markings are listed as optional in these manuals, the DBT shall provide them.

Epoxy pavement markings (C&MS 646) shall be used for all pavement markings on concrete, including auxiliary markings. Thermoplastic pavement markings (C&MS 644) shall be used for all pavement markings on asphalt, including auxiliary markings.

Crosswalks shall be placed parallel with the flow line of the adjacent street. Crosswalks serving the shared-use path shall be 12 feet wide and marked with two parallel lines that are each 8 inches wide. All other crosswalks shall be 10 feet wide and marked with two parallel lines that are each 8 inches wide.

Lane arrows shall be provided for all turning lanes at intersections. Lane arrows shall be centered transversely in the lanes and be of appropriate scale.

Arrows shall be provided for two-way left-turn lanes. Two-way left-turn lane arrows shall be placed no further than 16 feet apart.

Dotted lane line extensions shall be provided for all double left turns.

Variable spacing for intersection striping shall be provided in accordance with the TEM.

Raised Pavement Markers (RPMs) shall be new and conform to C&MS 621, SCDs, and the TEM. They shall be placed on concrete and asphalt pavements in accordance with current design standards. Raised pavement markers shall only be installed on interstate mainline and ramp areas.

Barrier reflectors shall be new and conform to C&MS 626, SCDs, and the TEM. They shall be placed on bridge parapets, concrete barrier walls, retaining walls, and guardrails in accordance with current design standards. Guardrail blockout reflectors shall be installed on the side of the blockout away from traffic.

Object markers shall conform to C&MS 630, Sign, Flat Sheet Type G.

Turn lane lengths were designed in accordance with the Location & Design Manual using traffic conditions from the design year 2020 with the exception of locations where geometric constraints exist. The DBT shall meet the minimum turn lane length requirements shown in Table 19-2 (Turn Lane Lengths). Lengths are measured from beginning of the diverging taper to the stop bar.

Table 19-2: Turn Lane Lengths

Location	Minimum Lane Length
E. 55th St. at Quadrant SB left turn lane	460 feet
E. 55th St. at Quadrant WB left turn lane	420 feet
E. 55th St. at Quadrant WB right turn lane	420 feet
OH-10 at Quadrant NB left turn lane	305 feet
OH-10 at Quadrant NB 2nd left turn lane	270 feet
OH-10 at Quadrant NB right turn lane	305 feet
OH-10 at Quadrant WB left turn lane	630 feet
OH-10 at Kinsman EB (OC) left turn lane	320 feet
OH-10 at Kinsman NB (Kinsman) left turn lane	340 feet
OH-10 at Kinsman SB (Kinsman) left turn lane	205 feet
OH-10 at Kinsman WB (OC) left turn lane	350 feet
OH-10 at E. 75th St. EB left turn lane	630 feet
OH-10 at E. 75th St. NB left turn lane	145 feet
OH-10 at E. 75th St. SB left turn lane	140 feet
OH-10 at E. 75th St. WB left turn lane	395 feet
OH-10 at E. 79th St. EB left turn lane	445 feet
OH-10 at E. 79th St. NB left turn lane	255 feet
OH-10 at E. 79th St. NB right turn lane	255 feet
OH-10 at E. 79th St. SB left turn lane	390 feet
OH-10 at E. 79th St. WB left turn lane	650 feet
OH-10 at Buckeye Rd. SB (Buckeye) left turn lane	230 feet
OH-10 at Buckeye Rd. EB (OC) left turn lane	650 feet
OH-10 at Buckeye Rd. WB (OC) left turn lane	260 feet
OH-10 at Buckeye Rd. NB (Buckeye) left turn lane	420 feet
OH-10 at Woodland Rd. NB (Woodland) left turn lane	375 feet
OH-10 at Woodland Rd. EB (OC) left turn lane	315 feet
OH-10 at Woodland Rd. EB (OC) right turn lane	535 feet
OH-10 at Woodland Rd. SB (Woodland) left turn lane	220 feet

Location	Minimum Lane Length
OH-10 at Woodland Rd. WB (OC) left turn lane	210 feet
OH-10 at E. 93rd St. EB left turn lane	485 feet

Shared-use paths shall be painted with yellow dashed centerline striping along the center line of the paths. White stop bars shall be provided where shared-use paths intersect crossing streets.

Permanent lane and edge markings on interstate facilities shall be 6 inches wide. Permanent channelizing line markings on the interstate facilities shall be 12 inches wide.

19.5 LIGHTING

The DBT shall design and construct a roadway lighting system for all roadways within the Project Limits. This work shall include design and implementation of a complete and functional lighting system that integrates utility service, foundations, poles, luminaires, support and support hardware, service equipment, conduits, conductors, boxes, grounding components, commissioning, and testing.

19.5.1 Points of Contact

Points of contact for coordination of lighting Work are:

Chris Hirzel
Department of Public Utilities
Cleveland Public Power
1300 Lakeside Avenue
Cleveland, OH 44114
(216) 664-3922
chirzel@cpp.prg

Ted Rader
Cleveland Electric Illuminating Company
6896 Miller Road
Brecksville, OH 44141
(440) 546-8738
radert@firstenergycorp.com

19.5.2 Design Parameters

A. General:
   1. The DBT shall provide permanent lighting for the entire length of the roadway and pedestrian facilities.
   2. The DBT shall coordinate with CPP and ODOT to provide appropriate design methods, procedures, submittals, plan preparation, analysis methodology, review and comment processes, approval procedures, equipment specifications, and construction requirements
   3. Power Service(s) shall be coordinated with CPP. It is anticipated that power will be supplied from new pad mounted transformers distributed at intersections (up to 5

locations) along the corridor. CPP shall supply and install transformers on DBT constructed concrete transformer pads. The DBT shall coordinate pad size and locations with CPP. The street lighting systems shall be metered separately from the traffic signals and accent lighting.

4. All lighting equipment shall be new at the time of installation.
5. Existing lighting foundations, pull boxes and miscellaneous items no longer in service shall be removed and disposed of by the DBT, except for existing ducts and conduits, which can be abandoned in place. Existing light poles, luminaires and conductors removed on the Project shall be returned to CPP. The DBT shall notify CPP and store the materials on Site, suitably protected, at a designated location for pick up by CPP staff within 30 Workdays of notification by the DBT. The DBT may dispose of materials not picked up within the 30 Workday timeframe. All other equipment and materials no longer in service shall be removed and disposed of by the DBT.
6. The DBT shall ground all structures. The grounding system shall ground all metal items and appurtenances on all structures, including any and all decorative items. The grounding system shall include parallels for redundancy. The grounding system shall be constructed in accordance with SCD HL-50.21, with additional items as needed to provide a complete and acceptable grounding system.
7. The DBT shall maintain lighting and power service to customers within the Project Limits.
8. Lighting design shall minimize spillover lighting onto adjacent residential properties.
9. Light poles on bridges shall be located and constructed to suppress structurally-induced vibration.

B. OH-10 Lighting:
   1. OH-10 lighting applies to roadway East of E. 55th Street
   2. For the OH-10 lighting, the DBT shall provide a lighting system to illuminate the roadway to 1.4 footcandles minimum with a 3:1 average to minimum uniformity. Intersections shall have a minimum of 2.8 footcandles in the area defined by the normal stop bar placement. The calculations shall be performed with a 0.7 maintenance factor.

C. Cross Streets:
   1. Cross street lighting shall extend from the construction limits to the beginning of the curb radius for OH-10.
   2. Cross streets in the construction zone shall comply with the same lighting design criteria as OH-10 with the minimum footcandles for each cross street listed in Table 19-3. Luminaires shall be placed on shared use power poles owned by either CPP or First Energy. If no power poles exist, the DBT shall install wood poles along with the luminaires.
   3. Cross street lighting circuits shall be installed overhead except to cross OH-10, along E. 55th Street, and along the Quadrant Roadway where underground conductor in conduit shall be utilized.

D. ODOT Lighting:
   1. The ODOT lighting begins with the E. 55th Street underpass and extends west.
   2. For ODOT lighting, the DBT shall provide a lighting system to illuminate the roadway to illumination levels as outlined in the ODOT Traffic Engineering Manual (TEM). Supplemental Specification 813 shall apply for the ODOT luminaires.
   3. The existing median lighting in the construction limits shall be demolished.
   4. The existing 2 wire control center shall be relocated and reconnected to existing luminaires that are to remain.

5. A new 3 wire control center shall be installed for the new luminaires.

E. Pedestrian Lighting:
   1. All new and reconstructed pedestrian facilities, including sidewalks and shared-use paths, shall be illuminated.
   2. Pedestrian facilities that are adjacent to roadways shall utilize the roadway lighting system to provide pedestrian lighting.
   3. When the pedestrian facility deviates from the roadway and separate path lighting is required, the LED light fixture shall be the Cooper Galleon, appropriately sized for the application. Pedestrian lighting shall emulate the treatments shown for pedestrian bridges in the AE-02 (Enhancement Plans).
   4. Pedestrian facility lighting shall comply with the guidelines in IESNA RP-33-14. Calculations shall be performed with a 0.7 maintenance factor.
   5. LED pedestrian and accent lighting shall be installed in accordance with Section 18 (Aesthetics and Enhancements) and Appendix AE-02 (Enhancement Plans).

F. Accent Lighting:
   1. Accent lighting shall comply with the treatments shown in the AE-02 (Enhancement Plans).

Table 19-3: Cross Street Lighting Requirements

Location	Land use	Minimum Illumination (footcandles)	Circuit Configuration	Pole Type
E. 55th Street	Commercial	1.4	Underground	OH-10 Style Light Poles
Kinsman Road	Commercial	1.4	Overhead	Electric wood Poles
Buckeye Road	Commercial	1.4	Overhead	Electric wood Poles
E. 79th Street	Intermediate	1.2	Overhead	Electric wood Poles
Woodland Avenue	Commercial	1.2	Overhead	Electric wood Poles
E. 59th Street	Residential	0.3	Overhead	Electric wood Poles
E. 73rd Street	Residential	0.3	Overhead	Electric wood Poles
E. 75th Street	Commercial	0.8	Overhead	Electric wood Poles
E. 89th Street	Intermediate	0.6	Overhead	Electric wood Poles
Berwick Road	Residential	0.3	Overhead	Electric wood Poles
Bower Avenue	Residential	0.3	Overhead	Electric wood Poles
Bragg Road	Commercial	0.8	Overhead	Electric wood Poles
Butler Avenue	Residential	0.3	Overhead	Electric wood Poles
Evarts Road	Intermediate	0.6	Overhead	Electric wood Poles
Francis Avenue	Residential	0.3	Overhead	Electric wood Poles
Grand Avenue	Intermediate	0.6	Overhead	Electric wood Poles
Kennedy Avenue	Intermediate	0.6	Overhead	Electric wood Poles
Lisbon Road	Intermediate	0.6	Overhead	Electric wood Poles
Quadrant Road	Intermediate	0.6	Underground	OH-10 Style Light Poles
Rawlings Avenue	Intermediate	0.6	Overhead	Electric wood Poles
Colfax Road	Residential	0.3	Overhead	Electric wood Poles

19.5.3 Equipment Requirements

A. General:
   1. Lighting shall remain separate from traffic signal structures. Luminaire extensions on traffic signal mast arm structures are not allowed.
   2. The roadway, pedestrian and accent luminaires shall be 4000 K LED with a minimum rating of IP66 and a vibration rating of 3G.
   3. OH-10 and pedestrian luminaires shall have a five-year warranty

B. OH-10 Lighting:
   1. TC-08 (Lighting Specifications) shall apply.
   2. Conduit systems shall comply with CPP requirements.
   3. OH-10 poles shall be round tapered fiberglass and shall comply with CPP standards.
   4. All pole foundations shall be 6'-0" deep and comply with SCD HL-20-11.
   5. Each luminaire shall contain a photocell to automatically activate the luminaire before dusk and deactivate after dawn. The photocells shall employ zero-crossing switching.
   6. The luminaire mounting height shall be 30 feet, and the pole spacing shall be 150 feet nominal or as required to meet the minimum footcandle requirements.

C. ODOT Lighting:
   1. ODOT Standards shall apply.
   2. Light poles shall be mounted on the outside of the roadway.
   3. East 55th Street underpass lighting equipment shall comply with ODOT Standards. Luminaires shall be wall packs with glass lens.

D. Cross Street Lighting:
   1. TC-08 (Lighting Specifications) shall apply.
   2. Cross street lighting shall comply with CPP standards.
   3. Luminaires shall be mounted to the power poles.

E. Pedestrian Lighting:
   1. Where separate path lighting is required, the LED light fixture shall be the Cooper Galleon, appropriately sized for the application. The pole shall be square, non-tapered and provide 15 feet mounting height.
   2. AE-02 (Enhancement Plans) shall apply.

F. Accent Lighting:
   1. The DBT shall provide architectural lighting at each pylon and parapet in accordance with Section 18 (Aesthetics and Enhancements) and AE-02 (Enhancement Plans). Luminaires shall be on an independent metered circuit, controlled by a lighting master controller.
   2. Materials shall comply with the following requirements:
      a. Hard-anodized aluminum body
      b. Stainless steel screws and anti-theft tabs
      c. PVC sleeve
      d. Heat-treated, tempered, extra clear glass
      e. Die-cast stainless steel trim
      f. Anodized aluminum color
      g. Labeled UL, wet location
   3. Lighting shall include the following:
      a. Lighting calculations that demonstrate a minimum of 10 foot-candles average on illuminated surfaces of pylons at end of fixture life.

b. Details of how all light fixtures are to be mounted.
c. Details of how conduit and junction boxes are mounted on bridge. Surface mounting of conduits/conductors for accent lighting is prohibited.

19.5.4 Circuit Requirements

A. Underground circuitry is to be installed on OH-10, Quadrant Roadway, and E. 55th Street. Aerial cross street conductors on power poles may be used on cross streets beyond the OH-10 curb radius. The conduit system shall be PVC conduit, 4 - 2 inch conduits, accompanied by 2 - 5 inch supplemental conduits, in the same concrete encasement, on each side of the roadway. At intersecting roadways, the conduit system shall follow the curb return and cross the intersecting roadway at the far side of the curb return. Pull boxes shall be used on each side of street crossings. The DBT shall construct the two 5-inch conduits as part of the duct bank along OH-10 no further west than the OH-10/Quadrant Road intersection. Along the Quadrant Road the DBT shall construct the two 5-inch conduits on each side of the roadway, connecting to the OH-10 conduits, and terminating in pull boxes at East 55th Street signal installation. In addition, 2-2 inch traffic conduits shall be included in the same concrete encasement on one side of the roadway. When on a bridge, all 2" conduits shall be located in the parapet and, or sidewalk areas. 5" conduits may be supported under the bridge deck. Structure mounted conduits shall be fiber reinforced epoxy (0.095 inch minimum wall thickness) with expansion devices provided.
B. The lighting circuits shall be 240 volt (phase to phase) plus ground conductor. Circuit conductors shall be sized to meet CPP voltage drop requirements.
C. The lighting system for OH-10 shall be fed from 120/240 volt CPP transformers. The luminaires shall be 240 volt.
D. From each power source independent circuits shall be provided for each side and each direction of OH-10.
E. The lighting system for ODOT shall be the same voltage as is existing.
F. The DBT shall coordinate with CPP for power source location.
G. Pull boxes shall meet CPP requirements. Pull boxes for 2-inch street light and accent light circuits shall be 13 inches x 24 inches. Pull boxes for street light circuits shall be increased to 24 inches x 36 inches whenever additional conduits are required. Pull boxes installed in bridge parapets shall be 12 inches x 22 inches. Pull boxes for 2-inch signal circuits shall be as specified in Section 19.2.10 (Signal Interconnect (Hard Wire)). Pull boxes for supplemental 5 inch conduits shall be 36-inch x 36 inch, spaced at a maximum of 300 feet and located midway between adjacent light poles. Pull boxes for supplemental 5 inch conduits shall not be constructed on bridges provided pull boxes are located immediately outside each approach slab.
G. The easterly-most pull boxes of the lighting circuit shall connect to the lighting conduits to be constructed under OC2 (CUY-10-21.98, PID 98695).
H. Connector kits for poles and pull boxes shall comply with ODOT requirements.
I. System testing shall comply with ODOT standards.
J. Pull wires shall be provided in all empty conduits.

19.5.5 Underpass Lighting

Underpass lighting shall comply with Supplemental Specification 813 and shall be an LED wall pack style fixture with a glass lens.

19.6 SECURITY SURVEILLANCE SYSTEM

The security surveillance system shall consist of an Internet protocol (IP) camera assembly and communications equipment that are self-contained within a weatherproof, tamper-resistant enclosure

that can be mounted to signal supports, or other sturdy location as required by the Project. The general capabilities of the security surveillance system shall include remote pan/tilt/zoom (PTZ) control, local video and audio recording, motion detection, multicast streaming of video, and configurable alarm notification via wireless communications.

The DBT shall provide one security surveillance system at each new or reconstructed signalized intersection. The DBT shall coordinate security camera location and installation with the City of Cleveland Division of Public Safety, see Section 19.6.1 (Point of Contact for Security Surveillance System). The DBT shall power the camera assembly from the signal controller cabinet via a properly sized power cable. The DBT shall provide a Cat5e communications cable with RJ45 connector ends from the camera assembly to the signal controller cabinet and 10 feet of slack at the signal controller cabinet. All wiring shall be underground using traffic signal conduits and pull boxes. The DBT shall not provide any network connectivity to the Security Surveillance System.

Security surveillance system components shall meet or exceed the following requirements:

A. Camera Assembly
    1. Environmental
        a. IP66 and NEMA 4X rated
        b. Operational between temperature range -40 to +122 degrees F (-40 to +5048 degrees C)
        c. Maximum temperature 140 degrees F (60 degrees C)
        d. Polycarbonate clear dome
        e. Sun glare shield
        f. Quick release mount within camera dome

    2. Communications interfaces supported:
        a. Ethernet 10/100Base-TX (8P8C connector) POE; IPv4, IPv6 compatible

    3. Pan/Tilt/Zoom
        a. 360 degrees pan angle (max pan speed 450 degrees/second)
        b. 220 degrees Tilt angle (with 180 degrees pan flip)
        c. 32x Optical zoom, focal length f=4.4 to 142.6mm
        d. Adjustable pan, tilt, and zoom speed

    4. Camera/Video
        a. Resolution – High Definition (1280 x 720)
        b. Day/night modes
        c. Wide dynamic range
        d. Overlay text supported
        e. Video frame rate – variable to 30fps (1080p), up to 60 fps (720p)
        f. Support unicast and multicast video streams in the following video formats:
            i. H.264
            ii. MPEG-4
            iii. JPEG

    5. Detection
        a. Live stream video motion detection

b. Highlight compensation
c. Shock detection
d. Pre and post alarm video buffering
e. File upload via FTP, SFTP, HTTP, or HTTPS
f. Alarm email notification

6. Power consumption: 100-240VAC, max 74 W
   a. 16W typical, 60W max Powered by PoE

B. Enclosure

1. Environmental
   a. IP66 and NEMA 4X rated,
   b. Operational between temperature range -20 to +140 degrees F (-29 to 60 degrees C)

2. Housing
   a. Polycarbonate thermal plastic alloy construction
   b. Thermal blanket barrier for ultraviolet and temperature protection
   c. Vandal-resistant lockable cover
   d. Internal mounting space for network equipment and battery backup
   e. Aluminum backplate with DIN rail. Minimum 8" rail space over 2 rows

3. Power
   a. Internal power supply
   b. Input: 110/220 VAC
   c. Output: 48V/120 W
   d. Battery Backup w/ charger and Low Voltage Disconnect. 17.2 Ahr, 12 V Sealed Lead Acid Battery.

C. Ethernet Network Switch

1. Environmental
   a. Meets NEMA TS-2 (traffic control equipment)
   b. -40 to +60 degrees C operating temperature
   c. -40 to +85 degrees C storage temperature

2. Network switch shall meet the following requirements:
   a. Layer 2 managed switch.
   b. Small form factor – to be installed within enclosure unit as described in Item B.
   c. Power: 45-55VDC, 150W max draw.
   d. Two gigabit uplink Ethernet SFP ports.
   e. Two switched 10/100/1000 BaseT copper Ethernet (8P8C) ports.
   f. Six 10/100/100 BaseT copper POE (25W) ports
   g. Configurable in point-to-point, daisy-chain, ring, and mesh topologies for connectivity into new and existing fiber optic and copper based Ethernet networks.
   h. Operating system that allows individual ports to be configured for port mirroring, speed, duplex, auto-negotiation, and flow control. The operating system shall also provide for broadcast storm frame filtering with user defined thresholds.

i. Operating system that allows for the collection of statistics on a per port basis and provides for full support of Remote Monitoring (RMON) statistics, history, alarms, and event groups.
j. Operating system that provides port security to prevent unknown devices from gaining access to the network. Unauthorized attempts to access the network shall result in the port being shut down for a period of time along with Simple Network Management Protocol (SNMP) trap and alarm generation.
k. All modules and assemblies clearly identified with name, model number, serial number, or any other pertinent information required to facilitate equipment maintenance.
l. All equipment shall include licenses, where required, for any software or hardware in the system.
m. Power cables and patch cords required for complete installation of site equipment are to be considered incidental to the cost of the Ethernet Network Switch.

3. Network switch shall comply with the following Institute of Electrical and Electronics Engineers (IEEE) Standard Specifications:
   a. IEEE802.1ab LLD
   b. IEEE 802.1d: Spanning Tree Protocol
   c. IEEE 802.1p: Class of Services
   d. IEEE 802.1q: VLAN Tagging
   e. IEEE 802.1w: Rapid Spanning Tree Protocol
   f. IEEE802.1x User Authentication (Radius)
   g. IEEE 802.3: 10BASE-T
   h. IEEE 802.3: PoE
   i. IEEE 802.3ab: 1000BASE-TX
   j. IEEE802.3ad Port trunk with LACP
   k. IEEE802.3af Class 1 – 3 Power over Ethernet
   l. IEEE 802.3d: MAC Bridges
   m. IEEE 802.3u: 100BASE-TX, 100BASE-FX
   n. IEEE 802.3x: Flow Control
   o. IEEE 802.3z: 1000BASE-LX
   p. MSTP (802.1Q-2005)
   q. Link aggregation (802.3ad)
   r. RFC768: UDP
   s. RFC783: TFTP
   t. RFC791: IP
   u. RFC792: ICMP
   v. RFC793: TCP
   w. RFC826: ARP
   x. RFC854: Telnet
   y. RFC894: IP over Ethernet
   z. RFC1112: IGMP v1
   aa. RFC1493: Bridge MIB
   bb. RFC1519: CIDR
   cc. RFC1541: DHCP (client)
   dd. RFC1907: SNMP v2 MIB
   ee. RFC2012: TCP MIB
   ff. RFC2013: UDP MIB

gg. RFC2030: SNTP
hh. RFC2068: HTTP
ii. RFC2236: IGMP v2
jj. RFC2578: SNMP v2 SMI
kk. RFC2579: SNMP v2 TC
ll. RFC2819: RMON MIB
mm. RFC2863: IF MIB

19.6.1 Point of Contact for Security Surveillance System

The point of contact for coordination of Security Surveillance System Work is:

Larry Jones, II
City of Cleveland
Division of Public Safety
Information Technology & Services
205 West St. Claire Avenue, Suite 400
Cleveland, OH 44113
(216) 664-3733
LjonesII@city.cleveland.oh.us

19.7 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copes		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Optimized Intersection Signal Timing and Phasing Plans	Approval[1]	N/A	1	30 days prior to implementation.	19.2.1
Final Timing Plans and Synchro Files	Submit[1]	N/A	1	Upon Project Completion	19.2.17
Final Intersection and Network Timing Plans	Submit[1]	3	1	Upon Project Completion	19.2.17

Deliverable	For Acceptance, Approval, or Submittal	Number of Copes		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
Manufacturer's Traffic Control Equipment Guarantees and/or Warrantees	Submit[1]	1	1	Upon Project Completion	19.2.5; 19.2.6; and 19.2.20
Designs of Segregated Shared-Use Path Signage	Approval	1	1	30 days prior to ordering signage	19.3.4
Re-Used Overhead Sign Support Calculations	Approval	N/A	1	30 days prior to ordering signage	19.3.2

[1] Deliverable to the City of Cleveland (for acceptance, approval, or submittal).

20 MAINTENANCE OF TRAFFIC

The DBT shall be responsible for designing, providing, and maintaining safe and effective work zone traffic control 24 hours a day for the duration of the Project. All traffic control devices shall be furnished, erected, maintained, and removed by the DBT. Maintenance of traffic (MOT) shall be implemented in a manner that minimizes both construction duration and impact to the traveling public. This section defines specific requirements, restrictions, detours, and allowable closure durations for travel lanes. If, in the opinion of the Department, the DBT fails to comply with the requirements of the Traffic Management Plan (TMP) in Section 20.2 (Traffic Management Plan) and/or the Contract Documents, the Department shall suspend Work until all requirements are met. Any costs or delays incurred as a result of the failure shall be the full responsibility of the DBT.

This section only pertains to vehicular and pedestrian traffic. For maintenance of rail traffic see Section 8 (Railroads).

20.1 NOTIFICATION AND COORDINATION REQUIREMENTS

At the commencement of the Project, local traffic may be restricted due to the Opportunity Corridor Section 2 (PID 98695) Project to the north of this Project. Also during the course of the Project local traffic may be restricted due to the CCG6A project (PID 13567, Replacement of the I-77 bridge over I-490), CCG6B project (PID 82388, Replacement of the Broadway Avenue Bridge over I-77), and the resurfacing of E.55th Street (PID 101535). The DBT shall coordinate maintenance of traffic for the Project with the contractor for the OC Section 2 Project as well as the other projects mentioned above for the entire Project duration.

In addition to the notification requirements in Section 4 (Public Information and Communication), the DBT shall provide to the agencies listed below 14 Days advance written notice of pending changes in MOT or traffic patterns, including changes to any of the following: MOT configuration, property access, detours, work schedule, or work duration associated with the MOT. The notice shall include existing and proposed MOT configuration and all applicable changes affecting property access, detours, work schedule, and work duration.

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Chris Ronayne, President
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20.2 TRAFFIC MANAGEMENT PLAN (TMP)

The DBT shall develop a Traffic Management Plan (TMP) that serves as a manual for the Department and affected stakeholders of all components of the DBT's plan for maintaining traffic during construction. The TMP shall cover all phases of construction, from Notice to Proceed (NTP) to final Acceptance, defining and detailing specific MOT procedures and plans for each construction phase. The TMP shall include, at a minimum:

A. Cover page/title sheet signed and sealed by an Ohio-registered professional engineer.
B. Name, email, cell phone, home phone, and applicable certifications for the Work Zone Traffic Supervisor.
C. Public Information Plan (PIP) sections relevant to the TMP (see Section 4 (Public Information and Communication)).
D. Contact information included in Section 20.1 (Notification and Coordination Requirements) and additional contacts as deemed necessary by the DBT and Department.
E. Anticipated schedule showing MOT phases and durations, including closure durations. The schedule shall take into consideration snow and ice operations from December 1 through March 31. Lane shifts, restrictions, and closures may not be Approved if they adversely affect snow removal operations. This schedule shall coordinate with the Progress Schedule. The DBT shall coordinate with the Department to adjust closures durations in the case of unexpected snow and ice conditions outside the above timeframe.
F. Discussion of sequence of operations and MOT procedures, identifying all long-term lane closures and all complete directional roadway closures (short-term or long-term). Long-term shall mean any closures greater than 24 hours.
G. Plans at an appropriate scale showing: the Work area, begin/end tapers, temporary pavement and/or structures, locations of signs (existing signs and all proposed, covered, or modified signs), locations of typical sections, detour routes, portable changeable message sign (PCMS) locations, and references to applicable standard construction drawings (SCDs).
H. Typical sections showing: lane widths, pavement markings, drums, portable barriers, limiting stations, work area, and drop-offs.
I. Information and guidance for signing and detour routes, including color-coded definitions of detour routes.
J. Identification and use of Law Enforcement Officers (LEO) in conformance with C&MS 614 and Section 20.6 (Law Enforcement Officer with Patrol Car).

The TMP shall be submitted in electronic format 30 Days prior to implementation. Any changes to the TMP must be approved by the IQF and submitted to the Department a minimum of seven Days prior to desired implementation of the proposed change(s).

20.3 MAINTENANCE OF TRAFFIC REQUIREMENTS

The DBT shall maintain all vehicular traffic including bicycles and all pedestrian traffic at all times on existing, temporary, or new pavements per the OMUTCD Part 6, TEM Part 6, C&MS 614 and 615, MT Series Standard Construction Drawings, traffic plan insert sheets and ADA requirements.

The DBT shall show all MOT signing, including detour signing, pavement markings, barricades and/or barriers, temporary pavements, work zone traffic signals, arrow boards, PCMS, and other elements including temporary drainage required for each MOT phase in each MOT plan set, in accordance with Section 2.5.3 (Design Submittals). This includes existing elements to remain in place, elements from the previous phases, and new elements required to support MOT movements.

The DBT shall maintain or provide street lighting at all times in accordance with Section 19.5 (Lighting) for all traveled lanes and pedestrian routes by use of existing, temporary, new lighting facilities or any combination of those. If the DBT elects to use existing lighting equipment it shall be the responsibility of the DBT to evaluate the condition and functionality of existing lighting systems prior to bidding. The

existing systems will be given as-is to the DBT for use. Any necessary repairs, modifications or maintenance to the system so it may be utilized during construction will be the responsibility of the DBT. Any modifications to the existing lighting system shall be Approved by the maintaining agency and the Department prior to implementation.

20.3.1 Disincentives for Closures

Disincentives shall be applied to the DBT for the following closures:

A. Closures that exceed closure duration limits set forth in the allowable closures tables in this Section 20 (Maintenance of Traffic).
B. Closures not identified in allowable closures tables in this Section 20 (Maintenance of Traffic)

Disincentives for I-490 and other interstate highways shall be applied at the rate of $50 dollars per minute per lane, maximum of 15,000 per day. Disincentives for E.55th Street, Kinsman Road, E.75th Street, E.79th Street, Buckeye Road, and Woodland Avenue shall be applied at the rate of $25 dollars per minute per lane, maximum of $5,000 per day. Disincentives for all other local roads listed in Table 20-1 shall be applied at $25 dollars per minute per lane maximum of $3,000 per day.

20.3.2 Closure Requirements

Lane closures, restrictions or otherwise reducing the capacity over segments of the Project in which no associated contracted work is anticipated to begin within 24 consecutive hours, shall not be permitted.

A long-term stationary closure is defined as a planned lane closure greater than 24 hours in duration.

The DBT shall not close any lanes (except allowable long-term stationary closures) during periods when snow accumulation is probable. During these periods, daily isolated lane closures may be used during off peak hours, weather permitting. The DBT shall be responsible for clearing snow and deicing the roadway prior to reopening an isolated lane closure during a snow event.

The DBT shall not close lanes (except for allowable long-term stationary closures) during Holidays and Holiday Weekends. Holidays include New Year's Day, Easter, Memorial Day, Fourth of July, Labor Day, Thanksgiving, and Christmas. A Holiday Weekend, for traffic maintenance purposes, begins at noon on the last normal weekday preceding the Holiday. The Holiday Weekend is considered to end at 12:00 a.m. (midnight) on the first normal weekday following the Holiday. If the Holiday falls on a Thursday or Tuesday, the respective Friday and Monday shall be considered part of the Holiday Weekend.

Table 20-1: Off Peak and Allowable Long Term Stationary Local Street Closures

Local Street	Closure(s)	Additional Requirements
All Local Streets (Off Peak Complete Closures)	Overnight and weekend complete closures of local streets with traffic detoured in addition to Allowable Long Term Closures are permitted with overnight and weekend closures defined as: A. Weekday overnight closure: 8:00 p.m. through 6:00 a.m. (Sunday-Thursday) B. Weekend closure: 8:00 p.m. Friday through 6:00 a.m. Monday Complete closures will be permitted only with written Approval from the Department. Prior to commencing any closure(s), a plan including closure(s) duration(s), and detour route(s) (if necessary) shall be submitted to the Department two (2) weeks in advance of any closure. Approval from the Department shall be obtained by the DBT prior to commencing work. When Approval is obtained, notification shall be given to all parties listed in Section 20.1 (Notification and Coordination Requirements).	Department Approval Required.
All Local Streets (Off Peak Lane Closures)	Lane closures in addition to long-term stationary closures with traffic maintained are permitted on all local streets except the following: Lane closures (except for long-term stationary closures) are prohibited between 7 a.m. and 9 a.m., and between 3:30 p.m. and 6 p.m. weekdays. The same Department Approval process for Off Peak Complete Closures shall be followed.	Department Approval Required.
I-490 (Allowable Long Term Stationary A)	Eastbound I-490 may be restricted to two lanes at E.55th Street. Access to both northbound and southbound E.55th Street shall be maintained at all times.	I-490 Eastbound restrictions shall be concurrent with E. 55th Street Northbound long term stationary closure "A" and E.55th Street Southbound long term stationary closure "A".

Table 20-1: Off Peak and Allowable Long Term Stationary Local Street Closures

Local Street	Closure(s)	Additional Requirements
I-490 (Allowable Long Term Stationary B)	May be closed between I-77 and E.55th Street and traffic detoured for up to 730 Days in total.	I-490 long term stationary closure "B" shall be concurrent with E. 55th Street long term stationary closure "B".
E. 55th Street Northbound (Allowable Long Term Stationary A)	The outside lane (curb lane) between Francis Avenue and E.55th Street Bridge over GCRTA/NS may be closed for up to 120 Days in total.	E. 55th Street Northbound long term stationary closure "A" shall not be concurrent with E.55th Street Southbound long term stationary closure "A". Concurrent restrictions to access on Francis Avenue and Bower Avenue are prohibited. Local Access shall be maintained at all times.
E. 55th Street Southbound (Allowable Long Term Stationary A)	The outside thru lane between Francis Avenue and E.55th Street Bridge over GCRTA/NS may be closed for up to 120 Days in total.	E. 55th Street Southbound long term stationary closure "A" shall not be concurrent with E.55th Street Northbound long term stationary closure "A". Access to I-490 shall be maintained at all times. Local Access shall be maintained at all times.
E. 55th Street (Allowable Long Term Stationary B)	May be restricted to one lane of traffic in each direction from Grand Avenue to Bragg Road for up to 730 Days in total.	E. 55th Street long term stationary closure "B" shall be concurrent with I-490 long term stationary closure "B". Local Access shall be maintained at all times.
E. 34th Street (Allowable Long Term Stationary)	May be closed at Woodland Avenue and traffic detoured for up to 730 Days in total.	E. 34th Street long term stationary closure shall be concurrent with I-490 long term stationary closure "B". Local Access shall be maintained at all times via E.37th Street.
Bragg Road (Allowable Long Term Stationary)	May be closed from Praha Avenue to E. 54th Street and traffic detoured for up to 90 Days in total.	Local Access shall be maintained at all times. This is the piece of Bragg extending north from its intersection with Praha Avenue and not the east/west roadway from E.55th Street.

Table 20-1: Off Peak and Allowable Long Term Stationary Local Street Closures

Local Street	Closure(s)	Additional Requirements
Bower Avenue (Allowable Long Term Stationary)	May be closed between E. 55th Street and E.59th Street and traffic detoured.	Ingress/Egress for buses, automobiles and pedestrians to/from GCRTA E.55th Station shall be maintained at all times. East of E.59th Street, Bower Avenue shall have 2-way traffic at all times.
E. 57th Street (Allowable Long Term Stationary)	May be closed between Francis Avenue and Bower Avenue and traffic detoured.	May be utilized for GCRTA Access.
E.59th Street (Allowable Long Term Stationary)	May be closed between Francis Avenue and Bower Avenue and traffic detoured for up to 90 Days in total.	Local Access shall be maintained at all times.
Butler Avenue (Allowable Long Term Stationary)	May be closed between E. 61st Street and E. 64th Street and traffic detoured for up to 60 Days in total.	Local Access shall be maintained at all times.
E. 64th Street (Allowable Long Term Stationary)	May be closed at Butler Avenue.	Local Access shall be maintained at all times until proposed construction renders E. 64th Street obsolete and it is permanently closed.
Francis Avenue (Allowable Long Term Stationary)	May be closed between E. 55th Street and E. 57th Street and traffic detoured for up to 120 Days in total.	Local Access shall be maintained at all times.
Kinsman Road (Allowable Long Term Stationary)	May be restricted to one lane of traffic in the northbound direction only between Sidaway Avenue and Grand Avenue for up to 60 Days in total. In periods when the above one-way restriction is not in place Kinsman may be restricted to one lane of traffic in each direction for up to 60 Days in total.	Kinsman Road long term stationary closures shall not be concurrent with long term stationary closures on E. 79th Street and E.55th Street Allowable Long Term Stationary B. Southbound traffic shall be detoured during one-way period. Local Access shall be maintained at all times.
E. 66th Street (Allowable Long Term Stationary)	May be closed between Kinsman Road and Berwick Road and traffic detoured.	E. 66th Street long term stationary closure shall be concurrent with Kinsman Road long term stationary closure.

Table 20-1: Off Peak and Allowable Long Term Stationary Local Street Closures

Local Street	Closure(s)	Additional Requirements
Berwick Road (Allowable Long Term Stationary)	May be closed between E. 66th Street and the limits of turn around construction for the portion of the roadway to remain.	Berwick Road long term stationary closure shall be concurrent with Kinsman Road long term stationary closure.
E. 68th Street (Allowable Long Term Stationary)	May be closed between Kinsman Road and Colfax Road and traffic detoured.	E. 68th Street long term stationary closure shall be concurrent with Kinsman Road long term stationary closure.
E. 69th Street (Allowable Long Term Stationary)	May be closed between Kinsman Road and Falcon Road and traffic detoured.	E. 69th Street long term stationary closure shall be concurrent with Kinsman Road long term stationary closure. Local Access shall be maintained at all times.
Colfax Road (Allowable Long Term Stationary)	May be closed between E.68th Street and E. 69th Street and traffic detoured.	Colfax Road long term stationary closure shall be concurrent with Kinsman Road long term stationary closure. Local Access shall be maintained at all times.
E. 75th Street (Allowable Long Term Stationary)	May be restricted to one lane of traffic in the southbound direction between Grand Avenue and Holton Avenue for up to 90 Days in total.	Northbound traffic shall be detoured during the one-way period. Local Access shall be maintained at all times including but not limited to Orlando Baking Company.
Wagner Avenue/E. 73rd Street (Allowable Long Term Stationary)	May be closed between Grand Avenue and the limits of turn around construction for the portion of the roadway to remain.	Wagner Avenue long term stationary closure shall be concurrent with E.75th Street long term stationary closure. Local Access shall be maintained at all times.
E. 71st. Place (Allowable Long Term Stationary)	May be closed at Grand Avenue.	Local Access shall be maintained at all times.
Rawlings Avenue (Allowable Long Term Stationary)	May be closed between E. 75th Street and E. 83rd Street and traffic detoured.	Rawlings Avenue long term stationary closure shall be concurrent with E.75th Street and E. 79th Street long term stationary closures. Local Access shall be maintained at all times including but not limited to Orlando Baking Company and McTech Corp.

Table 20-1: Off Peak and Allowable Long Term Stationary Local Street Closures

Local Street	Closure(s)	Additional Requirements
E. 79th Street (Allowable Long Term Stationary)	May be restricted to one lane of traffic in the northbound direction between Holton Avenue and Ewald Road for up to 120 Days in total.	E. 79th Street long term stationary closure shall not be concurrent to E. 75th street long term stationary closure, or Kinsman Road long term stationary closure in periods where one-way traffic operation is in place. Southbound traffic shall be detoured during the E.79th Street one-way restriction. Local Access shall be maintained at all times including but not limited to Orlando Baking Company, McTech Corp. and GCRTA Rapid Station.
Lisbon Road (Allowable Long Term Stationary)	May be closed between Buckeye Road and Evins Avenue for up to 60 Days in Total.	Local Access shall be maintained at all times.
Evins Avenue (Allowable Long Term Stationary)	May be closed between Lisbon Road and Grand Avenue.	Local Access shall be maintained at all times.
Grand Avenue (Allowable Long Term Stationary)	May be closed at Buckeye Road for up to 60 Days in Total.	Grand Avenue long term stationary closure shall not be concurrent with Lisbon Road and Evins Avenue long term stationary closure. Local Access shall be maintained at all times.
Evarts Road (Allowable Long Term Stationary)	May be closed between Grand Avenue and Tennyson Road and traffic detoured for up to 60 Days in Total.	Evarts Road long term stationary closure shall not be concurrent with Tennyson Road long term stationary closure unless E. 89th Street is converted to two-way access between Buckeye Road and Evarts Road. Local Access including but not limited to Miceli's Dairy shall be maintained at all times.

Table 20-1: Off Peak and Allowable Long Term Stationary Local Street Closures

Local Street	Closure(s)	Additional Requirements
Tennyson Road (Allowable Long Term Stationary)	May be closed between Evarts Avenue and Buckeye Road and traffic detoured for up to 30 Days in Total.	Tennyson Road long term stationary closure shall not be concurrent with Evarts Road long term stationary closure unless E. 89th Street is converted to two-way access between Buckeye Road and Evarts Road. Local Access including but not limited to Miceli's Dairy shall be maintained at all times.
E.89th Street (Allowable Long Term Stationary A)	May be closed between Buckeye Road and Evarts Road and traffic detoured for up to 30 Days in Total.	E.89th Street long term stationary closure "A" shall not be concurrent with Tennyson Road long term stationary closure. Local Access including but not limited to Miceli's Dairy shall be maintained at all times.
E.89th Street (Allowable Long Term Stationary B)	May be closed between Buckeye Road and Woodland Avenue and traffic detoured for up to 45 Days in total.	E. 89th Street long term stationary closure "B" shall be concurrent with long term stationary closure for Woodland Avenue. Access to Ken Johnson Recreation Center via Kennedy Avenue shall be maintained at all times. Local Access shall be maintained at all times.
Buckeye Road (Allowable Long Term Stationary)	May be restricted to one lane of traffic in each direction from Woodland Avenue to E.90th Street for up to 120 Days in total.	Buckeye Road long term stationary closure shall not be concurrent to Woodland Avenue long term stationary closure. Local Access including but not limited to Miceli's Dairy shall be maintained at all times.
E. 87th Street (Allowable Long Term Stationary)	May be closed at Buckeye Road.	E. 87th Street long term stationary closure shall be concurrent with long term stationary closure for Buckeye Road. Local Access shall be maintained until proposed construction renders E. 87th Street obsolete and it is permanently closed.

Table 20-1: Off Peak and Allowable Long Term Stationary Local Street Closures

Local Street	Closure(s)	Additional Requirements
Cumberland Avenue (Allowable Long Term Stationary)	May be closed at E.89th Street for up to 45 Days in total.	Cumberland Avenue long term stationary closure shall be concurrent with E. 89th Street long term stationary closure "B". Local Access shall be maintained at all times.
Kennedy Avenue (Allowable Long Term Stationary)	May be closed for up to 45 Days in total.	Kennedy Avenue long term stationary closure shall not be concurrent with Woodland Avenue long term stationary closure. Access to Ken Johnson Recreation Center via Kennedy Avenue shall be maintained at all times.
Woodland Avenue (Allowable Long Term Stationary)	May be restricted to one lane of traffic in each direction between Buckeye Road and E.93rd Street for up to 120 Days in Total.	Woodland Avenue restrictions for this project shall not compromise MOT operations for Opportunity Corridor Section 2 that may be ongoing. Department Approval of all Woodland Avenue restrictions will be required prior to implementation. Woodland Avenue long term stationary closure shall not be concurrent with Kennedy Avenue and Buckeye Road long term stationary closures. Local Access including but not limited to Farm House Food Distribution shall be maintained at all times.
E. 93rd Street (Allowable Long Term Stationary)	May be restricted to one lane of traffic in each direction between Quincy Avenue and Woodland Avenue for up to 60 Days in Total.	E. 93rd Street restrictions for this project shall not compromise MOT operations for Opportunity Corridor Section 2 that may be ongoing. Department Approval of all E.93rd Street restrictions will be required prior to implementation. Local Access shall be maintained at all times.

20.3.2.1 Local Access Requirements

Ingress/egress of pedestrian and vehicular traffic to all properties shall be maintained at all times. If access to residential drives cannot be maintained, the DBT shall provide provisions to allow residents to park safely within the Project Limits. Provisions to maintain handicap access at all times shall be provided by the DBT for all properties. All of this shall be at the

Approval/direction of the Department. The maximum out of service time for any residential drive shall be seven Days. The DBT shall notify in writing property owners at least one week in advance of any access changes or constraints. Specific attention should be given to the placement of traffic control devices so as to not impede access.

20.3.2.2 Traffic Signals

The DBT shall be responsible for developing and coordinating signal timing and signal phasing modifications at existing and/or proposed traffic signals located within the project work limits and along both detour and alternate routes. All timing and phasing changes on City of Cleveland traffic signals shall be approved and implemented by the City of Cleveland Division of Traffic. The DBT shall provide 14 days' notice to the Division of Traffic for timing and phasing modifications. All physical modifications to traffic signal equipment including moving existing signal head locations, the addition of temporary signals heads, covering existing signal heads and other work associated with maintaining traffic signals shall be the responsibility of The DBT. The DBT shall return all signals unless noted elsewhere in the Contract to be permanently modified to their original configurations and coordinate with the Division of Traffic for The City to return signals to their original operation once the Department is satisfied the Project has reached a point the modifications are no longer necessary. Care shall be used while operating existing signal equipment. Any equipment damaged as a result of DBT negligence shall be replaced at the expense of the DBT. The DBT shall document all existing conditions prior to making modifications.

20.3.2.3 Detour Routes

The DBT shall provide a signed detour whenever all lanes in a direction of traffic are closed on a roadway. Any roadway utilized by the DBT for diverting traffic for more than 14 total Days through the life of the project shall be considered a detour route for maintenance and restoration purposes. All detour routes shall be Approved by the Department. The DBT shall use the prescribed detour route below associated with the respective allowable long term stationary closure. All other required closures that are not prescribed a detour within this section shall have the detour route developed by the DBT and Approved by the Department.

During the I-490 allowable long term stationary closure "B", detour traffic from I-77 Northbound and I-490 Eastbound intending to reach E. 55th Street via I-77 Northbound Exit 162A to Woodland Avenue to E.55th Street. Detour traffic from I-77 Southbound intending to reach E.55th Street via I-77 Southbound Exit 162A to Orange Avenue to Woodland Avenue to E.55th Street. Detour traffic on E.55th Street intending to reach I-77 Northbound via Grand Avenue to Kinsman Road to Woodland Avenue to the E.30th Street entrance ramp to I-77 Northbound. Detour traffic on E.55th Street intending to reach I-77 Southbound or I-490 Westbound via Grand Avenue to Kinsman Road to Woodland Avenue to Orange Avenue to the E.30th Street entrance ramp to I-77 Southbound.

During E. 75th Street's allowable long term stationary closure, detour traffic intending to travel Northbound on E. 75th Street via Holton Avenue to E. 79th Street to Woodland Avenue to E. 75th Street.

During E. 79th Street's allowable long term stationary closure, detour traffic intending to travel Southbound on E. 79th Street via Woodland Avenue to E. 75th Street to Holton Avenue to E 79th Street.

During Kinsman Road's allowable long term stationary closure, detour traffic intending to travel Southbound on Kinsman Road via Woodland Avenue to E. 79th Street to Kinsman Road.

During the time that traffic is detoured, the DBT shall maintain the non-interstate detour routes, including bridge deck surfaces, in a condition that is reasonably smooth and free from holes, ruts, ridges, bumps, and standing water.

The DBT shall be responsible for restriping all detour routes if striping conditions become considerably reduced in visibility as determined by the Department, and maintaining signing during the construction of the Project.

Prior to use as a detour the DBT shall document the existing condition of the route with a digital preconstruction audio-video recording and supply the documentation to the Department. The recording shall be provided as follows:

A. General
    1. Recording. Construction in any area shall not start until the area has been recorded and the electronic files submitted to Department.
    2. Visual Inspection. Prior to recording, all areas to be recorded shall be investigated visually with notation made of features not readily visible by video recording methods. This would include, but not be limited to, culverts (size, type and condition) and manholes that may be partially buried. Record all measurements made during the inspection.
    3. Approvals. All recording shall be conducted in the presence of the Department unless waived by the Department. At the start of recording, the DBT shall submit a sample recording of a portion of this Project for the Department to review. The DBT must obtain Approval of the sample recording before any other recording is allowed.
    4. Certification. Upon completion of the work, the DBT shall provide Certification in writing to the Department that all the requirements of the audio-video color recording for this Project were accomplished in accordance with these specifications.
        a) Identification. All recordings (DVDs and cases) shall be properly identified by recording number, location, and project name in a manner acceptable to the Department.
        b) Record. A record of the contents of each recording shall be supplied on a run sheet identifying each segment in the recording number, location, and project name in a manner acceptable to the Department.

c) Inventory. A brief report and inventory of all recordings completed, referenced by location and recording number, shall be furnished to the Department upon completion of the work and delivery of the recordings. All recordings and written records shall become the property of the Department.

B. Video Information
   1. Audio Preamble. Each recording shall begin with the current date, project name, and municipality and be followed by the general location (e.g., name of the street or property owner, location of cross country line, viewing side, and direction of progress).
   2. Date and Time. To preclude the responsibility of tampering or editing in any manner, all video recordings shall, by electronic means, display continuously and simultaneously generated transparent digital information to include the date and time of recording. The date information will contain the month, day and year; for example, 10/05/14. The time information shall consist of hours, minutes, and seconds separated by colons; for example, 10:35:18.
   3. Stationing. The Engineering stationing shall correspond to the project stationing and include the standard Engineering symbols (e.g., 14+84). The Engineering stationing shall represent the location of the camera. If the Engineering stationing is not recorded simultaneously with recording, the stationing shall be noted on Audio Track 1. This transparent information shall appear in the lower half of the viewing screen. Houses and buildings shall be identified by an address when visible.
   4. Information. Below the Engineering stationing, periodic transparent alpha numeric information consisting of the names of the project, name of the area covered, direction of travel, viewing side, etc., shall appear.

C. Coverage
   1. General. Recorded coverage shall include, but not be limited to, all existing driveways, sidewalks, curbs, ditches (drainage patterns are of particular concern), streets (including condition of paving for full width), landscaping, trees, culverts, catch basins, headwalls, fences, and visible Utilities located within the zone of influence of construction along the detour and haul routes. Of particular concern are existing faults, fractures, defects or other imperfections.
   2. Streets. Unless otherwise noted, streets and street areas shall be recorded by audio-video for full width of the zone of influence of construction, including both sides of the street. The term “street” shall be understood to mean street, highway, avenue, boulevard, road, alley, lane, driveway, parking lot, and all adjacent areas within the possible zone of the influence of construction along the detour and haul routes.

The DBT shall resurface detour routes associated with allowable long term stationary closures per Section 12 (Pavement) and install new pavement markings per Section 19 (Traffic Control) at the direction of the Department. The DBT shall be responsible for restriping detour routes if striping conditions become considerably reduced in visibility as determined by the Department in accordance with C&MS 614.11.A, and for maintaining signing during the construction of the Project. At the completion of the detour, it is required that the markings be determined to have

a numerical rating of seven or higher for durability, visual effectiveness and night visibility in accordance with Supplement 1047. Resurfacing limits for detours shall be limited to Holton Avenue from E. 75th Street to E. 79th Street. Resurfacing of other detour routes that may be required during the project would be paid for through a force account per 109.05C of the C&MS.

20.3.2.4 I-490 Closure Detour Special Provisions

In addition to the requirements of 20.3.2.2 (Traffic Signals) the DBT shall implement the following measures along the detour routes for the long term stationary closure B associated with I-490. All work in this section is also subject to the requirements of 20.5 (Work Zone Traffic Control Devices). The DBT shall modify I-490 Eastbound and Ramp WN to provide a two-lane exit ramp from I-490 Eastbound to I-77 Northbound. The DBT shall also modify I-77 Northbound so Ramp W-N enters as two add lanes. The DBT shall also modify I-77 Northbound and the exit terminal to Exit 162 to E.30th Street/Woodland Avenue and create a two-lane exit ramp. No reduction in the number of thru lanes on I-77 Northbound is permitted to create the two-lane exit terminal. Exit 162 shall remain two lanes for its entire length. At the intersection of Exit 162 and Woodland Avenue Eastbound the lane usage for the ramp shall be a right turn only lane and a shared thru/right turn lane creating a double right turn movement. Woodland Avenue Eastbound shall be reduced to one lane by closure of the right lane between Orange Avenue and Exit 162. The DBT shall provide a temporary traffic signal at the intersection of Exit 162 (from I-77 northbound) and Woodland Avenue Eastbound. The signal shall meet the requirements of the OMUTCD and TEM and be equipped with temporary traffic detection units. The traffic signal shall also have signal heads and detection to control westbound Woodland Avenue prior to its convergence with Exit 162 WB traffic. The DBT shall establish phasing and timing for the signal which creates and optimizes traffic operation during both AM and PM peaks and off-peak periods. All timing and phasing shall be Approved by The Department. The DBT shall also close East 34th Street at Woodland Avenue. East 34th Street vehicular and pedestrian traffic shall be detoured to East 37th Street. The existing traffic signal at East 34th Street shall be turned off and all existing signal heads covered. The existing bus stop on the north side of Woodland Avenue at E.34th Street shall be relocated. The DBT shall coordinate the relocation of the bus stop with GCRTA. When OH-10 to E.55th Street is opened and the detour is obsolete the DBT shall remove all temporary equipment, pavements and other incidentals and restore the intersections, interstates and ramps to its original configuration and operation.

At the intersection of Woodland Avenue, Kinsman Road and East 55th Street the existing traffic signal shall be modified for eastbound traffic on Woodland Avenue. New signal heads shall be added to the existing mast arm or other temporary supports allowing a protected double left turn movement to northbound East 55th Street. All conflicting signing shall be covered and conflicting pavement markings removed and temporary lane usage signing added as well as temporary pavement markings added to Woodland Avenue to develop the new lane configuration. The southbound approach of E.55th Street to Woodland Avenue shall have the curb lane converted to a right turn only lane. Temporary pavement markings and temporary lane usage signs shall be added to this approach and all conflicting pavement markings removed

and conflicting signage covered. A temporary signal head shall be added to the existing traffic signal mast arm or temporary supports to create a protected right turn movement. When OH-10 to E.55th Street is opened and the detour is obsolete the DBT shall remove all temporary equipment and restore the intersection and traffic control to its original configuration and operation. All temporary signal heads shall be new or like new quality. Prior to modifying existing mast arms the DBT shall analyze the capacity of the existing mast arm and signal pole to ensure proper capacity is available and present the analysis to the Department/City for Approval. Splices are only permitted at the permanent signal head locations. Additional tapping of mast arms is not permitted.

As part of a separate contract the Department will complete a project within the Innerbelt Trench of I-90 Westbound creating a 4th lane from Prospect Avenue to the I-77 Southbound Exit by making the Prospect Avenue entrance ramp an add lane condition. Once I-490/OC Boulevard have been reopened to traffic and the I-490 Allowable Long Term Stationary Closure B is no longer in place, the DBT shall restore I-90 Westbound to the current condition of 3 through lanes from the Prospect Avenue entrance ramp to the I-77 Southbound exit ramp, with the Prospect Avenue entrance ramp being converted back to a merge lane condition by resurfacing and restriping. The DBT shall plane and resurface: the I-90 WB entrance ramp from Prospect Avenue, mainline I-90 WB, E. 21st Street Entrance Ramp, and the SB I-77 exit ramp as described in Section 12 (Pavement). The resurfacing of I-90 WB and the associated ramps shall be full width, including shoulders and gore areas, and extend to the limits of all pavement marking revisions. Hydro blasting pavement marking removal will be permitted on concrete bridge decks. Thermoplastic pavement markings (C&MS 644) shall be used for all pavement markings on asphalt surfaces and epoxy pavement markings (C&MS 646) shall be placed on all concrete surfaces as shown in Appendix MT-03 (I-90 Westbound Lane Reconfiguration). The DBT shall remove and replace existing raised pavement markings (RPMs). The DBT shall evaluate the existing ground mounted signs within the resurfacing and restriping area and remove any signs that are in conflict with the final lane condition and replace them with conforming ground mounted signage. The DBT shall furnish and install ground mounted signs to conform to the final lane configurations, including but not limited to, two yield signs on the Prospect Avenue entrance ramp for the merge lane condition. The DBT shall remove and dispose of the I-77 South overhead guide signs on the existing truss, OH-802, and the existing cantilever, OH-805, as shown in Appendix MT-03 (I-90 Westbound Lane Reconfiguration). The DBT shall design, furnish and install replacement major overhead guide signage at these locations based on the final lane configurations. The DBT shall furnish and install all temporary traffic control and temporary pavement markings per C&MS 614 to complete these revisions. All work to complete the modifications to I-90 and associated interchange ramps as described above, including planning, resurfacing, pavement markings including RPMs, and sign removal and replacement, shall be paid for under the following pay item:

Item 614E99000 Special – I-90 Westbound Lane Reconfiguration

The DBT shall provide ground mounted major guide signs per the governing regulations on the approaches to the I-490 alerting drivers of the closure at I-77 in advance of major freeways. Signs shall be level 1 signage and be black on orange color scheme. Signs shall be provided at the following locations with the legend "I-490 CLOSED AT E. 55TH ST":

- I-90 Eastbound at W.44th Street
- I-90 Eastbound at W.25th Street
- I-90 Westbound just east of E.55th Street exit
- I-90 Westbound between Hamilton Avenue and St. Clair Avenue
- I-90 Westbound between Superior Avenue and Payne Avenue
- I-90 Westbound between Chester Avenue and Euclid Avenue
- I-71 Northbound between Fulton Road and Pearl Road
- I-71 Northbound just south of I-71 bridge over SR176
- SR176 Northbound at Jennings Road
- SR176 Northbound just north of the Steelyard Commons entrance ramp
- SR176 Northbound just south of the W.14th Street Exit
- I-77 Northbound at Harvard Avenue
- I-77 Northbound at Dalton Avenue

20.3.2.5 Haul Roads

The DBT shall comply with all load restrictions.

20.3.2.6 Closure of Completed Roadways

Prior to opening to traffic The DBT Shall furnish and place type III barricades, portable concrete barrier, road closed signs, object marker signs, barrier reflectors and other incidentals to the satisfaction of the Department to close all roadways, bicycle and pedestrian facilities not intended to be used at that time. When the project construction has been declared substantially completed and the roadway opened by the Department the DBT shall subsequently remove all closure appurtenances. Until that point these appurtenances shall be treated as work zone traffic control items and shall be maintained by the DBT.

20.4 GENERAL MOT CRITERIA

In addition to the applicable governing regulations, the TMP and MOT shall comply with the following:

A. Design speed
    1. Urban Interstate = 50 mph, 55 mph, 60 mph, 65 mph, as posted
    2. Urban Arterial = 25 mph, 30 mph, 35 mph, 40 mph, or 45 mph, as posted
    3. Urban Collector = 25 mph, 30 mph or 35 mph, as posted
    4. Urban Local = 25 mph
B. 10-foot lane width minimum on arterial, collector and local roads. 12-foot lane width minimum on E.55th Street temporary roadway. 11-foot lane width on interstates and interchange ramps.
C. 1-foot minimum clearance from traveled lane edge to toe of barrier/drum/barricade except on E.55th Street temporary roadway 4-feet shall be provided.
D. Pavement for E.55th Street temporary roadway shall be Class A per C&MS 615.
E. The DBT shall ramp all drop offs in work zones and exposed castings in resurfacing areas with Asphalt Concrete for Maintaining Traffic per C&MS 614.

20.5 WORK ZONE TRAFFIC CONTROL DEVICES

The DBT shall provide, erect, maintain and remove when no longer needed drums, signs, pavement markings, barriers, barricades, temporary pavement, temporary traffic signals and all other traffic devices used for MOT. If any of the above items are inadvertently moved, either by an errant vehicle or other reason, the DBT shall reset and replace them, if damaged, within four hours. The DBT shall maintain all devices in satisfactory condition in accordance with the Department's Quality Guidelines for Work Zone Traffic Control Devices.

The DBT shall provide, install, and maintain six Portable Changeable Message Signs (PCMS) for use during the entire duration of construction. The signs shall be Class A on the Department's approved list at:

http://www.dot.state.oh.us/Divisions/ConstructionMgt/Materials/Traffic%20Information/PORTABLE-CHANGEABLE.pdf

The PCMSs shall be full matrix and trailer mounted. Placement and relocation of the signs shall be in accordance with the Traffic Engineering Manual (TEM), OMUTCD or as directed by the Department. The DBT shall provide the Department with licensed software and wireless connection to supply control of the PCMS via laptop from a remote location.

The DBT shall remove conflicting pavement markings by use of high pressure water.

20.6 LAW ENFORCEMENT OFFICER WITH PATROL CAR

The DBT shall provide and use LEOs for the following situations in accordance with TEM note 642-55:

A. For lane closures, the use of LEOs is required during initial setup periods, tear down periods, substantial shifts of a closure point, or when new lane closure arrangements are initiated. LEOs shall be positioned in advance of and on the same side of the lane restrictions or at the point of road closure, and to manually control traffic movements through intersections in work zones.
B. Use of LEOs is required during the entire advance preparation and closure sequence where complete blockage of traffic is required, and at 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.

The above LEO work shall be included in the DBT's base bid for Item 614E99000 – Special Maintaining Traffic. Under Item 614E11110 – Special Law Enforcement Officer With Patrol Car For Assistance, the DBT shall include a separate bid for a uniformed City of Cleveland law enforcement officer with patrol car per the TEM, for use as directed by the engineer for safety and non-traffic control purposes. A quantity of 3000 hours of LEO time has been included as the basis of bidding for this item.

20.7 WORK ZONE TRAFFIC SUPERVISOR

The DBT shall provide and use a Work Zone Traffic Supervisor (WTS) in accordance with the TEM note 642-44. The WTS shall be available 24 hours per day, seven days per week for the duration of construction.

20.8 CONSTRUCTION NOISE

The DBT shall coordinate and obtain any permit and/or variance required to perform nighttime work, which will be necessary for this Project.

20.9 DELIVERABLES

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the DBT shall submit the following to the Department:

Deliverable	For Acceptance, Approval, or Submittal	Number of Copies		Submittal Schedule	Reference Section
		Hardcopy	Electronic		
TMP	Approval	NA	1	30 days prior to implementation. See scope for information on revisions.	20.2