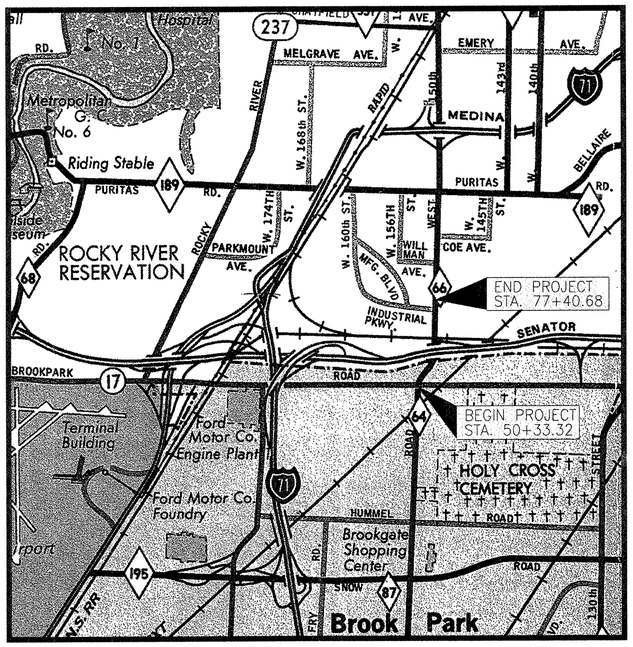
CUY-WEST 150th STREET

COUNTY ROUTE 66

WIDENING AND RECONSTRUCTION OF EXISTING ROADWAY

CITY OF CLEVELAND
CITY OF BROOK PARK
CUYAHOGA COUNTY



LOCATION MAP

DESIGN DESIGNATION – W. 150th STREET

CURRENT ADT (2007)	26,525
DESIGN YEAR ADT (2027)	31,675
DESIGN HOURLY VOLUME (2027)	2,850
DIRECTIONAL DISTRIBUTION	60%
TRUCKS (24 HOUR B&C)	3%
DESIGN SPEED	35 MPH
LEGAL SPEED	35 MPH

DESIGN FUNCTIONAL CLASSIFICATION – URBAN MINOR ARTERIAL

DESIGN DESIGNATION – INDUSTRIAL PARKWAY

CURRENT ADT (2007)	7,640
DESIGN YEAR ADT (2027)	9,130
DESIGN HOURLY VOLUME (2027)	820
DIRECTIONAL DISTRIBUTION	60%
TRUCKS (24 HOUR B&C)	3%
DESIGN SPEED	35 MPH
LEGAL SPEED	35 MPH

DESIGN FUNCTIONAL CLASSIFICATION – URBAN MINOR ARTERIAL

UNDERGROUND UTILITIES

TWO WORKING DAYS
BEFORE YOU DIG
CALL 1-800-362-2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
CALL 1-800-925-0988 (TOLL FREE)
OIL AND GAS PRODUCERS
UNDERGROUND PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

DESIGN VARIANCES
NONE

PLAN PREPARED BY:
EUTHENICS INC.
CONSULTING ENGINEERS
8235 MOHAWK DRIVE, STRONGSVILLE, Ohio

ENGINEERS SEAL:

STATE OF OHIO
RONALD A. BENDER
31771
REGISTERED
PROFESSIONAL ENGINEER

SIGNED: Ronald A Bender
DATE: MARCH 29, 2007

INDEX OF SHEETS

RECEIVED
APR 23 2007
PRODUCTION DEPT.

2005 SPECIFICATIONS

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

MAINTENANCE OF TRAFFIC ENDORSEMENT

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

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE FULL DEPTH REPLACEMENT AND WIDENING OF W. 150th STREET FROM BROOKPARK ROAD TO JUST NORTH OF INDUSTRIAL PARKWAY, APPROXIMATELY 2700 FEET. INDUSTRIAL PARKWAY WILL ALSO BE REPLACED FOR APPROXIMATELY 450 FEET. A SMALL PORTION OF I-480 EXIT RAMP WILL BE RECONSTRUCTED. A NEW DRAINAGE SYSTEM WILL BE INSTALLED, AND A SANITARY TRUNK SEWER WILL BE CONSTRUCTED FROM THE EXISTING 60" STUBBED SEWER AT THE NEORSD DROP STRUCTURE.

APPROVED _____ DATE 4/11/07
COMMISSIONER, DIVISION OF ENGINEERING AND CONSTRUCTION, CITY OF CLEVELAND

APPROVED _____ DATE 4/10/07
COMMISSIONER, DIVISION OF WATER, CITY OF CLEVELAND

APPROVED _____ DATE 4/5/07
COMMISSIONER, DIVISION OF WATER POLLUTION CONTROL, CITY OF CLEVELAND

APPROVED _____ DATE 04-10-07
COMMISSIONER, DIVISION OF TRAFFIC, CITY OF CLEVELAND

APPROVED _____ DATE 4/11/07
CHIEF ENGINEER, DIVISION OF ENGINEERING AND CONSTRUCTION, CITY OF CLEVELAND

APPROVED _____ DATE 4/14/07
CHIEF SURVEYOR, BUREAU OF PLATS AND SURVEYS, CITY OF CLEVELAND

APPROVED _____ DATE 4/4/07
CHIEF INSPECTOR, DIVISION OF ENGINEERING AND CONSTRUCTION, CITY OF CLEVELAND

APPROVED _____ DATE 4/12/07
CONSULTING ENGINEER, DIVISION OF ENGINEERING AND CONSTRUCTION, CITY OF CLEVELAND

APPROVED _____ DATE 4/13/07
DIRECTOR OF PUBLIC SERVICE, CITY OF BROOK PARK

CLEVELAND PROJECT NO. M-1004

TITLE SHEET

CUY-WEST 150th STREET

1
146

MMP 4/19/07 PLOT 1=1

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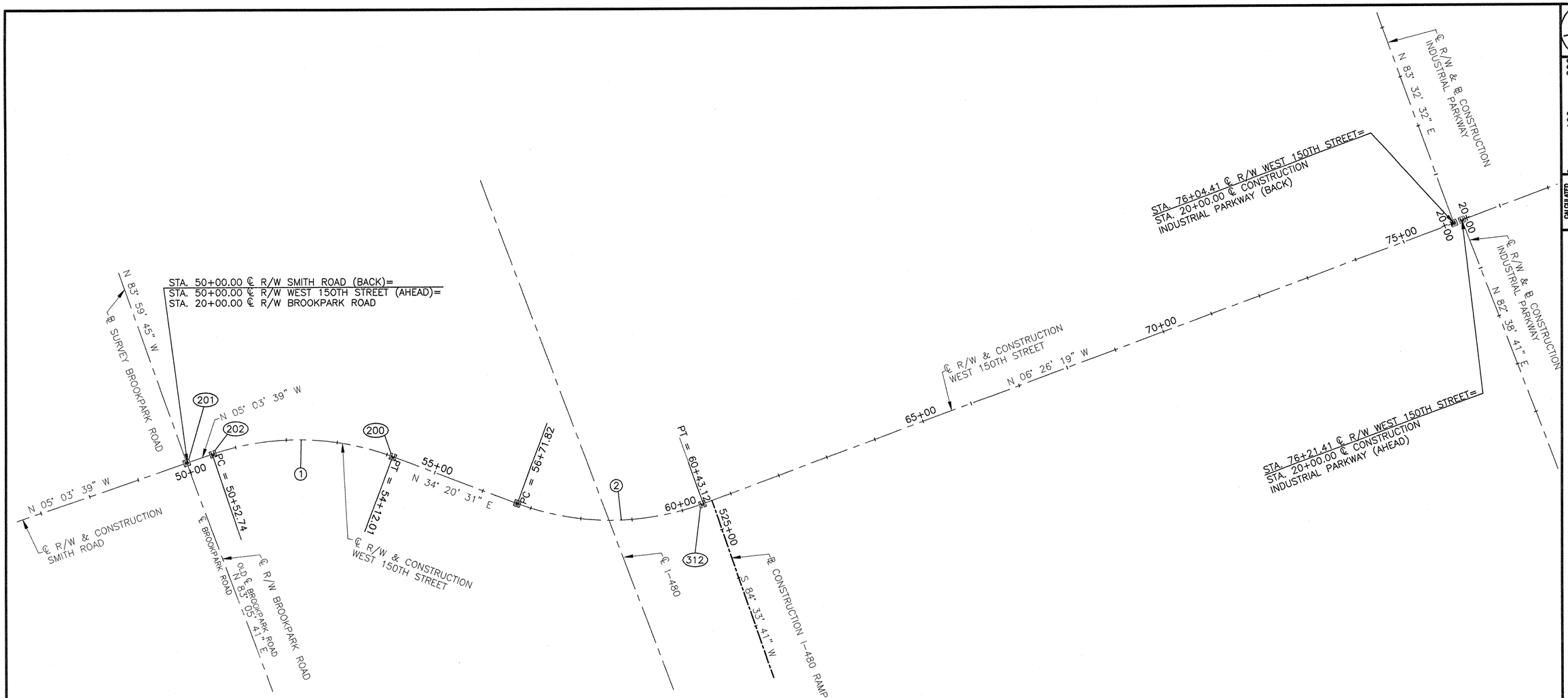


℄ R/W & CONSTRUCTION WEST 150TH STREET CONTROL				ITEM 604 MONUMENT ASSEMBLY	ITEM 604 MONUMENT REPLACED AND SET TO GRADE	LOCATION
POINT	NORTHING	EASTING	DESCRIPTION			
201	9965.4351	10085.3308	IRON PIN MON. FOUND			50+00.00
	10017.9696	10080.6784	PC CURVE 1			50+52.74
202	10018.6906	10080.6012	IRON PIN MON. FOUND		1 EACH	50+53.47.0.01'LT.
	10204.3081	10064.1765	PI CURVE 1			52+39.81
	10358.7672	10169.7072	PT CURVE 1			54+12.01
200	10358.8088	10169.7356	IRON PIN MON. FOUND		1 EACH	54+12.06
	10573.2842	10316.2710	PC CURVE 2	1 EACH		56+71.82
	10733.3900	10425.6596	PI CURVE 2			58+65.72
312	10923.9451	10404.2415	IRON PIN MON. FOUND		1 EACH	60+40.97.0.09'RT.
	10926.0735	10403.9152	PT CURVE 2			60+43.12
	12477.5166	10228.8343	INT. OF ℄ R/W INDUSTRIAL PKWY. (WEST)	1 EACH		76+04.41
	12494.4094	10226.9279	INT. OF ℄ R/W INDUSTRIAL PKWY. (EAST)	1 EACH		76+21.41
TOTAL CARRIED TO BID SCHEDULE				3 EACH	3 EACH	

WEST 150th STREET CURVE 1 DATA
P.I. STA. 52+39.81
Δ = 39° 24' 10"
DC = 10° 58' 03"
R = 522.42'
T = 187.07'
L = 359.27'
E = 32.48'

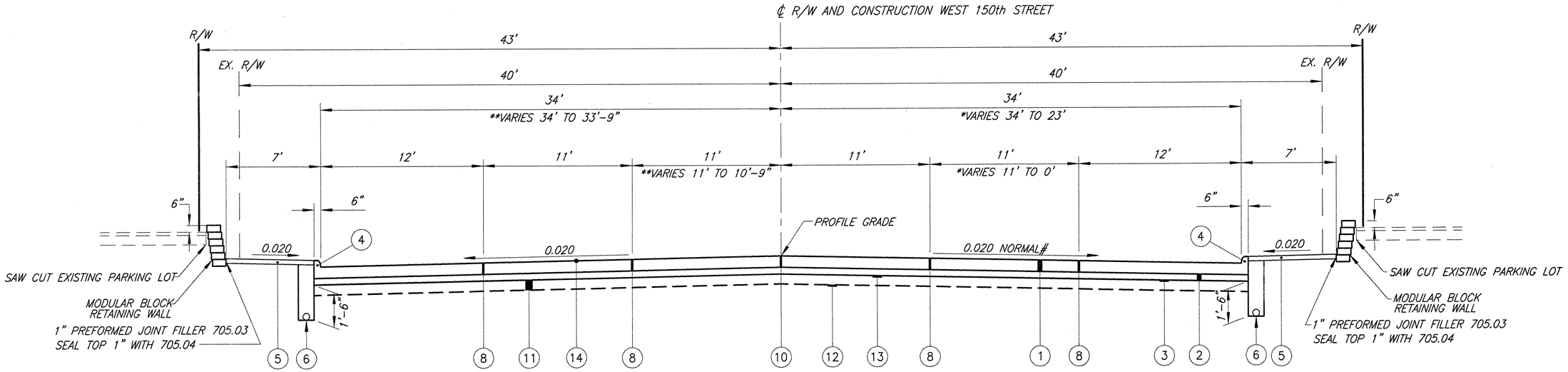
WEST 150th STREET CURVE 2 DATA
P.I. STA. 58+65.72
Δ = 40° 46' 50"
DC = 10° 58' 59"
R = 521.67'
T = 193.91'
L = 371.30'
E = 34.87'

N
0 100 200
HORIZONTAL SCALE IN FEET

CALCULATED JLN
CHECKED EPS

GEOMETRIC LAYOUT

CUY-WEST 150TH STREET

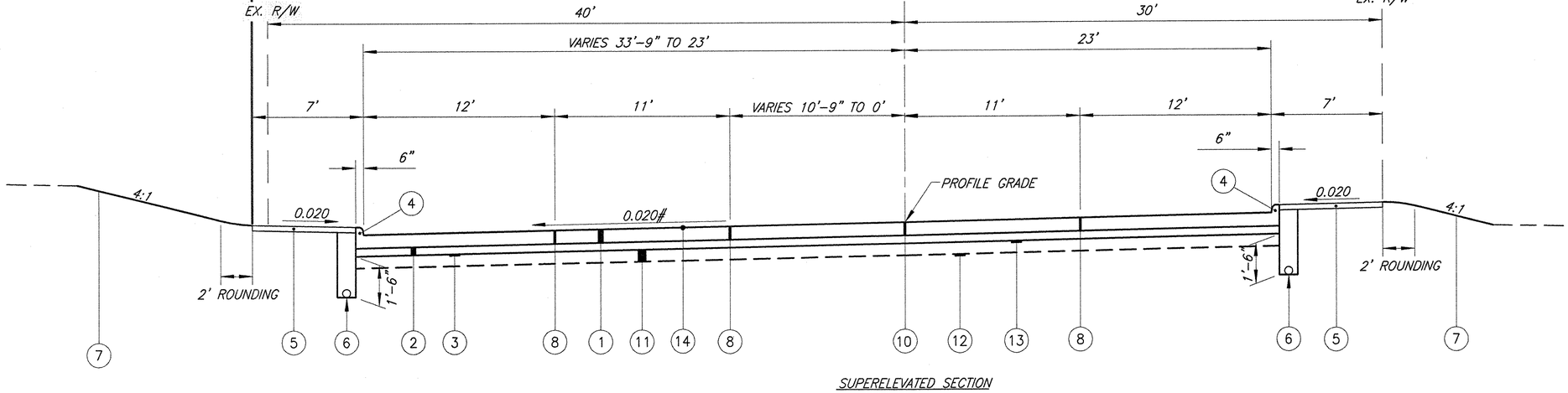


NORMAL 6-LANE SECTION

STA. 50+33.32 TO STA. 55+30.00 = 496.68 FT

*STA. 52+35.00 TO STA. 55+30.00
**STA. 55+25.00 TO STA. 55+30.00

RETAINING WALL: STA. 50+82 TO STA. 52+75 RIGHT SIDE
STA. 51+00 TO STA. 51+87.40 LEFT SIDE



SUPERELEVATED SECTION

STA. 55+30.00 TO STA. 57+50.00 = 220.00 FT

PROPOSED PAVEMENT LEGEND

1. ITEM 451 - 10" REINFORCED CONCRETE PAVEMENT
2. ITEM 304 - 6" AGGREGATE BASE
3. ITEM 204 - SUBGRADE COMPACTION
4. ITEM 609 - CURB, TYPE 2-A
5. ITEM 608 - 4" CONCRETE WALK
6. ITEM 605 - 6" BASE PIPE UNDERDRAINS WITH FABRIC WRAP
7. ITEM 659 - SEEDING AND MULCHING
8. LONGITUDINAL JOINT PER ODOT BP-2.1
9. ITEM 609 - CURB, TYPE 6
10. CONSTRUCTION JOINT PER ODOT BP-2.2
11. ITEM SPECIAL - UNDERCUTTING SUBGRADE AND SUBBASE
12. ITEM SPECIAL - GEOGRID BX 1100
13. ITEM 204 - PROOF ROLLING
14. ITEM SPECIAL - CONCRETE SEALANT

#FOR VARIABLE CROSS SLOPES, SEE SUPERELEVATION TABLE ON SHEET 49.

PROPOSED TYPICAL SECTIONS - W. 150th STREET

CUY-WEST 150th STREET

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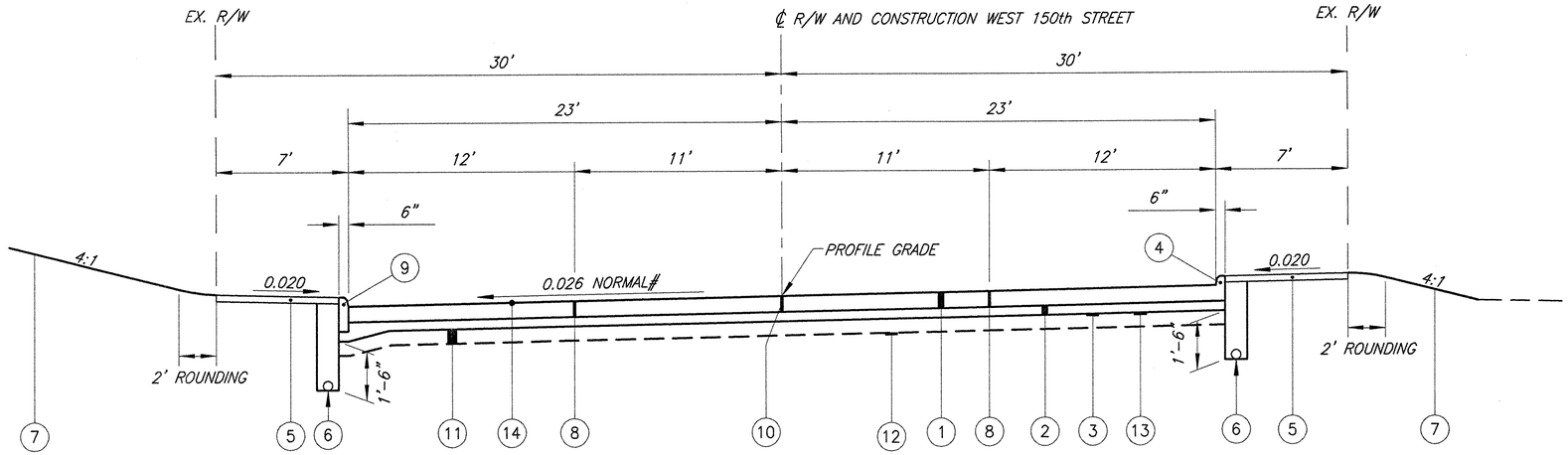
PROPOSED TYPICAL SECTIONS - W. 150th STREET

CUY-WEST 150th STREET

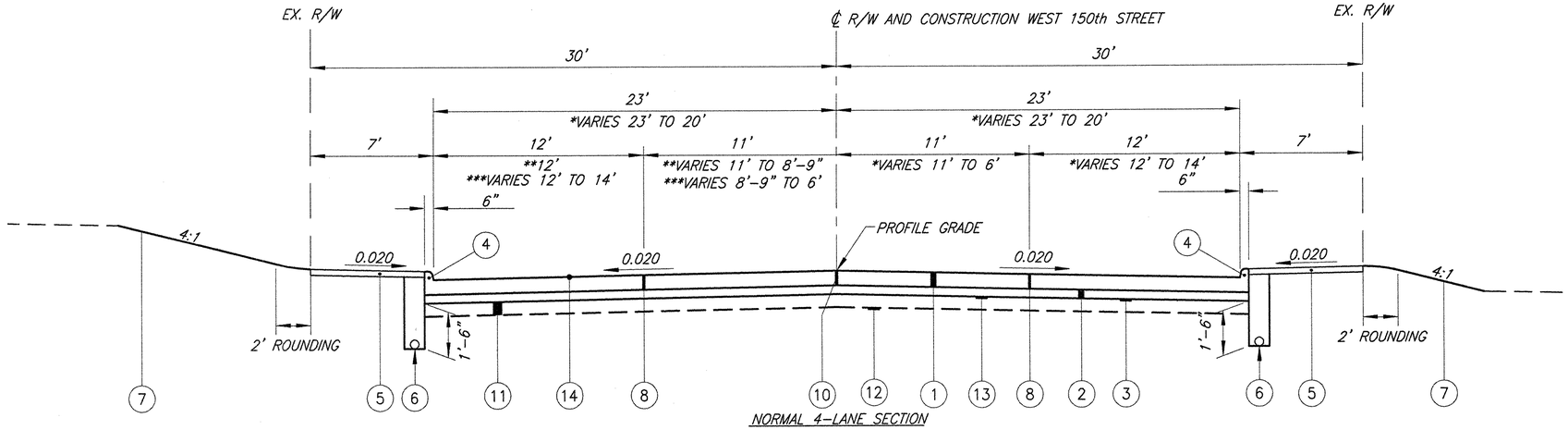
#FOR VARIABLE CROSS SLOPES, SEE SUPERELEVATION TABLE ON SHEET 49.

FOR PROPOSED PAVEMENT LEGEND, SEE SHEET 2.



SUPERELEVATED SECTION

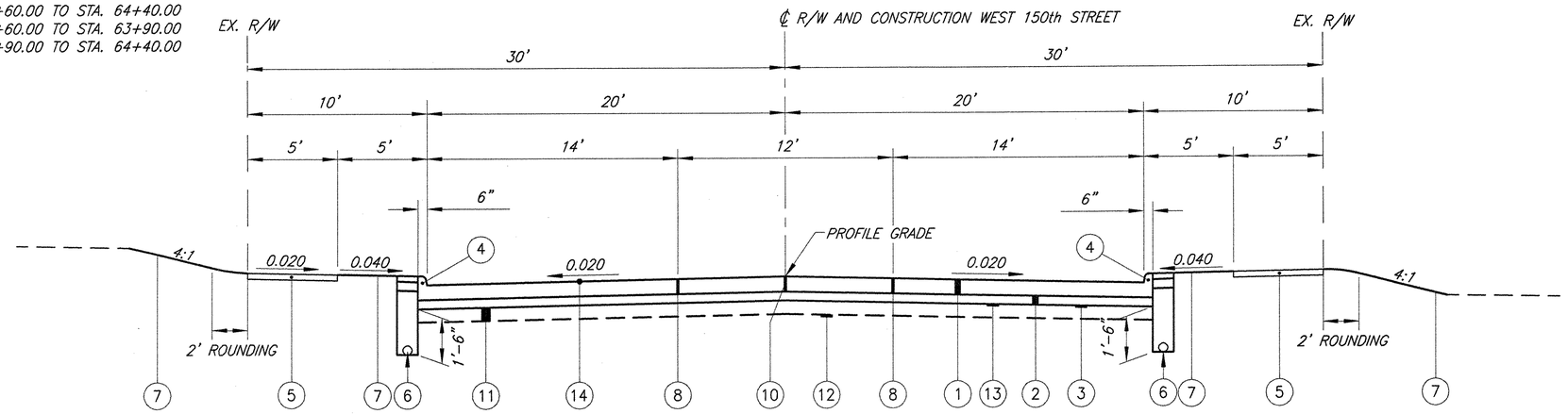
STA. 57+50.00 TO STA. 62+36.21 = 486.21 FT



NORMAL 4-LANE SECTION

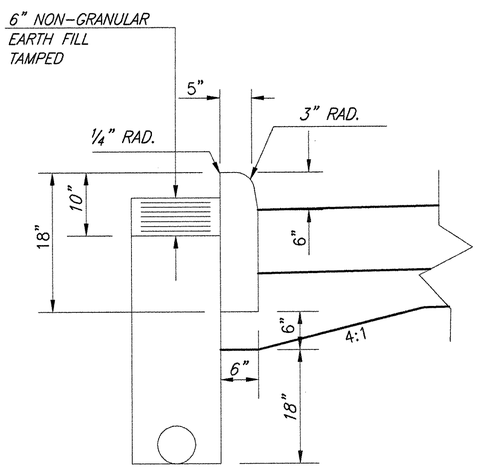
STA. 62+36.21 TO STA. 64+40.00 = 203.79 FT

*STA. 63+60.00 TO STA. 64+40.00
**STA. 63+60.00 TO STA. 63+90.00
***STA. 63+90.00 TO STA. 64+40.00



NORMAL 3-LANE SECTION

STA. 64+40.00 TO STA. 77+40.68 = 1300.68 FT



TYPE 6 CURB AND UNDERDRAIN DETAIL

NO SCALE

STA. 56+91 TO STA. 60+57

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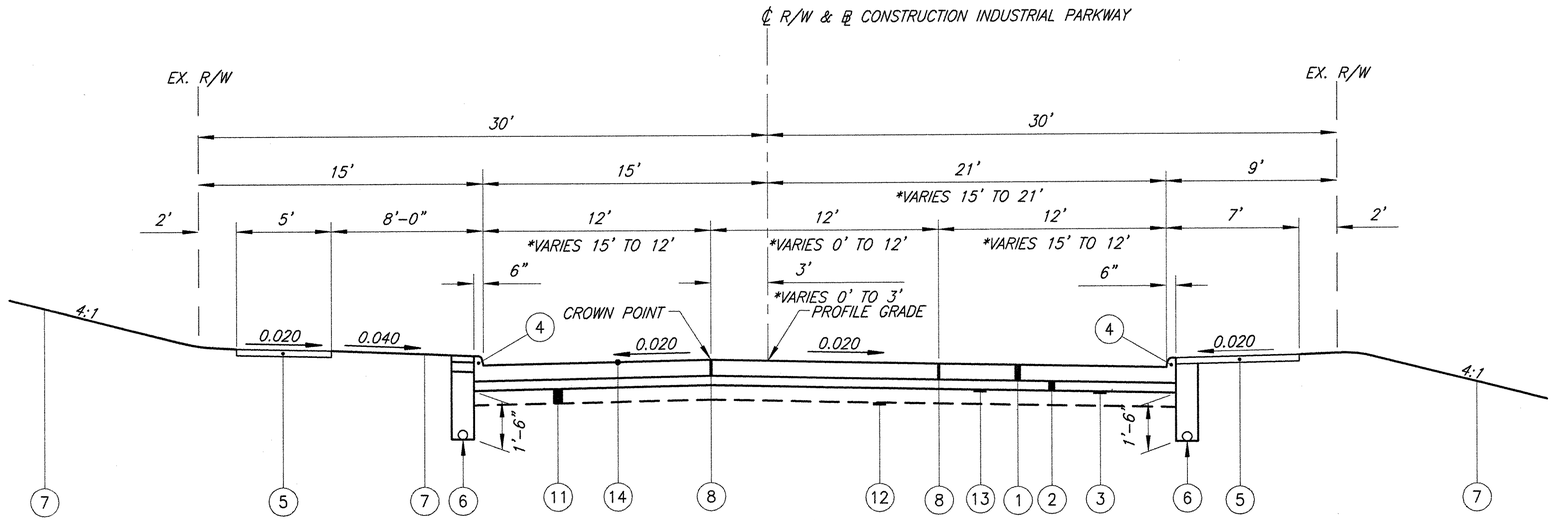

INDUSTRIAL PARKWAY
NORMAL SECTION

*STA. 16+25.00 TO STA. 16+75.00 = 50.00 FT.
STA. 16+75.00 TO STA. 19+80.00 = 305.00 FT.

PROPOSED PAVEMENT LEGEND

(1) ITEM 451 – 10" REINFORCED CONCRETE PAVEMENT
(2) ITEM 304 – 6" AGGREGATE BASE
(3) ITEM 204 – SUBGRADE COMPACTION
(4) ITEM 609 – CURB, TYPE 2–A
(5) ITEM 608 – 4" CONCRETE WALK
(6) ITEM 605 – 6" BASE PIPE UNDERDRAINS WITH FABRIC WRAP
(7) ITEM 659 – SEEDING AND MULCHING
(8) LONGITUDINAL JOINT PER ODOT BP–2.1
(9) ITEM 609 – CURB, TYPE 6
(10) CONSTRUCTION JOINT PER ODOT BP–2.2
(11) ITEM SPECIAL – UNDERCUTTING SUBGRADE AND SUBBASE
(12) ITEM SPECIAL – GEOGRID BX 1100
(13) ITEM 204 – PROOF ROLLING
(14) ITEM SPECIAL – CONCRETE SEALANT

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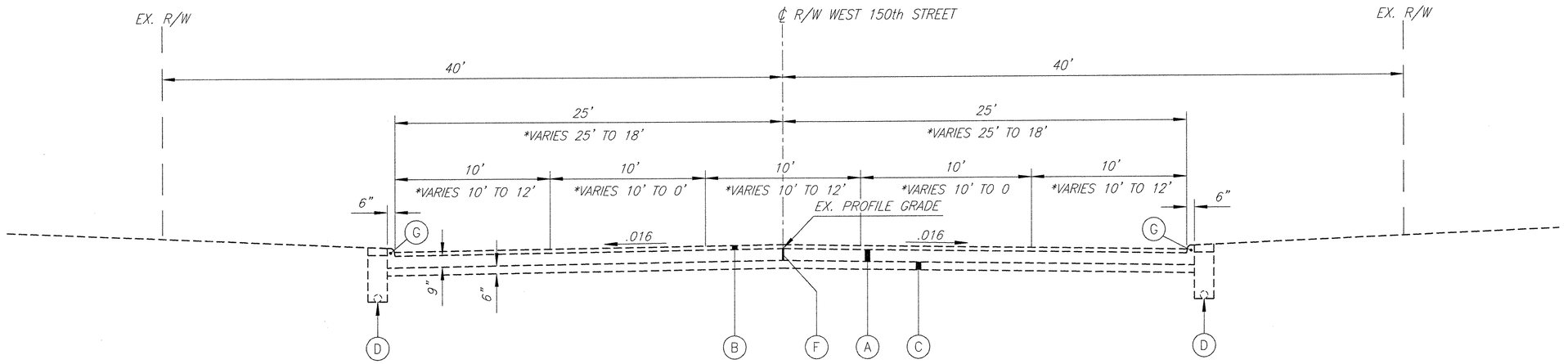
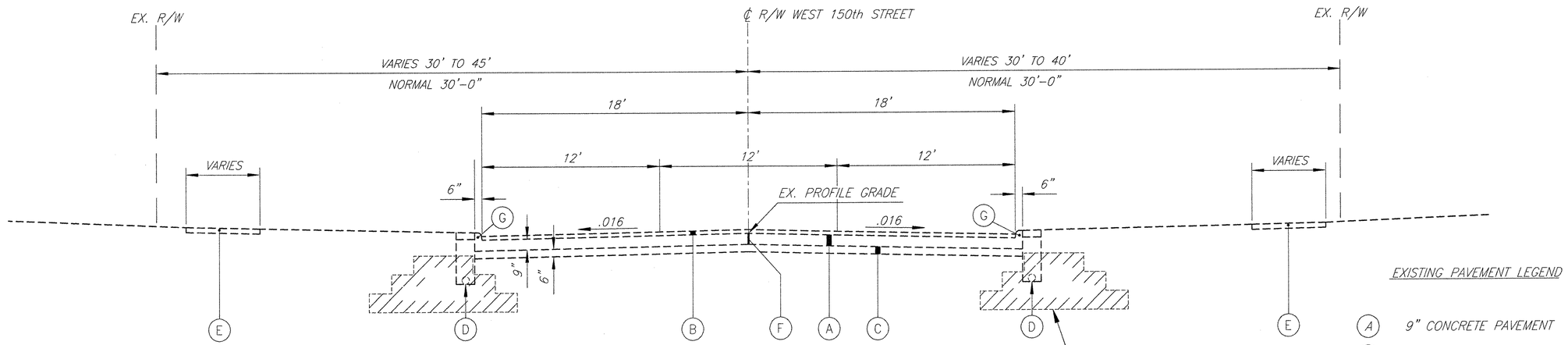
PROPOSED TYPICAL SECTIONS - INDUSTRIAL PARKWAY

CUY-WEST 150th STREET



NORMAL SECTION
STA. 50+33.22 TO STA. 54+00 = 366.78 FT
* STA. 54+00 TO STA. 56+75 = 275 FT



NORMAL SECTION
STA. 56+75 TO STA. 77+40.68 = 2065.68 FT.

EXISTING PAVEMENT LEGEND

- (A) 9" CONCRETE PAVEMENT
- (B) 3" ASPHALT CONCRETE
- (C) SUBBASE
- (D) UNDERDRAIN
- (E) CONCRETE WALK
- (F) LONGITUDINAL JOINT
- (G) CONCRETE CURB

EXISTING TYPICAL SECTIONS - W. 150th STREET

CUY-WEST 150th STREET

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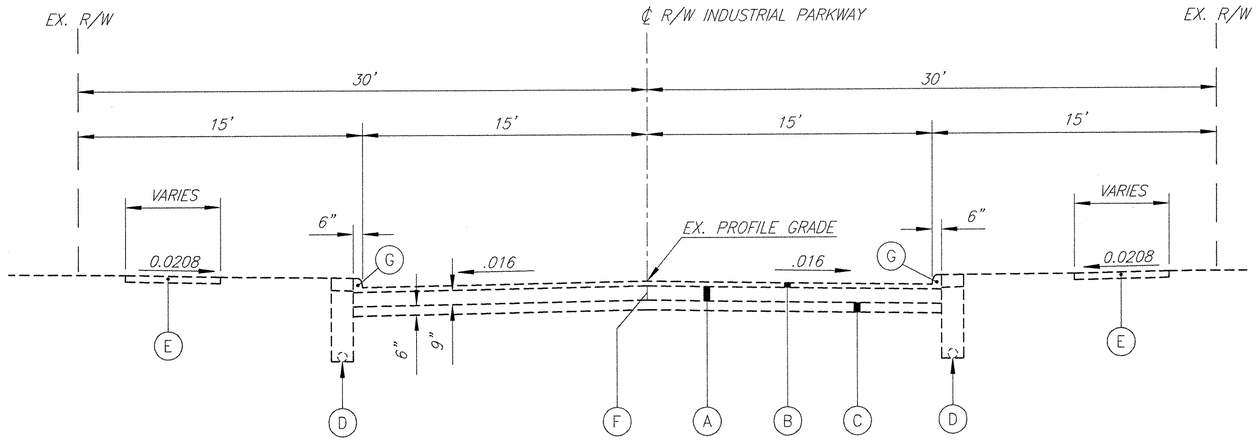
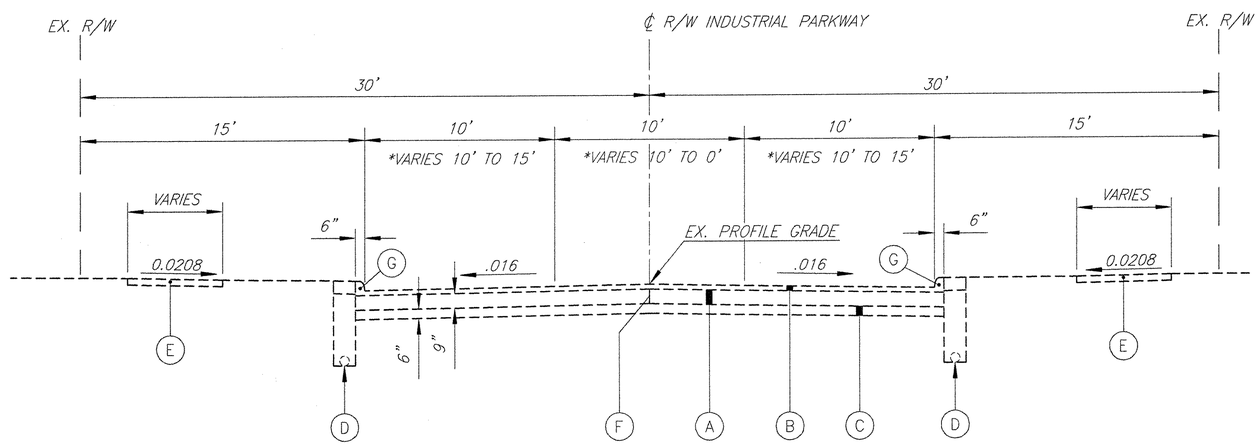


NORMAL SECTION

STA. 16+25 TO STA. 17+80 = 155 FT



NORMAL SECTION

STA. 18+30 TO STA. 19+80 = 150 FT.

* STA. 17+80 TO STA. 18+30 = 50 FT

EXISTING PAVEMENT LEGEND

- (A) 9" CONCRETE PAVEMENT
- (B) 3" ASPHALT CONCRETE
- (C) SUBBASE
- (D) UNDERDRAIN
- (E) CONCRETE WALK
- (F) LONGITUDINAL JOINT
- (G) CONCRETE CURB

EXISTING TYPICAL SECTIONS - INDUSTRIAL PARKWAY

CUY-WEST 150th STREET

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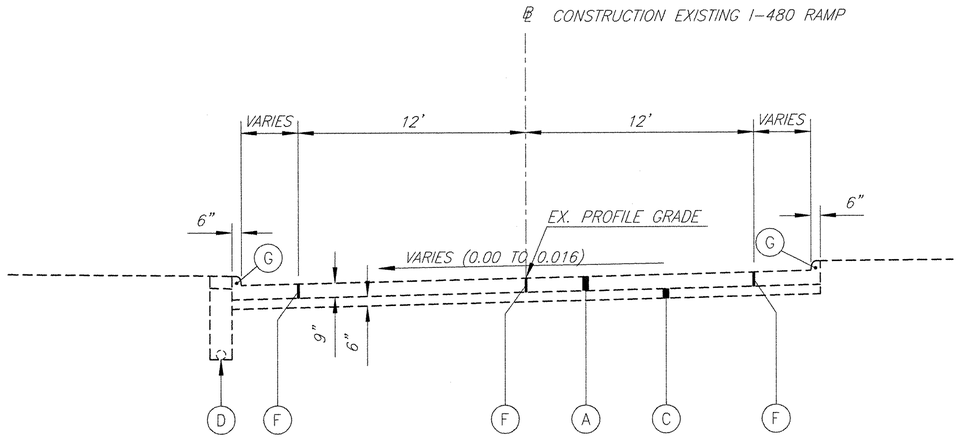

SUPERELEVATED SECTION

STA. 524+60.58 TO 524+83.58 = 23FT.

EXISTING PAVEMENT LEGEND

- (A) 9" CONCRETE PAVEMENT
- (B) 3" ASPHALT CONCRETE
- (C) SUBBASE
- (D) UNDERDRAIN
- (E) CONCRETE SIDEWALK
- (F) LONGITUDINAL JOINT
- (G) CONCRETE CURB

EXISTING TYPICAL SECTIONS - I-480 RAMP

CUY-WEST 150th STREET

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CALCULATED RSY CHECKED JLN

GENERAL NOTES

GENERAL

ROUNDING
The rounding at slope breakpoints shown on the Typical Sections apply to all cross-sections even though otherwise shown.

UTILITIES

Listed below are all utilities located within the project construction limits together with their respective owners:

City of Cleveland Division of Water
1201 Lakeside Avenue
Cleveland, Ohio 44114
Attn: Guy Singer
(216) 664-2444

AT & T Ohio
13630 Lorain Avenue, Room 350
Cleveland, Ohio 44111
Attn : Eric Westerburg
(216) 476-6142

The Illuminating Company
6896 Miller Road
Brecksville, Ohio 44141
Attn : Frank Dibbs
(440) 546-8748

Dominion East Ohio Gas
1201 East 55th Street
Cleveland, Ohio 44103
Attn : Mike Antonius
(216) 736-6675

NEORSD
3826 Euclid Avenue
Cleveland, Ohio 44115
Attn : Richard Switalski
(216) 881-6600

Norfolk Southern Corp.
1200 Peachtree NE
Atlanta, Georgia 30309
Attn: Dave Wyatt
(404) 529-1641

Time Warner
8179 Dow Circle
Strongsville, Ohio 44136
Attn: Scott Dompier
(216) 575-8016

Cavalier Telephone
6777 Eagle Road Suite G
Middleburg Heights, Ohio 44130
Attn: William Park
(440) 260-0102

Verizon
120 Ravine Street
Akron, Ohio 44303
Attn: Al Guest
(330) 253-8267

Quest Communication
930 15th Street Room 150
Denver, Colorado 80202
Attn: Kim Jordan
(800) 283-4237

BP Pipeline
4421 Bradley Road
Cleveland, Ohio 44109
Attn: Norbert Bruening
(216) 912-2573

Ohio Department of Transportation District 12
5500 Transportation Boulevard
Garfield Heights, Ohio 44125-5303
(216) 581-2100

City of Cleveland Division of Water Pollution Control
12302 Kirby Avenue
Cleveland, Ohio 44108
Attn: Rachid Zoghaib
(216) 664-3785

The location of the underground utilities shown on the plans are as obtained from the owners as required by Section 153.64 O.R.C. The location of the utilities shown in the profile of the Plan and Profile sheets are estimated. Call Ohio Utilities Protection Service two (2) working days before you dig (Toll Free) at 1-800-362-2764. Call Oil and Gas Producers Underground Protection Service two (2) working days before you dig (Toll Free) at 1-800-925-0988. Any and all work required for removing, relocating and construction of new facilities for private or public utilities will be done by and at the expense of the respective owners unless otherwise noted on the plans. The contractor shall coordinate his operations with the work of the utility owners or others who may be making the relocations.

CONTINGENCY QUANTITIES
The Contractor shall not order materials or perform work for items designated by plan note to be used "as directed by the Engineer" unless authorized by the Engineer. The actual work locations and quantities used for such items shall be incorporated into the final change order governing completion of this project.

FLASHING ARROW PANELS AND VARIABLE MESSAGE BOARDS
When flashing arrow panels or variable message signboards are shown on the plans, solar, electric, or battery powered equipment shall be exclusively utilized when located within 300 feet of any residence. Diesel or gasoline powered generators will not be permitted in these areas, except when used intermittently for the sole purpose of charging internal batteries which provide the primary power for the equipment.

ELEVATION DATUM
Elevations shown are based on Cleveland Regional Geodetic Survey (C.R.G.S.) data. Monuments are described on the plans.

WORK LIMITS
The work limits shown on these plans are for physical construction only. In addition to the requirements of Section 614.05, the Contractor shall furnish, erect, maintain, and subsequently remove such additional traffic control devices located outside the limits of construction as are required on highways which are used as detours, including the "ROAD CLOSED" signs upon the barricades at the point where the highway is closed to through traffic.

EXISTING TYPICAL SECTIONS
Existing typical sections have been developed from site measurements, pavement cores, and record plans and are believed to represent the width and composition of the existing pavement, but the City of Cleveland does not guarantee the accuracy of same.

CONSTRUCTION NOISE
Activities and land use adjacent to this project may be affected by construction noise. In order to minimize any adverse construction noise impacts, any power-operated construction-type device shall not be operated between the hours of 9 P.M. and 7 A.M. In addition, any such device shall not be operated at any time in such a manner that the noise created substantially exceeds the noise customarily and necessarily attendant to the reasonable and efficient performance of such equipment.

DEFINITIONS AND TERMS
Wherever there appears, in the Standard Specifications, Supplemental Specifications or proposal notes, the term "the state", "director of transportation", "department", "engineer", or any other term designating any representative or employee of the state or its department of transportation, such term shall, for the purpose of this contract, be considered and taken as meaning and designating the respective board officer or employee of City of Cleveland whose duty or function it is to deal with the subject matter in connection with which such term is used and specifically:

The State	shall mean the City of Cleveland
Department	shall mean the City of Cleveland Engineer's office
Director	shall mean the City of Cleveland Engineer, his deputies or any engineer designated as the city engineer's representative
Engineer	shall mean the duly authorized agent or representative of the City of Cleveland Engineer's office acting within the scope of his/her authority for the purposes of construction engineering and administration of the contract
Laboratory	shall mean any laboratory designated by the City of Cleveland

ITEM 619 -FIELD OFFICE, TYPE B
The Contractor shall furnish two cellular telephones, in lieu of the commercial grade base radio and 2 hand held radio units listed in Item 619.

The following quantity has been provided in the Bid Schedule for this Item:

Item 619-Field Office, Type B 18 Month

PROTECTION OF RIGHT-OF-WAY LANDSCAPING
The Contractor shall constrict all of his/her activities, equipment storage, and staging to within the construction limits. Should the Contractor wish to use any area outside these limits, a request in writing must be submitted to the Project Engineer. The document submitted must clearly identify the area that the Contractor plans to use and explain the proposed use and restoration of the area. The Engineer shall approve the request in writing before the Contractor has permission to use the area. Prior to beginning work, the Contractor, Superintendent or his representative, the Project Engineer, and a representative of the maintaining agency shall review and record all landscaping items within the right of way (both within and outside the construction limits). A record of this review will be kept in the Project Engineer's files. Prior to final acceptance, a final review of landscaping items will be made. Any items damaged beyond the construction limits as defined above will be replaced in kind or as directed by the Project Engineer.

PROGRESS SCHEDULE (CRITICAL PATH METHOD)
The pre-construction meeting will be held no later than thirty (30) calendar days after the contract is signed by the Contractor. The Contractor shall submit their proposed CPM schedule for review by the Construction Engineer no later than two (2) weeks after the contract is signed by the Contractor. Reference Section 108.02 of the specifications. Written comments regarding the CPM schedule will be provided to the Contractor by the Construction Engineer and formally discussed at the pre-construction meeting.

A final agreed upon CPM schedule shall be submitted to the Construction Engineer within ten (10) calendar days from the date of the pre-construction meeting but no more than seven (7) calendar days after the Notice to Proceed (the date designated as the starting date in the CPM schedule). The schedule will be signed and dated by the prime Contractor and named Subcontractors.

PROJECT PROGRESS MEETINGS
Progress meetings will be held every four (4) weeks at the project office or other location designated by the Construction Engineer, and will be attended by City of Cleveland and Contractor decision-making personnel.

The purpose of these meetings is to discuss critical operations and potential problems. also, the Contractor will confirm the number and duration of work shifts, number of work crews, and specific portions of the work to be performed during the following weeks.

These meetings can only be waived by the Construction Engineer.

ROADWAY

STUMP REMOVED, 30-INCH
The tree marked for removal on sheet 29 of these plans will be cut down by the City of Cleveland prior to The Illuminating Company utility pole relocation work at the northeast corner of the intersection. The Contractor shall remove the stump of said tree in accordance with ODOT CMS 201.03 and dispose of in accordance with ODOT CMS 105.16 and 105.17.

The following quantity has been provided in the Bid Schedule for this Item:

Item 201 - Stump Removed, 30-Inch 1 Each

INDIANA BAT NOTE
Clearing of any trees that have suitable summer brood rearing or roosting habitat for the federally endangered Indiana bat (e.g. trees with exfoliating bark and/or cavities), shall occur before April 15 or after September 15 when the bats would not be using such habitat.

ITEM SPECIAL RETAINING WALL MISC.: MODULAR BLOCK RETAINING WALL

The retaining walls in these plans are detailed using Unilock Siena Stone 500. Contractor shall provide the Unilock Siena Stone 500, Keystone Retaining Wall Systems, or an equivalent equal modular block approved by the Engineer. Contractor shall submit modular block retaining wall design for the Engineer's approval.

Payment shall be per square feet of wall installed complete for Item Special - Retaining Wall Misc.: Modular Block Retaining Wall. Payment shall include all material, labor, equipment, excavation, backfill, subgrade compaction, 8" compacted granular material, handrail, and all incidentals required for the complete installation of the wall.

ITEM 202 - REMOVAL MISC.: RAILROAD TIES
ITEM 202 - REMOVAL MISC.: LANDSCAPE TIMBERS
ITEM 202 - REMOVAL MISC.: 3 FT DIAMETER CONCRETE PLANTER
ITEM 202 - REMOVAL MISC.: SIGN FOUNDATION
ITEM 202 - REMOVAL MISC.: WOOD POST
ITEM 202 - REMOVAL MISC.: BOLLARD
ITEM 202 - REMOVAL MISC.: 2 FT DIAMETER LANDSCAPE ROCK

The Contractor shall carefully remove the respective items per locations indicated on the Plan and Profile sheets. The Contractor shall determine if the owners wants the respective item. If so, the items shall be returned to the property owner and placed at a location indicated by the Engineer. Otherwise, dispose of in accordance with ODOT CMS 202.02.

Payment shall be per the respective bid description as shown in the Bid Schedule. The removal of these items shall include all labor, tools, equipment and incidentals needed to complete the removal and disposal of the respective item.

CONTRACTION AND/OR EXPANSION JOINTS

Although specific locations of certain contraction and expansion joints have been detailed on this plan, no waiver of the specifications is intended. Provision of expansion joints at all major structures and the maximum spacing between contraction joints shall, in all cases, be in accordance with Standard Construction Drawing BP-2.2 and the specifications.

CONTRACTION JOINTS IN CONCRETE PAVEMENT OR BASE WIDENING

Where new concrete is placed adjacent to and tied to existing concrete, the contraction joint spacing required in Standard Construction Drawing BP-2.2 shall be waived. Contraction joints in the new concrete shall be located at all contraction joints in the existing concrete and shall be constructed to form a continuous line. Expansion joints in the new concrete shall be located at all expansion joints in the existing concrete and shall be constructed to form a continuous line. All material, labor, and equipment needed to install tied joints were existing pavement meets proposed pavement shall be included with Item 451 - Reinforced Concrete Pavement for payment.

CUY-WEST 150th STREET

ROADWAY (CONT'D)

CONSTRUCTION ADJACENT TO COMMERCIAL DRIVES

When construction involves or is adjacent to commercial drives, the following procedures shall be followed as directed by the Engineer.

When commercial properties have two or more (two-way) drives, the Contractor shall keep at least one-half of the total number drives open to two-way traffic. For commercial properties with one drive or one (two-way) drive, the Contractor shall perform part width construction in order to maintain access at all times.

The Contractor shall give written notification to each property owner at least seven (7) days in advance of commencing work that will inhibit access to that property.

In addition to the above, the following work limitations apply at the following locations:

Proposed drive construction shall be completed in (25) consecutive days from commencement of work on commercial drives DR-3,4,5,6,7,8,11 and 12.

ITEM SPECIAL - UNDERCUTTING SUBGRADE AND SUBBASE

Where soft grade is encountered, due to no fault or neglect of the Contractor, the unstable material shall be excavated to the depth required by the Engineer, and disposed of in accordance with 203.05. The undercut subgrade shall be replaced with Geogrid BX 1100 and Item 304, and placed and compacted in accordance with Item 304. The area shall be proof rolled to determine if adequate stabilization was achieved.

Where soft subgrade is due to the failure, neglect or any other fault of the Contractor, the unstable condition shall be corrected as outlined above at no additional expense to the project.

Payment for this item shall include all excavation, aggregate and addition of proof rolling, and shall be paid for at the bid unit price bid per cubic yard, Item Special - Undercutting Subgrade and Subbase.

The following estimated quantities have been carried to the Bid Schedule for use as directed by the Engineer:

Item Special - Undercutting Subgrade and Subbase	1600 Cu. Yd.
Item Special - Geogrid BX 1100	5,000 Sq. Yd.

INTEGRAL CONCRETE CURB REMOVED

Integral concrete curb removed in conjunction with base and/or pavement removal shall not be paid for separately, but shall be considered incidental to the base and/or pavement removal.

SOIL INFORMATION

The Soils Investigation Report is included in the Bid Document.

ITEM 623 - CONSTRUCTION LAYOUT STAKES

All benchmarks, horizontal and vertical controls required for the complete layout and performance of the work under this Contract shall be done by the Contractor at the Contractor's expense and may be periodically reviewed by the Engineer. Any inspection or reviewing of the Contractor's layout by the Engineer and the acceptance of all or any part of it shall not relieve the Contractor of his responsibility to secure the proper dimensions, grades and elevations of the several parts of the work.

The Contractor shall verify all grades, lines, levels and dimensions as indicated on the drawings and specifications, and he shall report any errors or inconsistencies in the above to the Engineer before commencing work or ordering any material.

The Contractor shall be responsible for the preservation of all stakes and marks and shall replace them at his expense if they are damaged, lost, displaced or removed. The Contractor shall use competent personnel and suitable equipment for the layout work required and shall provide that it be done under the supervision of a Registered Surveyor.

Payment for the above work shall be included in the contract lump sum price bid for

Item 623 - Construction Layout Stakes. Lump

ITEM 608 - CURB RAMP (CITY OF CLEVELAND)

1. The location of work shall be determined and marked by the Engineer.

2. All material and workmanship shall be in accordance with Ohio Department of Transportation, Construction and Material Specifications, Latest Edition unless modified by City of Cleveland standard "D" specifications including all supplements thereto. The ODOT, Construction and Materials Specifications shall govern all construction items that are a part of this plan except when such specifications are modified by the General Notes, Construction Details or City of Cleveland specifications set forth herein.

ITEM 608 - CURB RAMP (CITY OF CLEVELAND)

3. The Contractor shall be responsible for Curb Ramp and sidewalk layout. Contractor shall be responsible for having the finished work conform to the lines, grades, elevations and dimensions to meet ADA Requirements. Any inspection or checking or the Contractor's layout by the Owner and the acceptance of all or any part of it shall not relieve the Contractor of its responsibility to secure proper dimensions, grades and elevations of the several parts of the work. The Contractor shall use competent personnel and suitable equipment for the layout work required.

4. Truncated Domes For Ramps: All curb ramps shall have a Distinctively-Textured walking surfaces, detectable by cane, to warn pedestrians with visual impairments of an impending hazard on the circulation route ahead. The detectable warnings shall consist of truncated domes with a diameter of nominal 0.9 IN. (23 MM), a height of nominal 0.2 IN. (60 MM). The detectable warnings shall be 24 IN. (610 MM) in the direction of travel and extend the full width of the curb ramp or flush surface, except the flare surface. The location of the detectable warning shall be located so that the edge nearest the curb line or other potential hazard is 6 to 8 inches (150 to 205 MM) from the curb line or other potential hazard.

Truncated domes shall be tinted in a contrasting color to be approved by the engineer, using a single coat tinted curing and sealing compound. Said material shall be Polyseal, as manufactured by Chemmasters or approved equal at a coverage rate of 300-400 Sq.Ft./Gallon.

Cost of stamping and tinting the truncated domes to the curb ramps is incidental to the curb ramp layout pay item, no additional cost will be paid.

5. It is the contractor's responsibility to layout the curb ramp to meet ADA requirements.

6. Dimensions are based on a 6-inch curb height, and shall be proportionally adjusted for other curb heights.

7. The thickness of concrete in the Curb Ramp, including flared sides and rolled edges, shall be in the plans or as directed by the Engineer.

8. Ramps specified at 8-inch thickness shall be 8-inch thick everywhere in the ramp including the flared areas.

9. A 3-foot minimum width ramp may be used when existing space prohibits the construction of a 4-foot wide ramp with the approval of the engineer.

10. The ramp slope shall not exceed 12:1 at any Curb Ramp location where pedestrian traffic must travel along or across the Curb Ramp.

11. Cross-slope of Curb Ramps and sidewalks shall not exceed 48:1.

12. Transitional sections of sidewalk, that do not meet current standards and specifications, shall be installed to connect the new or replaced Curb Ramps. These transitions segments of sidewalk shall provide a smooth transition between the existing and new concrete.

13. All existing manhole covers, valve boxes, gratings, etc., that are located within the pedestrian right-of-way, shall be flushed mounted with the walking surface. Existing obstructions shall not have more than ±1/4 inch difference in elevation than the surrounding surface.

14. The location of Curb Ramps in new construction shall take precedence over the location of drainage structures, guardrails and traffic, utility or light poles.

15. The bottom edge of the Curb Ramp shall be flush with the edge of the adjacent pavement and gutter line.

16. Curb Ramps shall be aligned with the sidewalk and the crosswalk where possible. If alignment is not possible the Contractor is to notify the Engineer prior to proceeding with construction activities at this location.

17. Crosswalk markings placed in conjunction with Curb Ramp Type "2,3,6,8" shall be located such that, at a minimum, the Curb Ramp, exclusive of the flared sides or rolled edges, shall be completely contained with the crosswalk.

18. Crosswalk markings placed in conjunction with Curb Ramp Type "1,4,5,7,9,10,11 (Diagonal Ramps)" shall be located at least 2-feet beyond the outside of the flared sides.

19. The rolled edges shall be constructed so that they are parallel to the direction of pedestrian traffic.

20. Rolled edges shall only be used adjacent to tree lawns, utility strips and large obstructions such as signal controllers.

ITEM 608 - CURB RAMP (CONT.)

21. The normal gutter flow line shall be maintained throughout the Curb Ramp area, and appropriate drainage structures shall be used, as needed, to intercept the flow of water prior to the Curb ramp area. Positive drainage shall also be provided to carry water away from the intersection of the Curb Ramp and gutter line.

22. Surface texture of Curb Ramps shall be coarse-broomed or other approved method transverse to ramp slope (minimum 1/8 inch - maximum 3/16 inch deep). Beyond the TRUNCATED DOMES part of the ramp.

23. Curb poured separately from the ramp shall be separated from the ramp by 1/2 inch pre-molded expansion joint.

24. When less than 3-feet of a curb section remains after the curb cut is located, it shall also be removed and replaced. New curb shall be constructed in a minimum of 3-foot sections and a maximum of 5-foot sections, or as directed by the Engineer.

25. Fill for sidewalk and Curb Ramps, if required, shall be sand and gravel sub-base compacted in layers not exceeding 2-inches. Cost for the sub-base shall be incidental to ramp construction.

26. Curb Ramps and surrounding concrete walk shall be constructed of Portland cement concrete, City of Cleveland 650 mix, unless directed otherwise by the Engineer.

27. 1/2 - inch pre-molded expansion material shall be placed whenever new concrete touches existing construction.

28. Forms shall consist of wood or metal and extend for the full depth of the concrete, and of sufficient strength to resist the pressure of the concrete without springing.

29. An approved curing compound shall be properly applied immediately after finishing the concrete.

ITEM SPECIAL - CONCRETE INSTALLATIONS USING HIGH-EARLY STRENGTH CONCRETE

Where traffic conditions require-in the option of the Engineer-the early use of a concrete installation, high early strength concrete may be used in the concrete mixture. The mixture shall be according to ODOT CMS 499.05, Class MS, as per D-25.

The following estimated quantities have been included in the Bid Schedule, in addition to the calculated quantities for use as directed by the Engineer.

Item Special - Surcharge for MS Concrete	950 Cu. Yd.
Item Special - Surcharge for FS Concrete	50 Cu. Yd.

Item Special - Concrete Sealant

The Contractor shall provide all materials, labor and equipment necessary to apply portland cement concrete sealant to all newly constructed concrete surfaces, including roadway, curb, sidewalks, curb ramps and concrete tree lawn areas depicted in the plans.

The concrete sealant shall be an approved non-epoxy, non-silicon, non-toxic, non-hydrophobic, non-solvent material, such as Sinak S-101 and S-102 or equal, as approved by the Engineer. This sealant shall conform to AASHTO and ASTM test and performance criteria, as detailed in the project specifications, and shall be applied at the manufacturer's recommended rate of coverage.

The quantity to be paid for will be the actual number of square yards of accepted pavement sealed with concrete sealant, in accordance with D specifications. An estimated quantity of concrete sealant has been included in the Bid Schedule to perform this work. This quantity is used for estimating purposes only. Items meeting this specification shall be paid for under Item Special - Concrete Sealant.

The following estimated quantity has been carried to the Bid Schedule for use as directed by the Engineer:

Item Special - Concrete Sealant	22,500 Sq. Yd.

RTA BUS SHELTERS

RTA shelter personnel will remove the existing shelters and install the new shelters in areas designated as relocated bbus shelter area on these plans. The Contractor shall call RTA two weeks prior to the required removal date for the existing bus shelters to be removed. Contractor shall call RTA when work has been completed in the areas designated as relocated bus shelter area on these plans for RTA to re-install the bus shelters.

CALCULATED RSY CHECKED JLN

GENERAL NOTES

CUY-WEST 150th STREET

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EROSION CONTROL

ITEM 659–SEEDING AND MULCHING

When the above item is called for on the plans or in the proposal, all applicable provisions of Item 659, as set forth in the construction and material specifications, and as per Cleveland D–66 shall apply unless modified herein.

659.07 SEEDS. Unless otherwise directed/approved by the Engineer, high quality germination rates are required.

659.09 NATIVE GRASSES AND WILDFLOWERS. Unless otherwise directed/approved by the Engineer, the following seed mixture class(es) shall be as per Cleveland D–66.

659.10 SITE PREPARATION. In addition to "Areas in front of residences, commercial properties, etc." referred to in 659.10 (A), the special preparation shall be extended to encompass all lawns and/or lawn like areas as determined by the Engineer.

659.11 PLACING TOPSOIL. Topsoil shall be placed and spread to minimum compacted depth of four (4) inches. The finished topsoil surfaces shall be seeded and mulched within seventy–two (72) hours of their accepted completion.

659.12 SEEDING METHODS. Unless otherwise directed or approved by the Engineer, hydro seeding methods shall be used. As an option to hydro seeding and mulching, seed thoroughly mixed with the seed may be pneumatically applied per 659.15.

659.13 MULCHING OPERATION. Unless otherwise directed or approved by the Engineer, wood fiber mulch shall be used and hydraulically applied per 659.15. In lieu of mulch, compost thoroughly mixed with the seed may be pneumatically applied per 659.16.

659.17 WATERING. In addition to the requirements of 659.17, the seed bed shall be kept acceptably moist until the side has germinated; all at the direction of the Engineer.

659.23 PERFORMANCE. The county will inspect all seeded areas no earlier than one (1) month and no later than nine (9) months after final/completed seeding; all at the discreation/determination of the Engineer.

659.24 METHOD OF MEASUREMENT. Seeding and mulching shall be applied to all areas of exposed soil between right–of–way lines, and within the construction limits for areas outside the right–of–way lines covered by work agreement or slope easement. Quantity calculations for Item 659–Seeding and Mulching are based on these limits and are located on the cross section sheets.

The following estimated quantities are provided to promote growth and care of permanent seeded areas in accordance with the specifications:

Item 653 – Topsoil Furnished and Placed	637 Cu. Yd.
Item 659 – Soil Analysis Test	1 Each
Item 659 – Seeding and Mulching	3,824 Sq. Yd.
Item 659 – Repair Seeding and Mulching	191 Sq. Yd.
Item 659 – Inter–seeding	191 Sq. Yd.
Item 659 – Commercial Fertilizer	0.36 Tons
Item 659 – Agricultural Lime	0.79 Acre
Item 659 – Water for Seeding	21 M Gals
Item 659 – Mowing	9 M. Sq. Yd.
Item 671 – Erosion Control Mat	530 Sq. Yd.

ITEM 832 – EROSION CONTROL
ITEM 832 – STORM WATER POLLUTION PREVENTION PLAN

The Contractor shall develop a Storm Water Pollution Prevention Plan (SWPPP). After the contract is awarded and prior to any construction activity. The plan will be kept on site for review at any time during construction. Supplemental Specification 832 shall be used for Items 832 shall be used for items to be furnished and payment based as per 832.14.

The following estimated quantities are included in the Bid Schedule:

Item 832 – Erosion Control	Lump
Item 832 – Storm Water Pollution Prevention Plan	1 Each

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CUY-WEST 150th STREET

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DRAINAGE

REVIEW OF DRAINAGE FACILITIES

Before any work is started on the project and again before final acceptance by the County, representatives of the County and the Contractor, along with local representatives, shall make an inspection of all existing sewers which are to remain in service and which may be affected by the work. The condition of the existing conduits and their appurtenances shall be determined from field observations. Records of the inspection shall be kept in writing by the County.

All new conduits, inlets, catch basins, and manholes constructed as a part of the project shall be free of all foreign matter and in a clean condition before the project will be accepted by the County.

All existing sewers inspected initially by the above-mentioned parties shall be maintained and left in a condition reasonably comparable to that determined by the original inspection. Any change in the condition resulting from the Contractor's operations shall be corrected by the Contractor to the satisfaction of the Engineer.

Payment for all operations described above shall be included in the contract price for the pertinent 603 conduit items.

RESIDENTIAL AND COMMERCIAL DRAINAGE CONNECTIONS

Existing roof drains, footer drains or yard drains disturbed by the work shall be provided with unobstructed outlets by connecting a conduit into a storm sewer or drainage structure. The location, type, size and grade of the new conduit required to replace or extend the existing drain will be determined by the Engineer.

The following conduit types may be used: 706.01 (Class 3), 706.02, 706.08 (extra strength), 707.33, 707.41 non-perforated, 707.42, 707.43, 707.44, 707.45, 707.46, 707.47, 707.51, or 707.52 (ps 45 min.).

RESIDENTIAL AND COMMERCIAL DRAINAGE CONNECTIONS (CONT.)

The following estimated quantities have been included in the Bid Schedule for use as directed by the Engineer for the work noted above:

Item 603 – 6" Conduit, Type B, For Drainage Connection	50 Lin Ft
Item 603 – 12" Conduit, Type B, For Drainage Connection	50 Lin Ft

When encountered within the same trench, the cost for removal and disposal of the existing conduit shall be included in the payment for the pertinent 603 item listed above.

EXISTING TEST TEES

Storm, treated septic and/or sanitary sewer connection test tees encountered within the construction limits shall be adjusted to grade, reconstructed to grade, abandoned with new test tees installed at alternate locations, or simply replaced, as required and directed by the Engineer; all in accordance with the applicable provisions of Item 604 and the Miscellaneous Details. When it becomes necessary to place or replace test tees within paved areas such as driveways, sidewalks, etc. (relocate outside paved areas where possible), they shall be set to finished paved surface grade as detailed in the Miscellaneous Details and/or as otherwise specified by the Engineer.

The following estimated quantities have been included in the Bid Schedule for use as directed by the Engineer.

Item 202 – Abandon Misc.: Test Tee	1 Each
Item 604 – Drainage Structure, Misc.: Test Tee Adjusted To Grade	1 Each
Item 604 – Drainage Structure, Misc.: Test Tee	1 Each

None of the above materials shall be ordered by the Contractor until authorized by the Engineer.

ITEM SPECIAL – FILL AND PLUG EXISTING CONDUIT

This item shall consist of the construction of bulkheads in an existing conduit and filling the area thus sealed off with lean grout, Item 613, Sand or other material approved by the Engineer.

Bulkheads shall be located at the limits of the area to be filled as indicated on the plans. The bulkheads shall consist of brick or concrete masonry with a minimum thickness of 12 inches.

The fill material shall be pumped into place, or placed by other means approved by the Engineer, so that, after settlement, at least 90 percent of the cross-sectional area of the conduit, for it's entire length, shall be filled. The length of filled and plugged conduit to be paid for shall be the actual number of feet (measured along the centerline of each conduit from outer face to outer face of bulkheads) filled and plugged as described above.

In lieu of filling and plugging the existing conduit, the pipe may be removed. The length, measured as provided above, shall be paid for at the contract price per foot for, Item Special, Fill and Plug Existing Conduit.

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CALCULATED RSY CHECKED JLN

GENERAL NOTES

CUY-WEST 150th STREET

DRAINAGE (CONT'D)

CROSSINGS AND CONNECTIONS TO EXISTING PIPES AND UTILITIES

Where plans provide for a proposed conduit to be connected to, or cross over or under an existing sewer or underground utility, the Contractor shall locate the existing pipes or utilities both as to line and grade before starting to lay the proposed conduit.

If is determined that the elevation of the existing conduit, or existing appurtenance to be connected, differs from the plan elevation or results in a change in the plan conduit slope, the Engineer shall be notified before starting construction of any portion off the proposed conduit which will be affected by the variance in the existing elevations.

If it is determined that the proposed conduit will intersect an existing sewer or underground utility if constructed as shown on the plan, the Engineer shall be notified before starting construction of any portion of the proposed conduit which would be affected by the interference with an existing facility.

Payment for all the operations described above shall be included in the contract price for the pertinent 603 conduit item.

The cost of replacing existing conduit connections, if required, shall be paid for by size and type specified and/or designated by the Engineer. An estimated quantity of the following is provided in the General Summary for this work:

Item 603 – 12" Conduit, Type B, 706.02	50 Lin Ft
Item 603 – 12" Conduit, Type B, 706.08 E.S.	50 Lin Ft
Item 603 – 15" Conduit, Type B, 706.02	50 Lin Ft
Item 603 – 15" Conduit, Type B, 706.08 E.S.	50 Lin Ft
Item 603 – 18" Conduit, Type B, 706.02	25 Lin Ft
Item 603 – 18" Conduit, Type B, 706.08 E.S.	25 Lin Ft
Item 603 – 24" Conduit, Type B, 706.02	25 Lin Ft

STORM SEWER CONSTRUCTION

At the end of storm sewer construction, submit a video taped copy and as–built plans of the new sewers to the City of Cleveland, Division of Water Pollution Control.

Payment for all the operations described above shall be included in the contract price for pertinent 603 conduit items.

CALCULATED RSY CHECKED JLN

GENERAL NOTES

CUY-WEST 150th STREET

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MAINTENANCE OF TRAFFIC

ITEM 614 – MAINTAINING TRAFFIC

THE CONTRACTOR SHALL FOLLOW THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATION AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. HE SHALL FURNISH ERECT, MAINTAIN AND SUBSEQUENTLY REMOVE SUCH ADDITIONAL TRAFFIC CONTROL DEVICES AS ARE REQUIRED ON HIGHWAYS WHICH ARE USED AS DETOURS INCLUDING THE ROAD CLOSED SIGNS UPON THE BARRICADES AT THE POINT WHERE THE HIGHWAY IS CLOSED.

ITEM 614 – LAW ENFORCEMENT OFFICER WITH PATROL CAR

IN ADDITION TO THE REQUIREMENTS OF 614 AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD), A UNIFORMED LAW ENFORCEMENT OFFICER AND OFFICIAL PATROL CAR WITH WORKING TOP MOUNTED EMERGENCY FLASHING LIGHTS SHALL BE PROVIDED FOR CONTROLLING TRAFFIC FOR THE FOLLOWING TASKS:

– FOR LANE CLOSURES: DURING INITIAL SET–UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED.

– DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.

LAW ENFORCEMENT OFFICERS (LEO'S) SHOULD NOT BE USED WHERE OMUTCD INTENDS THAT FLAGGERS BE USED. THE LEO'S ARE CONSIDERED TO BE EMPLOYED BY THE CONTRACTOR AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR ACTIONS. ALTHOUGH THEY ARE EMPLOYED BY THE CONTRACTOR, THE PROJECT ENGINEER SHALL HAVE CONTROL OVER THEIR PLACEMENT. THE OFFICIAL PATROL CAR SHALL BE A PUBLIC SAFETY VEHICLE AS REQUIRED BY THE OHIO REVISED CODE.

THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THESE SERVICES WITH THE LOCAL POLICE DEPARTMENT.

LAW ENFORCEMENT OFFICERS WITH PATROL CAR REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON UNIT PRICE (HOURLY) BASIS UNDER ITEM 614 – LAW ENFORCEMENT OFFICER WITH PATROL CAR. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN PROVIDED IN THE BID SCHEDULE.

ITEM 614–LAW ENFORCEMENT OFFICER WITH PATROL CAR 40 HOURS

THE HOURS PAID SHALL INCLUDE MINIMUM SHOW–UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED.

IF THE CONTRACTORS WISH TO UTILIZE LEO'S FOR FLAGGING AND TRAFFIC CONTROL OTHER THAN REQUIRED IN THESE PLANS, THEY MAY DO SO AT THEIR OWN EXPENSE. PAYMENT FOR THE EXCESS ABOVE THE CONTRACT REQUIREMENTS WILL BE INCLUDED UNDER ITEM 614 – MAINTAINING TRAFFIC, AS PER PLAN

ITEM 614 – REPLACEMENT SIGN

FLAT SHEET SIGNS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT SIGNS SHALL BE NEW.

PAYMENT FOR THE NEW SIGNS SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM SPECIAL – REPLACEMENT SIGN, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF DAMAGED SIGNS, HARDWARE AND SUPPORTS, AND PROVIDING THE NECESSARY REPLACEMENT HARDWARE, SUPPORTS, ETC.

AN ESTIMATED QUANTITY OF 10 EACH HAS BEEN PROVIDED IN THE BID SCHEDULE.

ITEM 614 – REPLACEMENT DRUM

DRUMS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT DRUMS SHALL BE NEW.

PAYMENT FOR THE NEW DRUMS SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM SPECIAL – REPLACEMENT DRUM, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF THE DAMAGED DRUM, AND PROVIDING AND MAINTAINING THE REPLACEMENT DRUM IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS FOR THE ORIGINAL DRUM.

AN ESTIMATED QUANTITY OF 50 EACH HAS BEEN PROVIDED IN THE BID SCHEDULE.

ITEM 614 – ASPHALT CONCRETE FOR MAINTAINING TRAFFIC

THIS ITEM SHALL BE USED FOR REPAIRING HOLES IN THE ROADWAY SURFACE AND BERMS WHICH ARE DAMAGED BY TRAFFIC DURING THE LANE SHIFT DURING CONSTRUCTION. THE CONTRACTOR SHALL USE THIS ITEM TO MAINTAIN THE ROADWAY AND EXISTING SHOULDERS ACCORDING TO SECTION 614.02 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS. THE CONTRACTOR SHALL ALSO USE THIS ITEM TO CONSTRUCT, MAINTAIN AND REMOVE ASPHALT RAMPS TO MAINTAIN THE REQUIRED LANE WIDTHS AND ALLOW SUFFICIENT AREA FOR TURNING MOVEMENTS.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN PROVIDED IN THE BID SCHEDULE FOR MAINTENANCE OF TRAFFIC AS OUTLINED ABOVE, TO BE USED AS DIRECTED BY THE ENGINEER ON ALL PARTS OF THIS PROJECT.

ITEM 614 – ASPHALT CONCRETE
FOR MAINTAINING TRAFFIC 50 C Y

NOTICE OF CLOSURE SIGNS

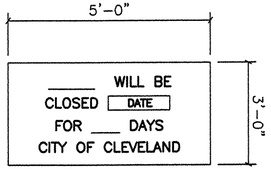
THESE SIGNS SHALL BE ERECTED BY THE CONTRACTOR AT LEAST TWO WEEKS IN ADVANCE OF THE SCHEDULED ROAD CLOSURE. THE SIGNS SHALL BE ERECTED ON THE RIGHT HAND SIDE OF THE ROAD FACING TRAFFIC. THEY SHALL BE LOCATED IN THE FIELD SO AS NOT TO INTERFERE WITH ANY PERMANENT SIGNS. ON THIS PROJECT THEY SHALL BE ERECTED AS CLOSE AS PRACTICAL TO THE POINT OF CLOSURE. SIGNS TO BE MADE OF TYPE G REFLECTIVE SHEETING FOR BACKGROUND AND LEGEND.

OC–60D SIGNS SHALL BE USED ON THE FOLLOWING LOCAL ROADS:

WEST 150th STREET	1 EACH
WEST 150th STREET (STA. 68+00 S.B.)	1 EACH
INDUSTRIAL PARKWAY	1 EACH

PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE LUMP SUM BID ITEM 614 MAINTAINING TRAFFIC, AND SHALL INCLUDE FURNISHING, ERECTING, MAINTAINING AND REMOVING THE SIGNS INCLUDING SUPPORTS.

NOTE: THE CONTRACTOR IS TO FILL IN THE ROAD, DATE, AND DURATION.



OC–60D

LIQUIDATED DAMAGES

THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION WORK SCHEDULE TO THE CITY OF CLEVELAND AND THE CITY OF BROOK PARK FOR THEIR APPROVAL PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY. THE WORK SCHEDULE SHALL INDICATE START AND COMPLETION DATES FOR WEST 150th STREET AND INDUSTRIAL PARKWAY. LIQUIDATED DAMAGES, AS SET FORTH BY THE CITY OF CLEVELAND, WILL BE ASSESSED TO THE CONTRACTOR FOR FAILURE TO MEET SET COMPLETION DATES.

ITEM 615 – ROADS FOR MAINTAINING TRAFFIC

THE CONTRACTOR SHALL CONSTRUCT THE ROADS FOR MAINTAINING TRAFFIC AT THE LOCATION SHOWN ON THE PLANS.

PAYMENT SHALL BE AT THE LUMP SUM BID FOR ITEM 615 – ROADS FOR MAINTAINING TRAFFIC WHICH PRICE SHALL INCLUDE ALL EMBANKMENT, EXCAVATION (RIGID OR FLEXIBLE PAVEMENT), DRAINAGE, TEMPORARY PIPES, SUBSEQUENT REMOVAL AND GRADING.

ITEM 615 – PAVEMENT FOR MAINTAINING TRAFFIC, CLASS A

THE CONTRACTOR SHALL CONSTRUCT PAVEMENT FOR MAINTAINING TRAFFIC, CLASS A AT LOCATIONS SHOWN ON THE PLANS.

PAYMENT SHALL BE AT THE UNIT PRICE BID PER S Y – ITEM 615 PAVEMENT FOR MAINTAINING TRAFFIC, CLASS A, WHICH PRICE SHALL INCLUDE ALL PAVEMENT WORK FOR MAINTAINING TRAFFIC.

AN ESTIMATED QUANTITY OF ITEM 615 – PAVEMENT FOR MAINTAINING TRAFFIC, HAS BEEN PROVIDED IN THE BID SCHEDULE.

ITEM 615 – PAVEMENT FOR MAINTAINING TRAFFIC, CLASS A 1300 S Y

ITEM 642 – REMOVAL OF PAVEMENT MARKING

THIS ITEM SHALL BE USED TO REMOVE EXISTING PERMANENT PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH THE TEMPORARY MARKINGS AS SHOWN ON THE TRAFFIC MAINTENANCE DETAILS. PAYMENT SHALL BE BASED UPON THE ACTUAL LENGTH REMOVED. ALL CONFLICTING PAVEMENT MARKINGS MUST BE COMPLETELY OBLITERATED. GAPS SHALL NOT BE INCLUDED IN THE MEASURED LENGTH. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN PROVIDED IN THE BID SCHEDULE TO BE USED AS OUTLINED ABOVE, AND AS DIRECTED BY THE ENGINEER.

ITEM 642 – REMOVAL OF PAVEMENT MARKING 2500 FT

ITEM 630 – COVERING OF SIGN

WHERE DIRECTED BY THE ENGINEER OR WHERE THE PLANS CALL FOR SIGNS TO BE COVERED, THE CONTRACTOR SHALL DO SO IN SUCH A MANNER AS TO AVOID DAMAGING THE PERMANENT SIGN WHEN THE COVER IS REMOVED. THE COVER SHALL BE TOTALLY OPAQUE. THE USE OF ADHESIVE TAPE APPLIED DIRECTLY TO A SIGN FACE IS STRICTLY PROHIBITED. THE FOLLOWING CONTINGENCY QUANTITY TO BE USED AS DIRECTED BY THE ENGINEER HAS BEEN PROVIDED IN THE BID SCHEDULE.

ITEM 630 – COVERING OF SIGN 1,000 S.F.

MAINTENANCE OF TRAFFIC – DROPOFFS IN WORK ZONES

AN ESTIMATED QUANTITY FOR 32" PORTABLE CONCRETE BARRIER (WITHOUT GLARE SHIELD) HAS BEEN PROVIDED IN THE BID SCHEDULE TO BE USED AS DIRECTED BY THE ENGINEER.

ITEM 622 – PORTABLE CONCRETE BARRIER, 32" 200 FT

DETOUR/PROTECTION OF PEDESTRIANS

THE CONTRACTOR SHALL MAINTAIN SAFE PEDESTRIAN PASSAGE AT ALL TIMES ON AT LEAST ONE SIDE OF WEST 150th STREET AND INDUSTRIAL PARKWAY. WHEN A SIDEWALK IS CLOSED OR A TEMPORARY WALK IS PROVIDED BY THE CONTRACTOR, PEDESTRIANS SHALL BE WARNED, GUIDED, AND PROTECTED THROUGH THE CONSTRUCTION ZONE IN ACCORDANCE WITH THE DETAILS PROVIDED IN STANDARD DRAWING MT–110.10 AND MT–110.20.

CALCULATED JEN CHECKED EPS

MAINTENANCE OF TRAFFIC GENERAL NOTES

CUY-WEST 150th STREET

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GENERAL NOTES

1. It is intended that this drawing be used for treatment of drop-offs that develop during construction operations, and that are not otherwise provided for in the construction plans. The suggested treatments are intended for high volume projects that will last at least seven days and have an active work zone 1 mile [1.6 km] or less in length. For guidance on the use of this sheet, see L&D Manual Volume One, Section 500. Where the plans do not provide specific items for labor, equipment, or materials to implement the drop-off treatments specified hereon, they shall be included for payment in the lump sum bid for **Item 614 - Maintaining Traffic.**

2. While the need for certain advisory signing is noted hereon, it is not intended that this be indicative of all signing that may be required to advise or warn motorists, and all requirements of the Ohio Manual of Uniform Traffic Control Devices (OMUTCD) must be fulfilled.

3. In urban or otherwise heavily developed areas where pedestrians and/or bicyclists may be present in significant numbers, additional signing and protective measures other than those shown hereon may be required.

4. The drop-off treatment selected for use at any given location shall be as appropriate for the prevailing conditions at the site.

5. Where concrete barrier is specified, it shall be in accordance with **SCD RM-4.2** and Item 622.

6. When drums are specified for a drop-off condition, a minimum number of four drums shall be used. Spacing shall be as indicated in the plans or as specified in the OMUTCD.

7. When W8-9 (Low Shoulder) signs or W8-9a (Shoulder Drop-Off) signs or W8-11 (Uneven Lanes) signs are required, they shall be placed 750' [230 m] in advance of the condition, on all intersecting entrance ramps within the limits of the condition and immediately beyond all inter secting roadways within the limits of the condition. When the drop-off condition extends more than 0.5 mile [800 m], additional signs should be erected at intervals of 1.0 mile [1600 m] or less.

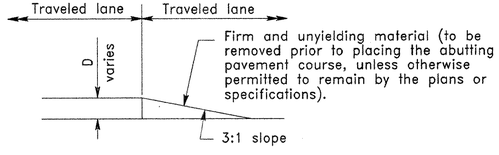
8. For locations, such as at ramps, lane shifts, lane closures, etc., where traffic is required to negotiate a difference in elevation between pavements, a 3:1 slope treatment similar to the Optional Wedge Treatment shall be provided.

9. Portable concrete barrier shall be placed on the same level as the traffic surface and shall not encroach on lane width(s) designated as the minimum required for traffic use. Where drums are used, and their presence would reduce traveled lane widths to less than 10' [3.0 m], drums may be placed on the opposite level from that of traffic provided the dropoff depth does not exceed 5" [125] and approval is granted by the Project Engineer.

10. Pavement Repairs (or similar work):
    a. Lengths greater than 60' [18 m] - utilize appropriate treatment from Condition I.
    b. Lengths of 60' [18 m] or less - repairs shall be effected in accordance with CMS 255.08. Drums may be used as a separator adjacent to the traveled lane.

OPTIONAL WEDGE TREATMENT
(MILLING OR RESURFACING)

1. This treatment may be used when permitted for Condition I only.
2. W8-11 sign required.

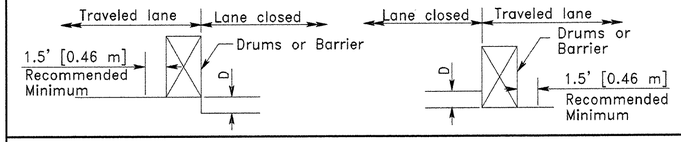


CONDITION I
DROP-OFFS BETWEEN TRAVELED LANES

1. These treatments are to be used for resurfacing, pavement planing, excavation, etc. between or within traveled lanes.

D	Treatment
_<1*" [<40]	Erect W8-11 sign.
1*"-3" [40-75]	1) Lane closure utilizing drums* as shown below OR 2) Optional Wedge Treatment
>3"-5" [>75-125]	Lane closure utilizing drums as shown below.
>5" [>125]	Lane closure utilizing portable concrete barrier as shown below.

* Cones may be used for daytime only conditions.

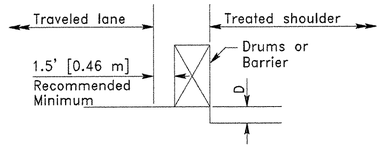


CONDITION II
DROP-OFFS WITHIN GRADED SHOULDER AREA

1. The treatments indicated below are for use in conjunction with resurfacing, planing, or excavations within the graded shoulder area.
2. The graded shoulder area is that flat or gradually sloping area between the edge of a normally traveled lane and the more steeply sloping ditch foreslope or embankment slope. Its surface may be soil or turf, and/or it may be inclusive of a "treated" area (improved with aggregates, asphaltic materials or concrete). For the purpose herein, its maximum width shall be considered to be 12' [3.6 m].

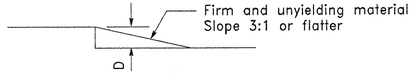
D	Treatment
_<1*" [<40]	1) Erect W8-9a signs.
>1*"-5" [>40-125]	1) If minimum lane width *requirements can be met, maintain lanes utilizing drums as shown below OR 2) If minimum. lane width *requirements cannot be met, close adjacent lane utilizing drums OR 3) Optional Shoulder Treatment.
>5"-12" [125-305] Daylight only	If minimum lane width *requirements can be met, maintain lanes utilizing drums as shown below.
>5"-24" [>125-610]	1) If minimum lane width *requirements can be met, maintain lanes utilizing portable concrete barrier as shown below. OR 2) If minimum lane width *requirements cannot be met, close adjacent lane utilizing drums.
>24" [>610]	Lane closure utilizing portable concrete barrier as shown below.

* Minimum lane widths shall be 10' [3.0 m] unless otherwise specified in the plans.



OPTIONAL SHOULDER TREATMENT

1. This treatment may not be used within a bituminous shoulder where a hot longitudinal joint per CMS 401.15 is required.
2. W8-9 signs required.

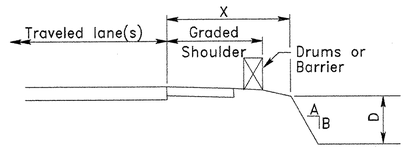


CONDITION III
DROP-OFFS BEYOND GRADED SHOULDER OR BACK OF CURB

1. See Note 2 under Condition II.
2. Use Chart A or B below, as applicable.

CHART A

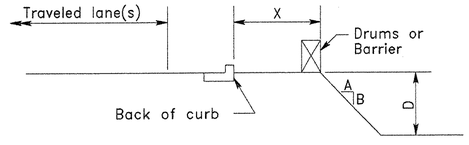
USE FOR: 1. Uncurbed Facilities.
2. Curbed Facilities, where:
   a. Curbs are less than 6" [150] in height.
   b. Curbs are 6" [150] or greater in height and the legal speed is greater than 40 mph [70 km/h].



X	D	A/B	Treatment Required	
			Day	Night
0-4' [0-1.2 m]	Any	Any	(a)	(a)
4'-30' [1.2-9.1 m]	Any	3:1 or Flatter	None	None
4'-12' [1.2-3.6 m]	<3" [<75]	Steeper than 3:1	None	None
4'-12' [1.2-3.6 m]	>3"-<12" [>75-<305]	Steeper than 3:1	Drums	Drums
4'-12' [1.2-3.6 m]	>12" [>305]	Steeper than 3:1	Drums	Barrier
>12'-20' [>3.6-6.1 m]	<12" [<305]	Steeper than 3:1	None	None
>12'-20' [>3.6-6.1 m]	>12"-<24" [>305-<610]	Steeper than 3:1	Drums	Drums
>12'-20' [>3.6-6.1 m]	>24" [>610]	Steeper than 3:1	Drums	Barrier
>20'-30' [>6.1-9.1 m]	<24" [<610]	Steeper than 3:1	None	None
>20'-30' [>6.1-9.1 m]	>24" [>610]	Steeper than 3:1	Drums	Barrier
>30' [>9.1 m]	Any	Any	None	None
(a) Use treatment specified under Condition II.				

CHART B

USE FOR: Curbed facilities, where the curb is 6" [150] or greater in height and the legal speed is 40 mph [70 km/h] or less.



X	D	A/B	Treatment Required	
			Day	Night
0-10' [0-3.0 m]	<12" [<305]	Any	None	Drums
0-10' [0-3.0 m]	>12" [>305]	Any	Drums	Drums
>10' [>3.0 m]	Any	Any	None	None

NOTE: All metric dimensions (in brackets []) are in millimeters unless otherwise noted.

CALCULATED ARP
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DROPOFFS IN WORK ZONES

OFFICE OF TRAFFIC ENGINEERING

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MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

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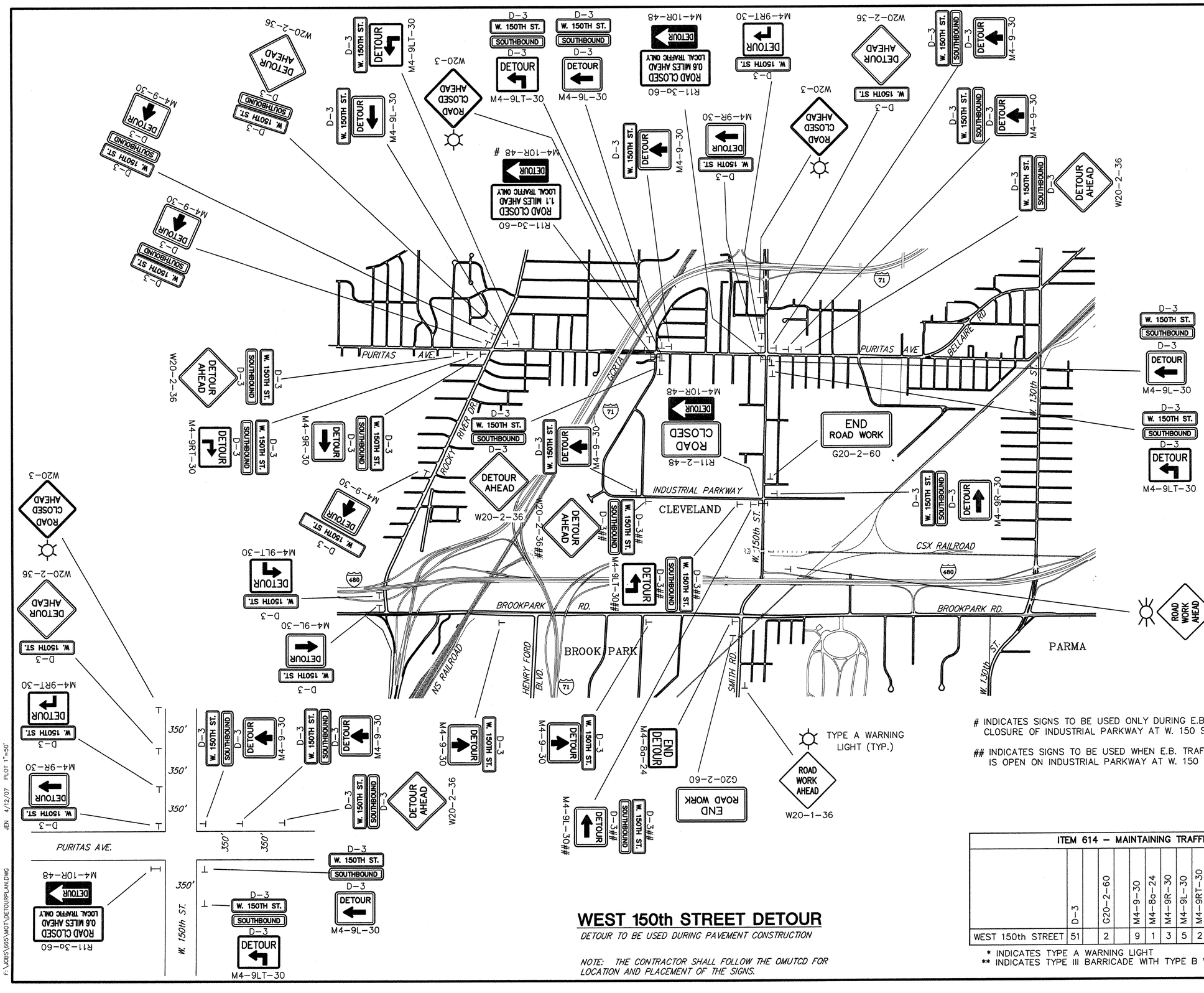

WEST 150th STREET DETOUR

DETOUR TO BE USED DURING PAVEMENT CONSTRUCTION

NOTE: THE CONTRACTOR SHALL FOLLOW THE OMUTCD FOR LOCATION AND PLACEMENT OF THE SIGNS.

# indicates signs to be used only during E.B. closure of Industrial Parkway at W. 150 St.

indicates signs to be used when E.B. traffic is open on Industrial Parkway at W. 150 St.

ITEM 614 – MAINTAINING TRAFFIC (DETOURS)

	D-3		G20-2-60		M4-9-30	M4-8a-24	M4-9R-30	M4-9L-30	M4-9RT-30	M4-9LT-30	M4-10R-48		R11-2-48**	R11-4-60**			W20-1-36*	W20-2-36	W20-3-36*
WEST 150th STREET	51		2		9	1	3	5	2	5	3		1	2			2	6	2

* INDICATES TYPE A WARNING LIGHT
** INDICATES TYPE III BARRICADE WITH TYPE B WARNING LIGHT

JEN
CHECKED EPS

0 1000 2000 SCALE IN FEET

MAINTENANCE OF TRAFFIC DETOUR PLAN

CUY-WEST 150th STREET

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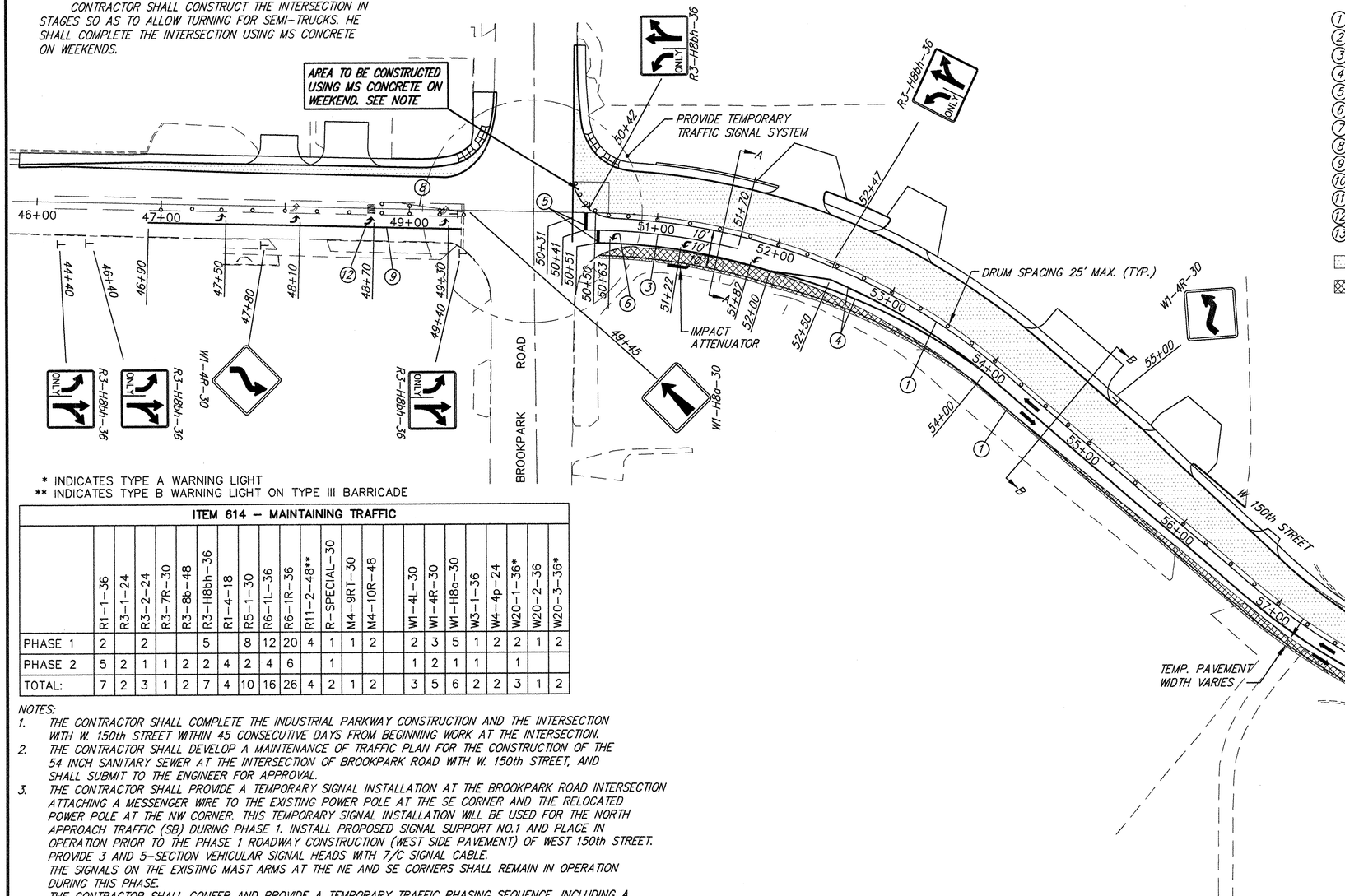
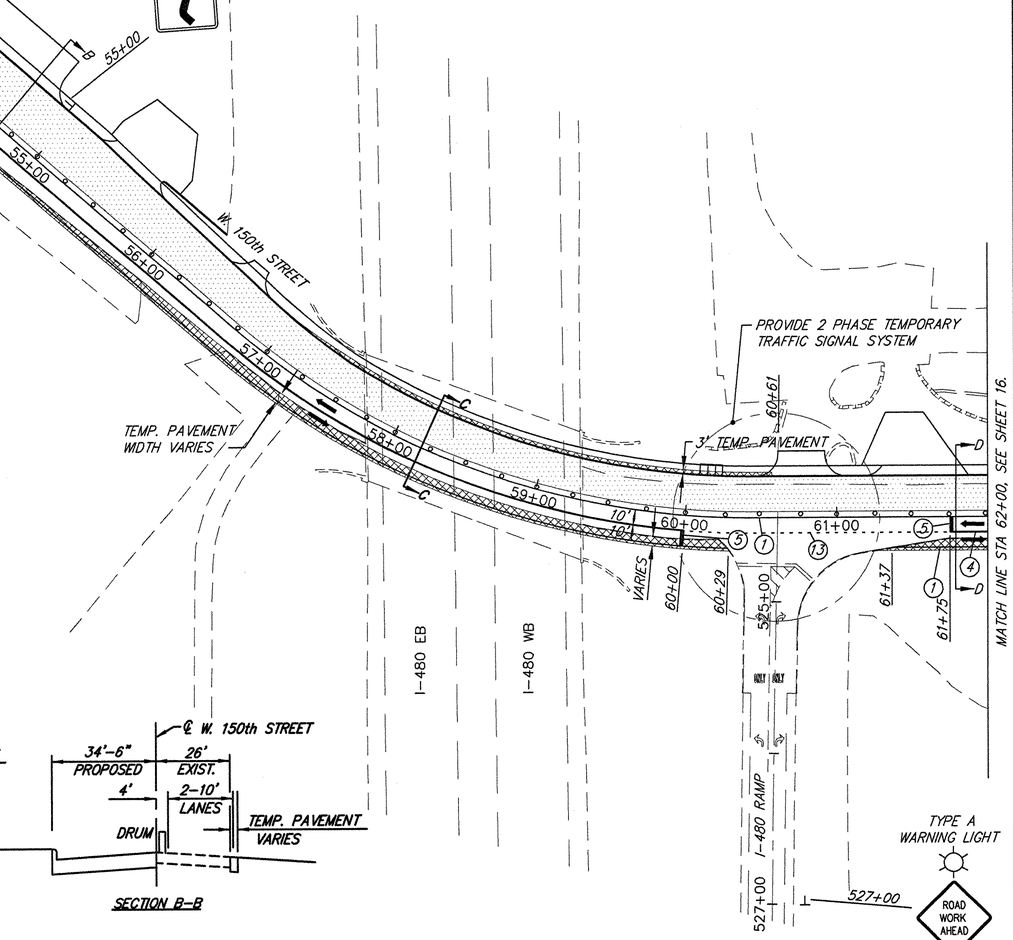
NOTE:
CONTRACTOR SHALL CONSTRUCT THE INTERSECTION IN STAGES SO AS TO ALLOW TURNING FOR SEMI-TRUCKS. HE SHALL COMPLETE THE INTERSECTION USING MS CONCRETE ON WEEKENDS.





* INDICATES TYPE A WARNING LIGHT
** INDICATES TYPE B WARNING LIGHT ON TYPE III BARRICADE

ITEM 614 – MAINTAINING TRAFFIC

	R1-1-36	R3-1-24	R3-2-24	R3-7R-30	R3-8b-48	R3-H8bh-36	R1-4-18	R5-1-30	R6-1L-36	R6-1R-36	R11-2-48**	R-SPECIAL-30	M4-9RT-30	M4-10R-48		W1-4L-30	W1-4R-30	W1-H8a-30	W3-1-36	W4-4p-24	W20-1-36*	W20-2-36	W20-3-36*
PHASE 1	2		2			5		8	12	20	4	1	1	2		2	3	5	1	2	2	1	2
PHASE 2	5	2	1	1	2	2	4	2	4	6		1				1	2	1	1		1		
TOTAL:	7	2	3	1	2	7	4	10	16	26	4	2	1	2		3	5	6	2	2	3	1	2

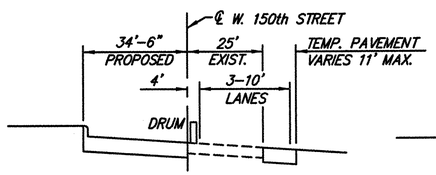
NOTES:
1. THE CONTRACTOR SHALL COMPLETE THE INDUSTRIAL PARKWAY CONSTRUCTION AND THE INTERSECTION WITH W. 150th STREET WITHIN 45 CONSECUTIVE DAYS FROM BEGINNING WORK AT THE INTERSECTION.
2. THE CONTRACTOR SHALL DEVELOP A MAINTENANCE OF TRAFFIC PLAN FOR THE CONSTRUCTION OF THE 54 INCH SANITARY SEWER AT THE INTERSECTION OF BROOKPARK ROAD WITH W. 150th STREET, AND SHALL SUBMIT TO THE ENGINEER FOR APPROVAL.
3. THE CONTRACTOR SHALL PROVIDE A TEMPORARY SIGNAL INSTALLATION AT THE BROOKPARK ROAD INTERSECTION ATTACHING A MESSENGER WIRE TO THE EXISTING POWER POLE AT THE SE CORNER AND THE RELOCATED POWER POLE AT THE NW CORNER. THIS TEMPORARY SIGNAL INSTALLATION WILL BE USED FOR THE NORTH APPROACH TRAFFIC (SB) DURING PHASE 1. INSTALL PROPOSED SIGNAL SUPPORT NO.1 AND PLACE IN OPERATION PRIOR TO THE PHASE 1 ROADWAY CONSTRUCTION (WEST SIDE PAVEMENT) OF WEST 150th STREET. PROVIDE 3 AND 5-SECTION VEHICULAR SIGNAL HEADS WITH 7/C SIGNAL CABLE.
   THE SIGNALS ON THE EXISTING MAST ARMS AT THE NE AND SE CORNERS SHALL REMAIN IN OPERATION DURING THIS PHASE.
   THE CONTRACTOR SHALL CONFER AND PROVIDE A TEMPORARY TRAFFIC PHASING SEQUENCE, INCLUDING A PROTECTED NB/SB LEFT TURN PHASE, TO THE ENGINEER FOR APPROVAL.
4. THE CONTRACTOR SHALL PROVIDE A TEMPORARY SIGNAL INSTALLATION FOR THE I-480 RAMP AND THE WEST 150th STREET INTERSECTION. A 2 PHASE SYSTEM SHALL BE PROVIDED. PHASING SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

SUGGESTED CONSTRUCTION SEQUENCE
PHASE 1
1. REMOVE EXISTING CURB ON THE EAST SIDE OF W. 150th STREET FROM BROOKPARK ROAD TO STA. 64+34.
2. CONSTRUCT TEMPORARY PAVEMENT AS SHOWN IN THE PLANS TO PROVIDE THREE TEMPORARY LANES OF PAVEMENT AT THE INTERSECTION WITH BROOKPARK ROAD AND TWO WAY TRAFFIC TO STA. 64+34.
3. MAINTAIN ONE LANE OF TRAFFIC NORTHBOUND ONLY FROM STA. 64+34 TO THE INTERSECTION WITH INDUSTRIAL PARKWAY.
4. CONSTRUCT SOUTHBOUND PAVEMENT FROM 400 FEET SOUTH OF BROOKPARK ROAD TO INDUSTRIAL PARKWAY. DO NOT CONSTRUCT PROPOSED CURB, AT THIS TIME, IN AREAS WHERE TEMPORARY PAVEMENT WILL BE NEEDED. CONSTRUCT 3 FOOT WIDE TEMPORARY PAVEMENT FROM STA. 56+89 TO STA. 63+25 AND CONSTRUCT TEMPORARY PAVEMENT FROM STA. 76+47 TO STA. 78+67 ON THE SOUTHBOUND SIDE, AND FROM STA. 76+51 TO STA. 78+34 ON THE NORTHBOUND SIDE.
5. CONSTRUCT INDUSTRIAL PARKWAY IN TWO STAGES WHILE MAINTAINING ONE LANE OF TRAFFIC WESTBOUND AT ALL TIMES.
6. THE CONTRACTOR SHALL MAINTAIN TRAFFIC ON THE I-480 EXIT RAMP WITH STAGE CONSTRUCTION AT ALL TIMES.
7. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ABUTTING PROPERTIES AT ALL TIMES.
8. THE CONTRACTOR SHALL MAINTAIN SAFE PEDESTRIAN PASSAGE AT ALL TIMES.

LEGEND

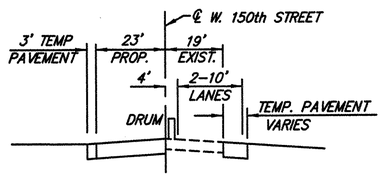
		TOTAL PHASE 1 & 2 ESTIMTED QUANTITIES
(1)	WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, WHITE	3843 L.F.
(2)	WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, YELLOW	1655 L.F.
(3)	WORK ZONE CHANNELIZING LINE, CLASS 1, 642 PAINT	129 L.F.
(4)	WORK ZONE CENTER LINE, CLASS 1, 642 PAINT	1320 L.F.
(5)	WORK ZONE STOP LINE, CLASS 1, 642 PAINT	125 L.F.
(6)	WORK ZONE LANE ARROW, CLASS 1, 642 PAINT	3 EACH
(7)	WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, WHITE	2286 L.F.
(8)	WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, YELLOW	475 L.F.
(9)	WORK ZONE CHANNELIZING LINE, CLASS 1, 740.06, TYPE 1	491 L.F.
(10)	WORK ZONE CENTER LINE, DOUBLE, CLASS 1, 740.06, TYPE 1	1495 L.F.
(11)	WORK ZONE STOP LINE, CLASS 1, 740.06, TYPE 1	92 L.F.
(12)	WORK ZONE LANE ARROW, CLASS 1, 740.06, TYPE 1	14 EACH
(13)	WORK ZONE DOTTED LINE, DOUBLE, CLASS 1, 740.06, TYPE 1, YELLOW	500 L.F.

PROPOSED PAVEMENT CONSTRUCTION
TEMPORARY PAVEMENT

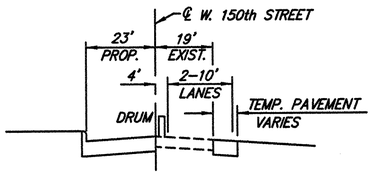


SECTION A-A

SECTION B-B



SECTION C-C



SECTION D-D

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JEN CHECKED EPS

MAINTENANCE OF TRAFFIC PHASES 1

CUY-WEST 150th STREET

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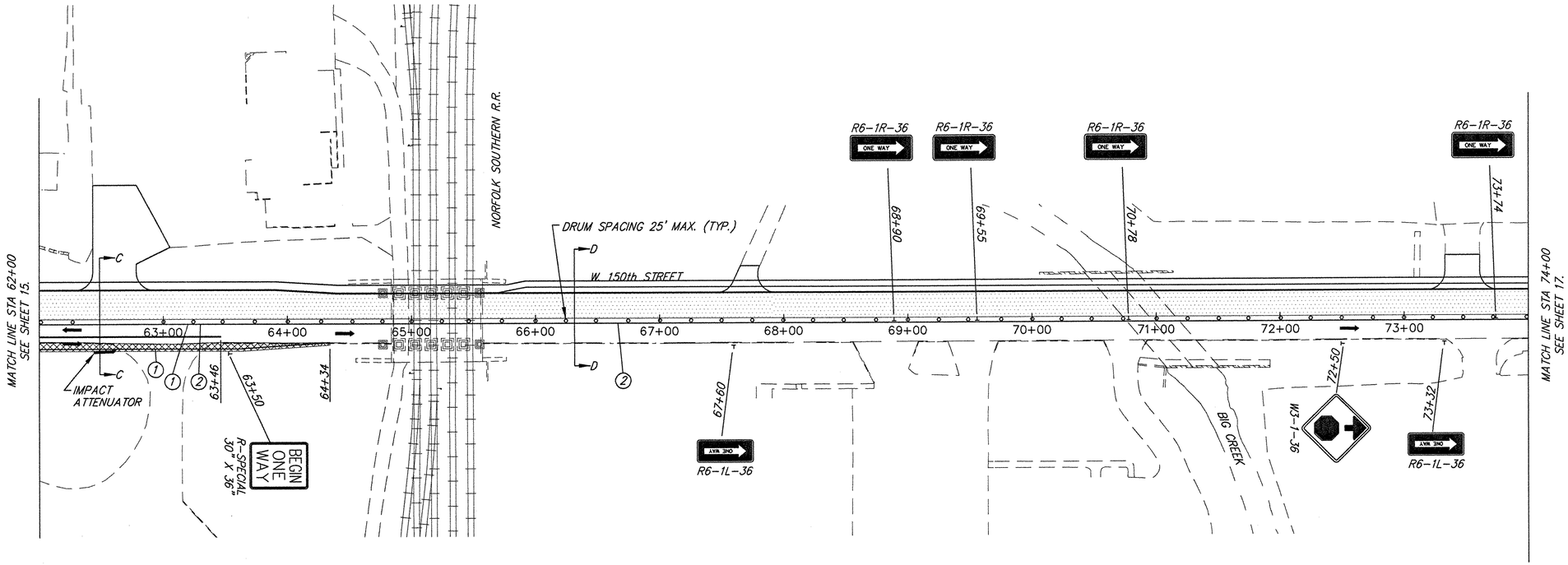
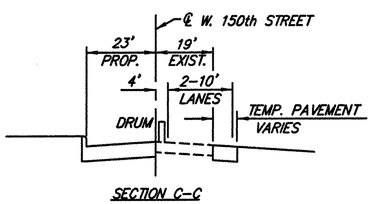
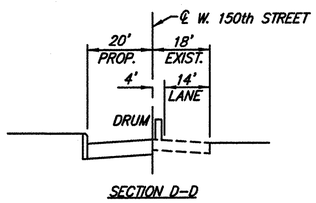




SECTION C-C



SECTION D-D

LEGEND

1. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, WHITE
2. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, YELLOW
3. WORK ZONE CHANNELIZING LINE, CLASS 1, 642 PAINT
4. WORK ZONE CENTER LINE, CLASS 1, 642 PAINT
5. WORK ZONE STOP LINE, CLASS 1, 642 PAINT
6. WORK ZONE LANE ARROW, CLASS 1, 642 PAINT
7. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, WHITE
8. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, YELLOW
9. WORK ZONE CHANNELIZING LINE, CLASS 1, 740.06, TYPE 1
10. WORK ZONE CENTER LINE, DOUBLE, CLASS 1, 740.06, TYPE 1
11. WORK ZONE STOP LINE, CLASS 1, 740.06, TYPE 1
12. WORK ZONE LANE ARROW, CLASS 1, 740.06, TYPE 1
13. WORK ZONE DOTTED LINE, DOUBLE, CLASS 1, 740.06, TYPE 1, YELLOW

PROPOSED PAVEMENT CONSTRUCTION

TEMPORARY PAVEMENT

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0 50 100
SCALE IN FEET

JEN
CHECKED EPS

MAINTENANCE OF TRAFFIC PHASES 1

CUY-WEST 150th STREET

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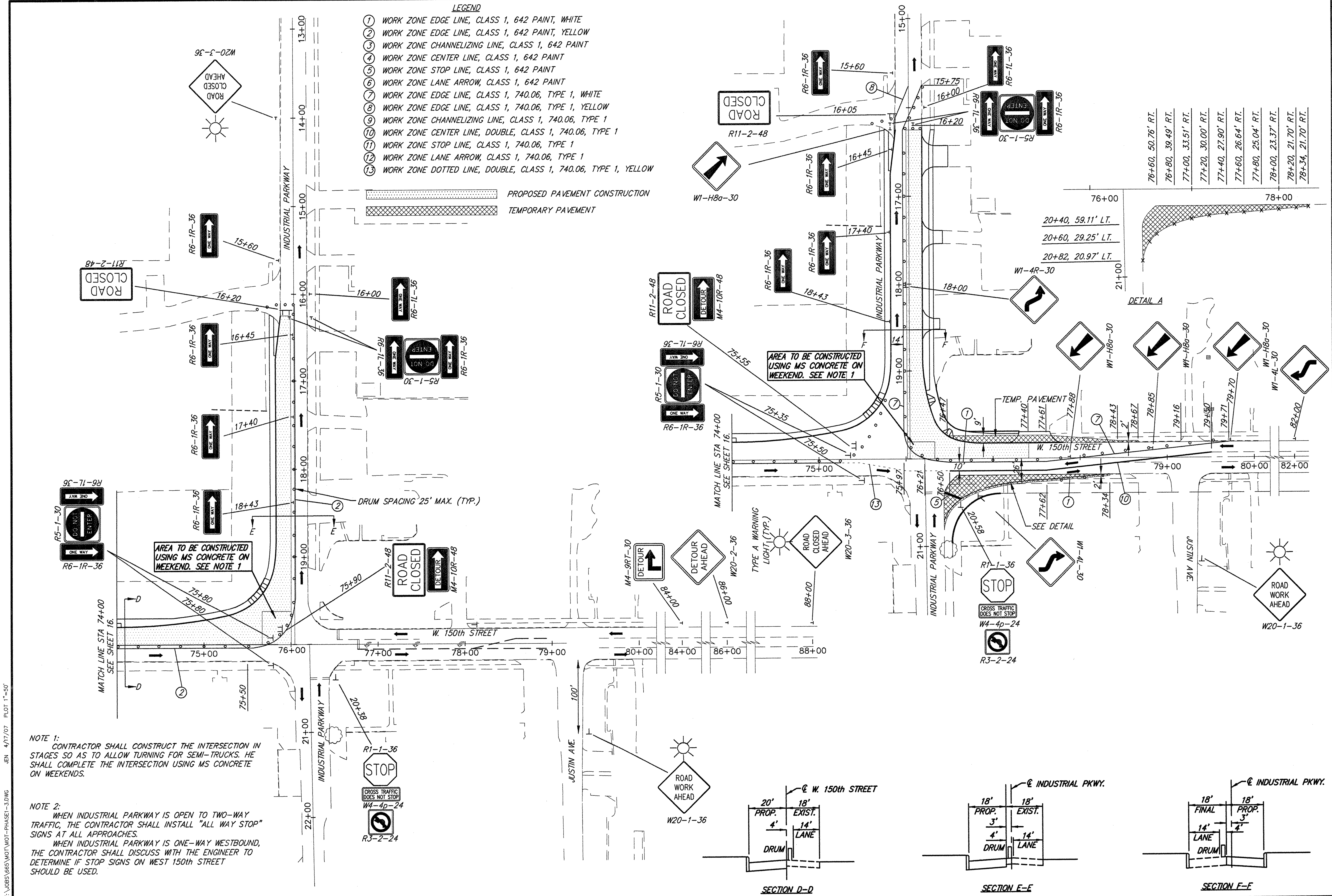
F:\JOBS\665\MOT\MOT-PHASE1-2.DWG JEN 3/22/07 PLOT 1"=50'



LEGEND

1. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, WHITE
2. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, YELLOW
3. WORK ZONE CHANNELIZING LINE, CLASS 1, 642 PAINT
4. WORK ZONE CENTER LINE, CLASS 1, 642 PAINT
5. WORK ZONE STOP LINE, CLASS 1, 642 PAINT
6. WORK ZONE LANE ARROW, CLASS 1, 642 PAINT
7. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, WHITE
8. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, YELLOW
9. WORK ZONE CHANNELIZING LINE, CLASS 1, 740.06, TYPE 1
10. WORK ZONE CENTER LINE, DOUBLE, CLASS 1, 740.06, TYPE 1
11. WORK ZONE STOP LINE, CLASS 1, 740.06, TYPE 1
12. WORK ZONE LANE ARROW, CLASS 1, 740.06, TYPE 1
13. WORK ZONE DOTTED LINE, DOUBLE, CLASS 1, 740.06, TYPE 1, YELLOW

PROPOSED PAVEMENT CONSTRUCTION

TEMPORARY PAVEMENT

NOTE 1:
CONTRACTOR SHALL CONSTRUCT THE INTERSECTION IN STAGES SO AS TO ALLOW TURNING FOR SEMI-TRUCKS. HE SHALL COMPLETE THE INTERSECTION USING MS CONCRETE ON WEEKENDS.

NOTE 2:
WHEN INDUSTRIAL PARKWAY IS OPEN TO TWO-WAY TRAFFIC, THE CONTRACTOR SHALL INSTALL "ALL WAY STOP" SIGNS AT ALL APPROACHES.
WHEN INDUSTRIAL PARKWAY IS ONE-WAY WESTBOUND, THE CONTRACTOR SHALL DISCUSS WITH THE ENGINEER TO DETERMINE IF STOP SIGNS ON WEST 150th STREET SHOULD BE USED.

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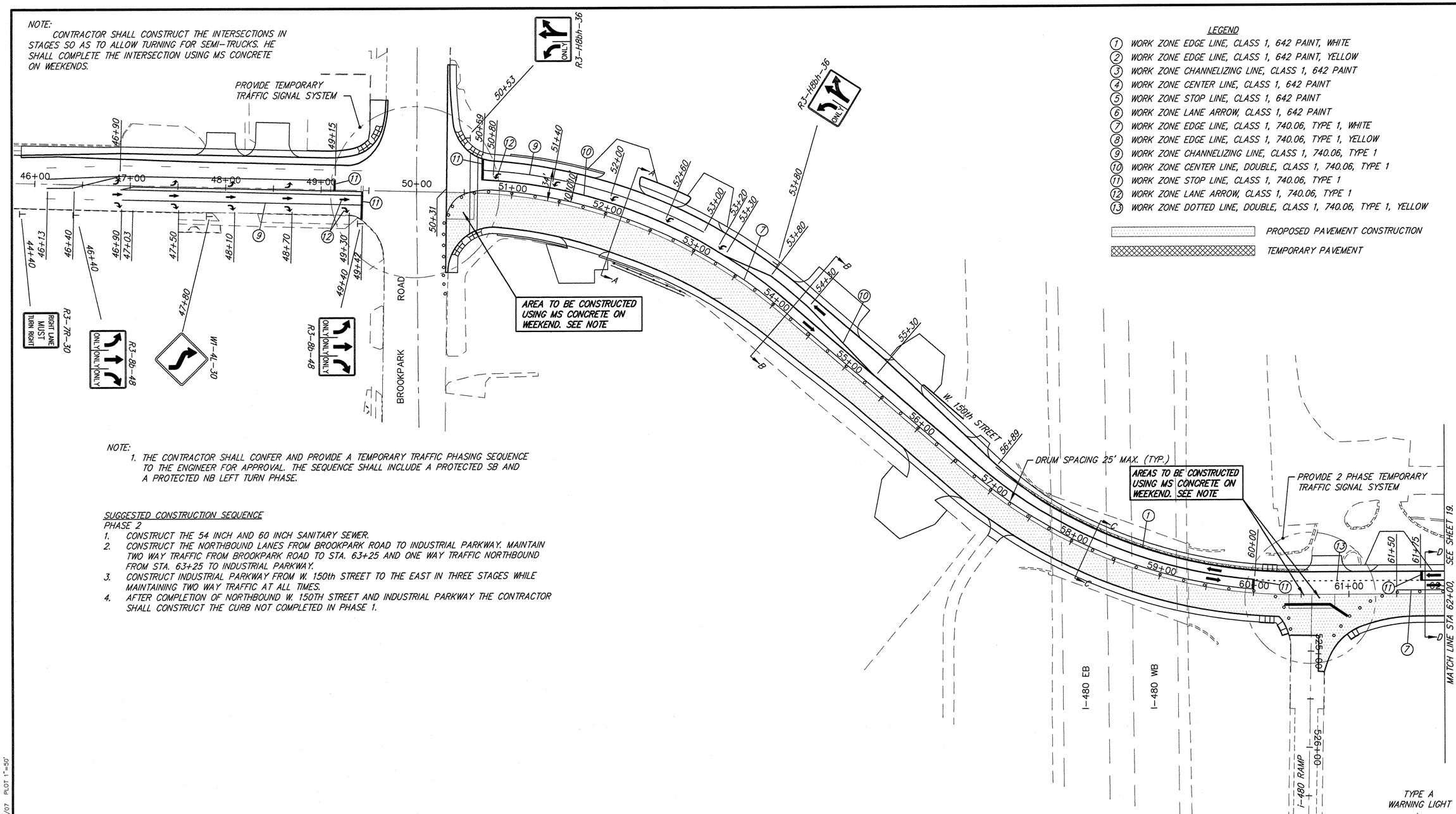
MAINTENANCE OF TRAFFIC PHASES 1

CUY-WEST 150th STREET

NOTE:
CONTRACTOR SHALL CONSTRUCT THE INTERSECTIONS IN STAGES SO AS TO ALLOW TURNING FOR SEMI-TRUCKS. HE SHALL COMPLETE THE INTERSECTION USING MS CONCRETE ON WEEKENDS.



LEGEND

1. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, WHITE
2. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, YELLOW
3. WORK ZONE CHANNELIZING LINE, CLASS 1, 642 PAINT
4. WORK ZONE CENTER LINE, CLASS 1, 642 PAINT
5. WORK ZONE STOP LINE, CLASS 1, 642 PAINT
6. WORK ZONE LANE ARROW, CLASS 1, 642 PAINT
7. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, WHITE
8. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, YELLOW
9. WORK ZONE CHANNELIZING LINE, CLASS 1, 740.06, TYPE 1
10. WORK ZONE CENTER LINE, DOUBLE, CLASS 1, 740.06, TYPE 1
11. WORK ZONE STOP LINE, CLASS 1, 740.06, TYPE 1
12. WORK ZONE LANE ARROW, CLASS 1, 740.06, TYPE 1
13. WORK ZONE DOTTED LINE, DOUBLE, CLASS 1, 740.06, TYPE 1, YELLOW

PROPOSED PAVEMENT CONSTRUCTION

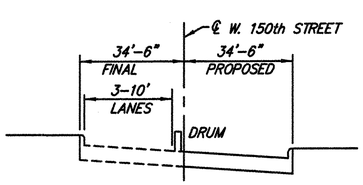
TEMPORARY PAVEMENT

NOTE:
1. THE CONTRACTOR SHALL CONFER AND PROVIDE A TEMPORARY TRAFFIC PHASING SEQUENCE TO THE ENGINEER FOR APPROVAL. THE SEQUENCE SHALL INCLUDE A PROTECTED SB AND A PROTECTED NB LEFT TURN PHASE.

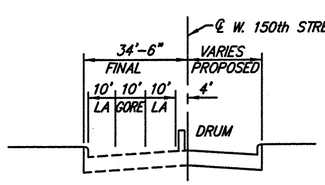
SUGGESTED CONSTRUCTION SEQUENCE
PHASE 2

1. CONSTRUCT THE 54 INCH AND 60 INCH SANITARY SEWER.
2. CONSTRUCT THE NORTHBOUND LANES FROM BROOKPARK ROAD TO INDUSTRIAL PARKWAY. MAINTAIN TWO WAY TRAFFIC FROM BROOKPARK ROAD TO STA. 63+25 AND ONE WAY TRAFFIC NORTHBOUND FROM STA. 63+25 TO INDUSTRIAL PARKWAY.
3. CONSTRUCT INDUSTRIAL PARKWAY FROM W. 150th STREET TO THE EAST IN THREE STAGES WHILE MAINTAINING TWO WAY TRAFFIC AT ALL TIMES.
4. AFTER COMPLETION OF NORTHBOUND W. 150TH STREET AND INDUSTRIAL PARKWAY THE CONTRACTOR SHALL CONSTRUCT THE CURB NOT COMPLETED IN PHASE 1.

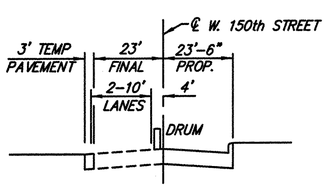
NOTE:
CONTRACTOR SHALL CONSTRUCT THE INTERSECTION OF I-480 RAMP WITH WEST 150th STREET IN STAGES TO MAINTAIN SEMI-TRUCK TURNING TRAFFIC AT ALL TIMES.



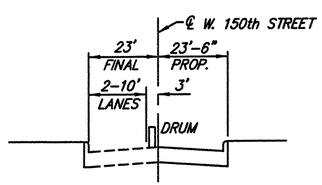
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

F:\JOBS\665\MOT\MOT-PHASE2-1.DWG JEN 4/12/07 PLOT 1"=50'

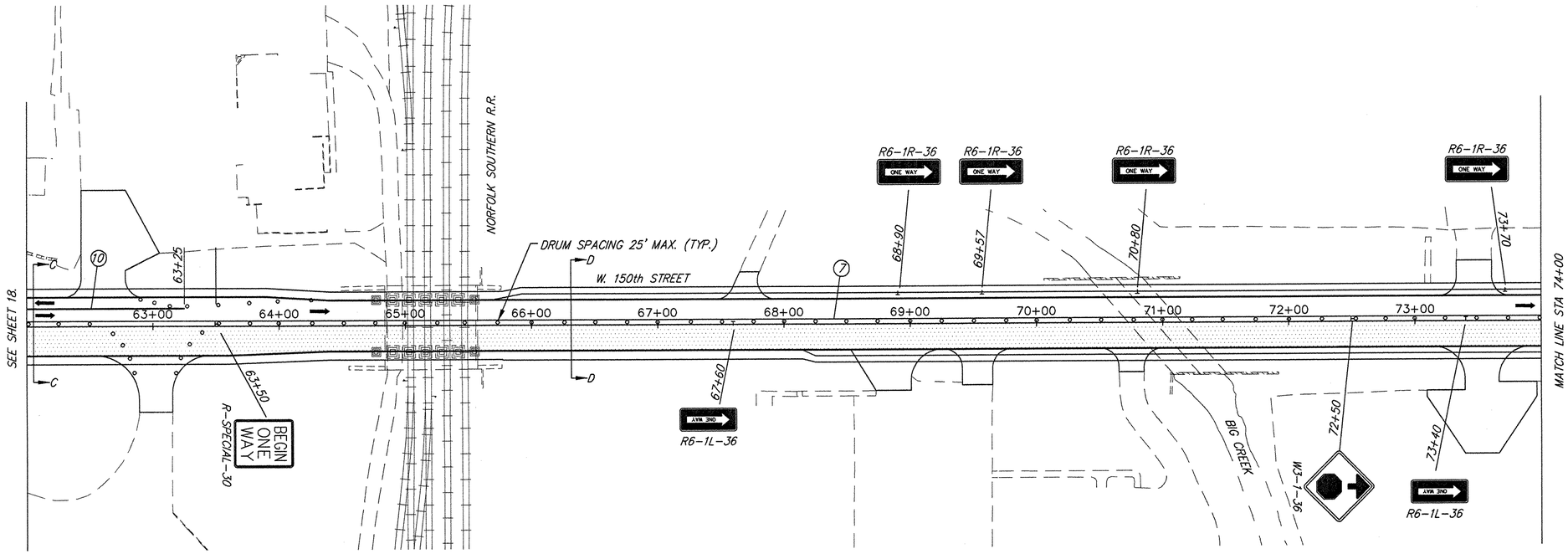
JEN CHECKED EPS

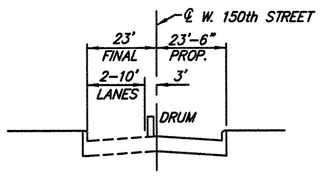
0 50 100 SCALE IN FEET

MAINTENANCE OF TRAFFIC PHASES 2

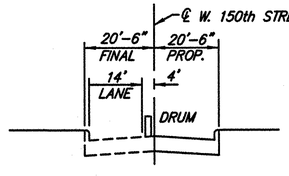
CUY-WEST 150th STREET

18
146





SECTION C-C



SECTION D-D

LEGEND

1. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, WHITE
2. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, YELLOW
3. WORK ZONE CHANNELIZING LINE, CLASS 1, 642 PAINT
4. WORK ZONE CENTER LINE, CLASS 1, 642 PAINT
5. WORK ZONE STOP LINE, CLASS 1, 642 PAINT
6. WORK ZONE LANE ARROW, CLASS 1, 642 PAINT
7. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, WHITE
8. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, YELLOW
9. WORK ZONE CHANNELIZING LINE, CLASS 1, 740.06, TYPE 1
10. WORK ZONE CENTER LINE, DOUBLE, CLASS 1, 740.06, TYPE 1
11. WORK ZONE STOP LINE, CLASS 1, 740.06, TYPE 1
12. WORK ZONE LANE ARROW, CLASS 1, 740.06, TYPE 1
13. WORK ZONE DOTTED LINE, DOUBLE, CLASS 1, 740.06, TYPE 1, YELLOW

PROPOSED PAVEMENT CONSTRUCTION

TEMPORARY PAVEMENT

N

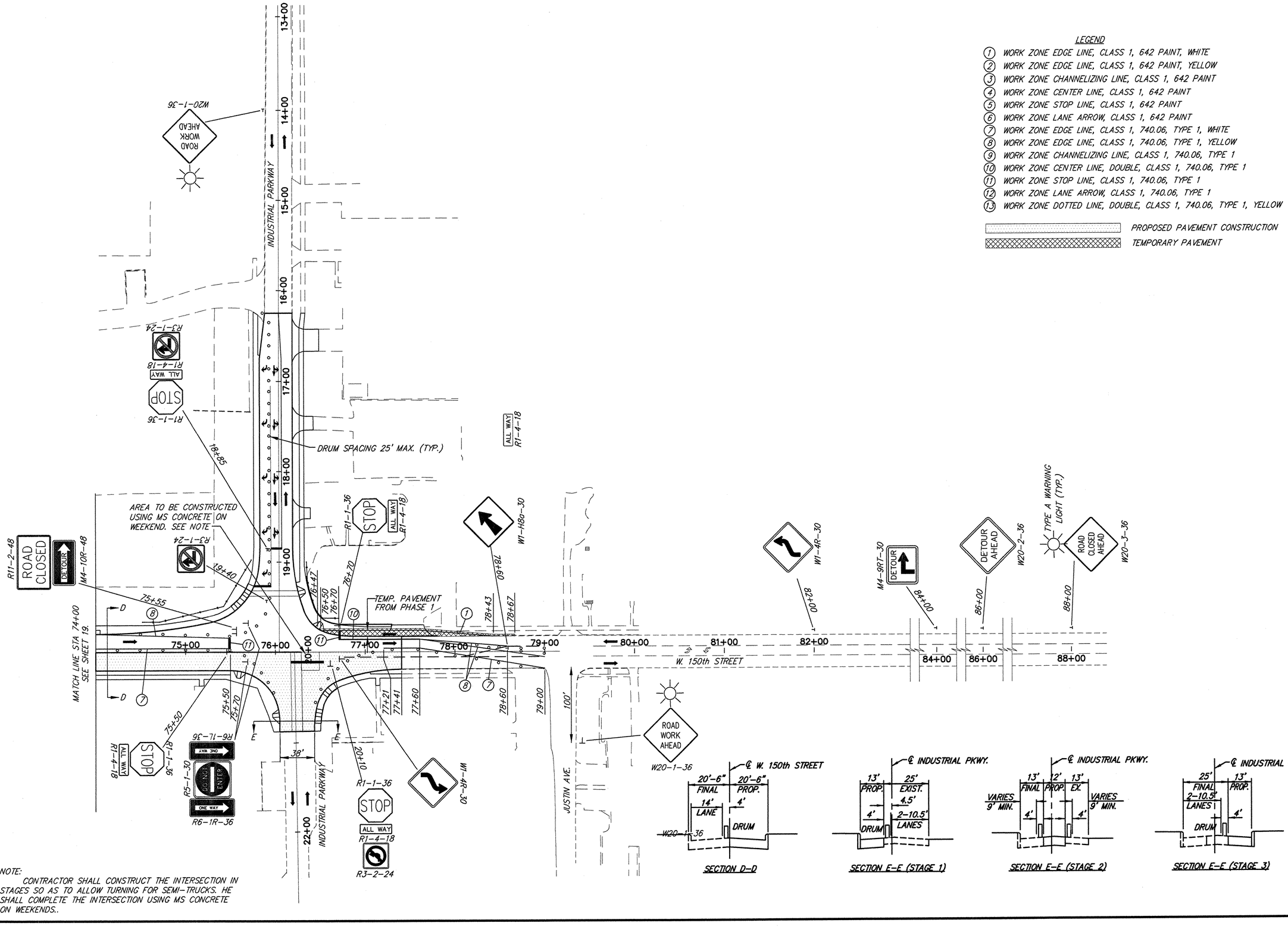
0 50 100 SCALE IN FEET

JEN
CHECKED EPS

MAINTENANCE OF TRAFFIC PHASES 2

CUY-WEST 150th STREET

F:\JOBS\665\MOT\MOT-PHASE2-2.DWG JEN 3/22/07 PLOT 1"=50'



LEGEND

1. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, WHITE
2. WORK ZONE EDGE LINE, CLASS 1, 642 PAINT, YELLOW
3. WORK ZONE CHANNELIZING LINE, CLASS 1, 642 PAINT
4. WORK ZONE CENTER LINE, CLASS 1, 642 PAINT
5. WORK ZONE STOP LINE, CLASS 1, 642 PAINT
6. WORK ZONE LANE ARROW, CLASS 1, 642 PAINT
7. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, WHITE
8. WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1, YELLOW
9. WORK ZONE CHANNELIZING LINE, CLASS 1, 740.06, TYPE 1
10. WORK ZONE CENTER LINE, DOUBLE, CLASS 1, 740.06, TYPE 1
11. WORK ZONE STOP LINE, CLASS 1, 740.06, TYPE 1
12. WORK ZONE LANE ARROW, CLASS 1, 740.06, TYPE 1
13. WORK ZONE DOTTED LINE, DOUBLE, CLASS 1, 740.06, TYPE 1, YELLOW

PROPOSED PAVEMENT CONSTRUCTION

TEMPORARY PAVEMENT

NOTE:
CONTRACTOR SHALL CONSTRUCT THE INTERSECTION IN STAGES SO AS TO ALLOW TURNING FOR SEMI–TRUCKS. HE SHALL COMPLETE THE INTERSECTION USING MS CONCRETE ON WEEKENDS..

N

0 50 100 SCALE IN FEET

JEN CHECKED EPS

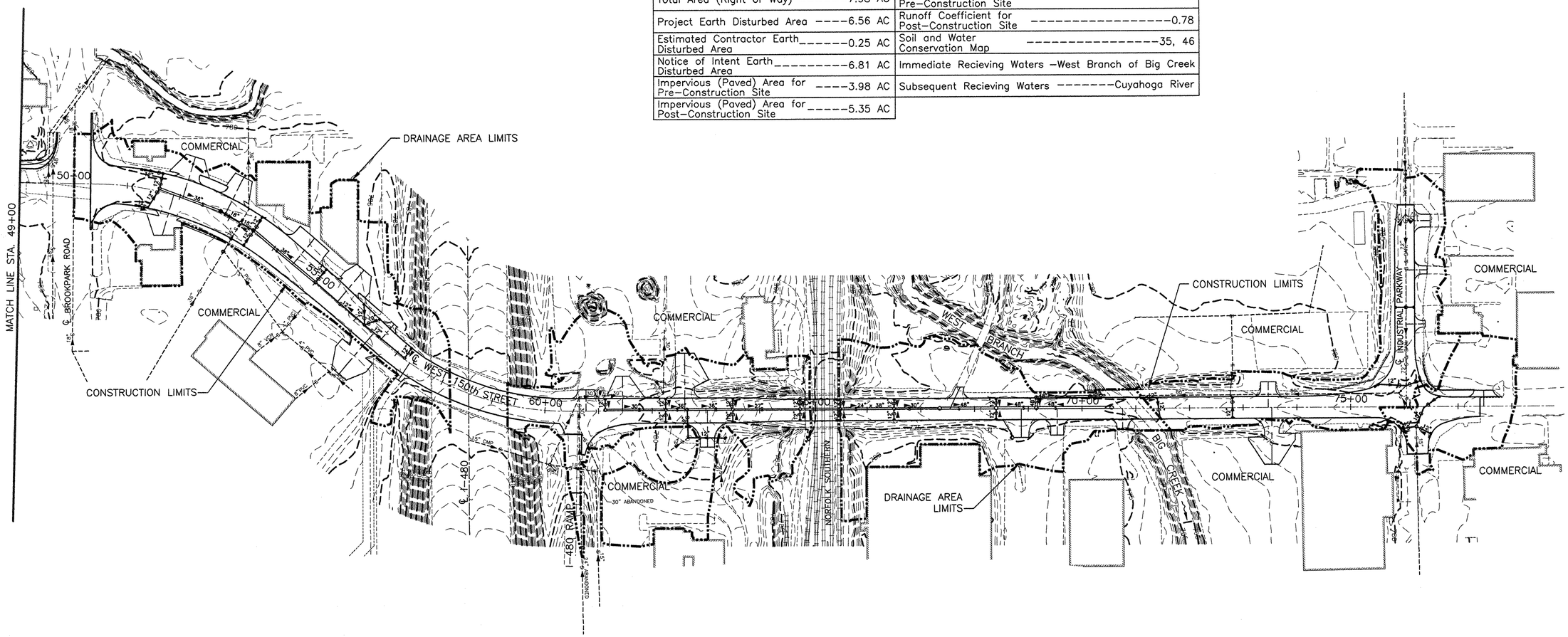
MAINTENANCE OF TRAFFIC PHASES 2

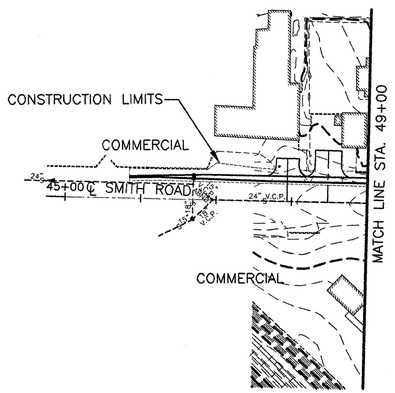
CUY-WEST 150th STREET

20 / 146

F:\JOBS\665\MOT\MOT-PHASE2-3.DWG JEN 4/12/07 PLOT 1"=50'

PROJECT DATA			
Total Area (Right of Way)	7.98 AC	Runoff Coefficient for Pre-Construction Site	0.3-0.6
Project Earth Disturbed Area	6.56 AC	Runoff Coefficient for Post-Construction Site	0.78
Estimated Contractor Earth Disturbed Area	0.25 AC	Soil and Water Conservation Map	35, 46
Notice of Intent Earth Disturbed Area	6.81 AC	Immediate Recieving Waters	West Branch of Big Creek
Impervious (Paved) Area for Pre-Construction Site	3.98 AC	Subsequent Recieving Waters	Cuyahoga River
Impervious (Paved) Area for Post-Construction Site	5.35 AC		





USGS QUADRANT NO. 41081-D7-TF-024
LAKEWOOD OHIO
LONGITUDE: 41°25'20"*
LATITUDE: 80°48'06"*

*LONGITUDE AND LATITUDE TO APPROX. CENTER OF PROJECT

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE FULL DEPTH REPLACEMENT AND WIDENING OF W. 150th STREET FROM BROOKPARK ROAD TO JUST NORTH OF INDUSTRIAL PARKWAY, APPROXIMATELY 2700 FEET. INDUSTRIAL PARKWAY WILL ALSO BE REPLACED FOR APPROXIMATELY 450 FEET. A SMALL PORTION OF I-480 EXIT RAMP WILL BE RECONSTRUCTED. A NEW DRAINAGE SYSTEM WILL BE INSTALLED, AND A SANITARY TRUNK SEWER WILL BE CONSTRUCTED FROM THE EXISTING 60" STUBBED SEWER AT THE NEORSD DROP STRUCTURE.

N

0 50 100
SCALE IN FEET

CALCULATED CGP
CHECKED JLN

PROJECT SITE PLAN

CUY - WEST 150th STREET

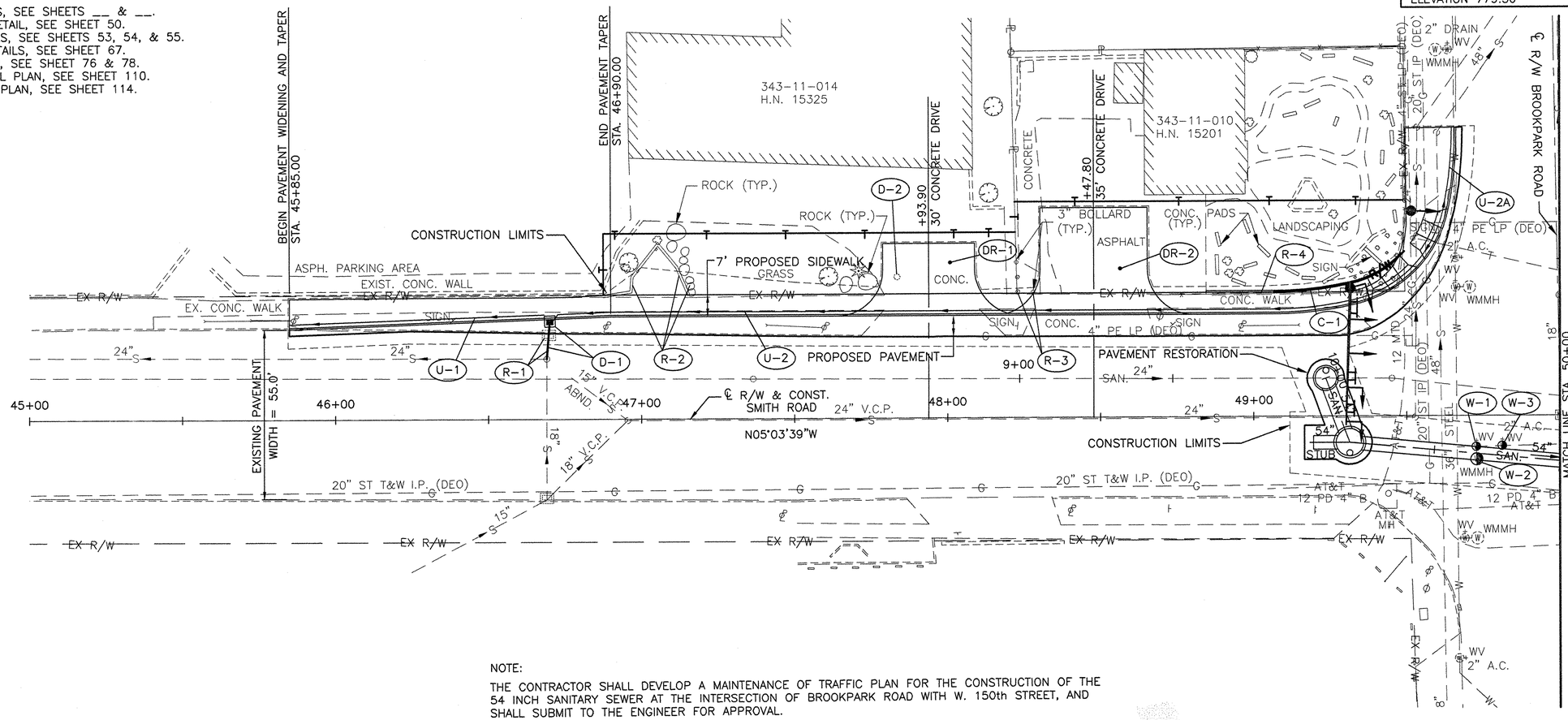
21
146

PJK 3/21/07 PLOT 1"=100'

F:\JOBS\665\DES\DE01.DWG

FOR CROSS SECTIONS, SEE SHEETS __ & __.
FOR INTERSECTION DETAIL, SEE SHEET 50.
FOR DRIVEWAY DETAILS, SEE SHEETS 53, 54, & 55.
FOR UNDERDRAIN DETAILS, SEE SHEET 67.
FOR SANITARY SEWER, SEE SHEET 76 & 78.
FOR TRAFFIC CONTROL PLAN, SEE SHEET 110.
FOR TRAFFIC SIGNAL PLAN, SEE SHEET 114.

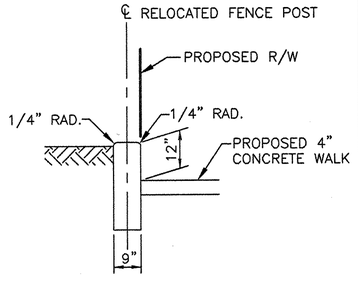
BENCH MARK NO. 1, MAG. NAIL IN ASPHALT
@ STA. 50+41.96, 81.95' LT.
℄ CONST. WEST 150th STREET
ELEVATION 779.30



NOTE:

THE CONTRACTOR SHALL DEVELOP A MAINTENANCE OF TRAFFIC PLAN FOR THE CONSTRUCTION OF THE 54 INCH SANITARY SEWER AT THE INTERSECTION OF BROOKPARK ROAD WITH W. 150th STREET, AND SHALL SUBMIT TO THE ENGINEER FOR APPROVAL.

NO. REF.	STATION FROM	STATION TO	SIDE	202 PIPE REMOVED, 24" AND UNDER FT	202 CATCH BASIN OR INLET REMOVED EACH	202 REMOVAL MISC.: BOLLARD EACH	202 REMOVAL MISC.: RAILROAD TIES FT	202 REMOVAL MISC.: 2' DIAMETER LANDSCAPE ROCK EACH	202 FENCE REMOVED FOR REUSE FT	202 CURB REMOVED FT	603 18" CONDUIT, TYPE B, 706.02 FT	604 MANHOLE ADJUSTED TO GRADE EACH	604 ODOT NO. 3A CATCH BASIN, AS PER PLAN EACH	607 FENCE REBUILT FT	609 CONCRETE CURB, 12" HIGH FT	638 VALVE BOX ADJUSTED TO GRADE EACH
C-1	48+86	49+49	LT												67	
D-1	46+69.0	46+70.00	LT								12		1			
D-2	47+83.5		LT									1				
R-1	46+69.0	46+69.8	LT	8	1											
R-2	46+87	47+16	LT				25	3								
R-3	48+23	48+28	LT			2										
R-4	48+86	49+49	LT						67	67				67		
W-1	49+73		RT													1
W-2	49+73		RT									1				
W-3	49+81		RT													1
			TOTAL	8	1	2	25	3	67	67	12	2	1	67	67	2



CONCRETE CURB, 12" HIGH DETAIL

N

SCALE IN FEET 0 20 40

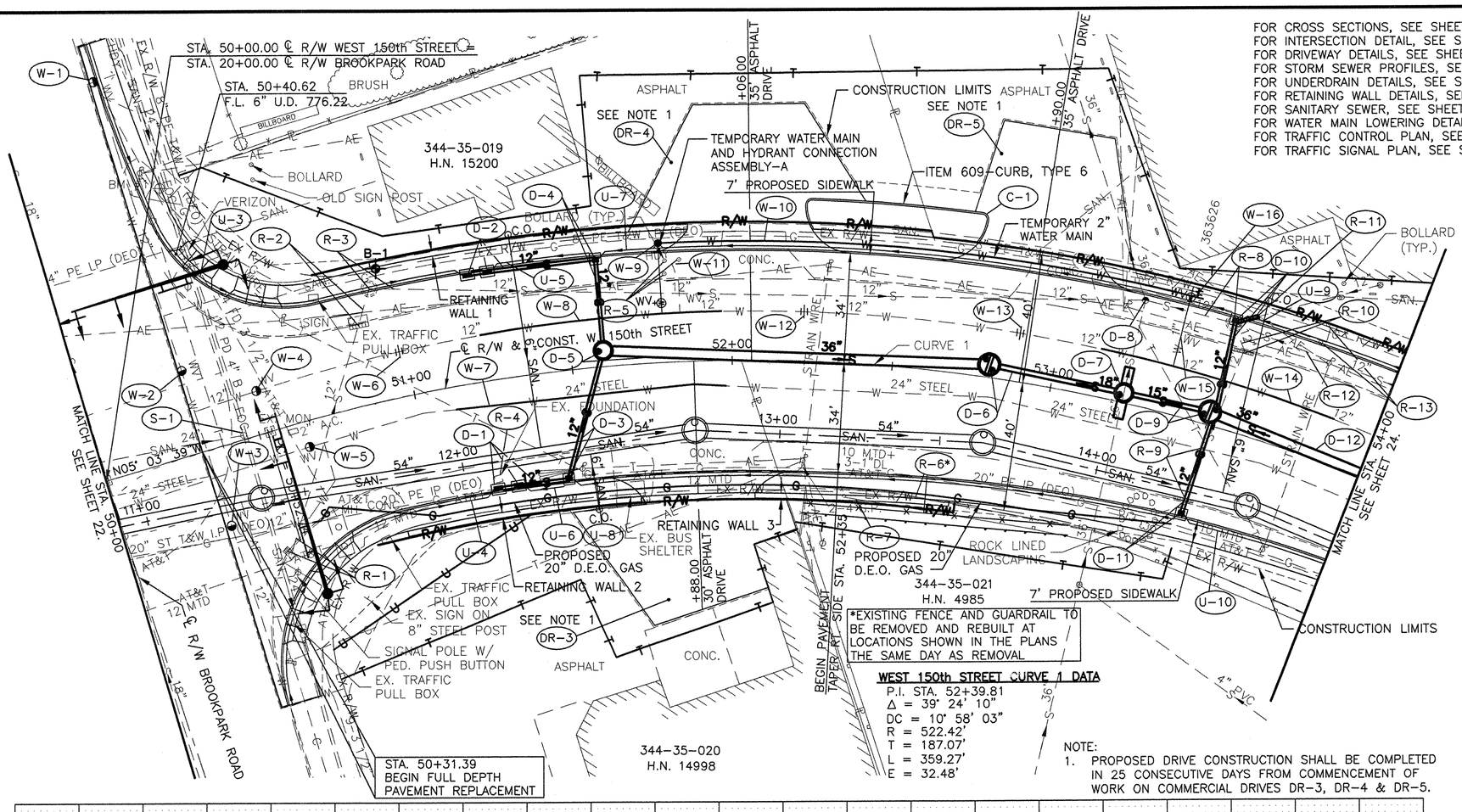
CALCULATED JLN
CHECKED EPS

PLAN AND PROFILE - SMITH ROAD STA. 45+00 TO STA. 50+00

CUY - WEST 150th STREET

22
146

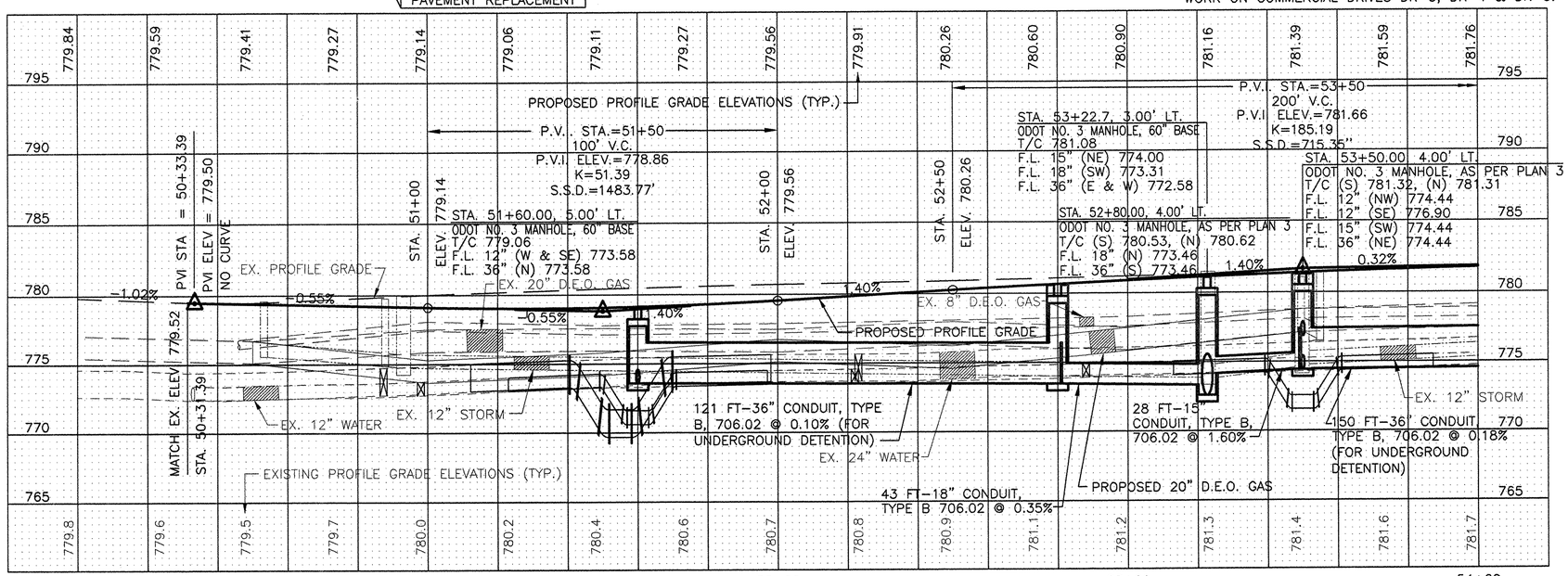
F:\JOBS\665\GP\GP100.DWG JLN 4/11/07 PLOT 1"=20'



FOR CROSS SECTIONS, SEE SHEETS 34-36.
FOR INTERSECTION DETAIL, SEE SHEET 50.
FOR DRIVEWAY DETAILS, SEE SHEETS 53, 54, 56 & 61.
FOR STORM SEWER PROFILES, SEE SHEET 64.
FOR UNDERDRAIN DETAILS, SEE SHEET 67.
FOR RETAINING WALL DETAILS, SEE SHEETS 70, 71, 72 & 75.
FOR SANITARY SEWER, SEE SHEETS 76-78.
FOR WATER MAIN LOWERING DETAIL, SEE SHEET 94.
FOR TRAFFIC CONTROL PLAN, SEE SHEET 110.
FOR TRAFFIC SIGNAL PLAN, SEE SHEET 114.

BENCH MARK NO. 1, MAG. NAIL IN ASPHALT
@ STA. 50+41.96, 81.95' LT.
℄ CONST. WEST 150th STREET
ELEVATION 779.30

NOTE:
1. PROPOSED DRIVE CONSTRUCTION SHALL BE COMPLETED IN 25 CONSECUTIVE DAYS FROM COMMENCEMENT OF WORK ON COMMERCIAL DRIVES DR-3, DR-4 & DR-5.



NO. REF.	STATION FROM	STATION TO	SIDE	SPECIAL TEMPORARY SERVICE CONNECTION EACH	SPECIAL INSTALL 1" WATER SERVICE CONNECTION, SHORT SIDE COMPLETE EACH	SPECIAL FURNISHING AND SETTING 6" HYDRANT, COMPLETE EACH	SPECIAL 12" CUTTING-IN VALVE WITH VALVE BOX, COMPLETE EACH	SPECIAL TEMPORARY BY-PASS CONNECTION, COMPLETE WITH PIPE AND FITTINGS FT	SPECIAL 24" WATER MAIN DUCTILE IRON PIPE WITH PUSH-ON JOINTS AND RETAINED MECHANICAL JOINT FITTINGS, ANSI CLASS 52 FT	SPECIAL 12" WATER MAIN DUCTILE IRON PIPE WITH PUSH-ON JOINTS AND RETAINED MECHANICAL JOINT FITTINGS, ANSI CLASS 52 FT	638 VALVE BOX ADJUSTED TO GRADE EACH	638 FIRE HYDRANT REMOVED AND DISPOSED OF EACH	202 PIPE REMOVED, 24" AND UNDER FT
W-1	50+31		LT								1		
W-2	50+32		LT								1		
W-3	50+34		RT								1		
W-4	50+53		LT								1		
W-5	50+64		RT										
W-6	50+98		LT										
W-7	51+12	51+98	RT						86				
W-8	51+23	51+97	LT						74				
W-9	51+79		LT										
W-10	51+79	53+40	LT									1	
W-11	51+83		LT										
W-12	52+22		LT										
W-13	52+88		LT						75				
W-14	53+13	53+87	LT						74				
W-15	53+36		LT										
W-16	53+38		LT										
			TOTAL	1	1	1	3	161	87	150	5	1	234

ESTIMATED QUANTITIES ARE CONTINUED ON SHEET 31.

CALCULATED JLN
CHECKED EPS

0 20 40 SCALE IN FEET

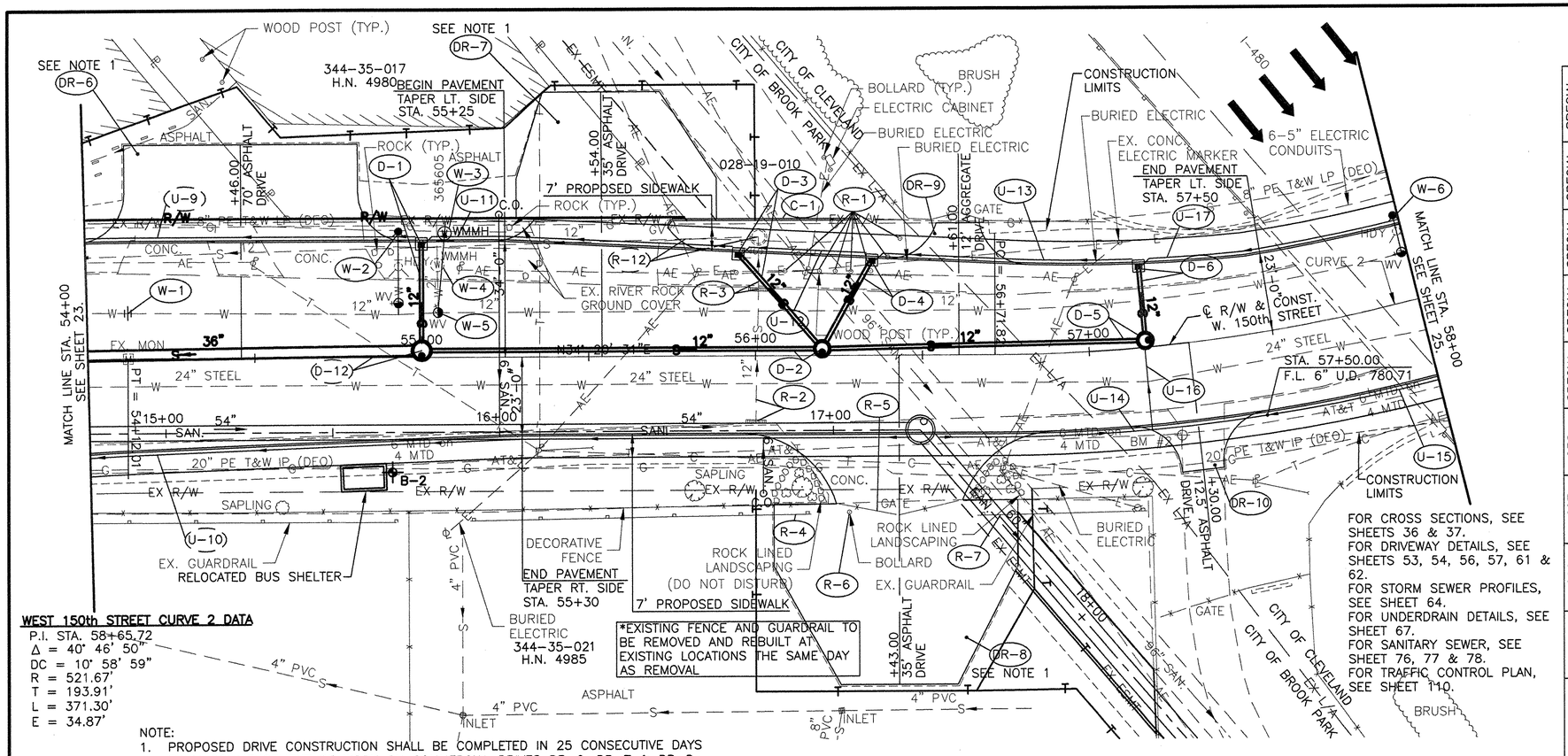
PLAN AND PROFILE - WEST 150th STREET STA. 50+00 TO STA. 54+00

CUY - WEST 150th STREET

23
146

F:\JOBS\665\GP\GP190A.DWG PJK 3/21/07 PLOT 1"=20'

BENCH MARK NO. 2, MAG NAIL IN ASPHALT
@ STA. 57+25.13, 27.04' RT.
℄ CONST. WEST 150th STREET
ELEVATION 783.89

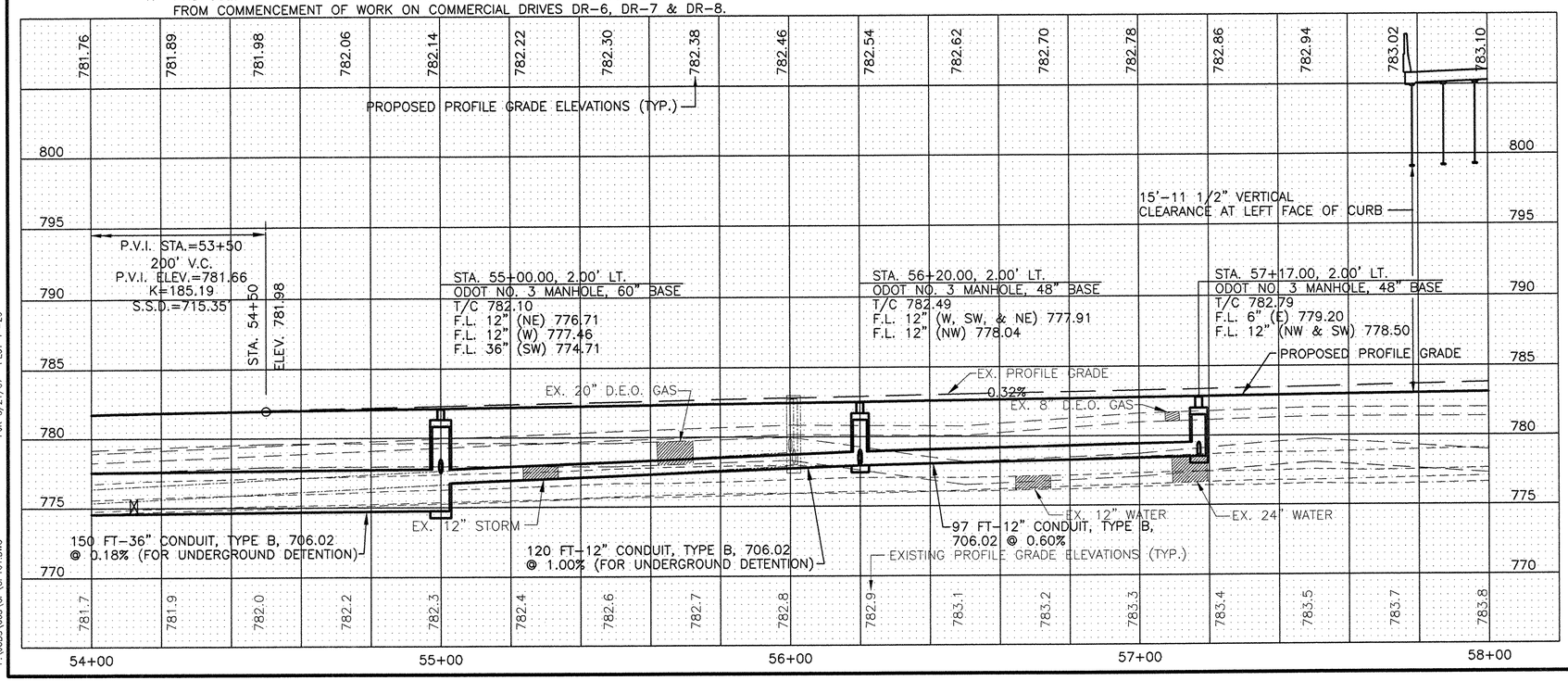


*EXISTING FENCE AND GUARDRAIL TO BE REMOVED AND REBUILT AT EXISTING LOCATIONS THE SAME DAY AS REMOVAL

WEST 150th STREET CURVE 2 DATA
P.I. STA. 58+65.72
Δ = 40° 46' 50"
DC = 10° 58' 59"
R = 521.67'
T = 193.91'
L = 371.30'
E = 34.87'

FOR CROSS SECTIONS, SEE SHEETS 36 & 37.
FOR DRIVEWAY DETAILS, SEE SHEETS 53, 54, 56, 57, 61 & 62.
FOR STORM SEWER PROFILES, SEE SHEET 64.
FOR UNDERDRAIN DETAILS, SEE SHEET 67.
FOR SANITARY SEWER, SEE SHEET 76, 77 & 78.
FOR TRAFFIC CONTROL PLAN, SEE SHEET 110.

NOTE:
1. PROPOSED DRIVE CONSTRUCTION SHALL BE COMPLETED IN 25 CONSECUTIVE DAYS FROM COMMENCEMENT OF WORK ON COMMERCIAL DRIVES DR-6, DR-7 & DR-8.



				202								606	607	638	SPECIAL	SPECIAL	SPECIAL	SPECIAL	SPECIAL
NO. REF.	STATION FROM	STATION TO	SIDE	METER VAULT REMOVED	PIPE REMOVED, 24" AND UNDER	CATCH BASIN OR INLET REMOVED	REMOVAL MISC.: WOOD POST	FENCE REMOVED FOR REUSE	GUARDRAIL REMOVED FOR REUSE	REMOVAL MISC.: BOLLARD		GUARDRAIL REBUILT	FENCE REBUILT	VALVE BOX ADJUSTED TO GRADE	12" CUTTING-IN VALVE WITH VALVE BOX, COMPLETE	EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A	INSTALL 2" METER SETTING, COMPLETE	2" METER VAULT	EXTEND 2" WATER SERVICE CONNECTION, SHORT SIDE COMPLETE
				EACH	FT	EACH	EACH	FT	FT	EACH		FT	FT	EACH	EACH	EACH	EACH	EACH	EACH
R-1	55+94	56+43	LT				7												
R-2	56+00.0	56+01.0	RT/LT		40	1													
R-3	56+01.0		LT		15	1													
R-4	56+05	56+17	RT						12			12							
R-5	56+05	56+80	RT					75					75						
R-6	56+28		RT							1									
R-7	56+67	56+83	RT						16			16							
W-1	54+12		LT												1				
W-2	54+93		LT													1			
W-3	55+07		LT														1	1	1
W-4	55+05		LT	1															
W-5	55+05		LT											1					
W-6	57+99		LT													1			
			TOTAL	1	55	2	7	75	28	1		28	75	1	1	2	1	1	1

ESTIMATED QUANTITIES ARE CONTINUED ON SHEET 31.

0 20 40
SCALE IN FEET

CALCULATED JLN
CHECKED EPS

PLAN AND PROFILE - WEST 150th STREET STA. 54+00 TO STA. 58+00

CUY - WEST 150th STREET

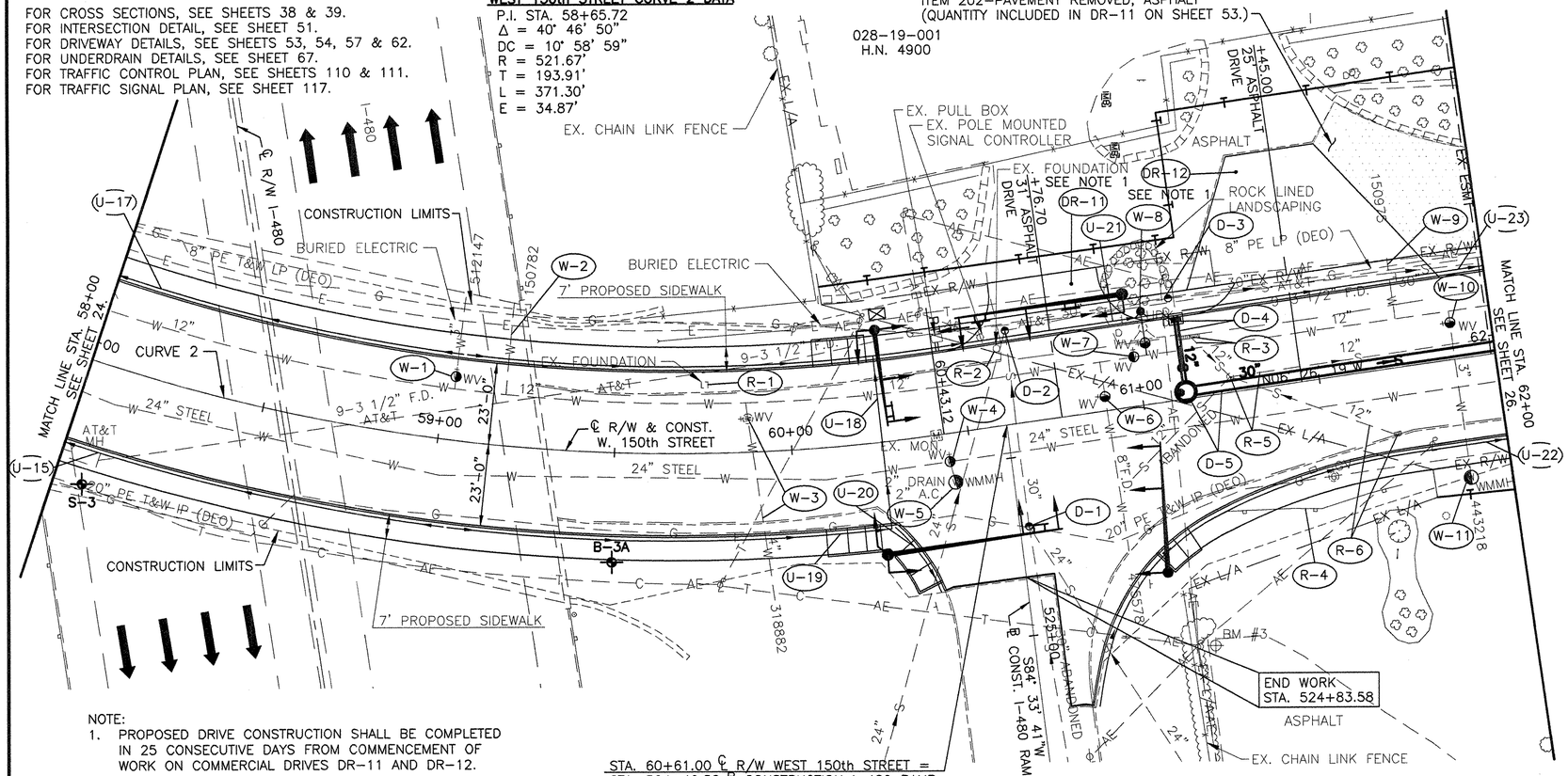
24
146

PJK 3/21/07 PLOT 1"=20'
F:\JOBS\665\GP\GP101.DWG

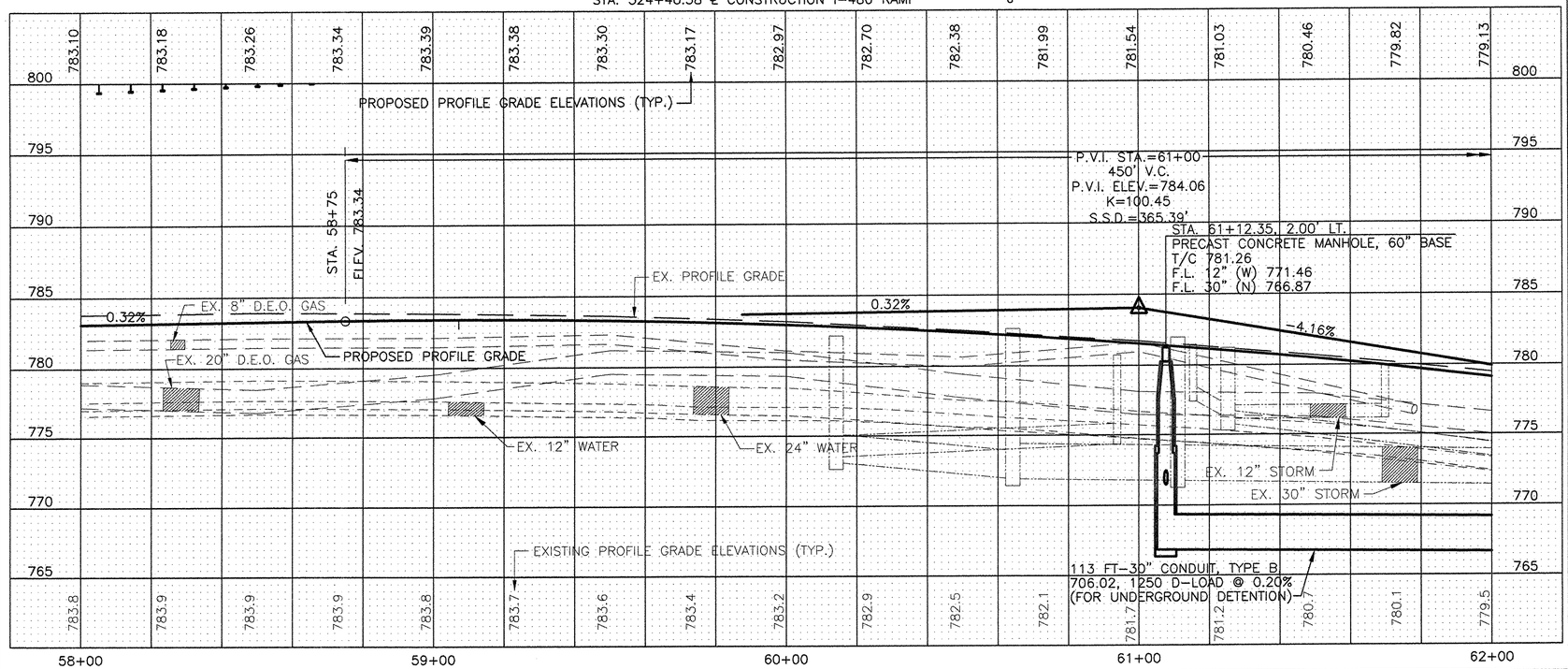
FOR CROSS SECTIONS, SEE SHEETS 38 & 39.
FOR INTERSECTION DETAIL, SEE SHEET 51.
FOR DRIVEWAY DETAILS, SEE SHEETS 53, 54, 57 & 62.
FOR UNDERDRAIN DETAILS, SEE SHEET 67.
FOR TRAFFIC CONTROL PLAN, SEE SHEETS 110 & 111.
FOR TRAFFIC SIGNAL PLAN, SEE SHEET 117.

WEST 150th STREET CURVE 2 DATA
P.I. STA. 58+65.72
Δ = 40° 46' 50"
DC = 10° 58' 59"
R = 521.67'
T = 193.91'
L = 371.30'
E = 34.87'

BENCH MARK NO. 3, MAG. NAIL IN ASPHALT
@ STA. 61+10.27, 69.67' RT.
℄ CONST. WEST 150th STREET
ELEVATION 783.18



NOTE:
1. PROPOSED DRIVE CONSTRUCTION SHALL BE COMPLETED IN 25 CONSECUTIVE DAYS FROM COMMENCEMENT OF WORK ON COMMERCIAL DRIVES DR–11 AND DR–12.



			D–1	D–2	D–3	D–4	D–5	R–1	R–2	R–3	R–4	R–5	R–6		W–1	W–2	W–3	W–4	W–5	W–6	W–7	W–8	W–9	W–10	W–11	TOTAL
SPECIAL	PLUG EXISTING SERVICE CONNECTION	EACH														1	1						1			3
SPECIAL	EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A	EACH																				1				1
638	VALVE BOX ADJUSTED TO GRADE	EACH													1			1		1	1			1		5
604	CITY OF CLEVELAND CB–1 CATCH BASIN, AS PER PLAN	EACH				1																				1
	PRECAST CONCRETE MANHOLE, 60" BASE	EACH					1																			1
	MANHOLE ADJUSTED TO GRADE	EACH	1	1	1														1						1	5
603	30" CONDUIT, TYPE B, 706.02, 1250 D–LOAD	FT					113																			113
	12" CONDUIT, TYPE B, 706.08 EXTRA STRENGTH	FT				21																				21
SPECIAL	FILL AND PLUG EXISTING CONDUIT	FT											50													50
202	VALVE BOX REMOVED	EACH															1									1
	GUARDRAIL REMOVED	FT									51															51
	REMOVAL MISC.: SIGN FOUNDATION	EACH						1	1																	2
	CATCH BASIN OR INLET REMOVED	EACH								1			1													2
	MANHOLE REMOVED	EACH										1														1
	PIPE REMOVED, 24" OR UNDER	FT								17		223														240
	SIDE		RT	LT	LT	LT	LT	LT	LT	LT	RT	LT	RT/LT		LT	LT	RT	RT	RT	LT	LT	LT	LT	LT	RT	TOTAL
STATION	FROM		60+63.1	60+64.2	61+11.0	61+12.35	61+12.35	59+76	60+61	61+15.3	61+18	61+25.2	61+25.2		59+03	59+18	59+89	60+44	60+45	60+90	60+99	61+03	61+73	61+89	61+89	
	TO						62+25.00			61+25.2	61+69	63+48.0	61+69.7													
NO. REF.			D–1	D–2	D–3	D–4	D–5	R–1	R–2	R–3	R–4	R–5	R–6		W–1	W–2	W–3	W–4	W–5	W–6	W–7	W–8	W–9	W–10	W–11	

0 20 40
SCALE IN FEET

CALCULATED JLN
CHECKED EPS

PLAN AND PROFILE - WEST 150th STREET
STA. 58+00 TO STA. 62+00

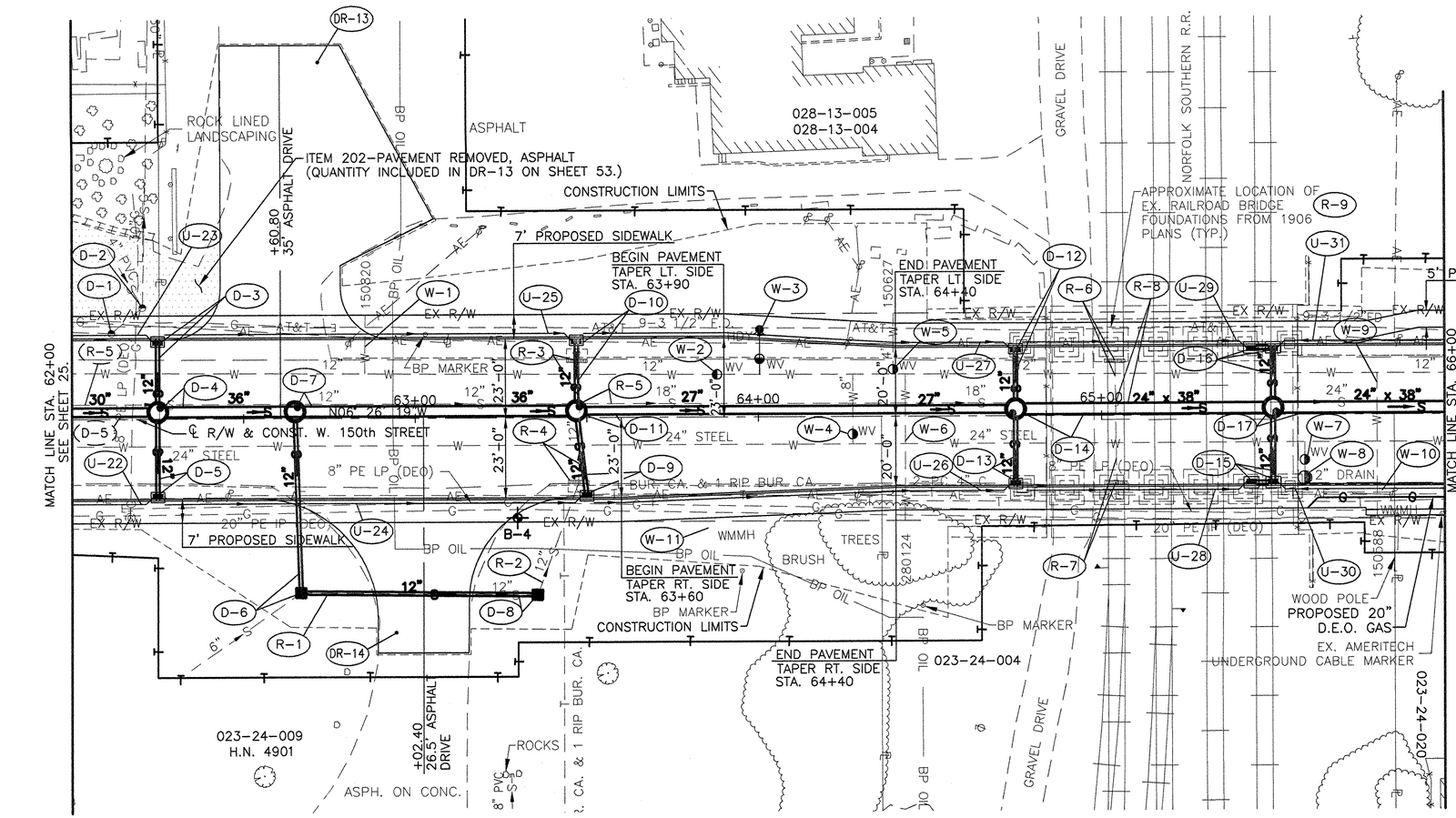
CUY - WEST 150th STREET

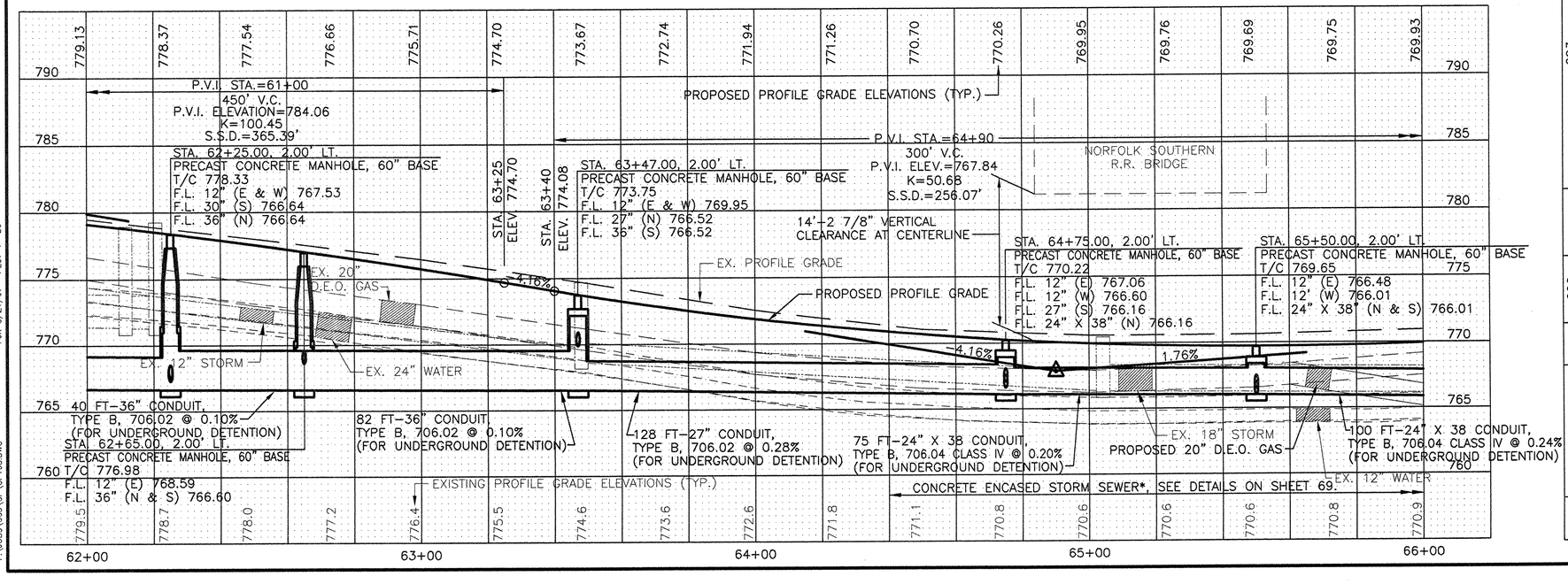
F:\JOBS\665\GP\GP102.DWG PJK 3/21/07 PLOT 1"=20'

BENCH MARK NO. 3, MAG. NAIL IN ASPHALT
@ STA. 61+10.27, 69.67' RT.
℄ CONST. WEST 150th STREET
ELEVATION 783.18

FOR CROSS SECTIONS, SEE SHEETS 40 & 41.
FOR DRIVEWAY DETAILS, SEE SHEETS 53, 54, 58, & 62.
FOR STORM SEWER PROFILES, SEE SHEET 65.
FOR UNDERDRAIN DETAILS, SEE SHEET 67.
FOR RETAINING WALL DETAILS, SEE SHEET 73.
FOR TRAFFIC CONTROL PLAN, SEE SHEET 111.

*PAYMENT SHALL BE PER CUBIC YARD OF CONCRETE INSTALLED COMPLETE FOR ITEM 602 – CONCRETE MASONRY. PAYMENT SHALL INCLUDE ALL MATERIAL, LABOR, EQUIPMENT, EXCAVATION, AND ALL INCIDENTALS REQUIRED FOR THE COMPLETE INSTALLATION OF THE CONCRETE ENCASED STORM SEWERS.





NO. REF.	STATION FROM	STATION TO	SIDE	602 CONCRETE MASONRY CU. YD.	603 24" X 38" CONDUIT, TYPE B, 706.04 CLASS IV FT	603 27" CONDUIT, TYPE B, 706.02 FT	603 36" CONDUIT, TYPE B, 706.02 FT	603 12" CONDUIT, TYPE B, 706.08, EXTRA STRENGTH FT	604 CLEVELAND TWIN CB–1 CATCH BASIN EACH	604 ODOT NO 2–2B CATCH BASIN, AS PER PLAN EACH	604 ODOT NO. 2–2B CATCH BASIN EACH	604 CITY OF CLEVELAND CB–1 CATCH BASIN, AS PER PLAN EACH	604 PRECAST CONCRETE MANHOLE, 60" BASE EACH	604 MANHOLE ADJUSTED TO GRADE EACH
D–1	62+11.5		LT											1
D–2	62+20.6		LT											1
D–3	62+25.00		LT				40	21		1		1	1	
D–4	62+65.00		LT					25			1			
D–5	62+25.00		RT					52				1		
D–6	62+65.00	62+66.70	RT											
D–7	62+65.00	63+47.00	LT				82	69				1	1	
D–8	62+66.70	63+35.60	RT					25				1	1	
D–9	63+50.00		RT					21						
D–10	63+50.00		LT	7.62		128								
D–11	63+47.00	64+75.00	LT					18					1	
D–12	64+75.00		LT					22					1	
D–13	64+75.00		RT											
D–14	64+75.00	65+50.00	LT	17.89	75			22					1	
D–15	65+50.00		RT					18						
D–16	65+50.00		LT	21.83	100									
D–17	65+50.00	66+50.00	LT				122	128	2	1	1	6	5	2
			TOTAL	47.34	175	128	122	293	2	1	1	6	5	2

CALCULATED JLN CHECKED EPS

0 20 40 SCALE IN FEET

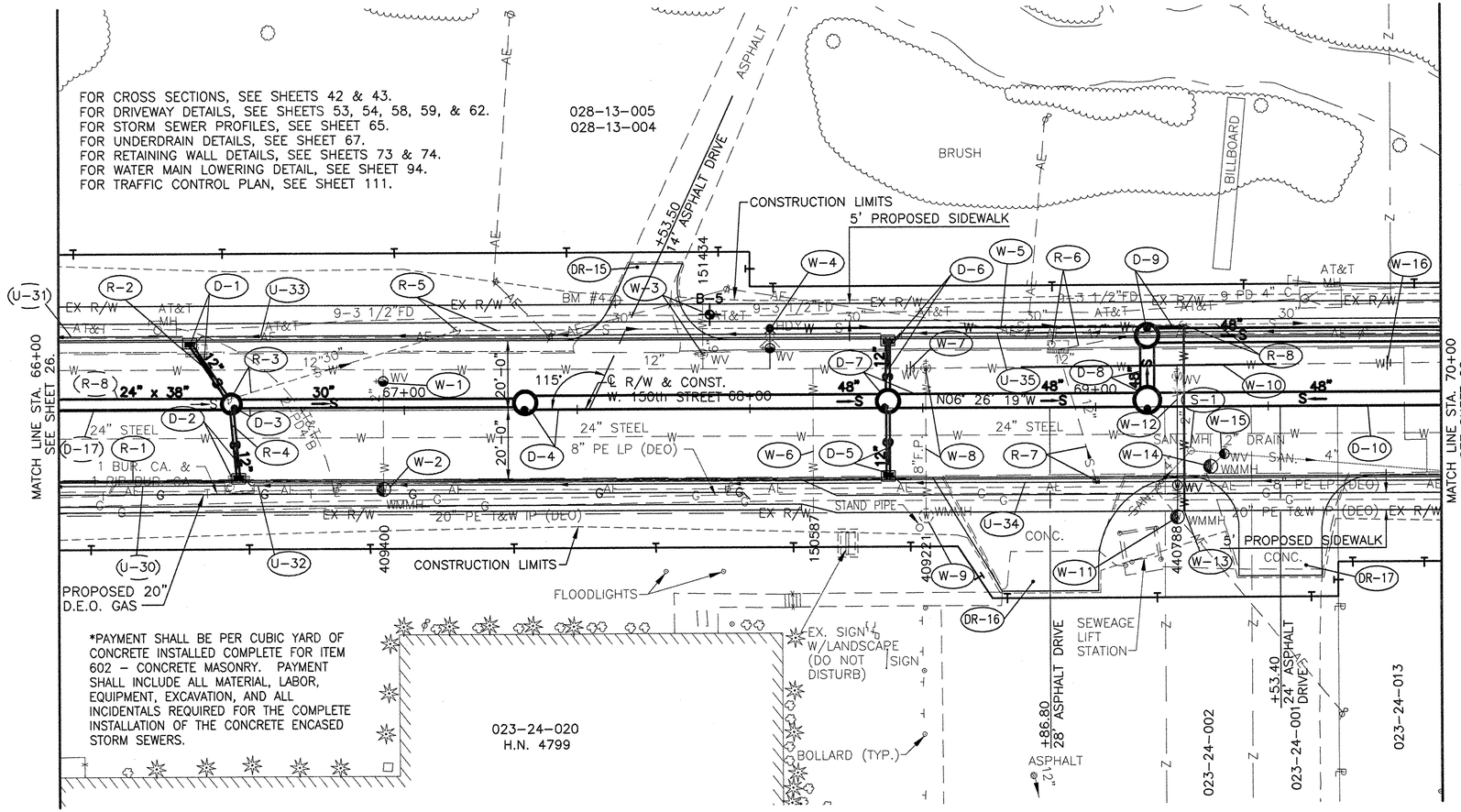
PLAN AND PROFILE - WEST 150th STREET STA. 62+00 TO STA. 66+00

CUY - WEST 150th STREET

P.M. 3/21/07 PLOT 1"=20'

F:\JOBS\665\GP\GP103.DWG

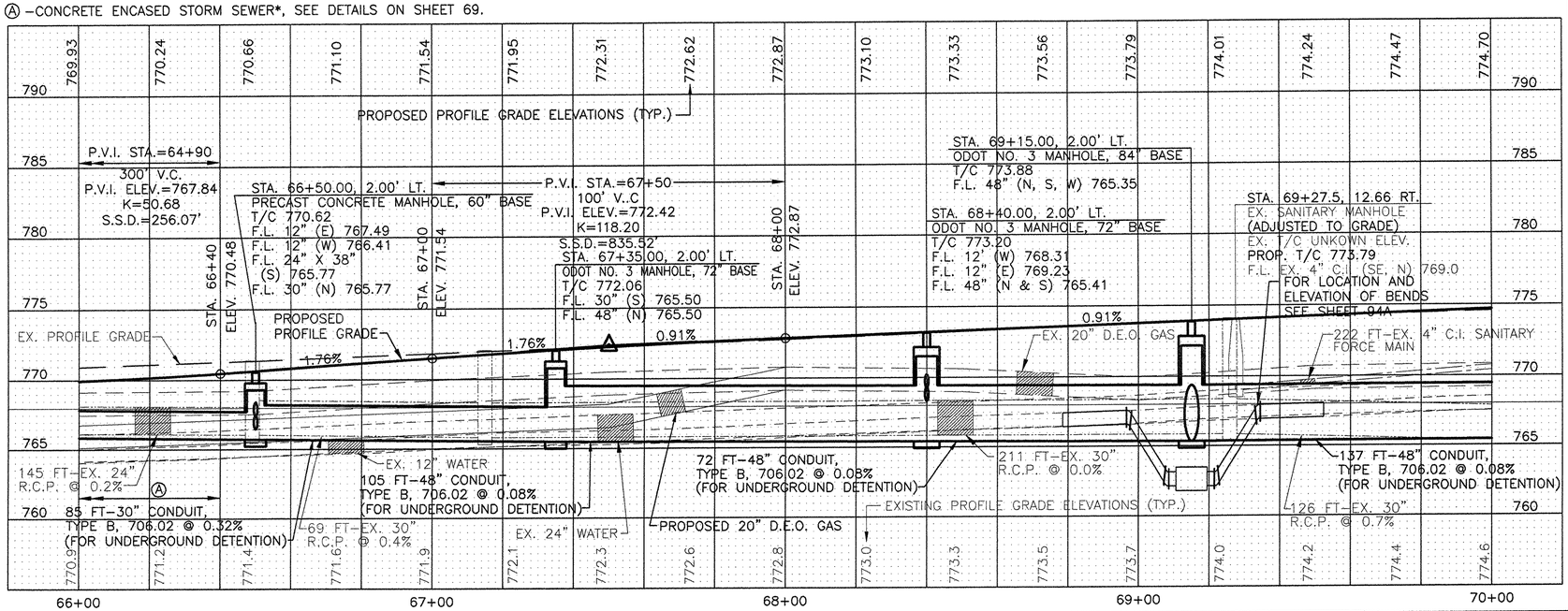
BENCH MARK NO. 4, MAG. NAIL IN ASPHALT
@ STA. 67+61.19, 31.22' LT.
℄ CONST. WEST 150th STREET
ELEVATION 772.72



FOR CROSS SECTIONS, SEE SHEETS 42 & 43.
FOR DRIVEWAY DETAILS, SEE SHEETS 53, 54, 58, 59, & 62.
FOR STORM SEWER PROFILES, SEE SHEET 65.
FOR UNDERDRAIN DETAILS, SEE SHEET 67.
FOR RETAINING WALL DETAILS, SEE SHEETS 73 & 74.
FOR WATER MAIN LOWERING DETAIL, SEE SHEET 94.
FOR TRAFFIC CONTROL PLAN, SEE SHEET 111.

*PAYMENT SHALL BE PER CUBIC YARD OF CONCRETE INSTALLED COMPLETE FOR ITEM 602 - CONCRETE MASONRY. PAYMENT SHALL INCLUDE ALL MATERIAL, LABOR, EQUIPMENT, EXCAVATION, AND ALL INCIDENTALS REQUIRED FOR THE COMPLETE INSTALLATION OF THE CONCRETE ENCASED STORM SEWERS.

Ⓐ -CONCRETE ENCASED STORM SEWER*, SEE DETAILS ON SHEET 69.



REF. NO.	STATION FROM	STATION TO	SIDE	604	604	604	604	604	603	603	603	SPECIAL	202	202	202	202	202
				MANHOLE ADJUSTED TO GRADE	CITY OF CLEVELAND CB-1 CATCH BASIN, AS PER PLAN	ODOT NO. 3 MANHOLE, 84" BASE	ODOT NO. 3 MANHOLE, 72" BASE	PRECAST CONCRETE MANHOLE, 60" BASE	48" CONDUIT, TYPE B, 706.02	30" CONDUIT, TYPE B, 706.02	12" CONDUIT, TYPE B, 706.08, EXTRA STRENGTH	FILL AND PLUG EXISTING CONDUIT	REMOVAL MISC.: LANDSCAPE TIMBERS	CATCH BASIN OR INLET REMOVED	MANHOLE REMOVED	PIPE REMOVED, OVER 24"	PIPE REMOVED, 24" AND UNDER
				EACH	EACH	EACH	EACH	EACH	FT	FT	FT	FT	FT	EACH	EACH	FT	FT
R-1	66+14	68+47	RT										239				
R-2	66+39.9	66+49.1	LT														16
R-3	66+49.1	67+14.9	LT									69			1		
R-4	66+49.1	66+52.1	RT														23
R-5	67+14.9	69+25.8	LT									211			1		
R-6	68+89.2	69+25.8	LT												1		39
R-7	68+89.2	69+00.0	RT									39		1			
R-8	69+25.8	70+52.2	LT												1	126	
D-1	66+38.00	66+50.00	LT		1						21						
D-2	66+50.00	66+52.00	RT		1						22						
D-3	66+50.00	67+35.00	LT					1		85							
D-4	67+35.00	68+40.00	LT				1		105								
D-5	68+40.00		RT		1						22						
D-6	68+40.00		LT		1						18						
D-7	68+40.00	69+15.00	LT				1		72								
D-8	69+15.00		LT			1			16								
D-9	69+15.00	70+15.00	LT				1		95								
D-10	69+15.00	70+55.00	LT				1		137								
S-1	69+27.5		RT	1													
TOTAL				1	4	1	4	1	425	85	83	319	239	1	4	126	78

ESTIMATED QUANTITIES ARE CONTINUED ON SHEET 31.

PLAN AND PROFILE - WEST 150th STREET
STA. 66+00 TO STA. 70+00

CUY - WEST 150th STREET

SCALE IN FEET 0 20 40

CALCULATED JLN
CHECKED EPS

PJK 3/21/07 PLOT 1"=20'
F:\JOBS\665\GP\GP104.DWG

FOR CROSS SECTIONS, SEE SHEETS 43, 44, & 45.
FOR DRIVEWAY DETAILS, SEE SHEETS 53, 54, 59, & 63.
FOR STORM SEWER PROFILES, SEE SHEET 66.
FOR UNDERDRAIN DETAILS, SEE SHEET 67.
FFOR TRAFFIC CONTROL PLAN, SEE SHEET 112.

BENCH MARK NO. 4, MAG. NAIL IN ASPHALT
@ STA. 67+61.19, 31.22' LT.
℄ CONST. WEST 150th STREET
ELEVATION 772.72

NO. REF.	STATION FROM	STATION TO	SIDE	604 MANHOLE ADJUSTED TO GRADE EACH	638 VALVE BOX ADJUSTED TO GRADE EACH	SPECIAL EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A EACH
W-1	70+10		LT		1	
W-2	70+13		LT		1	
W-3	70+13		RT	1		
W-4	70+30		RT		1	
W-5	70+81		RT		1	
W-6	70+81		RT	1		
W-7	71+59		LT		1	
W-8	71+65		LT			1
W-9	71+86		RT		1	
			TOTAL	2	6	1

NO. REF.	STATION FROM	STATION TO	SIDE	202 PIPE REMOVED, 24" AND UNDER FT	202 MANHOLE REMOVED EACH		603 12" CONDUIT, TYPE B, 706.08, EXTRA STRENGTH FT	603 30" CONDUIT, TYPE B, 706.02 FT		604 MANHOLE ADJUSTED TO GRADE EACH	604 PRECAST CONCRETE MANHOLE, 6'W X 10'L X 10'H EACH	604 CITY OF CLEVELAND CB-1 CATCH BASIN, AS PER PLAN EACH		
R-1	71+09.1	71+15.2	LT	9	1									
R-2	71+37.9	71+46.0	RT	10	1									
R-3	72+84.1	72+85.8	RT	34	1									
R-4	72+75.8	72+84.1	LT	12	1									
D-1	70+15.00	70+52.2	LT					32			1			
D-2	NOT USED													
D-3	71+09.1		LT							1				
D-4	71+13.00	71+40.00	LT				27					1		
D-5	71+40.00	71+45.00	RT/LT				40					1		
D-6	71+37.9	71+45.00	RT				10					1		
D-7	72+75.8		LT							1				
D-8	72+75.8	72+80.00	LT				9					1		
D-9	72+80.00	72+86.00	RT/LT				39					1		
S-1	71+49		RT							1				
S-2	73+29		RT							1				
			TOTAL	65	4		125	32		4	1	5		

0 20 40
SCALE IN FEET

CALCULATED JLN
CHECKED EPS

PLAN AND PROFILE - WEST 150th STREET
STA. 70+00 TO STA. 74+00

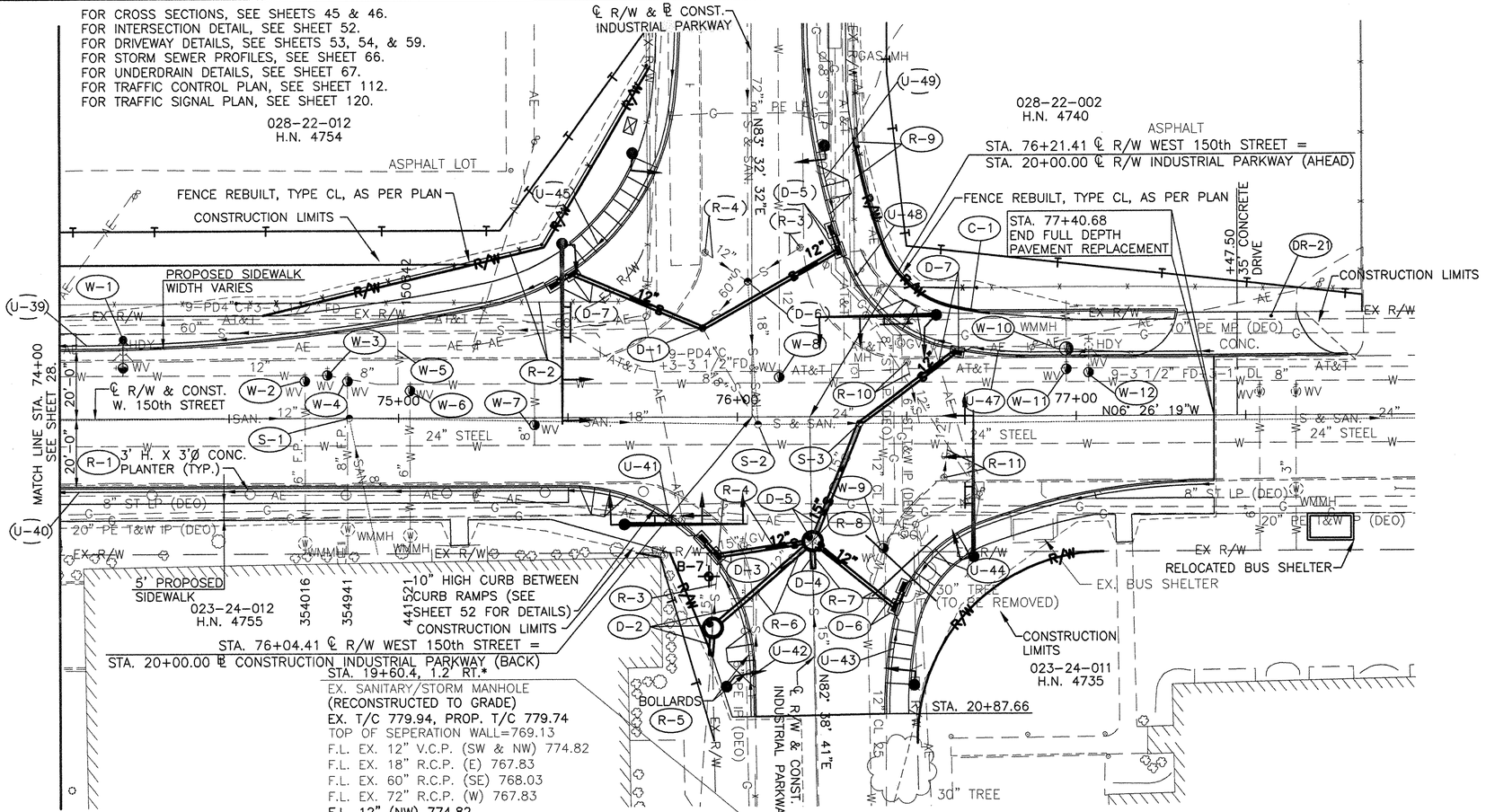
CUY - WEST 150th STREET

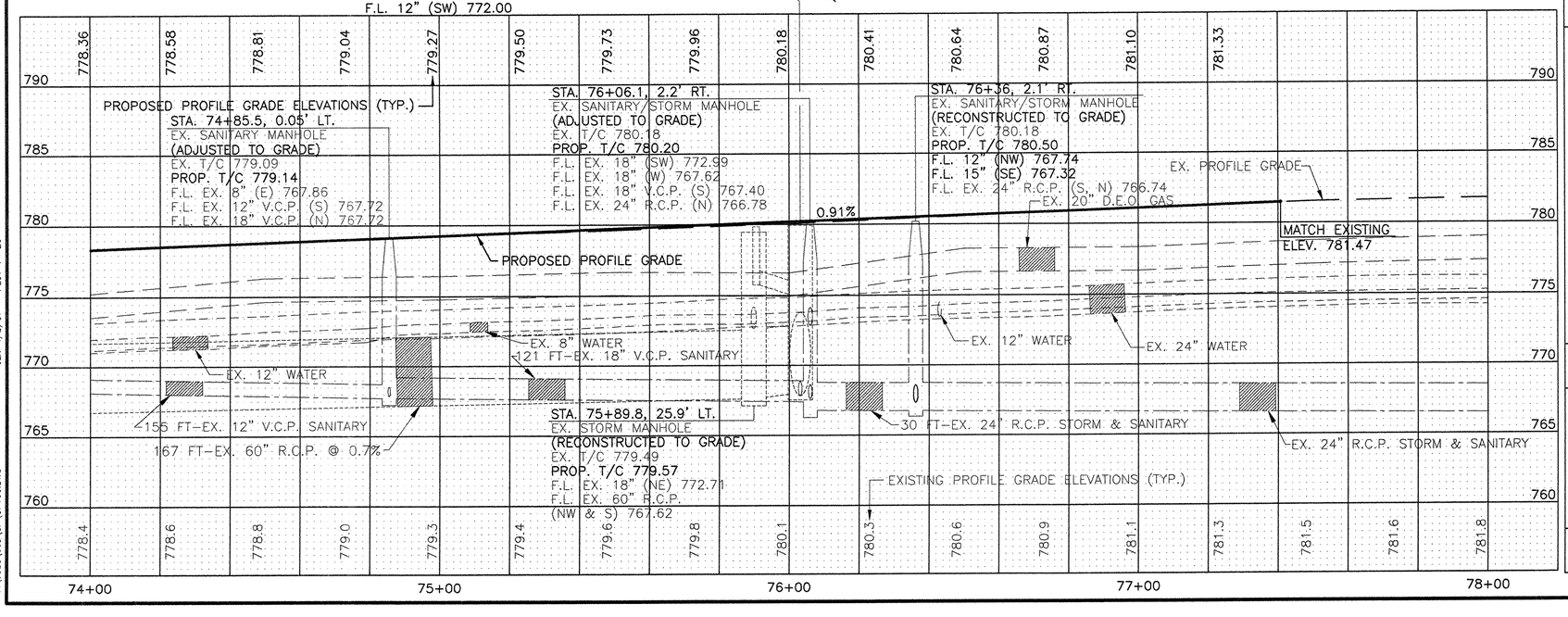
28
146

PJK 3/22/07 PLOT 1"=20'
F:\JOBS\665\GP\GP105.DWG

FOR CROSS SECTIONS, SEE SHEETS 45 & 46.
FOR INTERSECTION DETAIL, SEE SHEET 52.
FOR DRIVEWAY DETAILS, SEE SHEETS 53, 54, & 59.
FOR STORM SEWER PROFILES, SEE SHEET 66.
FOR UNDERDRAIN DETAILS, SEE SHEET 67.
FOR TRAFFIC CONTROL PLAN, SEE SHEET 112.
FOR TRAFFIC SIGNAL PLAN, SEE SHEET 120.

BENCH MARK NO. 4, MAG. NAIL IN ASPHALT
@ STA. 67+61.19, 31.22' LT.
℄ CONST. WEST 150th STREET
ELEVATION 772.72





ESTIMATED QUANTITIES ARE CONTINUED ON SHEET 31.

NO. REF.	STATION FROM	STATION TO	SIDE	609 CURB, TYPE 6 FT	603 15" CONDUIT, TYPE B, 706.02 FT	603 15" CONDUIT, TYPE B, 706.08, EXTRA STRENGTH FT	603 12" CONDUIT, TYPE B, 706.08, EXTRA STRENGTH FT	SPECIAL FILL AND PLUG EXISTING CONDUIT FT	607 FENCE REBUILT FT	604 CITY OF CLEVELAND TWIN CB-1 CATCH BASIN EACH	604 CITY OF CLEVELAND CB-1 CATCH BASIN, AS PER PLAN EACH	604 PRECAST CONCRETE MANHOLE, 60" BASE EACH	604 MANHOLE RECONSTRUCTED TO GRADE EACH	604 MANHOLE ADJUSTED TO GRADE EACH	202 FENCE REMOVED FOR REUSE FT	202 REMOVAL MISC.: BOLLARD EACH	202 REMOVAL MISC.: 3 FT DIAM. CONC. PLANTER EACH	202 MANHOLE REMOVED EACH	202 CATCH BASIN OR INLET REMOVED EACH	202 PIPE REMOVED, 24" AND UNDER FT
				133																
C-1	19+15.60*	77+30.00	LT																	
D-1	75+89.8		LT																	
D-2	75+92.6	76+22.2	RT				29													
D-3	75+93.5	76+22.2	RT		8						1									
D-4	76+16	76+22.2	RT							1										
D-5	76+22.2	76+36	RT		8							1								
D-6	76+22.2	76+49.50	RT																	
D-7	76+36	76+65.00	RT/LT																	
R-1	73+96	75+74	RT						153						7					
R-2	74+53	19+00*	LT			39														
R-3	75+92.6	75+94.3	RT				31													
R-4	75+94.3	76+22.2	RT				36		22									1		
R-5	76+05.5	76+03	RT												2					
R-6	76+05.5	76+22.2	RT											1						22
R-7	76+22.2	76+42.4	RT											1						34
R-8	76+22.2	76+36	RT															1		37
R-9	19+00*	76+70	LT						84											
R-10	76+50.1	76+54	LT											1					1	
R-11	76+61.0	76+63	RT											1					1	
S-1	74+85.5		LT																	
S-2	76+06.1		RT																	
S-3	76+36		RT																	
			TOTAL	133	16	76	96	56	237	2	1	2	2	2	7	2	4	1	2	129

*STATIONED OFF ℄ CONSTRUCTION INDUSTRIAL PARKWAY

CALCULATED JLN
CHECKED EPS

0 20 40
SCALE IN FEET

PLAN AND PROFILE - WEST 150th STREET STA. 74+00 TO STA. 78+00

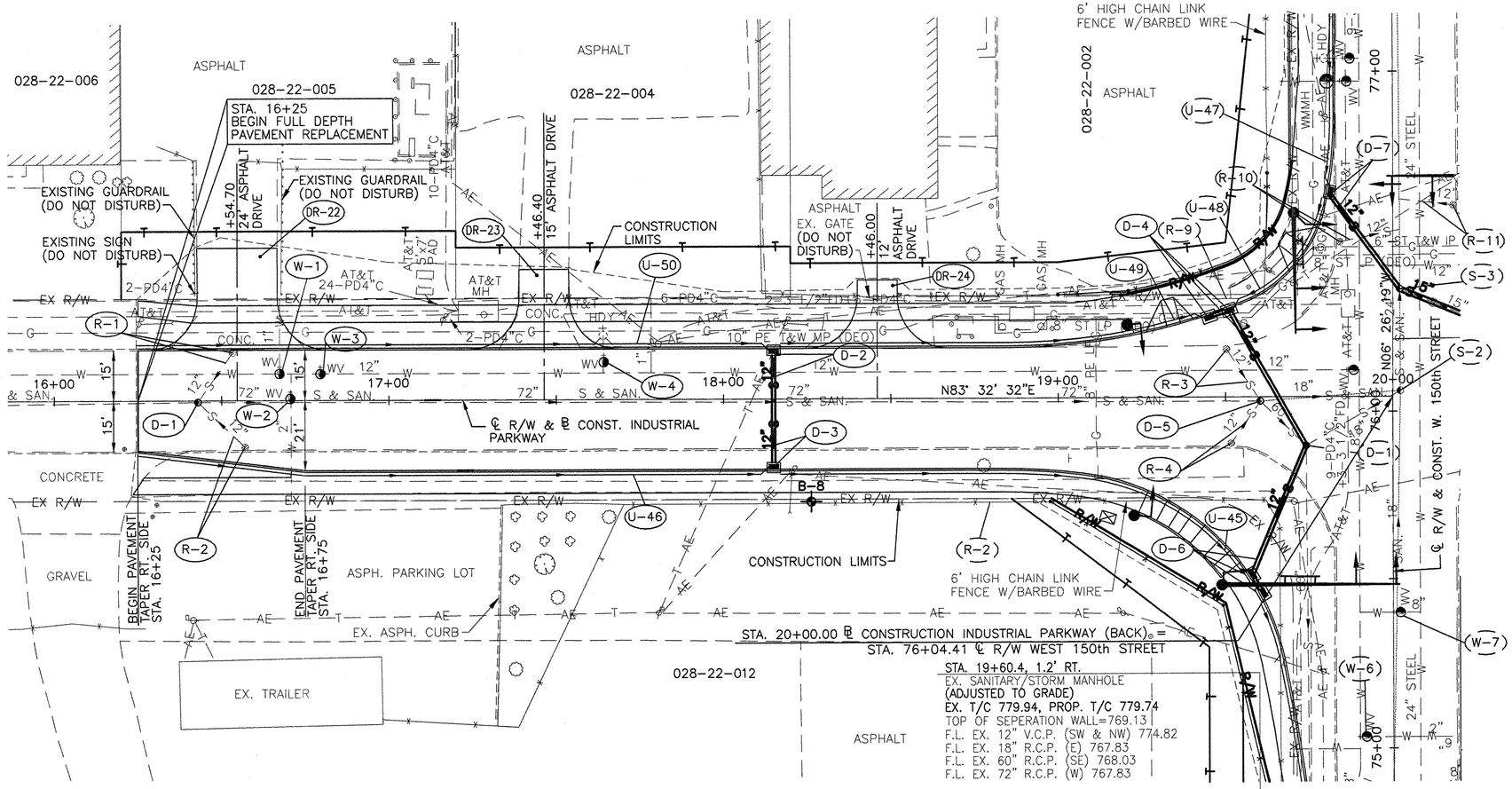
CUY - WEST 150th STREET

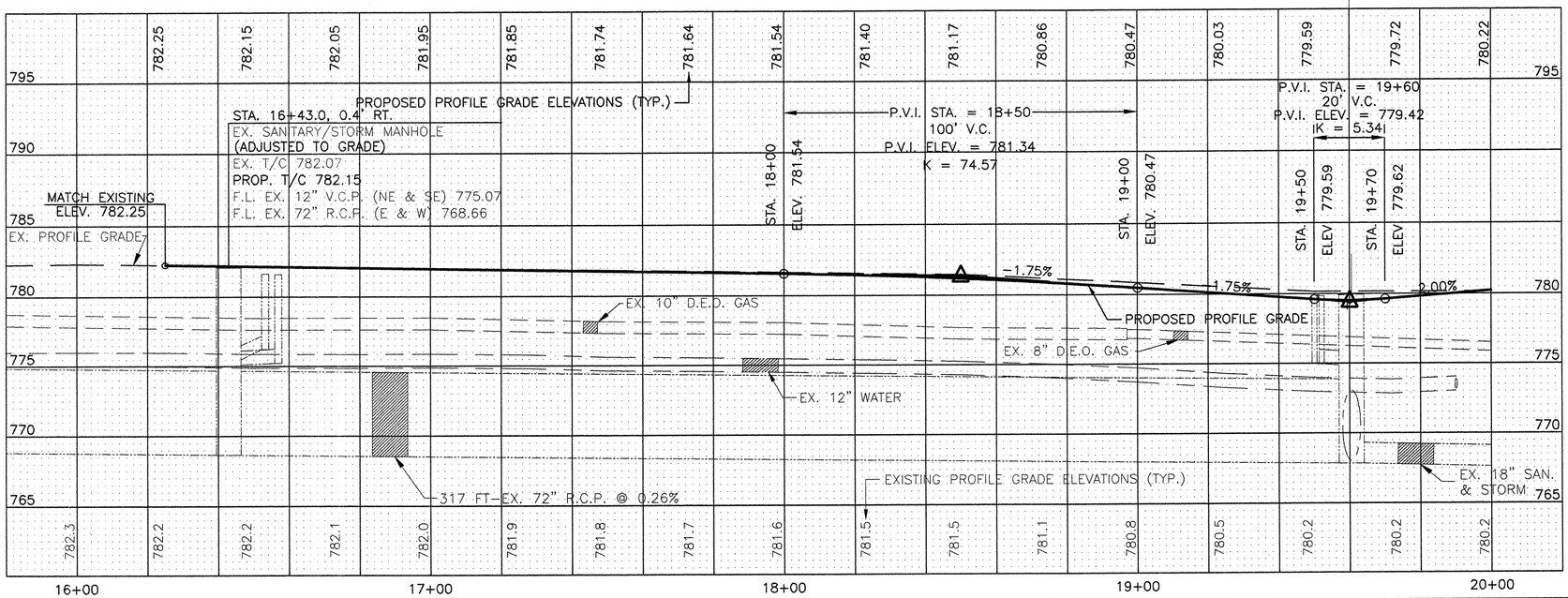
29
146

F:\JOBS\665\GP\GP106.DWG JLN 4/3/07 PLOT 1"=20'

BENCH MARK NO. 4, MAG. NAIL IN ASPHALT
@ STA. 67+61.19, 31.22' LT.
℄ CONST. WEST 150th STREET
ELEVATION 772.72

FOR CROSS SECTIONS, SEE SHEETS 48 & 49.
FOR INTERSECTION DETAIL, SEE SHEET 52.
FOR DRIVEWAY DETAILS, SEE SHEETS 53, 54, & 60.
FOR STORM SEWER PROFILES, SEE SHEET 66.
FOR UNDERDRAIN DETAILS, SEE SHEET 67.
FOR TRAFFIC CONTROL PLAN, SEE SHEET 112.
FOR TRAFFIC SIGNAL PLAN, SEE SHEET 120.





NO. REF.	STATION FROM	STATION TO	SIDE	638 VALVE BOX ADJUSTED TO GRADE EACH	604 CITY OF CLEVELAND TWIN CB-1 CATCH BASIN EACH	604 CITY OF CLEVELAND CB-1 CATCH BASIN, AS PER PLAN EACH	604 MANHOLE ADJUSTED TO GRADE EACH	603 12" CONDUIT, TYPE B, 706.08 EXTRA STRENGTH FT	SPECIAL FILL AND PLUG EXISTING CONDUIT FT	202 CATCH BASIN OR INLET REMOVED EACH
D-1	16+43.0		RT			1		16		
D-2	18+15.00		LT			1		19		
D-3	18+15.00		RT		1			46		
D-4	76+31.00	75+89.8	LT				1			
D-5	76+06.1		LT					42		
D-6	75+51.00	75+89.8	LT							
R-1	16+43.0	16+53.3	LT	1					18	
R-2	16+43.0	16+57.0	RT	1					20	
R-3	19+50.3	19+60.4	LT	1					18	
R-4	19+51.7	19+60.4	RT	1					15	
W-1	16+67		LT							
W-2	16+71		LT							
W-3	16+80		LT							
W-4	17+64		LT							
				4	1	2	2	123	71	4
			TOTAL							

PLAN AND PROFILE - INDUSTRIAL PARKWAY
STA. 16+00 TO STA. 20+00

CUY - WEST 150th STREET

CALCULATED JLN
CHECKED EPS

SCALE IN FEET 0 20 40

30
146

PJK 3/23/07 PLOT 1"=20'
F:\JOBS\665\GP\GP200.DWG

ESTIMATED QUANTITIES CONTINUED FROM SHEET 23.

REF. NO.	STATION FROM	STATION TO	SIDE	202 PIPE REMOVED, 24" AND UNDER	202 MANHOLE REMOVED	202 CATCH BASIN OR INLET REMOVED	202 REMOVAL MISC.: SIGN FOUNDATION	202 REMOVAL MISC.: BOLLARD	202 FENCE REMOVED FOR REUSE	202 GUARDRAIL REMOVED FOR REUSE	603 12" CONDUIT, TYPE B, 706.02	603 15" CONDUIT, TYPE B, 706.02	603 18" CONDUIT, TYPE B, 706.02	603 36" CONDUIT, TYPE B, 706.02	604 ODOT NO. 3 MANHOLE, 60" BASE	604 MANHOLE ADJUSTED TO GRADE	604 ODOT NO. 3A CATCH BASIN, AS PER PLAN	604 CUYAHOGA COUNTY TWIN 3C CATCH BASIN, AS PER PLAN	604 ODOT NO. 3 MANHOLE, AS PER PLAN 3	606 GUARDRAIL REBUILT	607 FENCE REBUILT	609 CURB, TYPE 6
				FT	EACH	EACH	EACH	EACH	FT	FT	FT	FT	FT	FT	EACH	EACH	EACH	EACH	EACH	FT	FT	FT
C-1	52+21.45	52+73.97	LT																			76
D-1	51+28.00	57+45.00	RT								16							1				
D-2	51+28.00	51+60.00	LT								34							1				
D-3	51+45.00	51+60.00	RT/LT								41						1					
D-4	51+60.00		LT								28						1					
D-5	51+60.00	52+80.00	LT											121	1							
D-6	52+80.00	53+22.7	LT										43						1			
D-7	53+22.70		LT											16	1							
D-8	53+22.9		LT													1						
D-9	53+22.7	53+50.00	LT									28							1			
D-10	53+50.00	53+56.2	LT								37						1					
D-11	53+50.00		RT/LT								33						1					
D-12	53+50.00	55+00.00	LT											150	1							
R-1	50+48	50+88	RT/LT	75		1																
R-2	50+88	50+93	LT	11		1																
R-3	50+93	53+22.9	LT	243	1																	
R-4	51+22		RT				1															
R-5	51+80	51+85	LT					3														
R-6	52+23	53+01	RT						86												86	
R-7	52+37	52+60	RT							21										21		
R-8	53+22.9	53+49.7	LT	29	1																	
R-9	53+49.6	53+54.9	RT/LT	50		1																
R-10	53+49.7	53+54.9	LT	9		1																
R-11	53+49.7	53+56.2	LT	8																		
R-12	53+54.9	56+01	LT	255	1																	
R-13	53+76		LT					2														
S-1	50+45.2		LT													1						
			TOTAL	680	3	4	1	5	86	21	189	28	43	287	3	2	4	2	2	21	86	76

ESTIMATED QUANTITIES CONTINUED FROM SHEET 29.

NO. REF.	STATION FROM	STATION TO	SIDE	604 MANHOLE ADJUSTED TO GRADE	638 VALVE BOX ADJUSTED TO GRADE	SPECIAL EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A	SPECIAL PLUG EXISTING SERVICE CONNECTION
				EACH	EACH	EACH	EACH
W-1	74+18		LT			1	
W-2	74+72		LT		1		
W-3	74+79		LT		1		
W-4	74+85		LT		1		
W-5	75+00		LT				1
W-6	75+03		LT		1		
W-7	75+40		RT		1		
W-8	76+12		LT		1		
W-9	76+43		RT		1		
W-10	76+97		LT	1			
W-11	76+97		LT		1		
W-12	77+04		LT		1		
			TOTAL	1	9	1	1

ESTIMATED QUANTITIES CONTINUED FROM SHEET 24.

NO. REF.	STATION FROM	STATION TO	SIDE	603 12" CONDUIT, TYPE B, 706.02	604 ODOT NO. 3A CATCH BASIN, AS PER PLAN	604 ODOT NO. 3 MANHOLE, 48" BASE
				FT	EACH	EACH
D-1	55+00.00		LT	31	1	
D-2	55+00.00	56+20.00	LT	120		1
D-3	55+95.00	56+20.00	LT	38	1	
D-4	56+20.00	56+35.00	LT	30	1	
D-5	56+20.00	57+17.00	LT	97		1
D-6	57+17.00		LT	22	1	
			TOTAL	338	4	2

ESTIMATED QUANTITIES CONTINUED FROM SHEET 26.

NO. REF.	STATION FROM	STATION TO	SIDE	202 ABANDON MISC.: METER VAULT	202 PIPE REMOVED, 24" AND UNDER	202 MANHOLE REMOVED	202 CATCH BASIN OR INLET REMOVED	202 PORTIONS OF STRUCTURE REMOVED	SPECIAL FILL AND PLUG EXISTING CONDUIT	604 MANHOLE ADJUSTED TO GRADE	638 VALVE BOX, ADJUSTED TO GRADE	SPECIAL EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A	SPECIAL PLUG EXISTING SERVICE CONNECTION
				EACH	FT	EACH	EACH	CY	FT	EACH	EACH	EACH	EACH
R-1	62+66.7	63+35.6	RT		69								
R-2	63+35.6	63+47.6	RT						34				
R-3	63+47.2	63+48.0	LT		13		1						
R-4	63+47.6	63+48.0	RT		23		1						
R-5	63+48.0	65+04.1	LT		156	1							
R-6	65+03.9	65+04.1	LT				1		13				
R-7	65+04.1	65+04.4	RT				1		23				
R-8	65+04.1	66+49.1	LT		145	1							
R-9	64+73	65+58	RT/LT					40					
W-1	62+86		LT										1
W-2	63+88		LT								1		
W-3	64+00		LT									1	
W-4	64+28		RT								1		
W-5	64+39		LT								1		
W-6	64+43		RT										1
W-7	65+59		RT								1		
W-8	65+59		RT							1			
W-9	65+80		RT										1
W-10	65+80		RT	1									
W-11	63+87		RT			1							
			TOTAL	1	406	3	4	40	70	1	4	1	3

ESTIMATED QUANTITIES CONTINUED FROM SHEET 27.

REF. NO.	STATION FROM	STATION TO	SIDE	202 PIPE REMOVED, 24" AND UNDER	202 ABANDON MISC.: METER VAULT	202 VALVE BOX REMOVED	604 MANHOLE ADJUSTED TO GRADE	638 VALVE BOX, ADJUSTED TO GRADE	SPECIAL 12" WATER MAIN DUCTILE IRON PIPE WITH PUSH-ON JOINTS AND RETAINED MECHANICAL JOINT FITTINGS, ANSI CLASS 52	SPECIAL RETAIN AND RECONNECT 2" WATER SERVICE CONNECTION, LONG SIDE COMPETE	SPECIAL EXTEND AND ADJUST HYDRANT TO GRADE. TYPE A	SPECIAL 12" CUTTING-IN VALVE WITH VALVE BOX, COMPLETE	SPECIAL PLUG EXISTING SERVICE CONNECTION	SPECIAL TEMPORARY BY-PASS CONNECTION COMPLETE WITH PIPE AND FITTINGS	SPECIAL TEMPORARY SERVICE CONNECTION	SPECIAL 20" STEEL CASING PIPE
				FT	EACH	EACH	EACH	EACH	FT	EACH	EACH	EACH	EACH	FT	EACH	FT
W-1	66+94		LT					1								
W-2	66+94		RT				1									
W-3	67+86		LT			1							1			
W-4	68+06		LT								1					
W-5	68+06	69+26	RT/LT											173		
W-6	68+18		RT										1			
W-7	68+46		LT									1				
W-8	68+51		RT			1							1			
W-9	68+51		RT		1											
W-10	68+79	69+52	LT	74					74							9
W-11	69+24		RT				1									
W-12	69+24		RT/LT							1						
W-13	69+26		RT												1	
W-14	69+33		RT				1									
W-15	69+37		RT					1								
W-16	69+85		LT									1				
			TOTAL	74	1	2	3	2	74	1	1	2	3	173	1	9

CALCULATED CGP
CHECKED JLN

ESTIMATED QUANTITIES-WEST 150th STREET

CUY-WEST 150th STREET

31
146

PJK 3/21/07 PLOT 1=1

(JOBS\665\GP\GP107.DWG)

SEEDING END WIDTH	SEEDING SQ. YDS.
4	33
8	22
0	3
1	1
0	
SHEET TOTAL	59

℄ CONSTRUCTION

STA.47+36.5, 12.9' LT.
EX. SANITARY MANHOLE
EX. T/C 776.10
F.L. 24" (N & S) 767.40

4:1

47+50
776.5

4:1

47+00
775.9

EX. 24" SANITARY

STA. 46+70.00, 32.26' LT.
ODOT NO. 3A C.B. AS PER PLAN
T/G 774.72
F.L. 6" U.D. 772.05
F.L. 18" (E) 771.01

STA. 46+69.8, 27.7' LT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 774.95
F.L. EX. 6" U.D. (W) 773.31
F.L. EX. 18" R.C.P. (E) 770.95

STA. 46+69.0, 19.5' LT
EX. STORM MANHOLE
EX. T/C 775.22
F.L. EX. 18" R.C.P. (W) 770.84
F.L. EX. 18" R.C.P. (E) 770.47
F.L. EX. 24" R.C.P. (S) 769.84

46+50
775.3

12 FT-18" CONDUIT,
TYPE B, 706.02 @ 1.35%

8 FT-EX. 18" R.C.P. @ 1.4%
(TO BE REMOVED)

EX. 24" SANITARY

46 FT-EX. 18" R.C.P. @ 1.7%

EX. RETAINING WALL (TYP.)

2:1

EX. 24" STORM

46+00
774.7

EX. 24" SANITARY

ITEM 202-PAVEMENT REMOVED (TYP.)

EX. 24" STORM

45+85
774.7

EX. 24" SANITARY

℄ CONSTRUCTION

60 50 40 30 20 10 0 10 20 30 40 50 60

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
14	0	31	0
20	0	28	0
10	0	14	0
5	0	1	0
0	0		
SHEET TOTAL		74	0

CALCULATED CGP
CHECKED JLN

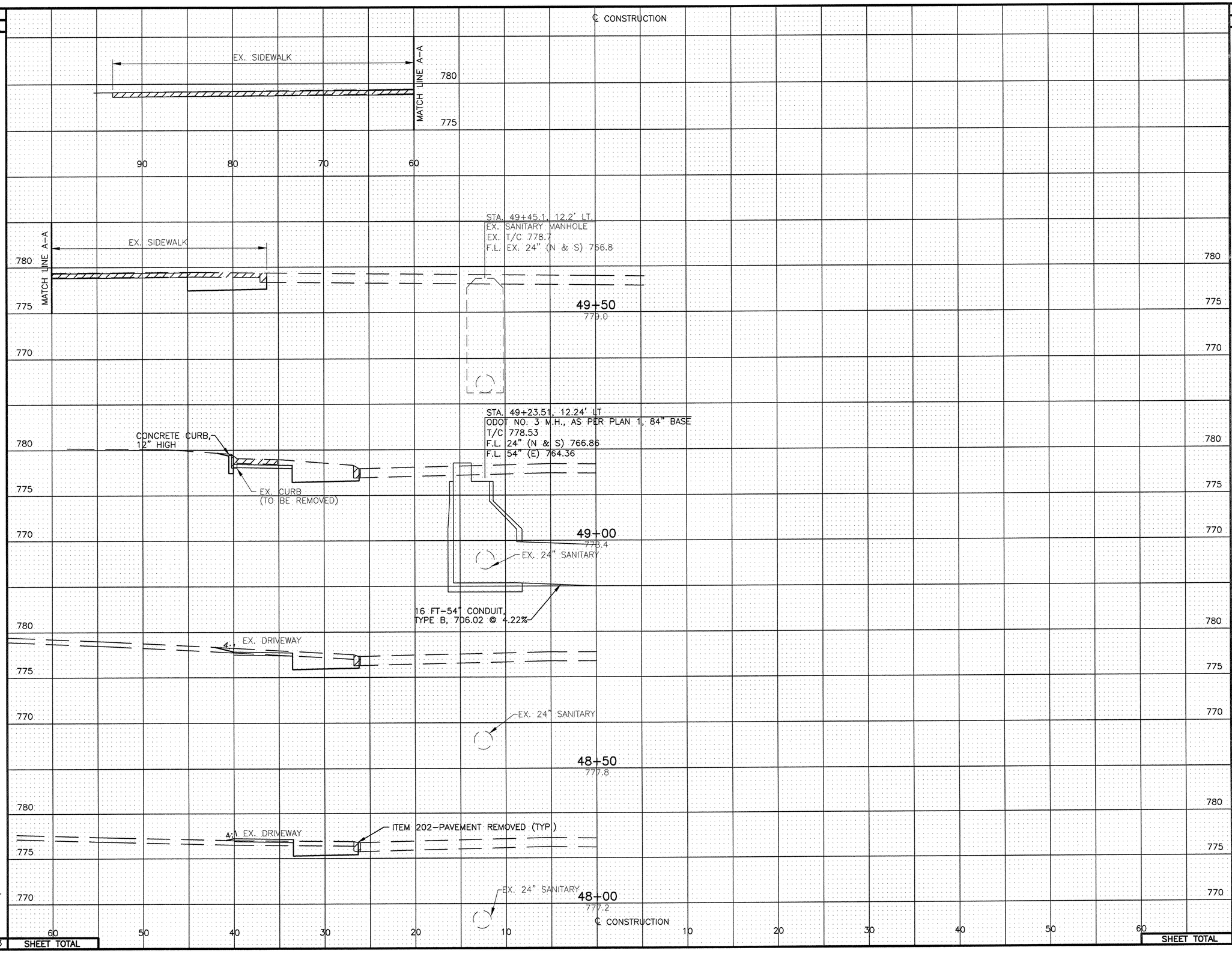
CROSS SECTION SHEET SMITH ROAD STA. 45+85 TO STA. 47+50

CUY-WEST 150th STREET

32
146

P.W. 3/22/07 PLOT 1:5
F:/JOBS/665/cx/CX300.DWG

SEEDING	
END WIDTH	SQ. YDS.
0	
	3
1	
	8
2	
	8
1	
	14
4	
	33



END AREA		VOLUME	
CUT	FILL	CUT	FILL
12	0	25	0
15	0	27	0
14	0	19	0
7	0	19	0
14	0		
SHEET TOTAL		90	0

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET SMITH ROAD STA. 48+00 TO STA. 49+50

CUY-WEST 150th STREET

33/146

P.W. 3/22/07 PLOT 1:5

F:/JOBS/665/cx/CX350.DWG

SEEDING END WIDTH	SEEDING SQ. YDS.
0	0
0	19
0	7
7	7
0	0
26	SHEET TOTAL

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
168	0		
		279	0
133	0		
		201	1
84	1		
		51	0
65	0		
SHEET TOTAL		531	1

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET
STA. 50+33.32 TO STA. 51+50

CUY-WEST 150th STREET

34
146

P.W. 3/22/07 PLOT 1:5

F:/JOBS/665/cx/GX100.DWG

BUILDING
EX. R/W
EX. PARKING LOT
STA. 51+60.00, 34.00' LT.
ODOT NO. 3A C.B., AS PER PLAN
T/G 778.31
F.L. 6" (N) 775.83
F.L. 12" (S & E) 773.86
℄ CONSTRUCTION
STA. 51+60.00, 5.00' LT.
ODOT NO. 3 MANHOLE, 60" BASE
T/C 779.06
F.L. 12" (W & SE) 773.58
F.L. 36" (N) 773.58
STA. 51+45.00, 34.00' RT.
ODOT NO. 3A C.B., AS PER PLAN
T/G 778.24
F.L. 6" (N) 775.61
F.L. 12" (S & NW) 773.99
END PROPOSED RETAINING WALL 1
STA. 51+87.40
EX. 8" D.E.O. GAS
EX. 12" STORM
EX. 12" W.M.
779.11
51+50
780.4
EX. 24" W.M.
EX. 20" D.E.O. GAS
EX. AT&T 12-4" MTD
END PROPOSED RETAINING WALL 2
STA. 51+68.69
PROPOSED 20" D.E.O. GAS
28 FT-12" CONDUIT,
TYPE B, 706.02 @ 1.00%
(FOR UNDERGROUND DETENTION)
18"
PROP. 12" W.M. LOWERING
PROP. 24" W.M. LOWERING
41 FT-12" CONDUIT,
TYPE B, 706.02 @ 1.00%
(FOR UNDERGROUND DETENTION)
STA. 50+93. 35' LT.
EX. STORM MANHOLE
(TO BE REMOVED)
EX. T/C UNKNOWN (BURIED)
F.L. EX. 12" (SE & N) UNKNOWN
STA. 50+88. 25' LT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 779.78
F.L. EX. 12" V.C.P. (SE) 774.88
F.L. EX. 12" R.C.P. (NW) 774.88
STA. 51+28.00, 34.00' RT.
CUY. CTY. TWIN NO. 3C C.B., AS PER PLAN
T/G 778.21
F.L. 6" (N & S) 775.54
F.L. 12" (N) 774.15
BEGIN PROPOSED RETAINING WALL 1
STA. 50+94.62
EX. 8" D.E.O. GAS
EX. 12" R.C.P. (TO BE REMOVED)
EX. 12" V.C.P.
779.14
51+00
780.0
ITEM 202-PAVEMENT REMOVED (TYP.)
BEGIN PROPOSED RETAINING WALL 2
STA. 50+88.58
PROPOSED 20" D.E.O. GAS
STA. 51+28.00, 34.00' LT.
CUY. CTY. TWIN NO. 3C C.B., AS PER PLAN
T/G 778.21
F.L. 6" (N & S) 775.54
F.L. 12" (N) 774.20
STA. 50+48. 37' RT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 779.61
F.L. EX. 12" V.C.P.(NW) 775.63
EX. CONC. WALK
ITEM 202-PAVEMENT REMOVED,
ASPHALT (TYP.)
EX. 8" D.E.O. GAS
EX. 12" W.M.
779.41
50+50
779.5
75 FT-EX. 12" V.C.P. @ 1.0%
(TO BE REMOVED)
EX. 24" W.M.
EX. 20" D.E.O. GAS
EX. AT&T 12-4" MTD
EX. 12" W.M.
EX. AT&T 24-3 1/2" F.D.
EX. AT&T 9-3 1/2" F.D.
MATCHLINE B-B
MATCHLINE A-A
EX. 4" D.E.O. GAS
779.52
50+31.39
779.5
EX. 12" W.M.
BEGIN PAVEMENT
REPLACEMENT
EX. 24" W.M.
EX. AT&T 12-4" MTD
EX. 12" W.M.
EX. 20" D.E.O. GAS
EX. AT&T 9-3 1/2" F.D.
℄ CONSTRUCTION
60 50 40 30 20 10 0 10 20 30 40 50 60

CROSS SECTION SHEET WEST 150th STREET
STA. 52+00 TO STA. 53+50

CUY-WEST 150th STREET

CALCULATED CGP | CHECKED JLN

SEEDING END MDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
1	11	42	0		
				93	1
3		58	1		
	33			146	2
9	50	100	1		
				214	2
9		131	1		
0	25			277	1
		168	0		
SHEET TOTAL	119			730	6

℄ CONSTRUCTION

STA. 53+49.7, 32.3' LT.
EX. STORM MANHOLE
(TO BE REMOVED)
EX. T/C 781.63
F.L. EX. 12" R.C.P. (NE & NW) 774.74
F.L. EX. 12" R.C.P. (E) 776.28
F.L. EX. 12" R.C.P. (S) 774.63

STA. 53+54.9, 25.2' LT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 781.41
F.L. EX. 6" U.D. (NE) 778.41
F.L. EX. 12" R.C.P. (SE) 776.53
F.L. EX. 12" R.C.P. (W) 776.62

STA. 53+50.00, 4.00' LT.
ODOT NO. 3 MANHOLE,
AS PER PLAN 3
T/C (S) 781.32, (N) 781.31
F.L. 12" (NW) 774.44
F.L. 12" (SE) 776.90
F.L. 15" (SW) 774.44
F.L. 36" (NE) 774.44

STA. 53+49.6, 24.8' RT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 781.08
F.L. EX. 12" R.C.P. (NW) 777.28

STA. 53+50.00, 29.71' RT.
ODOT NO. 3A C.B., AS PER PLAN
T/G 780.63
F.L. 6" (N) 777.96
F.L. 12" (NW) 777.23

STA. 53+50.00, 34.00' LT.
ODOT NO. 3A C.B., AS PER PLAN
T/G 780.55
F.L. 12" (NW) 774.74
F.L. 6" (N) 777.88
F.L. 12" (SE) 774.75

STA. 53+22.9, 32.4' LT.
EX. STORM MANHOLE
(ADJUSTED TO GRADE)
EX. T/C 781.47
PROP. T/C 780.74
F.L. EX. 12" (S) 773.85
F.L. EX. 12" R.C.P. (NE) 773.75
F.L. EX. 36" R.C.P. (SE) 772.48
F.L. EX. 36" R.C.P. (W) 772.42

STA. 53+22.7, 3.00' LT.
ODOT NO. 3 MANHOLE, 60" BASE
T/C 781.08
F.L. 15" (NE) 774.00
F.L. 36" (E & W) 772.58
F.L. 18" (SW) 773.31

STA. 53+22.3, 58.1' RT.
EX. CATCH BASIN
EX. T/G 779.71
F.L. EX. 4" P.V.C. (NE) 778.34
F.L. EX. 36" R.C.P. (SE) 772.98
F.L. EX. 36" R.C.P. (NW) 772.79

EX. R/W
EX. PARKING LOT
7.00%
EX. BUILDING
EX. 8" D.E.O. GAS
9 FT-EX. 12" R.C.P. @ 3.8% (TO BE REMOVED)
18"
EX. 12" W.M.
PROP. 12" W.M. LOWERING
12"
EX. 24" W.M.
29 FT-12" CONDUIT, TYPE B, 706.02 @ 1.00% (FOR UNDERGROUND DETENTION)
50 FT-EX. 12" R.C.P. @ 1.3% (TO BE REMOVED)
33 FT-12" CONDUIT, TYPE B, 706.02 @ 1.00% (FOR UNDERGROUND DETENTION)
EX. 20" D.E.O. GAS
EX. AT&T 10-4" MTD
781.39
53+50
781.4
ITEM 202-PAVEMENT REMOVED (TYP.)
4:1
PROPOSED 20" D.E.O. GAS
152 FT-EX. 36" R.C.P. @ 1.4%
90 FT-EX. 36" R.C.P. @ 0.3%
780.90
53+00
781.2
6:1
ITEM 609-CURB, TYPE 6 (TYP.)
PROP. 36" STORM/DETENTION
END PROPOSED RETAINING WALL 3
STA. 52+73.02
EX. 12" STORM
780.26
52+50
780.9
BEGIN PROPOSED RETAINING WALL 3
STA. 52+07.24
ITEM 202-PAVEMENT REMOVED, ASPHALT (TYP.)
EX. 8" D.E.O. GAS
EX. 12" STORM
EX. 12" W.M.
779.56
52+00
780.7
EX. 24" W.M.
EX. 20" D.E.O. GAS
EX. AT&T 12-4" MTD

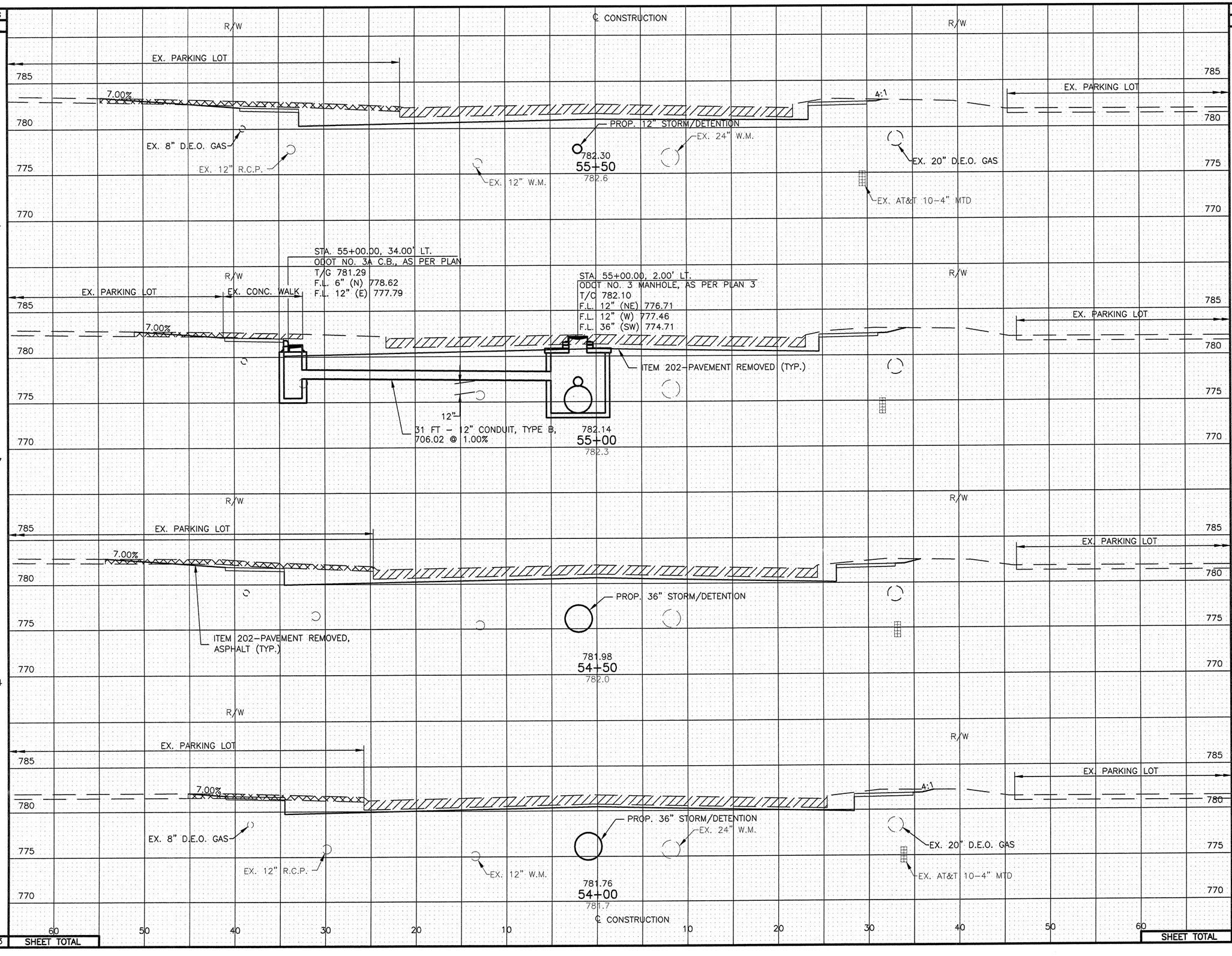
60 50 40 30 20 10 0 10 20 30 40 50 60

P.W. 3/22/07 PLOT 1:5

F:/JOBS/665/CX/GX101.DWG

35
146

SEEDING END WIDTH	SEEDING SQ YDS
2	14
3	17
3	14
2	8
1	
	53



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
50	0		
		87	0
44	0		
		82	0
45	0		
		74	0
35	0		
		71	0
42	0		
		314	0

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET STA. 54+00 TO STA. 55+50

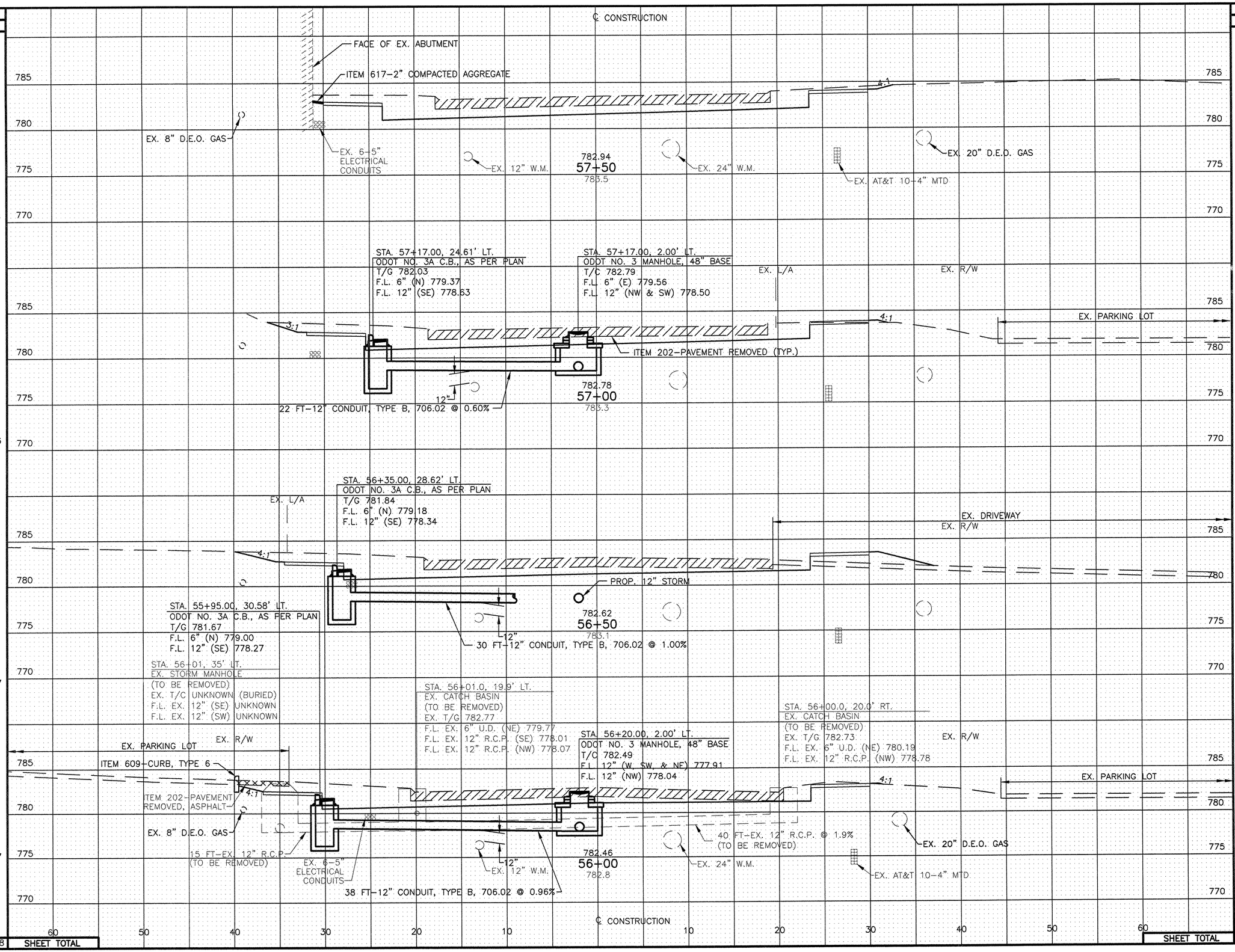
CUY-WEST 150th STREET

36
146

PJK 3/22/07 PLOT 1:5

F:/JOBS/665/GX/GX102.DWG

SEEDING END WIDTH	SEEDING SQ. YDS.
3	
	28
7	
	56
13	
	47
4	
	17
2	
	148



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
64	0		
		119	0
64	0		
		116	9
61	10		
		111	9
59	0		
		101	0
50	0		
SHEET TOTAL		447	18

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET STA. 56+00 TO STA. 57+50

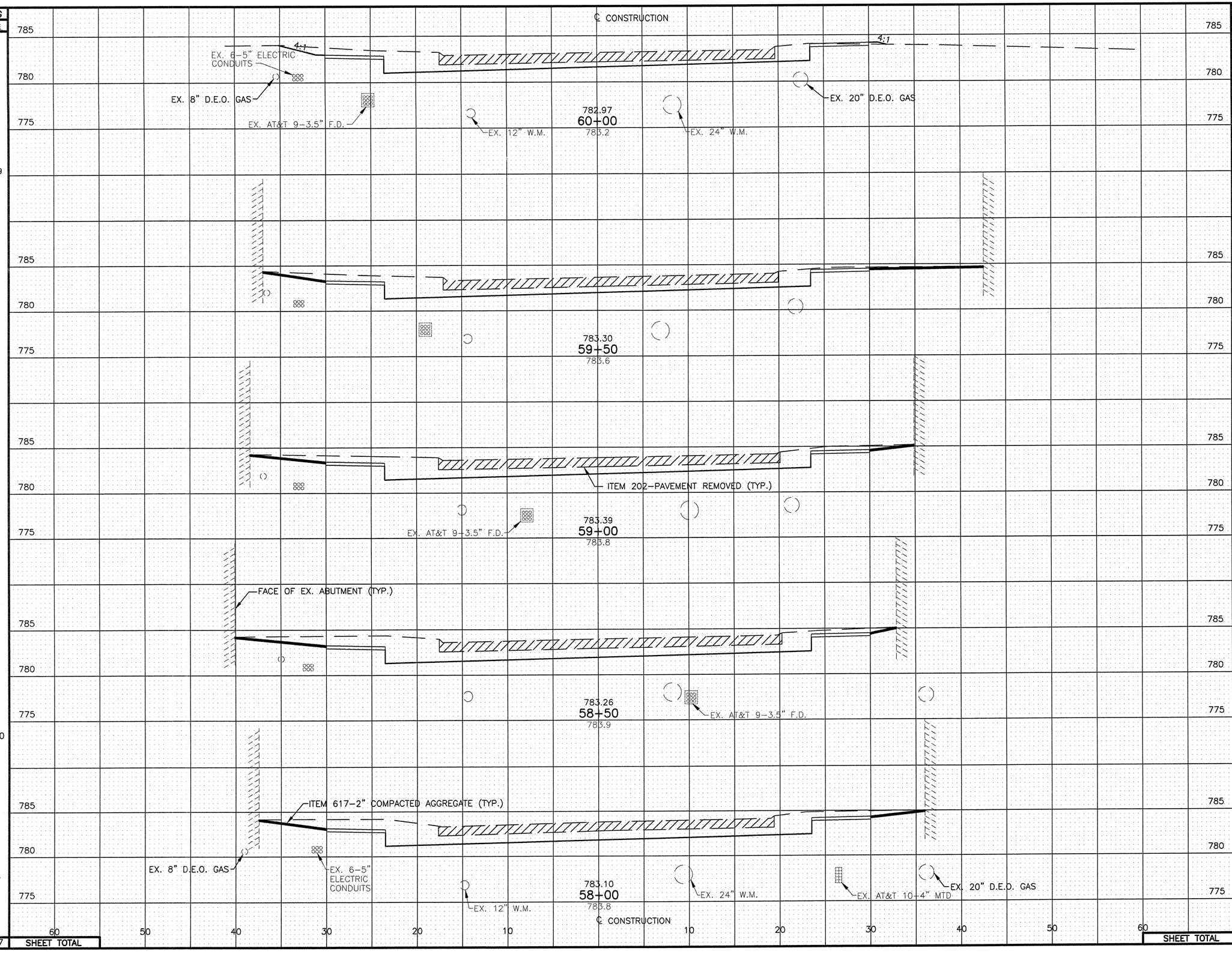
CUY-WEST 150th STREET

37
146

PJK 3/22/07 PLOT 1:5

F:/JOBS/665/GX/GX103.DWG

SEEDING END WIDTH	SEEDING SQ. YDS.
7	19
0	0
0	0
0	8
3	
	27



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
47	0		
		94	0
55	0		
		108	0
62	0		
		128	0
76	0		
		143	0
78	0		
		131	0
64	0		
SHEET TOTAL		604	0

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET
STA. 58+00 TO STA. 60+00

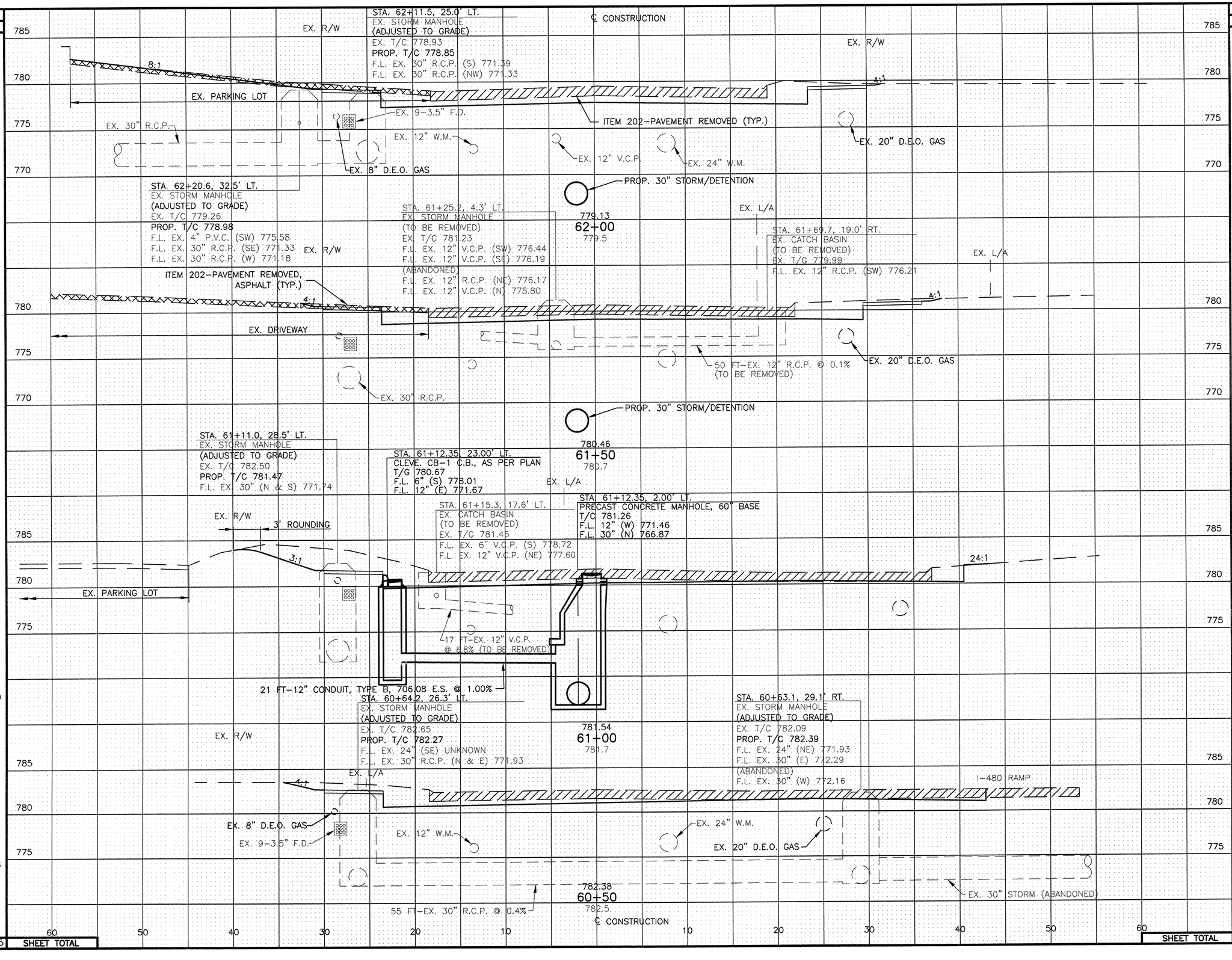
CUY-WEST 150th STREET

38
146

PJK 3/22/07 PLOT 1:5

F:/JOBS/665/CX/CX104.DWG

SEEDING END WIDTH	SEEDING SQ. YDS.
28	92
5	50
13	50
5	33
7	
	225



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
44	0	80	0
42	0	96	0
62	0	89	0
34	0	75	0
47	0		
		340	0

SHEET TOTAL

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET STA. 60+50 TO STA. 62+00

CUY-WEST 150th STREET

39
146

JLN 3/26/07 PLOT 1:5

F:/JOBS/665/Gx/GX105.DWG

SEEDING	
END WIDTH	SQ. YDS.
41	186
26	114
15	106
23	142
28	60
	548

END AREA		VOLUME	
CUT	FILL	CUT	FILL
185	0		
		301	0
140	0		
		212	0
89	0		
		129	0
50	0		
		87	0
44	0		
		729	0

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET STA. 62+50 TO STA. 64+00

CUY-WEST 150th STREET

40
146

℄ CONSTRUCTION

EX. R/W

EX. AT&T 9-3.5" F.D.

EX. 12" W.M.

EX. 18" R.C.P.

PROP. 27" STORM/DETENTION

771.94
64+00
772.6

EX. AT&T 1-BURIED CABLE

EX. 8" D.E.O. GAS

EX. 24" W.M.

EX. 20" D.E.O. GAS

STA. 63+47.2, 17.1' LT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 774.82
F.L. EX. 12" V.C.P. (E) 770.31

STA. 63+48.0, 4.0' LT.
EX. STORM MANHOLE
(TO BE REMOVED)
EX. T/C 774.70
F.L. EX. 12" V.C.P. (S) 768.76
F.L. EX. 12" V.C.P. (E) 769.68
F.L. EX. 12" V.C.P. (W) 769.51
F.L. EX. 18" R.C.P. (N) 768.64

STA. 63+47.6, 18.9' RT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 774.70
F.L. EX. 12" V.C.P. (E) 772.48
F.L. EX. 12" V.C.P. (W) 770.43

STA. 63+35.60, 51.20' RT.
ODOT NO. 2-2B C.B.
T/G 775.12
F.L. 6" (SE) 772.95
F.L. 12" (S) 771.24

STA. 63+35.6, 51.2' RT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 775.14
F.L. EX. 6" V.C.P. (SE) 772.95
F.L. EX. 12" V.C.P. (S) 772.52
F.L. EX. 12" V.C.P. (W) 771.24

34 FT-EX. 12" V.C.P. (FILL AND PLUG)

STA. 63+47.00, 23.00' LT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 773.16
F.L. 6" (S) 770.50
F.L. 12" (E) 770.16

13 FT-EX. 12" V.C.P.
@ 6.1% (TO BE REMOVED)

21 FT-12" CONDUIT, TYPE B,
706.08 E.S. @ 1.00%

STA. 63+47.00, 2.00' LT.
PRECAST CONCRETE MANHOLE, 60" BASE
T/C 773.75
F.L. 12" (E & W) 769.95
F.L. 27" (N) 766.52
F.L. 36" (S) 766.52

773.67
63+50
774.6

25 FT-12" CONDUIT, TYPE B,
706.08 E.S. @ 1.20%

23 FT-EX. 12" V.C.P. @ 3.3%
(TO BE REMOVED)

STA. 63+50.00, 23.00' RT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 773.05
F.L. 6" (S) 770.38
F.L. 12" (W) 770.25

EX. DRIVEWAY

ITEM 202-PAVEMENT REMOVED (TYP.)

EX. 6" B.P. PIPELINE
CROSSING AT STA. 62+93

EX. 12" V.C.P.

PROP. 12" STORM

PROP. 36" STORM/DETENTION

775.71
63+00
776.4

10" STEEL CASING

PROP. 6" BP PIPELINE RELOCATION

STA. 62+25.00, 23.00' LT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 777.74
F.L. 6" (S) 775.08
F.L. 12" (E) 767.74

STA. 62+25.00, 2.00' LT.
PRECAST CONCRETE MANHOLE, 60" BASE
T/C 778.33
F.L. 12" (E & W) 767.53
F.L. 30" (S) 766.64
F.L. 36" (N) 766.64

STA. 62+25.00, 23.00' RT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 777.79
F.L. 6" (S) 775.13
F.L. 12" (W) 767.93

STA. 62+66.70, 50.50' RT.
ODOT NO. 2-2B C.B., AS PER PLAN
T/G 776.29
F.L. 12" (W & N) 769.73
F.L. 6" (SE) 773.45

STA. 62+66.7, 50.5' RT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 776.29
F.L. EX. 6" V.C.P. (SE) 773.45
F.L. EX. 12" V.C.P. (N) 772.92

ITEM 202-PAVEMENT REMOVED,
ASPHALT (TYP.)
EX. 8" D.E.O. GAS
EX. AT&T 9-3.5" F.D.

EX. 12" W.M.

EX. 12" V.C.P.

EX. 24" W.M.

EX. 8" D.E.O. GAS

EX. 20" D.E.O. GAS

52 FT-12" CONDUIT, TYPE B,
706.08 E.S. @ 3.00%

21 FT-12" CONDUIT, TYPE B, 706.08 E.S.
@ 1.00% (FOR UNDERGROUND DETENTION)

777.54
62+50
778.0

25 FT-12" CONDUIT, TYPE B,
706.08 E.S. @ 1.60%
(FOR UNDERGROUND DETENTION)

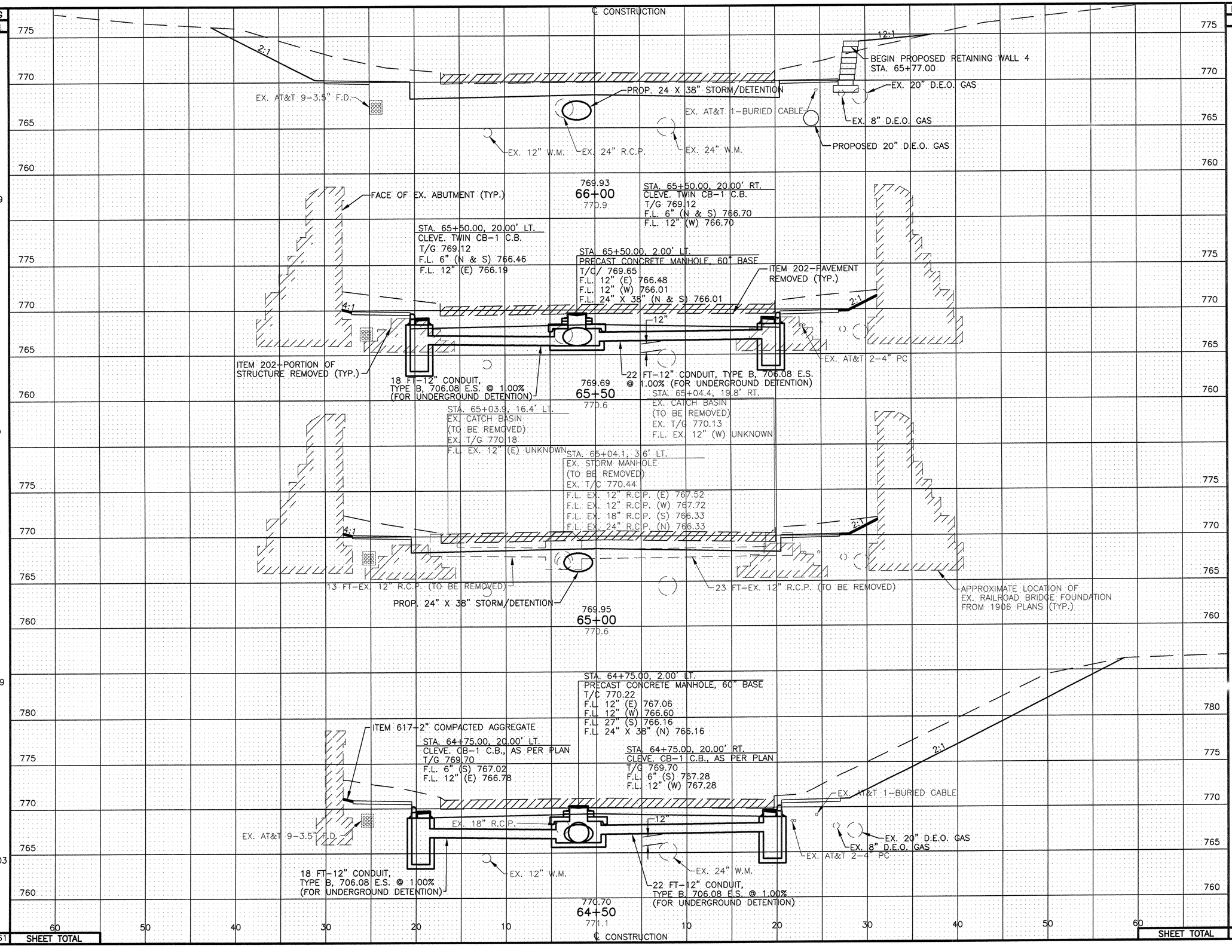
℄ CONSTRUCTION

SHEET TOTAL

JLN 4/18/07 PLOT 1:5

F:/JOBS/665/cy/CX106.DWG

SEEDING END WIDTH	SEEDING SQ. YDS.
25	69
0	0
0	89
32	203
41	361 SHEET TOTAL



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
126	4	201	4
91	0	148	0
69	0	192	0
138	0	299	0
185	0	840	4
SHEET TOTAL			

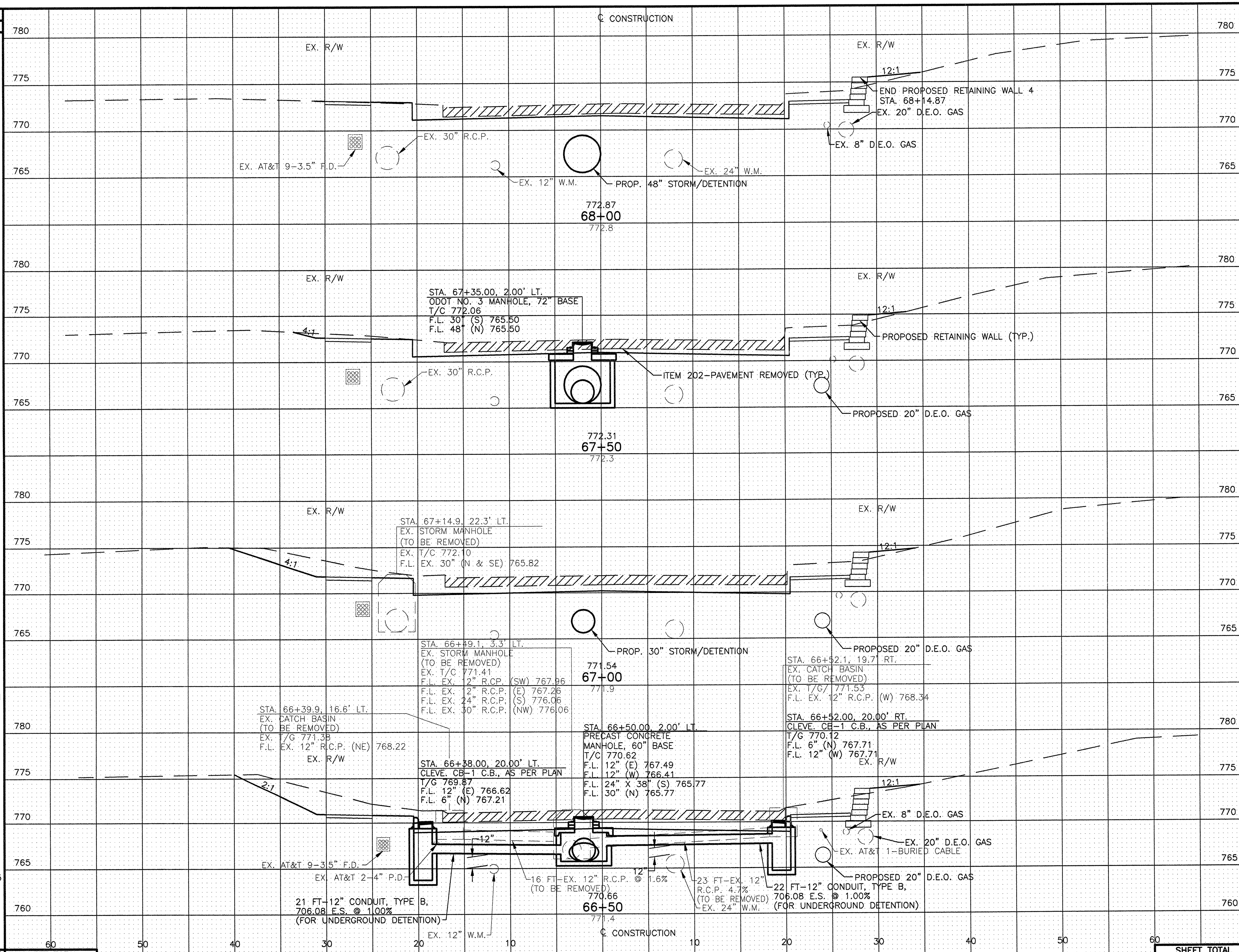
CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET
STA. 64+50 TO STA. 66+00

CUY-WEST 150th STREET

41
146

PJK 3/22/07 PLOT 1:5
F:/JOBS/665/CX/CX107.DWG



℄ CONSTRUCTION
EX. R/W
EX. R/W
12:1
END PROPOSED RETAINING WALL 4
STA. 68+14.87
EX. 20" D.E.O. GAS
EX. 8" D.E.O. GAS
EX. 30" R.C.P.
EX. AT&T 9-3.5" F.D.
EX. 24" W.M.
EX. 12" W.M.
PROP. 48" STORM/DETENTION
772.87
68+00
772.8
EX. R/W
EX. R/W
STA. 67+35.00, 2.00' LT.
ODOT NO. 3 MANHOLE, 72" BASE
T/C 772.06
F.L. 30" (S) 765.50
F.L. 48" (N) 765.50
4:1
12:1
PROPOSED RETAINING WALL (TYP.)
EX. 30" R.C.P.
ITEM 202-PAVEMENT REMOVED (TYP.)
PROPOSED 20" D.E.O. GAS
772.31
67+50
772.3
EX. R/W
EX. R/W
STA. 67+14.9, 22.3' LT.
EX. STORM MANHOLE
(TO BE REMOVED)
EX. T/C 772.10
F.L. EX. 30" (N & SE) 765.82
4:1
12:1
PROP. 30" STORM/DETENTION
PROPOSED 20" D.E.O. GAS
STA. 66+49.1, 3.3' LT.
EX. STORM MANHOLE
(TO BE REMOVED)
EX. T/C 771.41
F.L. EX. 12" R.C.P. (SW) 767.96
F.L. EX. 12" R.C.P. (E) 767.26
F.L. EX. 24" R.C.P. (S) 776.06
F.L. EX. 30" R.C.P. (NW) 776.06
771.54
67+00
771.9
STA. 66+52.1, 19.7' RT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 771.53
F.L. EX. 12" R.C.P. (W) 768.34
STA. 66+39.9, 16.6' LT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 771.38
F.L. EX. 12" R.C.P. (NE) 768.22
EX. R/W
STA. 66+50.00, 2.00' LT.
PRECAST CONCRETE
MANHOLE, 60" BASE
T/C 770.62
F.L. 12" (E) 767.49
F.L. 12" (W) 766.41
F.L. 24" X 38" (S) 765.77
F.L. 30" (N) 765.77
STA. 66+52.00, 20.00' RT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 770.12
F.L. 6" (N) 767.71
F.L. 12" (W) 767.71
EX. R/W
STA. 66+38.00, 20.00' LT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 769.87
F.L. 12" (E) 766.62
F.L. 6" (N) 767.21
2:1
12:1
EX. 8" D.E.O. GAS
EX. 20" D.E.O. GAS
EX. AT&T 1-BURIED CABLE
12"
EX. AT&T 9-3.5" F.D.
EX. AT&T 2-4" P.D.
16 FT-EX. 12" R.C.P. @ 1.6%
(TO BE REMOVED)
12"
23 FT-EX. 12"
R.C.P. 4.7%
(TO BE REMOVED)
EX. 24" W.M.
22 FT-12" CONDUIT, TYPE B,
706.08 E.S. @ 1.00%
(FOR UNDERGROUND DETENTION)
PROPOSED 20" D.E.O. GAS
21 FT-12" CONDUIT, TYPE B,
706.08 E.S. @ 1.00%
(FOR UNDERGROUND DETENTION)
770.66
66+50
771.4
EX. 12" W.M.
℄ CONSTRUCTION
780
775
770
765
760
60 50 40 30 20 10 10 20 30 40 50 60

SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
12		27	3		
	67			59	4
12		37	1		
	87			101	2
20		72	1		
	111			154	2
20		94	1		
	125			204	5
25		126	4		
SHEET TOTAL	392	SHEET TOTAL		518	13

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET STA. 66+50 TO STA. 68+00

CUY-WEST 150th STREET

F:/JOBS/665/CX/CX108.DWG PJK 3/22/07 PLOT 1:5

SEEDING END MONTH	SEEDING SQ. YDS.
12	72
14	75
13	114
28	117
14	76
12	
	450

EX. R/W

EX. CONC. WALK

EX. AT&T 9-3.5" F.D.

EX. 30" R.C.P.

EX. AT&T 9-4" P.D. IN STEEL CASING

EX. AT&T 9-4" P.D.

EX. AT&T 9-4" P.D.

EX. AT&T 9-4" P.D.

EX. AT&T 9-3.5" F.D.

EX. 30" R.C.P.

℄ CONSTRUCTION

STA. 70+55.00, 2.00' LT.
ODOT NO. 3 MANHOLE, 72" BASE
T/C 775.16
F.L. 48" (S) 765.46

EX. 12" W.M.

EX. 24" W.M.

775.16
70+50
774.9

STA. 70+15.00, 20.50' LT.
PRECAST RECTANGULAR MANHOLE
6'W X 10'L X 10'H
T/C (S) 774.99, (N) 775.04
F.L. 6" (N) 771.65
F.L. 30" (N) 765.26
F.L. 48" (S) 765.26

PROP. 48" STORM/DETENTION

774.70
70+00
774.6

STA. 69+25.8, 24.6' LT.
EX. STORM MANHOLE
(TO BE REMOVED)
EX. T/C 774.11
F.L. EX. 12" R.C.P (S) 768.35
F.L. EX. 30" R.C.P (N & S) 765.86

PROP. 48" STORM/DETENTION

PROP. 48" STORM/DETENTION

STA. 69+15.00, 20.50' LT.
ODOT NO. 3 MANHOLE, 72" BASE
T/C 774.02
F.L. 48" (N & E) 765.34

STA. 68+89.2, 16.7' LT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 773.60
F.L. EX. 12" R.C.P. (E) 769.14
F.L. EX. 12" R.C.P. (N) 769.05

774.24
69+50
774.2

STA. 69+15.00, 2.00' LT.
ODOT NO. 3 MANHOLE, 84" BASE
T/C 773.88
F.L. 48" (N, S, W) 765.35

STA. 69+00.0, 21.0' RT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 773.21
F.L. EX. 12" R.C.P.(W) 770.01

18"

19 FT-48" CONDUIT, TYPE B, 706.02 @ 0.08% (FOR UNDERGROUND DETENTION)

773.79
69+00
773.7

PROP. 12" W.M. LOWERING

STA. 68+40.00, 20.00' LT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 772.67
F.L. 6" (N) 770.01
F.L. 12" (E) 768.67

STA. 68+40.00, 2.00' LT.
ODOT NO. 3 MANHOLE, 72" BASE
T/C 773.20
F.L. 12" (W) 768.31
F.L. 12" (E) 769.23
F.L. 48" (N & S) 765.41

12"

EX. 24" W.M.

EX. 12" W.M.

18 FT-12" CONDUIT, TYPE B, 706.08 E.S. @ 2.00% (FOR UNDERGROUND DETENTION)

773.33
68+50
773.3

℄ CONSTRUCTION

EX. R/W

EX. 8" D.E.O. GAS

EX. 20" D.E.O. GAS

19 FT-48" CONDUIT, TYPE B, 706.02 @ 0.08%

EX. DRIVEWAY

ITEM 202-PAVEMENT REMOVED (TYP.)

39 FT-EX. 12" R.C.P. @ 2.2% (TO BE REMOVED)

STA. 68+40.00, 20.00' RT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 772.67
F.L. 6" (N) 770.01
F.L. 12" (W) 769.67

22 FT-12" CONDUIT, TYPE B, 706.08 E.S. @ 2.00%

4:1

48:1

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
13	0		
		31	0
20	0		
		38	0
21	0		
		36	7
18	8		
		40	7
25	0		
		48	3
27	3		
SHEET TOTAL		193	17

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET STA. 68+50 TO STA. 70+50

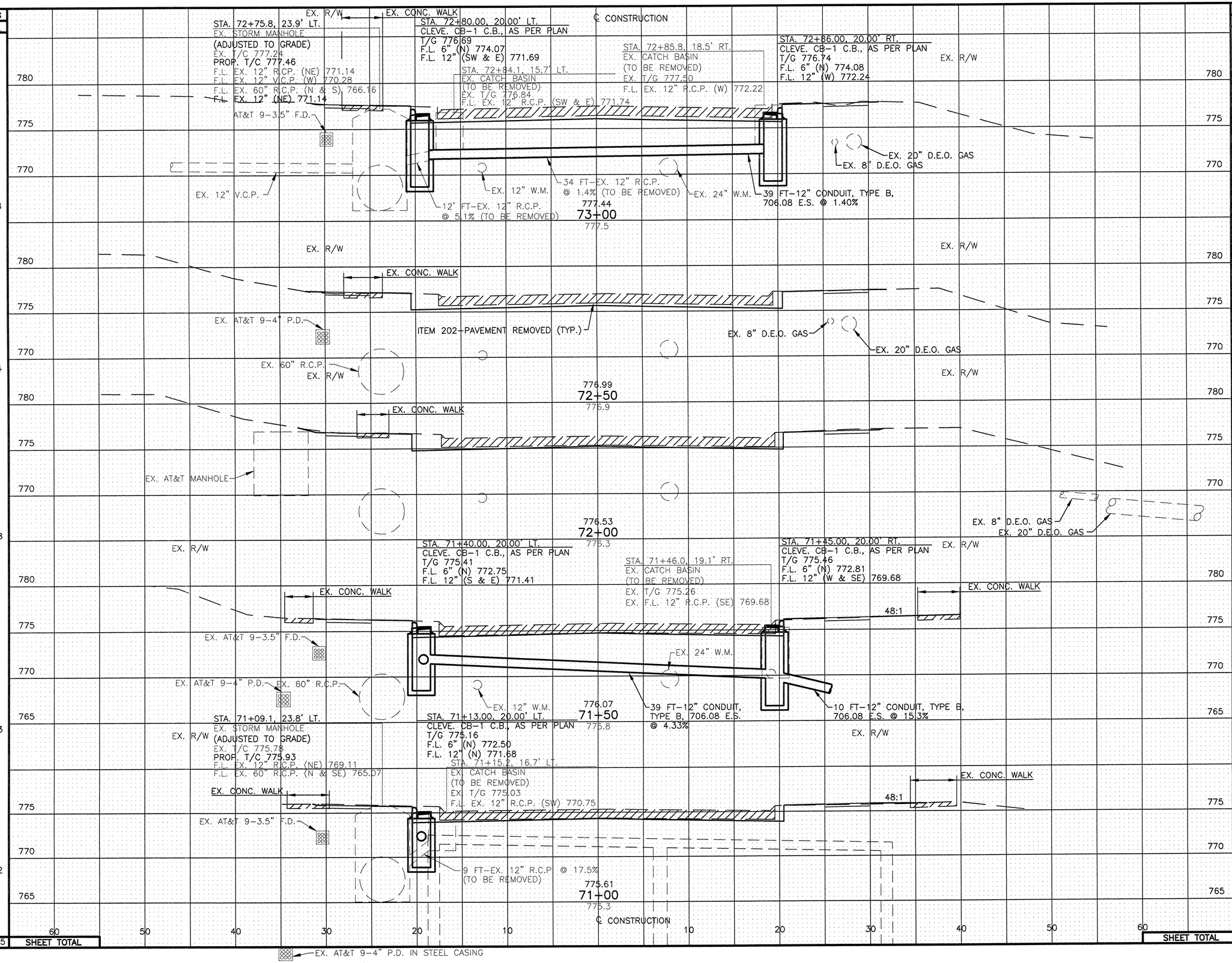
CUY-WEST 150th STREET

43
146

PJK 3/22/07 PLOT 1:5

F:/JOBS/A65/GX/GX109.DWG

SEEDING END WIDTH	SEEDING SQ. YDS.
10	58
11	64
12	78
16	83
14	72
12	
	355



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
22	0		
		39	1
20	1		
		34	1
17	0		
		26	1
11	1		
		22	2
13	1		
		24	1
13	0		
SHEET TOTAL		145	6

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET
STA. 71+00 TO STA. 73+00

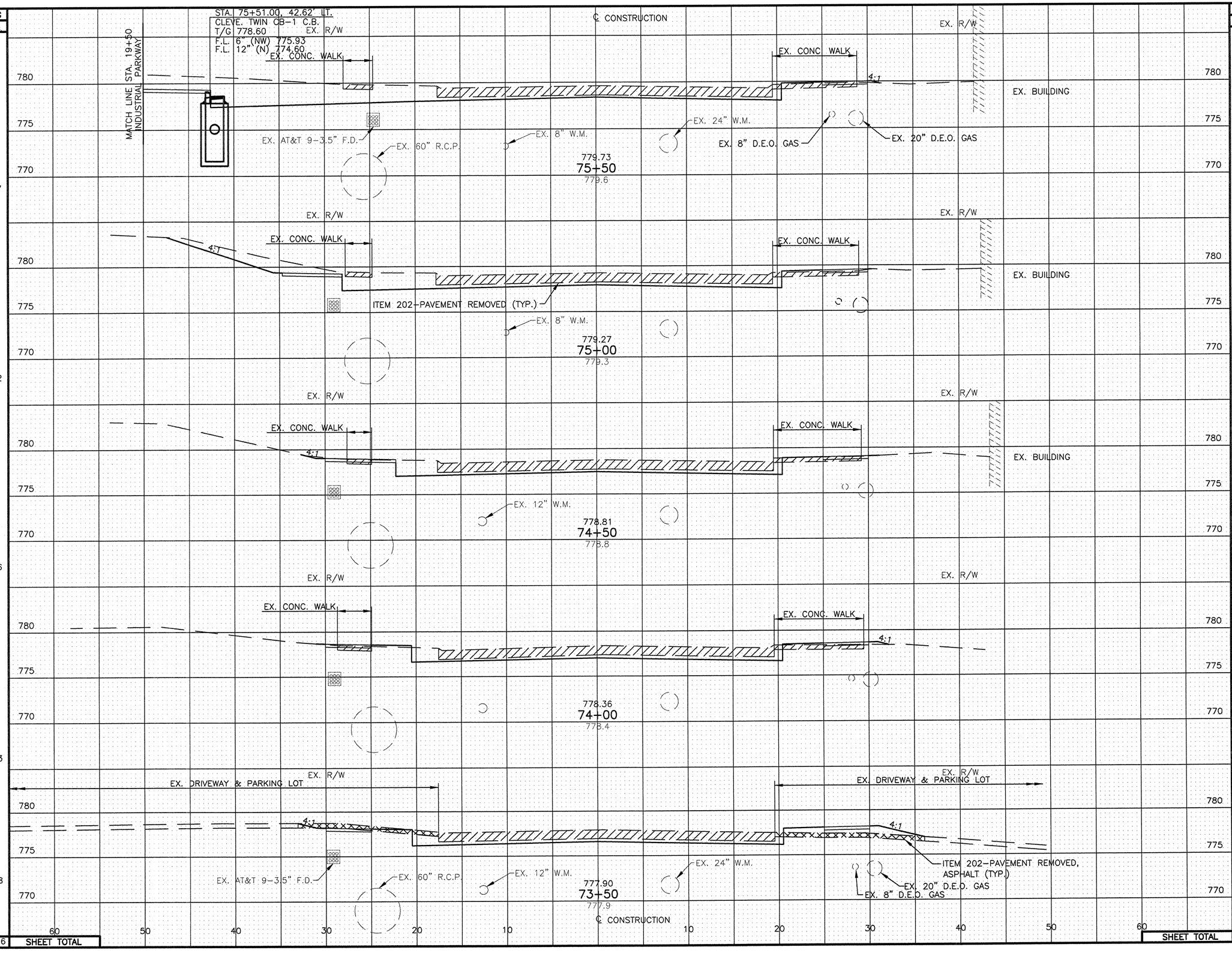
CUY-WEST 150th STREET

44
146

PJK 3/22/07 PLOT 1:5

F:/JOBS/655/GX/GX110.DWG

SEEDING END WIDTH	SEEDING SQ. YDS.
6	67
18	72
8	56
12	83
18	78
10	
	356 SHEET TOTAL



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
86	1		
49	1		
		125	2
		65	1
21	0		
		36	2
18	2		
		32	9
17	8		
		36	7
22	0		
SHEET TOTAL		294	21

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET WEST 150th STREET STA. 73+50 TO STA. 75+50

CUY-WEST 150th STREET

45
146

PJK 3/22/07 PLOT 1:5

F:/JOBS/665/cx/GX111.DWG

CROSS SECTION SHEET WEST 150th STREET STA. 76+00 TO STA. 77+40.68

CUY-WEST 150th STREET

SEEDING END WIDTH	SEEDING SQ. YDS.
0	
	9
4	
	14
1	
	3
0	
	17
6	
	43

SHEET TOTAL

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
0	0		
		17	1
22	1		
		127	1
115	0		
		176	0
75	0		
		151	1
88	1		
SHEET TOTAL		471	3

CALCULATED CGP
CHECKED JLN

F:/JOBS/665/GX/GX112.DWG
PJK 3/23/07 PLOT 1:5

SEEDING END WIDTH	SEEDING SQ. YDS.
22	125
23	150
31	43
0	
	318

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
24	4	42	8
21	5	32	13
14	9	6	4
0	0	80	25

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET INDUSTRIAL PARKWAY STA. 16+25 TO STA. 17+50

CUY-WEST 150th STREET

47
146

℄ CONSTRUCTION

EX. R/W
EX. DRIVEWAY
EX. CONC. WALK
6:1
ITEM 202–PAVEMENT REMOVED ASPHALT (TYP.)
EX. 10" D.E.O. GAS
EX. AT&T 2–4" P.D.
EX. 12" W.M.
EX. 72" R.C.P.
781.74
17+50
781.8
48:1
ITEM 202–PAVEMENT REMOVED (TYP.)
781.95
17+00
782.0
STA. 16+43.0, 0.4' RT.
EX. SANITARY/STORM MANHOLE
(ADJUSTED TO GRADE)
EX. T/C 782.07
PROP. T/C 782.15
F.L. EX. 12" V.C.P. (NE & SE) 775.07
F.L. EX. 72" R.C.P. (E & W) 768.66
STA. 16+53.3, 14.3' LT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 781.62
F.L. EX. 12" (SW) 776.34
12:1
18 FT–EX. 12" V.C.P. @ 7.1% (FILL AND PLUG)
19 FT–EX. 12" V.C.P. (FILL AND PLUG)
STA. 16+57.0,13.9' RT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 781.59
F.L. EX. 12" (NW) UNKNOWN
782.15
16+50
782.2
782.25
16+25
782.2
℄ CONSTRUCTION
BEGIN PAVEMENT REPLACEMENT

790 785 780 775 770

60 50 40 30 20 10 0 10 20 30 40 50 60

SHEET TOTAL

PJK 3/23/07 PLOT 1:5

F:\JOBS\665\GX\GX200.DWG

SEEDING END WIDTH	SEEDING SQ. YDS.
10	61
12	69
13	78
15	103
22	
SHEET TOTAL	311

℄ CONSTRUCTION

STA. 19+51.00, 26.17' LT.
CLEVE. TWIN CB-1 C.B.
T/G 779.17
F.L. 6" (W & NE) 776.51
F.L. 12" (SE) 775.88

STA. 19+50.3, 14.2' LT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 779.91
F.L. EX. 12" (SE) UNKNOWN

STA. 19+60.4, 12' RT.
EX. SANITARY/STORM MANHOLE
(ADJUSTEDTED TO GRADE)
EX. T/C 779.94, PROP. T/C 779.74
TOP OF SEPERATION WALL=769.13
F.L. EX. 12" V.C.P. (SW & NW) 774.62
F.L. EX. 18" R.C.P. (E) 767.83
F.L. EX. 60" R.C.P. (SE) 768.03
F.L. EX. 72" R.C.P. (W) 767.83

STA. 75+51.00 FROM ℄ WEST 150TH, 42.62' LT.
CLEVE. TWIN CB-1 C.B.
T/G 778.60
F.L. 6" (NW) 776.05
F.L. 12" (N) 774.60

EX. PARKING LOT
EX. CONC. WALK
ITEM 609 - CURB, TYPE 6
ITEM 202-PAVEMENT REMOVED, ASPHALT (TYP.)
EX. AT&T 6-4" P.D.
EX. AT&T 2-3.5" F.D.
EX. 6" D.E.O. GAS
EX. 8" D.E.O. GAS
46 FT-12" CONDUIT, TYPE B, 706.08 E.S. @ 2.00%
18 FT-EX. 12" V.C.P. (TO BE REMOVED)
EX. 12" W.M.
15 FT-EX. 12" V.C.P. (TO BE REMOVED)
STA. 19+51.7, 13.8' RT.
EX. CATCH BASIN
(TO BE REMOVED)
EX. T/G 779.85
F.L. EX. 12" (NE) UNKNOWN
42 FT-12" CONDUIT, TYPE B, 706.08 E.S. @ 2.00%

779.59
19+50
780.2

EX. PARKING LOT
EX. CONC. WALK
48:1
4:1
EX. 8" D.E.O. GAS
EX. 6" D.E.O. GAS
EX. 12" W.M.
ITEM 202-PAVEMENT REMOVED (TYP.)

780.47
19+00
780.8

EX. 72" R.C.P.

EX. DRIVEWAY & PARKING LOT
EX. CONC. WALK
5:1
EX. 10" D.E.O. GAS

781.17
18+50
781.4

EX. 72" R.C.P.

STA. 18+15.00, 15.00' LT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 781.12
F.L. 6" (W) 778.45
F.L. 12" (S) 772.12

STA. 18+15.00, 21.00' RT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 780.88
F.L. 6" (W) 778.21
F.L. 12" (N) 772.88

EX. CONC. WALK
48:1
5:1
EX. 10" D.E.O. GAS
EX. AT&T 6-4" P.D
EX. AT&T 2-3.5" F.D.
EX. 12" W.M.
12" MIN
16 FT-12" CONDUIT, TYPE B 706.08 E.S. @ 1.00%
19 FT-12" CONDUIT, TYPE B, 706.08 E.S. @ 5.00%

781.54
18+00
781.6

60 50 40 30 20 10 ℄ CONSTRUCTION 10 20 30 40 50 60

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
134	1		
38	1	159	2
32	3	65	4
27	2	55	5
24	4	47	6
SHEET TOTAL		326	17

CALCULATED CGP
CHECKED JLN

CROSS SECTION SHEET INDUSTRIAL PARKWAY STA. 18+00 TO STA. 19+50

CUY-WEST 150th STREET

48
146

JLN 3/26/07 PLOT 1:5
F:/JOBS/665/GX/GX201.DWG

WEST 150th STREET
SUPERELEVATION TABLE

LEFT EDGE OF PAVEMENT					CENTERLINE CONSTRUCTION		RIGHT EDGE OF PAVEMENT					
PAVEMENT EDGE ELEVATION	TRANSITION RATE	ELEVATION CORRECTION	CROSS SLOPE	WIDTH	STATION	PROFILE GRADE	WIDTH	CROSS SLOPE	ELEVATION CORRECTION	TRANSITION RATE	PAVEMENT EDGE ELEVATION	REMARKS
781.38		−0.680	−0.0200	34.00	54+75.00	782.06	25.05	−0.0200	−0.501		781.56	BEGIN TAPER LT.
781.40		−0.680	−0.0200	34.00	54+80.07	782.08	24.86	−0.0200	−0.497		781.58	
781.46		−0.680	−0.0200	34.00	55+00.00	782.14	24.12	−00161	−0.389		781.75	
781.54		−0.680	−0.0200	34.00	55+25.00	782.22	23.19	−0.0113	−0.262		781.96	
781.56		−0.675	−0.0200	33.76	55+30.00	782.24	23.00	−0.0103	−0.237		782.00	END TAPER LT. & RT.
781.64		−0.656	−0.0200	32.78	55+50.00	782.30	23.00	−0.0064	−0.148		782.15	
781.75		−0.631	−0.0200	31.56	55+75.00	782.38	23.00	−0.0016	−0.037		782.34	
781.79		−0.623	−0.0200	31.15	55+83.27	782.41	23.00	0.0000	0.000		782.41	
781.85		−0.607	−0.0200	30.33	56+00.00	782.46	23.00	0.0032	0.075		782.53	
781.96		−0.582	−0.0200	29.11	56+25.00	782.54	23.00	0.0081	0.186		782.73	
782.06		−0.558	−0.0200	27.89	56+50.00	782.62	23.00	0.0129	0.297		782.92	
782.17		−0.533	−0.0200	26.67	56+75.00	782.70	23.00	0.0178	0.409		783.11	
782.22		−0.522	−0.0200	26.11	56+86.48	782.74	23.00	0.0200	0.460		783.20	
782.20		−0.576	−0.0226	25.44	57+00.00	782.78	23.00	0.0226	0.520		783.30	
782.20		−0.639	−0.0260	24.59	57+17.44	782.84	23.00	0.0260	0.598		783.44	
782.23		−0.630	−0.0260	24.22	57+25.00	782.86	23.00	0.0260	0.598		783.46	
782.34		−0.598	−0.0260	23.00	57+50.00	782.94	23.00	0.0260	0.598		783.54	
782.42		−0.598	−0.0260	23.00	57+75.00	783.02	23.00	0.0260	0.598		783.62	
782.50		−0.598	−0.0260	23.00	58+00.00	783.10	23.00	0.0260	0.598		783.70	
782.58		−0.598	−0.0260	23.00	58+25.00	783.18	23.00	0.0260	0.598		783.78	
782.66		−0.598	−0.0260	23.00	58+50.00	783.26	23.00	0.0260	0.598		783.86	
782.74		−0.598	−0.0260	23.00	58+75.00	783.34	23.00	0.0260	0.598		783.94	
782.79		−0.598	−0.0260	23.00	59+00.00	783.39	23.00	0.0260	0.598		783.99	
782.78		−0.598	−0.0260	23.00	59+25.00	783.38	23.00	0.0260	0.598		783.98	
782.70		−0.598	−0.0260	23.00	59+50.00	783.30	23.00	0.0260	0.598		783.90	
782.57		−0.598	−0.0260	23.00	59+75.00	783.17	23.00	0.0260	0.598		783.77	
782.38		−0.598	−0.0260	23.00	59+98.83	782.98	23.00	0.0260	0.598		783.58	
782.38		−0.593	−0.0258	23.00	60+00.00	782.97	23.00	0.0258	0.593		783.56	
782.22		−0.481	−0.0209	23.00	60+25.00	782.70	23.00	0.0209	0.481		783.18	
782.19		−0.460	−0.0200	23.00	60+29.79	782.65	23.00	0.0200	0.460		783.11	
782.01		−0.460	−0.0200	23.00	60+43.12	782.47	23.00	0.0174	0.401		782.87	P.T. CURVE 2
781.92		−0.460	−0.0200	23.00	60+50.00	782.38	23.00	0.0161	0.370		782.75	
781.53		−0.460	−0.0200	23.00	60+75.00	781.99	23.00	0.0112	0.259		782.25	
781.08		−.0460	−0.0200	23.00	61+00.00	781.54	23.00	0.0064	0.147		781.69	
780.57		−0.460	−0.0200	23.00	61+25.00	781.03	23.00	0.0016	0.036		781.07	
780.40		−0.460	−0.0200	23.00	61+33.00	780.86	23.00	0.0000	0.000		780.86	
780.00		−0.460	−0.0200	23.00	61+50.00	780.46	23.00	−0.0033	−0.076		780.38	
779.36		−0.460	−0.0200	23.00	61+75.00	779.82	23.00	−0.0081	−0.187		779.63	
778.67		−0.460	−0.0200	23.00	62+00.00	779.13	23.00	−0.0130	−0.299		778.83	
777.91		−0.460	−0.0200	23.00	62+25.00	778.37	23.00	−0.0178	−0.410		777.96	
777.54		−0.460	−0.0200	23.00	62+36.21	778.00	23.00	−0.0200	−0.460		777.54	
777.08		−0.460	−0.0200	23.00	62+50.00	777.54	23.00	−0.0200	−0.460		777.08	NORMAL CROWN

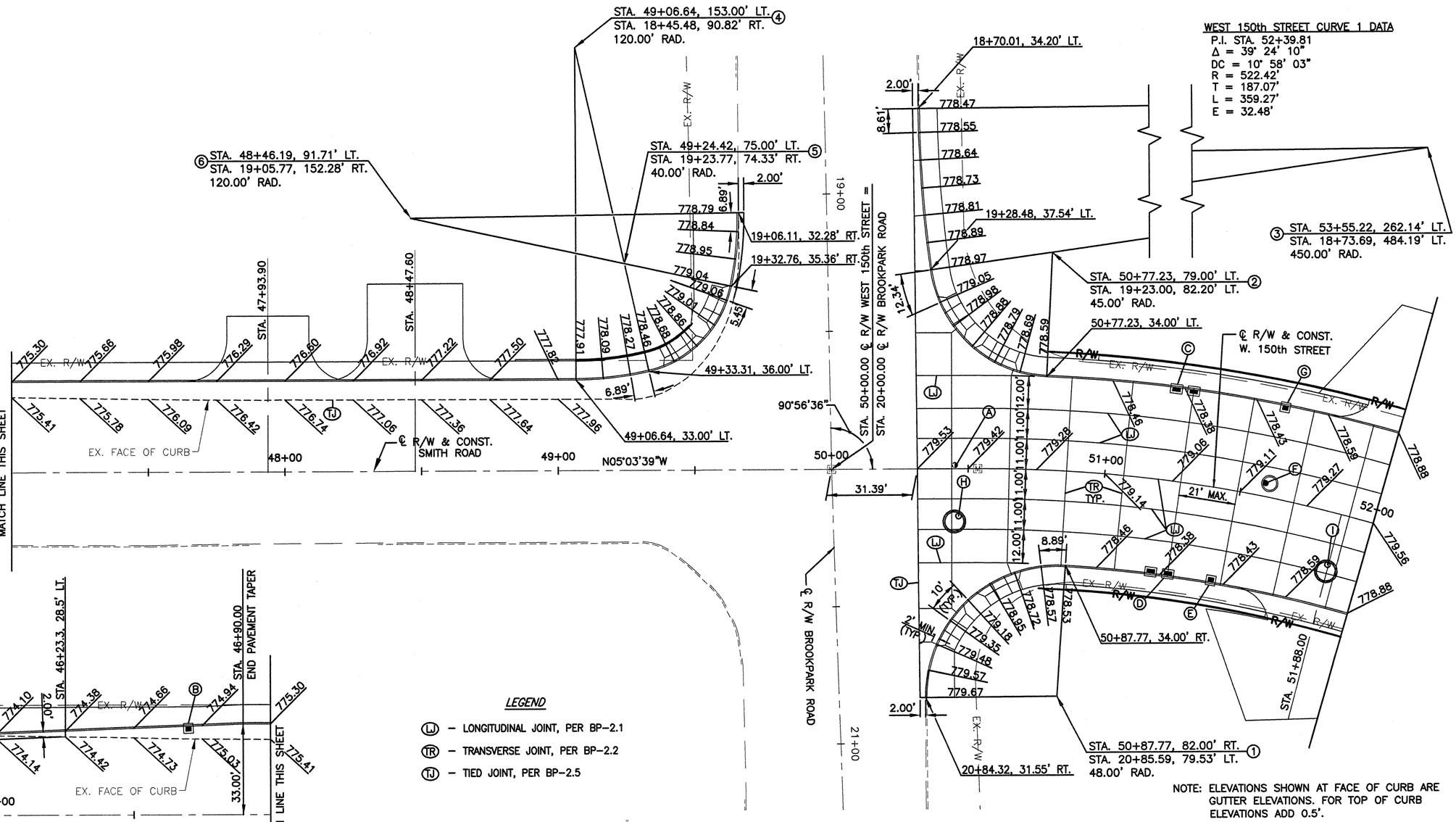
* NEGATIVE CORRECTIONS MEANING BELOW PROFILE GRADE
POSITIVE CORRECTIONS MEANING ABOVE PROFILE GRADE

CALCULATED JLN
CHECKED EPS

SUPERELEVATION TABLE

CUY-WEST 150th STREET

F:\JOBS\665\MISC\SUPER-TABLE.DWG JLN 3/26/07 PLOT 1=1



LEGEND

- (LJ) – LONGITUDINAL JOINT, PER BP–2.1
- (TR) – TRANSVERSE JOINT, PER BP–2.2
- (TJ) – TIED JOINT, PER BP–2.5

CATCH BASINS & MANHOLES

Ⓐ STA. 50+45.2, 1.4' LT.
MANHOLE ADJUSTED TO GRADE
T/C 779.41

Ⓑ STA. 46+70.00, 32.26' LT.
ODOT NO. 3A CATCH BASIN,
AS PER PLAN
T/G 774.72

Ⓒ STA. 51+28.00, 34.00' LT.
CUY. CTY. TWIN NO. 3C
CATCH BASIN, AS PER PLAN
T/G 778.21

Ⓓ STA. 51+28.00, 34.00' RT.
CUY. CTY. TWIN NO. 3C
CATCH BASIN, AS PER PLAN
T/G 778.21

Ⓔ STA. 51+45.00, 34.00' RT.
ODOT NO. 3A CATCH BASIN,
AS PER PLAN
T/G 778.24

Ⓕ STA. 51+60.00, 5.00' LT.
ODOT NO. 3 MANHOLE, 60" BASE
T/C 779.06

Ⓖ STA. 50+60.00, 34.00' LT.
ODOT NO. 3A CATCH BASIN,
AS PER PLAN
T/G 778.31

Ⓗ STA. 50+44.90, 19.15' RT.
ODOT NO. 3 MANHOLE,
AS PER PLAN 2, 84" BASE
T/C 778.67

Ⓘ STA. 51+87.67, 21.26' RT.
ODOT NO. 3 MANHOLE, 84" BASE
T/C 779.02

NOTE: ELEVATIONS SHOWN AT FACE OF CURB ARE GUTTER ELEVATIONS. FOR TOP OF CURB ELEVATIONS ADD 0.5'.

FOR DRIVEWAY DETAILS SEE SHEETS 53, 54 & 61.

CURVE DATA FOR RADIUS RETURNS

CURVE NO.	RADIUS	INTERIOR ANGLE	TANGENT	EXTERNAL	MIDDLE ORDINATE	LONG CHORD	LENGTH OF CURVE	DEGREE OF CURVE
1	48'	94°09'43"	51.62'	22.49'	15.31'	70.30'	78.89'	119°21'58"
2	45'	79°22'37"	37.34'	13.48'	10.37'	57.48'	62.34'	127°19'26"
3	450'	07°27'44"	29.35'	0.96'	0.95'	58.57'	58.61'	12°43'57"
4	120'	12°50'19"	13.50'	0.76'	0.75'	26.83'	26.89'	47°44'47"
5	40'	65°06'23"	25.54'	7.46'	6.28'	43.05'	45.45'	143°14'22"
6	120'	12°50'19"	13.50'	0.76'	0.75'	26.83'	26.89'	47°44'47"

ALL DISTANCES ARE MEASURED TO THE FACE OF CURB

N

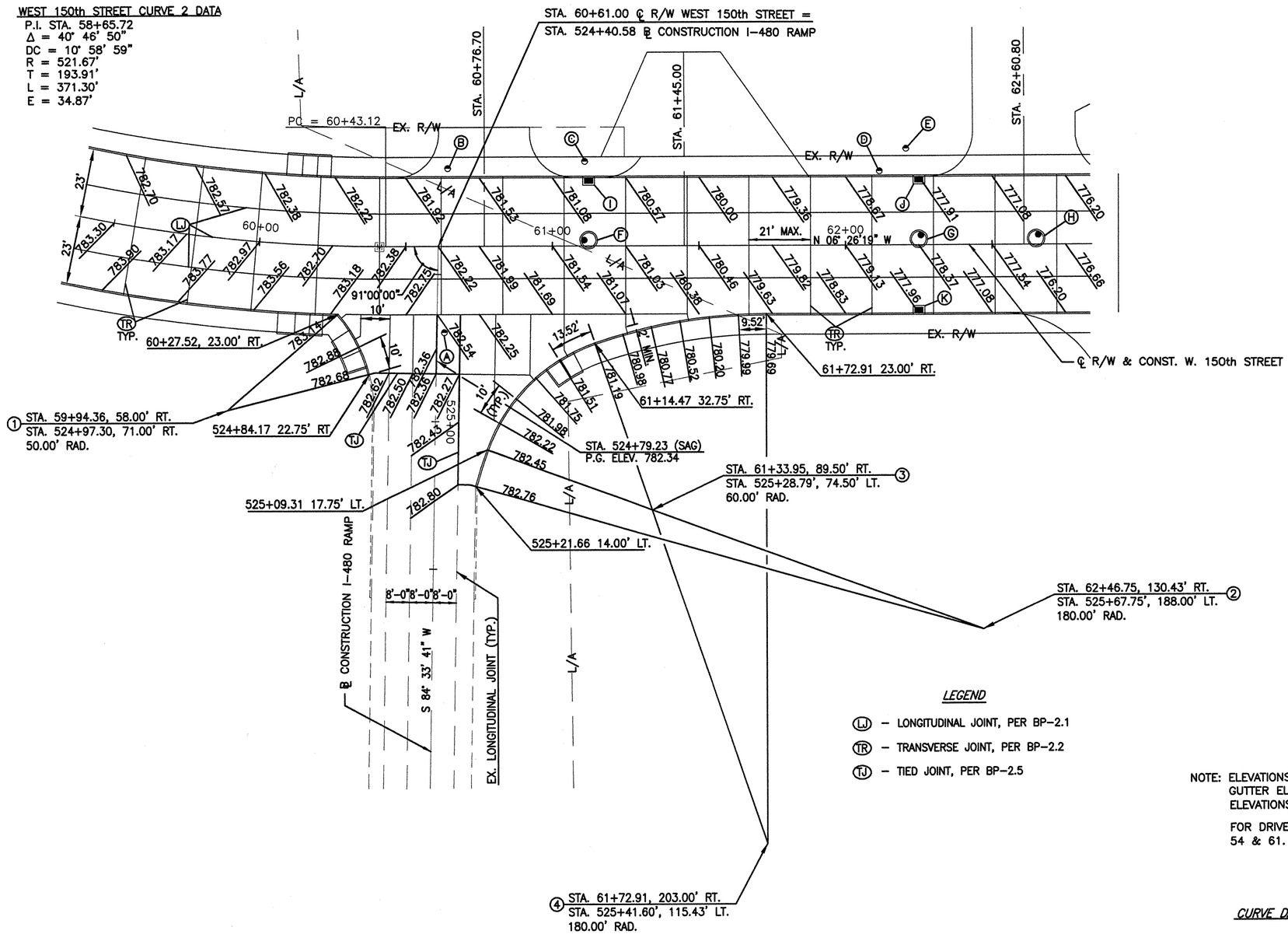
0 20 40 SCALE IN FEET

CALCULATED RSY
CHECKED JLN

INTERSECTION DETAIL & PAVEMENT ELEVATIONS W. 150th STREET AND BROOKPARK ROAD

CUY - WEST 150th STREET

F:\JOBS\665\GI\GI-BROOKPARK.DWG PJK 3/28/07 PLOT 1"=20'



CATCH BASINS & MANHOLES

Ⓐ STA. 60+63.1, 29.1' RT.
MANHOLE ADJUSTED TO GRADE
T/C 782.39

Ⓑ STA. 60+64.2, 26.3' LT.
MANHOLE ADJUSTED TO GRADE
T/C 782.27

Ⓒ STA. 61+11.0, 28.5' LT.
MANHOLE ADJUSTED TO GRADE
T/C 781.47

Ⓓ STA. 62+11.5, 25.0' LT.
MANHOLE ADJUSTED TO GRADE
T/C 778.85

Ⓔ STA. 62+20.6, 32.5' LT.
MANHOLE ADJUSTED TO GRADE
T/C 778.98

Ⓕ STA. 61+12.35, 2.00' LT.
PRECAST CONCRETE MANHOLE, 60" BASE
T/C 781.26

Ⓖ STA. 62+25.00, 2.00' LT.
PRECAST CONCRETE MANHOLE, 60" BASE
T/C 778.33

Ⓗ STA. 62+65.00, 2.00' LT.
PRECAST CONCRETE MANHOLE, 60" BASE
T/C 776.98

Ⓘ STA. 61+12.35, 23.00' LT.
CLEVE. CB-1 CATCH BASIN, AS PER PLAN
T/G 780.67

Ⓙ STA. 62+25.00, 23.00' LT.
CLEVE. CB-1 CATCH BASIN, AS PER PLAN
T/G 777.74

Ⓚ STA. 62+25.00, 23.00' RT.
CLEVE. CB-1 CATCH BASIN, AS PER PLAN
T/G 777.79

LEGEND

(LJ) – LONGITUDINAL JOINT, PER BP-2.1
(TR) – TRANSVERSE JOINT, PER BP-2.2
(TJ) – TIED JOINT, PER BP-2.5

NOTE: ELEVATIONS SHOWN AT FACE OF CURB ARE GUTTER ELEVATIONS. FOR TOP OF CURB ELEVATIONS ADD 0.5'.

FOR DRIVEWAY DETAILS SEE SHEETS 53, 54 & 61.

CURVE DATA FOR RADIUS RETURNS

CURVE NO.	RADIUS	INTERIOR ANGLE	TANGENT	EXTERNAL	MIDDLE ORDINATE	LONG CHORD	LENGTH OF CURVE	DEGREE OF CURVE
1	50'	26°38'54"	11.84'	1.38'	1.35'	23.05'	23.26'	114°35'30"
2	180'	04°06'34"	6.46'	0.12'	0.12'	12.91'	12.91'	31°49'52"
3	60'	51°06'39"	28.69'	6.51'	5.87'	51.77'	53.52'	95°29'35"
4	180'	18°56'40"	30.03'	2.49'	2.45'	59.25'	59.52'	31°49'52"

ALL DISTANCES ARE MEASURED TO THE FACE OF CURB

N

0 20 40 SCALE IN FEET

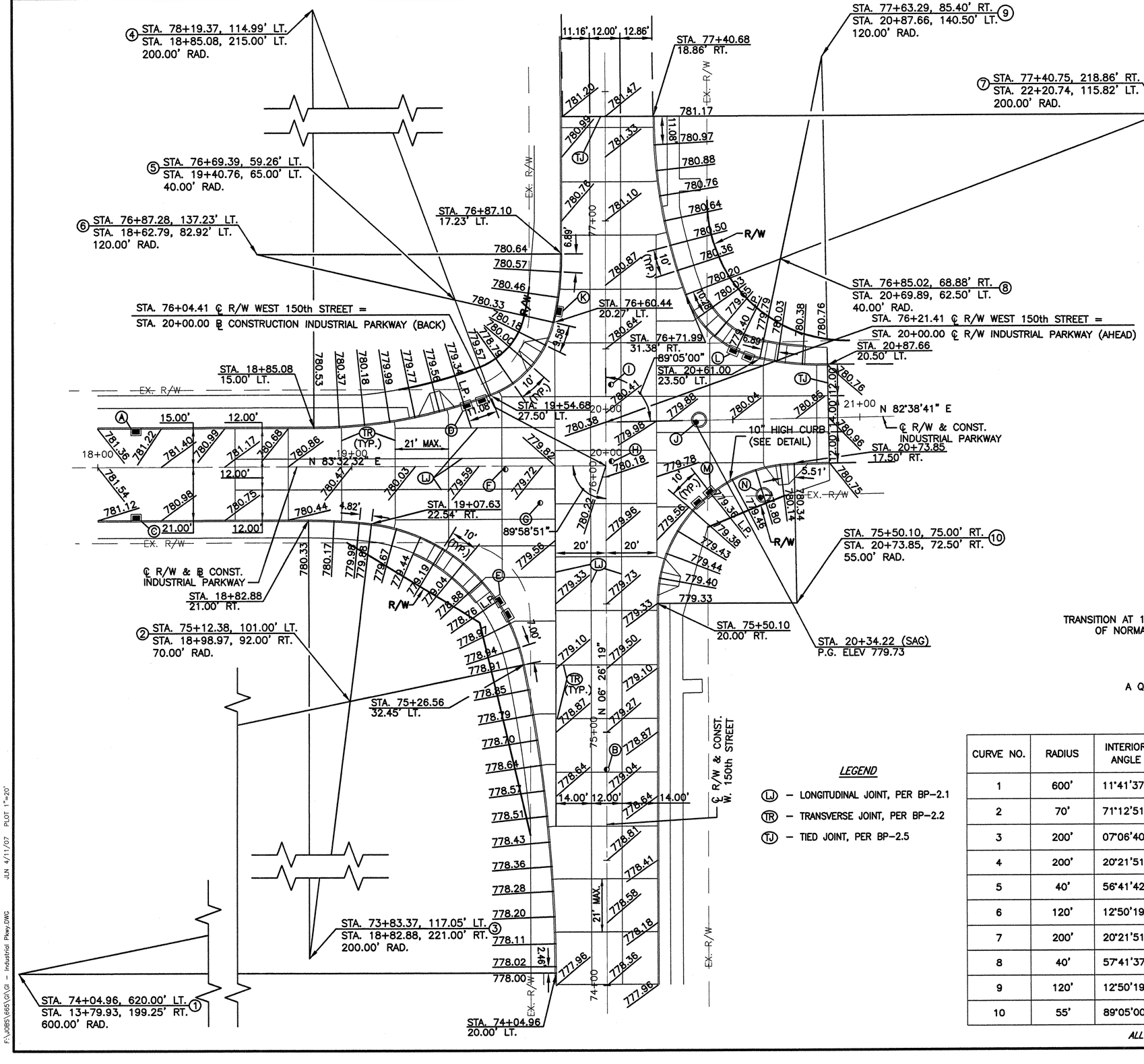
CALCULATED RSY CHECKED JLN

INTERSECTION DETAIL & PAVEMENT ELEVATIONS W. 150th STREET AND I-480 RAMP

CUY - WEST 150th STREET

51
146

F:\JOBS\665\GI\GI-1480RAMP.DWG PJK 3/29/07 PLOT 1"=20'



CATCH BASINS & MANHOLES

- Ⓐ STA. 18+15.00, 15.00' LT. CLEVE. CB–1 CATCH BASIN, AS PER PLAN T/G 781.12
- Ⓑ STA. 74+85.5, 0.05' LT. MANHOLE ADJUSTED TO GRADE T/C 779.14
- Ⓒ STA. 18+15.00, 21.00' RT. CLEVE. CB–1 CATCH BASIN, AS PER PLAN T/G 780.88
- Ⓓ STA. 19+51.00, 26.17' LT. CLEVE. TWIN CB–1 CATCH BASIN T/G 779.17
- Ⓔ STA. 75+51.00, 42.62' LT. CLEVE. TWIN CB–1 CATCH BASIN T/G 778.60
- Ⓕ STA. 19+60.4, 1.2' RT. MANHOLE ADJUSTED TO GRADE T/C 779.74
- Ⓖ STA. 75+89.8, 25.9' LT. MANHOLE RECONSTRUCTED TO GRADE T/C 779.57
- Ⓗ STA. 76+06.1, 2.2' RT. MANHOLE ADJUSTED TO GRADE T/C 780.20
- Ⓘ STA. 76+36, 2.1' RT. MANHOLE RECONSTRUCTED TO GRADE T/C 780.50
- Ⓙ STA. 76+22.2, 36.69' RT. PRECAST CONCRETE MANHOLE, 60" BASE T/C 779.77
- Ⓚ STA. 76+65.00, 19.32' LT. CLEVE. CB–1 CATCH BASIN, AS PER PLAN T/G 780.22
- Ⓛ STA. 76+49.50, 50.48' RT. CLEVE. TWIN CB–1 CATCH BASIN T/C 779.23
- Ⓜ STA. 75+93.50, 41.22' RT. CLEVE. TWIN CB–1 CATCH BASIN T/G 779.20
- Ⓝ STA. 75+92.6, 62.00' RT. PRECAST CONCRETE MANHOLE, 48" BASE T/C 780.83

ITEM 609 – CURB, TYPE 6, 10" HIGH DETAIL

A QUANTITY OF 56 FEET HAS BEEN PROVIDED IN THE BID SCHEDULE FOR THIS ITEM

LEGEND

- (LJ) – LONGITUDINAL JOINT, PER BP–2.1
- (TR) – TRANSVERSE JOINT, PER BP–2.2
- (TJ) – TIED JOINT, PER BP–2.5

CURVE DATA FOR RADIUS RETURNS

CURVE NO.	RADIUS	INTERIOR ANGLE	TANGENT	EXTERNAL	MIDDLE ORDINATE	LONG CHORD	LENGTH OF CURVE	DEGREE OF CURVE
1	600'	11°41'37"	61.44'	3.14'	3.12'	122.24'	122.46'	09°32'57"
2	70'	71°12'51"	50.13'	16.10'	13.09'	81.51'	87.00'	81°51'04"
3	200'	07°06'40"	12.43'	0.39'	0.38'	24.81'	24.82'	28°38'52"
4	200'	20°21'51"	35.92'	3.20'	3.15'	70.71'	71.08'	28°38'52"
5	40'	56°41'42"	21.58'	5.45'	4.80'	37.99'	39.58'	143°14'22"
6	120'	12°50'19"	13.50'	0.76'	0.75'	26.83'	26.89'	47°44'47"
7	200'	20°21'51"	35.92'	3.20'	3.15'	70.71'	71.08'	28°38'52"
8	40'	57°41'37"	22.03'	5.67'	4.96'	38.60'	40.28'	143°14'22"
9	120'	12°50'19"	13.50'	0.76'	0.75'	26.83'	26.89'	47°44'47"
10	55'	89°05'00"	54.13'	22.17'	15.80'	77.16'	85.51'	104°10'27"

ALL DISTANCES ARE MEASURED TO THE FACE OF CURB

SCALE IN FEET 0 20 40

CALCULATED RSY CHECKED JLN

INTERSECTION DETAIL & PAVEMENT ELEVATIONS W. 150th STREET AND INDUSTRIAL PARKWAY

CUY - WEST 150th STEET

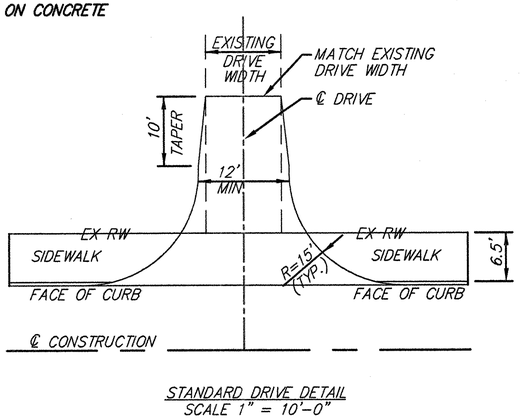
52 / 146

F:\J095\e65\GI\GI - Industrial Pkwy.DWG JLN 4/11/07 PLOT 1"=20'

ESTIMATED QUANTITIES

SHEET NO.	REFERENCE	STATION	SIDE	TYPE	SKEW ANGLE	EXISTING DRIVE	EXISTING APRON	PROPOSED DRIVE	PROPOSED APRON	EXISTING DRIVE WIDTH	LENGTH TO MATCHING POINT	PROPOSED DRIVE WIDTH	202 PAVEMENT REMOVED	202 PAVEMENT REMOVED, ASPHALT	203 EXCAVATION	203 EMBANKMENT	304 6" AGGREGATE BASE	304 8" AGGREGATE BASE	408 PRIME COAT (0.4 GAL/SQ. YD.)	448 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG 64-22 (DRIVEWAYS)	448 1.75" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG 64-22 (DRIVEWAYS)	452 8" NON-REINFORCED CONCRETE PAVEMENT	Special SURCHARGE FOR MS CONCRETE	DISTANCE FROM FACE OF CURB TO BACK OF APRON	REMARKS
										Ft.	Ft.	Ft.	Sq. Yd.	Sq. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Gal.	Cu. YD.	Cu. Yd.	Sq. Yd.	Cu. Yd.	Ft.	
	DR-1	47+93.90	LT.	COMMERCIAL	90°00'00"	CONC.	CONC.	CONCRETE	CONCRETE	29.2	56.5	30.00	110.8		12.2							88.96	19.77	7	
	DR-2	48+47.80	LT.			ASPH.	CONC.	ASPHALT		34.9	68.0	35.00	69.0	99.9	42.4			24.49	44.09	3.83	5.36	36.53	8.12	7	
	DR-3	51+88.00	RT.			ASPH.	CONC.			29.5	77.0	30.00	62.0	200.3	75.6			44.97	80.95	7.03	9.84	33.84	7.52	7	
	DR-4	52+06.00	LT.				CONC.			20.5	79.0	35.00	41.7	244.5	120.4			49.41	88.93	7.72	10.81	35.77	7.95	7	
	DR-5	52+90.00	LT.				CONC.			19.4	79.0	35.00	37.4	200.6	35.9			40.38	72.68	6.31	8.83	35.77	7.95	7	
	DR-6	54+46.00	LT.				CONC.			68.3	63.0	70.00	93.6	202.9	21.4			38.31	68.95	5.99	8.38	63.67	14.15	7	
	DR-7	55+54.00	LT.				ASPH.			32.2	78.0	35.00		332.0	28.1			48.60	87.48	7.59	10.63	36.48	8.11	7	
	DR-8	56+43.00	RT.			ASPH.	CONC.	ASPHALT		42.3	98.0	35.00	153.3	366.7	7.6	53.3		96.65	173.97	15.10	21.14	52.96	11.77	7	
	DR-9	56+61.00	LT.			NONE	NONE	AGGREGATE		N/A	39.0	12.00			11.4		1.24					18.85	4.19	7	
	DR-10	57+30.00	RT.			ASPH.	ASPH.	ASPHALT		12.9	38.0	12.50		28.9	3.9			2.73	4.91	0.43	0.60	18.59	4.13	7	
	DR-11	60+76.70	LT.				ASPH.	CONCRETE		30.2	40.0	31.00		76.9	7.1							69.29	15.38	17	
	DR-12	61+45.00	LT.				ASPH.	ASPHALT		20.7	65.0	25.00		525.1	14.6			39.28	70.71	6.14	8.59	45.54	10.12	7	
	DR-13	62+60.80	LT.				ASPH.			34.6	107.0	35.00		485.0	345.0			87.77	157.98	13.71	19.20	36.63	8.14	7	
	DR-14	63+02.40	RT.		90°00'00"		ASPH.*			26.2	68.0	26.50	215.2		33.3			29.64	53.36	4.63	6.48	49.79	11.06	7	
	DR-15	67+53.50	LT.		115°00'00"		ASPH.			14.2	46.0	14.00		57.6	4.0			4.93	8.87	0.77	1.08	31.02	6.89	11.03	
	DR-16	68+86.80	RT.		90°00'00"		CONC.			27.9	53.0	28.00	111.3	33.6	1.9			20.45	36.81	3.20	4.47	62.21	13.82	10	
	DR-17	69+53.40	RT.				CONC.			24.4	49.0	24.00	98.2	5.1	5.9			11.34	20.41	1.77	2.48	37.08	8.24	10	
	DR-18	70+75.30	RT.				CONC.			20.0	39.0	20.00	58.0	1.5				4.51	8.12	0.70	0.99	32.64	7.25	10	
	DR-19	73+46.80	LT.				CONC.			28.0	48.0	28.00	108.8	21.5	12.7			12.51	22.53	1.96	2.74	41.53	9.23	10	
	DR-20	73+53.00	RT.				ASPH.	ASPHALT		27.0	105.0	28.00		478.2	8.9	87.7		88.79	159.82	13.87	19.42	89.62	19.91	20	
	DR-21	77+47.50	LT.				CONC.	CONCRETE		35.0	30.0	35.00		8.5	6.0							60.68	13.48	12.85	
	DR-22	16+54.70	LT.				CONC.	ASPHALT		24.0	45.0	24.00	47.4	40.8	2.1			8.89	16.01	1.39	1.95	50.73	11.27	15	
	DR-23	17+46.40	LT.				CONC.	ASPHALT		15.0	38.5	15.0	29.0	14.2	0.7			3.13	5.63	0.49	0.68	35.73	7.94	15	
	DR-24	18+46.00	LT.	COMMERCIAL	90°00'00"	ASPH.	CONC.	ASPHALT	CONCRETE	32.0	35.0	12.0	52.4	8.0	1.7			1.48	2.67	0.23	0.32	30.73	6.83	15	
												SUB-TOTAL	1288.1	3431.8	802.8	141.0	1.24	658.26	1184.88	102.86	143.99	1094.64	243.22		
												TOTAL	1288	3432	803	141	1	658	1185	103	144	1095	243		

* ASPHALT ON CONCRETE



STANDARD DRIVE DETAIL
SCALE 1" = 10'-0"

NOTE:

DRIVEWAYS DR-1 THRU DR-10 SHALL BE CONCRETE TO THE BACK OF THE PROPOSED SIDEWALK. DRIVEWAYS DR-11 THRU DR-24 SHALL BE CONCRETE TO THE RIGHT-OF-WAY LINE.

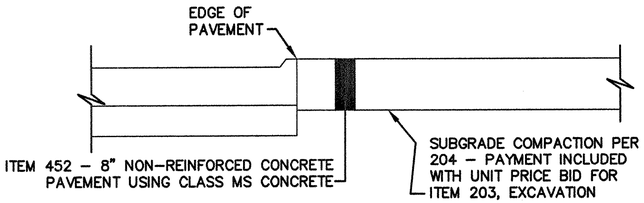
CALCULATED RSY CHECKED JLN

DRIVEWAY DETAILS

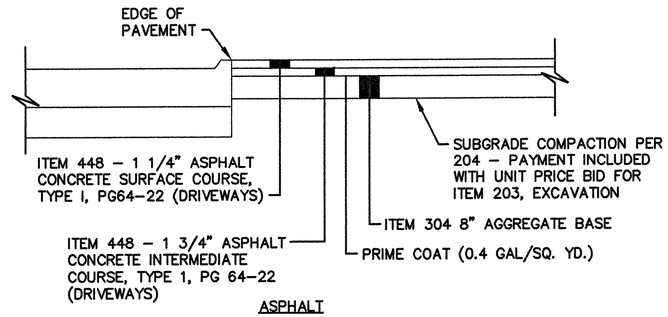
CUY-WEST 150th STREET

53
146

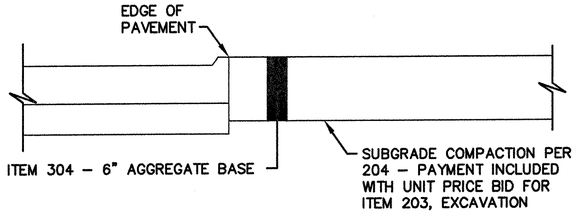
F:\JOBS\665\DRIVES\6650E001.DWG PJK 3/27/07 PLOT 1:1



CONCRETE

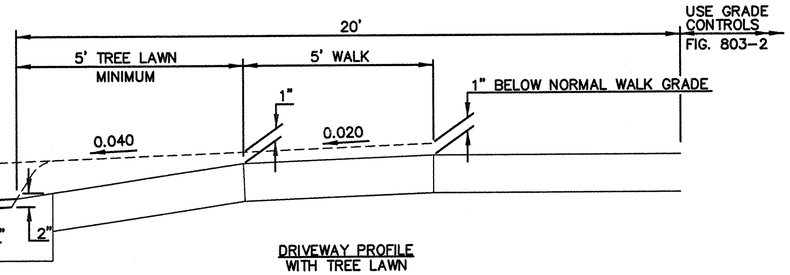


ASPHALT

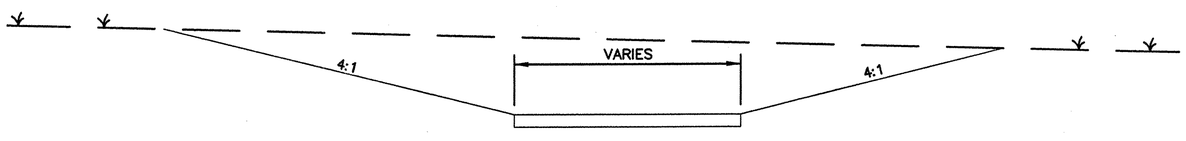


AGGREGATE

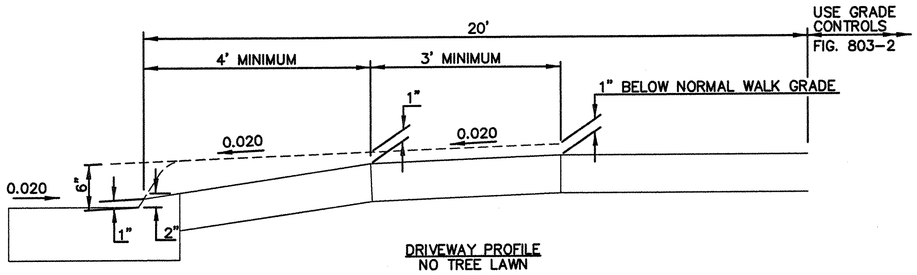
COMMERCIAL DRIVES



DRIVEWAY PROFILE
WITH TREE LAWN



DRIVE SIDE SLOPE GRADING DETAIL
FOR DRIVES IN CUT



DRIVEWAY PROFILE
NO TREE LAWN

SEE SHEET 53 FOR DRIVEWAY QUANTITIES.
SEE SHEETS 55–60 FOR DRIVEWAY PROFILES.

CALCULATED JLN CHECKED EPS

DRIVEWAY DETAILS

CUY-WEST 150th STRRET

54
146

PLOT 146 PJK 3/21/07

(JOBS\665\DRIVE\665DV001.DWG)

CALCULATED RSY
CHECKED JLN

DRIVEWAY PROFILES
SMITH ROAD

DR-2
Sta. 48+47.80 Lt.
Commercial

DR-1
Sta. 47+93.90 Lt.
Commercial

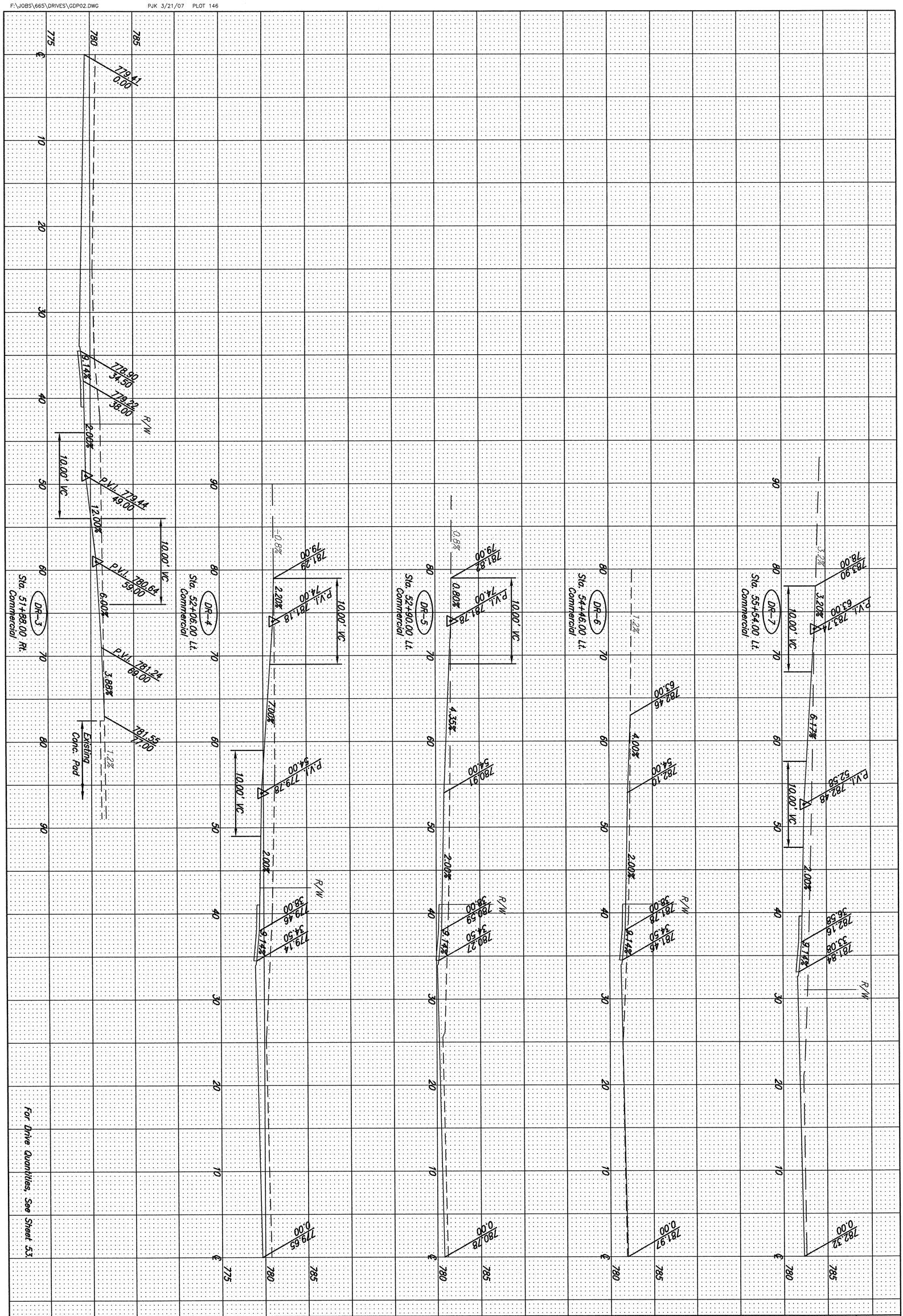
For Drive Quantities, See Sheet 53.

CUY-WEST 150th STREET

55
146

PLOT 1"=5'
PJK 3/21/07
F:\JOBS\665\DRIVES\GDP01.DWG

F:\JOBS\665\DRIVES\GDP02.DWG PJK 3/21/07 PLOT 146

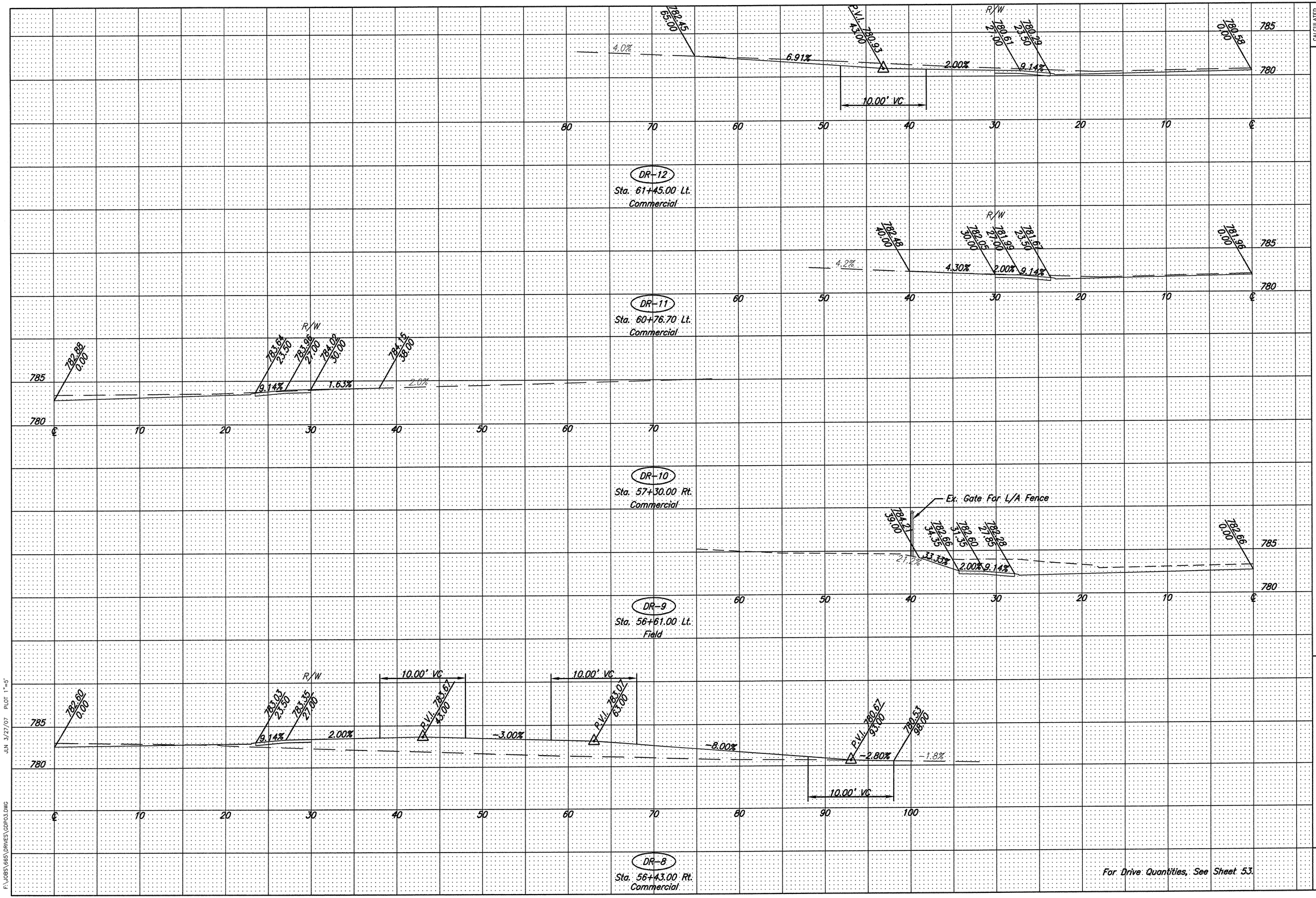


56
146

CUY-WEST 150th STREET

DRIVEWAY PROFILES
WEST 150th STREET

CALCULATED RSY
CHECKED JLN



CALCULATED RSY
CHECKED JLN

DRIVEWAY PROFILES
WEST 150th STREET

CUY-WEST 150th STREET

57
146

JLN 3/27/07 PLOT 1"=5'

F:\JOBS\665\DRIVES\GDP03.DWG

CALCULATED RSY
CHECKED JLN

DRIVEWAY PROFILES
WEST 150th STREET

DR-16
Sta. 68+86.80 Rt.
Commercial

R/W
773.67 0.00
773.44 20.50
773.87 25.00
773.97 30.00
774.50 50.00
9.56%
2.00%
2.30%
4.1%
R/W
773.03 46.00
772.84 33.10
772.71 27.58
772.25 22.62
772.35 0.00
2.9%
1.47%
2.36%
9.27%
775
770
℄ 10 20 30 40 50 60 70 60 50 40 30 20 10 ℄

DR-15
Sta. 67+53.50 Lt.
Commercial

R/W
775.62 0.00
775.33 23.50
775.65 27.00
P.V.I. 775.97 43.00
P.V.I. 777.27 63.00
777.41 68.00
10.00' VC
10.00' VC
9.14%
2.00%
6.50%
2.80%
2.6%
780
775
℄ 10 20 30 40 50 60 70

DR-14
Sta. 63+02.40 Rt.
Commercial

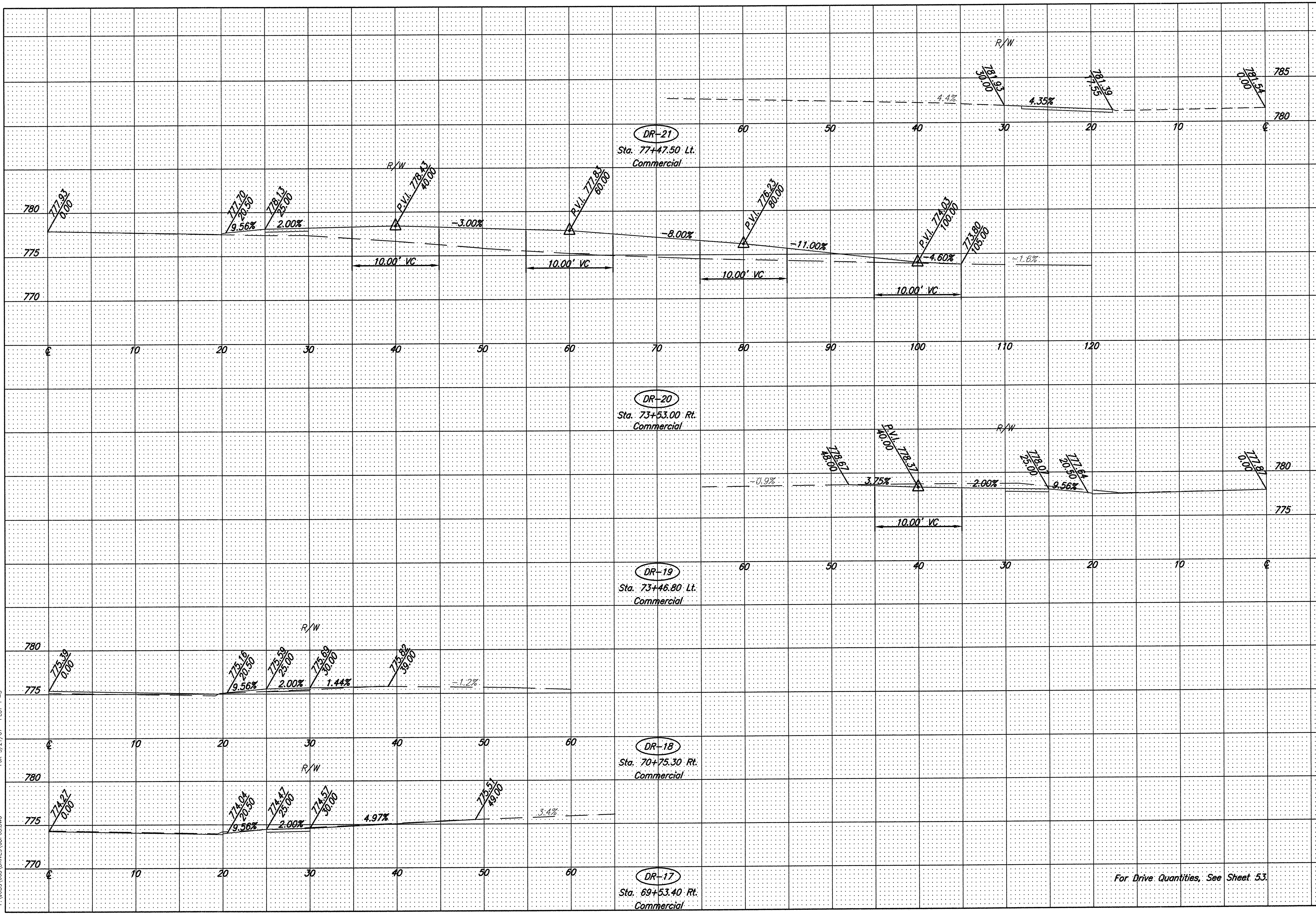
20.00' VC
P.V.I. 783.00 97.00
783.35 107.00
1.6%
3.50%
12.00%
P.V.I. 778.92 63.00
P.V.I. 777.52 43.00
10.00' VC
10.00' VC
7.00%
2.00%
R/W
777.20 21.00
776.88 23.50
777.17 0.00
9.14%
785
780
775
110 100 90 80 70 60 50 40 30 20 10 ℄

DR-13
Sta. 62+60.80 Lt.
Commercial

For Drive Quantities, See Sheet 53.

PLOT 1"=5'
PJK 3/21/07
F:\JOBS\665\DRIVES\GDP04.DWG

CUY-WEST 150th STREET



DRIVEWAY PROFILES WEST 150th STREET

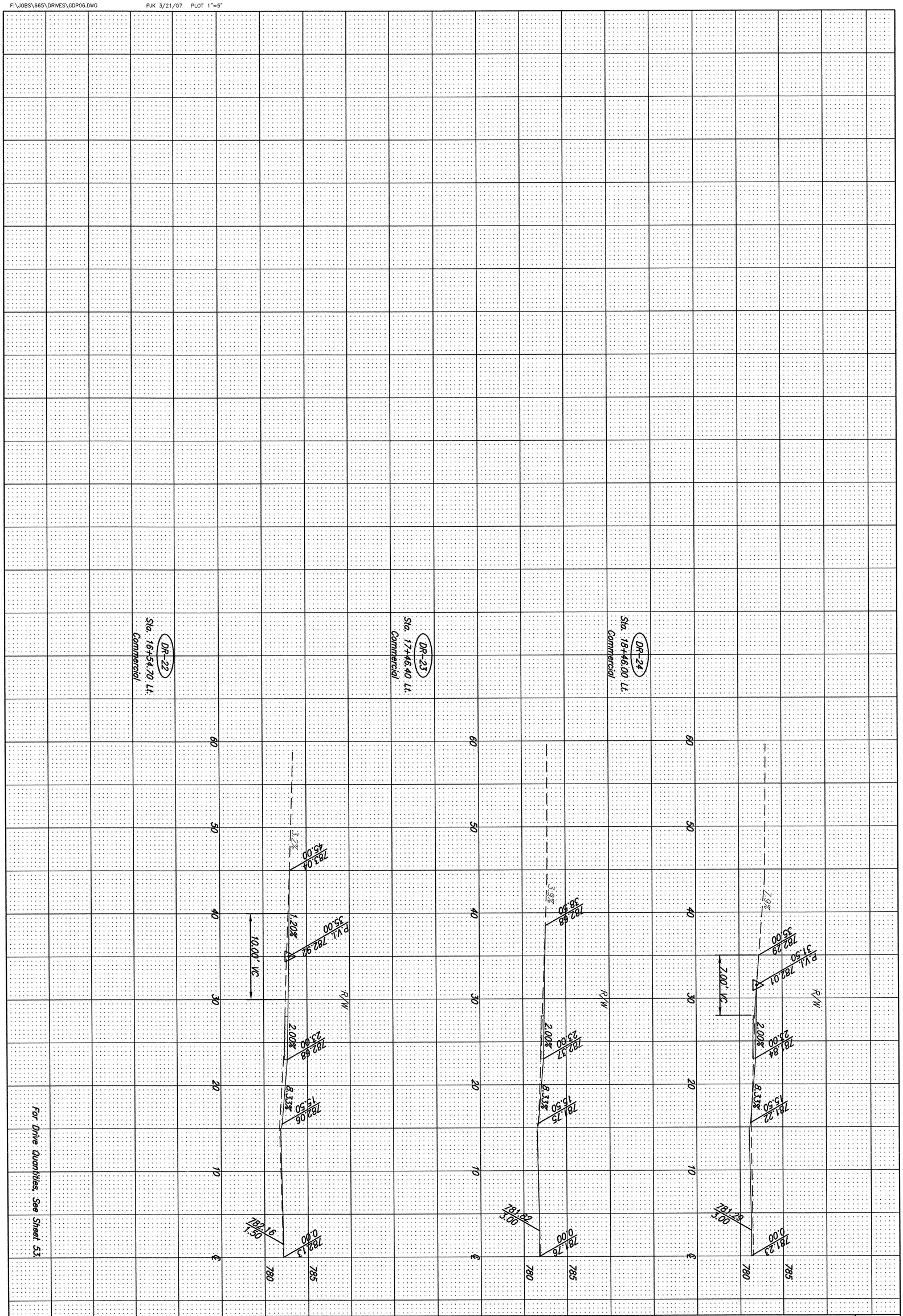
CUY-WEST 150th STREET

CALCULATED RSY
CHECKED JLN

59 / 146

F:\JOBS\665\DRIVES\GDP05.DWG PJK 3/21/07 PLOT 1"=5'

F:\JOBS\665\DRIVES\GDP06.DWG PJK 3/21/07 PLOT 1"=5'



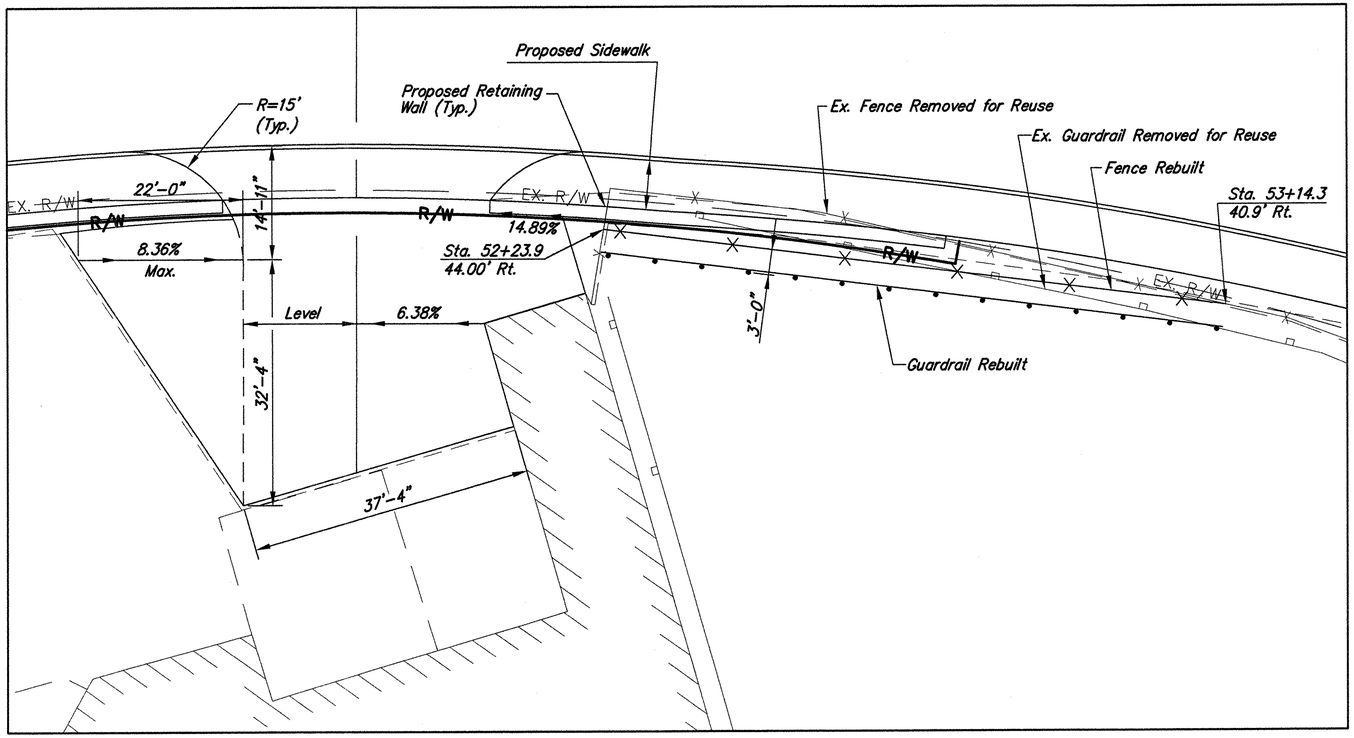
For Drive Quantities, See Sheet 53

60/145

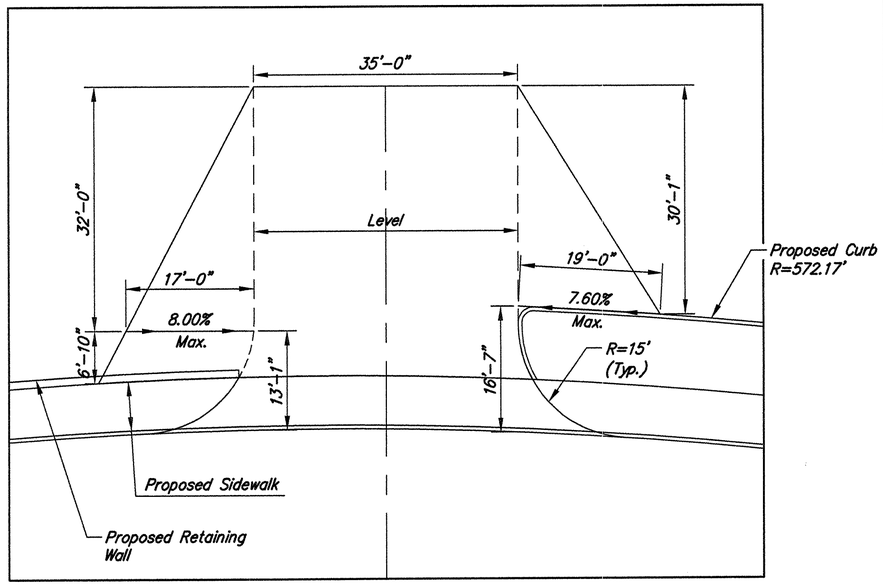
CUY-WEST 150th STREET

DRIVEWAY PROFILES
INDUSTRIAL PARKWAY

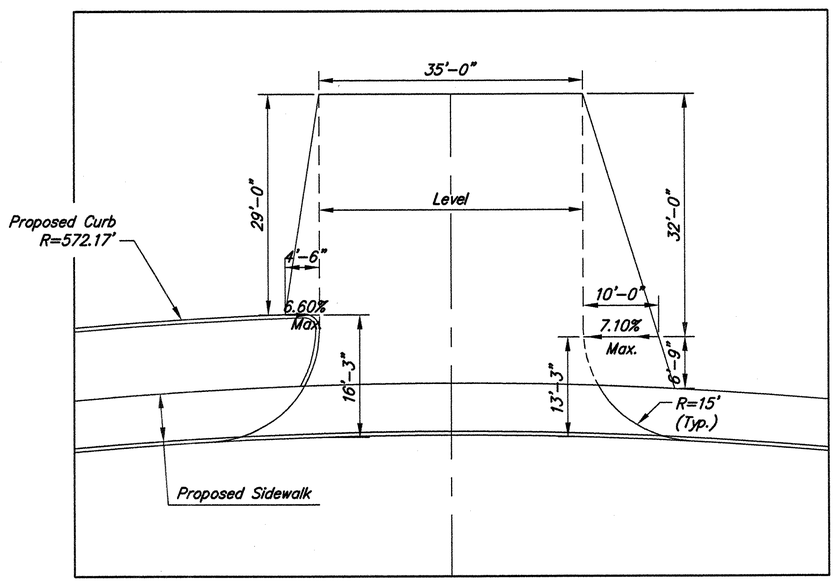
CALCULATED RSY
CHECKED JLN



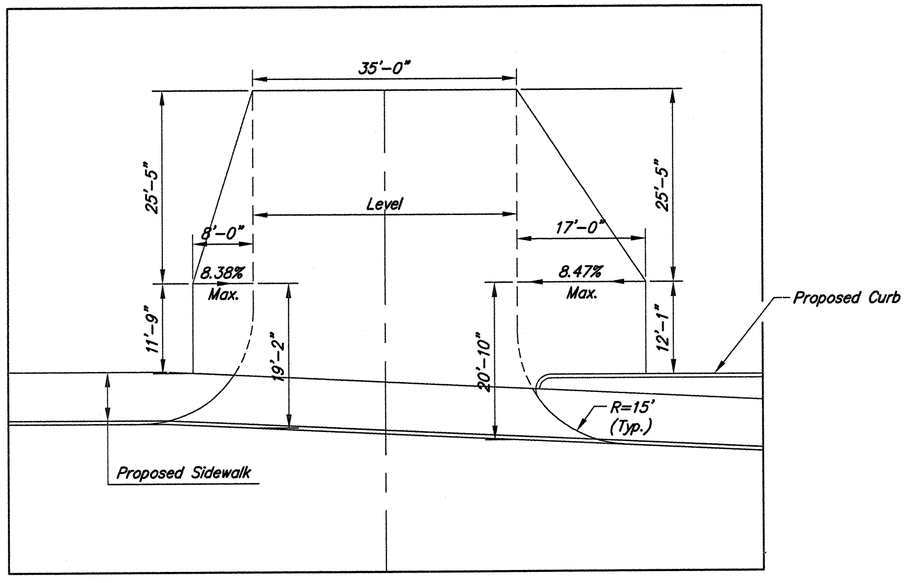
DR-3
Sta. 51+88.00 Rt.
Commercial



DR-4
Sta. 52+06.00 Lt.
Commercial



DR-5
Sta. 52+90.00 Lt.
Commercial



DR-7
Sta. 55+54.00 Lt.
Commercial

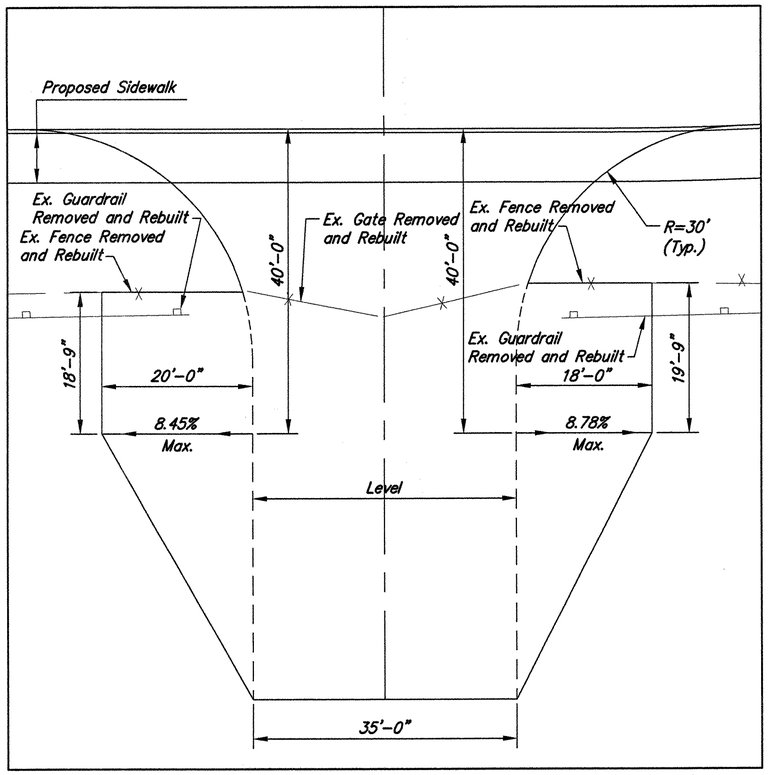
CALCULATED RSY
CHECKED JLN

DRIVEWAY DETAILS

CUY-WEST 150th STREET

61
146

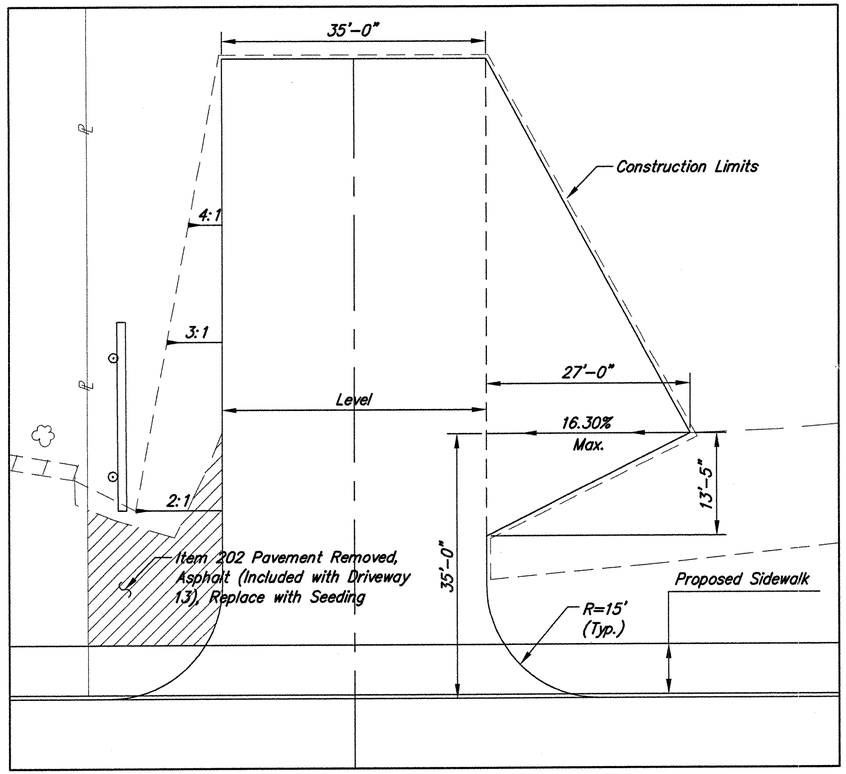
F:\JOBS\665\DRIVES\6650V002.DWG P.K 3/22/07 PLOT 1=1



DR-8

Sta. 56+43.00 Rt.

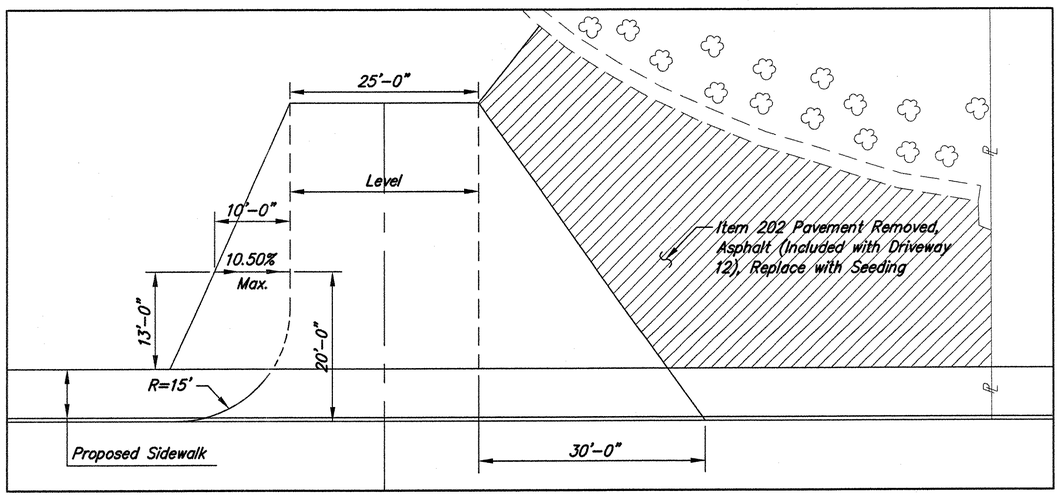
Commercial



DR-13

Sta. 62+60.80 Lt.

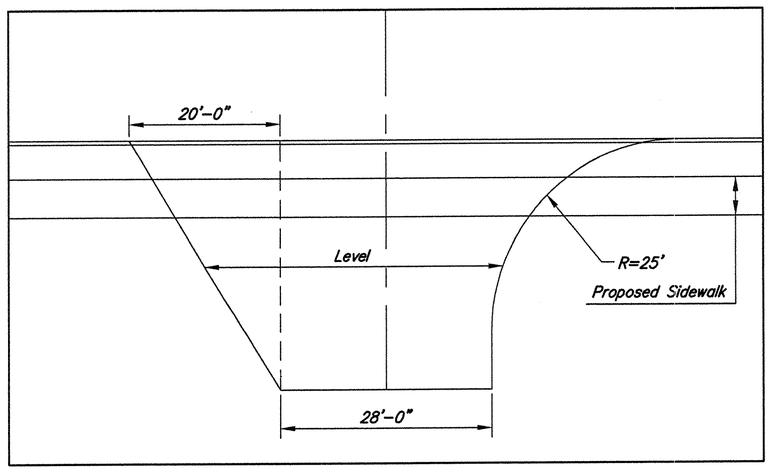
Commercial



DR-12

Sta. 61+45.00 Lt.

Commercial



DR-16

Sta. 68+86.80 Rt.

Commercial

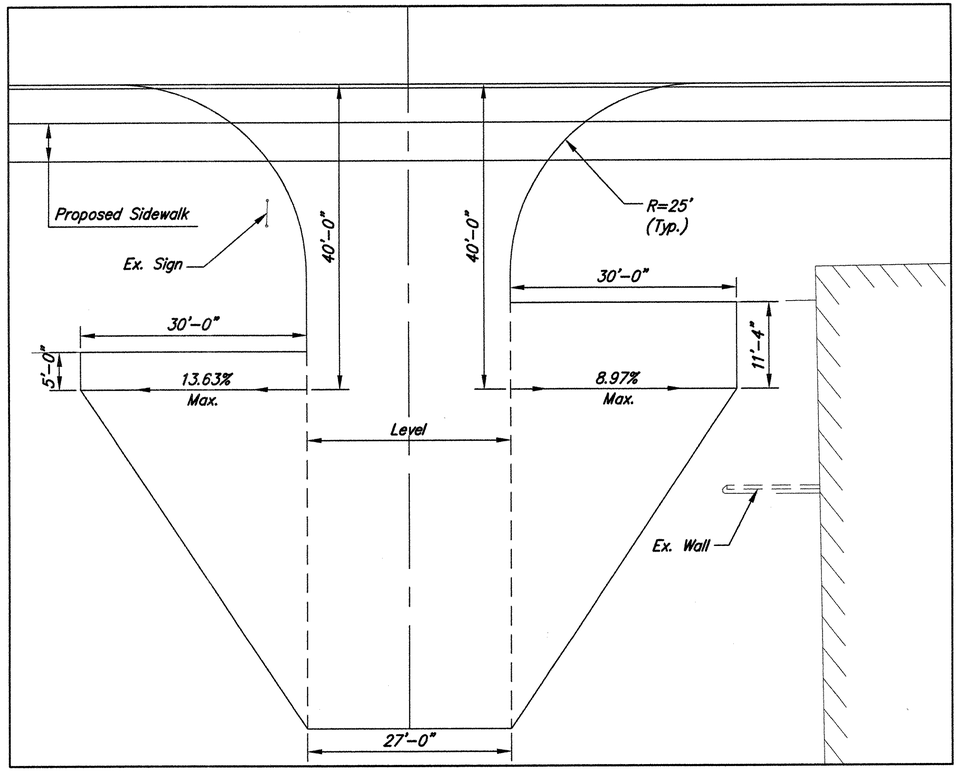
CALCULATED RSY CHECKED JLN

DRIVEWAY DETAILS

CUY-WEST 150th STREET

62
146

F:\JOBS\665\DRIVES\665DVD03.DWG PJK 3/22/07 PLOT 1:10



DR-20

Sta. 73+53.00 Rt.
Commercial

CALCULATED RSY
CHECKED JLN

DRIVEWAY DETAILS

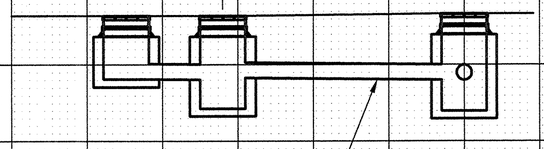
CUY-WEST 150th STREET

63
146

F:\JOBS\665\DRIVES\665DVD04.DWG P.K 3/21/07 PLOT 1:10

STA. 51+28.00, 34.00' RT.
CUY. CTY. TWIN NO. 3C C.B., AS PER PLAN
T/G 778.21
F.L. 6" (N & S) 775.54
F.L. 12" (N) 774.15

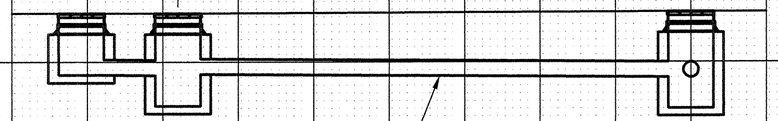
STA. 51+45.00, 34.00' RT.
ODOT NO. 3A C.B., AS PER PLAN
T/G 778.24
F.L. 6" (N) 775.83
F.L. 12" (S & NW) 773.99



16 FT-12" CONDUIT
TYPE B, 706.02 @ 1.00%
(FOR UNDERGROUND DETENTION)

STA. 51+28.00, 34.00' LT.
CUY. CTY. TWIN NO. 3C C.B., AS PER PLAN
T/G 778.21
F.L. 6" (N & S) 775.54
F.L. 12" (N) 774.20

STA. 51+60.00, 34.00' LT.
ODOT NO. 3A C.B., AS PER PLAN
T/G 778.31
F.L. 6" (N) 775.61
F.L. 12" (S & E) 773.86

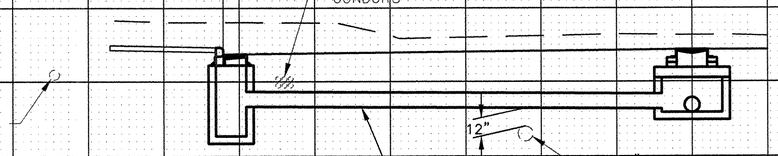


34 FT-12" CONDUIT
TYPE B, 706.02 @ 1.00%
(FOR UNDERGROUND DETENTION)

STA. 56+35.00, 28.62 LT.
ODOT NO. 3A C.B., AS PER PLAN
T/G 781.84
F.L. 6" (N) 779.18
F.L. 12" (SE) 778.34

STA. 56+20.00, 2.00 LT.
ODOT NO. 3 MANHOLE, 48" BASE
T/C 782.49
F.L. 12" (W, SW, & NE) 777.91
F.L. 12" (NW) 778.04

EX. 6-5" ELECTRICAL CONDUITS



EX. 8" D.E.O. GAS

12"

EX. 12" W.M.

30 FT-12" CONDUIT,
TYPE B, 706.02 @ 1.00%

CALCULATED CGP
CHECKED JLN

STORM SEWER PROFILES
WEST 150th STREET

CUY - WEST 150th STREET

64
146

PJK 3/27/07 PLOT 146

F:\JOBS\665\DP\DP01.DWG

CALCULATED CGP
CHECKED JLN

STORM SEWER PROFILES
WEST 150th STREET

CUY - WEST 150th STREET

STA. 62+65.00, 2.00' LT.
PRECAST CONCRETE MANHOLE, 60" BASE
T/C 776.98
F.L. 12" (E) 768.16
F.L. 36" (N & S) 766.60

STA. 62+66.70, 50.50' RT.
ODOT NO. 2-2B C.B.
T/G 776.29
F.L. 6" (SE) 773.45
F.L. 12" (W & N) 769.73

775
770
765

EX. 8" D.E.O. GAS
EX. 24" W.M.
12"
EX. 20" D.E.O. GAS

52 FT-12" CONDUIT,
TYPE B, 706.08 E.S. @ 3.00%

STA. 71+13.00, 20.00' LT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 775.16
F.L. 6" (N) 772.50
F.L. 12" (N) 771.68

STA. 71+40.00, 20.00' LT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 775.41
F.L. 6" (N) 772.75
F.L. 12" (S & E) 771.41

780
775
770

27 FT-12" CONDUIT,
TYPE B, 706.08 E.S. @ 1.00%

STA. 62+66.70, 50.50' RT.
ODOT NO. 2-2B C.B., AS PER PLAN
T/G 776.29
F.L. 6" (SE) 773.45
F.L. 12" (W & N) 769.73

℄ DRIVE 14

4:1

775
770
765

69 FT-12" CONDUIT,
TYPE B, 706.08 E.S. @ 2.18%

STA. 63+35.60, 51.20' RT.
ODOT NO. 2-2B C.B.
T/G 775.12
F.L. 6" (SE) 772.95
F.L. 12" (S) 771.24

STA. 71+45.00, 20.00' RT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 775.46
F.L. 6" (N) 772.81
F.L. 12" (W & SE) 769.68

775
770
765
760

REMOVE EXISTING 12" R.C.P. AND TIE-IN THE PROPOSED 12" CONDUIT AT THE EXISTING OPENING. PROVIDE 6" MIN. CONCRETE COLLAR AROUND THE CONNECTION.

F.L. EX. 12" R.C.P. = 768.20
F.L. 12" CONDUIT = 768.20

10 FT-12" CONDUIT, TYPE B,
706.08 E.S. @ 15.3%

STA. 69+15.00, 20.50' LT.
ODOT NO. 3 MANHOLE, 72" BASE
T/C 774.02
F.L. 48" (N & E) 765.34

STA. 70+15.00, 20.50' LT.
PRECAST RECTANGULAR MANHOLE
6' W X 10' L X 10' H
T/C (S) 774.99, (N) 775.04
F.L. 6" (N) 771.65
F.L. 30" (N) 765.26
F.L. 48" (S) 765.26

775
770
765
760

95 FT-48" CONDUIT,
TYPE B, 706.02 @ 0.08%
(FOR UNDERGROUND DETENTION)

REMOVE EXISTING 30" R.C.P. AND TIE-IN THE PROPOSED 30" CONDUIT AT THE EXISTING OPENING. PROVIDE 6" MIN. CONCRETE COLLAR AROUND THE CONNECTION.

32 FT-30" CONDUIT,
TYPE B, 706.02 @ 0.77%

P.W. 3/27/07 PLOT 1"=5'

F:\JOBS\665\DP\DF02.DWG

STA. 19+51.00, 26.17' LT.
CLEVE. TWIN CB-1 C.B.
T/G 779.17
F.L. 6" (W & NE) 776.51
F.L. 12" (SE) 775.67

STA. 75+89.8, 25.9' LT.
EX. STORM MANHOLE
(RECONSTRUCTED TO GRADE)
EX. T/C 779.49
PROP. T/C 779.57
F.L. EX. 18" (NE) 772.71
F.L. EX. 60" R.C.P.
(NW & S) 767.62
F.L. 12" (SW) 773.76
F.L. 12" (NW) 774.74

STA. 75+51.00 FROM ℄ WEST 150TH, 42.62' LT.
CLEVE. TWIN CB-1 C.B.
T/G 778.60
F.L. 6" (NW) 775.93
F.L. 12" (N) 774.60

780
775
770

EX. AT&T 6-4" P.D.
EX. AT&T 2-3.5" F.D.
EX. 6" D.E.O. GAS
EX. 8" D.E.O. GAS
46 FT-12" CONDUIT,
TYPE B, 706.08 E.S. @ 2.00%

12"
EX. 12" W.M.

42 FT-12" CONDUIT,
TYPE B, 706.08 E.S. @ 2.00%

STA. 75+93.50, 41.22' RT.
CLEVE. TWIN CB-1 C.B.
T/G 779.20
F.L. 6" (S & NE) 776.53
F.L. 12" (N) 768.88

STA. 76+22.2, 36.69' RT.
PRECAST CONCRETE MANHOLE, 60" BASE
T/C 779.77
F.L. 12" (NE & S) 767.94
F.L. 15" (SE, E, & W) 767.69

STA. 76+49.50, 50.48' RT.
CLEVE. TWIN CB-1 C.B.
T/G 779.23
F.L. 6" (S & N) 776.57
F.L. 12" (SW) 770.23

STA. 76+22.2, 36.69' RT.
PRECAST CONCRETE MANHOLE, 60" BASE
T/C 779.77
F.L. 15" (S, E, & W) 767.69
F.L. 12" (NE) 767.94
F.L. 12" (SE) 774.74

STA. 75+92.6, 62.0C' RT.
PRECAST CONCRETE MANHOLE, 48" BASE
T/C 780.83
F.L. 15" (NW & E) 769.0

780
775
770

EX. 6" D.E.O. GAS
EX. 12" W.M.
EX. 8" D.E.O. GAS

29 FT-12" CONDUIT,
TYPE B, 706.08 E.S. @ 4.10%

31 FT-12" CONDUIT,
TYPE B, 706.08 E.S. @ 7.39%

39 FT-12" CONDUIT, TYPE B,
706.08 E.S. @ 3.4%

STA. 76+65.00, 19.32' LT.
CLEVE. CB-1 C.B., AS PER PLAN
T/G 780.22
F.L. 6" (N) 777.55
F.L. 12" (SE) 771.22

STA. 76+36, 2.1' RT.
EX. SANITARTY/STORM MANHOLE
(RECONSTRUCTED TO GRADE)
EX. T/C 780.18
PROP. T/C 780.50
F.L. 12" (NW) 767.74
F.L. 15" (SE) 767.32
F.L. 24" R.C.P. (N & S) 766.74

STA. 76+22.2, 36.69' RT.
PRECAST CONCRETE MANHOLE, 60" BASE
T/C 779.77
F.L. 15" (S, E, & W) 767.69
F.L. 12" (NE) 767.94
F.L. 12" (SE) 774.74

780
775
770

EX. AT&T 9-3.5" F.D.
EX. 6" GAS D.E.O.
EX. 12" GAS D.E.O.
EX. 8" W.M.
EX. 12" W.M.
EX. 8" GAS D.E.O.
EX. 24" W.M. EX. 20" GAS D.E.O.

36 FT-12" CONDUIT, TYPE B,
706.08 E.S. @ 9.67%

37 FT-15" CONDUIT, TYPE B,
706.08 E.S. WITH @ 1.00%

CALCULATED CGP
CHECKED JLN

STORM SEWER PROFILES
WEST 150th STREET

CUY - WEST 150th STREET

66
146

PJK 3/27/07 PLOT 1"=5'

F:\JOBS\663\DF\DF03.DWG

REFERENCE NO.	PLAN AND PROFILE SHEET NUMBER	STATION		SIDE	UNDERDRAIN ELEV.		603		605		FOR INFORMATION ONLY	
					F.L. ELEVATION UPPER	F.L. ELEVATION LOWER	6" CONDUIT, TYPE F FOR UNDERDRAIN OUTLET	6" CONDUIT, TYPE B	6" BASE PIPE UNDER-DRAINS WITH FABRIC WRAP	6" UNCLASSIFIED PIPE UNDERDRAINS WITH FABRIC WRAP	6" X 6" TEE	6" X 90° BEND
		FROM	TO				FT.	FT.	FT.	FT.	NO.	NO.
U-1	22	45+85.00	46+70.00	LT.	772.05	MATCH EX.				85		
U-2	22	46+70.00	19+38.30**	LT.	776.23	772.05	10		292			
U-2A	22	19+06.11**	19+38.30**	LT.	776.23	MATCH EX.				32		
U-3	23	18+70.01**	51+28.00	LT.	776.64	775.54	10		85	70		
U-4	23	20+84.32**	51+28.00	RT.	776.84	775.54	10		97			
U-5	23	51+28.00	51+60.00	LT.	775.83	775.54	10		22			
U-6	23	51+28.00	51+45.00	RT.	775.61	775.54	10			4		
U-7	23	51+60.00	53+50.00	LT.	777.88	775.83	10		191			
U-8	23	51+45.00	53+50.00	RT.	777.96	775.61	10		180			
U-9	23	53+50.00	55+00.00	LT.	778.62	777.88	10		142			
U-10	23	53+50.00	56+43.00	RT.	780.04	777.96	10		279			
U-11	24	55+00.00	55+95.00	LT.	779.00	778.62	10		83			
U-12	24	55+95.00	56+35.00	LT.	779.18	779.00	10		28			
U-13	24	56+35.00	57+17.00	LT.	779.37	779.18	10		68			
U-14	24	56+55.00	57+17.00	RT.	780.13	779.80				64		
U-15	24	57+17.00	59+05.00	RT.	781.16	779.80			162	35		
U-16	24	57+17.00	57+17.00	LT./RT.	779.80	779.56		26			1	
U-17	24	57+17.00	59+05.00	LT.	779.97	779.37	10		169			
												1
U-18	25	60+26.00	60+26.00	LT./RT.	780.32	779.40		48			1	
U-19	25	59+05.00	60+26.00	RT.	781.16	780.32			126			
U-20	25	60+26.00	60+37.02	RT.	780.32	MATCH EX.				22		
U-21	25	59+05.00	61+12.35	LT.	779.97	778.01	10		190			
U-22	26	60+74.50	62+25.00	RT.	MATCH EX.	775.13	10		165			
U-23	26	61+12.35	62+25.00	LT.	778.01	775.08	10		100			
U-24	26	62+25.00	63+50.00	RT.	775.13	770.38	10		112			
U-25	26	62+25.00	63+47.00	LT.	775.08	770.50	10		109			
U-26	26	63+50.00	64+75.00	RT.	770.38	767.28	10			112		
U-27	26	63+47.00	64+75.00	LT.	770.50	767.02	10		115			
U-28	26	64+75.00	65+50.00	RT.	767.02	766.70	10			56		
U-29	26	64+75.00	65+50.00	LT.	767.02	766.46	10		56			
U-30	26	65+50.00	66+52.00	RT.	767.46	766.70	10			89		
U-31	26	65+50.00	66+38.00	LT.	767.20	766.46	10		75			
U-32	27	66+52.00	68+40.00	RT.	770.01	767.71	10			175		
U-33	27	66+38.00	68+40.00	LT.	770.01	767.20	10		189			
U-34	27	68+40.00	71+45.00	RT.	772.81	770.01	10		292			
U-35	27	68+40.00	70+09.00	LT.	771.55	770.01	10		159			
U-35A	27	70+20.00	71+13.00	LT.	772.50	771.65	10		81			
U-36	28	71+13.00	71+40.00	LT.	772.75	772.50	10		14			
U-37	28	71+40.00	72+84.00	LT.	774.07	772.75	10		131			
U-38	28	71+45.00	72+86.00	RT.	774.08	772.81	10		128			
U-39	28	72+84.00	75+43.10	LT.	776.14	774.07	10		250			
U-40	28	72+86.00	75+69.30	RT.	776.61	774.08	10		273			
SUBTOTAL COLUMN 1							340	74	4363	744	2	1

REFERENCE NO.	PLAN AND PROFILE SHEET NUMBER	STATION		SIDE	UNDERDRAIN ELEV.		603		605		FOR INFORMATION ONLY	
					F.L. ELEVATION UPPER	F.L. ELEVATION LOWER	6" CONDUIT, TYPE F FOR UNDERDRAIN OUTLET	6" CONDUIT, TYPE B	6" BASE PIPE UNDER-DRAINS WITH FABRIC WRAP	6" UNCLASSIFIED PIPE UNDERDRAINS WITH FABRIC WRAP	6" X 6" TEE	6" X 90° BEND
		FROM	TO				FT.	FT.	FT.	FT.	NO.	NO.
U-41	29	75+69.30	75+93.50	RT.	776.61	776.53	10		13			
U-42	29	75+93.50	20+87.66*	RT.	777.92	776.53	10		38			
U-43	29	20+87.66*	76+49.50	RT.	777.93	776.57	10		21			
U-44	29	77+40.68	76+49.50	RT.	MATCH EX.	776.57	10		89			
U-47	29	76+65.00	77+40.68	LT.	MATCH EX.	777.55	10		65			
U-48	29	19+51.00*	76+65.00	LT.	777.55	776.51	10		34			
U-45	30	18+15.00*	75+51.00	LT.	778.21	775.93	10		139			
U-46	30	16+25.00*	18+15.00*	RT.	MATCH EX.	778.21	10		180			
U-49	30	18+15.00*	19+51.00*	LT.	778.45	776.51	10		118			
U-50	30	16+25.00*	18+15.00*	LT.	MATCH EX.	778.45	10		180			
SUBTOTAL COLUMN 2							100		877			
SUBTOTAL FROM COLUMN 1							340	74	4363	744	2	1
TOTAL							440	74	5240	744	2	1

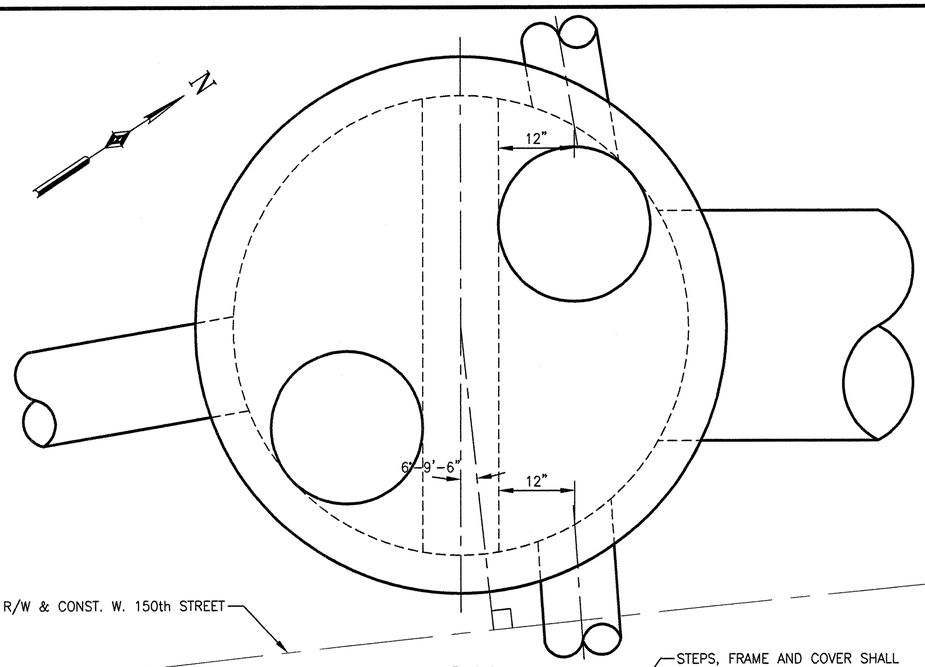
* STATIONED ALONG INDUSTRIAL PARKWAY
** STATIONED ALONG BROOKPARK ROAD

CALCULATED CGP
CHECKED JLN

UNDERDRAIN DETAILS

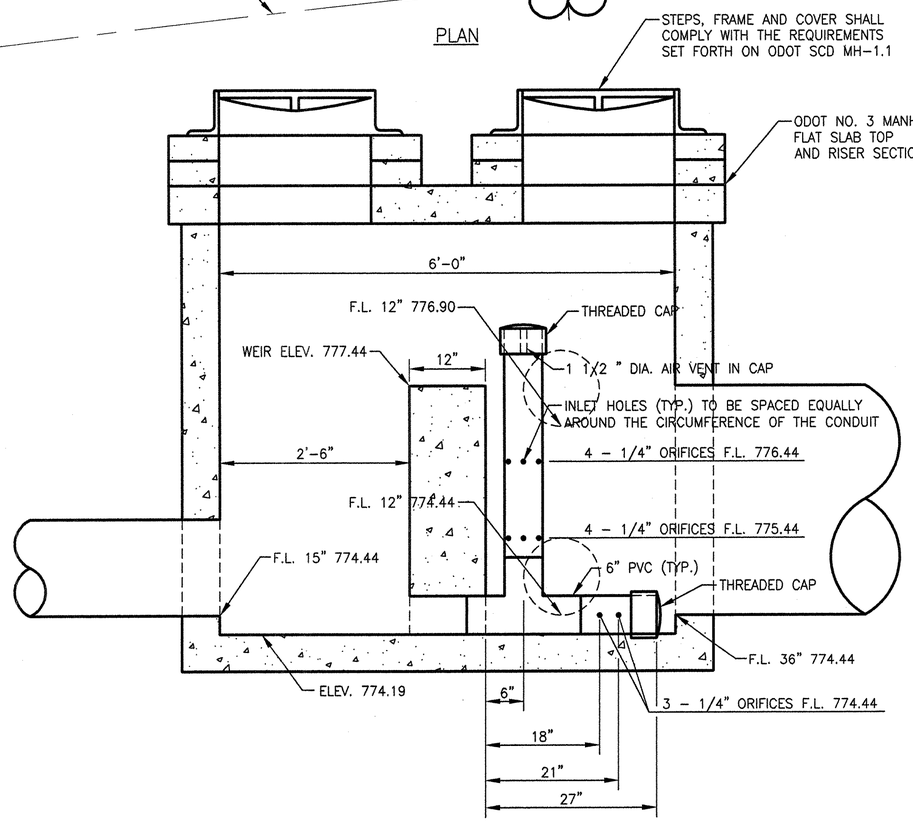
CUY-WEST 150th STREET

PJK 3/27/07 PLOT 1"=1'
JOBS\1665\DD\D001.DWG

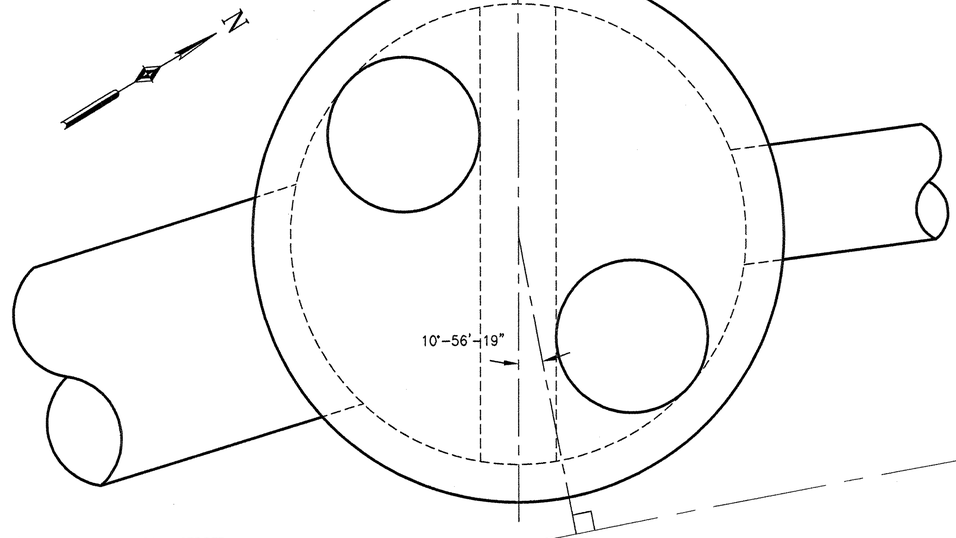


℄ R/W & CONST. W. 150th STREET

PLAN

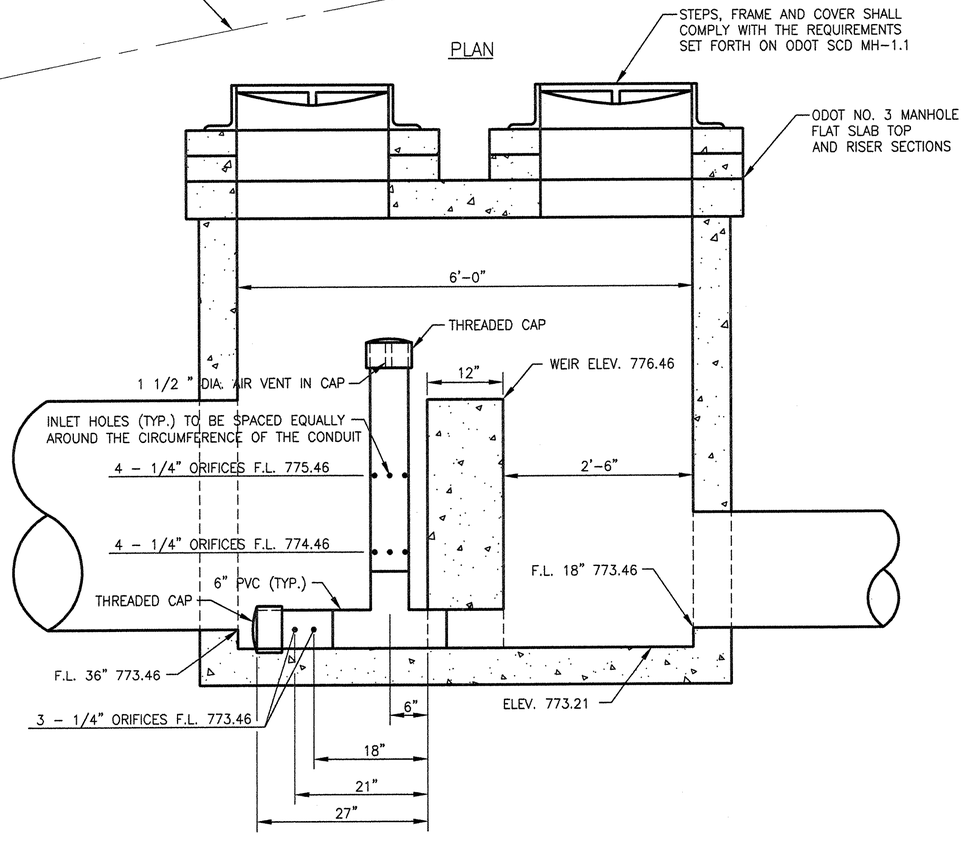


ODOT NO. 3 MANHOLE, AS PER PLAN 3
(STA. 53+50.00, 4.00' LT.)



℄ R/W & CONST. W. 150th STREET

PLAN



ODOT NO. 3 MANHOLE, AS PER PLAN 3
(STA. 52+80.00, 4.00' LT.)

DRAINAGE DETAILS

CUY-WEST 150th STREET

68
146

JLN 3/21/07 PLOT 1:1

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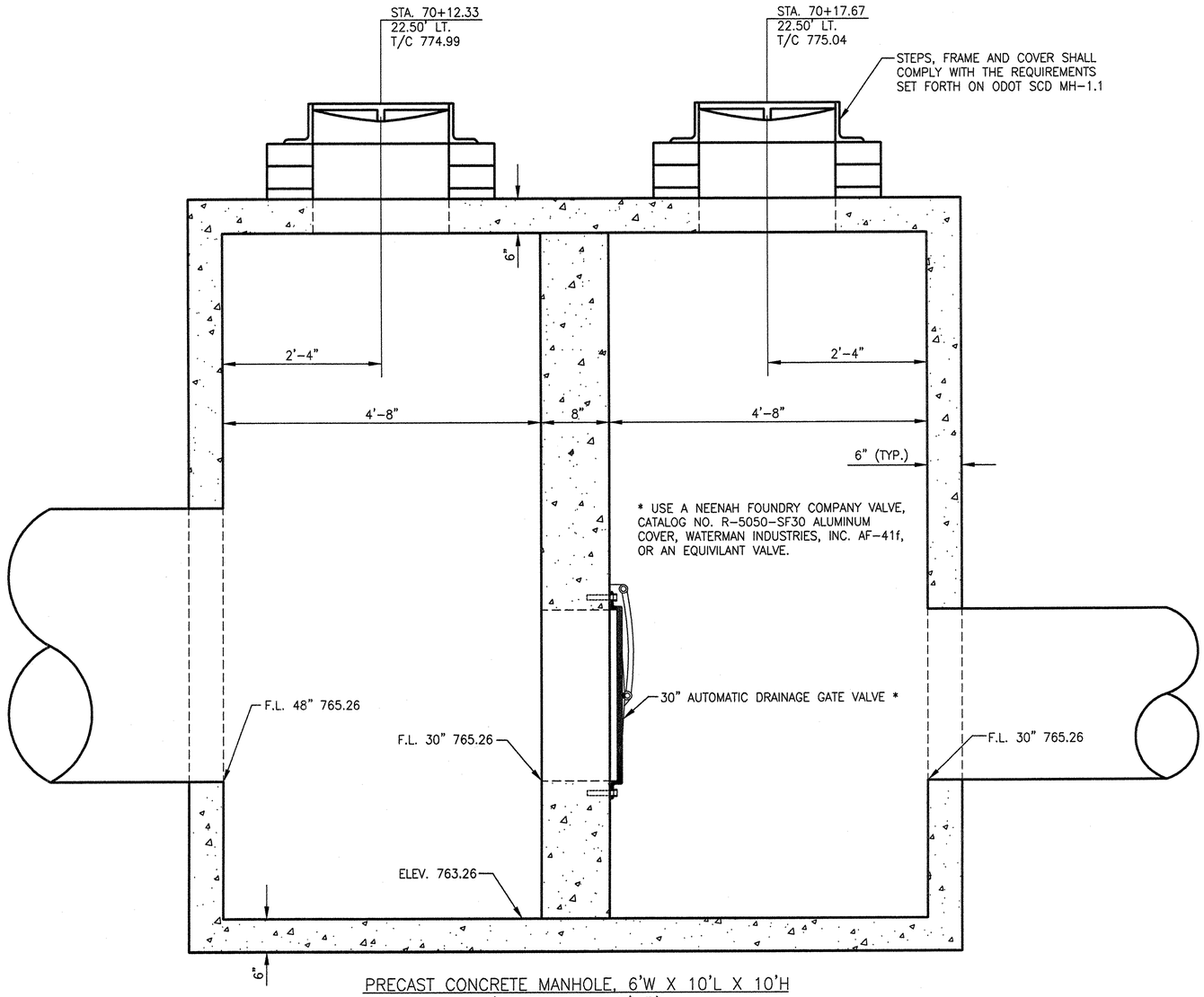
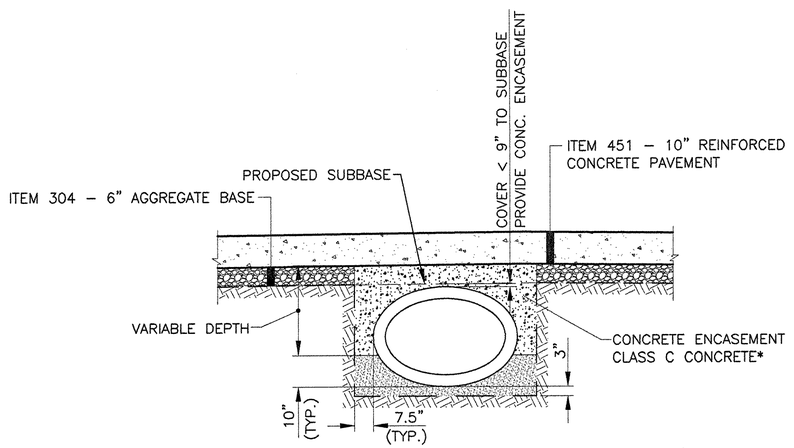
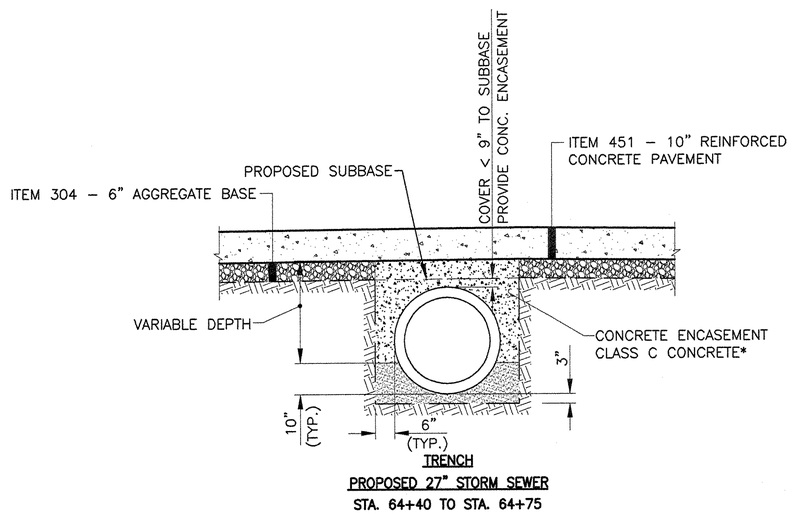


PRECAST CONCRETE MANHOLE, 6'W X 10'L X 10'H
(STA. 70+15.00, 20.50' LT.)

MANHOLE SHALL BE PRECAST WITH MANUFACTURER'S TRAFFIC BEARING (H-20) REINFORCING



TRENCH
PROPOSED 24" x 38" STORM SEWER
STA. 64+75 TO STA. 66+30



TRENCH
PROPOSED 27" STORM SEWER
STA. 64+40 TO STA. 64+75

*PAYMENT SHALL BE PER CUBIC YARD OF CONCRETE INSTALLED COMPLETE FOR ITEM 602 - CONCRETE MASONRY. PAYMENT SHALL INCLUDE ALL MATERIAL, LABOR, EQUIPMENT, EXCAVATION, AND ALL INCIDENTALS REQUIRED FOR THE COMPLETE INSTALLATION OF THE CONCRETE ENCASED STORM SEWERS.

DRAINAGE DETAILS

CUY-WEST 150th STREET

69
146

JLN 3/22/07 PLOT 1:1

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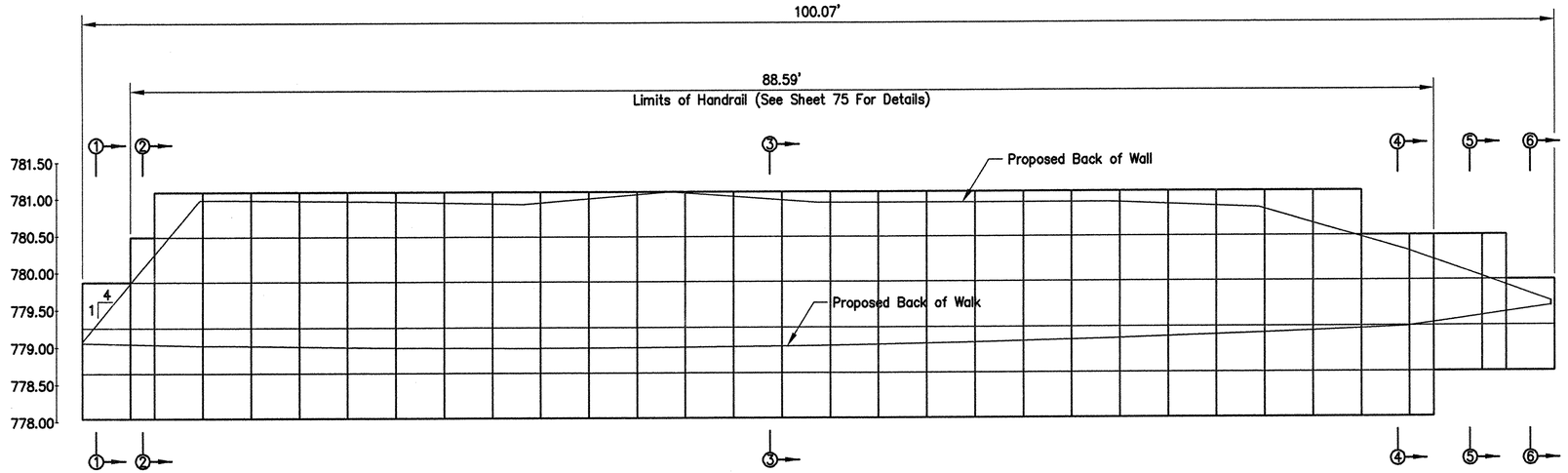
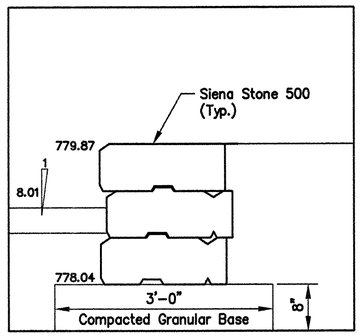


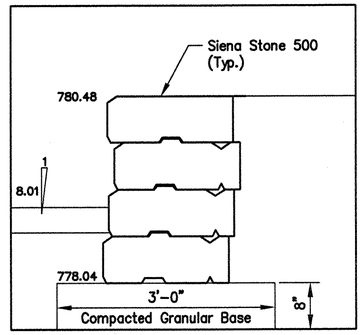
ELEVATION

Note:
The retaining wall is detailed using Unilock Siena Stone 500. Contractor shall provide the Siena Stone 500 or an equivalent equal stone approved by the Engineer. Contractor shall submit modular block retaining wall design for the Engineer's approval.

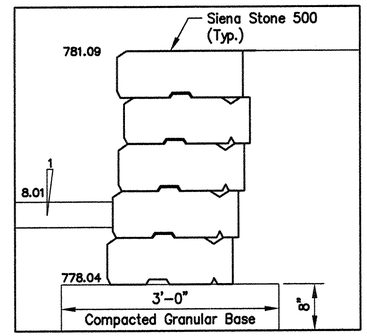
ESTIMATED QUANTITIES (FOR INFORMATION ONLY)			
Subgrade Compaction	Granular Material	Retaining Wall	Handrail
SQ YD	CU YD	SQ FT	FT
33.56	7.41	281.17	88.59



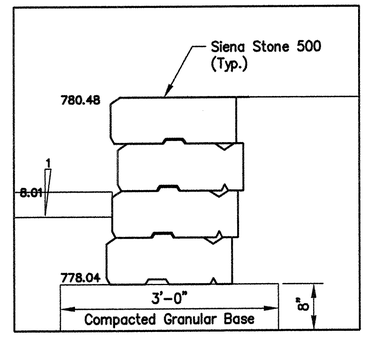
PANEL 1
Sta. 50+94.62 to Sta. 50+97.66



PANEL 2
Sta. 50+97.66 to Sta. 50+99.18



PANEL 3
Sta. 50+99.18 to Sta. 51+75.23



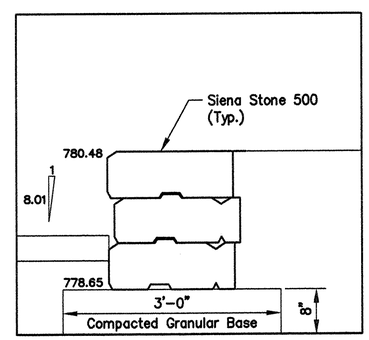
PANEL 4
Sta. 51+75.23 to Sta. 51+79.80

Panel	Top Elevation [ft]	Average Bottom Elevation [ft]	Base Elevation [ft]	Left Side [ft]	Right Side [ft]
1	779.870	779.052	778.040	0.000	3.281
2	780.480	779.039	778.040	3.281	4.921
3	781.090	779.130	778.040	4.921	86.947
4	780.480	779.263	778.040	86.947	91.868
5	780.480	779.369	778.650	91.868	96.790
6	779.870	779.481	778.650	96.790	100.071

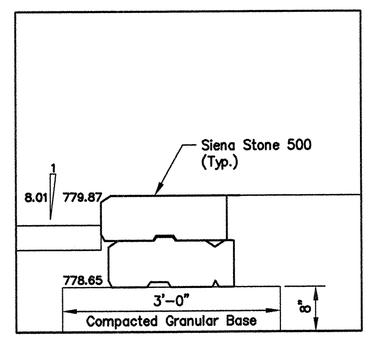
PANEL GEOMETRY

Standard Unit	7.25" x 20" x 39"	463 Lbs
Coping Unit	7.25" x 20" x 39"	406 Lbs

SIENA STONE 500



PANEL 5
Sta. 51+79.80 to Sta. 51+84.36



PANEL 6
Sta. 51+84.36 to Sta. 51+87.40

CALCULATED RSY
CHECKED JLN

RETAINING WALL DETAILS-WALL 1

CUY-WEST 150th STREET

70
146

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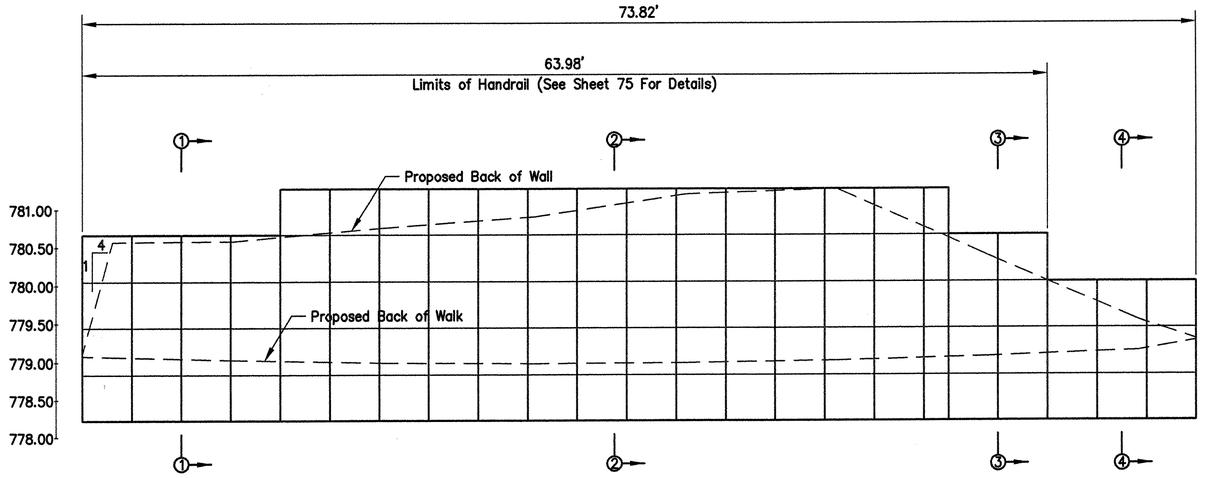
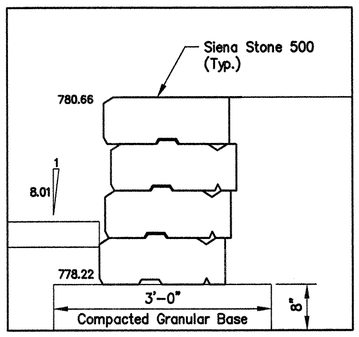


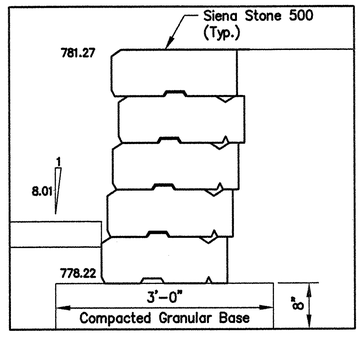
ELEVATION

Note:
The retaining wall is detailed using Unilock Siena Stone 500. Contractor shall provide the Siena Stone 500 or an equivalent equal stone approved by the Engineer. Contractor shall submit modular block retaining wall design for the Engineer's approval.

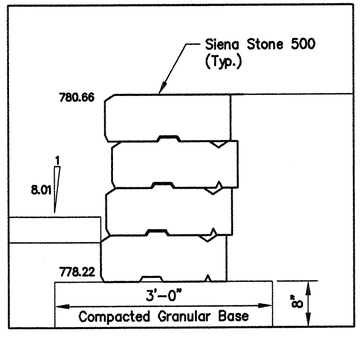
ESTIMATED QUANTITIES (FOR INFORMATION ONLY)			
Subgrade Compaction	Granular Material	Retaining Wall	Handrail
SQ YD	CU YD	SQ FT	FT
24.61	5.47	201.13	63.98



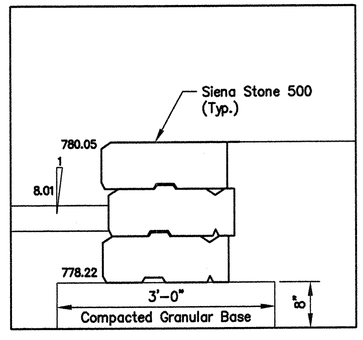
PANEL 1
Sta. 50+88.58 to Sta. 51+02.82



PANEL 2
Sta. 51+02.82 to Sta. 51+50.89



PANEL 3
Sta. 51+50.89 to Sta. 51+58.01



PANEL 4
Sta. 51+58.01 to Sta. 51+68.69

Panel	Top Elevation [ft]	Average Bottom Elevation [ft]	Base Elevation [ft]	Left Side [ft]	Right Side [ft]
1	780.660	779.049	778.220	0.000	13.124
2	781.270	779.037	778.220	13.124	57.417
3	780.660	779.077	778.220	57.417	63.979
4	780.050	779.240	778.220	63.979	73.822

PANEL GEOMETRY

Standard Unit	7.25" x 20" x 39"	463 Lbs
Coping Unit	7.25" x 20" x 39"	406 Lbs

SIENA STONE 500

CALCULATED RSY CHECKED JLN

RETAINING WALL DETAILS-WALL 2

CUY-WEST 150th STREET

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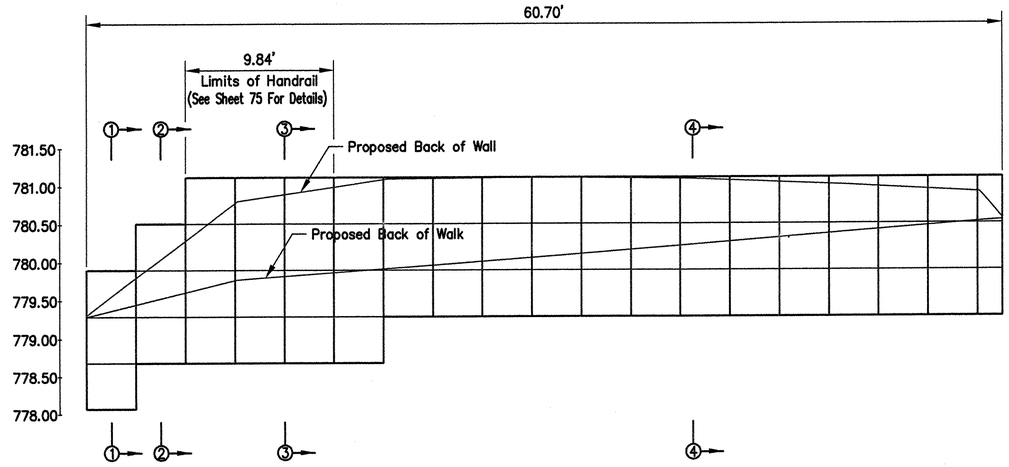
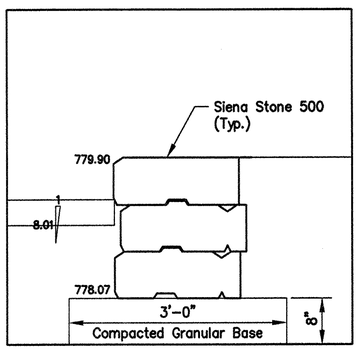


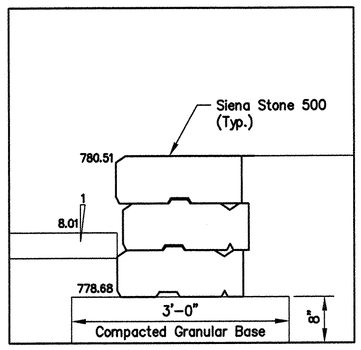
ELEVATION

Note:
The retaining wall is detailed using Unilock Siena Stone 500. Contractor shall provide the Siena Stone 500 or an equivalent equal stone approved by the Engineer. Contractor shall submit modular block retaining wall design for the Engineer's approval.

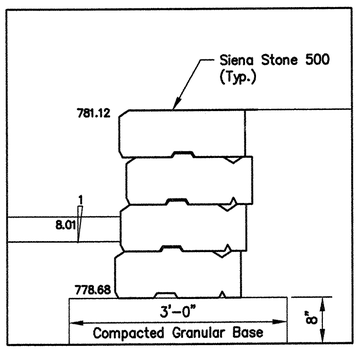
ESTIMATED QUANTITIES (FOR INFORMATION ONLY)			
Subgrade Compaction	Granular Material	Retaining Wall	Handrail
SQ YD	CU YD	SQ FT	FT
20.23	4.50	119.06	9.84



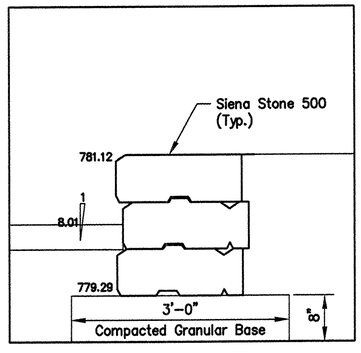
PANEL 1
Sta. 52+07.24 to Sta. 52+10.80



PANEL 2
Sta. 52+10.80 to Sta. 52+14.37



PANEL 3
Sta. 52+14.37 to Sta. 52+28.61



PANEL 4
Sta. 52+28.61 to Sta. 52+73.02

Panel	Top Elevation [ft]	Average Bottom Elevation [ft]	Base Elevation [ft]	Left Side [ft]	Right Side [ft]
1	779.900	779.369	778.070	0.000	3.281
2	780.510	779.526	778.680	3.281	6.562
3	781.120	779.760	778.680	6.562	19.686
4	781.120	779.233	779.290	19.686	60.698

PANEL GEOMETRY

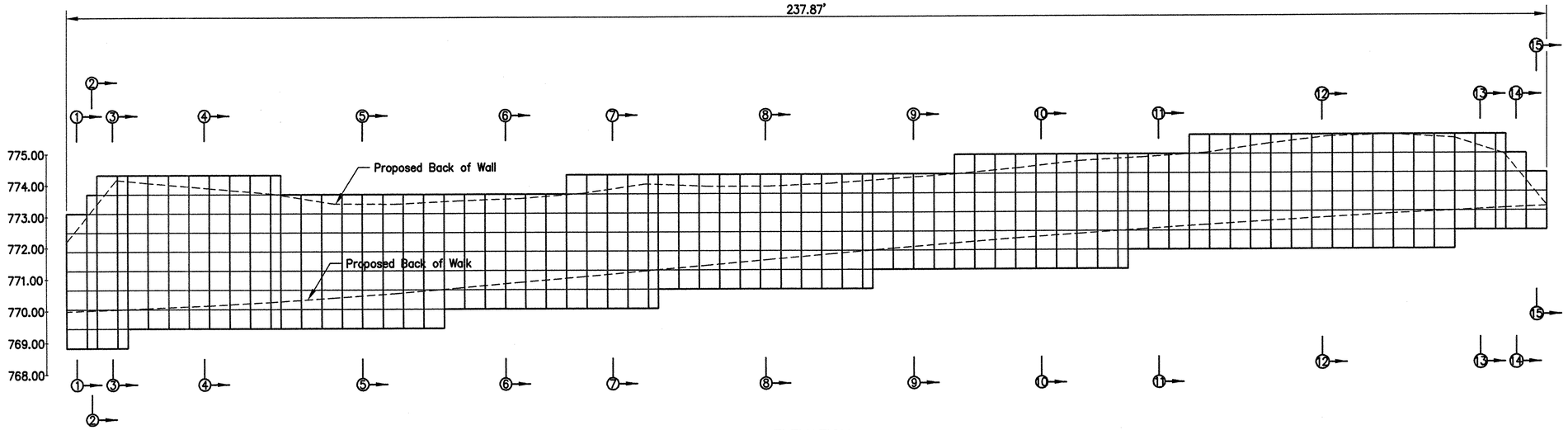
Standard Unit	7.25" x 20" x 39"	463 Lbs
Coping Unit	7.25" x 20" x 39"	406 Lbs

SIENA STONE 500

CALCULATED RSY CHECKED JLN

RETAINING WALL DETAILS-WALL 3

CUY-WEST 150th STREET



ELEVATION

Notes:
The retaining wall is detailed using Unilock Siena Stone 500. Contractor shall provide the Siena Stone 500 or an equivalent equal stone approved by the Engineer. Contractor shall submit modular block retaining wall design for the Engineer's approval.

For panels 7 thru 15 see sheet 74.

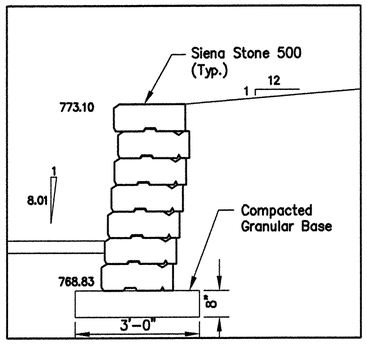
ESTIMATED QUANTITIES (FOR INFORMATION ONLY)		
Subgrade Compaction	Granular Material	Retaining Wall
SQ YD	CU YD	SQ FT
79.29	17.62	909.50

Panel	Top Elevation [ft]	Average Bottom Elevation [ft]	Base Elevation [ft]	Left Side [ft]	Right Side [ft]
1	773.100	770.000	768.830	0.000	3.281
2	773.710	770.016	768.830	3.281	4.921
3	774.320	770.038	768.830	4.921	9.843
4	774.320	770.172	769.440	9.843	34.450
5	773.710	770.480	769.440	34.450	60.698
6	773.710	770.843	770.050	60.698	80.384
7	774.320	771.146	770.051	80.384	95.149
8	774.320	771.579	770.661	95.149	129.600
9	774.320	771.989	771.271	129.600	142.724
10	774.930	772.301	771.271	142.724	170.612
11	774.930	772.572	771.881	170.612	180.455
12	775.540	772.869	771.881	180.455	223.108
13	775.540	773.142	772.491	223.108	231.311
14	774.930	773.197	772.491	231.311	234.592
15	774.320	773.226	772.491	234.592	237.873

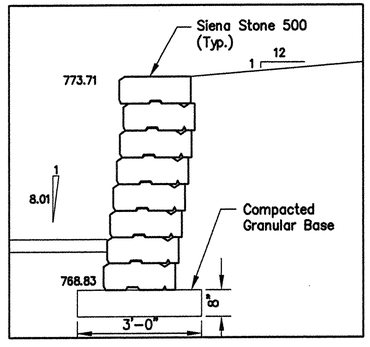
PANEL GEOMETRY

Standard Unit	7.25" x 20" x 39"	463 Lbs
Coping Unit	7.25" x 20" x 39"	406 Lbs

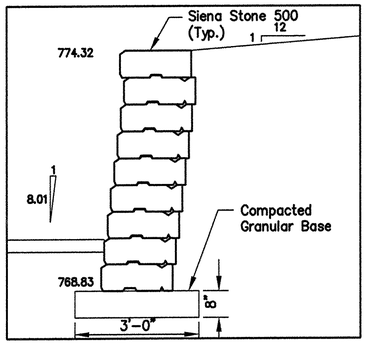
SIENA STONE 500



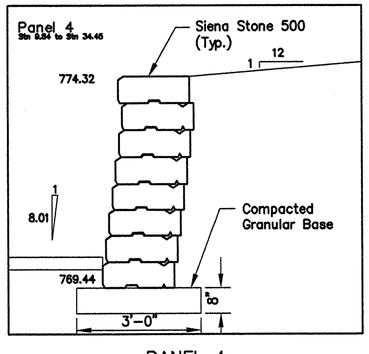
PANEL 1
Sta. 65+77.00 to Sta. 65+80.28



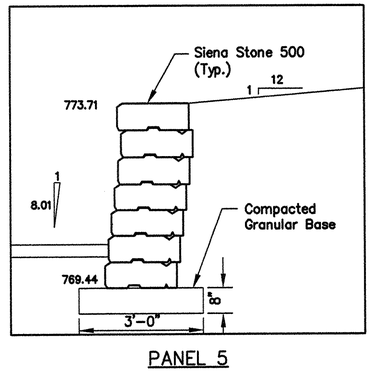
PANEL 2
Sta. 65+80.28 to Sta. 65+81.92



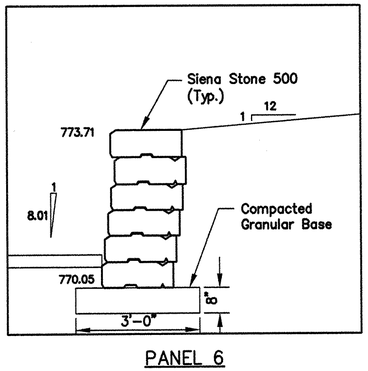
PANEL 3
Sta. 65+81.92 to Sta. 65+86.84



PANEL 4
Sta. 65+86.84 to Sta. 66+11.45



PANEL 5
Sta. 66+11.45 to Sta. 66+37.70



PANEL 6
Sta. 66+37.70 to Sta. 66+57.38

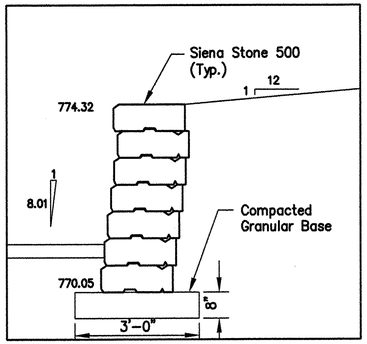
CALCULATED RSY
CHECKED JLN

RETAINING WALL DETAILS-WALL 4

CUY-WEST 150th STREET

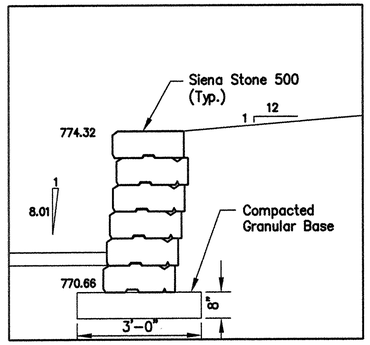
73
146

F:\JOBS\665\Retaining Wall\665WALL4.DWG PJK 3/22/07 PLOT 1:10



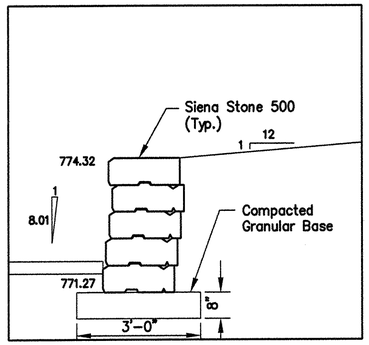
PANEL 7

Sta. 66+57.38 to Sta. 66+72.15



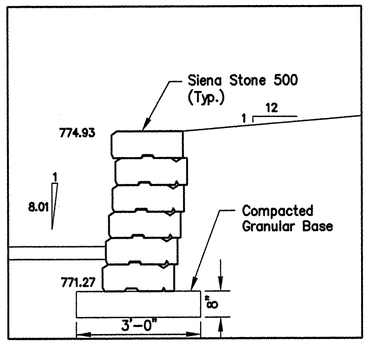
PANEL 8

Sta. 66+72.15 to Sta. 67+06.60



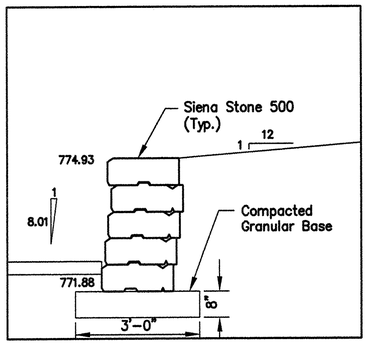
PANEL 9

Sta. 67+06.60 to Sta. 67+19.72



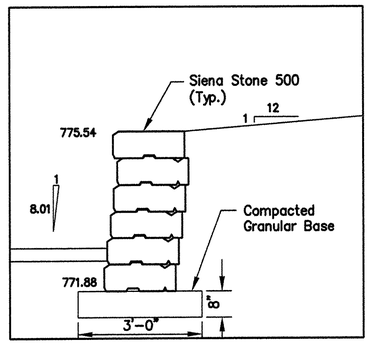
PANEL 10

Sta. 67+19.72 to Sta. 67+47.61



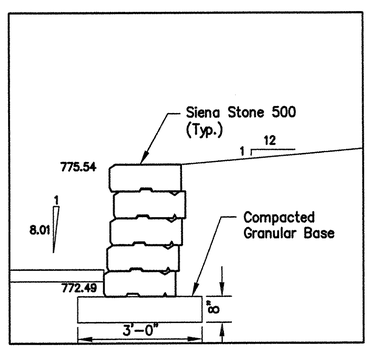
PANEL 11

Sta. 67+47.61 to Sta. 67+57.46



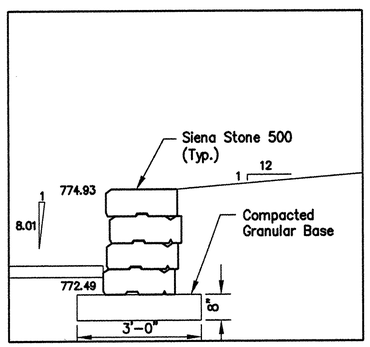
PANEL 12

Sta. 67+57.46 to Sta. 68+00.11



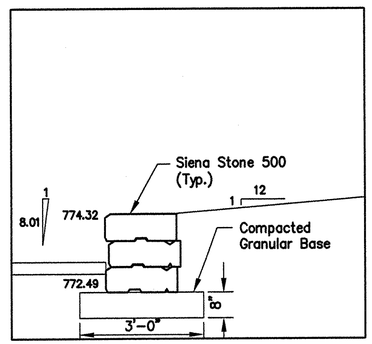
PANEL 13

Sta. 68+00.11 to Sta. 68+08.31



PANEL 14

Sta. 68+08.31 to Sta. 68+11.59



PANEL 15

Sta. 68+11.59 to Sta. 68+14.87

Notes:
The retaining wall is detailed using Unilock Siena Stone 500. Contractor shall provide the Siena Stone 500 or an equivalent equal stone approved by the Engineer. Contractor shall submit modular block retaining wall design for the Engineer's approval.

For panels 1 thru 6 and the elevation view see sheet 73.

Panel	Top Elevation [ft]	Average Bottom Elevation [ft]	Base Elevation [ft]	Left Side [ft]	Right Side [ft]
1	773.100	770.000	768.830	0.000	3.281
2	773.710	770.016	768.830	3.281	4.921
3	774.320	770.038	768.830	4.921	9.843
4	774.320	770.172	769.440	9.843	34.450
5	773.710	770.480	769.440	34.450	60.698
6	773.710	770.843	770.050	60.698	80.384
7	774.320	771.146	770.051	80.384	95.149
8	774.320	771.579	770.661	95.149	129.600
9	774.320	771.989	771.271	129.600	142.724
10	774.930	772.301	771.271	142.724	170.612
11	774.930	772.572	771.881	170.612	180.455
12	775.540	772.869	771.881	180.455	223.108
13	775.540	773.142	772.491	223.108	231.311
14	774.930	773.197	772.491	231.311	234.592
15	774.320	773.226	772.491	234.592	237.873

PANEL GEOMETRY

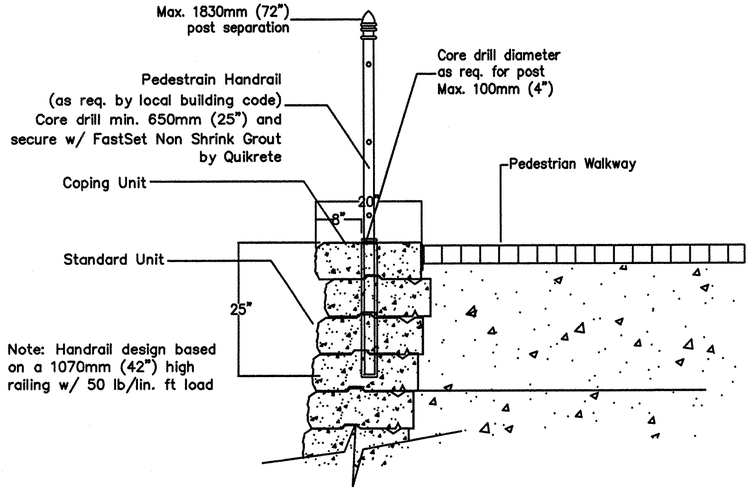
Standard Unit	7.25" x 20" x 39"	463 Lbs
Coping Unit	7.25" x 20" x 39"	406 Lbs

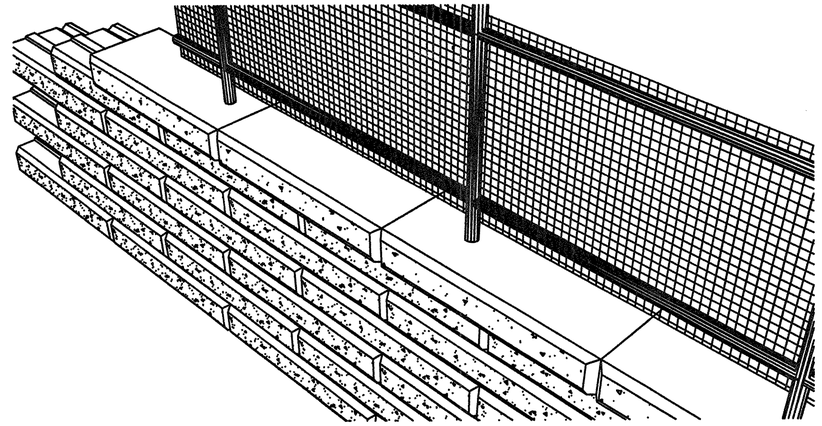
SIENA STONE 500

CALCULATED RSY CHECKED JLN

RETAINING WALL DETAILS-WALL 4

CUY-WEST 150th STREET





PEDSTRIAN HANDRAIL DETAIL

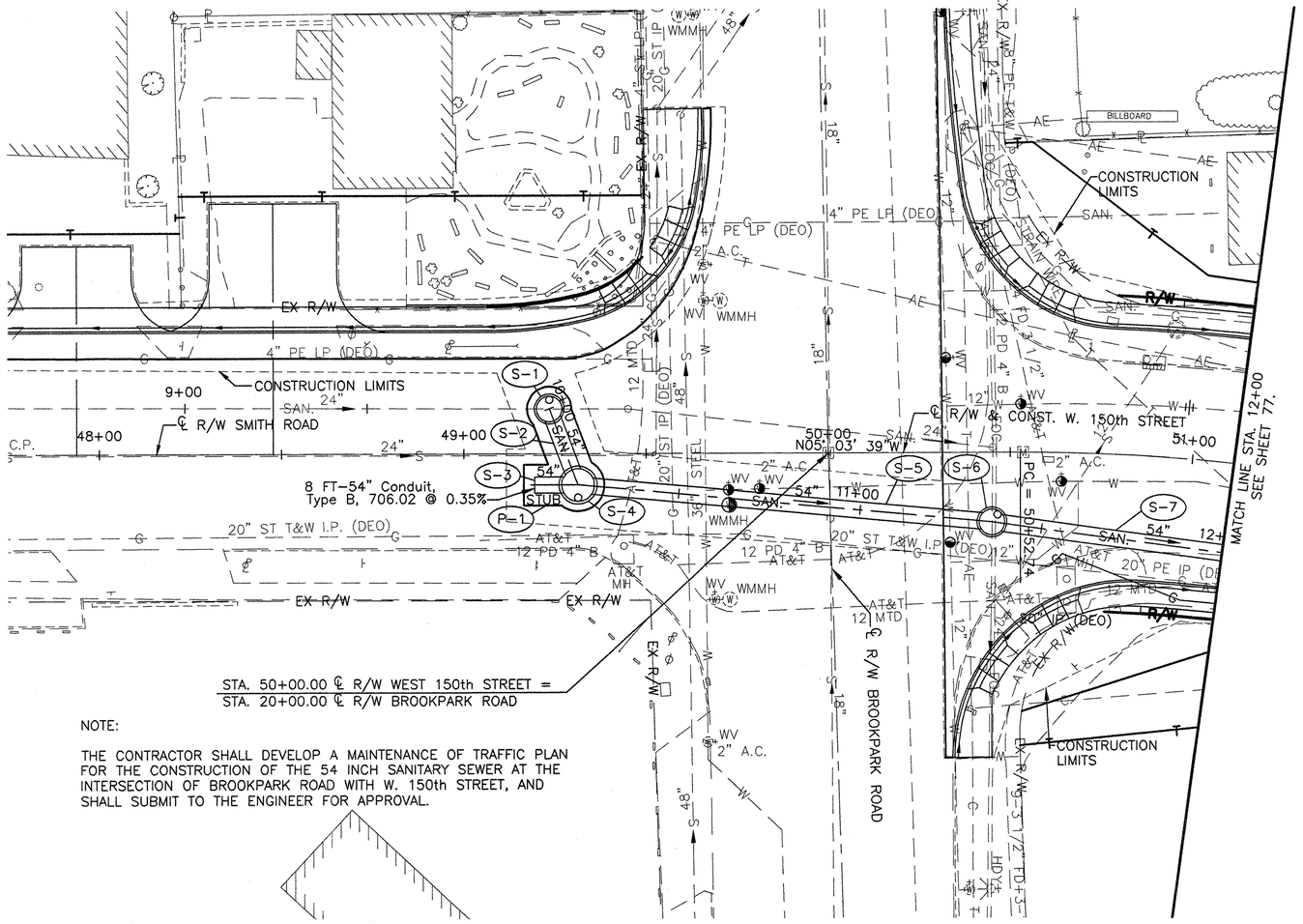
RETAINING WALL DETAILS

CALCULATED RSY
CHECKED JLN

CUY-WEST 150th STREET

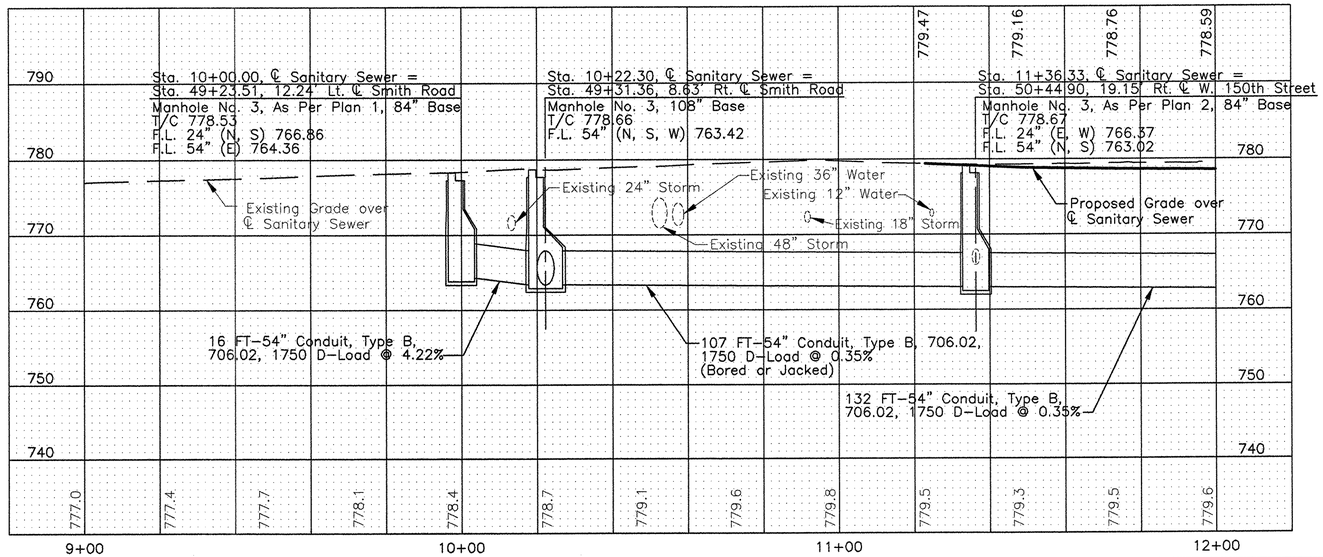
75
146

F:\JOBS\665\Retaining Wall\665WALLS.DWG P.W. 3/22/07 PLOT 1:5



NOTE:

THE CONTRACTOR SHALL DEVELOP A MAINTENANCE OF TRAFFIC PLAN FOR THE CONSTRUCTION OF THE 54 INCH SANITARY SEWER AT THE INTERSECTION OF BROOKPARK ROAD WITH W. 150th STREET, AND SHALL SUBMIT TO THE ENGINEER FOR APPROVAL.



NO. REF.	STATION		SIDE	202		304	408	448		451	603				604					606	607
	FROM	TO		GUARDRAIL REMOVED FOR REUSE	FENCE REMOVED FOR REUSE	AGGREGATE BASE	PRIME COAT (0.4 GAL/SQ. YD.)	1.75" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG64-22 (DRIVEWAYS)	1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22 (DRIVEWAYS)	10" REINFORCED CONCRETE PAVEMENT	6" PVC SANITARY CONNECTION	54" CONDUIT, TYPE B, 706.02, 1750 D-LOAD	60" CONDUIT, TYPE B, 706.02, 2250 D-LOAD	CONDUIT, BORED OR JACKED: 54" TYPE B, 706.02, 1750 D-LOAD	MANHOLE, ODOT NO. 3 84" BASE	MANHOLE, ODOT NO. 3 90" BASE	MANHOLE, ODOT NO. 3 108" BASE	MANHOLE, ODOT NO. 3, AS PER PLAN 1	MANHOLE, ODOT NO. 3, AS PER PLAN 2	GUARDRAIL REBUILT	FENCE REBUILT
				FT	FT	CU YD	GAL	CU YD	CU YD	SQ YD	FT	FT	FT	FT	EACH	EACH	EACH	EACH	EACH	FT	FT
P-1	9+97.84	10+25.46	LT/RT			9.12				54.69											
P-2	17+70.73	18+33.40	LT/RT			18.59	33.46	4.07	2.90												
R-1	17+59.76		LT/RT	22																22	
R-2	18+34.57		LT/RT		25																25
S-1	10+00.00		LT/RT															1			
S-2	10+00.00	10+22.30	LT/RT									16									
S-3	9+96.02	10+22.30	RT									8									
S-4	10+22.30		LT/RT														1				
S-5	10+22.30	11+36.33	LT/RT											107							
S-6	11+36.33		LT/RT																1		
S-7	11+36.33	12+73.46	LT/RT									132									
S-8	12+25.00		LT								71										
S-9	12+40.00		RT								23										
S-10	12+73.46		LT/RT												1						
S-11	12+73.46	13+63.40	LT/RT									85									
S-12	13+63.40		LT/RT												1						
S-13	13+63.40	14+48.40	LT/RT									80									
S-14	14+40.00		LT								66										
S-15	14+48.40		LT/RT												1						
S-16	16+00.00		LT								68										
S-17	14+48.40	17+26.06	LT/RT									272									
S-18	16+79.00		RT								25										
S-19	17+26.06		LT/RT													1					
S-20	17+26.06	20+93.83	LT/RT										362								
S-21	20+93.83		LT/RT													1					
S-22	20+93.83	21+61.53	LT/RT										65								
			TOTAL	22	25	27.71	33.46	4.07	2.90	54.69	253	593	427	107	3	2	1	1	1	22	25

F:\JOBS\665\GP\GP400.DWG JLN 4/5/07 PLOT 1"=20'

0 20 40
SCALE IN FEET

CALCULATED RSY
CHECKED JLN

CUY - WEST 150th STREET

SANITARY SEWER PLAN AND PROFILE - W. 150th STREET

CUY - WEST 150th STREET

SANITARY SEWER PLAN AND PROFILE - W. 150th STREET

CALCULATED RSY
CHECKED JLN

SCALE IN FEET
0 20 40

MATCH LINE STA. 17+00
SEE SHEET 78.

MATCH LINE STA. 12+00
SEE SHEET 76.

FOR ESTIMATED QUANTITIES SEE SHEET 76

CONSTRUCTION LIMITS

CONSTRUCTION LIMITS

Sta. 12+73.46 ℄ Sanitary Sewer =
Sta. 51+87.67, 21.26' Rt. ℄ W. 150th Street
Manhole No. 3, 84" Base
T/C 779.02
F.L. 54" (N, S) 762.54

Sta. 13+63.40 ℄ Sanitary Sewer =
Sta. 52+81.43, 20.03' Rt. ℄ W. 150th Street
Manhole No. 3, 84" Base
T/C 780.33
F.L. 54" (N, S) 762.23

Sta. 14+48.40 ℄ Sanitary Sewer =
Sta. 53+69.98, 20.63' Rt. ℄ W. 150th Street
Manhole No. 3, 84" Base
T/C 781.19
F.L. 54" (N, S) 761.93

Existing Grade over ℄ Sanitary Sewer

Proposed Grade over ℄ Sanitary Sewer

Sta. 12+25
7'-Riser

Sta. 12+40
8'-Riser

Sta. 14+40
8'-Riser

Sta. 16+00
9'-Riser

Sta. 16+79
11'-Riser

132 FT-54" Conduit, Type B, 706.02,
1750 D-Load @ 0.35%

85 FT-54" Conduit, Type B, 706.02,
1750 D-Load @ 0.35%

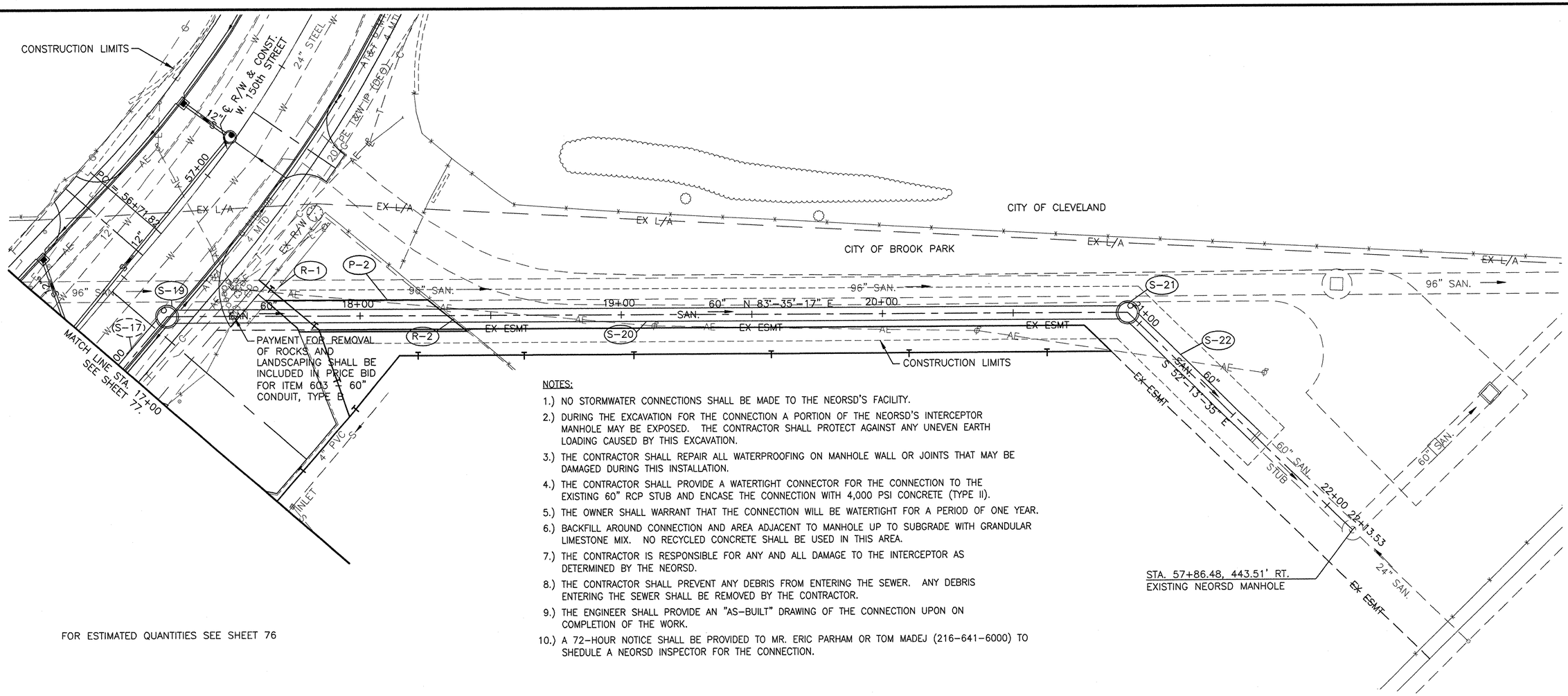
80 FT-54" Conduit, Type B, 706.02,
1750 D-Load @ 0.35%

272 FT-54" Conduit, Type B, 706.02,
1750 D-Load @ 0.35%

778.56	778.56	778.70	778.99	779.33	779.69	780.08	780.40	780.67	780.92	781.19	781.30	781.44	781.54	781.62	781.77	781.96	782.15	782.34	782.52	782.71					
779.6	780.0	780.2	780.3	780.5	780.5	780.6	780.8	781.0	781.1	781.4	781.4	781.6	781.7	781.9	782.0	782.4	782.7	783.1	783.1	782.9					

790 780 770 760 750 740

12+00 13+00 14+00 15+00 16+00 17+00



FOR ESTIMATED QUANTITIES SEE SHEET 76

NOTES:

1.) NO STORMWATER CONNECTIONS SHALL BE MADE TO THE NEORSD'S FACILITY.

2.) DURING THE EXCAVATION FOR THE CONNECTION A PORTION OF THE NEORSD'S INTERCEPTOR MANHOLE MAY BE EXPOSED. THE CONTRACTOR SHALL PROTECT AGAINST ANY UNEVEN EARTH LOADING CAUSED BY THIS EXCAVATION.

3.) THE CONTRACTOR SHALL REPAIR ALL WATERPROOFING ON MANHOLE WALL OR JOINTS THAT MAY BE DAMAGED DURING THIS INSTALLATION.

4.) THE CONTRACTOR SHALL PROVIDE A WATERTIGHT CONNECTOR FOR THE CONNECTION TO THE EXISTING 60" RCP STUB AND ENCASE THE CONNECTION WITH 4,000 PSI CONCRETE (TYPE II).

5.) THE OWNER SHALL WARRANT THAT THE CONNECTION WILL BE WATERTIGHT FOR A PERIOD OF ONE YEAR.

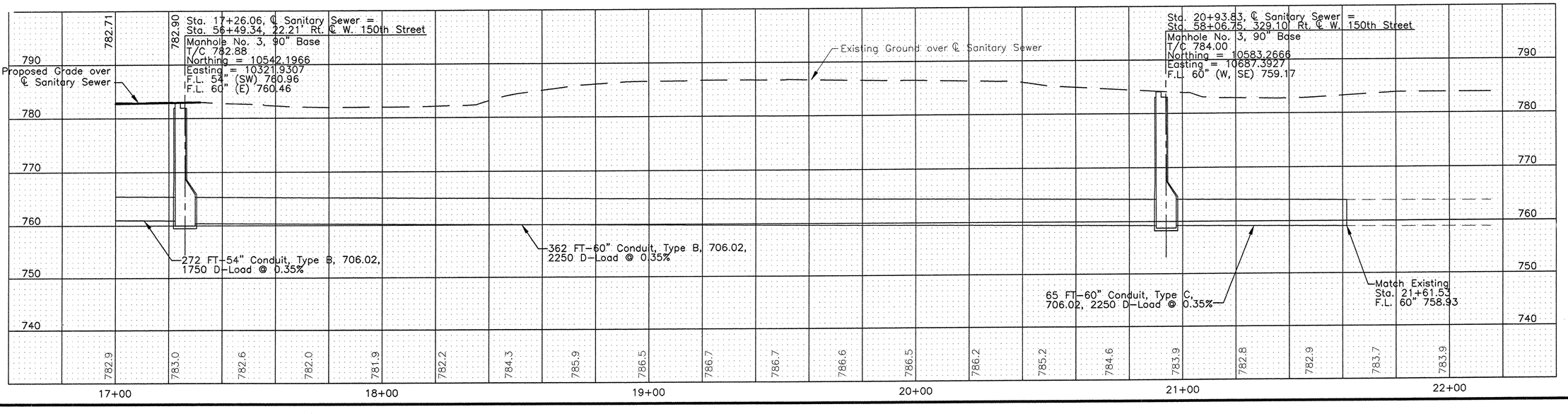
6.) BACKFILL AROUND CONNECTION AND AREA ADJACENT TO MANHOLE UP TO SUBGRADE WITH GRANDULAR LIMESTONE MIX. NO RECYCLED CONCRETE SHALL BE USED IN THIS AREA.

7.) THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGE TO THE INTERCEPTOR AS DETERMINED BY THE NEORSD.

8.) THE CONTRACTOR SHALL PREVENT ANY DEBRIS FROM ENTERING THE SEWER. ANY DEBRIS ENTERING THE SEWER SHALL BE REMOVED BY THE CONTRACTOR.

9.) THE ENGINEER SHALL PROVIDE AN "AS-BUILT" DRAWING OF THE CONNECTION UPON ON COMPLETION OF THE WORK.

10.) A 72-HOUR NOTICE SHALL BE PROVIDED TO MR. ERIC PARHAM OR TOM MADEJ (216-641-6000) TO SHEDULE A NEORSD INSPECTOR FOR THE CONNECTION.



CALCULATED RSY CHECKED JLN

SCALE IN FEET 0 20 40

SANITARY SEWER PLAN AND PROFILE - W. 150th STREET

CUY - WEST 150th STREET

78 / 146

PJK 3/27/07 PLOT 1"=20'

F:\JOBS\665\GP\GP402.DWG

WATER WORK NOTES

SCOPE OF WORK:

THE WORK COMTEMPLATED UNDER THIS CONTRACT COMPRISES THE FURNISHING AND INSTALLING COMPLETE WITH VALVES AND OTHER APPURTENANCES, WATER MAIN RELOCATIONS AND PERFORMING OTHER INCIDENTAL WORK NECESSARY AS SHOWN ON THE PLAN AND PROFILE SHEETS. THE WORK INVOLVES FURNISHING, INSTALLING, TESTING, FLUSHING AND CHLORINATION OF APPROXIMATELY 224 LINEAR FEET OF 12 INCH DUCTILE IRON WATERLINE AND 87 LINEAR FEET OF 24 INCH DUCTILE IRON WATERLINE ALONG WEST 150TH STREET.

GENERAL NOTES

THE EXACT LOCATION OF EXISTING WATER LINES AND UNDERGROUND STRUCTURES IS UNKNOWN. INFORMATION SHOWN ON THE PLANS WAS OBTAINED FROM CLEVELAND WATER DEPARTMENT DRAWINGS.

THE STATIC HEAD USED FOR BOTH DESIGN AND TESTING SHALL BE MEASURED FROM ELEVATION 1250.00.

THE FIELD TESTING HEAD SHALL BE 75 PSI PLUS THAT DUE TO THE STATIC HEAD PREVAILING AT THE SITE, BUT IN NO CASE LESS THAN 150 PSI, FOR WATERMAIN LESS THAN 20" AND 225 PSI FOR WATERMAIN 20" AND LARGER.

THE CONTRACTOR SHALL NOTIFY THE CLEVELAND WATER DEPARTMENT INSPECTION AND ENFORCEMENT THREE (3) WEEKS PRIOR TO STARTING ANY WATER WORKS CONSTRUCTION. CALL (216) 664-2274.

AFTER AWARD OF CONTRACT, THE CONTRACTOR THROUGH THE ENGINEER, SHALL SUBMIT TO THE CITY OF CLEVELAND, DIVISION OF WATER INSPECTION AND ENFORCEMENT SECTION, A CONSTRUCTION SCHEDULE AND CONSTRUCTION SEQUENCE RELATING TO WATERWORK.

CONTRACTOR SHALL ALSO MAKE PAYMENT TO THE DIVISION OF WATER FOR ALL DIVISION OF WATER LABOR REQUIRED TO COMPLETE THE WORK REQUIRED HEREIN. CONTRACTOR SHALL MAKE ALL PAYMENT FOR DIVISION OF WATER LABOR BEFORE ANY WATER WORK IS PERFORMED. SEE PARAGRAPH " DIVISION OF WATER - LABOR CHARGES." ALL DIVISION OF WATER LABOR CHARGES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE DEEMED TO BE INCLUDED IN THE APPROPRIATE BID ITEM.

ANY AND ALL SHUTDOWNS OF EXISTING WATERMAINS ARE SUBJECT TO PRIOR REVIEW AND APPROVAL OF CLEVELAND DIVISION OF WATER AND THE ENGINEER. SHUTDOWNS OF THE EXISTING 30" AND 36" WATERMAINS ARE LIMITED TO THE TIME PERIOD BETWEEN NOVEMBER 1 AND APRIL 1.

DEFINITIONS

WHEREVER IN THESE WATER WORK NOTES AND SPECIFICATIONS THE FOLLOWING TERMS OR PRONOUNS IN PLACE OF THEM ARE USED. THE INTENT AND MEANING SHALL BE INTERPRETED AS FOLLOWS:

THE COUNTY: CUYAHOGA COUNTY ACTING THROUGH ITS AUTHORIZED REPRESENTATIVE.

ENGINEER: THE ENGINEER IS THE DULY AUTHORIZED AGENT OR REPRESENTATIVE OF THE CUYAHOGA COUNTY ENGINEER'S OFFICE ACTING WITHIN THE SCOPE OF HIS/HER AUTHORITY FOR THE PURPOSE OF CONSTRUCTION ENGINEERING AND ADMINISTRATION OF THE CONTRACT.

THE CITY: THE CITY IS THE DIRECTOR OF THE DEPARTMENT OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND, OR HIS DULY DESIGNATED REPRESENTATIVE(S), CITY INSPECTOR, AND/OR THE WATER DESIGN REVIEW ENGINEER OF THE DIVISION OF WATER.

STATUS OF CITY INSPECTORS

INSPECTORS AS DESIGNATED BY THE DIRECTOR OF PUBLIC UTILITIES ARE AUTHORIZED TO INSPECT ALL WORK DONE AND MATERIALS FURNISHED, SUCH INSPECTION MAY EXTEND TO ALL OR ANY PART OF THE WATERWORK, AND TO THE PREPARATION OR MANUFACTURE OF THE MATERIALS TO BE USED IN THE WATERWORK. THE CITY INSPECTOR AS DESIGNATED BY THE DIRECTOR OF PUBLIC UTILITIES WILL MAKE WORK INSTRUCTIONS THROUGH THE ENGINEER. ARRANGEMENTS FOR CITY INSPECTORS ARE TO BE MADE BY NOTIFYING INSPECTION AND ENFORCEMENT DIVISION OF WATER (664-2274), WITHIN THE TIME SPECIFIED. NO WORK SHALL BE ACCEPTED UNLESS INSPECTED.

ACCESS TO WORK AND PLACE OF MANUFACTURE

THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND CITY, AT LEAST SEVEN (7) DAYS PREVIOUS TO THE COMMENCEMENT OF THE MANUFACTURE OF ANY MATERIALS, OF THE TIME AND PLACE WHERE THE MANUFACTURE IS TO COMMENCE, IN ORDER THAT A REPRESENTATIVE OF THE ENGINEER AND THE CITY, OR HIS DESIGNEE, MAY BE PRESENT TO INSPECT THE MANUFACTURE. THE CONTRACTOR SHALL PROVIDE, WITHOUT CHARGE OR EXPENSE TO THE COUNTY AND CITY, ALL NECESSARY ASSISTANCE TO THE ENGINEER AND THE CITY, OR HIS DESIGNEE, WHEN REQUIRED FOR INSPECTION OR VERIFICATION OF WORK DONE.

DIMENSIONS, DETAILED DRAWINGS AND ELEVATIONS

FIGURED DIMENSIONS ON DRAWINGS SHALL TAKE PRECEDENCE OVER MEASUREMENTS BY SCALE, AND DETAILED DRAWINGS ARE TO TAKE PRECEDENCE OVER GENERAL DRAWINGS AND SHALL BE CONSIDERED AS EXPLANATORY OF THEM AND NOT AS INDICATING EXTRA WORK. IF, HOWEVER, ANY OF THE DETAILED DRAWINGS SHOW MORE ELABORATE OR EXPENSIVE WORK THAN IS NORMALLY SPECIFIED AND INDICATED BY THE CONTRACT DRAWINGS, NOTICE THEREOF MUST BE GIVEN TO THE ENGINEER BY THE CONTRACTOR WITHIN TEN (10) DAYS AFTER RECEIPT OF SUCH DETAILED DRAWINGS IN ORDER THAT THE DRAWINGS MAY BE AMENDED OR THE ADDITIONAL EXPENSE ON ACCOUNT OF SUCH WORK MAY BE ADJUSTED AND AUTHORIZED. IF THE ENGINEER DOES NOT RECEIVE SUCH NOTICE FROM THE CONTRACTOR WITHIN TEN (10) DAYS AFTER THE DETAILED DRAWINGS HAVE BEEN RECEIVED BY HIM, IT IS HEREBY AGREED THAT THE CONTRACTOR ACCEPTS THE DRAWINGS AND WILL EXECUTE THEM WITHOUT CLAIM FOR EXTRA COMPENSATION.

ERRORS AND DISCREPANCIES

IF THE CONTRACTOR, IN THE COURSE OF HIS WORK, FINDS ANY DISCREPANCY BETWEEN THE PLANS, DESCRIPTION AND LOCATION OF WORK, ESTIMATE OF QUANTITIES, THE PHYSICAL CONDITION OF THE LOCALITY, OR ANY ERRORS IN PLANS OR IN THE LAYOUT AS GIVEN BY THE DRAWINGS AND INSTRUCTIONS WHICH MAKE IT IMPOSSIBLE FOR HIM TO COMPLETE THE WORK REQUIRED UNDER THE PLANS AND SPECIFICATIONS, IT SHALL BE HIS DUTY TO IMMEDIATELY INFORM THE ENGINEER IN WRITING AND THE ENGINEER SHALL VERIFY THE SAME. ANY WORK DONE AFTER SUCH DISCOVERY, UNTIL AUTHORIZED, SHALL BE DONE AT THE CONTRACTOR'S RISK.

FLOODS AND FREEZING WEATHER

PROPER FACILITIES SHALL BE PROVIDED FOR PROTECTING THE WORK FROM DAMAGE BY FLOOD, RAIN OR FROST, AND WORK DONE IN FREEZING WEATHER SHALL BE DONE IN SUCH MANNER AS THE ENGINEER MAY APPROVE. VALVES SHALL BE PROTECTED FROM FREEZING UNTIL BACKFILLED IN THE COMPLETED WORK.

ADDITIONAL WORK

ATTENTION IS CALLED TO THE FACT THAT THE WORK UNDER THIS CONTRACT INCLUDES CERTAIN PERFORMANCE AS INCIDENTAL TO THE ITEMIZED REQUIREMENTS HEREOF, THOUGH NOT EXCLUSIVE AS FOLLOWS:

CONTINGENCY QUANTITIES

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER, TO PROVIDE FOR WATER MAIN REPAIRS THAT MAY BE REQUIRED DURING CONSTRUCTION.

ITEM SPECIAL - 12" WATER MAIN DUCTILE IRON PIPE WITH PUSH-ON JOINTS AND RETAINED MECHANICAL JOINT FITTTINGS, ANSI CLASS 52 — 50 LIN. FT.

(A) TO PERFORM ALL EXCAVATION, BACKFILLING, SHEETING, SHORING, AND TO TEST AND CHLORINATE THE INSTALLATION. THE COUNTY WILL MAKE NO SPECIFIC OR SEPARATE PAYMENT OR ALLOWANCE, BUT THE COST THERE SHALL BE INCLUDED IN THE PRICES STIPULATED TO BE PAID FOR UNDER THE VARIOUS WATERWORK ITEMS TO BE DONE UNDER THIS CONTRACT.

(B) PRELIMINARY FLUSHING: BEFORE BEING PLACED IN SERVICE, ALL DIRT AND FOREIGN MATTER SHALL BE REMOVED FROM THE NEW AND/OR RELOCATED WATER MAIN OR EXTENSIONS TO EXISTING MAINS BY A THOROUGH FLUSHING THROUGH THE HYDRANTS OR BY OTHER APPROVED MEANS. EACH VALVED SECTION OF NEWLY LAID PIPE SHALL BE FLUSHED INDEPENDENTLY. THIS SHALL BE DONE AFTER THE PRESSURE TEST AND MAY BE DONE BEFORE OR AFTER THE TRENCH SHALL HAVE BEEN BACKFILLED.

(C) FLUSH, TEST AND SAMPLE: THE CITY, DIVISION OF WATER, WILL CHARGE TO THE CONTRACTOR A "FLUSHING, TEST AND SAMPLE" FEE FOR DIVISION OF WATER LABOR INCURRED IN THE WORK, PAYABLE TO THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER BEFORE ANY WORK IS PERFORMED. FLUSHING, TEST AND SAMPLING IS LIMITED TO 350 LINEAR FEET OF WATER MAIN. NEW AND/OR RELOCATED WATER MAINS OR EXTENSION OF WATER MAINS EXCEEDING 350 LINEAR FEET SHALL BE CHLORINATED. CHLORINATION FEES WILL BE CHARGED TO THE CONTRACTOR FOR CWD LABOR INCURRED IN THE CHLORINATION OF MAINS.

24-INCH WATER MAIN SHUT DOWN REQUIREMENTS

(A) THE 24" WATER MAIN MAY BE SHUT DOWN BETWEEN LABOR DAY AND MEMORIAL DAY WITH ADVANCED NOTICE TO THE FOLLOWING PERSONS:
PIERRE HADDAD - ENGINEERING, 216-664-2444 EX. 5571
XXXXX - DISTRIBUTION, 216-348-7277
PAYTON HALL - CONTROL CENTER, 216-664-4018

(B) SHORT PERIODS OF SHUTDOWN MAY BE AUTHORIZED THROUGH COORDINATION WITH THE ABOVE INDIVIDUALS WITH THE SAME ADVANCE SHUTDOWN NOTICE.

(C) VALVES 18" AND LARGER SHALL BE OPERATED BY CLEVELAND DIVISION OF WATER PERSONNEL ONLY. VALVES SMALLER THAN 18" MAY BE OPERATED BY THE CONTRACTOR ONLY IF A CLEVELAND DIVISION OF WATER INSPECTOR IS PRESENT.

(D) CONTRACTOR SHALL LOCATE THE EXISTING WATER ENDS WHERE CONNECTION OF THE PROPOSED WATER MAIN IS TO BE MADE ALONG WITH THE NEXT NEAREST JOINT TO DETERMINE THE EXACT ALIGNMENT, DEPTH AND GRADE OF THE EXISTING WATER MAIN. IN LOCATING THE EXISTING PIPE END THE CONTRACTOR SHALL DETERMINE THE EXACT TYPE OF THE EXISTING JOINT AND THE DIRECTION OF THE JOINT. NO PIPE FABRICATION DRAWING WILL BE APPROVED UNTIL THIS NOTIFICATION IS FURNISHED TO THE DESIGN ENGINEER, THE CITY AND THE PIPE FABRICATOR.

(E) ALL FIELD INFORMATION SHALL BE OBTAINED, SIGNED AND SEALED BY A PROFESSIONAL SURVEYOR REGISTERED IN THE STATE OF OHIO. ALL FIELD INFORMATION SHALL BE OBTAINED IN THE PRESENCE OF AND UNDER THE SUPERVISION OF THE DESIGN ENGINEER'S/CITY RESIDENT INSPECTOR.

(F) CONTRACTOR TO LOCATE EXISTING JOINTS IN WATERLINE NEAR PROPOSED CONNECTIONS AND NOTIFY ENGINEER, TO DETERMINE BEST LOCATION TO CONNECT THE PROPOSED LINE. DESIGN MAY VARY TO PREVENT CONNECTION FROM BEING LOCATED WITHIN WEST 150TH STREET AND STILL ALLOWING FOR PROPER CLEARANCE FROM SEWER STRUCTURE, THUS CHANGING SOME INTERMEDIATE PIPE LENGTHS OR ANGLES AS NECESSARY.

(G) THE CONTRACTOR SHALL OBTAIN CLEVELAND WATER DIVISION APPROVAL BEFORE THE WATER LINE RELOCATION WORK IS PERFORMED. THIS INCLUDES SUBMITTING THE NECESSARY MATERIAL SPECIFICATIONS AND LAYING SCHEDULE SHOP DRAWINGS TO THE CITY OF CLEVELAND WATER DIVISION. INFORMATION REGARDING THE AMOUNT OF CHARGES AND PERMIT TYPES CAN BE OBTAINED FROM THE PERMITS AND SALES SECTION, DIVISION OF WATER AT 216-664-2444 EX. 5202.

(H) THE CONTRACTOR SHALL CONTACT MR. RICHARD KMETZ, SUPERVISOR OF THE INSPECTION AND ENFORCEMENT UNIT OF THE DIVISION AT 216-664-2342 THREE WEEKS PRIOR TO THE START OF THE PROJECT.

(I) THE CONTRACTOR IS REQUIRED TO USE THE MOST RECENT, UPDATED VERSION OF THE CITY OF CLEVELAND DIVISION OF WATER'S SUPPLY MAIN INSTALLATION DETAILS AND SPECIFICATIONS.

TESTING MAINS

(A) ALL PIPES, VALVES, FITTINGS, ETC., SHALL BE LAID IN SUCH A MANNER AS TO LEAVE ALL JOINTS WATERTIGHT. AFTER THE PIPE IS LAID, SUCH LENGTHS OF THE WATER MAIN AS THE CITY OR HIS DESIGNATE MAY DETERMINE, SHALL BE TESTED UNDER HYDROSTATIC PRESSURE INDICATED IN GENERAL NOTES.

(B) THE HYDROSTATIC TEST SHALL BE UNDER THE DIRECTION OF THE CITY, OR ITS DESIGNATE. THE CONTRACTOR MAY OBTAIN WATER FOR TESTING BY OBSERVING THE RULES AND REGULATIONS ENFORCED IN THE MUNICIPALITIES OR TOWNSHIPS IN WHICH THE WORK IS BEING DONE. THE CITY WILL FURNISH A PRESSURE GAUGE FOR MEASURING THE PRESSURE ON THE WATER MAIN, BUT THE CONTRACTOR SHALL FURNISH A SUITABLE PUMP, PIPES, TEST HEADS AND ALL APPLIANCES, LABOR, FUEL AND OTHER APPURTENANCES NECESSARY TO MAKE THESE TESTS.

(C) THE HYDROSTATIC TEST PRESSURE SHALL BE FOR A DURATION OF A MINIMUM OF TWO (2) HOURS WITH ALL VALVES CLOSED DURING WHICH TIME THE INTERNAL PRESSURE SHALL REMAIN WITHIN 5 PSI OF THE SPECIFIED TEST PRESSURE. SHOULD THE TEST PRESSURE DROP MORE THAN 5 PSI, THE CONTRACTOR SHALL RECHARGE THE WATER MAIN TO THE SPECIFIED TEST PRESSURE AND LOCATE AND REPAIR THE LEAK TO THE SATISFACTION OF THE CITY. ANY DAMAGED OR DEFECTIVE PIPE, PIPE JOINTS, FITTINGS, VALVES, HYDRANTS OR APPURTENANCES SHALL BE REPAIRED OR REPLACED WITH SOUND MATERIAL AND THE HYDROSTATIC PRESSURE TEST REPEATED.

(D) AFTER A SECTION OF THE WATER MAIN HAS BEEN TESTED, THE CONTRACTOR SHALL FLUSH THE SAME. IN THE CASE OF SUPPLY MAINS WHERE DRAINS ARE CONNECTED TO VALVE OR DRAIN VAULTS, THE CONTRACTOR SHALL, WITHIN A REASONABLE TIME AFTER THE TEST HAS BEEN COMPLETED, PUMP ALL WATER OUT OF THE VAULTS. FLUSHING SHALL BE DONE IN ACCORDANCE WITH THESE SPECIFICATIONS.

(E) IN COLD WEATHER IMMEDIATELY AFTER TESTING A SECTION OF THE WATER MAIN, THE CONTRACTOR SHALL OPEN ALL VALVES, AND IN THE CASE OF SUPPLY MAINS ALL AIR RELIEF VALVES, BYPASSES AND DRAINS AND PROPERLY DRAIN BONNETS OF ALL VALVES IN THE SECTION OF THE WATER MAIN, AND TAKE ALL OTHER PRECAUTIONS NECESSARY TO PREVENT INJURY TO WATER MAIN AND APPURTENANCES DUE TO FREEZING.

(F) IN ORDER TO BE ABLE TO MAKE PROPER ALLOWANCE FOR LEAKAGE AT VALVES, AIR RELIEF VALVES, BYPASSES, AND DRAINS, ONLY THOSE SECTIONS OF WATER MAIN MAY BE TESTED AS SHALL HAVE SUCH VALVES, TEST PLUGS AND CAPS ACCESSIBLE. THE PERMITTED LEAKAGE SHALL NOT EXCEED A RATE OF SEVENTY-FIVE (75) GALLONS PER TWENTY-FOUR (24) HOURS PER MILE OF PIPE PER INCH OF NOMINAL DIAMETER.

(G) IN TESTING NEW MAINS, THE CONTRACTOR SHALL NOT BE PERMITTED TO USE ANY PART OF THE EXISTING MAINS IN HIS TEST UNLESS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS. THE LIMITS OF THE HYDROSTATIC SHALL BE AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL PROVIDE BLIND FLANGES, PLUGS OR CAPS, DEPENDING ON DESIGN, TO THE TESTED LENGTH OF THE PROPOSED MAIN SO THAT IT WILL BE COMPLETELY INDEPENDENT OF THE SAID EXISTING MAINS. PROPER RESTRAINT OF ALL BLIND FLANGES, PLUGS OR CAPS TO PREVENT BLOWOFF SHALL BE PROVIDED AND IN THE CASE OF DEAD END MAINS CONCRETE PIERS WILL BE REQUIRED. NO EXTRA PAYMENT WILL BE MADE AND THE ENTIRE COST SHALL BE DEEMED TO BE INCLUDED IN THE BID PRICE.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

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WATER WORK NOTES

WATER MAIN DISINFECTION

WATER MAIN DISINFECTION SHALL CONSIST OF: (A) PRELIMINARY FLUSHING WATER MAINS AFTER THE HYDROSTATIC TEST AND PRIOR TO THE CHLORINATION PROCEDURE; (B) THE CHLORINATION PROCEDURE; (C) THE FINAL FLUSHING; (D) SAMPLING. ALL CONTRACTOR LABOR AND MATERIAL REQUIRED TO ASSIST THE CITY IN THE DISINFECTION OF WATER MAINS SHALL BE INCLUDED IN THE PRICE PER LINEAR FOOT OF WATER MAIN BID. THE CITY, DIVISION OF WATER WILL CHARGE TO THE CONTRACTOR A "CHLORINATION" FEE FOR DIVISION OF WATER LABOR INCURRED IN THE WORK, PAYABLE TO THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER BEFORE ANY WORK IS PERFORMED.

(A) PRELIMINARY FLUSHING:

BEFORE DISINFECTION ALL DIRT AND FOREIGN MATTER SHALL BE REMOVED FROM THE NEW AND/OR RELOCATED WATER MAIN OR EXTENSIONS TO EXISTING MAINS BY A THOROUGH FLUSHING THROUGH THE HYDRANTS OR BY OTHER APPROVED MEANS BY THE CONTRACTOR. EACH VALVED SECTION OF THE NEWLY LAID PIPE SHALL BE FLUSHED INDEPENDENTLY. THIS SHALL BE DONE AFTER THE PRESSURE TEST. FLUSHING SHALL BE IN ACCORDANCE WITH ANSI/AWWA C-651 STANDARD FOR "DISINFECTING WATER MAINS." WHERE THE FLUSHING VELOCITY SPECIFIED THEREIN CANNOT BE ATTAINED FLUSHING RATES AS DETERMINED BY THE CITY TO BE SUFFICIENT WILL BE PERMITTED. IF IN THE OPINION OF THE CITY THE FLUSHING PRIOR TO THE CHLORINATION PROCEDURE DOES NOT REMOVE DIRT OR OTHER ACCUMULATIONS IN THE PIPE, THE PIPE SHALL BE CLEANED BY MECHANICAL MEANS BY THE CONTRACTOR AND THE FLUSHING SHALL BE REPEATED.

(B) CHLORINATION PROCEDURE:

SUCH LENGTHS OF THE WATER MAIN AS THE CITY MAY DETERMINE, SHALL BE CHLORINATED; HOWEVER, IN NO CASE SHALL THE LENGTH EXCEED THAT WHICH CAN BE CHLORINATED SATISFACTORILY IN ONE (1) WORK DAY. SUCH MAXIMUM LENGTH IS GENERALLY UP TO THREE (3) MILES TOTAL, INCLUDING BRANCHES AND CONNECTING WATER MAIN(S), FOR SIXTEEN INCH (16") AND SMALLER; AND THREE (3) VALVE SECTIONS, OR TWO (2) MILES, FOR TWENTY INCH (20") OR LARGER WATER MAINS.

THE CONTRACTOR SHALL COOPERATE WITH THE CITY'S CHLORINATION CREW AND/OR INSPECTOR BY OPERATING ANY REQUIRED WATER MAIN APPURTENANCES TO ASSURE THE DISINFECTION OF SUCH APPURTENANCES AND OF ANY PIPE BRANCHES TO ASSURE CHLORINATION SOLUTION IS CONFINED TO WATER MAIN BEING DISINFECTED. NO OPERATION OF WATER MAIN APPURTENANCES BY THE CONTRACTOR SHALL BE PERFORMED WITHOUT THE CONSENT OF THE CITY.

THE CITY OF CLEVELAND, DIVISION OF WATER'S, CHLORINATION CREW WILL DETERMINE THE LENGTH OF TIME THE CHLORINE SOLUTION IS TO REMAIN IN THE WATER MAIN BEING DISINFECTED.

(C) FINAL FLUSHING:

1. THE FLUSHING OF THE CHLORINATION SOLUTION SHALL BE DONE BY THE CONTRACTOR UNTIL THE CHLORINE SOLUTION IS TOTALLY FLUSHED OUT OF THE SYSTEM BEING DISINFECTED. ALL FLUSHING SHALL BE UNDER THE CONTROL OF THE CITY, OR HIS DESIGNATE. THE CONTRACTOR SHALL OBTAIN WATER FOR FLUSHING IN THE SAME MANNER AS FOR TESTING.

2. IN FLUSHING, THE CONTRACTOR SHALL PROPERLY DISPOSE OF THE CHLORINATION SOLUTION. ONLY POINTS OF DISCHARGE APPROVED BY THE ENGINEER AND THE CITY'S CHLORINATION CREW SHALL BE UTILIZED WITHOUT ANY TREATMENT TO CHEMICALLY NEUTRALIZE THE SOLUTION. IN CASES WHERE DIRECT DISPOSAL IS NOT APPROVED, THE CONTRACTOR SHALL NEUTRALIZE THE CHLORINE SOLUTION AS PROVIDED IN APPENDIX B OF AWWA C-651. CONTRACTOR SHALL OBTAIN APPROVAL, IN WRITING, OF THE LOCAL SEWER AUTHORITY BEFORE DISPOSING TO A SANITARY SEWER. A COPY OF SUCH WRITTEN APPROVAL SHALL BE PROVIDED TO THE INSPECTOR AND CHLORINATION CREW BEFORE ANY FLUSHING IS BEGUN.

3. THE CITY'S CHLORINATION CREW WILL DETERMINE WHEN THE DISINFECTION SOLUTION HAS BEEN SATISFACTORILY FLUSHED FROM THE MAIN AND BRANCHES.

(D) SAMPLING:

1. A TIME PERIOD AS DETERMINED BY THE CITY SHALL ELAPSE BEFORE WATER SAMPLES ARE TAKEN FROM THE WATER MAIN(S) AND BRANCH(ES) TO DETERMINE THE BACTERIOLOGICAL QUALITY OF THE WATER THEREIN. IN NO CASE, SHALL THE TIME PERIOD BE LESS THAN TWENTY-FOUR (24) HOURS.

NO SAMPLES SHALL BE TAKEN FROM FIRE HYDRANTS. THE CONTRACTOR SHALL ASSIST THE CITY'S CHLORINATION CREW IN OBTAINING SAMPLES. THE CITY WILL FURNISH ALL CONTAINERS AND CONTROL PROCEDURES FOR OBTAINING SAMPLES. THE CITY WILL DETERMINE THE NUMBER AND LOCATIONS OF SAMPLES TO BE TAKEN FROM THE DISINFECTED SECTIONS.

THE CITY WILL DETERMINE THE BACTERIOLOGICAL QUALITY OF THE WATER SAMPLES. IF SAMPLING RESULTS IN TWO (2) CONSECUTIVE POSITIVE SAMPLES, THE PROCEDURE OF CHLORINATION, FLUSHING AND SAMPLING SHALL BE REPEATED. FIGURE 1, SUGGESTED COMBINATION AND SAMPLING TAP, TAKEN FROM AWWA C-651, IS HEREIN MADE A PART OF THESE SPECIFICATIONS.

2. IN CASES WHERE THE LENGTH OF WATER MAIN IS LESS THAN 350 FEET, AFTER HYDROSTATIC TESTING ONLY, PRELIMINARY FLUSHING AND SAMPLING WILL BE DONE; HOWEVER, IF THERE ARE TWO (2) POSITIVE SAMPLES, AFTER FLUSHING, THE ENTIRE PROCEDURE OF PRELIMINARY FLUSHING, CHLORINATION, FLUSHING AND SAMPLING SHALL BE REQUIRED. THE CITY'S CHLORINATION CREW WILL COMPLETE AND DISTRIBUTE THE CHLORINATION APPROVAL FORM.

CONTRACTOR'S LABOR

THE CONTRACTOR SHALL FURNISH AT LEAST TWO (2) TRAINED WORKMEN TO PERFORM ALL LABOR UNDER THE SUPERVISION AND DIRECTION OF THE CITY'S CHLORINATION CREW. THE CONTRACTOR'S LABORERS SHALL PERFORM ALL DUTIES SPECIFIED IN WATER MAIN DISINFECTION GENERAL NOTE. THE CONTRACTOR SHALL PROVIDE PROPER EQUIPMENT AND PROTECTIVE CLOTHING AS MAY BE REQUIRED BY THE LABORERS IN PERFORMING THE NEEDED TASK.

ACCESS PITS

(A) THE CONTRACTOR SHALL PROVIDE TIGHTLY WOOD SHEETED ACCESS PITS, CONFORMING TO THE REQUIREMENTS OF "THE SPECIFIC SAFETY REQUIREMENTS OF THE INDUSTRIAL COMMISSION OF OHIO RELATING TO CONSTRUCTION" RULE 4121:1-3-13, FOR ACCESS TO ALL WATER MAIN APPURTENANCES TO BE UTILIZED IN DISINFECTING WATER MAINS.

(B) THE CONTRACTOR SHALL HAVE ON HAND READY FOR USE, PUMPING EQUIPMENT TO DEWATER ANY AND ALL ACCESS PITS USED FOR DISINFECTING WATER MAINS AND SHALL DEWATER THE ACCESS PITS WHEN ORDERED BY THE CITY.

CONNECTION OF NEW MAINS

WHEN THE NEW AND/OR RELOCATED WATER MAINS HAVE BEEN TESTED AND CHLORINATED AND ARE READY TO BE CONNECTED TO THE EXISTING MAIN, THE CONTRACTOR SHALL MAKE SUCH CONNECTIONS AT A TIME DESIGNATED BY THE CITY. PRIOR TO SHUTTING DOWN THE EXISTING MAINS, THE CONTRACTOR SHALL TAKE SUITABLE PRECAUTIONS TO ASSURE A MINIMUM INTERRUPTION TO SERVICE, INCLUDING THE FOLLOWING:

(A) PERFORM ALL NECESSARY EXCAVATION, INCLUDING BELL HOLES, EXPOSING THE EXISTING MAIN SUFFICIENTLY FOR THE OPERATION OF THE PIPE SAW BY THE CITY, OR PIPE CUTTING BY THE CONTRACTOR.

(B) REMOVE THE CAP OR PLUG FROM THE END OF THE NEW MAIN.

(C) SWAB THE INSIDE OF ALL PIPES, BENDS, SLEEVES, COUPLINGS AND OTHER FITTINGS TO BE USED IN CONNECTION THOROUGHLY WITH A CHLORINE SOLUTION OF AT LEAST 100 P.P.M.

(D) MAKE UP AS MUCH OF THE WATER MAIN CONNECTION AS POSSIBLE OUTSIDE THE DITCH TO ELIMINATE THE NEED FOR MAKING MOST OF THE NECESSARY JOINTS DURING THE SHUTDOWN. BY CAREFUL MEASUREMENT ALL PIPE CUTS MAY BE MADE BY THE CONTRACTOR PRIOR TO SHUTTING DOWN.

(E) HAVE SUFFICIENT MANPOWER AND EQUIPMENT ON THE SITE TO PERFORM THE OPERATION IN A MINIMUM AMOUNT OF TIME.

(F) PERFORM AS MUCH OF THE SERVICE AND HYDRANT CONNECTION WORK ALONG RELOCATED MAINS AS IS POSSIBLE.

(G) IN THE TIME PERIOD FROM APRIL 1, THRU TO NOVEMBER 1, NO SHUTDOWNS WILL BE PERMITTED DUE TO SEASONAL AND SYSTEM DEMANDS UNLESS OTHERWISE APPROVED BY THE CITY.

PAINTING

(A) IT IS THE INTENTION OF THESE SPECIFICATIONS TO PROVIDE THAT ALL METAL WORK SUBJECT TO CORROSION SHALL BE SATISFACTORILY PROTECTED BY A DURABLE COATING OF PAINT OR OTHER APPROVED MATERIAL AND THAT ALL METAL SURFACES NOT BURIED IN EARTH, OR IN CONCRETE SHALL BE LEFT CLEAN AND WELL PAINTED AT THE COMPLETION OF THE CONTRACT. UNLESS OTHERWISE SPECIFIED, THE PROTECTION SHALL BE AT LEAST THAT GIVEN BY THREE (3) COATS OF APPROVED PAINT. THE FIRST COAT IS TO BE APPLIED AT THE SHOP BEFORE THE METAL HAS RUSTED AND AFTER ALL GREASE, DIRT AND SCALE HAS BEEN REMOVED. BOLTS AND NUTS SHALL NOT BE SHOP COATED, BUT SHALL RECEIVE THREE (3) COATS OF APPROVED PAINT AFTER INSTALLATION.

(B) ALL METAL WORK WHICH HAS NOT BEEN COATED BEFORE THE ARRIVAL ON THE JOB SHALL BE GIVEN A TEMPORARY PROTECTIVE COATING OF SUCH A NATURE AS TO PERMIT THE READY ADHERENCE OF FUTURE COATINGS. THE TEMPORARY COATING SHALL BE A GOOD GRADE ASPHALTIC PAINT OR OTHER APPROVED MATERIAL. THE TEMPORARY PROTECTION SHALL APPLY PARTICULARLY TO THE VALVE BOXES AND COVERS, MANHOLE RINGS AND COVERS, LADDERS AND LADDER RUNGS, DRESSER TYPE/VICTAULIC TYPE COUPLINGS AND ELSEWHERE WHEN IN THE OPINION OF THE CITY, SUCH PROTECTION IS NECESSARY.

(C) ALL SURFACES OF METAL WHICH WILL BE IN CONTACT AFTER ASSEMBLING SHALL BE PAINTED, AT LEAST ONE (1) COAT, BEFORE ASSEMBLING. THE FINAL COAT OF PAINT ON ALL EXPOSED WORK SHALL BE GIVEN SHORTLY BEFORE THE COMPLETION OF THE CONTRACT.

(D) WHERE PAINTING CLAUSES APPEAR HEREINAFTER, THEY SHALL TAKE PRECEDENCE OVER THIS SECTION, EXCEPT THAT TEMPORARY PROTECTION HEREIN DESCRIBED MAY BE REQUIRED.

(E) ALL OF THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE PARTICULAR ITEM REQUIRING THE PAINTING.

TESTS, INSPECTION AND REPORTS

NOTWITHSTANDING THE REQUIREMENTS OF ANY OTHER PROVISIONS OF THESE SPECIFICATIONS, THE CONTRACTOR SHALL ARRANGE FOR AND PAY ALL COSTS INVOLVED FOR SHOP INSPECTION OF ALL MATERIALS FURNISHED, MANUFACTURE OF ALL PIPE, VALVES, FITTINGS, ETC., FIELD AND SHOP WELDS AND WELDING, AND FURNISH TO THE COUNTY AND THE CITY OF CLEVELAND COPIES OF ALL SHOP, FABRICATION, MANUFACTURE AND OTHER RELATED INSPECTION REPORTS OF MATERIALS FURNISHED. THIS INSPECTION SHALL BE DONE BY A RECOGNIZED INSPECTION LABORATORY APPROVED BY THE CITY OF CLEVELAND. IN THE CASE OF ANY ITEM NOT SPECIFICALLY MENTIONED IN THE "WATERWORK NOTES," OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS - JANUARY 1, 1997 SHALL GOVERN.

HANDLING PIPE AND ACCESSORIES

(A) UNLOADING PIPE, FITTINGS, VALVES, HYDRANTS, AND OTHER ACCESSORIES SHALL, UNLESS OTHERWISE DIRECTED, BE UNLOADED AT THE POINT OF DELIVERY, HAULED TO AND DISTRIBUTED AT THE SITE OF THE PROJECT BY THE CONTRACTOR. THEY SHALL AT ALL TIMES BE HANDLED WITH CARE TO AVOID DAMAGE. IN LOADING AND UNLOADING, THEY SHALL BE LIFTED BY HOISTS OR SLID, OR ROLLED ON SKIDWAYS IN SUCH MANNER AS TO AVOID SHOCK. UNDER NO CIRCUMSTANCES SHALL THEY BE DROPPED. PIPE HANDLED ON SKIDWAYS MUST NOT BE SKIDDED OR ROLLED AGAINST PIPE ALREADY ON THE GROUND.

(B) AT SITE OF WORK: IN DISTRIBUTING THE MATERIAL AT THE SITE OF THE WORK, EACH PIECE SHALL BE UNLOADED OPPOSITE OR NEAR THE PLACE WHERE IT IS TO BE LAID IN THE TRENCH.

(C) PROTECTION OF PIPE COATING: PIPE SHALL BE HANDLED IN SUCH MANNER THAT A MINIMUM AMOUNT OF DAMAGE TO THE COATING WILL RESULT. ANY PIPE OR FITTING, THE COATING OF WHICH HAS BEEN DAMAGED IN SHIPPING OR HANDLING, SHALL HAVE THE DAMAGED PORTION WELL CLEANED AND COATED IN THE SHOP WITH A MATERIAL EQUAL TO THAT APPLIED TO THE PIPE AND FITTINGS AND APPROVED BY THE CITY BEFORE BEING PLACED IN THE WORK. THE CONTRACTOR SHALL THOROUGHLY COAT ALL EXPOSED PARTS OF BOLTS AND NUTS WITH AN APPROVED ASPHALT PAINT, AFTER ALL PIPE HAS BEEN LAID AND BEFORE BACKFILLING HAS BEEN PLACED. ALL FIELD COATINGS SHALL BE FURNISHED AND APPLIED BY THE CONTRACTOR.

(D) PROTECTION OF CONCRETE PIPE: IF, IN THE PROCESS OF MANUFACTURE, TRANSPORTATION, OR HANDLING, ANY CONCRETE PIPE, FITTING OR SPECIAL RECEIVES ANY INDENTATION OR DEFORMATION TO THE CONCRETE, STEEL ENDS OR CONNECTIONS, THE REMOVAL OF WHICH WILL IN ANY DEGREE INJURE IT, SUCH PIPE, FITTING OR SPECIAL SHALL BE REJECTED AND REPLACED WITH NEW MATERIAL TO THE SATISFACTION OF THE CITY AT THE CONTRACTOR'S EXPENSE.

(E) PIPE KEPT CLEAN: THE INTERIOR OF THE PIPE, FITTINGS, AND OTHER ACCESSORIES SHALL BE KEPT FREE FROM DIRT AND FOREIGN MATTER AT ALL TIMES.

(F) FROST PROTECTION: VALVES AND HYDRANTS BEFORE INSTALLATION SHALL BE DRAINED AND STORED IN A MANNER THAT WILL PROTECT THEM FROM DAMAGE BY FREEZING.

CHANGES IN WATER MAINS

WHEREVER IT BECOMES NECESSARY, IN THE OPINION OF THE ENGINEER OR THE CITY TO CHANGE THE LOCATION OR ELEVATION OF WATER MAINS AND HYDRANTS AND WHERE WATER MAIN CONNECTIONS ARE TO BE MADE BETWEEN EXISTING DISTRIBUTION MAINS AND WATER MAINS INSTALLED UNDER THIS CONTRACT, THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING LINE MATERIALS AS REQUIRED IN ORDER TO RECONNECT THE WATER MAIN AND SHALL FURNISH AND INSTALL COMPLETE, ALL NEW WATER MAIN MATERIALS INCLUDING PIPE, FITTINGS AND VALVES TO MAKE THE CONNECTIONS INDICATED, EXCEPT BRANCH SLEEVES AND VALVES WHICH SHALL BE FURNISHED BY THE CONTRACTOR BUT WILL BE INSTALLED BY THE CITY, EXCEPT WHERE OTHERWISE SPECIFIED UNDER THE SECTION ENTITLED "WORK TO BE DONE BY THE CITY." THE CONTRACTOR SHALL ALSO FURNISH ALL NECESSARY LABOR, MATERIALS, TOOLS AND EQUIPMENT AND MAKE THE EXCAVATION, BACKFILL AND REPAVING FOR SUCH CONNECTIONS. PAYMENT FOR THIS SHALL BE INCLUDED IN PRICE BID UNDER THE APPROPRIATE ITEM FOR SIZE OF WATER MAIN OR CONNECTION TO BE INSTALLED. ALL WATER MAIN MATERIALS, VALVES, AND APPURTENANCES REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR. (SEE WORK TO BE DONE BY THE CITY).

WORK TO BE DONE BY THE CITY

(A) TAPPING MAINS: THE CONTRACTOR SHALL FURNISH ALL BRANCH SLEEVES, TAPPING SADDLES AND TAPPING VALVES OF THE SIZES AND TYPES INDICATED ON THE CONTRACT DRAWINGS. THE CONTRACTOR SHALL DO ALL THE NECESSARY EXCAVATION, BACKFILLING, SEEDING OR SODDING AND REPAVING REQUIRED THEREFORE. THE CONTRACTOR SHALL ALSO FURNISH ALL EQUIPMENT, TOOLS AND INCIDENTALS, INCLUDING AIR COMPRESSOR, REQUIRED TO DO THIS WORK.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

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WATER WORK NOTES

1) THE CITY WILL INSTALL ALL BRANCH SLEEVES, TAPPING SLEEVES AND TAPPING VALVES ON ALL CAST IRON, DUCTILE IRON AND CONCRETE PIPE OF ALL SIZES.

2) THE CITY WILL MAKE THE PRESSURE TAPS ON CAST IRON OR DUCTILE IRON WATER MAINS FOR TAP SIZES UP TO AND INCLUDING 16–INCHES, AND ON CONCRETE WATER MAINS FOR TAP SIZES UP TO AND INCLUDING 12–INCHES.

3) THE CONTRACTOR SHALL ARRANGE FOR AND SHALL PAY FOR ALL PRESSURE TAPS OF 20–INCH AND LARGER ON CAST IRON OR DUCTILE IRON WATER MAINS AND FOR ALL PRESSURE TAPS OF 16–INCH AND LARGER ON CONCRETE AND STEEL WATER MAINS. THE CONTRACTOR'S COSTS FOR SUCH ARRANGEMENTS FOR PRESSURE TAPPING SHALL BE INCLUDED IN THE APPROPRIATE BID ITEM.

4) THE CITY WILL NOT OPERATE EQUIPMENT PROVIDED BY THE CONTRACTOR. HOWEVER, THE CITY WILL INSTALL ALL BRANCH SLEEVES, TAPPING SADDLES AND TAPPING VALVES AS INDICATED HEREIN AND WILL ASSIST IN MAKING THE PRESSURE TAP WHERE PRESSURE TAPPING IS PROVIDED BY THE CONTRACTOR. THE CITY WILL ONLY OPERATE EQUIPMENT BELONGING TO THE CITY. ALL LABOR COSTS INCURRED BY THE CITY FOR WORK REQUIRED TO BE DONE BY THE CITY IN THE TAPPING OF WATER MAINS WILL BE CHARGED TO THE CONTRACTOR. SEE THE "DIVISION OF WATER–LABOR CHARGES" NOTE. THE CITY, DIVISION OF WATER, WILL CHARGE TO THE CONTRACTOR A "TAPPING FEE" FOR DIVISION OF WATER INCURRED IN IN THE WORK, PAYABLE TO THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER BEFORE ANY WORK IS PERFORMED.

(B) PIPE CUTTING: IN LOCATIONS WHERE BRANCH SLEEVES AND VALVES CANNOT BE INSTALLED, THE CONTRACTOR WILL BE REQUIRED TO CUT IN TEES AND SLEEVE–IN THE REMAINDER OF THE CUT SECTION OF THE EXISTING MAIN, OR, WHEN OTHERWISE REQUIRED WHERE THE CONTRACTOR MUST MAKE PIPE CUTS, IT IS CALLED TO THE CONTRACTOR'S ATTENTION THAT THE DIVISION OF WATER HAS ON HAND AT HARVARD YARDS MOTOR OPERATED PIPE CUTTERS WHICH ARE AVAILABLE FOR CUTTING PIPE BY CITY FORCES.

THE COSTS CHARGED FOR PIPE CUTTING BY CITY FORCES MAY BE OBTAINED FROM THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER, PUBLIC UTILITIES BUILDING, 1201 LAKESIDE AVENUE, CLEVELAND, OHIO 44114. THE CONTRACTOR SHALL DO ALL NECESSARY EXCAVATION, BACKFILLING AND REPAVING AND ALL AIR COMPRESSOR AND CRANE SERVICE SHALL BE FURNISHED BY THE CONTRACTOR. THE CITY, DIVISION OF WATER, WILL CHARGE TO THE CONTRACTOR A "PIPE CUTTING FEE" FOR DIVISION OF WATER LABOR INCURRED IN THE WORK, PAYABLE TO THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER BEFORE ANY WORK IS PERFORMED.

DIVISION OF WATER – LABOR CHARGES

THE CITY, DIVISION OF WATER, WILL CHARGE TO THE CONTRACTOR CERTAIN CHARGES PURSUANT TO SECTION 531.03(a) OF THE CODIFIED ORDINANCES OF THE DIVISION OF WATER, AS AMENDED BY ORDINANCE 1043–75 AND ADOPTED BY THE CITY OF CLEVELAND BOARD OF CONTROL RESOLUTION NO: 003–82, AND PER ORDINANCE NO: 2661–81, FOR DIVISION OF WATER LABOR REQUIRED IN THE WORK, PAYABLE TO THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER BEFORE ANY WORK IS PERFORMED. THE PROSPECTIVE BIDDERS/CONTRACTOR SHALL VERIFY THE LATEST CHARGES WITH THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER FOR THE VARIOUS WORK IN ACCORDANCE WITH 102.05 OF THE GENERAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE IN HIS BID, INCLUDED WITH THE APPROPRIATE PAY ITEM FOR WATER WORK TO BE PERFORMED IN THIS CONTRACT, ANY AND ALL CITY OF CLEVELAND, DIVISION OF WATER, LABOR CHARGES IN THE AMOUNTS CURRENTLY IN EFFECT AND ON FILE WITH THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER. NO COMPENSATION WILL BE PROVIDED TO THE CONTRACTOR(S) BY THE COUNTY FOR DIVISION OF WATER LABOR CHARGES FOR WORK REQUIRED TO BE PERFORMED BY THE DIVISION OF WATER BUT THE REQUIRED DIVISION OF LABOR CHARGES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR(S) AND SHALL BE DEEMED TO BE INCLUDED IN THE PRICE BID FOR THE APPROPRIATE WATER WORK PAY ITEM.

EXCAVATION

(A) THE CONTRACTOR SHALL REMOVE ALL EXISTING STRUCTURES, ROADWAYS, DRIVEWAYS AND OTHER SIMILAR MATERIALS AND MAKE ALL EXCAVATION NECESSARY FOR THE PROPER CONSTRUCTION OF THE WATER MAIN, PIPE CONNECTIONS AND APPURTENANT STRUCTURES, INCLUDING TUNNEL AND SHAFT EXCAVATION. THE EXCAVATION SHALL INCLUDE THE REMOVAL, HANDLING, REHANDLING AND DISPOSAL OF MATERIALS ENCOUNTERED IN THE WORK AND SHALL INCLUDE ALL PUMPING, BAILING, DRAINAGE, SHEETING AND BRACING. MOREOVER, THE CONTRACTOR MUST ASSUME ALL RESPONSIBILITY FOR ANY ADDED EXPENSE OR OTHER LIABILITY WHICH MAY ARISE BY MEANS OF QUICKSAND, OBSTACLES OR CONDITIONS FORESEEN AND UNFORESEEN OR ENCOUNTERED IN THE WORK OF THIS CONTRACT.

(B) TRENCHES SHALL IN EVERY CASE BE OF SUFFICIENT WIDTH TO PERMIT SOLID PACKING OF BACKFILL UNDER AND AROUND PIPES, AND SATISFACTORY CONSTRUCTION OF ALL APPURTENANCES AND FOR SUCH SHEETING AND SHORING, PUMPING AND DRAINING AS MAY BE NECESSARY.

(C) THE TRENCH SHALL BE DUG TO THE ALIGNMENT AND DEPTH REQUIRED AND ONLY SO FAR IN ADVANCE OF PIPE LAYING AS THE ENGINEER SHALL PERMIT. THE TRENCH SHALL BE SO BRACED AND DRAINED THAT WORKMEN MAY WORK THEREIN SAFELY AND EFFICIENTLY. IT IS ESSENTIAL THAT THE DISCHARGE FROM PUMPS BE LED TO NATURAL DRAINAGE CHANNELS, TO DRAINS, OR TO SEWERS.

(D) THE TRENCH WIDTH MAY VARY WITH AND DEPEND UPON THE DEPTH OF TRENCH AND THE NATURE OF THE EXCAVATED MATERIAL ENCOUNTERED, BUT IN ANY CASE SHALL BE OF AMPLE WIDTH TO PERMIT THE PIPE TO BE LAID AND JOINTED PROPERLY AND OF THE BACKFILL TO BE PLACED AND COMPACTED PROPERLY. THE MINIMUM WIDTH OF UNSHEETED TRENCH SHALL BE EIGHTEEN (18) INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE EXCEPT BY CONSENT OF THE CITY; THE MAXIMUM CLEAR WIDTH OF TRENCH SHALL NOT BE MORE THAN TWO (2) FEET GREATER THAN THE OUTSIDE PIPE DIAMETER. WHEN SHEETING AND BRACING IS USED, THE TRENCH WIDTH SHALL BE INCREASED ACCORDINGLY.

(E) THE TRENCH, UNLESS OTHERWISE SPECIFIED, SHALL HAVE A FLAT BOTTOM CONFORMING TO THE GRADE TO WHICH THE PIPE IS TO BE LAID UPON SOUND SOIL CUT TRUE AND EVEN, SO THAT THE BARREL OF THE PIPE WILL HAVE A BEARING FOR ITS FULL LENGTH.

(F) ANY PART OF THE TRENCH EXCAVATED BELOW GRADE SHALL BE CORRECTED WITH APPROVED MATERIAL, THOROUGHLY COMPACTED.

(G) WHEN THE UNCOVERED TRENCH BOTTOM AT SUBGRADE IS SOFT AND IN THE OPINION OF THE ENGINEER CANNOT SUPPORT THE PIPE, A FURTHER DEPTH AND OR WIDTH SHALL BE EXCAVATED AND BACKFILLED TO PIPE FOUNDATION GRADE AS REQUIRED UNDER (F), OR OTHER APPROVED MEANS SHALL BE ADOPTED TO ASSURE A FIRM FOUNDATION FOR THE PIPE.

(H) LEDGE ROCK, BOULDERS, LARGE STONES, AND SHALE SHALL BE REMOVED TO PROVIDE A CLEARANCE OF AT LEAST SIX (6) INCHES BELOW ALL PARTS OF THE PIPE, VALVES, OR FITTINGS AND A CLEAR WIDTH OF NINE (9) INCHES ON EACH SIDE OF ALL IRON PIPE, CONCRETE PIPE, AND STEEL PIPE SHALL BE PROVIDED.

(I) EXCAVATION BELOW SUBGRADE IN ROCK, SHALE OR IN BOULDERS SHALL BE BACKFILLED TO SUBGRADE WITH APPROVED MATERIAL, THOROUGHLY COMPACTED.

(J) BELL HOLES OF AMPLE DIMENSIONS SHALL BE DUG IN EARTH TRENCHES AT EACH JOINT TO PERMIT THE JOINTING TO BE MADE PROPERLY. ADEQUATE CLEARANCE FOR PROPER JOINTING OF PIPE LAID IN ROCK SHALL BE PROVIDED AT BELL HOLES.

(K) THE USE OF EXCAVATING MACHINERY WILL BE PERMITTED EXCEPT IN PLACES WHERE ITS OPERATION WILL CAUSE DAMAGE TO TREES, BUILDINGS, OR EXISTING STRUCTURES ABOVE OR BELOW GROUND, IN WHICH CASE HAND METHODS SHALL BE EMPLOYED.

(L) TREES, FENCES, POLES AND ALL OTHER PROPERTY SHALL BE PROTECTED UNLESS THEIR REMOVAL IS AUTHORIZED. ANY PROPERTY DAMAGED SHALL BE SATISFACTORILY RESTORED BY THE CONTRACTOR.

(M) HYDRANTS UNDER PRESSURE, VALVE PIT COVERS, VALVE BOXES, CURB STOP BOXES, FIRE OR POLICE CALL BOXES, OR OTHER UTILITY CONTROLS SHALL BE LEFT UNOBSTRUCTED AND ACCESSIBLE DURING THE CONSTRUCTION PERIOD.

(N) THE CONTRACTOR SHALL MAINTAIN ALL EXCAVATIONS IN GOOD ORDER DURING THE CONSTRUCTION, SO AS NOT TO HINDER OR INJURE THE PIPE LAYING, MASONRY OR OTHER WORK. HE SHALL TAKE ALL REASONABLE PRECAUTIONS TO PREVENT MOVEMENT OF THE SIDES OF SUCH EXCAVATION, AND SHALL REMOVE AT HIS OWN EXPENSE ANY MATERIAL SLIDING INTO THE EXCAVATION.

SHEETING AND BRACING

(A) THE CONTRACTOR SHALL FURNISH AND PUT IN PLACE SUCH SHEETING AND BRACING AS MAY BE REQUIRED TO SUPPORT THE SIDES OF TRENCHES OR OTHER EXCAVATION AND SHALL REMOVE SUCH SHEETING AND BRACING, AS THE TRENCH OR EXCAVATION IS FILLED UP, UNLESS THE ENGINEER SHALL ORDER IT LEFT IN PLACE, IN WHICH CASE THE CONTRACTOR SHALL CUT THE PLANK OFF AT A HEIGHT AS ORDERED BY THE ENGINEER, OR AS CALLED FOR ON THE CONTRACT DRAWINGS. THAT PORTION OF THE TIMBER ORDERED TO BE LEFT IN PLACE WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER THOUSAND BOARD FEET MEASURE. NO PAYMENT WILL BE MADE FOR WASTED ENDS. A QUANTITY OF 1 M.B.F. HAS BEEN PROVIDED IN THE GENERAL SUMMARY FOR ITEM SPECIAL – SHEETING LEFT IN PLACE.

(B) FOR ALL EXCAVATIONS FOR THE WORK DESCRIBED HEREIN, THE CONTRACTOR SHALL FURNISH AND PLACE SHEETING AND BRACING SO AS TO REDUCE TO A MINIMUM THE POSSIBILITY OF INJURY OR DAMAGE TO THE SAME.

(C) IF THE ENGINEER IS OF THE OPINION THAT AT ANY POINT SUFFICIENT OR PROPER SUPPORTS, SHEETING, OR BRACINGS HAVE NOT BEEN PROVIDED, HE MAY ORDER ADDITIONAL SUPPORTS, SHEETING OR BRACING, AT THE EXPENSE OF THE CONTRACTOR, AND THE COMPLIANCE WITH SUCH ORDERS BY THE CONTRACTOR SHALL NOT RELIEVE OR RELEASE HIM FROM HIS RESPONSIBILITY FOR SUFFICIENCY OF SUCH SUPPORTS.

(D) SHEETING AND BRACING SHALL BE PROVIDED IN ACCORDANCE WITH RULE 4121:1–3–13 OF " THE SPECIFIC SAFETY REQUIREMENTS OF THE INDUSTRIAL COMMISSION OF OHIO RELATING TO CONSTRUCTION."

PREQUALIFICATIONS OF CONTRACTOR FOR TAPPING OF SERVICE CONNECTIONS ONE (1) INCH AND UNDER

FOR THE RETAPPING OF EXISTING SERVICE CONNECTIONS ONE (1) INCH AND UNDER THE COMMISSIONER OF WATER IS AUTHORIZED TO DEEM PERSONS OR FIRMS QUALIFIED TO TAP MAINS FOR SERVICE CONNECTION REINSTALLATION AFTER QUALIFICATIONS OF TAPPER, INSPECTION OF EQUIPMENT, AND PROVEN ABILITY AND WORKMANSHIP HAVE BEEN ESTABLISHED TO THE COMMISSIONER'S SATISFACTION. TO DETERMINE THE QUALIFICATIONS OF ANY PERSON OR FIRM TO TAP MAINS, THE COMMISSIONER, OR HIS DESIGNEE, SHALL WITNESS THE INSTALLATION OF A SERVICE CONNECTION IN A WATER MAIN UNDER PRESSURE AND INSPECT TAPPING EQUIPMENT TO BE USED BY TAPPER. UPON SUCCESSFUL COMPLETION OF A TAP, THE TAPPER SHALL BE CERTIFIED BY LETTER FROM THE COMMISSIONER TO THE ENGINEER INDICATING THE TAPPER'S COMPETENCE AND QUALIFICATIONS. THIS QUALIFICATION MAY BE REVOKED BY THE COMMISSIONER OF WATER IF IT IS DETERMINED THAT THE TAPPER'S COMPETENCY IS NOT MAINTAINED OR EQUIPMENT IS CHANGED. CERTIFICATION FOR TAPPING ONE (1) INCH AND UNDER SERVICE CONNECTIONS WILL BE REQUIRED ON A JOB BY JOB BASIS AND SUCH CERTIFICATION SHALL ONLY BE IN FORCE FOR THE PROJECT APPLIED FOR.

ALL TAPPING SHALL BE DONE UNDER THE INSPECTION OF THE DIVISION OF WATER'S INSPECTOR. FOR EACH SERVICE TAP TO BE MADE IN ORDER TO REINSTALL A WATER SERVICE CONNECTION, THE TAPPER SHALL OBTAIN AND COMPLETE A CITY OF CLEVELAND "CITY METER REPAIRS HY" FORM C OF C 101–130A FROM THE INSPECTOR. FAILURE TO PRESENT FORM AT TIME OF COMPLETION OF REINSTALLATION SHALL BE CAUSE FOR IMMEDIATE DISQUALIFICATION.

REMOVAL OF EXCAVATED MATERIAL

(A) ALL SURPLUS MATERIAL AND SUCH OTHER MATERIAL AS THE ENGINEER MAY DEEM UNFIT FOR USE AS BACKFILL SHALL BE DISPOSED OF BY THE CONTRACTOR SO AS TO GIVE A MINIMUM OF INCONVENIENCE TO THE PUBLIC. IN CASE OF SETTLEMENT AFTER BACKFILL, THE CONTRACTOR SHALL SUPPLY SUFFICIENT MATERIAL SATISFACTORY TO THE ENGINEER TO MAKE UP FOR THE DEFICIENCY.

(B) IN THE STORING OF EXCAVATED MATERIAL, WHICH IS TO BE USED AS A BACKFILL, THE CONTRACTOR SHALL EXERCISE CARE SO AS TO AVOID INCONVENIENCING THE PUBLIC. IF IN THE OPINION OF THE ENGINEER IT IS NECESSARY TO REMOVE THIS EXCAVATED MATERIAL FROM THE STREET OR LOTS, THE CONTRACTOR SHALL BE REQUIRED TO DO SO.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

81
146

P.W. 3/22/07 PLOT 1:1

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WATER WORK NOTES

(C) ANY MATERIAL WHICH MAY SPILL OR DRIP FROM VEHICLES BY HAULING IN THE STREETS SHALL BE REMOVED AND THE STREETS CLEANED BY THE CONTRACTOR, TO THE SATISFACTION OF THE ENGINEER.

(D) WHEN SO DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL IMMEDIATELY REMOVE ALL EXCAVATED MATERIALS FROM THE SITE.

LAYING PIPE

(A) PROPER IMPLEMENTS, TOOLS, AND FACILITIES, SATISFACTORY TO THE ENGINEER, SHALL BE PROVIDED AND USED BY THE CONTRACTOR FOR THE SAFE AND CONVENIENT PROSECUTION OF THE WORK. ALL PIPE, FITTINGS, AND VALVES SHALL BE CAREFULLY LOWERED INTO THE TRENCH, PIECE BY PIECE, BY MEANS OF DERRICK, PROPER SLINGS, AND OTHER SUITABLE TOOLS OR EQUIPMENT, IN SUCH MANNER AS TO PREVENT DAMAGE TO PIPE OR COATING. UNDER NO CIRCUMSTANCES SHALL PIPE OR ACCESSORIES BE DROPPED OR DUMPED INTO THE TRENCH. IF ANY DEFECTIVE PIECE IS DISCOVERED WHILE PIPE IS SUSPENDED OR AFTER BEING LAID, A NEW PIECE SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.

(B) ALL FOREIGN MATTER OR DIRT SHALL BE REMOVED FROM THE INSIDE OF THE PIPE BEFORE IT IS LOWERED INTO ITS POSITION IN THE TRENCH, AND IT SHALL BE KEPT CLEAN BY APPROVED MEANS DURING AND AFTER LAYING.

(C) AT TIMES WHEN PIPE LAYING IS NOT IN PROGRESS, THE OPEN ENDS OF PIPE SHALL BE CLOSED BY APPROVED MEANS, AND NO TRENCH WATER SHALL BE PERMITTED TO ENTER THE PIPE. NO PIPE SHALL BE LAID IN WATER, OR WHEN THE TRENCH CONDITIONS OR THE WEATHER IS UNSUITABLE FOR SUCH WORK, EXCEPT BY PERMISSION OF THE ENGINEER.

(D) WHEREVER NECESSARY TO DEFLECT PIPE FROM A STRAIGHT LINE, EITHER IN THE VERTICAL OR HORIZONTAL PLANE TO AVOID OBSTRUCTIONS, TO PLUMB STEMS, OR FOR OTHER REASONS, THE DEGREE OF DEFLECTION SHALL BE APPROVED BY THE ENGINEER.

(E) BEFORE LAYING DUCTILE IRON PIPE, ALL LUMPS, BLISTERS AND EXCESS COAL TAR COATING SHALL BE REMOVED FROM THE BELL AND SPIGOT ENDS OF EACH PIPE. THE PIPE ENDS SHALL THEN BE KEPT CLEAN UNTIL JOINTS ARE MADE.

(F) BEFORE LAYING CONCRETE PIPE, THE PIPE ENDS SHALL BE MADE SMOOTH WITH EMERY CLOTH, FILE OR OTHER APPROVED MEANS, WIRE BRUSHED AND WIPED UNTIL CLEAN AND DRY. PIPE ENDS SHALL BE KEPT CLEAN UNTIL JOINTS ARE MADE. AFTER CLEANING AND DRYING, ALL CONTACT SURFACES OF THE GASKETS AND STEEL JOINT RINGS SHALL BE COATED WITH AN APPROVED FLAX SOAP BEFORE ENTERING THE SPIGOT ENDS INTO THE SOCKET. IMMEDIATELY AFTER THE JOINT IS PULLED TOGETHER, THE PIPE SHALL BE BLOCKED WITH WOOD BLOCKING. A SURCINGLE SHALL BE INSTALLED AROUND THE JOINT AND THE PIPE SHALL BE SECURED WITH EARTH OR SAND AS REQUIRED, CAREFULLY TAMPED UNDER AND ON EACH SIDE UP TO THE SPRING-LINE OF THE PIPE, INCLUDING THE BELL HOLES. ALL BLOCKING SHALL BE REMOVED WHEN BACKFILL HAS REACHED THE SPRING LINE FOR THE PIPE.

(G) BEFORE LAYING STEEL PIPE, THE PREPARATION OF PIPE ENDS FOR THE STEEL PIPE AND FITTINGS SHALL BE MADE IN ACCORDANCE WITH THE AWWA SPECIFICATIONS, C 200-86, "STEEL PIPE 6" AND LARGER," OR LATEST REVISION THEREOF.

FLOATING

THE CONTRACTOR SHALL TAKE EVERY PRECAUTION AGAINST THE FLOATING OF THE PIPE DUE TO WATER COMING INTO THE TRENCH, OR THROUGH CAVING IN, FLUSHING OR PUDDLING. IN CASE OF SUCH FLOATING THE CONTRACTOR SHALL REPLACE THE PIPE AT HIS OWN EXPENSE AND MAKE WHOLLY GOOD ANY INJURY OR DAMAGE WHICH MAY HAVE RESULTED.

BACKFILLING

A. BACKFILLING SHALL CONSIST OF A SAND BEDDING BACKFILL, AND BACKFILL, UNLESS OTHERWISE SPECIFIED, OR WHERE PREMIUM BACKFILL IS REQUIRED, MADE WITH MATERIAL EXCAVATED FROM THE TRENCHES, PROVIDING THE SAME IS SATISFACTORY TO THE ENGINEER AND THE CITY. IF, IN THE OPINION OF THE ENGINEER AND THE CITY, THE MATERIAL EXCAVATED IS UNSATISFACTORY, THEN THE CONTRACTOR SHALL FURNISH AT HIS OWN EXPENSE OTHER SUITABLE MATERIAL FOR BACKFILL. ALL BACKFILL MATERIAL SHALL BE FREE FROM SLAG, CINDERS, RUBBISH, AND OTHER OBJECTIONABLE MATERIAL. BACKFILL SHALL BE PLACED INTO THE TRENCH AND NOT DOZED OR DUMPED FROM THE TOP OF THE TRENCH. THIS WORK INCLUDES ALL BACKFILLING, TOGETHER WITH RAMMING, PUDDLING, AND ROLLING, AS REQUIRED; THE FURNISHING OF SAND BEDDING BACKFILL, SUITABLE MATERIAL FOR BACKFILL, INCLUDING PREMIUM BACKFILL; AND ALL APPURTENANT WORK INCIDENTAL THERETO.

B. BEFORE LAYING THE PIPE, THE BOTTOM OF THE TRENCH SHALL BE BROUGHT TO THE GRADE OF THE BOTTOM OF THE PIPE, EXCEPT AT PIPE JOINTS. WHEREVER THE BOTTOM OF THE TRENCH HAS BEEN EXCAVATED BELOW THE BOTTOM OF THE PIPE, THE CONTRACTOR SHALL PLACE SAND BEDDING, OR OTHER APPROVED MATERIAL SATISFACTORY TO THE ENGINEER AND THE CITY, TO BRING THE BOTTOM OF THE TRENCH TO THE GRADE OF THE BOTTOM OF THE PIPE. THIS SAND BEDDING SHALL BE THOROUGHLY TAMPED BEFORE THE PIPE IS PLACED IN THE TRENCH.

C. THE BEDDING BACKFILL THREE (3) INCHES UNDER, AROUND AND TO A DEPTH OF ONE (1) FOOT ABOVE THE TOP OF ALL PIPE, SHALL BE MADE WITH SAND, WHICH MATERIAL SHALL BE FREE FROM STONE AND OTHER OBJECTIONABLE MATERIAL NOTED ABOVE IN PARAGRAPH (A) AND HEREIN. THE SAND USED FOR BEDDING BACKFILL SHALL BE A NATURAL BANK SAND, GRADED FROM FINE TO COARSE, NOT LUMPY OR FROZEN, AND FREE FROM SLAG, CINDERS, ASHES, RUBBISH, OR OTHER DELETERIOUS OR OBJECTIONABLE MATERIAL. THE SAND USED FOR BEDDING BACKFILL SHALL NOT CONTAIN A TOTAL OF MORE THAN 10% BY WEIGHT OF LOAM AND CLAY, AND ALL SUCH MATERIAL MUST BE CAPABLE OF BEING PASSED THROUGH A 3/4 INCH SIEVE. NOT MORE THAN 5% SHALL REMAIN ON A #4 SIEVE. THE CONTRACTOR MUST USE SPECIAL CARE IN PLACING THIS PORTION OF THE SAND BEDDING BACKFILL, SO AS TO AVOID SCRAPING OF THE EXTERIOR COATING, INJURING THE PIPE, AND DISTORTING OR MOVING THE PIPE WHEN COMPACTING THE SAME. THE SAND BEDDING BACKFILL SHALL BE TAMPED IN THIN LAYERS OF SIX (6) INCHES, SIMULTANEOUSLY ON EACH SIDE OF THE PIPE, AND THOROUGHLY COMPACTED SO AS TO PROVIDE A SOLID BACKING AGAINST THE EXTERNAL SURFACE OF THE PIPE.

D. BACKFILL ABOVE THE ONE (1) FOOT SAND BEDDING BACKFILL SHALL BE MADE WITH MATERIAL SPECIFIED HEREIN IN EITHER PARAGRAPH (A) OR AS SPECIFIED HEREIN FOR PREMIUM BACKFILL IN PARAGRAPH (G).

E. PREMIUM BACKFILL SHALL BE PLACED WHERE EXISTING AND FUTURE PERMANENT PAVEMENT, SIDEWALKS, DRIVEWAYS, SEWER PIPE CROSSINGS AND CURB CROSSINGS HAVE BEEN OPEN OR UNDERCUT. THE PLACEMENT OF PREMIUM BACKFILL ALSO APPLIES TO ALL EXCAVATION WITHIN THREE (3) FEET OF EXISTING OR FUTURE PERMANENT PAVEMENT, SIDEWALKS, DRIVEWAYS, SEWER PIPE CROSSINGS AND CURB CROSSINGS. IF PART OF THE TRENCH IS UNDER EXISTING OR FUTURE PAVEMENT, SIDEWALK, DRIVEWAY OR CURB THE ENTIRE TRENCH SHALL BE BACKFILLED WITH PREMIUM BACKFILL MATERIAL SPECIFIED HEREIN.

F. ONLY AFTER THE ONE (1) FOOT SAND BEDDING BACKFILL HAS BEEN SATISFACTORILY COMPACTED, MAY WORK PROCEED IN PLACING THE REMAINING BACKFILL WHICH MUST BE CAREFULLY PLACED AND COMPACTED BY TAMPING, PUDDLING, OR ROLLING. ALL PRECAUTIONS MUST BE TAKEN TO ELIMINATE FUTURE SETTLEMENT. THE NUMBER OF MEN TAMPING SHALL BE NOT LESS THAN THE NUMBER BACKFILLING, AND ADDITIONAL MEN SHALL BE KEPT IN THE TRENCH TO SPREAD THE MATERIAL.

G. PREMIUM BACKFILL SHALL CONSIST OF LIMESTONE SCREENINGS. THE PREMIUM BACKFILL SHALL BE READILY INCORPORATED IN AN 8-INCH LAYER AND SHALL BE IN ACCORDANCE WITH OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIALS SPECIFICATIONS, ITEM 304, MEETING THE FOLLOWING REQUIREMENTS:

SIEVE	% PASSING GRADING
2-INCH	100
1-INCH	70-100
3/4-INCH	50-90
NO. 4	30-60
NO. 30	9-33
NO. 200	0-13

THE FRACTION OF THESE MATERIALS PASSING A #40 SIEVE SHALL HAVE A LIQUID LIMIT NOT GREATER THAN 30 (THIRTY) AND A PLASTICITY INDEX NOT GREATER THAN 6 (SIX).

SLAG; NATURAL OR SYNTHETIC CRUSHED AGGREGATE SUCH AS BROKEN OR CRUSHED ROCK; CRUSHED CONCRETE; OR OTHER TYPE OF MATERIAL IN LIEU OF THE SAND BEDDING BACKFILL AND THE LIMESTONE SCREENING BACKFILL MATERIAL WILL NOT BE PERMITTED.

THE MINIMUM COMPACTION FOR ALL SAND BEDDING BACKFILL, BACKFILL AND PREMIUM BACKFILL SHALL BE 95% STANDARD PROCTER.

H. BACKFILLING SHALL NOT BE DONE IN FREEZING WEATHER, EXCEPT BY PERMISSION OF THE ENGINEER AND THE CITY, AND IT SHALL NOT BE MADE WITH FROZEN MATERIAL, NOR SHALL ANY FILL BE MADE WHERE THE MATERIAL ALREADY IN THE DITCH IS FROZEN.

I. SPECIAL TREATMENT OF THE TRENCH WILL BE REQUIRED WHERE CINDER EXCAVATION, EXCEEDING ONE (1) FOOT MEASURED FROM THE GROUND OR PAVEMENT SURFACE IS ENCOUNTERED. BEFORE LAYING THE PIPE, THE BOTTOM OF THE TRENCH SHALL BE DUG EIGHT (8) INCHES BELOW PIPE GRADE AND THEN BROUGHT TO THE GRADE OF THE PIPE IN THE FOLLOWING MANNER. A FOUR (4) INCH LAYER OF CRUSHED LIMESTONE SHALL BE PLACED ON THE ENTIRE WIDTH OF THE BOTTOM OF THE TRENCH, FOLLOWED BY A FILLER OF HYDRATED LIME AND A LAYER OF SAND BEDDING TO SIX (6) INCHES ABOVE THE TOP OF THE PIPE. THE FOUR (4) INCH CRUSHED LIMESTONE SHALL BE WELL GRADED FROM FINE TO COARSE, AND FREE FROM SLAG, CINDERS, ASHES, RUBBISH OR OTHER OBJECTIONABLE MATERIAL. ALL LIMESTONE MUST BE CAPABLE OF BEING PASSED THROUGH A 3/4 INCH SIEVE.

ON TOP OF THIS LAYER OF CRUSHED LIMESTONE, HYDRATED LIME SHALL BE SUPPLIED IN THE AMOUNT OF 3/8 OF A POUND PER SQUARE FOOT OF TRENCH. THIS BED OF CRUSHED LIMESTONE, WITH FILLER OF HYDRATED LIME IN PLACE, SHALL BE THOROUGHLY TAMPED BEFORE THE PIPE IS LAID IN THE TRENCH AND THE SAND BEDDING BACKFILL IS PLACED. THE SAND BEDDING BACKFILL SHALL BE FOR THREE (3) INCHES UNDER, AROUND AND TO A DEPTH OF SIX (6) INCHES ABOVE THE TOP OF THE PIPE. THE CONTRACTOR MUST USE SPECIAL CARE IN PLACING THIS PORTION OF THE BACKFILL SO AS TO AVOID SCRAPING OF THE EXTERIOR COATING, INJURING THE PIPE, AND DISTORTING OR MOVING THE PIPE WHEN COMPACTING THE SAME. ON TOP OF THE SAND BEDDING BACKFILL THE CONTRACTOR SHALL PLACE ANOTHER LAYER OF CRUSHED LIMESTONE SIX (6) INCHES THICK FOR THE ENTIRE WIDTH OF THE TRENCH. ON TOP OF THIS SIX (6) INCH LAYER OF COMPACTED LIMESTONE A SECOND FILLER OF HYDRATED LIME SHALL THEN BE APPLIED IN THE AMOUNT OF 3/8 OF A POUND PER SQUARE FOOT OF TRENCH. THE REMAINING BACKFILL SHALL BE MADE WITH LIMESTONE SCREENINGS AS ELSEWHERE SPECIFIED HEREIN, CAREFULLY PLACED AND COMPACTED BY TAMPING, OR ROLLING. ALL PRECAUTIONS SHALL BE TAKEN TO ELIMINATE FUTURE SETTLEMENT. THE TREATMENT OF THE TRENCH BOTTOM PREVIOUSLY DESCRIBED, MAY BE OMITTED WHERE THE CINDER DEPTH, MEASURED FROM THE TOP SURFACE DOES NOT EXCEED 2'-6".

PROVISIONS FOR PROTECTING THE WORK

THE CONTRACTOR SHALL FURNISH ALL THE NECESSARY EQUIPMENT, SHALL TAKE ALL NECESSARY PRECAUTIONS AND SHALL ASSUME THE ENTIRE COST OF HANDLING ANY SEWAGE, SEEPAGE, STORM SURFACE AND FLOOD FLOWS OR ICE, WHICH MAY BE ENCOUNTERED AT ANY TIME DURING THE CONSTRUCTION OF THE WORK. THE MANNER OF PROVIDING FOR THESE OCCURRENCES SHALL MEET WITH THE APPROVAL OF THE ENGINEER. AFTER INSTALLATION, THE CONTRACTOR SHALL FURNISH AND MAINTAIN SATISFACTORY PROTECTION TO ALL EQUIPMENT WHETHER OF THIS OR OTHER CONTRACT AGAINST INJURY BY WEATHER, FLOODING OR BY DIRECT OR INCIDENTAL DAMAGE FROM HIS OWN OPERATIONS, LEAVING ALL WORK IN A PERFECT CONDITION AT THE COMPLETION OF THE CONTRACT. ANY EXISTING PIPE THAT IS EXPOSED SHALL RECEIVE A 16 MIL THICKNESS OF AN APPROVED COAL TAR EPOXY EXTERIOR SURFACE COATING. THE COATING SHALL BE APPLIED IN TWO (2) COATS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND SHALL HAVE A DRY FILM THICKNESS (DFT) OF 16 MILS. DEICING SALTS SHALL NOT BE USED WHILE ANY PIPE IS EXPOSED. THE CONTRACTOR SHALL INFORM THE CITY OF PARMA STREET DEPARTMENT ANY TIME DEICING SALTS ARE NOT TO BE USED DURING CONSTRUCTION.

DRAWINGS

(A) THE CONTRACTOR SHALL SUBMIT TO THE CITY THROUGH THE ENGINEER FOR APPROVAL, SIX (6) SETS OF PRINTS OF ALL SHOP DRAWINGS. SHOP DRAWINGS SHALL BE FULLY DIMENSIONED LEGIBLE DRAWINGS AS DEVELOPED BY THE MATERIALS FABRICATOR. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL BOLTLESS RESTRAINED IRON PIPE AND FITTINGS, PRESTRESSED CONCRETE PIPE AND FITTINGS, STEEL PIPE AND FITTINGS; SPECIAL FITTINGS, COUPLINGS, SPECIALS, AND MISCELLANEOUS DETAILS, SUCH AS VALVES, DRAIN FORGINGS, PRECAST VAULTS, CASTINGS, ETC. DRAWINGS SHALL INCLUDE DETAILS, LAYOUTS AND LAYING SCHEDULE FOR ALL PIECES FURNISHED REQUIRING DRAWING SUBMITTAL.

(B) TWO (2) SETS OF PRINTS OF EACH OF THE DRAWINGS SUBMITTED WILL BE RETURNED TO THE CONTRACTOR THROUGH THE ENGINEER WITH THE CRITICISMS OR APPROVAL OF THE CITY NOTED THEREON. IN CASE THE DRAWINGS ARE NOT APPROVED, THE CONTRACTOR SHALL AGAIN SEND FOR APPROVAL SIX (6) SETS OF REVISED PRINTS OF EACH OF THE DRAWINGS TO TAKE CARE OF THE CRITICISMS NOTED. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED.

(C) AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED, THE

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

82
146

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WATER WORK NOTES

CONTRACTOR SHALL FURNISH THE CITY THROUGH THE ENGINEER WITH ONE (1) COMPLETE SET OF REPRODUCIBLE TRACINGS ON MYLAR OF EACH OF THE FINAL SHOP DRAWINGS. MYLAR SHALL BE OF MINIMUM 4-MIL THICKNESS, SHALL BE OF A SINGLE BASE STOCK WITH AN ETCHED SURFACE TO PROVIDE A MATTE FINISH ON THE FRONT AND SHALL BE OF A PERMANENT NON-ERASABLE, "WASH-OFF" TYPE, OF WHICH THE IMAGE ON THE MYLAR MEDIUM CANNOT BE REMOVED BY ERASURE. ALL SHOP DRAWINGS SHALL BE REPRODUCED FROM THEIR FULL SIZED ORIGINAL TRACINGS AND NOT AS REDUCED SIZES AS MAY HAVE BEEN SUBMITTED DURING THE REVIEW PROCESS. SMALL SIZED DRAWINGS PERTAINING TO A GIVEN ITEM SHALL BE GROUPED FOR REPRODUCTION SO THAT ALL TRACINGS SHALL BE 24" X 36" OVERALL. TRACINGS NOT 24" X 36" IN SIZE WILL NOT BE ACCEPTED.

(D) THE APPROVAL OF THE DRAWINGS BY THE ENGINEER AND THE CITY SHALL NOT RELIEVE THE CONTRACTOR OF ANY OF HIS OBLIGATIONS IN CONNECTION WITH THIS CONTRACT.

CASING PIPE OR TUNNELING

THE INSTALLATION OF CASING PIPE OR TUNNELING WILL NOT BE PERMITTED WITHOUT PERMISSION OF THE CITY. ONLY WHERE SPECIFICALLY SHOWN ON THE DRAWINGS WILL CASING PIPE OR TUNNELING BE PERMITTED. IN BACKFILLING THE CASING PIPE OR TUNNEL, SAND SHALL BE USED. BACKFILLING MADE WITH NON-SHRINKING GROUT MAY BE USED WITH THE APPROVAL OF THE ENGINEER AND THE CITY. BRICK BULKHEADS ARE ALSO REQUIRED AT THE END OF EACH OPENING.

LISTS AND INVOICES

(A) THE CONTRACTOR SHALL FURNISH THE CITY WITH THE LIST IN DUPLICATE OF PIECES IN EACH SHIPMENT OF PIPE AND SPECIALS, GIVING THE SERIAL NUMBER AND DESIGNATION OF EACH PIPE AND SPECIAL SENT AT THAT TIME.

(B) THE MATERIAL SHALL BE SHIPPED IN SUCH SECTIONS AS THE STATE AND CITY MAY ORDER.

ITEM SPECIAL - DUCTILE IRON PIPE AND FITTINGS - 20" AND SMALLER

WORK INCLUDED

(A) THE CONTRACTOR SHALL, UNDER ITEM SPECIAL - DUCTILE IRON PIPE AND FITTINGS - 20" AND SMALLER, FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY CONSTRUCT AND CONNECT IN PLACE AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED, ALL DUCTILE IRON PIPE AND FITTINGS, INCLUDING ALL EXCAVATION WORK, THE CUTTING INTO AND REMOVAL OF EXISTING PIPE, BACKFILLING, SAND BEDDING AND PREMIUM BACKFILL, AND REPAVING (BOTH TEMPORARY AND PERMANENT), ALL AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT. IN GENERAL THIS WORK SHALL INCLUDE THE FURNISHING, LAYING, CONNECTING, PAINTING, TESTING OF PIPE AND FITTINGS, THE EXCAVATION, REMOVAL AND RESTORATION OF MISCELLANEOUS ITEMS, SHEETING AND SHORING, BACKFILLING, SAND BEDDING AND PREMIUM BACKFILL, SEEDING AND SODDING, THE PERMANENT REPAVING, IF SO NOTED ON THE CONTRACT DRAWINGS, THE CUTTING INTO, REMOVAL AND STORAGE OF EXISTING MAINS, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT TO COMPLETE THE WORK AS SPECIFIED, SHOWN OR ORDERED.

(B) IN MAKING THE CONNECTION TO EXISTING MAINS WHERE BRANCH SLEEVES CAN BE USED, THE CONTRACTOR SHALL SUPPLY THE SAME. THE DIVISION OF WATER WILL INSTALL THE BRANCH SLEEVE AND WILL MAKE THE PRESSURE TAP (IF APPLICABLE) IN ACCORDANCE WITH THE REQUIREMENTS INDICATED UNDER "WORK TO BE DONE BY CITY." IF THE INSTALLATION OF BRANCH SLEEVES AND VALVES CANNOT BE ACCOMPLISHED, THE CONTRACTOR WILL BE REQUIRED TO FURNISH AND INSTALL TEES WITH SLEEVES OR COUPLINGS TO COMPLETE THE CONNECTION. THE CONTRACTOR WILL BE REQUIRED TO MAKE THE NECESSARY EXCAVATION, BACKFILL AND REPAVING (IF NOT PAID FOR SEPARATELY AS PART OF THIS CONTRACT).

DUCTILE-IRON PIPE AND FITTINGS - 20" AND SMALLER

(A) ALL PIPE AND FITTINGS SHALL BE MANUFACTURED IN ACCORDANCE WITH AND IN ALL RESPECTS WITH THE REQUIREMENTS OF THE LATEST SPECIFICATIONS OF THE "AMERICAN NATIONAL STANDARD" FOR ANSI/AWWA C151/A21.51-86, "DUCTILE IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS, AND DUCTILE IRON FITTINGS FOR WATER AND OTHER LIQUIDS," AND ANSI/AWWA C111/A21.11-85, "RUBBER-GASKET JOINTS FOR DUCTILE-IRON PIPE AND GRAY-IRON PRESSURE PIPE AND FITTINGS," ADOPTED BY THE AMERICAN WATER WORKS ASSOCIATION; WHICH STANDARDS EXCEPT AS HEREIN MODIFIED ARE MADE A PART OF THESE SPECIFICATIONS. PIPE AND FITTINGS UP TO AND INCLUDING 20-INCHES SHALL HAVE RETAINED MECHANICAL JOINTS EXCEPT WHERE BOLTLESS RESTRAINED PUSH-ON JOINT PIPE AND FITTINGS IS CALLED FOR ON THE CONTRACT DRAWINGS OR DIRECTLY SPECIFIED.

(B) ALL PIPE AND FITTINGS SHALL BE CEMENT LINED AND OF THE SIZE AND THICKNESS AND PRESSURE CLASSES NOTED ON THE RESPECTIVE CONTRACT DRAWINGS OR DIRECTLY SPECIFIED. FITTINGS ON PIPE SIZES UP TO AND INCLUDING 12-INCHES MAY BE OF THE SHORT BODIED (COMPACT) TYPE.

(C) ALL DUCTILE IRON FITTINGS SHALL BE MANUFACTURED IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD, ANSI/AWWA C110/A21.10-87, "DUCTILE IRON AND GRAY-IRON FITTINGS, 3-INCH THROUGH 48-INCH, FOR WATER AND OTHER LIQUIDS," AND ALL SUBSEQUENT AMENDMENTS THERETO. METAL FOR FITTINGS SHALL CONFORM TO AMERICAN NATIONAL STANDARD ANSI A21.10-87. FITTINGS ON PIPE SIZE UP TO AND INCLUDING 12" MAY BE OF THE SHORT BODIED TYPE IN ACCORDANCE WITH ANSI/AWWA C153/A21.53-88, "DUCTILE IRON COMPACT FITTINGS, 3" THROUGH 16" FOR WATER AND OTHER LIQUIDS," AND ALL SUBSEQUENT AMENDMENTS THERETO.

(D) THE CONTRACTOR SHALL FURNISH CENTRIFUGAL CAST DUCTILE IRON CEMENT LINED PIPE. DUCTILE IRON METAL SHALL HAVE A MINIMUM TENSILE STRENGTH OF 60,000 PSI, MINIMUM YIELD STRENGTH OF 42,000 PSI AND MINIMUM ELONGATION OF 10 PERCENT AND SHALL BE FOR THE THICKNESS CLASS NOTED ON THE CONTRACT DRAWINGS OR DIRECTLY SPECIFIED. PIPE MAY BE FURNISHED IN 18 OR 20 FEET NOMINAL LAYING LENGTHS. THE CENTRIFUGALLY CAST DUCTILE SHALL CONFORM TO THE AMERICAN NATIONAL STANDARD ANSI/AWWA C151/A21.51-86, "DUCTILE IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS, AND DUCTILE IRON FITTINGS FOR WATER AND OTHER LIQUIDS," AND ALL SUBSEQUENT AMENDMENTS THERETO. PIPE ON STRAIGHT RUNS SHALL HAVE PUSH-ON SINGLE RUBBER-GASKET COMPRESSION JOINTS, ALL IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD, ANSI/AWWA C111/A21.11-85, "RUBBER-GASKET JOINTS FOR DUCTILE-IRON PIPE AND GRAY-IRON PRESSURE PIPE AND FITTINGS," AND ALL SUBSEQUENT AMENDMENTS THERETO. FOR PIPE SIZES UP TO AND INCLUDING 20-INCHES RETAINED MECHANICAL JOINTS SHALL BE FURNISHED AT BENDS, TEES, CROSSES, SPECIAL FITTINGS AND BETWEEN VERTICAL OFFSETS OR BENDS, ON HYDRANT BRANCHES AND SHALL BE RETAINED AS SPECIFIED IN SECTION "JOINTS", (B), "MECHANICAL JOINTS/RETAINED MECHANICAL JOINTS."

(E) STANDARD THICKNESS AND PIPE CLASS TABLES

THE THICKNESS OF THE CENTRIFUGALLY CAST DUCTILE IRON PIPE SHALL CONFORM TO THE FOLLOWING TABLE:

STANDARD THICKNESS OF CENTRIFUGALLY CAST, DUCTILE IRON PIPE

PIPE SIZE	WORKING PRESSURE (PSI)	STANDARD THICKNESS CLASS 52	53	54	56	FITTINGS PSI
4"	350	.29	.32	.35	.41	350
6"	350	.31	.34	.37	.43	350
8"	350	.33	.36	.39	.45	350
10"	350	.35	.38	.41	.47	350
12"	350	.37	.40	.43	.49	350
16"	350	.40	.43	.46	.52	350
20"	350	.42	.45	.48	.54	350

(F) ALL FITTINGS, UNLESS OTHERWISE NOTED ON THE CONTRACT DRAWINGS, SUCH AS BENDS, TEES, CROSSES, HYDRANT BRANCHES, ETC. SHALL HAVE BELL AND BELL, BELL AND PLAIN ENDS OF THE MECHANICAL BOLTED STUFFING-BOX TYPE WITH PIPE OR FITTING PLAIN END SEALING GASKET AND BOLTED FOLLOWER GLAND. MECHANICAL JOINT FITTINGS SHALL BE THE MECHANICAL JOINTED BOLTED STUFFING-BOX TYPE IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD, ANSI/AWWA C111/A21.11-85, "RUBBER-GASKET JOINTS FOR DUCTILE-IRON PIPE AND GRAY-IRON PRESSURE PIPE AND FITTINGS," AND ALL SUBSEQUENT AMENDMENTS THERETO. ALL FITTINGS SHALL BE CEMENT LINED. ALL MECHANICAL JOINTS SHALL BE RETAINED AS SPECIFIED IN SECTION, "JOINTS", (E) "RETAINED MECHANICAL JOINTS".

(G) WHERE CALLED FOR ON THE CONTRACT DRAWINGS OR DIRECTLY SPECIFIED, PIPE AND FITTINGS HAVING BOLTLESS RESTRAINED TYPE JOINTS SHALL BE FURNISHED. BOLTLESS RESTRAINED TYPE JOINTS SHALL BE AS SPECIFIED IN SECTION "JOINTS", (D) "BOLTLESS RESTRAINED SLIP-ON JOINTS."

(H) GLANDS FOR ALL MECHANICAL JOINT PIPE AND FITTINGS SHALL BE DUCTILE IRON. BOLTS AND NUTS SHALL BE CORROSION RESISTANT, HIGH-STRENGTH, LOW ALLOY STEEL IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD, ANSI/AWWA C111/A21.11-85, "RUBBER-GASKET JOINTS FOR DUCTILE-IRON PIPE AND GRAY-IRON PRESSURE PIPE AND FITTINGS," AND ALL SUBSEQUENT AMENDMENTS THERETO.

GASKETS SHALL BE OF RUBBER OR OTHER EQUALLY EFFECTIVE PROTECTION AGAINST UNEVEN DISTORTION OF GASKET.

(I) WHERE FITTINGS ARE SHOWN WHICH ARE NOT COVERED BY THE ABOVE SPECIFICATIONS, THEY IN SUCH PARTICULARS AS ARE LACKING THEREON SHALL CONFORM TO THE DIMENSIONS AND OTHERWISE MEET THE SPECIFICATIONS FOR THE RESPECTIVE TYPE WHICH ARE CARRIED IN THE LATEST REVISIONS TO THE CURRENT EDITION OF THE DUCTILE IRON PIPE RESEARCH ASSOCIATION "HANDBOOK OF DUCTILE IRON PIPE" OR WHICH ARE OTHERWISE SHOWN ON THE CONTRACT DRAWINGS.

(J) WHEREVER CHANGES IN LINE AND GRADES OF THE MAIN AS SHOWN ON THE DRAWINGS ARE NOT STANDARD FITTING DEFLECTIONS, THE CONTRACTOR WILL BE PERMITTED TO SUBMIT DETAILS USING COMBINATIONS OF STANDARD FITTINGS AND SMALL DEFLECTIONS (NOT TO EXCEED THE MANUFACTURER'S MAXIMUM SUGGESTED JOINT OPENING) IN THE ADJOINING LENGTHS OF PIPE.

(K) ON NEW AND/OR RELOCATED OR EXTENDED WATER MAINS, UP TO AND INCLUDING 20-INCH DIAMETER, WHERE WATER MAINS END OR TERMINATE AND ARE NOT CONNECTED TO EXISTING MAINS, RETAINED MECHANICAL BELL JOINT PLUGS ARE TO BE INSTALLED. PLUGS CAPS SHALL BE FURNISHED WITH TWO (2) PLUGGED TWO (2")-INCH TAPS FOR DRAIN AND AIR RELIEF CONNECTIONS.

(L) CLOSURE PIECES SHALL BE ACCURATELY MEASURED AND CUT IN THE FIELD AND INSTALLED USING SOLID SHORT PATTERN SLEEVES HAVING MECHANICAL BELL JOINTS. MECHANICAL BELL JOINT SLEEVES SHALL BE OF THE RETAINED TYPE AS SPECIFIED IN SECTION, "JOINTS", (E) "MECHANICAL JOINTS/RETAINED MECHANICAL JOINTS."

(M) TESTS, INSPECTION, REPORTS AND ANALYSES OF TESTS OF SAMPLES FOR ALL MATERIALS SHALL BE FURNISHED IN ACCORDANCE WITH PARAGRAPH "TEST, INSPECTION AND REPORTS" OF THE GENERAL NOTES.

(N) BITUMASTIC COATING SHALL BE APPLIED ON THE EXTERIOR OF ALL DUCTILE IRON PIPE AND FITTINGS IN ACCORDANCE WITH AWWA SPECIFICATIONS.

CEMENT LINING

ALL PIPE FITTINGS, SHALL BE GIVEN A CEMENT MORTAR LINING AT THE POINT OF MANUFACTURE. THE LINING SHALL CONFORM TO THE AMERICAN NATIONAL STANDARD, ANSI/AWWA C104/A21.4-1990, "CEMENT-MORTAR LINING FOR DUCTILE-IRON PIPE AND FITTINGS," AND ALL SUBSEQUENT AMENDMENTS THERETO.

MARKING

ALL PIPE AND FITTINGS SHALL BE SUITABLY MARKED TO DENOTE THE MANUFACTURER, CLASS, DATE, WEIGHT AND OTHER ELEMENTS OF IDENTIFICATION.

FACING AND DRILLING

ALL FLANGES SHALL BE CAST SOLID AND FACED ACCURATELY AT RIGHT ANGLES TO THE AXIS OF THE PIPE. ALL FLANGES SHALL BE SHOP COATED WITH A COAT OF COAL TAR EPOXY, EXCEPT THE FACE OF THE FLANGE WHICH SHALL RECEIVE ONE (1) COAT OF A ZINC RICH PRIMER AT THE SHOP IMMEDIATELY AFTER THEY HAVE BEEN FACED AND DRILLED. ALL FLANGED PIPE AND FITTINGS SHALL BE FACED AND DRILLED TO ANSI B16-1, 125 LB. DRILLING, UNLESS SPECIAL DRILLING IS CALLED FOR. WHERE TAP OR STUD BOLTS ARE REQUIRED, FLANGES SHALL ALSO BE TAPPED.

LAYING

(A) PROPER AND SUITABLE TOOLS AND APPLIANCES FOR THE SAFE AND CONVENIENT HANDLING AND LAYING OF THE PIPE AND FITTINGS SHALL BE USED. GREAT CARE SHALL BE TAKEN TO PREVENT THE PIPE COATING AND FITTINGS FROM BEING DAMAGED PARTICULARLY ON THE INSIDE OF THE PIPES AND FITTINGS AND ANY SUCH DAMAGE SHALL BE REMEDIED AS DIRECTED. ALL PIPES AND FITTINGS SHALL BE CAREFULLY EXAMINED BY THE CONTRACTOR FOR DEFECTS JUST BEFORE LAYING AND NO PIPE OR FITTINGS SHALL BE LAID WHICH IS KNOWN TO BE DEFECTIVE.

(B) IF ANY DEFECTIVE PIPE IS DISCOVERED AFTER HAVING BEEN LAID, IT SHALL BE REMOVED AND REPLACED WITH A SOUND PIPE OR FITTING IN A SATISFACTORY MANNER, BY THE CONTRACTOR AT HIS OWN EXPENSE. ALL PIPES AND FITTINGS SHALL BE THOROUGHLY CLEANED BEFORE THEY ARE LAID, SHALL BE KEPT CLEAN UNTIL THEY ARE USED IN THE COMPLETED WORK, AND WHEN LAID, SHALL CONFORM TO THE LINES AND GRADES GIVEN BY THE ENGINEER. OPEN ENDS OF PIPES SHALL BE KEPT PLUGGED WITH A BULK HEAD DURING CONSTRUCTION.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

WATER WORK NOTES

(C) PIPE LAID IN TRENCH SHALL BE LAID TO A FIRM AND EVEN BEARING FOR ITS FULL LENGTH. PRECAUTIONS SHALL BE TAKEN AGAINST FLOATING.

(D) IT IS THE INTENTION OF THESE SPECIFICATIONS TO SECURE FIRST CLASS WORKMANSHIP IN THE PLACING OF PIPE AND ACCESSORIES. IN SUCH DETAILS AS ARE NOT SPECIFICALLY MENTIONED HEREIN OR CALLED FOR ON THE DRAWINGS, THE CONTRACTOR WILL BE REQUIRED TO CONFORM WITH THE APPLICABLE SECTIONS OF THE LATEST AMERICAN NATIONAL STANDARD, ANSI/AWWA C 600-87, INSTALLATION OF GRAY AND DUCTILE CAST IRON WATER MAINS AND APPURTENANCES," AS ADOPTED BY THE AMERICAN WATER WORKS ASSOCIATION.

CUTTING PIPE

WHENEVER THE PIPES REQUIRE CUTTING TO FIT INTO THE LINES, THE WORK SHALL BE DONE IN A SATISFACTORY MANNER SO AS TO LEAVE A SMOOTH END AT RIGHT ANGLES TO THE AXIS OF THE PIPE. WHEN A PIECE OF PIPE IS CUT TO FIT INTO THE LINE, NO PAYMENT WILL BE MADE FOR THE PORTION CUT OFF AND NOT USED IN THE LINE. THE CONTRACTOR'S ATTENTION IS CALLED TO THE PARAGRAPH "WORK TO BE DONE BY THE CITY."

JOINTS

(A) SLIP-ON JOINTS:

ALL PIPE UNLESS OTHERWISE REQUIRED, SHOWN ON CONTRACT DRAWINGS, DIRECTLY SPECIFIED OR CONNECTED TO FITTINGS, VALVES AND HYDRANTS SHALL HAVE SOCKET BY PLAIN END RUBBER-GASKET PUSH-ON JOINTS WITH RADIALLY COMPRESSED LOCKED IN PLACE RUBBER RING GASKETS APPROVED BY THE COMMISSIONER OF WATER. SLIP-ON COMPRESSION JOINTS SHALL CONFORM TO THE REGULAR AND SPECIAL REQUIREMENT FOR PUSH-ON JOINTS IN AMERICAN NATIONAL STANDARD, ANSI/AWWA C111/A21.11-85, "RUBBER GASKET JOINTS FOR DUCTILE-IRON AND GRAY-IRON PRESSURE PIPE AND FITTINGS," AND ALL SUBSEQUENT AMENDMENTS THERETO.

(B) MECHANICAL JOINTS/RETAINED MECHANICAL JOINTS:

1. ALL FITTINGS AND PIPE BELL ENDS CONNECTED TO FITTINGS, UNLESS OTHERWISE REQUIRED, SHOWN ON CONTRACT DRAWINGS, OR DIRECTLY SPECIFIED SHALL HAVE BELL OR PLAIN END JOINTS OF THE MECHANICAL BOLTED STUFFING-BOX TYPE WITH SEALING GASKET AND BOLTED DUCTILE IRON FOLLOWER GLAND AND SHALL BE OF THE SPECIFIED RETAINED TYPE. BOLTS AND NUTS FOR MECHANICAL JOINTS SHALL BE CORROSION RESISTANT, HIGH STRENGTH, LOW ALLOY STEEL.

2. MECHANICAL JOINTS SHALL CONFORM TO THE REGULAR AND SPECIAL REQUIREMENT THAT ALL GLANDS SHALL BE DUCTILE IRON WITH JOINT DIMENSIONS AND TOLERANCES, BOLT HOLES AND SLOTS, GASKETS, RUBBER, QUALITY CONTROL, BOLTS AND NUTS AND MARKING BE IN CONFORMANCE WITH AMERICAN NATIONAL STANDARD, ANSI/AWWA C111/A21.11-85, "RUBBER GASKET JOINTS FOR DUCTILE IRON AND GRAY IRON PRESSURE PIPE AND FITTINGS." ON ALL PIPE AND FITTINGS AT BENDS, TEES, CROSSES, SPECIAL FITTINGS, BETWEEN VERTICAL OFFSETS OR BENDS, ON HYDRANT BRANCHES, ON VALVES AND HYDRANT BASE ELBOWS, UP TO AND INCLUDING 16-INCH SIZE, THE CONTRACTOR SHALL FURNISH AND INSTALL RETAINED TYPE MECHANICAL JOINTS.

3. ON ALL PIPE AND FITTINGS AT BENDS, TEES, CROSSES, SPECIAL FITTINGS, BETWEEN VERTICAL OFFSETS OR BENDS, ON HYDRANT BRANCHES, ON VALVES AND HYDRANT BASE ELBOWS, UP TO AND INCLUDING 16-INCH SIZE, THE CONTRACTOR SHALL FURNISH AND INSTALL RETAINED TYPE MECHANICAL JOINTS.

4. PIPE AND FITTING BELL JOINT AND GASKETS SHALL BE FURNISHED AS SPECIFIED. GLANDS FOR RETAINED MECHANICAL JOINTS SHALL BE BOLTED TYPE OF DUCTILE-IRON MATERIAL CONFORMING TO AMERICAN NATIONAL STANDARD, ANSI/AWWA C111/A21.11-85, "RUBBER-GASKET JOINTS FOR DUCTILE-IRON AND GRAY-IRON PRESSURE PIPE AND FITTINGS," AND/OR CONFORMING WITH ASTM A 536-84, "SPECIFICATION FOR DUCTILE-IRON CASTINGS." RETAINED MECHANICAL JOINT FOLLOWER GLANDS SHALL BE EQUAL TO THE "MEG-A-LUG" AS MANUFACTURED BY EBAA IRON SALES, INC., THE "SUPER-LUG" AS MANUFACTURED BY THE SIGMA CORPORATION OR THE "UNI-FLANGE SERIES 1400" AS MANUFACTURED BY THE FORD METER BOX COMPANY, INC. PROPER TORQUE SHALL BE THAT AS RECOMMENCED BY THE RETAINER GLAND MANUFACTURER. WHERE JOINT DEFLECTION IS NECESSARY FOR ALIGNMENT SUCH DEFLECTION SHALL BE LIMITED TO MANUFACTURER'S MAXIMUM JOINT OPENING. ALL RETAINED JOINTS SHALL BE RATED FOR MINIMUM 250 PSI PRESSURE. ALL RETAINED JOINTS SHALL BE POLYETHYLENE ENCASED AS SPECIFIED IN SECTION, "JOINTS", (C), EXCEPT WHERE SUCH RETAINED MECHANICAL JOINTS ARE BONDED JOINTS WHERE NO POLYETHYLENE ENCASEMENT WILL BE REQUIRED.

5. RETAINER GLANDS USING PERPENDICULAR SET SCREWS AS A MEANS RESTRAINT WILL NOT BE PERMITTED.

(C) POLYETHYLENE ENCASEMENT:

1. ALL MECHANICAL JOINTS, ALL RETAINED MECHANICAL JOINTS, FLANGES, VICTAULIC AND COMPRESSION TYPE BOLTED SLEEVED COUPLINGS, AND ALL PIPE AND FITTINGS HAVING BOLTS OR OTHER TYPE OF FASTENERS IN JOINT CONSTRUCTION AND PIPE AND FITTINGS AS SHOWN ON THE CONTRACT DRAWINGS OR WHERE REQUIRED SHALL BE POLYETHYLENE ENCASED. PIPE, FITTING AND OTHER JOINTS THAT ARE BONDED JOINTS NEED NOT BE POLYETHYLENE ENCASED. POLYETHYLENE ENCASEMENT FOR MECHANICAL JOINTS, RETAINED MECHANICAL JOINTS OR ANY JOINT REQUIRING BOLTS AND NUTS SHALL BE WRAPPED IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD, ANSI/AWWA C105/A21.5-88, "POLYETHYLENE ENCASEMENT FOR DUCTILE-IRON PIPING FOR WATER AND OTHER LIQUIDS," AND ALL SUBSEQUENT AMENDMENTS THERETO. MECHANICAL JOINTS, RETAINED MECHANICAL JOINTS AND ALL BOLTED JOINTS SHALL HAVE DOUBLE POLYETHYLENE ENCASEMENT OF CLASS "C" (BLACK) FILM, METHOD "C" DOUBLING SHEET AND PROVIDING ONE FOOT (1') MINIMUM OVERLAP ON PIPE OR FITTING ON BOTH SIDES OF JOINT. ALL PIPE AND FITTINGS WHERE SHOWN ON THE DRAWINGS OR WHERE OTHERWISE REQUIRED TO BE POLYETHYLENE ENCASED SHALL BE ENCASED USING CLASS "C" FILM, METHOD "B". POLYETHYLENE ENCASEMENT SHALL BE SECURELY TAPED SNUG AROUND PIPE AND FITTINGS.

2. ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, RETAINED MECHANICAL JOINTS, FLANGES, VICTAULIC AND COMPRESSION TYPE BOLTED SLEEVED COUPLINGS, SHALL HAVE FIELD APPLIED THREE (3) COATS OF BITUMASTIC COATING PRIOR TO POLYETHYLENE ENCASEMENT.

(D) BOLTLESS RESTRAINED SLIP-ON JOINTS:

WHERE CALLED FOR ON THE CONTRACT DRAWINGS OR DIRECTLY SPECIFIED ALL JOINT RESTRAINT SHALL BE OF THE BOLTLESS RESTRAINED SLIP-ON JOINT DESIGN. VALVES AND VALVE JOINT TYPE WITHIN THE LIMITS OF THE BOLTLESS RESTRAINED PIPE AND FITTINGS SHALL BE OF THE TYPE INDICATED ON THE CONTRACT DRAWINGS OR AS SPECIFIED.

BOLTLESS RESTRAINED PUSH-ON JOINT PIPE AND FITTINGS SHALL BE OF A DESIGN CONSISTING OF A SHOP WELDED RETAINER RING OR SEGMENT ON THE SPIGOT END OF THE PIPE THAT WHEN THE JOINT IS FULLY ASSEMBLED "LOCKS" INTO THE BELL OF THE ADJACENT PIPE OR FITTING PROVIDING A POSITIVE RESTRAINED JOINT. NO FIELD WELDED RESTRAINED JOINTS ARE PERMITTED EXCEPT ON LENGTHS OF PIPE LESS THAN NOMINAL LENGTH NEEDED TO CLOSE THE LINE. BOLTLESS RESTRAINED JOINTS SHALL BE OF A DESIGN THAT PROVIDES RESTRAINED ACTION BETWEEN THE SPIGOT AND BELL OF THE PIPE OR FITTING INDEPENDENT OF THE GASKET. BOLTLESS RESTRAINED PUSH-ON JOINTS SHALL BE EQUAL TO: "FLEX-RING" AS MANUFACTURED BY AMERICAN CAST IRON PIPE COMPANY; "SUPER-LOCK" AS MANUFACTURED BY CLOW CORPORATION (MCWANE, INC.); OR "TR-FLEX" AS MANUFACTURED BY U. S. PIPE AND FOUNDRY.

(E) COMPRESSION COUPLINGS:

1. ALL PIPE COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING WITH STOPS REMOVED; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND, BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276-89A, TYPE 304) TO PROPERLY COMPRESS THE GASKETS. THE MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536). THE COMPRESSION COUPLING SHALL HAVE A MINIMUM WORKING PRESSURE RATING OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE NOS: 38, 138, OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

2. ALL COMPRESSION COUPLINGS SHALL BE COATED IN THE SHOP WITH A FACTORY COATING COMPATIBLE WITH FIELD APPLIED PRIMER AND ENAMEL COATINGS. COMPRESSION COUPLINGS SHALL BE CLEANED AND PAINTED WITH THREE (3) FIELD COATS OF KOPPERS BITUMASTIC SUPER TANK SOLUTION OR EQUIVALENT.

COMPRESSION COUPLINGS:

COMPRESSION COUPLINGS WHERE REQUIRED, SHALL BE SIMILAR AND EQUAL TO DRESSER STYLE 38 COUPLING AS MANUFACTURED BY THE DRESSER MANUFACTURING DIVISION OF DRESSER INDUSTRIES. THEY SHALL CONSIST OF TWO (2) STEEL FOLLOWER FLANGES, ONE (1) STEEL MIDDLE RING, TWO (2) MOLDED RUBBER GASKETS, AND SUFFICIENTLY ROLLED THREAD, TRACK HEADED BOLTS TO PROPERLY COMPRESS THE GASKETS. THE MIDDLE RING SHALL CONTAIN NO PIPE STOPS.

ALL METAL PARTS OF THE COUPLINGS INCLUDING BOLTS AND NUTS SHALL BE GALVANIZED OR HEAVILY CADMIUM PLATED AT THE POINT OF MAUNFACTURE.

(F) FLANGED JOINTS:

1. FLANGED JOINTS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS OR AS SPECIFIED. FLANGES SHALL BE EITHER CAST STEEL, FORGED OR ROLLED STEEL, OR PROPERLY WELDED AND MACHINED FABRICATED STEEL PLATES, WELDED TO PIPE WITH TWO CONTINUOUS WELDS. THEY SHALL HAVE PLAIN FACES AND SHALL BE FACED TRUE AND SMOOTH AT RIGHT ANGLES TO THE AXIS OF THE PIPE AND SHALL BE SPOT FACED ON THE BACK. DRILLING SHALL CONFORM TO ANSI B16.1, 125 LBS. EACH BLIND FLANGE SHALL BE CAST IRON AND HAVE BOSSES TAPPED AT TOP AND BOTTOM FOR TWO (2) INCH STANDARD PIPE AND FURNISHED WITH PLUGS.

2. ALL MACHINED STEEL SURFACES AT THE ENDS OF PIPE AND/OR FITTINGS TO RECEIVE VICTAULIC TYPE COUPLINGS OR PIPE ENDS HAVING FLANGES (FACE OF FLANGE) SHALL BE COATED WITH ONE (1) SHOP COAT OF AN APPROVED ZINC RICH PAINT.

3. ALL BOLTS AND NUTS USED IN THE FINISHED WORK FOR FLANGES SHALL BE MADE OF SILICON BRONZE (ASTM B 98-84, ALLOY A, "SPECIFICATION FOR COPPER-SILICON ALLOY ROD, BARS, AND SHAPES") OR STAINLESS STEEL (ASTM A 276-89A, TYPE 304, "SPECIFICATION FOR STAINLESS AND HEAT-RESISTING STEEL BARS AND SHAPES"). THE ENDS OF ALL BOLTS MUST BE FINISHED TO STANDARD RADIUS IN ACCEPTABLE MANNER. ALL SCREW THREADS SHALL BE AMERICAN STANDARD COARSE THREAD (N.C.). STUD BOLTS DOUBLE END (ROD) SHALL BE USED TO MAKE THE FLANGED JOINTS ON PIPE. ALL DIMENSIONS TO BE ACCORDING TO AMERICAN STANDARD HEAVY. BOLTS AND NUTS SHALL BE DELIVERED TO THE FIELD FREE FROM GREASE, RUST AND DIRT AND SHALL BE PROPERLY PROTECTED FROM MOISTURE AND DIRT IN THE FIELD. GASKETS FOR FLANGED PIPE SHALL BE 5X MANILA ROPE PATTERN OR OTHER APPROVED TYPE.

PAINTING

AFTER INSTALLATION AND BEFORE POLYETHYLENE ENCASEMENT, ALL EXPOSED OR DAMAGED COATING AND ALL BOLTS FOR MECHANICAL JOINTS, RETAINED MECHANICAL JOINTS, FLANGES AND VICTAULIC OR COMPRESSION TYPE BOLTED SLEEVED COUPLINGS SHALL BE CLEANED AND PAINTED WITH THREE (3) FIELD COATS OF KOPPERS BITUMASTIC SUPER TANK SOLUTION OR EQUIVALENT.

DRAWINGS

(A) THE CONTRACTOR SHALL SUBMIT TO THE CITY THROUGH THE ENGINEER FOR APPROVAL SIX (6) SETS OF PRINTS OF ALL SHOP DRAWINGS FOR PIPE AND FITTINGS AND MISCELLANEOUS OR SPECIAL DETAILS OF PIPE AND FITTING JOINTS WHICH ARE NOT STANDARD CONSTRUCTION OR FULLY DETAILED IN THE REGULAR CATALOGUE OF THE COMPANY FURNISHING THE PIPE, FITTINGS AND SPECIALS. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN APPROVED.

(B) THE APPROVAL OF THE DRAWINGS BY THE CITY SHALL NOT RELIEVE THE CONTRACTOR OF ANY OF HIS OBLIGATIONS IN CONNECTION WITH THIS CONTRACT.

MEASUREMENT

THE NUMBER OF LINEAR FEET OF DUCTILE IRON PIPE AND FITTINGS TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF LINEAR FEET FURNISHED AND PLACED IN ACCORDANCE WITH THE CONTRACT DRAWINGS AND THESE SPECIFICATIONS AS MEASURED ALONG THE AXIS OF THE PIPING, INCLUDING FITTINGS AND VALVES CONNECTED UP IN PLACE.

FOR CONNECTIONS BETWEEN NEW AND/OR EXISTING WATER MAINS THE NUMBER OF LINEAR FEET OF DUCTILE IRON PIPE AND FITTINGS, INCLUDING CONNECTIONS THERETO, TO BE PAID FOR SHALL BE ACTUAL NUMBER OF LINEAR FEET FURNISHED AND PLACED IN ACCORDANCE WITH THE CONTRACT DRAWINGS AND THESE SPECIFICATIONS AS MEASURED ALONG THE AXIS OF THE PIPING FROM CENTER TO CENTER OF EXISTING MAINS.

PAYMENT

THE FOOTAGE MEASURED AS PROVIDED ABOVE SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR:

"ITEM SPECIAL – WATER MAIN, DUCTILE IRON PIPE WITH PUSH-ON JOINTS AND RETAINED MECHANICAL JOINT FITTINGS", CLASSIFIED AS TO SIZE AND CLASS; _____(F.T.)"

"ITEM SPECIAL – WATER MAIN, DUCTILE IRON PIPE WITH BOLTLESS RESTRAINED JOINTS AND FITTINGS", CLASSIFIED AS TO SIZE, TYPE AND CLASS; _____(F.T.)"

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

84
146

F:\JOBS\665\WP\665WCN06.DWG PJK 3/22/07 PLOT 1:1

WATER WORK NOTES

ITEM SPECIAL – DUCTILE IRON PIPE AND FITTINGS – 24" AND LARGER

WORK INCLUDED

(A) THE CONTRACTOR SHALL UNDER ITEM SPECIAL – DUCTILE IRON PIPE AND FITTINGS – 24" AND LARGER, FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY CONSTRUCT AND CONNECT IN PLACE AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED, ALL DUCTILE IRON PIPE AND FITTINGS, INCLUDING ALL EXCAVATION WORK, THE CUTTING INTO AND REMOVAL OF EXISTING PIPE, BACKFILLING, SAND BEDDING AND PREMIUM BACKFILL, AND REPAVING (BOTH TEMPORARY AND PERMANENT), ALL AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT. IN GENERAL THIS WORK SHALL INCLUDE THE FURNISHING, LAYING, CONNECTING, PAINTING, SPECIAL EXTERIOR COATING, JOINT BONDING, AND TESTING OF PIPE AND FITTINGS, THE EXCAVATION, REMOVAL AND RESTORATION OF MISCELLANEOUS ITEMS, SHEETING AND SHORING, BACKFILLING, SAND BEDDING AND PREMIUM BACKFILL, SEEDING AND SODDING, THE PERMANENT REPAVING, IF SO NOTED ON THE CONTRACT DRAWINGS, THE CUTTING INTO, REMOVAL AND STORAGE OF EXISTING MAINS, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT TO COMPLETE THE WORK AS SPECIFIED, SHOWN OR ORDERED.

(B) IN MAKING THE CONNECTION TO EXISTING MAINS WHERE BRANCH SLEEVES CAN BE USED, THE CONTRACTOR SHALL SUPPLY THE SAME. THE DIVISION OF WATER WILL INSTALL THE BRANCH SLEEVE AND WILL MAKE THE PRESSURE TAP (IF APPLICABLE) IN ACCORDANCE WITH THE REQUIREMENTS INDICATED UNDER "WORK TO BE DONE BY THE CITY." IF THE INSTALLATION OF BRANCH SLEEVES AND VALVES CANNOT BE ACCOMPLISHED, THE CONTRACTOR WILL BE REQUIRED TO FURNISH AND INSTALL TEES WITH SLEEVES OR COUPLINGS TO COMPLETE THE CONNECTION. THE CONTRACTOR WILL BE REQUIRED TO MAKE THE NECESSARY EXCAVATION, BACKFILL AND REPAVING (IF NOT PAID FOR SEPARATELY AS PART OF THIS CONTRACT.

LAYOUT OF DUCTILE IRON PIPE AND FITTINGS 24" AND LARGER

(A) AS ONE (1) OF THE ALTERNATE MATERIALS THE CONTRACTOR SHALL FURNISH, UNDER ITEM SPECIAL – DUCTILE IRON PIPE AND FITTINGS – 24" AND LARGER. CLASS OF PIPE SHALL BE MINIMUM CLASS 52 OR HIGHER AS SPECIFIED HEREIN UNDER PARAGRAPHS F, G AND H. CLASS OF FITTINGS SHALL BE AS SPECIFIED IN PARAGRAPH E. VALVE ASSEMBLIES, PLAIN ANCHORS, ACCESS MANHOLES, DRAIN ASSEMBLIES, AIR RELIEF OUTLETS, PITOMETER OUTLETS AND JOINT BONDING AND ELECTROLYSIS TEST STATION ASSEMBLIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DETAIL DRAWINGS. THE PLANS THE DUCTILE IRON PIPE AND FITTINGS FURNISHED UNDER THIS ITEM SHALL HAVE A SPECIAL EXTERIOR PIPE COATING AS SPECIFIED IN PARAGRAPH I. ALL TEES SHALL HAVE FLANGED OUTLETS EXCEPT AS OTHERWISE SPECIFIED HEREIN. ALL RESTRAINED JOINTS SHALL BE OF THE BOLTLESS TYPE AS SPECIFIED HEREIN.

(B) PIPE LAYOUT INDICATED ON THE CONTRACT DRAWINGS IS BASED UPON GEOMETRIC DESIGN THAT WILL ALLOW INSTALLATION OF EITHER DUCTILE IRON PIPE AND FITTINGS OR PRESTRESSED CONCRETE CYLINDER PIPE AND FITTINGS OR STEEL PIPE AND FITTINGS. IN ORDER TO ACHIEVE THE HORIZONTAL AND VERTICAL DEFLECTIONS SHOWN ON THE CONTRACT DRAWINGS STANDARD BENDS OF 11– 1/4, 22–1/2, OR 45 DEGREES SHALL BE USED. JOINT OPENINGS AS REQUIRED, NOT TO EXCEED THE MANUFACTURER'S MAXIMUM SUGGESTED JOINT OPENING, SHALL BE USED TO MEET THE HORIZONTAL AND VERTICAL DEFLECTIONS SHOWN ON THE DRAWINGS. THE MAXIMUM PIPE LENGTH SHALL BE 20'–0". IN SOME CASES DUE TO RESTRAINED JOINTS ON CURVES, LENGTHS LESS THAN 20'–0" MAY BE USED. THESE SHALL BE INCLUDED IN THE BID PRICE PER LINEAL FEET OF PIPE. CONTRACTOR SHALL MAINTAIN ALL HORIZONTAL POINTS OF INTERSECTION (HPI), AND AS CLOSE AS POSSIBLE, THE VERTICAL POINTS OF INTERSECTION (VPI), AS SHOWN ON THE CONTRACT DRAWINGS.

(C) WHERE "RESTRAINED DISTANCE" IS SHOWN ON THE CONTRACT DRAWINGS AND STANDARD FITTINGS ARE USED TO OBTAIN THE REQUIRED LINE AND GRADE, THE CONTRACTOR SHALL FURNISH DUCTILE IRON MINIMUM CLASS 52 (SEE PARAGRAPHS F, G, AND H) CEMENT LINED BOLTLESS RESTRAINED PUSH–ON JOINT FITTINGS TO THE LIMITS OF THE "RESTRAINED DISTANCE" SHOWN ON THE CONTRACT DRAWINGS. ALL RESTRAINED JOINTS SHALL BE DESIGNED FOR A BULKHEAD THRUST WITH A PRESSURE OF MINIMUM 225 PSI.

(D) IN VALVE ASSEMBLIES ALL PIPE JOINTS, FITTINGS, AND VALVE JOINTS, BETWEEN THE TWO PLAIN ANCHORS OR ACCESS MANHOLES AND ANCHORAGES WHETHER WITHIN "RESTRAINED DISTANCE" OR WHERE NO "RESTRAINED DISTANCE" IS SHOWN ON THE DRAWINGS SHALL HAVE JOINTS DESIGNED FOR A BULKHEAD THRUST WITH A PRESSURE OF MINIMUM 225 PSI. VALVE ENDS SHALL BE OF THE TYPE CALLED FOR ON THE CONTRACT DRAWINGS OR AS SPECIFIED HEREIN.

(E) SUPPLEMENTAL CONNECTIONS, WHERE CALLED FOR ON THE PLANS, SHALL BE CONSTRUCTED WITH STANDARD FULL BODIED FITTINGS FOR THOSE CONNECTIONS 16–INCHES AND LARGER; SHORT BODIED FITTINGS MAY BE USED FOR THOSE SUPPLEMENTAL CONNECTIONS 12–INCHES IN SIZE. OUTLET FOR SUPPLEMENTAL CONNECTIONS ON SUPPLY MAINS SHALL BE FURNISHED BY PROVIDING INSULATED FLANGED OUTLET TEES; SEE SECTION ENTITLED "JOINTS, PARAGRAPH (E)(4). THE TEES WHERE FALLING WITHIN "RESTRAINED DISTANCE" SHOWN ON THE DRAWINGS SHALL BE A FULL BODIED BOLTLESS RESTRAINED FITTING. WHERE THE SUPPLEMENTAL CONNECTION FALLS OUTSIDE THE LIMITS OF RESTRAINED DISTANCE THE TEE MAY BE A RETAINED MECHANICAL JOINT FITTING IF SUCH IS AVAILABLE OTHERWISE THE TEE SHALL BE A BOLTLESS RESTRAINED FITTING. THE RESTRAINED JOINTS AND RETAINED MECHANICAL SHALL BE DESIGNED FOR BULKHEAD THRUST WITH A PRESSURE OF MINIMUM 225 PSI.

(F) WHERE DEPTH OF COVER FOR 30–INCH, 36–INCH, 42–INCH AND 48–INCH DUCTILE IRON PIPE EXCEEDS TWENTY (20) FEET, PIPE THICKNESS SHALL BE INCREASED TO MINIMUM CLASS 53. WHERE DEPTH OF COVER EXCEEDS TWENTY–FOUR (24) FEET, PIPE THICKNESS SHALL BE INCREASED TO MINIMUM CLASS 54.

(G) WHERE DEPTH OF COVER FOR 24–INCH DUCTILE IRON PIPE EXCEEDS TWENTY–FOUR (24) FEET, PIPE THICKNESS SHALL BE INCREASED TO MINIMUM CLASS 54.

(H) WHERE DEPTH OF COVER FOR 20–INCH DUCTILE IRON PIPE EXCEEDS TWENTY–EIGHT (28) FEET, PIPE THICKNESS SHALL BE INCREASED TO MINIMUM CLASS 54

(I) SPECIAL EXTERIOR COATING:

DUCTILE IRON PIPE AND FITTINGS (24" AND LARGER) SHALL HAVE SHOP APPLIED A 16 MIL THICKNESS OF AN APPROVED COAL TAR EPOXY EXTERIOR COATING. THE COATING SHALL BE APPLIED IN TWO (2) COATS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND SHALL HAVE A DRY FILM THICKNESS (DFT) OF 16 MILS.

(J) BONDED JOINTS:

1. GENERAL: ALL DUCTILE IRON PIPE JOINTS AND PIPE FITTING JOINTS ON DUCTILE IRON PIPE SHALL HAVE APPROVED TYPE BONDED JOINTS. THE BONDED TYPE JOINTS SHALL BE OF A TYPE THAT CAN BE USED IN CONJUNCTION WITH A CATHODIC PROTECTION SYSTEM AND BE OF A TYPE THAT WILL PROVIDE POSITIVE ELECTRICAL CONTINUITY ACROSS THE JOINTS OF ALL PUSH–ON JOINT PIPE; ALL RETAINED MECHANICAL JOINT FITTINGS; ALL BOLTLESS RESTRAINED JOINT PIPE AND FITTINGS; ALL FLANGED JOINTS, EXCEPT WHERE INSULATED FLANGED JOINTS ARE REQUIRED OR ORDERED; ALL COMPRESSION TYPE COUPLING JOINTS, EXCEPT WHERE INSULATED COMPRESSION COUPLINGS ARE REQUIRED OR ORDERED; ALL VICTAULIC TYPE JOINTS; AND ANY OTHER SPECIALS. ELECTROLYSIS TEST STATIONS SHALL BE FURNISHED AND INSTALLED WHERE SHOWN ON THE CONTRACT DRAWINGS. THE BONDING WIRE, CONNECTORS, AND TEST STATION ASSEMBLIES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE DETAILED DRAWINGS EXCEPT THAT BONDING CONNECTORS SHALL BE INSTALLED AT EACH PIPE JOINT AT THE ELEVEN (11) AND ONE (1) O'CLOCK POSITIONS ON PIPE SIZES 30", 36", 42", AND 48". AFTER THE JOINT BONDING HAS BEEN INSTALLED THE CONTRACTOR SHALL COMPLETE THE EXTERIOR JOINT PER CONTRACT DRAWING DETAILS INCLUDING EXTERIOR COATING REPAIR.

2. ELECTROLYSIS TEST STATIONS: WHERE SHOWN ON THE PLANS OR WHERE ORDERED THE CONTRACTOR SHALL FURNISH AND INSTALL ELECTROLYSIS TEST STATION ASSEMBLIES. ALL MATERIALS REQUIRED FOR THE ELECTROLYSIS TEST STATION ASSEMBLIES SHALL CONFORM WITH THE DETAILS SHOWN ON THE DETAIL DRAWINGS OR AS SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.

3. PAYMENT: PAYMENT FOR FURNISHING AND INSTALLING BONDED JOINTS AND ELECTROLYSIS TEST STATIONS SHALL BE INCLUDED IN THE COST PER LINEAL FOOT OF DUCTILE IRON PIPE AND FITTINGS FURNISHED AND INSTALLED IN THE WORK. ADDITIONAL JOINT BONDING AND TEST STATIONS REQUIRED AS A RESULT OF CATHODIC PROTECTION REQUIREMENTS SHALL BE FURNISHED, INSTALLED AND PAID FOR UNDER THAT ITEM.

DRAWINGS – WATER MAINS 24" AND LARGER

(A) THE CONTRACTOR SHALL SUBMIT TO THE CITY THROUGH THE ENGINEER FOR REVIEW AND/OR APPROVAL, SIX (6) COMPLETE SETS OF ALL SHOP DRAWINGS FOR FITTINGS AND SPECIALS, AND MISCELLANEOUS DETAILS, SUCH AS AIR RELIEF AND DRAIN OUTLETS, BONDING OF JOINTS, ANCHORS, PITOMETER OPENING, RESTRAINED JOINT, ACCESS OPENINGS, DRAIN PIPE ASSEMBLY, PIPING FOR GATE VALVE ASSEMBLY, ETC.

(B) THE CONTRACTOR SHALL ALSO INITIALLY FURNISH TO THE CITY THROUGH THE ENGINEER A MINIMUM OF SIX (6) SETS OF A COMPLETE ASSEMBLY PLAN FOR THE ENTIRE LENGTH OF THE PIPE LINE INCLUDING A DETAILED TABULATED LAYING SCHEDULE. THIS ASSEMBLY PLAN SHALL ALSO SHOW THE CORRECT LOCATION OF ALL FITTINGS TO BE FURNISHED, INCLUDING AIR RELIEF VALVES, DRAINS, ANCHORS, MANHOLES, PITOMETER VAULTS, VALVE VAULTS, RESTRAINED JOINTS, ACCESS MANHOLES, ELECTROLYSIS TEST STATIONS, VALVES, ETC.

(C) AT LEAST TWO (2) SETS OF EACH OF THE SHOP DRAWINGS AND ASSEMBLY PLAN SUBMITTED WILL BE RETURNED TO THE CONTRACTOR WITH THE CRITICISMS OR APPROVAL OF THE ENGINEER. IN CASE THE DRAWINGS ARE NOT APPROVED, THE CONTRACTOR SHALL AGAIN SUBMIT FOR APPROVAL, SIX (6) COMPLETE SETS OF REVISED SHOP DRAWINGS AND ASSEMBLY PLAN REQUIRED FOR REVIEW AND/OR APPROVAL. AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED, THE CONTRACTOR SHALL AGAIN FURNISH TO THE CITY, THROUGH THE ENGINEER, A SUFFICIENT NUMBER OF ADDITIONAL SETS OF SHOP DRAWINGS AND ASSEMBLY PLAN ON PAPER FOR HIS USE AND FOR THE CITY'S INTERNAL DISTRIBUTION AND FINALLY ONE (1) MYLAR OR REPRODUCIBLE CLOTH TRACING OF EACH DRAWING AS PREVIOUSLY SPECIFIED. NO WORK SHALL BE DONE IN THE SHOP OR IN THE FIELD UNTIL ALL THE DRAWINGS HAVE BEEN FINALLY APPROVED. MYLAR TRACINGS SHALL BE SUBMITTED AS SPECIFIED IN THE GENERAL NOTES "DRAWINGS."

(D) THE APPROVAL OF THE DRAWINGS BY THE CITY SHALL NOT RELIEVE THE CONTRACTOR OF ANY OF HIS OBLIGATIONS IN CONNECTION WITH THIS CONTRACT.

MATERIALS DATA WITH PROPOSAL

EACH BIDDER SHALL SUBMIT WITH HIS PROPOSAL, AND IN FORM PROVIDED, THE INFORMATION CALLED FOR BELOW:

A. NAME OF PIPE MANUFACTURER AND LOCATION OF PLANT.

B. NAME OF COUPLING MANUFACTURER AND LOCATION OF PLANT.

C. NAME OF EXTERIOR PIPE COATING MANUFACTURER

CONNECTING TO EXISTING WATER MAINS

(A) THE CONTRACTOR SHALL LOCATE ALL PIPE ENDS AND/OR ALL EXISTING PIPE JOINTS WHERE CONNECTIONS ARE TO MADE, INCLUDING WHERE EXISTING MAINS ARE TO BE TAPPED, ALONG WITH THE NEXT EXISTING PIPE JOINT TO DETERMINE THE EXACT LOCATION AND ELEVATION (LINE AND GRADE) OF THE EXISTING WATER MAIN. THE CONTRACTOR SHALL ALSO EXPOSE THE EXISTING PIPE JOINTS WHERE CONNECTIONS ARE TO MADE TO DETERMINE THE TYPE OF EXISTING JOINT AND THE DIRECTION OF THE EXISTING JOINT. NO PIPE FABRICATION DRAWING WILL BE APPROVED UNTIL THIS INFORMATION IS SUBMITTED TO THE ENGINEER AND TO THE CITY. ALL FIELD DATA SHALL BE OBTAINED IN THE PRESENCE OF THE DIVISION OF WATER'S RESIDENT INSPECTOR.

(B) IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL FIELD DIMENSIONS PRIOR TO PREPARING THE VARIOUS SHOP DRAWING SUBMITTALS. AT THE TIME OF EACH SUBMISSION, THE CONTRACTOR SHALL GIVE THE CITY SPECIFIC WRITTEN NOTICE OF EACH VARIATION THAT THE SHOP DRAWINGS MAY HAVE FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. IN ADDITION, THE CONTRACTOR SHALL CAUSE A SPECIFIC NOTATION TO BE MADE ON EACH SHOP DRAWING SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL OF EACH SUCH VARIATION. THE CITY'S REVIEW AND APPROVAL OF SHOP DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ANY VARIATION FROM THE REQUIREMENTS OF THE CONTRACT DRAWINGS. THE CITY'S APPROVAL SHALL NOT EXTEND TO ANY SUCH VARIATION UNLESS CONTRACTOR HAS, IN WRITING, CONSPICUOUSLY CALLED THE CITY'S ATTENTION TO EACH SUCH VARIATION AT THE TIME OF SUBMITTAL, AS REQUIRED BY THIS PARAGRAPH, AND THE CITY HAS GIVEN WRITTEN APPROVAL OF THAT PARTICULAR VARIATION BY A SPECIFIC WRITTEN NOTATION THEREOF INCORPORATED IN OR ACCOMPANYING THE SHOP DRAWING APPROVAL.

(C) THE FIELD DATA SHALL BE OBTAINED IN SUFFICIENT TIME IN ADVANCE OF THE PROPOSED CONNECTION IN ORDER TO DETERMINE IF ANY ADJUSTMENTS TO THE LINE AND GRADE OF THE PROPOSED WATER MAIN IS REQUIRED DUE TO THE INFORMATION OBTAINED IN THE FIELD DATA. THE INFORMATION OBTAINED IN THE FIELD DATA SHALL ALSO BE FORWARDED TO THE PIPE FABRICATOR WITH SUFFICIENT TIME TO ALLOW FOR THE PREPARATION OF REVISED SHOP DRAWINGS AND FOR FABRICATION OF THOSE PIPE AND FITTINGS REQUIRED TO MAKE THE CONNECTION. NO EXTRA COMPENSATION TO THE CONTRACTOR WILL BE ALLOWED FOR ANY DELAYS AND/OR ADDITIONAL PIPE AND FITTINGS FOR FAILURE TO HAVING PROPERLY OBTAINED FORWARDED THE REQUIRED FIELD INFORMATION DATA.

DUCTILE–IRON PIPE AND FITTINGS – GENERAL

(A) ALL PIPE AND FITTINGS SHALL BE MANUFACTURED IN ACCORDANCE WITH AND IN ALL RESPECTS WITH THE REQUIREMENTS OF THE LATEST SPECIFICATIONS OF THE "AMERICAN NATIONAL STANDARD" FOR ANSI/AWWA C151/A21.51–86, "DUCTILE IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SAND–LINED MOLDS, AND DUCTILE IRON FITTINGS FOR WATER AND OTHER LIQUIDS," AND ANSI/AWWA C111/A21.11–85, "RUBBER–GASKET JOINTS FOR DUCTILE–IRON PIPE AND GRAY–IRON PRESSURE PIPE AND FITTINGS," ADOPTED BY THE AMERICAN WATER WORKS ASSOCIATION; WHICH STANDARDS EXCEPT AS HEREIN MODIFIED ARE MADE A PART OF THESE SPECIFICATIONS. PIPE AND FITTINGS ON 24–INCH AND LARGER WATER MAIN INSTALLATIONS SHALL HAVE BOLTLESS RESTRAINED PUSH–ON JOINT PIPE AND FITTINGS WITHIN "RESTRAINED DISTANCE" SHOWN ON THE CONTRACT DRAWINGS AND WHERE CALLED OUT TO BE RESTRAINED.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

85
146

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WATER WORK NOTES

(B) ALL PIPE AND FITTINGS SHALL BE CEMENT LINED AND OF THE SIZE AND THICKNESS AND PRESSURE CLASSES NOTED ON THE RESPECTIVE CONTRACT DRAWING OR DIRECTLY SPECIFIED.

(C) ALL DUCTILE IRON FITTINGS SHALL BE MANUFACTURED IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD, ANSI/AWWA C110/A21.10–87, "DUCTILE IRON AND GRAY–IRON FITTINGS, 3–INCH THROUGH 48–INCH, FOR WATER OTHER LIQUIDS," AND ALL SUBSEQUENT AMENDMENTS THERETO. METAL FOR FITTINGS SHALL CONFORM TO AMERICAN NATIONAL STANDARD ANSI A21.10–87.

(D) THE CONTRACTOR SHALL FURNISH CENTRIFUGAL CAST DUCTILE IRON CEMENT LINED PIPE. DUCTILE IRON METAL SHALL HAVE A MINIMUM TENSILE STRENGTH OF 60,000 PSI, MINIMUM YIELD STRENGTH OF 42,000 PSI AND MINIMUM ELONGATION OF 10 PERCENT AND SHALL BE FOR THE THICKNESS CLASS NOTED ON THE CONTRACT DRAWINGS OR DIRECTLY SPECIFIED. PIPE MAY BE FURNISHED IN 18 OR 20 FEET NOMINAL LAYING LENGTHS. THE CENTRIFUGALLY CAST DUCTILE SHALL CONFORM TO THE AMERICAN NATIONAL STANDARD ANSI/AWWA C151/A21.51–86, "DUCTILE IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SAND–LINED MOLDS, AND DUCTILE IRON FITTINGS FOR WATER AND OTHER LIQUIDS," AND ALL SUBSEQUENT AMENDMENTS THERETO. PIPE ON STRAIGHT RUNS SHALL HAVE PUSH–ON SINGLE RUBBER–GASKET COMPRESSION JOINTS, ALL IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD, ANSI/AWWA C111/A21.11–85, "RUBBER–GASKET JOINTS FOR DUCTILE–IRON PIPE AND GRAY–IRON PRESSURE PIPE AND FITTINGS," AND ALL SUBSEQUENT AMENDMENTS THERETO.

(E) STANDARD THICKNESS AND PIPE CLASS TABLES

THE THICKNESS OF THE CENTRIFUGALLY CAST DUCTILE IRON PIPE SHALL CONFORM TO THE FOLLOWING TABLE:

STANDARD THICKNESS OF CENTRIFUGALLY CAST, DUCTILE IRON PIPE

PIPE SIZE	WORKING PRESSURE (PSI)	STANDARD THICKNESS CLASS 52	53	54	FITTINGS 56	PSI
24"	350	.44	.47	.50	.56	350
30"	350	.47	.51	.55	.63	250
36"	350	.53	.58	.63	.73	250
42"	350	.59	.65	.71	.83	250
48"	350	.65	.72	.79	.93	250

(F) WHERE "RESTRAINED DISTANCES" ARE SHOWN ON THE PLANS OR DIRECTLY SPECIFIED, PIPE AND FITTINGS HAVING BOLTLESS RESTRAINED TYPE JOINTS SHALL BE FURNISHED. BOLTLESS RESTRAINED TYPE JOINTS SHALL BE AS SPECIFIED IN SECTION "JOINTS, D: "BOLTLESS RESTRAINED SLIP–ON JOINTS."

(G) WHERE FITTINGS ARE SHOWN WHICH ARE NOT COVERED BY THE ABOVE SPECIFICATIONS, THEY IN SUCH PARTICULARS AS ARE LACKING THEREON SHALL CONFORM TO THE DIMENSIONS AND OTHERWISE MEET THE SPECIFICATIONS FOR THE RESPECTIVE TYPE WHICH ARE CARRIED IN THE LATEST REVISIONS TO THE CURRENT EDITION OF THE DUCTILE IRON PIPE RESEARCH ASSOCIATION "HANDBOOK OF DUCTILE IRON PIPE" OR WHICH ARE OTHERWISE SHOWN ON THE CONTRACT DRAWINGS.

(H) WHEREVER CHANGES IN LINE AND GRADES OF THE MAIN AS SHOWN ON THE DRAWINGS ARE NOT STANDARD FITTING DEFLECTIONS, THE CONTRACTOR WILL BE PERMITTED TO SUBMIT DETAILS USING COMBINATIONS OF STANDARD FITTINGS AND SMALL DEFLECTIONS (NOT TO EXCEED THE MANUFACTURER'S MAXIMUM SUGGESTED JOINT OPENING) IN THE ADJOINING LENGTHS OF PIPE.

(I) ON NEW AND/OR RELOCATED OR EXTENDED WATER MAINS, 24–INCH DIAMETER AND LARGER, WHERE WATER MAINS END OR TERMINATE AND ARE NOT CONNECTED TO EXISTING MAINS, AN APPROVED TYPED BOLTLESS RESTRAINED CAP/PLUG SHALL BE FURNISHED AND INSTALLED. PLUGS AND CAPS SHALL BE FURNISHED WITH TWO (2) PLUGGED TWO (2")–INCH TAPS FOR DRAIN AND AIR RELIEF CONNECTIONS.

(J) CLOSURE PIECES SHALL BE ACCURATELY MEASURED AND CUT IN THE FIELD AND INSTALLED USING SOLID SHORT PATTERN SLEEVES HAVING RETAINED MECHANICAL BELL JOINTS OR APPROVED COMPRESSION TYPE COUPLINGS. RETAINED MECHANICAL BELL JOINT SLEEVES AND COMPRESSION TYPE COUPLINGS SHALL BE AS SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.

(K) TESTS, INSPECTION, REPORTS AND ANALYSES OF TESTS OF SAMPLES FOR ALL MATERIALS SHALL BE FURNISHED IN ACCORDANCE WITH THE PARAGRAPH "TEST, INSPECTION AND REPORTS" OF THE GENERAL NOTES.

CEMENT LINING

ALL PIPE FITTINGS, SHALL BE GIVEN A CEMENT MORTAR LINING AT THE POINT OF MANUFACTURE. THE LINING SHALL CONFORM TO THE AMERICAN NATIONAL STANDARD, ANSI/AWWA C104/A21.4–1990, "CEMENT–MORTAR LINING FOR DUCTILE–IRON PIPE AND FITTINGS," AND ALL SUBSEQUENT AMENDMENTS THERETO.

MARKING

ALL PIPE AND FITTINGS SHALL BE SUITABLY MARKED TO DENOTE THE MANUFACTURER, CLASS, DATE, WEIGHT AND OTHER ELEMENTS OF IDENTIFICATION.

FACING AND DRILLING

ALL FLANGES SHALL BE CAST SOLID AND FACED ACCURATELY AT RIGHT ANGLES TO THE AXIS OF THE PIPE. ALL FLANGES SHALL BE SHOP COATED WITH A COAT OF COAL TAR EPOXY, EXCEPT THE FACE OF THE FLANGE WHICH SHALL RECEIVE ONE (1) COAT OF A ZINC RICH PRIMER AT THE SHOP IMMEDIATELY AFTER THEY HAVE BEEN FACED AND DRILLED. ALL FLANGED PIPE AND FITTINGS SHALL BE FACED AND DRILLED TO ANSI B16–1, 125 LB. DRILLING, UNLESS SPECIAL DRILLING IS CALLED FOR. WHERE TAP OR STUD BOLTS ARE REQUIRED, FLANGES SHALL ALSO BE TAPPED.

LAYING

(A) PROPER AND SUITABLE TOOLS AND APPLIANCES FOR THE SAFE AND CONVENIENT HANDLING AND LAYING OF THE PIPE AND FITTINGS SHALL BE USED. GREAT CARE SHALL BE TAKEN TO PREVENT THE PIPE COATING AND FITTINGS FROM BEING DAMAGED PARTICULARLY ON THE INSIDE OF THE PIPES AND FITTINGS AND ANY SUCH DAMAGE SHALL BE REMEDIED AS DIRECTED. ALL PIPES AND FITTINGS SHALL BE CAREFULLY EXAMINED BY THE CONTRACTOR FOR DEFECTS JUST BEFORE LAYING AND NO PIPE OR FITTINGS SHALL BE LAID WHICH IS KNOWN TO BE DEFECTIVE.

(B) IF ANY DEFECTIVE PIPE IS DISCOVERED AFTER HAVING BEEN LAID, IT SHALL BE REMOVED AND REPLACED WITH A SOUND PIPE OR FITTING IN A SATISFACTORY MANNER, BY THE CONTRACTOR AT HIS OWN EXPENSE. ALL PIPES AND FITTINGS SHALL BE THOROUGHLY CLEANED BEFORE THEY ARE LAID, SHALL BE KEPT CLEAN UNTIL THEY ARE USED IN THE COMPLETED WORK, AND WHEN LAID, SHALL CONFORM TO THE LINES AND GRADES GIVEN BY THE ENGINEER. OPEN ENDS OF PIPES SHALL BE KEPT PLUGGED WITH A BULK HEAD DURING CONSTRUCTION.

(C) PIPE LAID IN TRENCH SHALL BE LAID TO A FIRM AND EVEN BEARING FOR ITS FULL LENGTH. PRECAUTIONS SHALL BE TAKEN AGAINST FLOATING.

(D) IT IS THE INTENTION OF THESE SPECIFICATIONS TO SECURE FIRST CLASS WORKMANSHIP IN THE PLACING OF PIPE AND ACCESSORIES. IN SUCH DETAILS AS ARE NOT SPECIFICALLY MENTIONED HEREIN OR CALLED FOR ON THE DRAWINGS, THE CONTRACTOR WILL BE REQUIRED TO CONFORM WITH THE APPLICABLE SECTIONS OF THE LATEST AMERICAN NATIONAL STANDARD, ANSI/AWWA C 600–87, INSTALLATION OF GRAY AND DUCTILE CAST IRON WATER MAINS AND APPURTENANCES," AS ADOPTED BY THE AMERICAN WATER WORKS ASSOCIATION.

CUTTING PIPE

WHENEVER THE PIPES REQUIRE CUTTING TO FIT INTO THE LINES, THE WORK SHALL BE DONE IN A SATISFACTORY MANNER SO AS TO LEAVE A SMOOTH END AT RIGHT ANGLES TO THE AXIS OF THE PIPE. WHEN A PIECE OF PIPE IS CUT TO FIT INTO THE LINE, NO PAYMENT WILL BE MADE FOR THE PORTION CUT OFF AND NOT USED IN THE LINE. THE CONTRACTOR'S ATTENTION IS CALLED TO PARAGRAPH "WORK TO BE DONE BY THE CITY."

JOINTS

(A) SLIP–ON JOINTS:

ALL PIPE UNLESS OTHERWISE REQUIRED, SHOWN ON CONTRACT DRAWINGS, DIRECTLY SPECIFIED SHALL HAVE SOCKET BY PLAIN END RUBBER–GASKET PUSH–ON JOINTS WITH RADIALLY COMPRESSED LOCKED IN PLACE RUBBER RING GASKETS APPROVED BY THE COMMISSIONER OF WATER. SLIP–ON COMPRESSION JOINTS SHALL CONFORM TO THE REGULAR AND SPECIAL REQUIREMENT FOR PUSH–ON JOINTS IN AMERICAN NATIONAL STANDARD, ANSI/AWWA C111/A21.11–85, "RUBBER GASKET JOINTS FOR DUCTILE–IRON AND GRAY–IRON PRESSURE PIPE AND FITTINGS," AND ALL SUBSEQUENT AMENDMENTS THERETO.

(B) POLYETHYLENE ENCASEMENT:

1. ALL FLANGES, VICTAULIC AND COMPRESSION TYPE BOLTED SLEEVED COUPLINGS, AND ALL PIPE AND FITTINGS HAVING BOLTS OR OTHER TYPE OF FASTENERS IN JOINT CONSTRUCTION AND PIPE AND FITTINGS AS SHOWN ON THE CONTRACT DRAWINGS OR WHERE REQUIRED SHALL BE POLYETHYLENE ENCASED. PIPE, FITTING AND OTHER JOINTS THAT ARE BONDED JOINTS NEED NOT BE POLYETHYLENE ENCASED. POLYETHYLENE ENCASEMENT SHALL BE WRAPPED IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD, ANSI/AWWA C105/A21.5–88, "POLYETHYLENE ENCASEMENT FOR DUCTILE–IRON PIPING FOR WATER AND OTHER LIQUIDS," AND ALL SUBSEQUENT AMENDMENTS THERETO AND SHALL HAVE DOUBLE POLYETHYLENE ENCASEMENT OF CLASS "C" (BLACK) FILM, METHOD "C" DOUBLING SHEET AND PROVIDING ONE FOOT (1') MINIMUM OVERLAP ON PIPE OR FITTING ON BOTH SIDES OF JOINT.

2. ALL BOLTS AND NUTS ON ALL RETAINED MECHANICAL JOINTS, FLANGES, VICTAULIC AND COMPRESSION TYPE BOLTED SLEEVED COUPLINGS, SHALL HAVE FIELD APPLIED THREE (3) COATS OF BITUMASTIC COATING PRIOR TO POLYETHYLENE ENCASEMENT.

(C) BOLTLESS RESTRAINED SLIP–ON JOINTS:

WHERE SHOWN ON THE CONTRACT DRAWINGS ON ALL DUCTILE IRON PIPE AND FITTINGS, 24–INCHES OR LARGER, WHERE "RESTRAINED DISTANCE" IS REQUIRED OR SHOWN ALL RESTRAINT SHALL BE OF THE BOLTLESS RESTRAINED SLIP–ON JOINT TYPE. VALVES WITHIN "RESTRAINED DISTANCES" SHALL BE OF THE TYPE INDICATED ON THE CONTRACT DRAWINGS OR AS SPECIFIED. BOLTLESS RESTRAINED SLIP–ON JOINTS SHALL BE OF A DESIGN CONSISTING OF A SHOP WELDED RETAINER RING OR SEGMENT ON THE SPIGOT END OF THE PIPE THAT WHEN THE JOINT IS FULLY ASSEMBLED "LOCKS" INTO THE BELL OF THE ADJACENT PIPE OR FITTING PROVIDING A POSITIVE RESTRAINED JOINT. NO FIELD WELDED RESTRAINED JOINTS ARE PERMITTED EXCEPT ON LENGTHS OF PIPE LESS THAN NOMINAL LENGTH NEED TO CLOSE THE LINE. BOLTLESS RESTRAINED JOINTS SHALL BE OF A DESIGN THAT PROVIDES RESTRAINED ACTION BETWEEN THE SPIGOT AND BELL OF THE PIPE OR FITTING INDEPENDENT OF THE GASKET.

(D) COMPRESSION COUPLINGS:

1. ALL PIPE COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING WITH STOPS REMOVED; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER–COMPOUND, BUNA–N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276–89A, TYPE 304) TO PROPERLY COMPRESS THE GASKETS. THE MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM–A536). THE COMPRESSION COUPLING SHALL HAVE STOPS REMOVED AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE NOS: 38, 138, OR 162 (TRANSITION TYPE), OR SMITH–BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

2. ALL COMPRESSION COUPLINGS SHALL BE COATED IN THE SHOP WITH A FACTORY COATING COMPATIBLE WITH FIELD APPLIED PRIMER AND ENAMEL COATINGS. COMPRESSION COUPLINGS SHALL BE CLEANED AND PAINTED WITH THREE (3) FIELD COATS OF KOPPERS BITUMASTIC SUPER TANK SOLUTION OR EQUIVALENT.

(E) FLANGED JOINTS:

1. FLANGED JOINTS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS OR AS SPECIFIED. FLANGES SHALL BE EITHER CAST STEEL, FORGED OR ROLLED STEEL, OR PROPERLY WELDED AND MACHINED FABRICATED STEEL PLATES, WELDED TO PIPE WITH TWO CONTINUOUS WELDS. THEY SHALL HAVE PLAIN FACES AND SHALL BE FACED TRUE AND SMOOTH AT RIGHT ANGLES TO THE AXIS OF THE PIPE AND SHALL BE SPOT FACED ON THE BACK. DRILLING SHALL CONFORM TO ANSI B16.1, 125 LBS. EACH BLIND FLANGE SHALL BE CAST IRON AND HAVE BOSSES TAPPED AT TOP AND BOTTOM FOR TWO (2) INCH STANDARD PIPE AND FURNISHED WITH PLUGS.

2. ALL MACHINED STEEL SURFACES AT THE ENDS OF PIPE AND/OR FITTINGS TO RECEIVE VICTAULIC TYPE COUPLINGS OR PIPE ENDS HAVING FLANGES (FACE OF FLANGE) SHALL BE COATED WITH ONE (1) SHOP COAT OF AN APPROVED ZINC RICH PAINT.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

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WATER WORK NOTES

3. ALL BOLTS AND NUTS USED IN THE FINISHED WORK FOR FLANGES SHALL BE MADE OF SILICON BRONZE (ASTM B 98–84, ALLOY A, "SPECIFICATION FOR COPPER–SILICON ALLOY ROD, BARS, AND SHAPES") OR STAINLESS STEEL (ASTM A 276–89A, TYPE 304, "SPECIFICATION FOR STAINLESS AND HEAT–RESISTING STEEL BARS AND SHAPES"). THE ENDS OF ALL BOLTS MUST BE FINISHED TO STANDARD RADIUS IN ACCEPTABLE MANNER. ALL SCREW THREADS SHALL BE AMERICAN STANDARD COARSE THREAD (N.C.). STUD BOLTS DOUBLE END (ROD) SHALL BE USED TO MAKE THE FLANGED JOINTS ON PIPE. ALL DIMENSIONS TO BE ACCORDING TO AMERICAN STANDARD HEAVY. BOLTS AND NUTS SHALL BE DELIVERED TO THE FIELD FREE FROM GREASE, RUST AND DIRT AND SHALL BE PROPERLY PROTECTED FROM MOISTURE AND DIRT IN THE FIELD. GASKETS FOR FLANGED PIPE SHALL BE 5X MANILA ROPE PATTERN OR OTHER APPROVED TYPE.

4. WHERE FLANGED VALVE INSULATORS ARE REQUIRED AT SUPPLEMENTAL CONNECTIONS, OR WHERE ORDERED, EACH OF THE FLANGE BOLT HOLES SHALL BE INCREASED BY 1/16" TO ACCEPT A BOLT INSULATOR SLEEVE.

(F) VICTAULIC TYPE COUPLINGS:

1. WHERE SHOWN ON THE DRAWINGS, SPECIFIED OR WHERE REQUIRED, THE CONTRACTOR SHALL FURNISH AND INSTALL VICTAULIC TYPE COUPLINGS FOR CONNECTION OF DUCTILE IRON PIPE ENDS TO VALVES. SHOULDERED PIPE ENDS SHALL BE DESIGNED FOR NOT LESS THAN THE WORKING PRESSURE NOTED ON THE CONTRACT DRAWINGS. COUPLINGS SHALL BE COMPOSED OF MALLEABLE IRON HOUSINGS HELD TOGETHER WITH STEEL BOLTS HEAT TREATED AND "HOT–DIP" GALVANIZED AND WITH A CONTINUOUS HOLLOW, MOLDED RUBBER SEALING RING, OF SUCH TYPE THAT THE SEAL BECOMES TIGHT AS THE PRESSURE WITHIN THE PIPE INCREASES. THE JOINTS SHALL BE CONSTRUCTED AND INSTALLED AND SHALL BE EQUAL IN ALL RESPECTS TO THOSE MANUFACTURED BY THE VICTAULIC COMPANY OF AMERICA. MALLEABLE HOUSINGS SHALL CONFORM TO THE "STANDARD SPECIFICATIONS FOR FERRITIC MALLEABLE IRON CASTINGS," ASTM DESIGNATION A 47–84; OR TO THE "STANDARD SPECIFICATIONS FOR DUCTILE IRON CASTINGS," ASTM DESIGNATION A 536, LATEST REVISION. BOLTS AND NUTS SHALL BE MANUFACTURED BY THE COUPLING MANUFACTURER AND SHALL BE HEAT TREATED STEEL BOLTS HAVING 100,000 PSI. TENSILE STRENGTH CONFORMING TO ASTM A 183–83, OR LATEST REVISION, STANDARD SPECIFICATION FOR "CARBON STEEL TRACK BOLTS AND NUTS." ALL BOLTS AND NUTS SHALL BE ZINC COATED BY THE "HOT–DIP" METHOD ACCORDING TO ASTM DESIGNATION A 123–89A, "SPECIFICATION FOR ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS."

2. ALL METAL PARTS OF THE COUPLINGS SHALL BE COATED AT THE SHOP WITH ONE COAT OF BITUMINOUS PRIMER FURNISHED BY THE SAME MANUFACTURER WHO FURNISHES THE COATINGS AS SPECIFIED UNDER PARAGRAPH "PAINTING."

PAINTING

AFTER INSTALLATION AND BEFORE POLYETHYLENE ENCASEMENT, ALL EXPOSED OR DAMAGED COATING AND ALL BOLTS FOR RETAINED MECHANICAL JOINTS, FLANGES AND VICTAULIC OR COMPRESSION TYPE BOLTED SLEEVED COUPLINGS SHALL BE CLEANED AND PAINTED WITH THREE (3) FIELD COATS OF KOPPERS BITUMASTIC SUPER TANK SOLUTION OR EQUIVALENT.

DRAWINGS

(A) THE CONTRACTOR SHALL SUBMIT TO THE CITY THROUGH THE ENGINEER FOR APPROVAL SIX (6) SETS OF PRINTS OF ALL SHOP DRAWINGS FOR PIPE AND FITTINGS AND MISCELLANEOUS OR SPECIAL DETAILS OF PIPE AND FITTING JOINTS WHICH ARE NOT STANDARD CONSTRUCTION OR FULLY DETAILED IN THE REGULAR CATALOGUE OF THE COMPANY FURNISHING THE PIPE, FITTINGS AND SPECIALS. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN APPROVED.

(B) THE APPROVAL OF THE DRAWINGS BY THE CITY SHALL NOT RELIEVE THE CONTRACTOR OF ANY OF HIS OBLIGATIONS IN CONNECTION WITH THIS CONTRACT.

MEASUREMENT

THE NUMBER OF LINEAR FEET OF DUCTILE IRON PIPE AND FITTINGS TO BE PAID FOR UNDER ITEM SPECIAL – DUCTILE IRON PIPE AND FITTINGS – 20" AND LARGER, SHALL BE THAT ACTUALLY FURNISHED AND PLACED IN ACCORDANCE WITH THESE SPECIFICATIONS ALONG THE AXIS OF THE PIPING, INCLUDING FITTINGS AND VALVES CONNECTED UP IN PLACE.

PAYMENT

THE FOOTAGE MEASURED AS PROVIDED ABOVE SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR:

"ITEM SPECIAL – WATER MAIN, DUCTILE IRON PIPE AND PIPE AND FITTINGS WITH BOLTLESS RESTRAINED JOINTS", CLASSIFIED AS TO SIZE AND CLASS; _____(L.F.)"

ITEM SPECIAL – VALVES

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL MATERIALS FOR AND SHALL PROPERLY SET IN PLACE AND CONNECT AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED, ALL GATE VALVES WITH VALVE BOX COMPLETE, CHECK VALVES, DOUBLE CHECK BACKFLOW ASSEMBLIES OF THE VARIOUS SIZES AND TYPE SPECIFIED.
IN GENERAL, THIS WORK SHALL INCLUDE THE FURNISHING, PLACING, TESTING, AND PAINTING OF THE GATE VALVES, INCLUDING BYPASS VALVES, CHECK VALVES, BACKFLOW ASSEMBLIES COMPLETE, OPERATING NUTS AND OTHER ACCESSORIES AND APPURTENANCES AND THE FURNISHING OF ALL LABOR, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.
THE CONTRACTOR SHALL, UNDER THIS ITEM, ALSO FURNISH TAPPING VALVES WITH VALVE BOX COMPLETE OF THE VARIOUS SIZES AND TYPE SPECIFIED. TAPPING VALVES SHALL CONFORM WITH THESE SPECIFICATIONS BUT SHALL BE FURNISHED, INSTALLED AND PAID FOR UNDER THE APPROPRIATE TAPPING VALVE ITEM. SEE PARAGRAPH "WORK TO BE DONE BY THE CITY".

GATE VALVES AND CHECK VALVES

(A) STRENGTH OF VALVES:

THE GATE VALVES, 3" TO 12", SHALL BE DESIGNED FOR 200 PSI WORKING PRESSURE AND GATE VALVES 16" AND ABOVE FOR 150 PSI WORKING PRESSURE; AND SHALL WITHSTAND AN INTERNALLY APPLIED HYDROSTATIC PRESSURE AT ALL POINTS OF AT LEAST TWICE THE RATED WORKING PRESSURE, EXCEPT AS SPECIFIED UNDER MATERIAL SPECIFICATIONS PARAGRAPH I, "HYDROSTATIC TESTS AT SHOP". SHOULD TESTS REVEAL ANY WEAKNESS, THE VALVES FROM THAT DESIGN SHALL BE SHALL BE REJECTED AND A NEW DESIGN MADE.

(B) PARTS TO BE INTERCHANGEABLE:

ALL PARTS OF VALVES OF THE SAME SIZE AND MAKE MUST BE PERFECTLY INTERCHANGEABLE AND ALL WORK DONE IN A THOROUGH AND WORKMANLIKE MANNER.

(C) VALVE BODY:

THE VALVE BODY SHALL BE OF SHORT BODY DESIGN. THE VALVE BODY SHALL HAVE CAST THEREON IN A CONSPICUOUS PLACE THE MANUFACTURER'S NAME OR INITIALS, RATED WORKING PRESSURE, AND THE YEAR OF MANUFACTURE. THESE LETTERS SHALL BE 1/8–INCH IN RELIEF AND OF AN APPROVED HEIGHT.

(D) CASTINGS:

ALL CASTINGS, WHETHER OF BRONZE, IRON, OR STEEL, SHALL BE SOUND AND SMOOTH WITHOUT COLD SHUTS, SWELLS, LUMPS, SCABS, BLISTERS, SAND HOLES OR OTHER IMPERFECTIONS, AND SHALL BE MADE IN ACCORDANCE WITH THE BEST MODERN FOUNDRY PRACTICE TO OBTAIN CASTINGS OF THE BEST QUALITY AND OF UNIFORM THICKNESS. NO WELDING, PLUGGING OR FILLING OF HOLES OR OTHER DEFECT WILL BE PERMITTED. FOR PARTS WHOSE THICKNESS IS LESS THAN ONE (1") INCH, CASTINGS BEING THINNER THAN THE SPECIFIED THICKNESS BY .06 INCH OR MORE SHALL BE REJECTED; AND FOR PARTS FOR WHOSE THICKNESS IS ONE (1") INCH OR MORE, CASTINGS BEING THINNER THAN SPECIFIED BY .08 INCH OR MORE SHALL BE REJECTED.

(E) MECHANICAL JOINT ENDS:

ALL VALVES REQUIRING MECHANICAL JOINT ENDS SHALL BE FURNISHED WITH RETAINED MECHANICAL JOINT ENDS COMPLETE WITH GASKETS AND RETAINER TYPE GLANDS AND SHALL FIT THE PLAIN–END OF ALL DUCTILE IRON PIPE, CLASSES 150, 200 AND 250 MANUFACTURED TO SPECIFICATIONS ASA A21.8, OR LATEST REVISION, INCLUDING THE PLAIN–END OF ALL MAKES OF DUCTILE IRON PIPE OF THE SLIP–ON CONNECTION TYPE.

(F) VICTAULIC ENDS:

VICTAULIC ENDS WHEN REQUIRED, SHALL CONFORM TO THE DIMENSIONS GIVEN ON THE CONTRACT DRAWINGS OR AS SPECIFIED. VICTAULIC COUPLINGS TO BE FURNISHED AND INSTALLED TO CONNECT THE VICTAULIC VALVE END TO THE VICTAULIC PIPE AND SHALL BE INCLUDED AND PAID FOR UNDER THE APPROPRIATE PIPE ITEM.

(G) FLANGED ENDS:

WHEN FLANGED VALVES ARE REQUIRED, THE FLANGES SHALL BE FACED AND DRILLED. BOLT HOLES SHALL BE SPOT FACED ON THE BACK WHEN NECESSARY TO SECURE AN EVEN BEARING. SPOT FACING SHALL BE REQUIRED ON THE BACK OF VALVE FLANGES WHERE SUCH IS NOT PARALLEL TO THE FACE OF THE FLANGE WITHIN THREE (3) DEGREES AS SPECIFIED IN ASME/ANSI B16.1. ALL SPOT FACING, WHEN REQUIRED SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS STANDARDIZATION SOCIETY (MSS) STANDARD PRACTICES, SP–9. ALL BOLT HOLES SHALL BE OF THE SIZE SHOWN ON THE DRAWINGS OR AS SPECIFIED TO BE SUBMITTED AND APPROVED, AND SHALL BE ACCURATELY DRILLED FROM TEMPLATES, SPACED EQUAL DISTANCES APART AND SHALL STRADDLE HORIZONTAL AND VERTICAL AXIS, ALL AS SHOWN ON THE DRAWINGS. FLANGED ENDS SHALL BE RATED FOR THE TEST PRESSURE OF 225 PSI AND WORKING PRESSURE OF 150 PSI. THE DIMENSIONS AND DRILLING OF ALL END FLANGES SHALL CONFORM TO THE SPACING INDICATED ON THE DRAWINGS OR AS SPECIFIED, WHICH SHALL BE AMERICAN 125 LB. CAST IRON FLANGE STANDARD. FLANGES SHALL BE PLAIN FACE WITH A SMOOTH FINISH.

WHERE FLANGED VALVE INSULATORS ARE REQUIRED AT SUPPLEMENTAL CONNECTIONS, CONNECTING TO EXISTING MAINS, OR WHERE ORDERED, EACH OF THE FLANGE BOLT HOLES SHALL BE INCREASED BY 1/16" TO ACCEPT A BOLT INSULATOR SLEEVE. CONTRACTOR'S ATTENTION IS DIRECTED TO THE PARAGRAPH "FLANGED VALVE INSULATORS" OF THIS SPECIFICATION. IN LIEU OF INSULATED FLANGED CONNECTIONS, INCLUDING THE FLANGED END VALVE, AT SUPPLEMENTAL CONNECTIONS THE CONTRACTOR MAY FURNISH RETAINED MECHANICAL JOINT BELL END GATE VALVE AND INSTALL AN INSULATED COUPLING EQUAL TO THAT MANUFACTURED BY SMITH–BLAIR COUPLING NO: 438.

GATE VALVES – GENERAL

(A) TYPE OF VALVES:

THE GATE VALVES SHALL BE MANUFACTURED IN FULL COMPLIANCE WITH THE STANDARD SPECIFICATIONS FOR "GATE VALVES FOR WATER AND SEWERAGE SYSTEMS" OF THE AMERICAN WATER WORKS ASSOCIATION AWWA C 500–86, OR LATEST REVISION THEREOF, AND IN ADDITION SHALL COMPLY WITH THE FOLLOWING SUPPLEMENTARY REQUIREMENTS. ALL GATE VALVES SHALL BE OF THE DOUBLE–DISC PARALLEL SEAT BOTTOM WEDGE OR SIDE WEDGE TYPE OR DOUBLE REVOLVING DISC PARALLEL SEAT BOTTOM WEDGE OR SIDE WEDGE TYPE. ALL GATE VALVES 20–INCHES AND OVER IN SIZE SHALL INCLUDE BYPASS VALVES ATTACHED THERETO. IN OPENING OR CLOSING THE VALVE, THE GATES SHALL BE FORCED TO ASCENT OR DESCENT BY REASON OF THE THRUST EXERTED UPON THE GATES DIRECTLY BY THE VALVE STEM WRENCH NUT, THIS THRUST BEING GENERATED BY THE ROTATION OF THE VALVE STEM. IN CLOSING THE VALVE, THE DISCS, WHEN OPPOSITE THE PORTS, SHALL BE PRESSED FIRMLY AGAINST THE BODY SEATS BY WEDGES OR SOME OTHER DEVICE EQUALLY SUITABLE AND APPROVED BY THE COMMISSIONER OF WATER.

THE DESIGN OF THE MECHANICAL WEDGING ACTION SHALL BE SUCH THAT SEATING FORCE IS APPLIED EQUALLY TO TWO OR MORE CONTACT POINTS NEAR THE OUTER EDGE OF EACH DISC AT OR ABOVE AND BELOW THE HORIZONTAL CENTERLINE OF DISC. THE MECHANISM SHALL BE DESIGNED SO THAT ALL WEDGING MEMBERS ARE ACTIVATED AT ONE TIME. IT SHOULD BE OF THE TYPE WHICH WILL ELIMINATE UNBALANCED SEATING PRESSURE AND MINIMIZE DISTORTION OF THE DISCS.

(B) CAST IRON PARTS:

THE VALVE BODIES, COVERS, DISCS, FRAMES, ETC., OF ALL GATE VALVES 3–INCH AND OVER, SHALL BE CAST IRON.

(C) VERTICAL AND HORIZONTAL VALVES:

ALL GATE VALVES, 16–INCH AND UNDER, SHALL BE CONSTRUCTED TO WORK VERTICALLY. VALVES HAVING 20–INCH AND OVER WATERWAY SHALL BE CONSTRUCTED TO WORK HORIZONTALLY.

(D) WATERWAY OPENING:

WITH THE GATE VALVE OPEN, AN UNOBSTRUCTED WATERWAY SHALL BE AFFORDED; THE DIAMETER OF WHICH IS NOT TO BE LESS THAN THE FULL NOMINAL DIAMETER OF THE VALVE, EXCEPT WHERE LUGS ARE PROVIDED FOR INSERTING OR REMOVING THE BODY–SEAT RINGS. THE LUGS NEED NOT BE REMOVED AFTER THE VALVE IS ASSEMBLED.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

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WATER WORK NOTES

(E) STUFFING BOXES:

THE STUFFING BOX ON EACH GATE VALVE 3–INCH OR OVER, MUST BE SEPARATE FROM THE DOME AND FASTENED TO IT BY BOLTS. FOR 2–INCH VALVES AND UNDER, THE STUFFING BOXES MAY BE FORMED IN THE DOME OF THE VALVE. WHEN REQUIRED BY THE CITY, VALVES 16–INCH AND SMALLER, SHALL BE FURNISHED WITH "O" RING TYPE SEALS. THE SEALS SHALL BE FITTED WITH AT LEAST TWO (2) "O" RINGS; THE LOWER "O" RING SERVING AS THE PRESSURE SEAL AND THE UPPER "O" RING AS A COMBINED DIRT AND MOISTURE SEAL. THE "O" RING SHALL BE COMPOUNDED TO MEET ASTM D 2000–86, "CLASSIFICATION SYSTEM FOR RUBBER PRODUCTS IN AUTOMOTIVE APPLICATIONS," AND HAVE PHYSICAL PROPERTIES SUITABLE FOR THE APPLICATION.

THE DIMENSIONS OF THE STUFFING BOX FLANGES SHALL BE OF A THICKNESS AND UNIFORMITY PROPORTIONED TO FIT THE VARIOUS EXTERNALLY APPLIED TORQUE AND INTERNAL THRUST PRESSURE. BOLT HOLES SHALL BE FITTED AND OF A NUMBER SUCH THAT WILL LEAVE A SUFFICIENT CROSS SECTIONAL AREA OF METAL THEREBY PROVIDING SATISFACTORY STRENGTH TO THE UPPER AND LOWER STUFFING BOX FLANGE.

(F) VALVE STEM:

THE STEM SHALL BE OF SUFFICIENT LENGTH TO ALLOW THE REMOVAL OF PACKING WITHOUT NECESSITATING THE REMOVAL OF THE OPERATING NUT. THE STEM OPENING AND THRUST BEARING RECESS SHALL BE BRONZE BUSHED WITH TWO (2) "O" RINGS LOCATED ABOVE THE THRUST COLLAR AND ONE (1) "O" RING BELOW FORMING A LUBRICANT CHAMBER. THE NUMBER OF THREADS PER INCH SHALL BE AS INDICATED IN AWWA C 500–86.

(G) VALVES WITH STATIONARY STEMS:

ALL GATE VALVES, UNLESS OTHERWISE ORDERED, SHALL BE MADE WITH SINGLE, NON–RISING STEMS.

(H) VALVES TO OPEN CLOCKWISE, EXCEPT 2–INCH AND UNDER:

ALL GATE VALVES 3–INCH AND OVER, INCLUDING BYPASS VALVES, SHALL BE MADE TO OPEN BY TURNING IN A CLOCKWISE DIRECTION. VALVES 2–INCH AND UNDER SHALL BE MADE TO OPEN BY TURNING IN A COUNTERCLOCKWISE DIRECTION. ALL VALVES TO BE MADE SO THAT THEY CAN BE EASILY OPERATED.

(I) WRENCH CAPS:

THE WRENCH CAPS (OPERATING NUTS) AND RETAINING NUTS ON HEADS OF VALVE STEMS AND PINION SHAFTS SHALL BE OF BRONZE OR DUCTILE IRON SPECIFICATION A–536. ON VALVES 24–INCH AND OVER, WRENCH CAPS SHALL BE 2–INCH SQUARE AND 2–INCH DEEP. ON VALVES 3–INCH THRU 20–INCH INCLUSIVE, THEY SHALL BE 1–3/4 INCH SQUARE ON TOP, 1–7/8 INCH SQUARE AT BASE AND 1–3/4 INCH DEEP. ON 2–INCH VALVES AND UNDER, THEY SHALL BE 1–1/4 INCH SQUARE ON TOP, 1–3/8 INCH SQUARE AT BASE AND 1–1/2 INCH DEEP. MACHINED WRENCH CAPS FOR VALVES 3–INCH TO 48–INCH INCLUSIVE SHALL BE FITTED TO A MACHINED SQUARE STEM OR PINION SHAFT AND HELD IN PLACE BY A RETAINING NUT OF BRONZE, ASTM B 584–90, C.A. 867, "SPECIFICATION FOR COPPER ALLOY SAND CASTINGS FOR GENERAL APPLICATIONS." ON 1–1/2 INCH AND 2–INCH VALVES THE WRENCH CAP SHALL BE SECURED TO THE SHAFT WITH A BRASS PIN. WRENCH CAPS SHALL HAVE A CUT–AWAY SKIRT TO PERMIT EASY ACCESS TO GLAND BOLTS.

(J) FACING OF GATES:

ALL DISCS OF GATES AND THREADS FOR SEAT RINGS IN THE BODY SHALL BE MACHINED TRUE AND ANY GROOVE OR GROOVES SHALL BE MACHINED IN EACH DISC OR GATE FOR THE RECEPTION OF THE FACE RING. THE DISC AND SEAT RINGS SHALL BE SECURELY AND RIGIDLY ATTACHED TO THE DISCS OR BODY SEATS IN A MANNER APPROVED BY THE CITY; THE RINGS ARE TO BE FINISHED TO A TRUE SURFACE.

(K) OUTSIDE SCREW AND YOKE VALVES:

GATE VALVES WITH OUTSIDE SCREW AND YOKES, SHALL BE MADE WITH SINGLE RISING STEMS. ALL OUTSIDE SCREW AND YOKE VALVES SHALL BE EQUIPPED WITH WHEELS FOR OPERATING SAME. WHEELS ARE TO BE OF CAST IRON OR DUCTILE IRON. WHEELS SHALL HAVE CAST ON THEM AN ARROW INDICATING THE DIRECTION OF TURNING FOR OPENING THE VALVE.

OUTSIDE SCREW AND YOKE GATE VALVES 6–INCH AND LARGER IN SIZE SHALL BE PROVIDED WITH TWO BOSSES ON ONE SIDE OF THE BODY, LOCATED ON THE HORIZONTAL CENTERLINE OF GATE VALVES, TO PERMIT THE INSTALLATION OF BYPASS AROUND THE GATE. BOSSES ARE TO BE LEFT SOLID AND OF AMPLE SIZE TO PERMIT DRILLING AND TAPPING FOR BYPASSES.

(L) MARKING:

ALL GATE VALVES 3–INCH AND OVER SHALL HAVE THE IDENTITY OF THE MAKER, SIZE AND YEAR WHEN MADE AND ALSO THE LETTERS "C.W.D." CAST UPON ITS BODY OR DOME IN RAISED LETTERS OR HAVE AN PERMANENT BRONZE TAG OF SUFFICIENT SIZE AFFIXED TO THE BODY OF THE VALVE WITH THE IDENTITY OF THE MAKER, SIZE AND YEAR WHEN MADE AND THE LETTERS "C.W.D." INDICATED THEREON.

MATERIAL SPECIFICATIONS

(A) BOLTS AND NUTS:

ALL BOLTS AND NUTS ON THE EXTERNAL VALVE BODIES OF ALL GATE, CHECK AND BACKFLOW DEVICES SHALL BE MADE OF STAINLESS STEEL: ASTM A 276–89A, TYPE 304, "SPECIFICATION FOR STAINLESS AND HEAT–RESISTING SHEET BARS AND SHAPES."

(B) BRONZE PARTS:

ALL GRADES OF BRONZE SHALL BE IN ACCORDANCE WITH AWWA C500–86 UNLESS OTHERWISE SPECIFIED HEREIN.

(C) CAST IRON:

CAST IRON SHALL CONFORM TO ASTM SPECIFICATION A 126–84, CLASS B, "SPECIFICATION FOR GRAY IRON CASTINGS FOR VALVES, FLANGES, AND PIPE FITTINGS," OR LATEST REVISION THEREOF.

ALL IRON CASTINGS SHALL BE TOUGH AND WITHOUT BRITTLENESS, SUCH AS MAY BE CUT, DRILLED AND CHIPPED BY HAND WITH DUE EASE. A BLOW FROM A HAMMER SHALL PRODUCE AN INDENTATION ON THE EDGE OF THE CASTING WITHOUT FLAKING THE METAL.

(D) SILICON BRONZE:

THIS BRONZE SHALL CONFORM TO ASTM SPECIFICATION B 98–84, ALLOY 655, "SPECIFICATION FOR COPPER–SILICON ALLOY ROD, BAR AND SHAPES;

(E) STAINLESS STEEL:

THE STAINLESS STEEL SHALL CONFORM TO ASTM SPECIFICATION A 276–89A, TYPE 304 AND TYPE 316, "SPECIFICATION FOR STAINLESS AND HEAT–RESISTING SHEET BARS AND SHAPES."

(F) OTHER MATERIALS:

ALL OTHER MATERIALS USED IN THE MANUFACTURE OF THESE VALVES AND NOT SPECIFIED IN THE SPECIFICATIONS, SHALL BE OF THE BEST QUALITY OF THEIR RESPECTIVE KINDS, AND SUBJECT TO INSPECTION, TESTS, AND APPROVAL BY THE CITY.

(G) CHEMICAL ANALYSIS:

CHEMICAL ANALYSIS OF THE MATERIAL USED SHALL BE FURNISHED BY THE CONTRACTOR WHENEVER REQUIRED BY THE ENGINEER OR THE CITY.

(H) CLEANING OF CASTINGS:

ALL IRON CASTINGS SHALL BE THOROUGHLY CLEANED ON THE OUTSIDE AND INSIDE SURFACES AND PROTECTED FROM RAIN OR MOISTURE UNTIL THEY ARE PAINTED.

(I) HYDROSTATIC TESTS AT SHOP:

ALL GATE VALVES SHALL BE TESTED IN THE SHOP BY HYDROSTATIC PRESSURE, BY CLOSING THE VALVE AND APPLYING THE REQUIRED TEST PRESSURE IN THE BODY AND DOME OF THE VALVE AS SPECIFIED BELOW.

3" THROUGH 12" .... 400 PSI. – NO TIME REQUIREMENT

14" THROUGH 20" .... 300 PSI. – FOR 15 MINUTES, DROP PRESSURE TO 150 PSI, THEN ELEVATE AGAIN TO 300 PSI FOR 15 MIN.

– A TOTAL OF 1/2 HOUR.

24" THROUGH 48" .... 300 PSI – FOR 1/2 HOUR, DROP PRESSURE TO 150 PSI, THEN ELEVATE AGAIN TO 300 PSI FOR 30 MINUTES.

– A TOTAL OF 1 HOUR.

THIS IS MODIFICATION OF SECTION 5.1 OF THE STANDARD SPECIFICATIONS, AWWA DESIGNATION: C 500–86. ALL LEAKS, FLAWS OR OTHER DEFECTS DEVELOPED IN MAKING THESE TESTS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AND/OR THE CITY OR THE ENTIRE PIECE SHALL BE REJECTED. AFTER TESTING, ALL VALVES SHALL BE THOROUGHLY DRAINED. ALL EQUIPMENT FOR TESTING AND ALL TESTS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.

THE CONTRACTOR SHALL INCLUDE WITH EACH VALVE THREE (3) CERTIFIED COPIES OF REPORTS SHOWING THE RESULTS OF ALL SHOP TESTS, AND A BRIEF DESCRIPTION OF HOW THE TESTS WERE PERFORMED.

(J) PERFORMANCE TESTS:

EACH VALVE SHALL BE OPERATED IN THE POSITION THAT IT WILL ASSUME IN SERVICE AND FOR THE FULL LENGTH OF GATE TRAVEL IN BOTH DIRECTION, TO DEMONSTRATE THE FREE AND PERFECT FUNCTIONING OF ALL PARTS IN THE INTENDED MANNER. ANY DEFECTS OF WORKMANSHIP SHALL BE CORRECTED AND THE TEST REPEATED UNTIL SATISFACTORY PERFORMANCE IS DEMONSTRATED.

PLACING AND TESTING

(A) ALL VALVES SHALL BE TESTED ACCURATELY AND CAREFULLY TO THE LINES AND GRADES GIVEN. ALL CONNECTIONS TO PIPE SHALL HAVE THE NECESSARY MECHANICAL JOINT, FLANGED, SCREWED, VICTAULIC OR SOLDERED ENDS AS REQUIRED.

(B) AFTER THE VALVES ARE SET IN PLACE AND READY TO OPERATE, THE CONTRACTOR SHALL TEST THEM UNDER THE TEST PRESSURE AND CONDITIONS HEREIN SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS AND ANY VALVE FOUND TO LEAK SHALL BE MADE WATERTIGHT AND, IF FOUND TO BE OF FAULTY DESIGN, SHALL BE SATISFACTORILY REPAIRED OR REPLACED BY THE CONTRACTOR.

(C) ALL BURIED VALVES SHALL COME COMPLETE WITH VALVE BOXES TO GRADE. THIS SHALL INCLUDE MAIN VALVE OPERATION AND THE BYPASS VALVE.

VALVE BOXES AND COVERS

(A) THE CONTRACTOR SHALL FURNISH AND INSTALL, OVER EACH VERTICALLY SET VALVE AT THE LOCATIONS SHOWN ON THE DRAWINGS, OR AS REQUIRED, VALVE BOXES WITH COVERS OF THE ASSEMBLED TYPES AND SIZES INDICATED ON THE CONTRACT PLANS. ASSEMBLED TYPE VALVE BOXES SHALL EXTEND FROM THE VALVE BONNET TO THE FINISHED GRADE OR THE ELEVATION REQUIRED, BEING CAREFULLY LOCATED OVER THE VALVE OPERATING NUT(S) AND SHALL BE SET PLUMB AND TRUE AS REQUIRED.

(B) VALVE BOXES AND COVER ASSEMBLIES SHALL BE COMPLETED AND THEIR PARTS SHALL COMPLY WITH THOSE PARTS SHOWN ON STANDARD DETAIL DRAWINGS.

PAINTING

(A) IRON BODY VALVES SHALL EITHER BE DIPPED IN ASPHALT PAINT AND ALL BRONZE AND PLASTIC COATED INTERNAL PARTS CLEANED, OR AFTER PASSING THE HYDRAULIC TEST, SHALL BE GIVEN AT LEAST TWO (2) COATS OF APPROVED PAINT OUTSIDE.

(B) ALL INTERIOR OR EXTERIOR FERROUS METAL SURFACES, EXCEPT MACHINE SURFACES, SHALL BE THOROUGHLY CLEANED OF ALL RUST, WIRE BRUSHED AND WASHED WITH BENZENE BEFORE PAINTING OR COATING.

(C) AFTER INSTALLATION, ALL EXPOSED METAL SURFACES OF VALVES EXCEPT BRASS OR BRONZE SHALL BE PAINTED WITH TWO (2) FIELD COATS OF COAL TAR PITCH PAINT EQUAL TO KOPPERS BITUMASTIC SUPER TANK SOLUTION.

INSPECTION

THE ENGINEER, CITY, OR HIS AUTHORIZED DESIGNATE, WILL INSPECT THE MATERIAL AND WORK DONE, AS THE INTEREST OF THE CITY MAY REQUIRE. SUCH OFFICER SHALL HAVE UNRESTRICTED ACCESS TO THE CONTRACTOR'S PLANT, AND TO ALL PARTS OF THE WORK AND OTHER PLACES AT WHICH THE PREPARATION OF THE MATERIAL AND THE CONSTRUCTION OF THE DIFFERENT PARTS OF THE WORK TO BE DONE UNDER THESE SPECIFICATIONS ARE CARRIED ON, AND HE SHALL RECEIVE ALL FACILITIES AND ASSISTANCE TO CARRY OUT HIS WORK OF INSPECTION AND TESTING, IN A MANNER SATISFACTORY TO THE CITY. SUCH INSPECTION SHALL NOT RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM SAID WORK STRICTLY IN ACCORDANCE WITH THE SPECIFICATIONS, OR ANY MODIFICATIONS THEREOF, AS HEREIN PROVIDED, AND WORK NOT SO CONSTRUCTED SHALL BE REMOVED AND MADE GOOD BY THE CONTRACTOR, AT HIS OWN EXPENSE.

DATA WITH PROPOSALS

PROPOSALS SHALL BE ACCOMPANIED BY DRAWINGS FURNISHED BY THE MANUFACTURER, FULLY AND DISTINCTLY ILLUSTRATING, DESCRIBING AND GIVING THE WEIGHT OF EACH OF THE VALVES PROPOSED TO BE FURNISHED. VALVE DRAWINGS PREVIOUSLY APPROVED AND ON FILE WITH DIVISION OF WATER NEED NOT BE FURNISHED IN PROPOSAL BUT WILL BE REQUIRED AS SUBMITTAL FOR APPROVAL AS INDICATED IN THE PARAGRAPH "DRAWINGS".

DRAWINGS

(A) PRIOR TO THE MANUFACTURE OF ANY VALVES, THE CONTRACTOR SHALL SUBMIT TO THE CITY THROUGH THE ENGINEER FOR APPROVAL OF THE CITY, SIX (6) COMPLETE WORKING, DETAIL, AND DIMENSION DRAWINGS SHOWING THICKNESSES AND KINDS OF MATERIAL AND SIMILAR INFORMATION.

(B) TWO (2) PRINTS OF EACH OF THE DRAWINGS SUBMITTED WILL BE RETURNED WITH THE CRITICISMS OR APPROVAL OF THE CITY. IN CASE THE DRAWINGS ARE NOT APPROVED, THE CONTRACTOR SHALL AGAIN SEND FOR APPROVAL, SIX (6) REVISED PRINTS OF THE DRAWINGS TO TAKE CARE OF THE CRITICISMS NOTED, AND AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED, THE CONTRACTOR SHALL FURNISH TO THE CITY SIX (6) ADDITIONAL PRINTS, AND ONE (1) MYLAR OR REPRODUCIBLE CLOTH TRACING OF EACH DRAWING. MYLAR TRACINGS SHALL BE SUBMITTED AS SPECIFIED IN THE GENERAL NOTES "DRAWINGS." NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

88
146

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WATER WORK NOTES

PAYMENT

THE UNIT PRICE STIPULATED FOR EACH "ITEM SPECIAL – VALVES WITH VALVE BOX, COMPLETE", CLASSIFIED AS TO SIZE AND TYPE, SHALL INCLUDE THE FURNISHING, PLACING, TESTING AND PAINTING OF THE VALVES, CHECK VALVES, DOUBLE BACKFLOW ASSEMBLIES, VALVE BOXES, FLANGED VALVE INSULATOR, OPERATING NUTS, VALVE STEM EXTENSION IF REQUIRED AND OTHER ACCESSORIES AND APPURTENANCES AND THE FURNISHING OF ALL LABOR, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN ON THE CONTRACT DRAWINGS.

WHERE TAPPING VALVES WITH VALVE BOX COMPLETE, CURB GATE VALVES WITH VALVE BOX COMPLETE, CHECK VALVES, OR DOUBLE CHECK BACKFLOW ASSEMBLIES ARE INSTALLED AS PART OF DOMESTIC OR FIRE LINE SERVICE CONNECTIONS, PAYMENT FOR SUCH VALVES SHALL BE MADE UNDER THE APPROPRIATE WATER SERVICE CONNECTION WORK.

ITEM SPECIAL – CUTTING–IN VALVE WITH VALVE BOX, COMPLETE

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH AND INSTALL AT THE LOCATION(S) NOTED ON THE CONTRACT DRAWINGS OR WHERE ORDERED ALL CUTTING–IN VALVE ASSEMBLIES WITH VALVE BOX COMPLETE INCLUDING THE FURNISHING AND INSTALLATION OF A VALVE STEM EXTENSION IF SO REQUIRED. THE DIVISION OF WATER WILL SET THE TIME OF INSTALLATION OF THE CUT–IN–VALVE AND THE CONTRACTOR SHALL DO ALL PIPE CUTTING AND INSTALLATION. THE INSTALLATION OF THE CUTTING–IN VALVE SHALL BE DONE UNDER THE SUPERVISION OF THE DIVISION OF WATER. THE CONTRACTOR SHALL FURNISH AND DELIVER TO AND INSTALL AT THE LOCATION(S) SHOWN ON THE PLANS A RETAINED MECHANICAL JOINT BELL END GATE VALVE, VALVE BOX COMPLETE, EITHER RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT PATTERN) OR COMPRESSION COUPLINGS (WITH STOPS REMOVED) EQUAL TO DRESSER STYLE NO. 38, 138 OR 162 OR SMITH–BLAIR NO. 441, HAVING STAINLESS STEEL BOLTS AND NUTS (ASTM A276–89A, TYPE 304), DUCTILE IRON PIPE SHORTS AND, IF REQUIRED, PIPE REDUCER FITTINGS AND A VALVE STEM EXTENSION. COMPRESSION COUPLINGS SHALL HAVE A MINIMUM PRESSURE RATING OF 250 PSI. THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND DO ALL NECESSARY EXCAVATION, SHEETING, SHORING, BACKFILLING, MISCELLANEOUS REMOVAL AND RESTORATION, SEEDING AND/OR SODDING, REPAVING AND REPLACEMENT OF SIDEWALK REQUIRED TO COMPLETE THE WORK AS HEREIN SPECIFIED.

QUALITY OF VALVES

THE GATE VALVES FURNISHED AND INSTALLED AS PART OF THE CUTTING–IN VALVE ASSEMBLY SHALL CONFORM WITH THE REQUIREMENTS OF THE "ITEM SPECIAL – VALVES" OF THESE SPECIFICATIONS, INSOFAR AS THEY APPLY.

PAYMENT

THE WORK INCLUDED IN THIS ITEM SHALL BE PAID FOR AT THE UNIT PRICE BID FOR EACH "ITEM SPECIAL – CUTTING–IN VALVE WITH VALVE BOX COMPLETE", CLASSIFIED AS TO SIZE. THE PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR PERFORMING ALL EXCAVATION, BACKFILLING, AND THE FURNISHING OF ALL LABOR, TOOLS, PIPING, VALVES, REDUCER FITTINGS, VALVE BOX, VALVE STEM EXTENSION, ALL EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN PLACE AS SHOWN. SEEDING AND SODDING, REPAVING (BOTH TEMPORARY AND PERMANENT), SIDEWALK REPLACEMENT AND OTHER SITE RESTORATION SHALL BE INCLUDED IF NOT PAID FOR SEPARATELY UNDER OTHER ITEMS INDICATED IN THE PLANS.

ITEM SPECIAL – COPPER WATER TUBING

THE CONTRACTOR SHALL PROVIDE AND INSTALL COPPER WATER TUBING AS NECESSARY BETWEEN THE CURB STOP AND GRADING LIMITS. A CONTINGENCY QUANTITY OF 1000 FEET OF COPPER WATER TUBING HAS BEEN PROVIDED TO USE AS DIRECTED BY THE ENGINEER.

THE UNIT PRICE STIPULATED FOR EACH FOOT "ITEM SPECIAL – COPPER WATER TUBING" SHALL INCLUDE FURNISHING, PLACING, TESTING AND EXCAVATION AND BACKFILL.

ITEM SPECIAL – COPPER WATER TUBING 1000 FT.

ITEM SPECIAL – WATER SERVICE CONNECTIONS

GENERAL

ALL NEW AND UNUSED MATERIALS SHALL BE USED IN THE FOLLOWING SITUATION(S) INVOLVING WATER SERVICE CONNECTIONS.

(A) WHERE A GENERAL SUPPLY WATER SERVICE CONNECTION OR FIRE SERVICE CONNECTION IS DAMAGED OR IS DISTURBED FOR LOWERING, RAISING, EXTENDING, OR RELOCATING BETWEEN THE WATER MAIN AT THE "CORPORATION SHUTOFF VALVE" AND THE "CURB SHUTOFF VALVE", IT SHALL BE TOTALLY REPLACED WITH NEW AND UNUSED MATERIALS FROM THE "CORPORATION SHUTOFF VALVE" TO "CURB

(B) WHERE AN EXISTING CONNECTION REQUIRES TOTAL REPLACEMENT AND IS FOUND TO HAVE A FERRULE TYPE "TAP" THE CONNECTION SHALL BE REINSTALLED BY THE CONTRACTOR WITH A BRONZE DOUBLE STRAP TAP SADDLE. REPLACEMENT OF EXISTING 5/8" AND 3/4" WATER SERVICE CONNECTIONS SHALL INCLUDE ALL FITTINGS, ADAPTERS, CORPORATIONS AND STRAP SADDLES AS REQUIRED TO INSTALL A 3/4" COPPER WATER SERVICE CONNECTION COMPLETE. EXISTING ONE (1") INCH WATER SERVICE CONNECTIONS, WHEN REQUIRED TO BE TOTALLY REPLACED, SHALL BE REPLACED AS A ONE (1") INCH COPPER WATER SERVICE CONNECTION COMPLETE INCLUDING ALL FITTINGS, CORPORATIONS AND ADAPTERS. WHEN REPLACING EXISTING LEAD OR GALVANIZED 5/8" WATER SERVICE CONNECTIONS THE REPLACEMENT SHALL ALSO INCLUDE A NEW CURB SHUT–OFF VALVE AND CURB VALVE BOX COMPLETE.

(C) WHERE AN EXISTING COPPER GENERAL SUPPLY WATER SERVICE CONNECTION OR FIRE SERVICE CONNECTION IS DAMAGED OR IS DISTURBED FOR LOWERING, RAISING, EXTENDING BETWEEN THE "CORPORATION SHUTOFF VALVE" AND THE "CURB SHUTOFF VALVE", IT MAY BE RECONNECTED USING APPROVED COMPRESSION COUPLING. NO MORE THAN TWO (2) SUCH COMPRESSION COUPLINGS SHALL BE USED ON ONE (1) WATER SERVICE CONNECTION.

(D) WHERE A GENERAL SUPPLY WATER SERVICE CONNECTION OR FIRE SERVICE CONNECTION IS DISTURBED ON THE "PROPERTY SIDE" OF THE CURB SHUT–OFF VALVE, FOR LOWERING, RAISING AND/OR EXTENDING, OR NEEDS REPLACEMENT BECAUSE IT IS OF LEAD OR GALVANIZED PIPING MATERIAL, THE PIPING MATERIALS AND FITTINGS SHALL BE TOTALLY REPLACED WITH NEW AND UNUSED MATERIALS FROM THE EXISTING CURB SHUT–OFF VALVE TO THE NEW CURB SHUT–OFF VALVE REQUIRED AS A RESULT OF THE EXTENSION LOWERING, RAISING OR REPLACEMENT.

(E) WHERE A GENERAL SUPPLY WATER SERVICE CONNECTION OR FIRE SERVICE CONNECTION IS DISTURBED FOR LOWERING, RAISING AND/OR EXTENDING, IT SHALL BE EXTENDED IN A STRAIGHT PROLONGATION OF THE EXISTING CONNECTION. WHERE THE "PROPERTY SIDE" CONNECTION PIPING IS NOT IMMEDIATELY CONTIGUOUS TO THE EXTENDED CONNECTION CURB SHUTOFF, ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO RECONNECT SHALL BE PROVIDED AS PROJECT WORK. ALL RECONNECTION ON THE "PROPERTY SIDE" OF THE CURB SHUT–OFF MUST BE PARALLEL TO THE STREET CENTERLINE OR RIGHT–OF–WAY FROM THE CURB SHUT–OFF. IF UPON INSPECTION OF THE "PROPERTY SIDE" PIPING IT IS FOUND UNSUITABLE FOR SUCH RECONNECTION, THE CONNECTION SHALL NOT BE DISTURBED UNTIL SUCH TIME AS THE ENGINEER HAS ARRANGED FOR REPLACEMENT.

(F) WHERE A CONNECTION IS ADVERTENTLY DAMAGED OR BROKEN WHICH WAS NOT TO BE DISTURBED, ONLY THE DAMAGED PORTION NEEDS TO BE REPLACED. IF THE EXTENT OF DAMAGE CANNOT BE FULLY ASSESSED, THE CONNECTION SHALL BE REPLACED AS NOTED IN PARAGRAPH A AT THE CONTRACTOR'S EXPENSE.

(G) ANY CLEVELAND WATER DEPARTMENT VALVE BOXES, CURB SHUT–OFF VALVE BOXES OR OTHER CASTINGS DAMAGED DURING CONSTRUCTION OR FOUND UNSUITABLE FOR REUSE SHALL BE REPLACED WITH NEW AND UNUSED MATERIAL IN ACCORDANCE WITH THE SPECIFICATION, MISCELLANEOUS METAL WORK. PAYMENT FOR ADDITIONAL REQUIRED VALVE BOXES, CURB SHUT–OFF VALVE BOXES OR OTHER CASTINGS WILL BE MADE UNDER "ITEM SPECIAL, MISCELLANEOUS METAL WORK".

(H) ALL GENERAL SUPPLY WATER SERVICE CONNECTIONS AND FIRE SERVICE CONNECTIONS SHALL BE LAID NOT LESS THAN SIX (6) FEET BELOW ESTABLISHED STREET GRADE AND NOT LESS THAN FIVE AND ONE–HALF (5–1/2) FEET BELOW GROUND SURFACE.

PIPE MATERIAL FOR WATER SERVICE CONNECTIONS

THE FOLLOWING PIPE MATERIAL SHALL BE USED FOR THE SERVICE CONNECTIONS ON THIS PROJECT:

COPPER WATER TUBING, TYPE K, ASTM B88–74, 3/4" TO 2" DIAMETER

DUCTILE IRON PIPE AND FITTINGS, ANSI CLASS 52(NEW); ANSI CLASS 56(RECONSTRUCT), CEMENT LINED, 3" DIAMETER AND UP.

WORK INCLUDED

IN ADDITION TO THE WORK DESCRIBED ABOVE, THE CONTRACTOR SHALL INSTALL NEW AND/OR RECONNECT WATER SERVICE CONNECTIONS AS DETAILED IN THE PLANS.

PAYMENT

THE FOLLOWING PAY ITEMS ARE LISTED IN THE BID SCHEDULE FOR WATER SERVICE CONNECTION WORK:

ITEM SPECIAL – RETAP AND RECONNECT ()" WATER SERVICE CONNECTION, SHORT(LONG) SIDE, COMPLETE

THE CONTRACT UNIT PRICE BID FOR EACH ITEM SPECIAL, CLASSIFIED BY SIZE, SHALL INCLUDE THE EXCAVATION, BACKFILLING, TAPPING AND FURNISHING OF ALL LABOR, TOOLS, NEW MATERIAL, AND EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN PLACE AS SHOWN. SEEDING, SODDING AND REPAVING SHALL ALSO BE INCLUDED IF NOT PAID FOR SEPARATELY IN THE PLANS. REMOVAL OF THE CURB SHUT OFF VALVE AND VALVE BOX ARE ALSO INCLUDED IN THE PAYMENT FOR THIS ITEM.

ITEM SPECIAL – TEMPORARY WATER SERVICE CONNECTION, COMPLETE

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH AND INSTALL THE TEMPORARY WATER SERVICE CONNECTION(S) INCLUDING PIPE AND FITTINGS AT LOCATIONS SHOWN ON THE PLANS. MATERIAL USED FOR PROVIDING THE TEMPORARY WATER SERVICE 3" AND UNDER CONNECTION SHALL BE APPROVED BY THE ENGINEER AND THE DIVISION OF WATER. MATERIAL USED FOR PROVIDING THE TEMPORARY WATER SERVICE 4" AND LARGER SHALL CONFORM WITH THE SPECIFICATIONS FOR DUCTILE IRON WATER MAINS.

THE TEMPORARY WATER MAIN SHALL NOT OBSTRUCT ANY STREETS, SIDEWALKS OR DRIVEWAYS. TRENCHING OR RAMPING SHALL BE PERFORMED AS REQUIRED TO PROVIDE PROTECTION FOR THE TEMPORARY WATER MAINS AND TO PROVIDE FOR THE SAFE MOVEMENT OF VEHICULAR AND PEDESTRIAN TRAFFIC.

PAYMENT

(A) THE WORK INCLUDED IN THIS ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER EACH CLASSIFIED AS TO SIZE FOR "ITEM SPECIAL – TEMPORARY WATER SERVICE CONNECTION COMPLETE," WHICH PRICE SHALL CONSTITUTE FULL PAYMENT SHALL INCLUDE THE EXCAVATION, BACKFILLING, DIVISION OF WATER TAPPING FEE (IF APPLICABLE) AND THE FURNISHING OF ALL LABOR, TOOLS, MATERIALS AND ALL EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN PLACE AS SHOWN. SEEDING AND SODDING, REPAVING (BOTH TEMPORARY AND PERMANENT), SIDEWALK REPLACEMENT AND OTHER SITE RESTORATION SHALL BE INCLUDED IF NOT PAID FOR SEPARATELY UNDER OTHER ITEMS INDICATED IN THE PLANS.
(B) THE DIVISION OF WATER WILL REQUIRE THAT THE CONTRACTOR PAY ALL DIVISION OF LABOR CHARGES FOR "FLUSHING, TESTING AND SAMPLING" OF THE TEMPORARY WATER SERVICE CONNECTION IN ACCORDANCE WITH THE FEE SCHEDULE INDICATED IN THE GENERAL NOTES "DIVISION OF WATER CHARGES." PAYMENT FOR DIVISION OF WATER LABOR SHALL BE MADE TO THE PERMITS AND SALES SECTION PRIOR TO ANY WATER SERVICE CONNECTION WORK BEING PERFORM.
(C) UPON COMPLETION OF WATER WORK AND THE TEMPORARY CONNECTION IS NO LONGER NEEDED, THE CONTRACTOR SHALL REMOVE THE TEMPORARY CONNECTION AND REPLACE THE DAMAGED SEEDED, SODDED OR PAVED AREAS IF NOT PAID FOR SEPARATELY UNDER OTHER ITEMS OF WORK IN THIS CONTRACT.

ITEM SPECIAL – TEMPORARY BY–PASS CONNECTION, COMPLETE WITH PIPE AND FITTINGS

THE CONTRACTOR SHALL INSTALL THE PROPOSED 6" FIRE HYDRANT AT STA. 51+79 AND A 2" TEMPORARY WATER MAIN FOR DOMESTIC USE IN AREAS INDICATED IN THE PLANS, PRIOR TO SHUTTING DOWN THE EXISTING 12" WATER MAIN BETWEEN STA. 52+88 AND STA. 54+12. THIS WILL PROVIDE CONNECTION NUMBER 363626 A TEMPORARY WATER SERVICE CONNECTION DURING THE CONSTRUCTION OF THE PROPOSED 12" WATER MAIN BETWEEN STA. 53+13 AND STA. 53+87.

ITEM SPECIAL– MISCELLANEOUS METAL WORK

WORK INCLUDED

(A) THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MISCELLANEOUS METAL WORK WHICH IS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT AND IS NOT SPECIFICALLY INCLUDED UNDER THE OTHER ITEMS OF THESE SPECIFICATIONS.

(B) IN GENERAL, MISCELLANEOUS METAL FURNISHED AND INSTALLED UNDER THE APPROPRIATE ITEMS SHALL INCLUDE MANHOLE STEPS, VALVE BOXES, EXTENSION STEMS AND BRACE, STRUCTURAL MEMBERS, BRONZE BOLTS, REINFORCING STEEL AND OTHER SIMILAR ITEMS REQUIRED FOR THE PROPER COMPLETION OF THE WORK. ALL MISCELLANEOUS METAL WORK SHALL INCLUDE THE REPLACEMENT OF ANY VALVE BOXES, COVERS, MANHOLE RINGS AND COVERS, WATER SERVICE STOP BOXES, BRONZE BOLTS, MANHOLE STEPS, EXTENSION STEMS, BRACE STRUCTURAL MEMBERS AND OTHER SIMILAR ITEMS AS DETERMINED BY THE ENGINEER

MATERIALS

(A) ALL IRON CASTINGS SHALL BE SMOOTH AND FREE FROM BLOW HOLES AND OTHER DEFECTS, AND MUST CONFORM TO THE DIMENSIONS GIVEN ON THE DRAWINGS, AND TO THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS OF THE AMERICAN SOCIETY FOR TESTING AND MATERIALS, SERIAL DESIGNATION A–48–74, CLASS 30C. ALL CASTINGS SHALL BE TRUE AND WHERE REQUIRED SHALL FIT PROPERLY TOGETHER. THE CONTACT SURFACES OF THE FRAMES AND COVERS FOR MANHOLES AND FLOOR OPENINGS SHALL BE CHIPPED AND MACHINED IF NECESSARY, IN ORDER TO GIVE AN EVEN BEARING FOR THE COVER ON THE FRAME, AND TO RENDER THEM TIGHT. WHERE REQUIRED, THE SURFACES OF PLATES AND COVERS SHALL BE CAST WITH SUITABLE CHECKERED OR OTHER RAISED PATTERN.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

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WATER WORK NOTES

(B) CAST IRON VALVE BOXES AND COVERS SHALL BE GRAY IRON CASTINGS, IN WHICH APPEARANCE AND DIMENSION TOLERANCES ARE PRIMARY CONSIDERATIONS AND STRENGTH IS NOT A PRIMARY OR MAJOR CONSIDERATION. VALVE BOXES AND COVERS SHALL BE ASTM DESIGNATION A 48-83, "SPECIFICATION FOR GRAY-IRON CASTINGS," WITH NO SPECIFIC REQUIREMENT AS TO CLASS. CHEMICAL COMPOSITION SHALL NOT BE CONSIDERED, BUT THE MATERIAL SHALL BE OF GOOD QUALITY AND OF SUCH CHARACTER AS SHALL MAKE THE METAL OF THE CASTINGS STRONG, TOUGH AND OF EVEN GRAIN. THE METAL SHALL BE MADE WITHOUT ANY ADMIXTURE OF CINDER IRON OR OTHER INFERIOR METAL.

(C) WORKMANSHIP AND FINISH SHALL CONFORM SUBSTANTIALLY TO THE DIMENSIONS ON THE CONTRACT DRAWINGS OR FURNISHED DRAWINGS. THE CASTINGS OR MOLDINGS SHALL BE FREE FROM INJURIOUS DEFECTS, CRACKS, GAS HOLES, FLAWS, AND EXCESSIVE SHRINKAGE. ADDITIONAL INSPECTION MAY BE MADE AT THE PROJECT OR WORK SITE. INSPECTION SHALL BE VISUAL INSPECTION FOR APPEARANCE AND SURFACE SMOOTHNESS IN COMPARISON WITH SAMPLES ACCEPTED AS STANDARD. SAMPLE CASTINGS OR MOLDINGS FROM EACH PATTERN, WHEN REQUIRED BY THE ENGINEER, SHALL BE SUBMITTED BY THE MANUFACTURER FOR THE PURPOSE OF ESTABLISHING STANDARDS OF APPEARANCE AND DIMENSIONAL TOLERANCES. THE MANUFACTURER SHALL CERTIFY THAT HIS PRODUCT CONFORMS TO THESE SPECIFICATIONS. EACH CERTIFICATION SO FURNISHED SHALL BE SIGNED BY AN AUTHORIZED AGENT OF THE MANUFACTURER.

(D) ALL STEEL SHALL MEET THE REQUIREMENTS OF THE "SPECIFICATIONS FOR STRUCTURAL STEEL", SERIAL DESIGNATION A 36-70A, ADOPTED BY THE AMERICAN SOCIETY FOR TESTING AND MATERIALS.

(E) WHERE IRON OR STEEL IS SHOWN GALVANIZED, CADMIUM PLATED, PARKERIZED OR OTHERWISE TREATED, OR IS SO ORDERED, NO ADDITIONAL ALLOWANCE WILL BE MADE FOR SUCH TREATMENT. ALL METAL TO BE GALVANIZED SHALL BE THOROUGHLY CLEANED, BY IMMERSION IN PICKLING LIQUORS. GALVANIZING SHALL BE PERFORMED BY DIPPING IN HOT ZINC BATH AND KEEPING THE METAL IMMERSED UNTIL THE TEMPERATURE OF THE METAL HAS OBTAINED THE SAME TEMPERATURE AS THAT OF THE BATH. CADMIUM PLATING SHALL BE BY AN APPROVED PROCESS AND PLATING SHALL BE FROM 0.0003 INCH TO 0.0005 INCH THICK.

(F) ALUMINUM, EXCEPT AS OTHERWISE REQUIRED, SHALL BE ALUMINUM ALLOY EQUIVALENT TO SPECIFICATION 6063; RIVETS AND SCREWS SHALL BE 2017 ALLOY; ALUMINUM PLATE AND STRUCTURAL SHAPES SHALL BE 6061-T6 AND EXTRUDED SHAPES SHALL BE 6063-T5; ALL AS MANUFACTURED BY THE ALUMINUM COMPANY OF AMERICA, OR APPROVED EQUAL.

(G) BRASS SHALL BE OF A COMMERCIAL GRADE CONFORMING TO THE "STANDARD SPECIFICATIONS FOR BRASS PLATE, SHEET, STRIP AND ROLLED BAR", ASTM DESIGNATION B 36-89, ALLOY NO. 3, "SPECIFICATION FOR STRUCTURAL STEEL."

(H) BRONZE FOR BOLTS, NUTS AND ANCHOR BOLTS SHALL BE TOBIN OR MANGANESE BRONZE OR OF SIMILAR APPROVED MATERIAL.

(I) COPPER-SILICON ALLOY OR "EVERDUR" SHALL CONFORM TO ASTM DESIGNATION B 96-86, "SPECIFICATION FOR COPPER-SILICON ALLOY PLATE SHEET, STRIP, AND ROLLED BAR FOR GENERAL PURPOSES AND PRESSURE VESSELS," (FORMERLY B 97-70, TYPE B).

(J) STAINLESS STEEL RODS AND FASTENERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A 276-89A, TYPE 304, "SPECIFICATION FOR STAINLESS AND HEAT-RESISTING STEEL BARS AND SHAPES".

(K) ALL CASTINGS SHALL BE SMOOTH, FREE FROM BLOW HOLES, TRUE AND WHERE REQUIRED, SHALL FIT PROPERLY TOGETHER.

(L) ALL WROUGHT IRON SHALL MEET THE REQUIREMENTS OF ASTM DESIGNATION A 860-89, "SPECIFICATION FOR HIGH STRENGTH BUTT WELDING FITTINGS OF WROUGHT HIGH STRENGTH FOR ALLOY STEEL."

CLEANING AND TESTING

ALL CASTINGS SHALL BE THOROUGHLY CLEANED AND SUBJECTED TO A CAREFUL HAMMER TEST. NO CASTINGS SHALL BE COATED UNLESS CLEAN AND FREE FROM RUST, AND APPROVED IN THESE RESPECTS BY THE ENGINEER OR HIS AUTHORIZED INSPECTOR IMMEDIATELY BEFORE BEING DIPPED.

COATING

EACH CASTING SHALL BE SPRAYED OR BRUSHED INSIDE AND OUT WITH ONE COAT OF ASPHALTIC COMPOUND VARNISH. THE VARNISH SHALL BE MADE OF HIGH GRADE ASPHALT FLUXED AND BLENDED WITH PROPERLY TREATED DRYING OILS AND THINNED TO A PROPER CONSISTENCY WITH A VOLATILE SOLVENT. THE VARNISH SHALL BE EQUAL TO BLACK ASPHALT VARNISH AS MANUFACTURED BY THE EXCELSIOR VARNISH WORKS, INC., CLEVELAND, OHIO 44102. OTHER METHODS OF COATING AND TYPES OF COATING MATERIALS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. IN ADDITION TO THE SHOP COAT, THE CASTINGS SHALL RECEIVE TWO (2) COATS OF APPROVED PAINT.

INSPECTION

THE ENGINEER OR HIS AUTHORIZED DESIGNEE, SHALL HAVE THE RIGHT TO INSPECT THE MATERIAL AND WORK DONE, AS THE INTEREST OF THE CITY MAY REQUIRE. SUCH INSPECTION SHALL NOT RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM SAID WORK STRICTLY IN ACCORDANCE WITH THE SPECIFICATIONS, OR ANY MODIFICATIONS THEREOF, AS HEREIN PROVIDED, AND WORK NOT SO CONSTRUCTED SHALL BE REMOVED AND MADE GOOD BY THE CONTRACTOR, AT HIS OWN EXPENSE. ALL MANHOLE RINGS AND COVERS MUST BE SOUND AND SHALL CONFORM TO THESE SPECIFICATIONS, AND ANY DEFECTIVE CASTINGS WHICH MAY HAVE PASSED THE INSPECTOR AT THE WORKS, OR ELSEWHERE, SHALL BE AT ALL TIMES LIABLE TO REJECTION WHEN DISCOVERED, UNTIL THE DATE OF FINAL PAYMENT UNDER THIS CONTRACT.

STEPS AND LADDERS

GALVANIZED WROUGHT IRON STEPS, DUCTILE IRON STEPS OR APPROVED POLYPROPYLENE PLASTIC STEPS OF THE SIZE AND SHAPE SHOWN ON THE CONTRACT DRAWINGS, SHALL BE BUILT INTO THE BRICK AND CONCRETE MASONRY MANHOLES, AS INDICATED ON THE DRAWINGS.

MANHOLE FRAME AND COVERS

(A) THE CONTRACTOR SHALL FURNISH AND INSTALL, AT LOCATIONS SHOWN ON THE DRAWINGS AND AS REQUIRED, TOGETHER WITH ALL GATE VALVE VAULTS (CHAMBERS), DRAIN MANHOLES, ACCESS MANHOLE AND ANCHORAGE ASSEMBLIES, AND PITOMETER VAULTS, ALL MANHOLE FRAME AND COVERS OF THE ASSEMBLED TYPES AND SIZES SHOWN ON STANDARD DETAIL REFERENCE DRAWING SM-31. ASSEMBLY AND PLACEMENT OF THE MANHOLE FRAME AND COVERS SHALL BE MADE IN ACCORDANCE WITH THE CONFIGURATIONS SHOWN ON THE VARIOUS DETAILS SHOWN ON THE CONTRACT DRAWINGS.

(B) THE RIMS SHALL BE PROPERLY SET IN PLACE IN FULL BED OF MORTAR OR POURED MONOLITHIC IN THE MASONRY, AT SUCH ELEVATION AS TO MAKE THE TOP OF THE RIM CONFORM TO THE FINISHED SURFACES OF THE STRUCTURES OR THE FINISHED GRADE AS ESTABLISHED BY THE ENGINEER.

(C) REQUIRED MANHOLE FRAME AND COVER ASSEMBLIES SHALL BE COMPLETE AS FOLLOWS:

(1) 20" THRU 48" GATE VALVE VAULTS (CHAMBERS): MANHOLE FRAME AND COVER MARK SM-31B: CAST IRON ROUND DOUBLE-COVER STYLED CASTING CONSISTING OF MANHOLE FRAME, PATTERN SM-31-B1; TOP COVER, PATTERN SM-31-B2; AND INSIDE COVER, PATTERN SM-31-B3.

(2) 4"/6" DRAIN MANHOLE: MANHOLE FRAME AND COVER MARK NO. 3: CAST IRON ROUND SINGLE-COVER STYLE CASTING CONSISTING OF MANHOLE FRAME , PATTERN SM-31-C1; AND TOP COVER, PATTERN SM-31-B2.

(3) ACCESS MANHOLE AND ANCHORAGE, TYPE "A": MANHOLE FRAME AND COVER MARK SM-31A: CAST IRON RECTANGULAR DOUBLE-COVER STYLED CASTING CONSISTING OF MANHOLE FRAME, PATTERN SM-31-A1; TOP COVER PATTERN SM-31-A2; AND INSIDE COVER PATTERN SM-31-A3.

(4) ACCESS MANHOLE AND ANCHORAGE, TYPE "B": MANHOLE FRAME AND COVER MARK SM-31B: CAST IRON ROUND DOUBLE-COVER STYLED CASTING CONSISTING OF MANHOLE FRAME, PATTERN SM-31-B1; TOP COVER PATTERN SM-31-B2; AND INSIDE COVER, PATTERN SM31-B3.

(5) ACCESS MANHOLE AND ANCHORAGE TYPE "C": MANHOLE FRAME AND COVER MARK SM-31A: CAST IRON RECTANGULAR DOUBLE-COVER STYLED CASTING CONSISTING OF MANHOLE FRAME, PATTERN SM-31-A1; TOP COVER PATTERN SM-31-A2; AND INSIDE COVER, PATTERN SM-31-A3.

(6) PITOMETER VAULTS: MANHOLE FRAME AND COVER MARK SM-31B: CAST IRON ROUND DOUBLE-COVER STYLED CASTING CONSISTING OF MANHOLE FRAME, PATTERN SM-31-B1; TOP COVER, PATTERN SM-31-B2; AND INSIDE COVER, PATTERN SM-31-B3.

DETAILED DRAWINGS

COMPLETE DETAILED DRAWINGS OF MISCELLANEOUS METAL WORK SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL, PRIOR TO THE MANUFACTURE OF ANY WORK TO BE FURNISHED UNDER THIS ITEM IN ACCORDANCE WITH THESE SPECIFICATIONS.

PAINTING

ALL MISCELLANEOUS METAL WORK NOT GALVANIZED SHALL BE THOROUGHLY CLEANED AND GIVEN THREE (3) FIELD COATS OF COAL TAR PITCH EQUAL TO KOPPERS BITUMASTIC SUPER TANK SOLUTION OR EQUIVALENT.

MEASUREMENT

THE MISCELLANEOUS METAL WORK SHALL BE THE METAL WORK ACTUALLY FURNISHED AND PLACED IN ACCORDANCE WITH THESE SPECIFICATIONS AND THE DETAILED DRAWINGS APPROVED BY THE ENGINEER. IN THE COMPUTING OF WEIGHTS, IF NOT DETERMINED BY WEIGHING, ONE (1) CUBIC FOOT OF CAST IRON SHALL BE ASSUMED TO WEIGH FOUR HUNDRED AND FIFTY (450) POUNDS, AND ONE (1) CUBIC FOOT OF STEEL SHALL BE ASSUMED TO WEIGH FOUR HUNDRED AND NINETY (490) POUNDS. THE WEIGHT OF CAST IRON SHALL BE USED FOR CAST IRON VALVE BOXES AND COVERS, ANY CAST IRON SECTIONS OF VALVE BOXES AND COVERS, AND MANHOLE FRAME AND COVERS.

PAYMENT

THE UNIT PRICE STIPULATED PER POUND FOR MISCELLANEOUS METAL WORK SHALL INCLUDE THE FURNISHING, ERECTING, MACHINING, FITTING, ADJUSTING, BOLTING, CLEANING AND PAINTING OF ALL MISCELLANEOUS METAL WORK, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN. THE FOLLOWING ESTIMATED QUANTITIES ARE INCLUDED IN THE GENERAL SUMMARY FOR THIS WORK:

ITEM SPECIAL- MISCELLANEOUS METAL WORK 1,000 LBS.

ITEM SPECIAL - BRICK AND CONCRETE MASONRY:
VAULTS, MANHOLES OR CHAMBERS

WORK INCLUDED

UNDER THESE ITEMS THE CONTRACTOR SHALL FURNISH ALL NECESSARY LABOR, MATERIALS, INCLUDING FRAMES, COVERS, AND STEPS, TOOLS AND EQUIPMENT FOR THE CONSTRUCTION, COMPLETE, OF ALL MISCELLANEOUS MASONRY STRUCTURES AND INCLUDING ALL WATER MAIN VALVE CHAMBERS, DRAIN VAULTS, PITOMETER VAULTS, METER VAULTS, FIRELINE VAULTS, ACCESS AND ANCHORAGE MANHOLES, PLAIN ANCHORS, PIERS (THRUST BLOCKS), SUPPORTS UNDER VALVES, FLOORS FOR VAULTS AND CHAMBERS, AND OTHER PERTINENT WORK TOGETHER WITH THE HAULING, MIXING, PLACING, FORMING, SCAFFOLDING, SHEETING AND BRACING, GROUTING, PLASTERING, CURING, ETC., ALL AS SPECIFIED AND AS REQUIRED OR SHOWN ON THE CONTRACT DRAWINGS.

BRICK AND MASONRY MATERIAL

THE MATERIAL FURNISHED BY THE CONTRACTOR FOR THE VARIOUS KINDS OF MASONRY CONSTRUCTION TO BE CONSTRUCTED SHALL CONFORM TO THE FOLLOWING OHIO DEPARTMENT OF TRANSPORTATION (ODOT) SPECIFICATIONS:

(A) ALL BRICK FURNISHED AND USED SHALL EITHER BE O.D.O.T. ITEM 704.01 SHALE BRICK COMPLYING WITH THE REQUIREMENTS FOR "GRADE SM", ASTM DESIGNATION: C 32-84, "SPECIFICATION FOR SEWER AND MANHOLE BRICK (MADE FROM CLAY OR SHALE)," OR SHALL BE SOLID TYPE O.D.O.T. ITEM 704.02 CONCRETE BRICK COMPLYING WITH THE REQUIREMENTS PER ASTM DESIGNATION: C 55-85,"SPECIFICATION FOR CONCRETE BUILDING BLOCK," TYPE II, GRADES N-11 OR S-11, EXCEPT AS MODIFIED PER ODOT SPECIFICATIONS.

(B) ALL CEMENT USED SHALL CONFORM TO ASTM DESIGNATION: C 150-89, "SPECIFICATION FOR PORTLAND CEMENT," TYPE III, PER O.D.O.T. ITEM 701.05 AND ITEM 705.10.

(C) FINE AGGREGATE USED FOR CONCRETE SAND, MORTAR OR GROUT SHALL BE CLEAN, FREE FROM DIRT, LOAM, VEGETABLE OR OTHER ORGANIC MATTER. SAND SHALL NOT CONTAIN MORE THAN THREE PERCENT (3%) BY WEIGHT OF LOAM OR CLAY AND IN NO CASE SHALL SAND BE USED IF ITS GRAINS ARE COATED WITH THESE SUBSTANCES. FINE AGGREGATE SHALL BE WELL GRADED FROM COURSE TO FINE AND WHEN TESTED BY MEANS OF LABORATORY SIEVES SHALL CONFORM TO THE REQUIREMENTS OF O.D.O.T. ITEM 703.03. SILT SHALL NOT EXCEED THREE (3%) PERCENT.

(D) AGGREGATE FOR PORTLAND CEMENT CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF 703.02 ODOT.

(E) ALL WATER SHALL BE CLEAN AND ACCURATELY MEASURED FOR EACH BATCH OF CONCRETE.

(F) ALL PLAIN CONCRETE SHALL BE CLASS "C" CONCRETE PER ODOT ITEM 499.03 HAVING A COMPRESSIVE STRENGTH AT 28 DAYS OF 4000 POUNDS. PLACING AND JOINTS SHALL BE PER DETAILS AND PER ODOT 511.08, 511.09, 511.10, 511.11 AND 511.12. CONCRETE TEST CYLINDERS SHALL BE MADE AND TESTED PER ASTM C31-84 AND C-39-83B.

(G) REINFORCING STEEL SHALL BE GRADE 60 AND BE PER ODOT ITEM 509.

(H) ALL CEMENT MORTAR SHALL BE MIXED IN THE PROPORTION OF ONE (1) PART CEMENT, THREE (3) PARTS OF SAND, EXCEPT THE MORTAR FOR BRICK CATCH BASINS AND SEWER MANHOLES WHICH SHALL BE 1:2 MIX.

(I) PRECAST MASONRY VAULT SECTIONS MAY BE FURNISHED IF THEY MEET THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS ON FILE WITH THE CLEVELAND DIVISION OF WATER OR APPROVED BY THE ENGINEER.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

90
146

F:\JOBS\665\WP\665WKN12.DWG RSY 3/22/07 PLOT 1:1

WATER WORK NOTES

VAULT, MANHOLE AND CHAMBER CONSTRUCTION

(A) ALL BRICK MANHOLES, BRICK NECKS AND EXTENSIONS SHALL BE BUILT IN ACCORDANCE WITH THE CONTRACT DRAWINGS.

(B) THE WALLS OF MANHOLES SHALL BE BUILT OF SHALE BRICK OR CONCRETE BRICK OF THE TYPE SPECIFIED HEREIN LAID IN 1:3 PORTLAND CEMENT MORTAR, WITH BRICK ARRANGED RADIALLY AS HEADERS, FORMING A WALL NINE (9) INCHES THICK. IN DEEP MANHOLES THE WALL SHALL BE 13" THICK BELOW A POINT 12 FEET FROM THE SURFACE. ALL OF THE BRICK COMPOSING SAID STRUCTURES SHALL BE LAID IN FULL MORTAR BEDS AND JOINTS, WITH NO MORTAR JOINTS APPEARING ON THE INNER SURFACE OF THE MANHOLE EXCEEDING THREE-EIGHTHS (3/8") INCHES THICK.

(C) THE TOP OF THE WALLS OF STRUCTURES SHALL BE PROPERLY LEVELED OFF WITH MORTAR SO AS TO FORM A FLAT SURFACE UPON WHICH THE CAST IRON MANHOLE RING IS TO REST. ALL STRUCTURES SHALL BE BUILT TO PROPER HEIGHT AS INDICATED BY THE CONTRACT DRAWINGS.

(D) THE ENTIRE OUTER SURFACE OF ALL BRICK MANHOLES SHALL BE PLASTERED WITH A SMOOTH COATING OF 1:3 PORTLAND CEMENT MORTAR, AT LEAST ONE-HALF (1/2) INCH THICK.

(E) PRECAST OR CAST-IN-PLACE CONCRETE MASONRY CONSTRUCTION SHALL FOLLOW THE APPLICABLE SECTIONS OF ODOT SPECIFICATIONS, ITEM 604.

PAYMENT

PAYMENT SHALL BE MADE AT THE CONTRACT UNIT PRICE BID PER EACH "ITEM SPECIAL-BRICK AND CONCRETE MASONRY: VAULTS, MANHOLES OR CHAMBERS" CLASSIFIED AS TO SIZE AND TYPE, COMPLETE AND ACCEPTED IN PLACE INCLUDING MANHOLE FRAMES, AND COVERS, STEPS AND REINFORCING STEEL AS FOLLOWS:

ITEM SPECIAL - 1-1/2" METER VAULT
ITEM SPECIAL - 2" METER VAULT
ITEM SPECIAL - 3" METER VAULT
ITEM SPECIAL - 8" METER VAULT
ITEM SPECIAL - 4" DRAIN VAULT

PAYMENT FOR BRICK OR CONCRETE MASONRY IS TO BE INCLUDED IN THE UNIT PRICE IN WHICH IT IS TO BE USED AND SHALL CONSTITUTE FULL COMPENSATION FOR PERFORMING ALL THE REQUIREMENTS OF THIS ITEM INCLUDING ALL NECESSARY LABOR, TOOLS, EQUIPMENT AND INCIDENTALS TO MAKE THIS A COMPLETE ITEM OF WORK.

PAYMENT FOR PLAIN CONCRETE MASONRY USED FOR CONCRETE ANCHORS AND PIERS (THRUST BLOCKS) SHALL BE INCLUDED IN THE UNIT PRICE PER LINEAR FOOT OF WATER MAIN BID FOR "ITEM SPECIAL - DUCTILE IRON PIPE"; "ITEM SPECIAL - PRESTRESSED CONCRETE CYLINDER PIPE"; "ITEM SPECIAL - STEEL PIPE AND FITTINGS"; OR SHALL BE INCLUDED IN "ITEM SPECIAL - PLUGGING EXISTING WATER MAINS AND BRANCHES."

ITEM 202 - REMOVE EXISTING VALVE BOX/CURB SHUT OFF VALVE BOX/ VAULT/MANHOLE FRAME AND COVER

WORK INCLUDED

WHERE INDICATED ON THE CONTRACT DRAWINGS, OR AS ORDERED, THE CONTRACTOR SHALL REMOVE EXISTING VALVE BOX; REMOVE EXISTING CURB SHUT OFF VALVE BOX; OR REMOVE EXISTING VAULT/MANHOLE FRAME AND COVER. THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY AT THE LOCATIONS SHOWN ON THE CONTRACT DRAWINGS OR WHERE ORDERED INCLUDING PAVEMENT CUTTING, PAVEMENT REMOVAL, EXCAVATION, BACKFILLING, SEEDING AND SODDING AND REPAVING, ALL AS REQUIRED OR AS ORDERED TO COMPLETE THE WORK.

PAYMENT

PAYMENT FOR WORK UNDER THIS ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR EACH:

ITEM 202 - REMOVE EXISTING VALVE BOX;
ITEM 202 - REMOVE EXISTING CURB SHUT OFF VALVE BOX; OR
ITEM 202 - REMOVE EXISTING VAULT/MANHOLE FRAME AND COVER

AND SHALL INCLUDE ALL PAVEMENT CUTTING, PAVEMENT REMOVAL, EXCAVATION, AND BACKFILLING, AND THE FURNISHING OF ALL LABOR, TOOLS, AND ALL EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK AS SHOWN OR AS ORDERED. SEEDING AND SODDING, REPAVING (BOTH TEMPORARY AND PERMANENT), SIDEWALK REPLACEMENT AND OTHER SIDE RESTORATION SHALL BE INCLUDED IF NOT PAID FOR SEPARATELY UNDER OTHER ITEMS INDICATED IN THE PLANS.

ITEM 202 - PIPE REMOVED, 24" AND UNDER

ALL WATER MAINS AND APPURTENANCES INCLUDING VALVES, VALVE BOXES, FITTINGS AND HYDRANTS, WHICH ARE NOT TO REMAIN IN SERVICE SHALL BE REMOVED, UNLESS OTHERWISE INDICATED ON THE PLANS. ALL SUCH WATERWORK SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF BY HIM UNLESS SPECIFICALLY SPECIFIED OTHERWISE UNDER OTHER ITEMS OF WORK.

ALL WATER MAINS AND APPURTENANCES WHICH ARE TO BE REMOVED ALONG WITH ROADWAY EXCAVATION OR ALONG WITH OTHER ITEMS OF WORK CALLED FOR IN THESE PLANS WILL NOT BE PAID FOR UNDER THIS ITEM.

PAYMENT

PAYMENT FOR WORK UNDER ITEM 202 - "PIPE REMOVED, 24" AND UNDER" SHALL BE PAID FOR AT THE UNIT PRICE BID PER LINEAR FOOT OF WATER MAIN REMOVED AND DISPOSED OF AND SHALL ALSO INCLUDE THE REMOVAL OF ALL VALVES, VALVE BOXES, FITTINGS AND HYDRANTS. PAYMENT FOR REMOVAL OF CURB STOP BOXES, AND MANHOLE FRAME AND COVERS WILL BE PAID FOR UNDER OTHER ITEMS.

ITEM SPECIAL - PLUG EXISTING WATER SERVICE CONNECTION

WORK INCLUDED

(A) EXISTING MAINS: ON EXISTING WATER MAINS TO REMAIN IN SERVICE, WHERE INDICATED ON THE CONTRACT DRAWINGS OR WHERE ORDERED, THE CONTRACTOR SHALL PLUG THE WATER SERVICE CONNECTION OR FIRE LINE CONNECTION AT THE MAIN, AND DO ALL THE NECESSARY EXCAVATION, SHEETING AND SHORING, BACKFILLING, SEEDING AND SODDING, AND REPAVING REQUIRED THEREFOR. ALL WATER SERVICE CONNECTIONS AND FIRE LINE CONNECTIONS SHALL BE PLUGGED AT THE MAIN, BUT ALL LEAD TYPE FITTINGS SHALL BE CUT OUT OF THE MAINS BY SLEEVING-IN A DUCTILE IRON SPOOL PIECE CONNECTING TO EXISTING MAIN WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT PATTERN) OR WITH APPROVED COMPRESSION COUPLINGS EQUAL TO DRESSER STYLE NO. 38, 138, OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS WITH TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276-89A, TYPE 304). THE COMPRESSION COUPLING SHALL HAVE STOPS REMOVED AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI.

(B) ABANDONED MAINS: ON ABANDONED WATER MAINS TO BE TAKEN OUT OF SERVICE THE CONTRACTOR SHALL PLUG THE WATER SERVICE CONNECTION OR FIRE LINE CONNECTION AS FOLLOWS:

1. CONNECTIONS 1-1/2" AND SMALLER: THE CONTRACTOR SHALL CRIMP THE COPPER TUBING ENDS, OR IN THE CASE OF LEAD OR GALVANIZED PIPING, SHALL CRIMP OR FILL WITH CONCRETE THE ENDS OF ALL WATER SERVICE CONNECTIONS DESIGNATED TO BE PLUGGED ON THE CONTRACT DRAWINGS. THE "PLUGGING" SHALL BE DONE IN THE RELOCATED WATER MAIN TRENCH AFTER THE CONNECTIONS HAVE BEEN TRANSFERRED, OR IF SUCH CONNECTION IS NOT TO BE TRANSFERRED IS TO BE PLUGGED AT THE TIME THE RELOCATED WATER INSTALLATION.

2. CONNECTIONS 2" AND LARGER: WHERE CONNECTIONS 2-INCH AND LARGER ARE DESIGNATED TO BE PLUGGED ON THE CONTRACT DRAWINGS, THE CONTRACTOR SHALL CLOSE ALL CONNECTIONS VALVES AT THE ABANDONED WATER MAIN, FILL ABANDONED LOWER VALVE BOX CASTING WITH CONCRETE, AND FILL WITH CONCRETE THE ENDS OF ALL WATER SERVICE CONNECTIONS. THE "PLUGGING" SHALL BE DONE AFTER THE CONNECTIONS HAVE BEEN TRANSFERRED TO THE RELOCATED WATER MAIN, OR IF SUCH CONNECTION IS NOT TO BE TRANSFERRED MAY BE PLUGGED AT THE TIME THE RELOCATED WATER INSTALLATION.

PAYMENT

THE WORK INCLUDED IN THIS ITEM SHALL BE PAID FOR AT THE UNIT PRICE BID FOR EACH "ITEM SPECIAL - PLUG EXISTING WATER SERVICE/FIRE LINE/COMBINATION CONNECTION", CLASSIFIED AS TO SIZE. THE PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR PERFORMING ALL EXCAVATION, BACKFILLING, AND THE FURNISHING OF ALL MATERIALS, LABOR, TOOLS, AND ALL EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN PLACE AS SHOWN. SEEDING AND SODDING, REPAVING (BOTH TEMPORARY AND PERMANENT), SIDEWALK REPLACEMENT AND OTHER SITE RESTORATION SHALL BE INCLUDED IF NOT PAID FOR SEPARATELY UNDER OTHER ITEMS INDICATED IN THE PLANS. PAYMENT FOR REMOVAL OF EXISTING VALVE BOXES ON CONNECTIONS 1-1/2" AND LARGER WILL PAID FOR UNDER "ITEM SPECIAL - REMOVE EXISTING VALVE BOX" AND PAYMENT FOR REMOVAL OF EXISTING CURB VALVE BOXES UNDER "ITEM SPECIAL - REMOVE EXISTING CURB SHUT-OFF VALVE BOX."

ITEM SPECIAL-MAINTENANCE OF WATER SERVICE

(A) THE CONTRACTOR SHALL PROVIDE, INSTALL, MAINTAIN AND REMOVE ALL TEMPORARY WATER MAINS AND TEMPORARY SERVICE CONNECTIONS, INCLUDING NECESSARY VALVES AND TEMPORARY HYDRANTS FOR FIRE PROTECTION ON THE TEMPORARY WATER MAINS, TO ALL AFFECTED PREMISES WHERE THE RELOCATIONS OF THE EXISTING WATER MAIN AND CONSTRUCTION OF NEW SERVICE CONNECTIONS WILL RESULT IN THE INTERRUPTION OF SERVICE FOR PERIODS LONGER THAN FOUR (4) HOURS BETWEEN 6:00 A.M. AND MIDNIGHT. BETWEEN MIDNIGHT AND 6:00 A.M. SERVICES MAY BE INTERRUPTED FOR THE ENTIRE SIX (6) HOUR PERIOD. THE PROVIDING OF TEMPORARY WATER MAINS SHALL ALSO INCLUDE FLUSHING, TESTING, SAMPLING AND, IF REQUIRED, CHLORINATION; ALL AS SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.

(B) THE CONTRACTOR SHALL SUBMIT A PLAN FOR MAINTAINING WATER SERVICE IN CONFORMANCE WITH THE REQUIREMENTS HEREIN STIPULATED. THE PLAN SHALL ALSO SPECIFY ALL CONSTRUCTION METHODS AND MATERIALS UTILIZED AND MEET THE APPROVAL OF THE ENGINEER, LOCAL FIRE DEPARTMENT AND THE CLEVELAND WATER DEPARTMENT BEFORE THE CONTRACTOR BEGINS ANY OF THE WATERWORK. APPROVAL OF SUCH A PLAN FOR TEMPORARY WATER MAINS SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PROVIDING SUFFICIENT SUPPLY. THE CONTRACTOR SHALL AT HIS OWN EXPENSE INCREASE THE SIZES OF THE TEMPORARY WATER MAINS BEYOND THE SIZES INDICATED HEREIN IF THE SIZES AS NOTED IN THESE SPECIFICATIONS ARE FOUND TO BE INSUFFICIENT.

(C) TEMPORARY WATER MAINS SHALL BE PLACED ON ONE OR BOTH SIDES OF THE STREET. CONNECTIONS ARE PERMISSIBLE ONLY ON THE SIDE OF THE STREET ON WHICH THE PARTICULAR TEMPORARY MAIN IS LOCATED. THE TEMPORARY MAINS SHALL NOT OBSTRUCT ANY STREETS, SIDEWALKS OR DRIVEWAYS. TRENCHING OR RAMPING SHALL BE PERFORMED AS REQUIRED TO PROVIDE PROTECTION FOR THE TEMPORARY WATER MAINS AND TO PROVIDE FOR THE SAFE MOVEMENT OF VEHICULAR AND PEDESTRIAN TRAFFIC.

(D) SIZES FOR TEMPORARY WATER MAINS SHALL BE AS FOLLOWS:

1. WHERE IT IS NOT POSSIBLE TO HAVE BOTH RELOCATED/NEW AND EXISTING WATER MAINS SIMULTANEOUSLY IN SERVICE IN ORDER TO TRANSFER AND RECONNECT EXISTING SERVICE CONNECTIONS TO THE RELOCATED/NEW WATER MAIN, OR WHEN THE TIME REQUIRED TO PUT THE RELOCATED/NEW WATER MAIN, EXCLUDING SERVICE CONNECTIONS, INTO SERVICE EXCEEDS THE DURATIONS SPECIFIED IN PARAGRAPH "A", THE SIZES FOR TEMPORARY WATER MAINS SHALL BE AS FOLLOWS:

A. WHEN WITHIN THE LIMITS OF THE WATER MAIN RELOCATION NO SERVICE CONNECTIONS EXIST, OR SERVICE CONNECTIONS EXIST ON ONLY ONE SIDE OF THE STREET, THE TEMPORARY WATER MAIN SHALL NOT BE LESS THAN TWO (2) NOMINAL PIPE DIAMETERS SMALLER THAN EXISTING PIPE BUT IN NO CASE LESS THAN FOUR (4) INCHES IN DIAMETER AND SUCH TEMPORARY WATER MAIN SHALL BE PLACED ON ONLY ONE SIDE OF THE STREET. FOR EXAMPLE, IF EXISTING WATER MAIN IS TWELVE (12) INCH NOMINAL DIAMETER, TEMPORARY WATER MAIN SHALL NOT BE LESS THAN EIGHT (8) INCH NOMINAL DIAMETER.

B. WHEN WITHIN THE LIMITS OF THE WATER MAIN RELOCATION SERVICE CONNECTIONS EXIST ON BOTH SIDES OF THE STREET, THE TEMPORARY WATER MAINS SHALL BE NOT BE LESS THAN ONE (1) NOMINAL PIPE DIAMETER SMALLER THAN THE EXISTING PIPE BUT IN NO CASE LESS THAN SIX (6) INCHES IN DIAMETER AND SUCH TEMPORARY WATER MAINS SHALL BE PLACED ON BOTH SIDES OF THE STREET. FOR EXAMPLE, IF EXISTING WATER MAIN IS TWELVE (12) INCH NOMINAL DIAMETER, TEMPORARY WATER MAINS SHALL NOT BE LESS THAN TEN (10) INCH NOMINAL DIAMETER, ON EACH SIDE.

2. WHEN TEMPORARY WATERLINES AS DESCRIBED IN PARAGRAPH D-1 ARE NOT REQUIRED, BUT THE INTERRUPTION IN WATER SERVICE EXCEEDS THE DURATIONS SPECIFIED IN PARAGRAPH "A" BECAUSE OF THE TIME REQUIRED TO CONNECT NEW/RELOCATED WATER MAINS TO EXISTING MAINS AND/OR TO RE-CONNECT EXISTING SERVICE CONNECTIONS TO THE NEW/RELOCATED MAIN, THE SIZES FOR TEMPORARY WATER MAINS, ON ONE OR BOTH SIDES OF THE STREET, AS REQUIRED, SHALL NOT BE LESS THAN THAT INDICATED BELOW PROVIDED THAT THESE SIZES ARE APPROVED BY THE FIRE DEPARTMENT OF THE MUNICIPALITY IN WHICH THE WORK IS BEING PERFORMED.

A. FOR SERVICE CONNECTIONS THREE-QUARTER (3/4) INCH OR LESS IN DIAMETER THE TEMPORARY WATER MAINS SHALL BE A MINIMUM OF TWO (2) INCHES INSIDE DIAMETER PIPE AND FITTINGS.

B. FOR SERVICE CONNECTIONS LARGER THAN THREE-QUARTER (3/4) INCH IN DIAMETER THE TEMPORARY WATER MAIN SHALL BE A MINIMUM OF FOUR (4) INCHES INSIDE DIAMETER PIPE AND FITTINGS.

(E) THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REQUIRED REPAIRS TO, OR REPLACEMENT OF, DAMAGED TEMPORARY WATER MAINS AND APPURTENANCES. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING AND REPAIRING ANY DAMAGED PAVEMENT, SIDEWALKS, CURBS, TREELAWNS OR OTHER AREAS DISTURBED BY THE INSTALLATION; AND FOR MAINTENANCE OR REPAIR OF THE TEMPORARY WATER MAINS, TEMPORARY SERVICE CONNECTIONS AND APPURTENANCES THERETO. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR "ITEM SPECIAL-MAINTENANCE OF WATER SERVICE".

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

F:\JOBS\665\WP\665WGN13.DWG P.K. 3/22/07 PLOT 1:1

WATER WORK NOTES

(F) THE CONTRACTOR SHALL NOT PUT ANY TEMPORARY WATER MAINS INTO SERVICE UNTIL THE CITY OF CLEVELAND HAS PROVIDED WRITTEN CONFIRMATION THAT SUFFICIENT WATER VOLUMES AND PRESSURES ARE AVAILABLE TO SUPPLY THE TEMPORARY WATER MAINS AND APPURTENANCES. NO TEMPORARY WATER MAIN WILL BE ALLOWED TO BE PLACED IN SERVICE WITHOUT AN APPROVED PLAN AS INDICATED IN PARAGRAPH B.

(G) THE TEMPORARY WATER MAIN AND ALL APPURTENANCES SHALL BE FURNISHED, MAINTAINED AND REMOVED BY THE CONTRACTOR. THE TEMPORARY WATER MAIN PIPE AND APPURTENANCES FURNISHED SHALL BE CLEAN AND IN SUCH CONDITION THAT THEY MAY BE TESTED, FLUSHED, CHLORINATED AND PRODUCE SATISFACTORY WATER SAMPLES AS REQUIRED BY THE CITY. ANY NECESSARY CHLORINATION SHALL BE DONE BY THE CITY AS STIPULATED ELSEWHERE IN THESE SPECIFICATIONS, AND IF NOT INCLUDED AS PART OF AN O.D.O.T. FORCE ACCOUNT AGREEMENT, SHALL BE DONE AT THE CONTRACTOR'S EXPENSE. ALL CONNECTIONS TO THE TEMPORARY WATER MAIN SHALL BE MADE BY THE CONTRACTOR UNDER THE SUPERVISION OF THE CITY.

(H) THE CONTRACTOR SHALL PROVIDE TEMPORARY FOUR (4) INCH FIRE HYDRANTS ON THE TEMPORARY WATERLINE IN ACCORDANCE WITH THE DETAIL ON SHEET NO. 313. THE CONTRACTOR SHALL PROVIDE A SUFFICIENT NUMBER OF VALVES ON THE TEMPORARY WATER MAIN AS TO ALLOW PROPER SEQUENCING OF THE NEW/RELOCATED WATER MAIN WORK WITHOUT UNDUE DELAY. WATER TO THE TEMPORARY WATER MAIN WILL BE PROVIDED FROM THE EXISTING PERMANENT HYDRANTS THROUGH THE TEMPORARY HYDRANTS JUST BEYOND THE LIMITS OF THE SHUTDOWN AND/OR FROM ADJACENT WATER MAINS.

(I) THE CONTRACTOR SHALL MINIMALLY INSTALL TEMPORARY FOUR (4) INCH FIRE HYDRANTS AT EACH LOCATION WHERE A PERMANENT FIRE HYDRANT IS TAKEN OUT OF SERVICE OR USED TO SUPPLY A TEMPORARY WATER MAIN.

PAYMENT

PAYMENT FOR PROVIDING TEMPORARY WATER SERVICE SHALL BE MADE AT THE CONTRACT LUMP SUM PRICE BID FOR "ITEM SPECIAL– MAINTENANCE OF WATER SERVICE" WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR EQUIPMENT AND MATERIALS NECESSARY TO PERFORM THE WORK TO THE SATISFACTION OF THE ENGINEER AND THE CITY.

THE DIVISION OF WATER WILL REQUIRE THAT THE CONTRACTOR PAY ALL DIVISION OF LABOR CHARGES FOR "FLUSHING AND SAMPLING" OF TEMPORARY WATER MAINS IN ACCORDANCE WITH THE FEE SCHEDULE INDICATED IN THE GENERAL NOTES "DIVISION OF WATER CHARGES." PAYMENT FOR DIVISION OF WATER LABOR SHALL BE MADE TO THE PERMITS AND SALES SECTION PRIOR TO ANY WATER WORK BEING PERFORMED.

ITEM SPECIAL – FURNISHING AND SETTING 6" HYDRANT COMPLETE

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL CITY OF CLEVELAND STANDARD HYDRANTS, HYDRANT BRANCH DUCTILE IRON PIPE AND RETAINED MECHANICAL JOINT FITTINGS; TAPPING VALVES; VALVE BOXES AND COVERS, LABOR, TOOLS AND EQUIPMENT FOR AND SHALL PROPERLY INSTALL AT THE LOCATION(S) SHOWN ON THE CONTRACT DRAWINGS, 6" HYDRANT ASSEMBLY COMPLETE.

IN GENERAL, THIS WORK SHALL INCLUDE THE FURNISHING, SETTING, TESTING, PAINTING, THE EXCAVATION, SHEETING, SHORING, BACKFILLING, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS, AND APP– LIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN. SETTING OF THE HYDRANT SHALL BE AS SPECIFIED IN THE NOTE "ITEM SPECIAL – HYDRANT ADJUSTED TO GRADE".

HYDRANTS

THE 6" HYDRANT SHALL CONFORM WITH THE DIVISION OF WATER'S SPECI– FICATIONS AND APPROVED HYDRANT DRAWINGS ON FILE WITH THE DIVISION OF WATER AT THE PUBLIC UTILITIES BUILDING, 1201 LAKESIDE AVENUE, CLEVELAND, OHIO 44114.

SETTING

(A) GENERAL LOCATION:

HYDRANTS SHALL BE LOCATED A MINIMUM OF TEN (10) FEET AWAY FROM SANITARY SEWERS AND FIVE (5) FEET AWAY FROM STORM SEWERS AND IN A MANNER TO PROVIDE COMPLETE ACCESSIBILITY, AND IN SUCH A MANNER THAT THE POSSIBILITY OF DAMAGES FROM VEHICLES OR INJURY TO PEDESTRIANS WILL BE MINIMIZED. UNLESS OTHERWISE DIRECTED, THE SETTING OF ANY HYDRANT SHALL CONFORM TO THE FOLLOWING:

(B) LOCATION REGARDING CURB LINES:
WHEN PLACED BEHIND THE CURB, THE HYDRANT BARREL SHALL BE SET SO THAT THE CENTER OF THE BARREL WILL BE NO LESS THAN THREE (3) FEET FROM THE GUTTER FACE OF THE CURB, OR DEVIATE FROM SUCH LOCATION OR DEVIATE FROM THE LOCATION INDICATED ON THE CONTRACT DRAWINGS, EXCEPT BY CONSENT OF THE ENGINEER.

(C) LOCATION REGARDING SIDEWALKS:
WHEN SET IN THE LAWN SPACE BETWEEN THE CURB AND SIDEWALK, OR BETWEEN THE SIDEWALK AND THE PROPERTY LINE, NO PORTION OF THE NOZZLE OR HYDRANT CAP SHALL BE WITHIN SIX (6) OF THE SIDEWALK.

(D) POSITION OF NOZZLES:
THE HYDRANT SHALL STAND PLUMB, WITH THE NOZZLE POINTING TOWARD THE CURB AND AT AN ANGLE OF NINETY DEGREES THEREFROM. WHERE HYDRANT BRANCH PIPING IS PARALLEL WITH, OR NOT AT RIGHT ANGLES

TO THE CURB, THE CONTRACTOR SHALL RELEASE THE SWIVEL HEAD BOLTS AND ADJUST HYDRANT NOZZLES TO FACE THE CURB AT THE PROPER ANGLE. HYDRANT WITHOUT SWIVEL HEADS WILL BE ADJUSTED BY THE CITY WHERE NECESSARY TO CORRECT OF NOZZLE FACING CURBING. HEIGHT OF HYDRANT SHALL CONFORM TO THE ESTABLISHED GRADE WITH TOPS OF THE FROST CASING AT LEAST FOUR (4) INCHES ABOVE GRADE.

(E) CONNECTION TO MAIN:
THE HYDRANT SHALL BE CONNECTED TO THE DISTRIBUTION WATER MAIN WITH A DUCTILE IRON PIPE BRANCH CONTROLLED BY AN INDEPENDENT SIX (6) INCH CITY OF CLEVELAND, DIVISION OF WATER, STANDARD GATE VALVE WITH VALVE BOX COMPLETE. THE BRANCH PIPING SHALL BE SIX (6) INCH AND SHALL INCLUDE ALL NECESSARY DUCTILE IRON CEMENT LINED RETAINED MECHANICAL JOINT FITTINGS AND/OR OFFSETS REQUIRED TO BRING THE HYDRANT TO THE PROPER GRADE. THE BRANCH VALVE WITH THE VALVE BOX COMPLETE SHALL BE INSTALLED OUT OF THE WATER MAIN RETAINED MECHANICAL JOINT TEE (ALL BELL) OR SWIVEL TEE AT A DISTANCE NOT TO EXCEED THREE (3) FEET.

WHERE DISTANCE FORM BRANCH VALVE TO HYDRANT SHOE EXCEEDS ONE (1) FULL LENGTH OF DUCTILE IRON PIPE ALL PIPE JOINTS AND FITTINGS JOINTS SHALL BE RESTRAINED. WHERE HYDRANT BRANCH MUST BE HORIZONTALLY OFFSET WITH A NINETY (90) DEGREE BEND THE DISTANCE FROM THE BEND TO THE HYDRANT SHOE SHALL NOT EXCEED ONE (1) FULL LENGTH OF DUCTILE IRON PIPE.

(F) DRAINAGE OF HYDRANT:
DRAINAGE SHALL BE PROVIDED AT THE BASE OF THE HYDRANT BY FILLING AROUND THE ELBOW WITH COARSE GRAVEL OR CRUSHED STONE TO AT LEAST SIX (6) INCHES ABOVE THE WASTE OPENING. WHEREVER THE HYDRANT IS SET IN ROCK, CLAY OR OTHER IMPERVIOUS SOIL, THE TRENCH SHALL BE WIDENED AND DEEPENED ON EACH SIDE OF THE HYDRANT BASE, WHICH SPACE SHALL BE FILLED COMPACTLY WITH COARSE GRAVEL, CRUSHED STONE, OR BROKEN STONE AND MIXED WITH COARSE SAND OF SUFFICIENT QUANTITY TO ABSORB ALL WATER TO BE DRAINED FROM THE HYDRANT WHEN BRANCH VALVE IS CLOSED.

(G) ANCHORAGE FOR HYDRANT:
THE HYDRANT SHALL BE SET ON A STONE SLAB OR SIMILAR FOUNDATION AND THE BASE OF THE HYDRANT SHALL BE BRACED AGAINST UNEXCAVATED EARTH TO THE END OF THE TRENCH WITH CONCRETE BACKING AND IT SHALL BE TIED TI THE PIPE WITH SUITABLE RODS, CLAMPS OR OTHER APPROVED RESTRAINT AS APPROVED OR DIRECTED BY THE ENGINEER.

(H) CLEANING:
THE INTERIOR OF THE HYDRANT SHALL BE THOROUGHLY CLEANED OF ALL DIRT AND FOREIGN MATTER BEFORE SETTING.

PAYMENT

THE UNIT PRICE STIPULATED TO BE PAID FOR EACH ITEM SPECIAL – "FURNISHING AND SETTING 6" HYDRANT COMPLETE" SHALL INCLUDE FURNISHING HYDRANT, HYDRANT BRANCH PIPE AND FITTINGS, 6" TAPPING SLEEVE AND VALVE WITH VALVE BOX COMPLETE. OR 6" BRANCH TEE WITH 6" GATE VALVE AND VALVE BOX COMPLETE, SETTING, TESTING, PAINTING, EXCAVATING, SHEETING AND SHORING, BACKFILLING, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

ITEM SPECIAL –INSTALL METER SETTING, COMPLETE

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL THE MATERIAL AND SHALL ARRANGE FOR THE CITY TO INSTALL THE METER SETTING ASSEMBLY IN THE THE NEW VAULTS AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.

INSTALLATION OF ALL NECESSARY PIPE, FITTINGS, VALVES, ETC, AS SHOWN IN THE DETAILS EXCEPT FOR THE METER SETTING ASSEMBLY SHALL BE PERFORMED BY THE CONTRACTOR.

MATERIALS REQUIRED FOR EACH SIZE AND TYPE OF INSTALLATION HAVE HAVE BEEN TABULATED IN THESE NOTES – SEE "MATERIALS REQUIRED FOR INSTALLATION". THE NECESSARY DIMENSIONS AND OTHER DETAILS ARE INCLUDED IN THE DETAILED PLAN SECTION. THE CONTRACTOR SHALL

PROVIDE THE NECESSARY LABOR AND EQUIPMENT FOR HANDLING THE MATERIAL AND ASSISTING THE CITY IN THE METER SETTING INSTALLATION.

REMOVAL OF THE METER AND METER SETTING FROM THE EXISTING VAULT FOR PICK–UP BY CITY FORCES WILL ALSO BE INCLUDED IN THIS ITEM OF WORK.

MEASURMENT

THE METER SETTING TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF EACH UNIT LISTED AND ESTIMATED SEPARATELY BY SIZE, COMPLETED AND ACCEPTED.

PAYMENT

PAYMENT FOR THIS WORK, PERFORMED JOINTLY BY THE CITY AND THE CONTRACTOR, WILL BE AT THE CONTRACT PRICE BID FOR EACH ITEM SPECIAL – "INSTALL METER SETTING, COMPLETE", CLASSIFIED BY PIPE SIZE. THIS PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR PERFORMING ALL THE REQUIREMENTS OF THIS ITEM INCLUDING THE REMOVAL OF EXISTING METER AND METER SETTING, FURNISHING ALL NECESSARY MATERIALS (INCLUDING PIPE, FITTINGS, AND VALVES), LABOR TOOLS EQUIPMENT, SUPPLIES AND INCIDENTALS. THE LABOR TOOLS, EQUIPMENT AND INCIDENTALS FURNISHED BY THE CITY OF CLEVELAND, DIVISION OF WATER WILL BE AT NO EXPENSE TO THE CONTRACTOR.

METER SETTING INSTALLATION REQUIREMENTS

GENERAL

THE INFORMATION PROVIDED HEREIN IS INTENDED TO PROVIDE A GUIDELINE OF THE REQUIREMENTS FOR WATER WORK REGARDING METERS, METER SETTINGS AND METER VAULTS REQUIRED TO COMPLETE THE WORK AND OF DIVISION OF WATER CHARGES LABOR CHARGES TO BE ASSESSED THE CONTRACTOR FOR PERFORMANCES OF CERTAIN CWD LABOR. WHERE SO NOTED ON THE PLANS OR WHERE ORDERED THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW AND UNUSED MATERIALS REQUIRED FOR THE PROPER COMPLETION OF THE WORK. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS WITH THE DIVISION OF WATER AND SHALL MAKE ALL PAYMENT TO THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER FOR ALL CWD LABOR INCURRED BY THE DIVISION OF WATER. DIVISION OF WATER LABOR CHARGES ARE SUBJECT TO CHANGE; THEREFORE, THE CONTRACTOR SHALL VERIFY ALL DIVISION OF WATER LABOR CHARGES WITH THE PERMITS AND SALES SECTION PRIOR TO MAKING ANY PAYMENT. ALL PAYMENT FOR DIVISION OF WATER LABOR SHALL BE MADE BEFORE ANY WATER WORK IS PERFORMED.

DEFINITIONS:

COPPER METER SETTER:	ALSO REFFERED TO AS A COPPER METER YOKE. IS USED TO CONNECT 1" (OR UNDER) METERS TO A WATER SERVICE CONNECTION. A COPPER METER SETTER WITH ALL REQUIRED PIPING AND FITTINGS AND A 1" (OR UNDER) METER INSTALLED COMPLETES A 1" (OR UNDER) METER SETTING.
BYPASS PIPING ASSEMBLY:	ALL MATERIALS, PIPING, VALVES AND FITTINGS, BUT WITHOUT A METER, REQUIRED TO INSTALL A METER SETTING ON A 1–1/2' THRU 8" WATER SERVICE CONNECTION.
METER SETTING:	ALL MATERIALS, PIPING, VALVES, FITTINGS AND METER REQUIRED TO INSTALL A COMPLETE METER SETTING ON A 1–1/2" THRU 8" WATER SERVICE CONNECTION.

PROCEDURES FOR: 1–1/2" OR 2" METER SETTING (BYPASS PIPING ASSEMBLY) INSTALLATION

WHERE NEW METER VAULT IS TO BE INSTALLED OR WHERE EXISTING METER VAULT IS TO BE RELOCATED THE FOLLOWING WATER WORK IS REQUIRED

INSTALL 1–1/2" OR 2" METER VAULT COMPLETE

CONTRACTOR SHALL INSTALL NEW METER VAULT COMPLETE INCLUDING NEW MANHOLE FRAME AND COVER COMPLETE OF THE SIZE(S) NOTED AND AT THE LOCATIONS SHOWN ON THE PLANS OR WHERE ORDERED.

ASSEMBLE 1–1/2" OR 2" BYPASS PIPING ASSEMBLY (WITHOUT METER)

CONTRACTOR SHALL FURNISH AND DELIVER ALL NEW MATERIALS TO THE CITY (HARVARD YARDS) COMPLETE REQUIRED FOR BYPASS PIPING ASSEMBLY (LESS METER) FOR CWD TO ASSEMBLE METER SETTING WITHOUT THE METER. CONTRACTOR SHALL THEN PICK UP THE BYPASS PIPING ASSEMBLY AT THE HARVARD YARDS AND INSTALL THE METER SETTING (WITH SPACER IN LIEU OF METER) IN NEW VAULT OR NEW RELOCATED VAULT. ALL 1–1/2" AND 2" BYPASS PIPING ASSEMBLIES WILL BE PROVIDED TO THE CONTRACTOR (WITH SPACERS IN LIEU OF METERS). SEE "SPECIAL NOTE". THE DIVISION OF WATER WILL ASSESS THE CONTRACTOR A CWD LABOR CHARGE FOR EACH 1–1/2" AND 2" BYPASS PIPING ASSEMBLY.

INSTALL 1–1/2" OR 2" METER

AFTER THE BYPASS PIPING ASSEMBLY IS INSTALLED BY THE CONTRACTOR CWD WILL THEN REMOVE THE SPACER AND INSTALL A NEW METER IN THE NEW METER VAULT OR NEW RELOCATED METER VAULT. THE DIVISION OF WATER WILL ASSESS THE CONTRACTOR A CWD LABOR CHARGE FOR EACH TO INSTALL A 1–1/2" OR 2" METER.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

92
146

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WATER WORK NOTES

REMOVE EXISTING 1-1/2" OR 2" METER SETTING COMPLETE

ALL EXISTING 1-1/2" AND 2" METER SETTINGS WILL REMAIN IN THE EXISTING METER VAULTS. WHEN INSTALLING NEW METERS CWD WILL RECORD THE METER READING AND FORWARD THE READING TO CUSTOMER ACCOUNTS SERVICE. CWD WILL THEN REMOVE EXISTING METER FROM THE EXISTING METER VAULT. EXISTING METER IS PROPERTY OF CWD. EXISTING BYPASS PIPING BECOMES PROPERTY OF THE CONTRACTOR. THE DIVISION OF WATER WILL ASSESS THE CONTRACTOR A CWD LABOR CHARGE FOR EACH 1-1/2" OR 2" METER REMOVED BY CWD.

REMOVE EXISTING 1-1/2" OR 2" METER VAULT AND BACKFILL

EXISTING METER VAULT TO BE REMOVED TO ONE (1) FOOT BELOW GRADE AND BACKFILLED BY THE CONTRACTOR. EXISTING METER MANHOLE RING AND COVER TO BE DELIVERED TO THE CITY (HARVARD YARDS).

SPECIAL NOTE

ALL METERS 1-1/2" AND 2" WILL ONLY BE GIVEN OUT IN QUANTITIES OF ONE (1) OR TWO (2). ONLY WHEN A CWD INSPECTOR INDICATES THAT MORE WATER SERVICE CONNECTIONS ARE READY FOR SETTING WILL ANY ADDITIONAL METER SETTINGS (BYPASS PIPING ASSEMBLIES) BE RELEASED. NOTE THAT SPACERS IN 1-1/2" AND 2" BYPASS PIPING ASSEMBLIES WILL BE INSTALLED IN PLACE OF THE METER. WITH LIMITING THE NUMBER OF METER INSTALLATIONS TO ONE (1) OR TWO (2) AND HAVING METERS SET BY THE DIVISION OF WATER, THE CORRECT METER WILL BE ASSIGNED TO THE CORRECT LOCATION.

ITEM 638 - VALVE BOX ADJUSTED TO GRADE
ITEM 604 - MANHOLE ADJUSTED TO GRADE, AS PER PLAN

WORK INCLUDED

WHERE INDICATED ON THE CONTRACT DRAWINGS, OR WHERE ORDERED, THE CONTRACTOR SHALL RESET EXISTING VALVE BOX; EXISTING SERVICE BOX; OR EXISTING VAULT/MANHOLE FRAME AND COVER TO ESTABLISHED GRADE BY RAISING OR LOWERING THE EXISTING CASTINGS OR BY EITHER ADDING OR DELETING OR CUTTING THE APPROPRIATE VALVE BOX STEM SECTIONS OR BY ADDING OR REMOVING BRICK RISERS. IN RAISING OF THE CASTINGS, NO INSERTS WILL BE PERMITTED. ANY VALVE BOXES, SERVICE BOXES AND/OR VAULT/MANHOLE FRAME AND COVER FOUND TO BE DAMAGED OR UNSUITABLE FOR REUSE SHALL BE REPLACED BY THE CONTRACTOR. CASTINGS REPLACED SHALL CONFORN WITH "ITEM SPECIAL - MISCELLANEOUS METAL WORK" THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY AT THE LOCATIONS SHOWN ON THE CONTRACT DRAWINGS OR WHERE ORDERED INCLUDING PAVEMENT CUTTING, PAVEMENT REMOVAL, EXCAVATION, BACKFILLING, SEEDING AND SODDING AND REPAVING, ALL AS REQUIRED OR AS ORDERED TO COMPLETE THE WORK.

PAYMENT

PAYMENT FOR WORK UNDER THIS ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR EACH: "ITEM 638 - VALVE BOX ADJUSTED TO GRADE"; "ITEM 638 - SERVICE BOX ADJUSTED TO GRADE"; OR "ITEM 604 - MANHOLE ADJUSTED TO GRADE, AS PER PLAN" AND SHALL INCLUDE ALL PAVEMENT CUTTING, PAVEMENT REMOVAL AND ALL EXCAVATION AND BACKFILLING, AND THE FURNISHING OF ALL LABOR, TOOLS AND ALL EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK AS SHOWN OR AS ORDERED. SEEDING AND SODDING, REPAVING (BOTH TEMPORARY AND PERMANENT), SIDEWALK REPLACEMENT AND OTHER SITE RESTORATION SHALL BE INCLUDED IF NOT PAID FOR SEPARATELY UNDER OTHER ITEMS INDICATED IN THE PLANS. PAYMENT FOR REPLACEMENT OF DAMAGED OR UNSUITABLE CASTINGS WILL BE MADE UNDER "ITEM SPECIAL - MISCELLANEOUS METAL".

PAVEMENT SAW CUTS

WHERE "VERMEER" TYPE SAW OR ANY OTHER TYPE OF MACHINERY OR MEANS IS USED TO CUT THE EXISTING PAVEMENT IN ADVANCE OF THE PAVEMENT REMOVAL, THE CONTRACTOR SHALL IMMEDIATELY FILL THE SAW-CUT GAP WITH ASPHALT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR, AND AT HIS EXPENSE, MAINTAIN, THE SAW-CUT GAPS AND SHALL REPAIR AND/OR REPLACE ASPHALT AS NECESSARY.

PAVEMENT DAMAGE - CONTRACTOR'S RESPONSIBILITY

THE CONTRACTOR SHALL BE RESPONSIBLE FOR, AND AT HIS EXPENSE, MAINTAIN, REPAIR AND/OR REPLACE ANY PAVEMENT, ROADWAYS, DRIVEWAYS, BERMS, CURBS, SIDEWALKS AND TREELAWNS OR OTHER AREAS WITHIN THE LIMITS OF THIS PROJECT, THAT MAY BE DAMAGED

BY HIM OR THOSE IN HIS EMPLOY DUE TO MANUVERING OF CONSTRUCTION EQUIPMENT, OR DAMAGED BY VEHICULAR TRAFFIC REROUTED DUE TO CONSTRUCTION AND TRAFFIC MAINTENANCE.

THE CONTRACTOR SHALL MAINTAIN, REPAIR AND/OR REPLACE ALL DAMAGED OR INJURED PAVEMENT, ROADWAYS, DRIVEWAYS, BERMS, CURBS, SIDEWALKS AND TREELAWNS, BOTH TEMPORARY AND PERMANENT, IN ACCORDANCE WITH THESE SPECIFICATIONS, CONTRACT DRAWINGS OR APPLICABLE CONSTRUCTION AND MATERIAL SPECIFICATIONS OF THE CUYAHOGA COUNTY ENGINEER OR STATE OF OHIO DEPARTMENT OF TRANSPORTATION (O.D.O.T.).

REMOVED ITEMS

ALL MATERIALS CONSISTING OF PIPE, FITTINGS, VALVES, CASTINGS AND OTHER WATER MAIN STRUCTURES, UNLESS SPECIFICALLY INDICATED OTHERWISE HEREIN, WHICH ARE DESIGNATED FOR REMOVAL BY THE CONTRACTOR SHALL BECOME PROPERTY OF THE CONTRACTOR AND BE REMOVED AND DISPOSED OF BY HIM.

ITEM SPECIAL - EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A

WORK INCLUDED - EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A

THE WORK INCLUDED UNDER ITEM SPECIAL- EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A, SHALL CONSIST OF EXTENDING AND ADJUSTING NEW 6" HYDRANT TO GRADE FROM THE EXISTING BRANCH VALVE TO THE NEW HYDRANT LOCATION AS DETAILED ON SHEETS NO. 24-29 AT THE LOCATION(S) SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. ITEM SPECIAL- EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A, SHALL INCLUDE ALL EXCAVATION, CUTTING EXISTING PIPE, REMOVING AND DISPOSING OF EXISTING HYDRANT AND RESETTING NEW 6" HYDRANT TO GRADE AT NEW LOCATION; RESETTING NEW VALVE BOX TO GRADE; FURNISHING AND EXTENDING OF BRANCH PIPE WITH NEW 6" DUCTILE IRON CEMENT LINED PIPE WITH CEMENT LINED RETAINED MECHANICAL JOINT FITTINGS; CONNECTING EXISTING HYDRANT TO EXTENDED BRANCH PIPING WITH RETAINED MECHANICAL JOINT SOLID SLEEVES OR COMPRESSION COUPLINGS (WITH STOPS REMOVED); AND THE TESTING, PAINTING, EXCAVATION, SHEETING, SHORING, BACKFILLING, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS, AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN. WHERE CUTTING OF EXISTING BRANCH PIPE IS REQUIRED SUCH CUTS SHALL BE NOT LESS THAN EIGHTEEN (18) INCHES FROM THE FACE OF THE EXISTING LEAD JOINT BRANCH GATE VALVE BELL.

MATERIALS

ALL OTHER MATERIALS AND APPURTENANCES NECESSARY FOR THE PROPER COMPLETION OF THIS ITEM SHALL BE OF THE KIND AND GRADE CALLED FOR ELSEWHERE IN THESE SPECIFICATIONS FOR THE PARTICULAR KIND OF CONSTRUCTION IN WHICH THE MATERIALS ARE USED.

HYDRANTS

THE NEW 6" HYDRANTS SHALL CONFORM WITH THE DIVISION OF WATER'S SPECIFICATIONS AND APPROVED HYDRANT DRAWINGS ON FILE WITH THE DIVISION OF WATER AT THE PUBLIC UTILITIES BUILDING, 1201 LAKESIDE AVENUE, CLEVELAND, OHIO 44114.

SETTING

(A) GENERAL LOCATION:

HYDRANTS SHALL BE LOCATED A MINIMUM OF TEN (10) FEET AWAY FROM SANITARY SEWERS AND FIVE (5) FEET AWAY FROM STORM SEWERS AND IN A MANNER TO PROVIDE COMPLETE ACCESSIBILITY, AND IN SUCH A MANNER THAT THE POSSIBILITY OF DAMAGES FROM VEHICLES OR INJURY TO PEDESTRIANS WILL BE MINIMIZED. UNLESS OTHERWISE DIRECTED, THE SETTING OF ANY HYDRANT SHALL CONFORM TO THE FOLLOWING:

(B) LOCATION REGARDING CURB LINES:

WHEN PLACED BEHIND THE CURB, THE HYDRANT BARREL SHALL BE SET SO THAT THE CENTER OF THE BARREL WILL BE NO LESS THAN THREE (3) FEET FROM THE GUTTER FACE OF THE CURB, OR DEVIATE FROM SUCH LOCATION OR DEVIATE FROM THE LOCATION INDICATED ON THE CONTRACT DRAWINGS, EXCEPT BY CONSENT OF THE ENGINEER.

(C) LOCATION REGARDING SIDEWALKS:

WHEN SET IN THE LAWN SPACE BETWEEN THE CURB AND THE SIDEWALK, OR BETWEEN THE SIDEWALK AND THE PROPERTY LINE, NO PORTION OF THE NOZZLE OR HYDRANT CAP SHALL BE WITHIN SIX (6) INCHES OF THE SIDEWALK.

(D) POSITION OF NOZZLES:

THE HYDRANT SHALL STAND PLUMB, WITH THE NOZZLE POINTING TOWARD THE CURB AND AT AN ANGLE OF NINETY DEGREES THEREFROM. WHERE HYDRANT BRANCH PIPING IS PARALLEL WITH, OR NOT AT RIGHT ANGLES TO THE CURB, THE CONTRACTOR SHALL RELEASE THE SWIVEL HEAD BOLTS AND ADJUST HYDRANT NOZZLES TO FACE THE CURB AT THE PROPER ANGLE. HYDRANT WITHOUT SWIVEL HEADS WILL BE ADJUSTED BY THE CITY WHERE NECESSARY TO CORRECT OF NOZZLE FACING CURBING. HEIGHT OF HYDRANT SHALL CONFORM TO THE ESTABLISHED GRADE WITH TOPS OF FROST CASING AT LEAST FOUR (4) INCHES ABOVE GRADE.

(E) CONNECTION TO MAIN:

WHERE DISTANCE FROM BRANCH VALVE TO HYDRANT SHOE EXCEEDS ONE (1) FULL LENGTH OF DUCTILE IRON PIPE ALL PIPE JOINTS AND FITTINGS JOINTS SHALL BE RESTRAINED. WHERE HYDRANT BRANCH MUST BE HORIZONTALLY OFFSET WITH A NINETY (90) DEGREE BEND THE DISTANCE FROM THE BEND TO THE HYDRANT SHOE SHALL NOT EXCEED ONE (1) FULL LENGTH OF DUCTILE IRON PIPE.

(F) DRAINAGE OF HYDRANT:

DRAINAGE SHALL BE PROVIDE AT THE BASE OF THE HYDRANT BY FILLING AROUND THE ELBOW WITH COARSE GRAVEL OR CRUSHED STONE TO AT LEAST SIX (6) INCHES ABOVE THE WASTE OPENING. WHEREVER THE HYDRANT IS SET IN ROCK, CLAY, OR OTHER IMPERVIOUS SOIL, THE TRENCH SHALL BE WIDENED AND DEEPENED ON EACH SIDE OF THE HYDRANT BASE, WHICH SPACE SHALL BE FILLED COMPACTLY WITH COARSE GRAVEL, CRUSHED STONE, OR BROKEN STONE AND MIXED WITH COARSE SAND OF SUFFICIENT QUANTITY TO ABSORB ALL WATER TO BE DRAINED FROM THE HYDRANT WHEN BRANCH VALVE IS CLOSED.

(G) ANCHORAGE FOR HYDRANT:

THE HYDRANT SHALL BE SET ON A STONE SLAB OR SIMILAR FOUNDATION AND THE BASE OF THE HYDRANT SHALL BE WELL BRACED AGAINST UNEXCAVATED EARTH TO THE END OF THE TRENCH WITH CONCRETE BACKING, AND IT SHALL BE TIED TO THE PIPE WITH SUITABLE RODS, CLAMPS, OR OTHER APPROVED RESTRAINT AS APPROVED OR DIRECTED BY THE ENGINEER.

(H) CLEANING:

THE INTERIOR OF THE HYDRANT SHALL BE THOROUGHLY CLEANED OF ALL DIRT AND FOREIGN MATTER BEFORE SETTING.

PAYMENT

THE UNIT PRICE STIPULATED FOR EACH:

"ITEM SPECIAL - EXTEND AND ADJUST HYDRANT TO GRADE, TYPE A"

SHALL INCLUDE ALL THE FURNISHING AND INSTALLATION OF ALL NEW 6" HYDRANTS, PIPE, FITTINGS, APPURTENANCES, AND VALVE BOXES COMPLETE; ALL PIPE CUTTING; REMOVING AND DISPOSING OF EXISTING HYDRANT, EXTENDING AND/OR REPLACING BRANCH PIPING, RESETTING NEW VALVE BOX, AND THE TESTING, PAINTING, EXCAVATION, SHEETING, SHORING, BACKFILLING, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS, AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

93
146

PJK 3/22/07 PLOT 1:1

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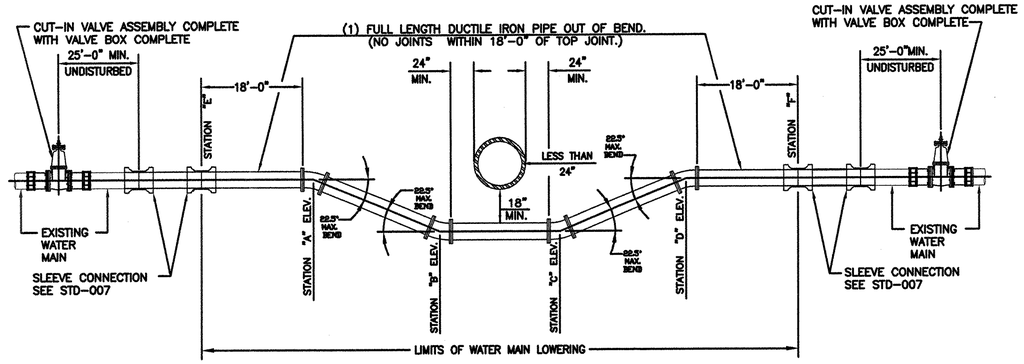


NOTE:

1) WATER MAIN SHALL BE DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PUSH-ON JOINT PIPE WITH RETAINED MECHANICAL JOINT DUCTILE IRON CLASS 350, CEMENT LINED OR FUSION BONDED EPOXY COATED RETAINED MECHANICAL JOINT FITTINGS.

2) WHERE DEPTH OF LOWERING REQUIRES AN INTERMEDIATE JOINT BETWEEN STATIONS 'A' & 'B' AND/OR 'C' & 'D' THE ENTIRE LOWERING SHALL BE MADE WITH DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PIPE AND DUCTILE IRON CLASS 350, CEMENT LINED FITTINGS ALL HAVING BOLTLESS RESTRAINED PUSH-ON JOINTS, TYPE II.

3) WHERE LENGTH OF LOWERING UNDER OBSTRUCTION(S) REQUIRES AN INTERMEDIATE JOINT ONLY BETWEEN STATIONS 'B' & 'C', THAT INTERMEDIATE JOINT(S) SHALL BE MADE WITH A BOLTLESS RESTRAINED PUSH-ON JOINT, TYPE II.

4) WHERE EXISTING WATER MAIN IS SIX (6)-INCHES IN DIAMETER THE PIPE LOWERING SHALL BE MADE WITH PIPE AND FITTINGS NO LESS THAN EIGHT (8)-INCH IN DIAMETER WITH REDUCERS INSTALLED AT STATIONS 'E' AND 'F'. THE REDUCERS SHALL BE RETAINED MECHANICAL JOINT WITH SMALL END OF REDUCER PLAIN END FOR CONNECTION WITH SLEEVES OR COMPRESSION COUPLINGS.

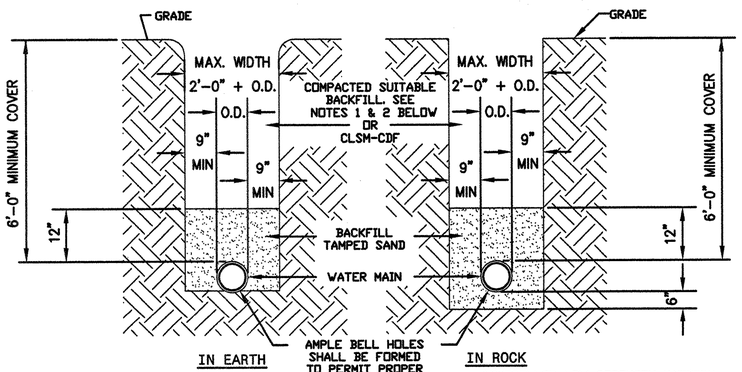
5) ALL EXISTING WATER SERVICE CONNECTIONS BETWEEN THE CUT-IN-VALVE ASSEMBLIES SHALL BE MAINTAINED BY 'TEMPORARY SERVICE CONNECTIONS' PROVIDED AND MAINTAINED BY THE CONTRACTOR.

6) EXISTING WATER SERVICE CONNECTIONS NEEDED TO BE RETAPPED AND RECONNECTED WILL ONLY BE PERMITTED BETWEEN STATIONS 'A' AND 'E' AND STATIONS 'D' AND 'F'. NO RETAPPING OF SERVICE CONNECTIONS WILL BE ALLOWED BETWEEN STATIONS 'A' AND 'D'.

DETAIL FOR WATER MAIN LOWERING UNDER OBSTRUCTIONS LESS THAN 24" IN DIAMETER OR WIDTH FOR "EXISTING CONSTRUCTION"

- NOT TO SCALE -

WATER MAIN LOWERING LOCATION	WATER MAIN SIZE	STATION A ELEVATION	STATION B ELEVATION	STATION C ELEVATION	STATION D ELEVATION	STATION E	STATION F
STATION 51+12 TO STATION 51+98	24"	51+41.76 774.28	51+50.46 770.67	51+59.46 770.67	51+68.55 774.52	51+22.00	51+88.00
STATION 51+23 TO STATION 51+97	12"	51+49.78 773.77	51+56.33 771.10	51+63.83 771.10	51+70.25 773.85	51+31.00	51+89.00
STATION 53+13 TO STATION 53+87	12"	53+39.76 774.73	53+46.21 772.05	53+53.71 772.05	53+60.52 774.85	53+21.00	53+79.00



WATER MAIN TRENCH DETAILS

- NOT TO SCALE -

* CONTROLLED LOW STRENGTH MATERIAL-CONTROLLED DENSITY FILL (CLSM-CDF) 'FLOWABLE FILL' IS REQUIRED WITHIN THE CITY OF CLEVELAND CORPORATION LIMITS AND PERMITTED IN ALL COMMUNITIES SERVICED BY CWD. CHECK LOCAL REQUIREMENTS.

NOTES:

1) PREMIUM BACKFILL REQUIRED UNDER EXISTING OR FUTURE PAVEMENTS, SIDEWALKS, AND/OR DRIVES OR WHEN REQUIRED BY LOCAL MUNICIPALITY.
2) PREMIUM BACKFILL SHALL BE LIMESTONE GRADED PER ODOT 304.02 OR ODOT 411. NO SLAG IS PERMITTED.*
3) CONTRACTOR SHALL USE SPECIAL CARE IN PLACING THE SAND BEDDING BACKFILL, SO AS TO AVOID SCRAPING OF THE EXTERIOR COATING, INJURING THE PIPE, DISTORTING OR MOVING THE PIPE WHEN COMPACTING THE SAME. THE SAND BEDDING BACKFILL SHALL BE TAMPED IN SIX (6) INCH LAYERS, SIMULTANEOUSLY ON EACH SIDE OF THE PIPE, AND THOROUGHLY COMPACTED SO AS TO PROVIDE A SOLID BACKING AGAINST THE EXTERNAL SURFACE OF THE PIPE.
4) MINIMUM COMPACTION FOR ALL SAND BEDDING BACKFILL, BACKFILL AND PREMIUM BACKFILL SHALL BE 95% STANDARD PROCTOR.
5) PAVEMENT, SIDEWALK OR DRIVES TO BE INSTALLED IN ACCORDANCE WITH LOCAL MUNICIPALITY'S SPECIFICATIONS.

1) PLAIN END x PLAIN END DUCTILE IRON PIPE AS SPECIFIED (CUT TO SUIT).

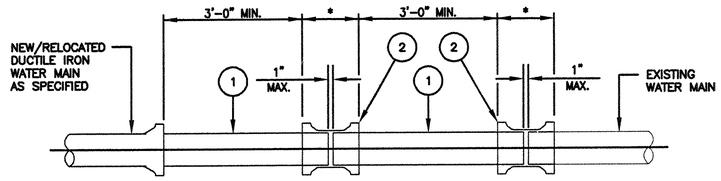
2) *CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

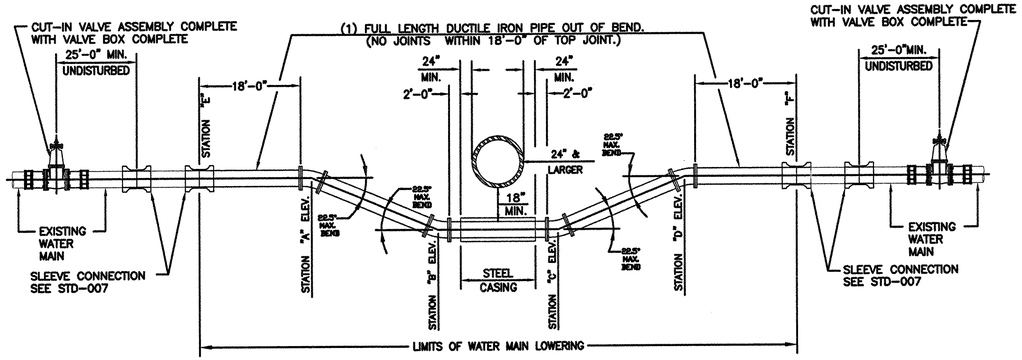
THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".



SLEEVE-IN INSTALLATION DETAIL

- NOT TO SCALE -



NOTE:

1) WATER MAIN SHALL BE DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PUSH-ON JOINT PIPE WITH RETAINED MECHANICAL JOINT DUCTILE IRON CLASS 350, CEMENT LINED OR FUSION BONDED EPOXY COATED RETAINED MECHANICAL JOINT FITTINGS.

2) WHERE DEPTH OF LOWERING REQUIRES AN INTERMEDIATE JOINT BETWEEN STATIONS "A" & "B" AND/OR "C" & "D" THE ENTIRE LOWERING SHALL BE MADE WITH DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PIPE AND DUCTILE IRON CLASS 350, CEMENT LINED FITTINGS ALL HAVING BOLTLESS RESTRAINED PUSH-ON JOINTS, TYPE II.

3) WHERE LENGTH OF LOWERING UNDER OBSTRUCTION(S) REQUIRES AN INTERMEDIATE JOINT ONLY BETWEEN STATIONS "B" & "C", THAT INTERMEDIATE JOINT(S) SHALL BE MADE WITH A BOLTLESS RESTRAINED PUSH-ON JOINT, TYPE II.

4) WHERE EXISTING WATER MAIN IS SIX (6)-INCHES IN DIAMETER THE PIPE LOWERING SHALL BE MADE WITH PIPE AND FITTINGS NO LESS THAN EIGHT (8)-INCH IN DIAMETER WITH REDUCERS INSTALLED AT STATIONS "E" AND "F". THE REDUCERS SHALL BE RETAINED MECHANICAL JOINT WITH SMALL END OF REDUCER PLAIN END FOR CONNECTION WITH SLEEVES OR COMPRESSION COUPLINGS.

5) ALL EXISTING WATER SERVICE CONNECTIONS BETWEEN THE CUT-IN-VALVE ASSEMBLIES SHALL BE MAINTAINED BY 'TEMPORARY SERVICE CONNECTIONS' PROVIDED AND MAINTAINED BY THE CONTRACTOR.

6) EXISTING WATER SERVICE CONNECTIONS NEEDED TO BE RETAPPED AND RECONNECTED WILL ONLY BE PERMITTED BETWEEN STATIONS "A" AND "E" AND STATIONS "D" AND "F". NO RETAPPING OF SERVICE CONNECTIONS WILL BE ALLOWED BETWEEN STATIONS "A" AND "D".

DETAIL FOR WATER MAIN LOWERING UNDER OBSTRUCTIONS 24" & LARGER IN DIAMETER OR WIDTH FOR "EXISTING CONSTRUCTION"

- NOT TO SCALE -

WATER MAIN LOWERING LOCATION	WATER MAIN SIZE	STATION A ELEVATION	STATION B ELEVATION	STATION C ELEVATION	STATION D ELEVATION	STATION E	STATION F
STATION 68+79 TO STATION 69+52	12"	68+97.15 767.07	69+07.96 762.59	69+22.04 762.59	69+33.74 767.43	68+78.52	69+52.36

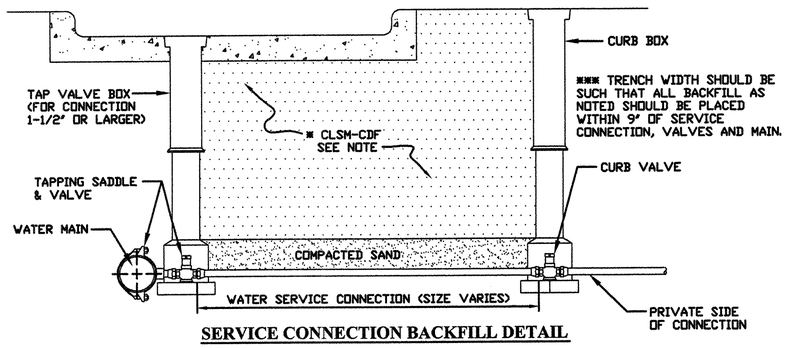
CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

** CLEVELAND REQUIRED MIX DESIGN -
CEMENT - 50 LBS. PER CUBIC YARD
SAND - 2850 LBS. PER CUBIC YARD
WATER - 50 GALLONS PER CUBIC YARD
RHEOCELL 30MB - 3 OZ. PER CUBIC YARD

* CONTROLLED LOW STRENGTH MATERIAL-
CONTROLLED DENSITY FILL (CLSM-CDF)
"FLOWABLE FILL" IS REQUIRED WITH THE
CITY OF CLEVELAND CORPORATION LIMITS
AND PERMITTED IN ALL COMMUNITIES
SERVIED BY CWD. CHECK LOCAL REQUIREMENTS.

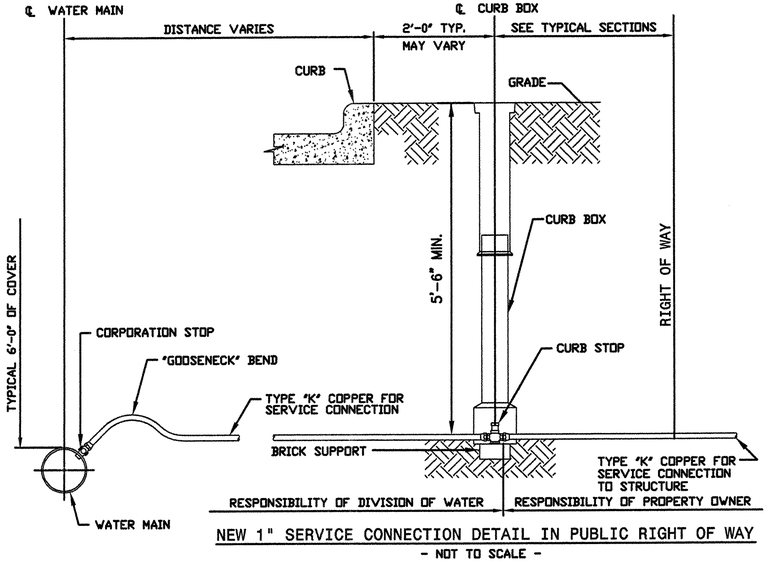


SERVICE CONNECTION BACKFILL DETAIL

- NOT TO SCALE -

NOTES:
1) CONTRACTOR SHALL USE SPECIAL CARE IN PLACING THE SAND BEDDING BACKFILL, SO AS TO AVOID SCRAPING OF THE EXTERIOR COATING, INJURING THE PIPE, DISTORTING OR MOVING THE PIPE WHEN COMPACTING THE SAME. THE SAND BEDDING BACKFILL SHALL BE TAMPED IN SIX (6) INCH LAYERS, SIMULTANEOUSLY ON EACH SIDE OF THE PIPE, AND THOROUGHLY COMPACTED SO AS TO PROVIDE A SOLID BACKING AGAINST THE EXTERNAL SURFACE OF THE PIPE.
2) MINIMUM COMPACTION FOR ALL SAND BEDDING BACKFILL, BACKFILL AND PREMIUM BACKFILL SHALL BE 95% STANDARD PROCTOR.

NOTE:
WHERE POSSIBLE DO NOT INSTALL CURB BOX IN PAVEMENT, SIDEWALKS, DRIVEWAYS, APRONS.



NEW 1" SERVICE CONNECTION DETAIL IN PUBLIC RIGHT OF WAY

- NOT TO SCALE -

*CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

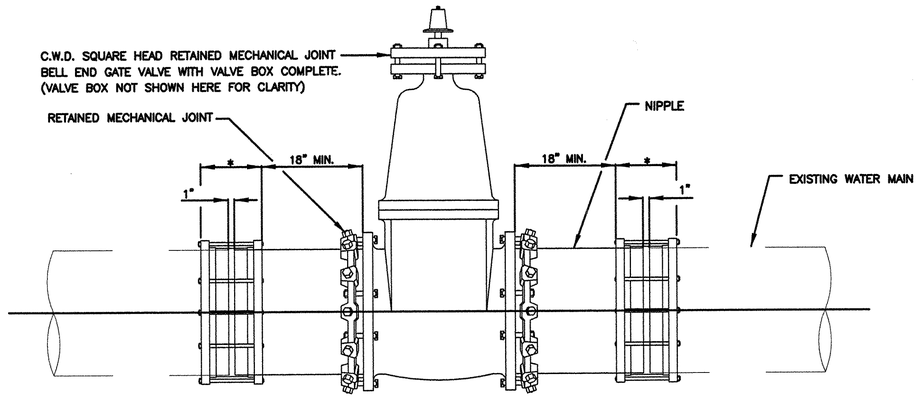
MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".

THE DIVISION OF WATER WILL DETERMINE THE FIELD LOCATION OF THE CUT-IN-VALVE ASSEMBLY. THE DIVISION OF WATER WILL ALSO SET THE TIME OF INSTALLATION OF THE CUT-IN-VALVE ASSEMBLY.

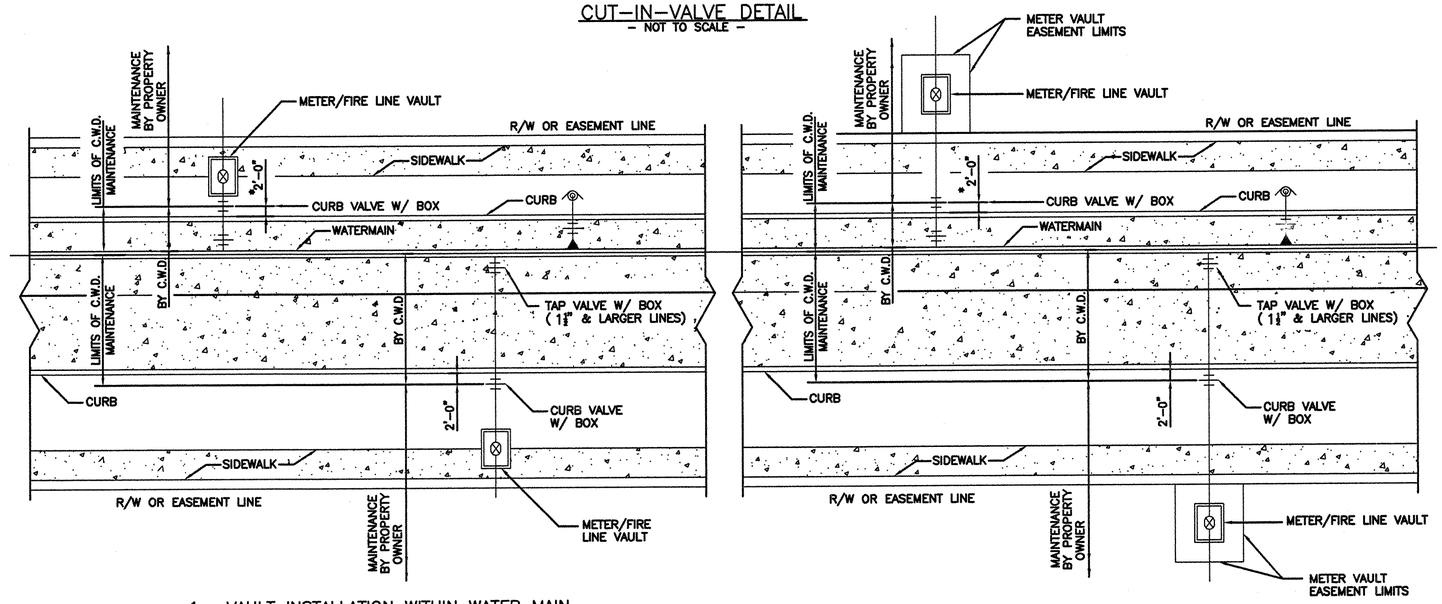
THE CONTRACTOR SHALL DO ALL PIPE CUTTING AND INSTALLATION. HOWEVER, THE INSTALLATION OF THE CUT-IN-VALVE ASSEMBLY SHALL BE DONE UNDER THE SUPERVISION OF THE DIVISION OF WATER.



CUT-IN-VALVE DETAIL

- NOT TO SCALE -

NOTE:
BEFORE CUTTING EXISTING WATER MAIN, THE NIPPLES SHALL BE CONNECTED TO THE MECHANICAL JOINT BELL END GATE VALVE. AFTER CUTTING PIPE, FINAL CONNECTIONS SHALL BE MADE WITH COUPLINGS/SOLID SLEEVES AS SPECIFIED.



1. VAULT INSTALLATION WITHIN WATER MAIN EASEMENT OR DEDICATED R/W

2. VAULT INSTALLATION IN PRIVATE PROPERTY

VAULT AND CURB VALVE ARRANGEMENT

1. ALL DOMESTIC SERVICE CONNECTIONS (THAT IS ALL CONNECTIONS USED FOR DRINKING, SANITATION OR IRRIGATION PURPOSES) UTILIZING A VAULT FOR THE PLACEMENT OF THE METER SHALL MATCH ONE OF THE TWO STANDARD DRAWINGS ABOVE.
2. IF ONLY THE BACKFLOW PREVENTION DEVICE FOR THE FIRE SERVICE CONNECTION IS TO BE PLACED IN A VAULT (THAT IS THE DOMESTIC SERVICE CONNECTION WILL BE METERED INSIDE THE BUILDING WITH A REMOTE REGISTER), THEN THAT VAULT MAY BE PLACED AS SHOWN IN DRAWING No. 2 ABOVE AND A METER VAULT EASEMENT WILL NOT BE REQUIRED.
3. SINGLE FAMILY RESIDENTIAL DOMESTIC SERVICE CONNECTIONS IN EASEMENTS, WITHOUT METERVAULTS, SHALL HAVE THE CURB VALVE PLACED NO MORE THAN FIVE (5) FEET FROM THE MAIN. THE CURB VALVE WILL STILL MARK THE CHANGE IN RESPONSIBILITY FOR MAINTENANCE.
4. VAULT AND VAULT COVERS SHALL BE PLACED OUTSIDE OF SIDEWALKS AND DRIVEWAYS WHEN POSSIBLE. VAULT COVERS IN PAVEMENT SHALL BE FLUSH TO THE SURFACE.
* 5. IN THE CASE WHEN THE WATERMAIN IS IN THE TREE LAWN IN A DEDICATED RIGHT OF WAY, NOT UNDER THE PAVEMENT, THE SHORT SIDE SHALL HAVE THE CURB VALVE 3'-0" FROM THE WATERMAIN.

CALCULATED RSY | CHECKED JLN

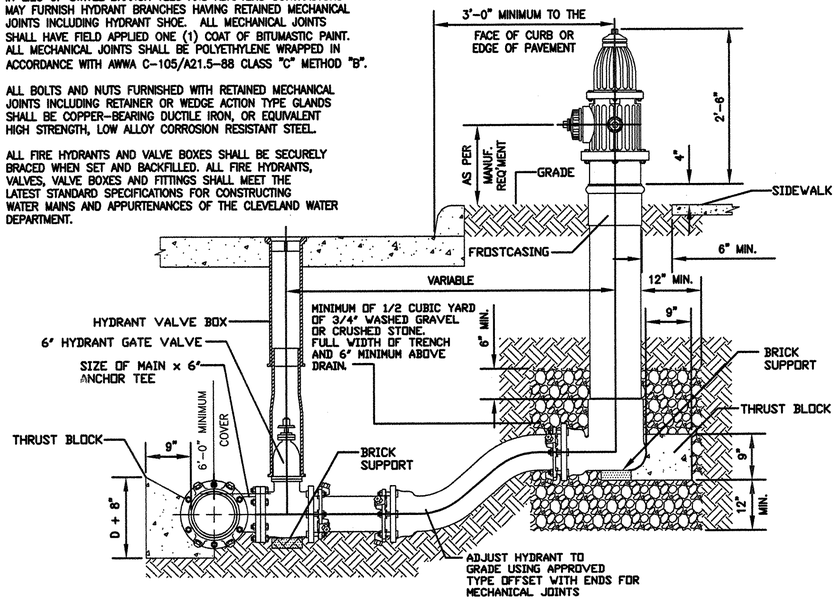
WATER WORK DETAILS

CUY-WEST 150th STREET

NOTE:
IN LIEU OF SWIVEL BRANCH TEES AND ADAPTERS CONTRACTORS MAY FURNISH HYDRANT BRANCHES HAVING RETAINED MECHANICAL JOINTS INCLUDING HYDRANT SHOE. ALL MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINT. ALL MECHANICAL JOINTS SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH AWWA C-105/A21.5-88 CLASS "C" METHOD "B".

ALL BOLTS AND NUTS FURNISHED WITH RETAINED MECHANICAL JOINTS INCLUDING RETAINER OR WEDGE ACTION TYPE GLANDS SHALL BE COPPER-BEARING DUCTILE IRON, OR EQUIVALENT HIGH STRENGTH, LOW ALLOY CORROSION RESISTANT STEEL.

ALL FIRE HYDRANTS AND VALVE BOXES SHALL BE SECURELY BRACED WHEN SET AND BACKFILLED. ALL FIRE HYDRANTS, VALVES, VALVE BOXES AND FITTINGS SHALL MEET THE LATEST STANDARD SPECIFICATIONS FOR CONSTRUCTING WATER MAINS AND APPURTENANCES OF THE CLEVELAND WATER DEPARTMENT.

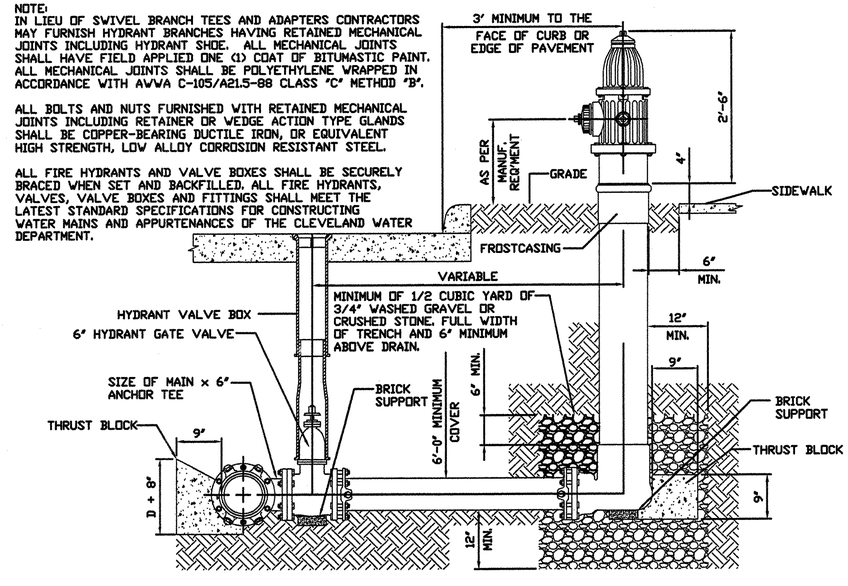


ADJUSTING 6" HYDRANT ELEVATION

NOTE:
IN LIEU OF SWIVEL BRANCH TEES AND ADAPTERS CONTRACTORS MAY FURNISH HYDRANT BRANCHES HAVING RETAINED MECHANICAL JOINTS INCLUDING HYDRANT SHOE. ALL MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINT. ALL MECHANICAL JOINTS SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH AWWA C-105/A21.5-88 CLASS "C" METHOD "B".

ALL BOLTS AND NUTS FURNISHED WITH RETAINED MECHANICAL JOINTS INCLUDING RETAINER OR WEDGE ACTION TYPE GLANDS SHALL BE COPPER-BEARING DUCTILE IRON, OR EQUIVALENT HIGH STRENGTH, LOW ALLOY CORROSION RESISTANT STEEL.

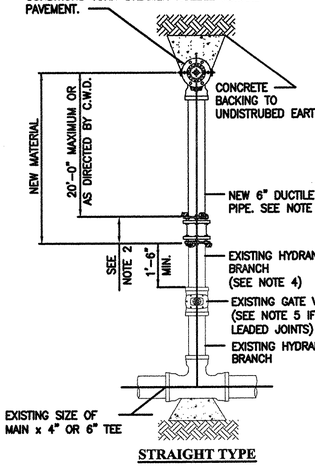
ALL FIRE HYDRANTS AND VALVE BOXES SHALL BE SECURELY BRACED WHEN SET AND BACKFILLED. ALL FIRE HYDRANTS, VALVES, VALVE BOXES AND FITTINGS SHALL MEET THE LATEST STANDARD SPECIFICATIONS FOR CONSTRUCTING WATER MAINS AND APPURTENANCES OF THE CLEVELAND WATER DEPARTMENT.



6" HYDRANT ELEVATION

– NOT TO SCALE –

INSTALL NEW 6" MECHANICAL JOINT HYDRANT. ADJUST HYDRANT TO GRADE TO MEET FIELD CONDITIONS TURN STEAMER NOZZLE TOWARD PAVEMENT.



STRAIGHT TYPE

1) PLAIN END x PLAIN END DUCTILE IRON PIPE AS SPECIFIED (CUT TO SUIT).

2) CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250, RETAINED MECHANICAL JOINT REDUCERS WHERE EXISTING PIPE IS 4" IN DIAMETER, OR COMPRESSION COUPLINGS WITH ROD AND CLAMPS AS DIRECTED BY C.W.D. INSPECTOR.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS. MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536). THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUN WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 (STRAIGHT TYPE), 162 (TRANSITION TYPE), 253 (REDUCING TYPE); OR SMITH-BLAIR 441 (STRAIGHT AND TRANSITION TYPE), R441 (REDUCING TYPE); OR ROMAC STYLE 501 (STRAIGHT AND TRANSITION TYPE), STYLE RC501 (REDUCING TYPE).

IF THE BRANCH IS TO BE SHORTENED, NO NEW IS PIPE REQUIRED.

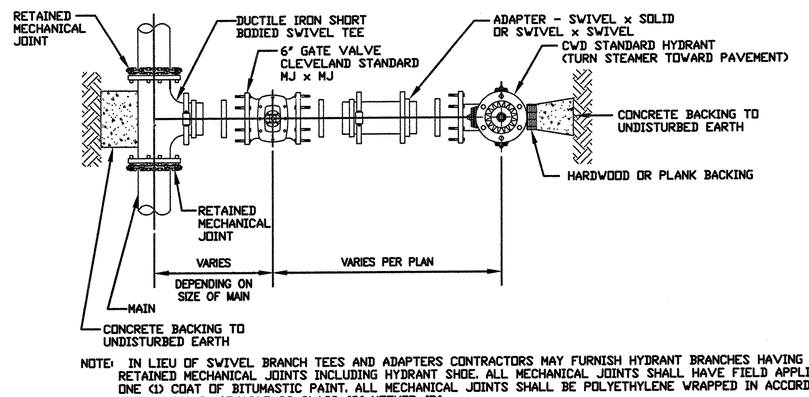
3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".

4) IF EXISTING PIPING IS 4" USE 4" TO 6" REDUCING MJ REDUCER OR REDUCING TRANSITION COUPLING WITH ROD & CLAMP IF APPROVED BY CWD.

5) IN HIGH PRESSURE AREAS THE EXISTING VALVE MAY NEED TO BE RESTRAINED TO EXISTING TEE OR FITTING USING ROD & CLAMP AS DIRECTED BY CWD.

EXTEND, SHORTEN AND ADJUST HYDRANT TO GRADE, STRAIGHT TYPE

– NOT TO SCALE –

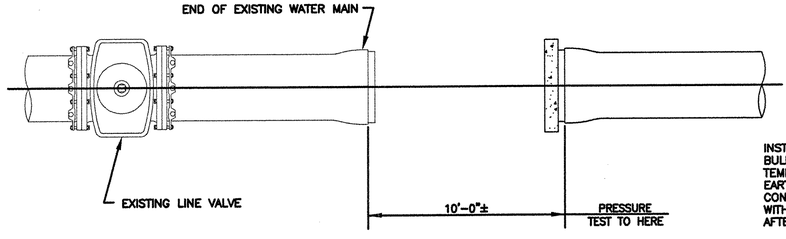


NOTE: IN LIEU OF SWIVEL BRANCH TEES AND ADAPTERS CONTRACTORS MAY FURNISH HYDRANT BRANCHES HAVING RETAINED MECHANICAL JOINTS INCLUDING HYDRANT SHOE. ALL MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINT. ALL MECHANICAL JOINTS SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH AWWA C-105/A21.5-88 CLASS 'C' METHOD 'B'.

ALL BOLTS AND NUTS FURNISHED WITH RETAINED MECHANICAL JOINTS INCLUDING RETAINER OR WEDGE ACTION TYPE GLANDS SHALL BE COPPER-BEARING DUCTILE IRON, OR EQUIVALENT HIGH STRENGTH, LOW ALLOY CORROSION RESISTANT STEEL.

TYPICAL NEW HYDRANT INSTALLATION DETAIL "A"

– NOT TO SCALE –



INSTALL TEMPORARY PLUG/CAP AND BULKHEAD FOR PRESSURE TEST. TEMPORARY BLOCKING TO UNDISTURBED EARTH AS NEEDED FOR PRESSURE TEST. CONNECT TO EXISTING WATER MAIN WITH SOLID SLEEVE AND SHORTS AFTER SUCCESSFUL TESTING.

NOTE:
PRESSURE TESTING OF WATER MAINS:
WHERE NEW/EXTENDED WATER MAINS ARE CONNECTED TO AN EXISTING WATER MAIN FOR PRESSURE TEST, RESULTING IN FAILURE OF THE PRESSURE TEST OR ANY DAMAGE TO THE EXISTING WATER MAIN , OR ITS APPURTENANCES, THE REPAIR THEREOF SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ALL REPAIRS SHALL BE DONE TO THE SATISFACTION OF THE DIVISION OF WATER.

ALTERNATE PRESSURE TESTING DETAIL

– NOT TO SCALE –

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

96
146

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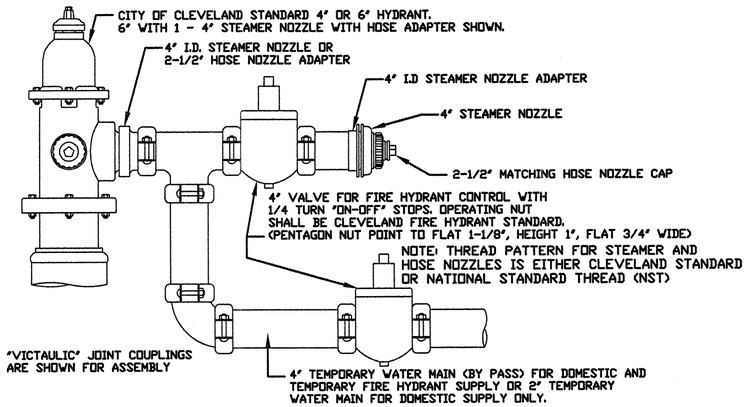
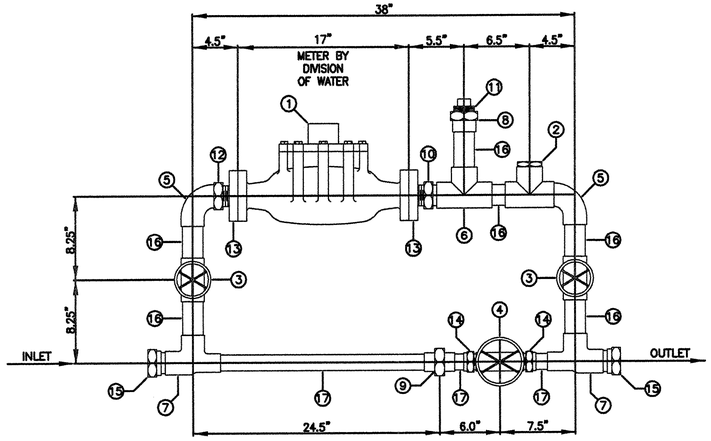


TEMPORARY WATER MAIN & HYDRANT CONNECTION ASSEMBLY-A

TO PROVIDE SIMULTANEOUS SERVICE IN EXISTING HYDRANT AND TEMPORARY BYPASS MAIN

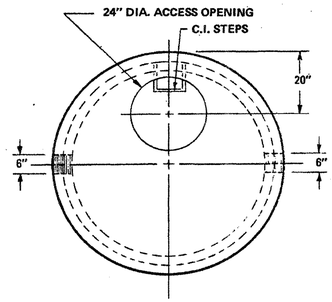
- NOT TO SCALE -



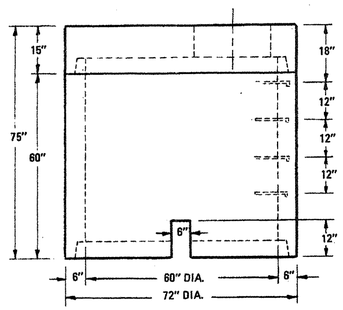
ELEVATION

ITEM (4) TO BE AT AN ANGLE WITH LOCK AND CABLE.

NOTE:
MINOR VARIATIONS IN THE OVERALL LENGTH ARE TO BE EXPECTED DEPENDING ON THE TEE'S, VALVES, AND CHECK VALVES SUPPLIED.
ADJUSTMENTS TO THE BYPASS (ITEM 17) WILL BE MADE BY THE DIVISION OF WATER AS NEEDED.
ALL BOLTS AND GASKETS BY SUPPLIER.



TOP VIEW



RIGHT SIDE VIEW

NOTES

UTILIZED FOR 1-1/2" & 2" DOMESTIC METER SERVICE
OPENING FOR SERVICE LINE
STEEL REINFORCING:
#3 GRADE 40 REBAR
4x12 4/9 GAUGE WIRE MESH

MATERIALS REQUIRED FOR INSTALLATION
STANDARD 2" METER SETTING WITH 2" METER

ITEM	REQ'D	SIZE	DESCRIPTION
1	1	2"	METER BY C.W.D.
2	1	2"	STREAMLINE SWING CHECK VALVE, COPPER TO COPPER
3	2	2"	STREAM LINE HAND WHEEL GATE VALVES
4	1	1-1/2"	STREAMLINE O.S. & Y GATE VALVE
5	2	2"	STREAMLINE STREET ELBOW, COPPER TO COPPER
6	1	2"	STREAM LINE TEE, COPPER TO COPPER
7	2	2" x 1-1/2" x 2"	STREAMLINE TEE, COPPER TO COPPER
8	1	2"	STREAMLINE COUPLING, COPPER TO IRON, FEMALE
9	1	1-1/2"	STREAMLINE UNION, COPPER TO COPPER
10	1	2"	STREAMLINE COUPLING, COPPER TO IRON, MALE
11	1	2"	BRASS SCREW PLUG
12	1	2"	STREAMLINE COUPLING, COPPER TO IRON, FEMALE
13	2	2"	OVAL FLANGES, FEMALE
14	2	1-1/2'	STREAMLINE COUPLING, COPPER TO IRON, FEMALE
15	2	2"	STREAMLINE COUPLING, COPPER TO IRON, FEMALE
16	37"	2"	COPPER TUBING-HARD
17	30"	1-1/2"	COPPER TUBING-HARD
18	1lb		SPECIAL SOLDER

(SEE DRAWING No. STD-M02 AND STD-V01).

CALCULATED RSY CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

97
146

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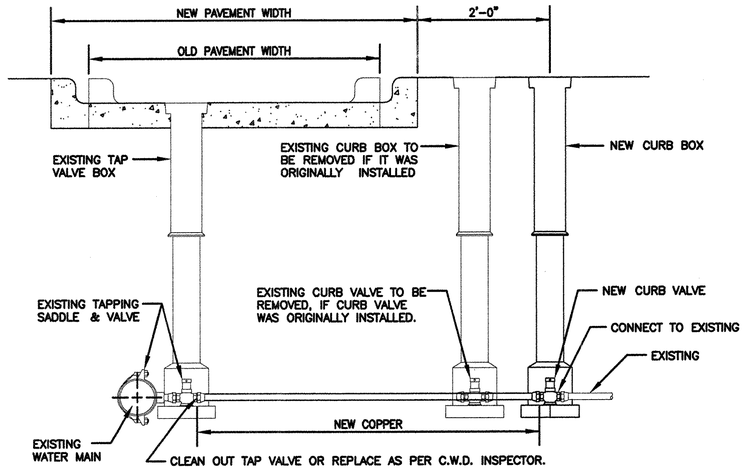


WATER SERVICE CONNECTION REPLACEMENT FOR $1\frac{1}{2}$" & 2"

– NOT TO SCALE –

MATERIALS REQUIRED FOR INSTALLATION

1" GENERAL SUPPLY WATER SERVICE CONNECTIONS

ON DUCTILE/CAST IRON WATER MAINS:

1	1" CORPORATION STOP – COPPER TO IRON
1	1" CURB STOP VALVE – COPPER TO IRON
1	CURB STOP VALVE BOX COVER
1	CURB STOP VALVE BOX TOP
1	CURB STOP VALVE BOX BOTTOM
x FT	1" TYPE K, ASTM B88, COPPER TUBING

OR

1	1" COMPRESSION CORPORATION STOP
1	1" ORISEAL COMPRESSION VALVE
1	ORISEAL VALVE BOX
1	ORISEAL VALVE BOX FOOTPIECE
x FT	1" TYPE K, ASTM B88, COPPER TUBING

ON CONCRETE WATER MAINS:

1	SOM x 1" TAPPING SADDLE FOR CONCRETE PIPE
1	1" CORPORATION STOP – COPPER TO IRON
1	1" CURB STOP VALVE – COPPER TO IRON
1	CURB STOP VALVE BOX TOP
1	CURB STOP VALVE BOX BOTTOM
x FT	1" TYPE K, ASTM B88, COPPER TUBING

OR

1	SOM x 1" TAPPING SADDLE FOR CONCRETE PIPE
1	1" COMPRESSION CORPORATION STOP
1	1" ORISEAL COMPRESSION VALVE
1	ORISEAL VALVE BOX
1	ORISEAL VALVE BOX FOOTPIECE
x FT	1" TYPE K, ASTM B88, COPPER TUBING

NOTE: SOM = SIZE OF MAIN

MATERIALS REQUIRED FOR INSTALLATION

2" CONNECTION FOR DOMESTIC SUPPLY OR FIRE PROTECTION CONNECTION

ALTERNATE #1

REQ'D	SIZE	DESCRIPTION
1	SOM x 2"	STRAP SADDLE
1	2" X 6"	BRASS NIPPLE
2	2"	(IRON TO IRON) BALL TYPE VALVE
2	2"	CAST IRON COMPRESSED UNION (MALE)
X#FT	2"	COPPER TUBING
2	#2	ADJUSTABLE VALVE BOX TOP
2	#2	ADJUSTABLE VALVE BOX COVER
2	#2	ADJUSTABLE BOX BOTTOM

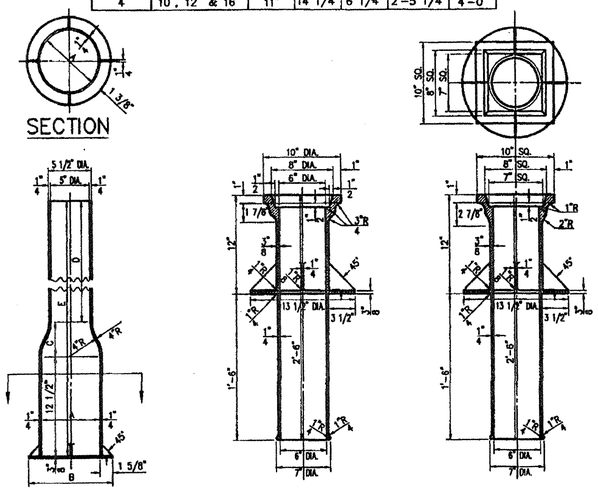
ALTERNATE #2

REQ'D	SIZE	DESCRIPTION
1	SOM x 2"	STRAP SADDLE
1	2" X 6"	BRASS NIPPLE
2	2"	BALL TYPE VALVES–IRON TO IRON
2	2"	COMPRESSION UNION COPPER TO IRON, MALE
X#FT	2"	COPPER TUBING
2	#2	ADJUSTABLE VALVE BOX TOP
2	#2	ADJUSTABLE VALVE BOX COVER
2	#2	ADJUSTABLE BOX BOTTOM
2		STATIONARY ROD

*SOM MEAN SIZE OF MAIN
SEE DRAWING STD–V01 & STD–V02

NOTE: IF CONNECTION IS TO BE LONGER THAN TWENTY FEET, ONE ADDITIONAL 1–1/2" STREAMLINE COUPLING (COPPER TO COPPER) IS TO BE ADDED FOR EACH ADDITIONAL TWENTY FOOT LENGTH OR EACH PORTION (20'–0") OVER THE INITIAL TWENTY FEET OR COMPRESSION 3 PART UNION, (COPPER TO COPPER).

BASE NO.	VALVE SIZE	A	B	C	D	E
2 & 3	3", 4", 6" & 8"	7 1/2"	10 3/4"	4 1/4"	3'-1 1/4"	4'-6"
4	10", 12" & 16"	11"	14 1/4"	6 1/4"	2'-5 1/4"	4'-0"



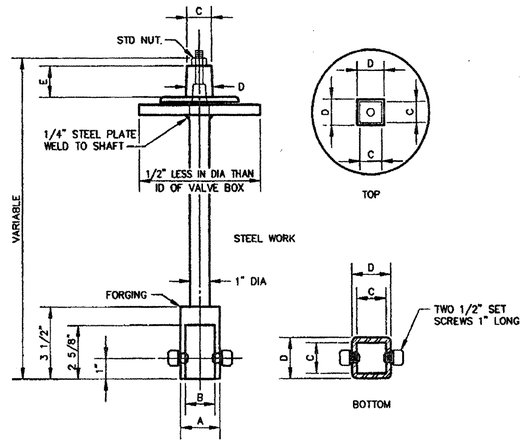
BASE NO. 2, 3 & 4
EST. WT. 71 POUNDS (NOS. 2 & 3)
EST. WT. 79 POUNDS (NOS. 4)

TOP NO. 1 & 2 (ROUND HEAD)
EST. WT. 73 POUNDS

TOP NO. 3 & 4 (SQUARE HEAD)
EST. WT. 73 POUNDS

VALVE BOXES

NOT TO SCALE



NOTE: VALVE NUTS TO BE CONTERSUNK 1/8" TO RECEIVE SET SCREWS

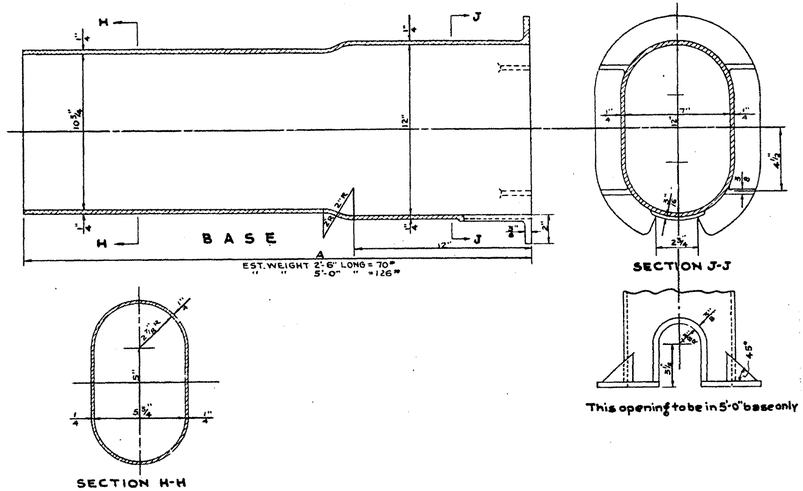
VALVE SIZE	A	B	C	D	E
3" AND SMALLER	2"	1 1/2"	1 1/4"	1 3/8"	1 1/2"
4" TO 20"	2 1/2"	2"	1 3/4"	1 7/8"	1 3/4"
24" AND LARGER	2 5/8"	2 1/8"	* 2"	* 2"	2"

*–NOT TEPERED

VALVE EXTENSION STEM DETAIL

NOT TO SCALE

NOTE: EXTENSION STEM REQUIRED WHENEVER DEPTH TO TOP OF VALVE OPERATING NUT EXCEEDS 4'–0"



CALCULATED RSY CHECKED JLN

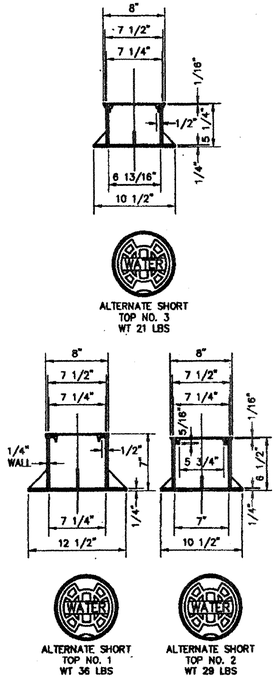
WATER WORK DETAILS

CUY-WEST 150th STREET

98
146

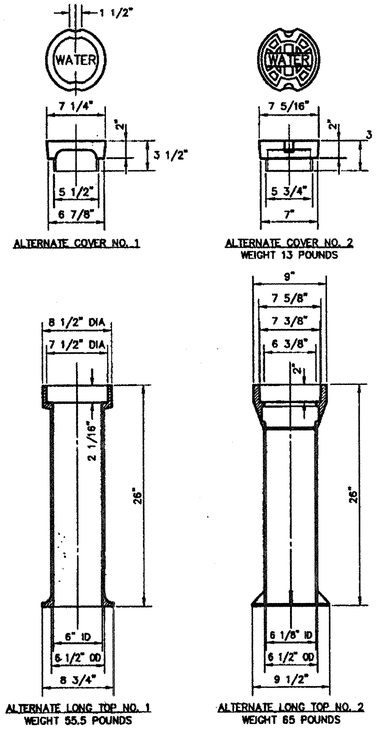
P.W. 3/22/07 PLOT 1:1

F:\JOBS\685\WP\685WD05.DWG



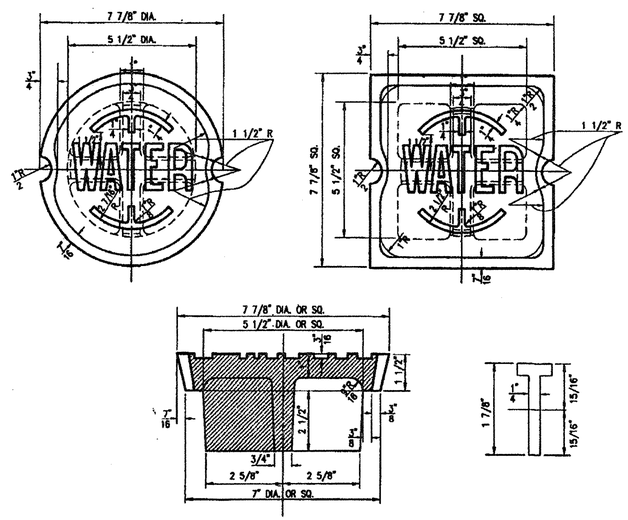
SHORT STYLE VALVE BOX ROUND TOP AND COVER DETAIL

NOT TO SCALE



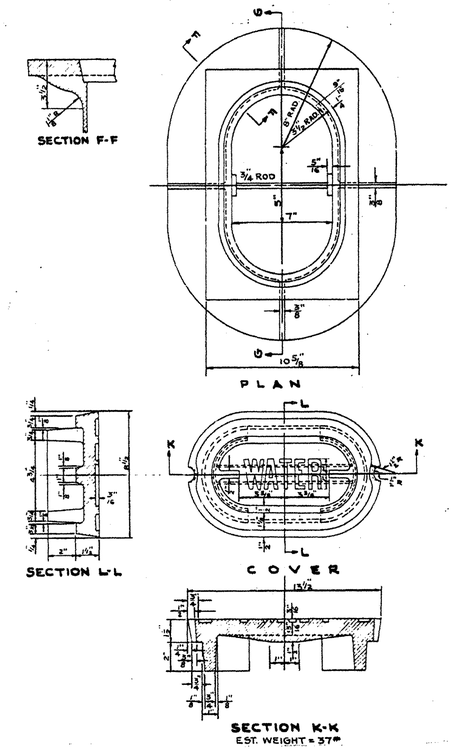
LONG STYLE VALVE BOX ROUND TOP AND COVER DETAIL

NOT TO SCALE



VALVE BOX COVER DETAIL

NOT TO SCALE



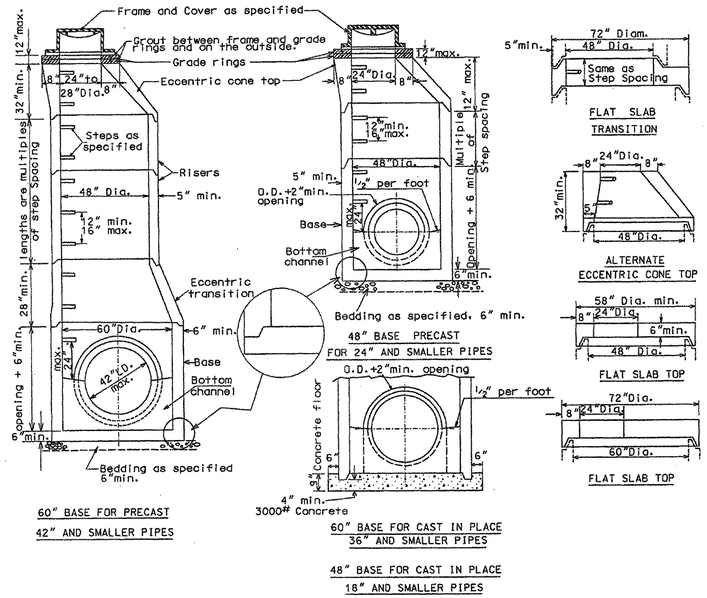
CALCULATED RSY
CHECKED JLN

WATER WORK DETAILS

CUY-WEST 150th STREET

99
146

F:\JOBS\665\WP\665W006.DWG PJK 3/22/07 PLOT 1:1



60" BASE FOR PRECAST
42" AND SMALLER PIPES

60" BASE FOR CAST IN PLACE
36" AND SMALLER PIPES

48" BASE FOR CAST IN PLACE
18" AND SMALLER PIPES

NOTES

Sections of the precast manhole shall be cast and assembled with either all tongue or all groove ends up. Lift holes may be provided in each section for handling.

TOP AND TRANSITION /or reducer/
Sections may be either eccentric cone, concentric cone or flat slab.
BASES for Manholes are shown with monolithic floor and riser which may be cast in one or two operations.
A permissible alternate is to cast and ship the floor and barrel separately. Openings for inlet and outlet pipes shall be provided, either when the unit is cast or later, to meet project requirements. Bottom channels may be formed of concrete precast in the base or by field construction. Floors may also be poured in place.

OPENINGS IN RISER SECTIONS for 18" and smaller inlet pipes shall be prefabricated. Flexible connections shall be provided for sanitary and combined sewers. Premium seals shall meet A.S.T.M C-923.

JOINT SEALS between precast manhole sections and sewers shall be resilient and flexible gasket joints shall meet A.S.T.M C-443, FEDERAL SPECIFICATIONS SS-S-00210 (210 A) and AASHTO M-198

MANHOLE JOINTS and GRADE RINGS shall be sealed externally and between the grade rings with a layer of mastic compound such as Faberlite, Kent Seal or equal.

MATERIALS for bases and other precast sections including reinforcement not specified hereon, shall comply with the specifications.

PRECAST MANHOLES shall conform to the requirements of A.S.T.M C-478.

SEAL all lift holes with approved concrete plugs.

LANDING PLATFORMS as shown on the LANDING DETAILS shall be installed in manholes that are over 28 feet deep to the invert with a maximum vertical spacing of 20 feet.

MANHOLE FRAMES - chimney seals will be required on all new sanitary manholes.

A minimum 3" vertical wall is required below the casting for installation of chimney seals.

PRECAST CONCRETE MANHOLE
42" PIPE OR SMALLER

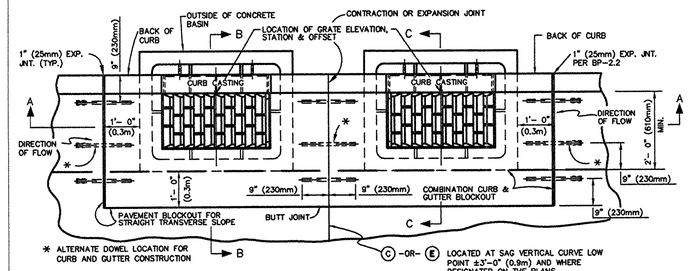
REVISIONS:

SCALE NO SCALE

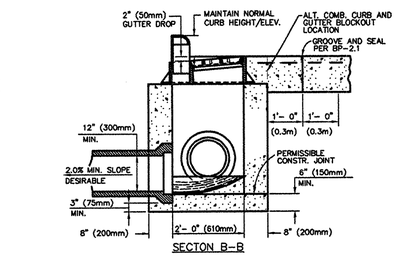
DATE : DEC. 1998

UNIFORM STANDARDS: CLEVELAND --- CUYAHOGA COUNTY --- NORTHEAST OHIO REGIONAL SEWER DISTRICT

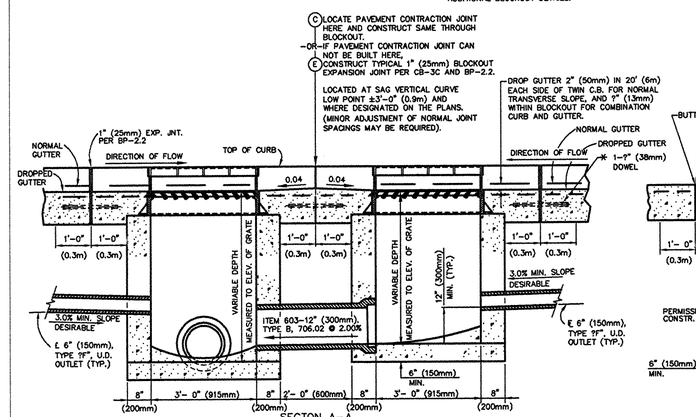
Sheet No. 4/27



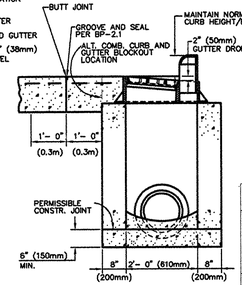
PLAN OF CATCH BASINS AND PAVEMENT JOINTS



SECTON B-B



SECTON A-A



SECTON C-C

NOTES

FOR SUPPLEMENTAL DETAILS/NOTES GOVERNING THE CONSTRUCTION OF THIS INSTALLATION, SEE THE CUYAHOGA COUNTY ENGINEER'S CONSTRUCTION DRAWINGS CB-3C AND BP-2.8C. EACH INSTALLATION SHALL CONSIST OF TWO (2) CUYAHOGA COUNTY No. 3C CATCH BASINS AND **SIX (6) LINEAR FEET (2m) OF TWELVE (12) INCH (300mm) TYPE B CONDUIT (603). PAYMENT SHALL BE MADE AT THE PER EACH CONTRACT UNIT PRICE BID FOR ITEM 604-CATCH BASIN, CUYAHOGA COUNTY, TWIN 3C".

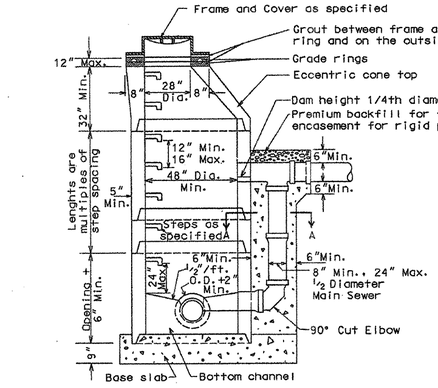
** MEASURED FROM CENTER TO CENTER OF CATCH BASINS. THE SIX (6) LIN. FT. (2m) MEASUREMENT AND THE TWELVE (12) INCH (300mm) DIAMETER SIZE REPRESENTS THE TYPICAL/MINIMUM LENGTH AND SIZE OF THE CONNECTING CONDUIT REQUIRED AT EACH INSTALLATION. THE ACTUAL LENGTH AND SIZE MAY BE MORE.

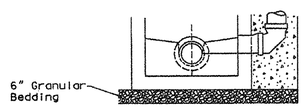
CUYAHOGA COUNTY ENGINEER

TWIN 3C CATCH BASIN

DATE 12-07-99 08-15-00

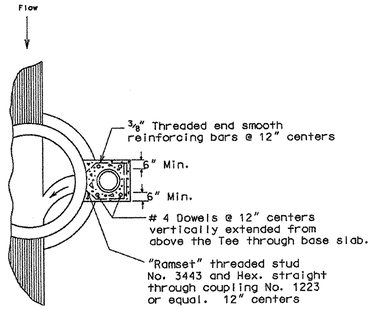
CONSTRUCTION DRAWING CB-3C2





ALTERNATE

NOTE: This bedding with precast base on manhole.



SECTION A - A.

NOTES: A drop manhole shall be constructed in sanitary sewers wherever the distance between the inverts is 2.0 ft. or greater. General manhole details refer to ODOT No. 3 Manhole. Poured in place concrete shall be 3000# Concrete. Core bore seals shall meet ASTM C-923 and C-167.

PRECAST CONCRETE DROP MANHOLE

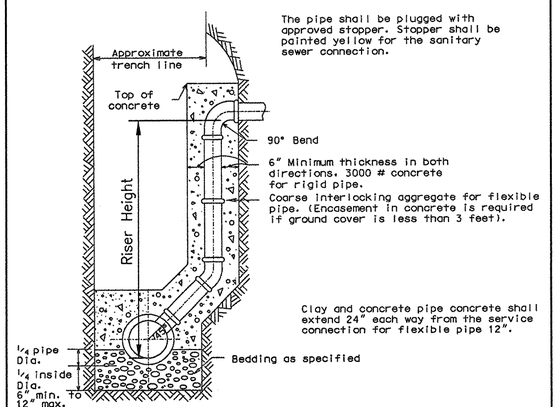
REVISIONS:

SCALE NO SCALE

DATE : DEC. 1998

UNIFORM STANDARDS: CLEVELAND --- CUYAHOGA COUNTY --- NORTHEAST OHIO REGIONAL SEWER DISTRICT

Sheet No. 6/27



TYPICAL RISER DETAIL

MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

100
146

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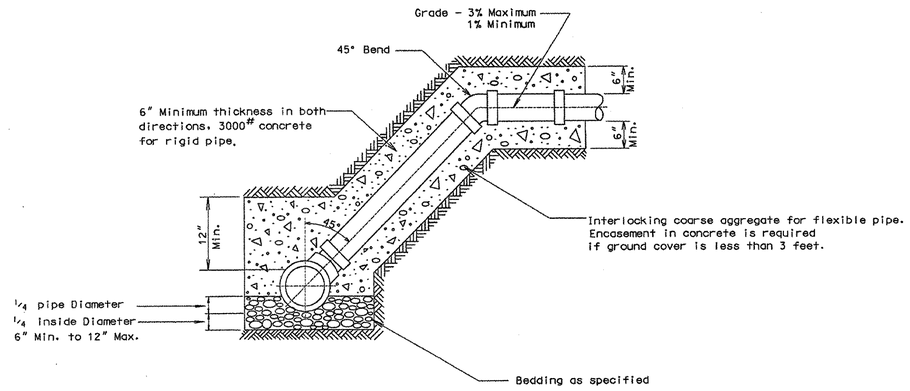
The pipe shall be plugged with approved stopper. Stopper shall be painted yellow for the sanitary service connection.



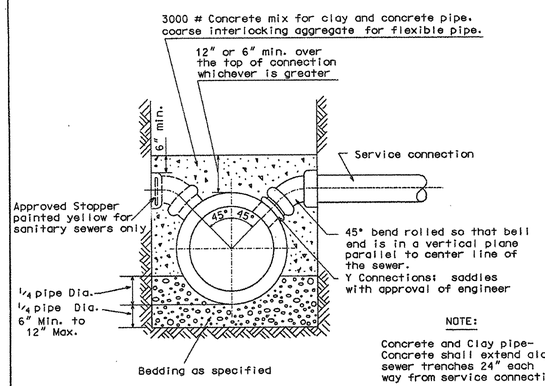
Concrete shall extend 24" each side of service connection for rigid pipe and 12" each side for flexible pipe.
Properly compacted interlocking coarse aggregate for flexible pipe.

RISER DETAIL ALTERNATIVE

REVISIONS:	SCALE NO SCALE	DATE : DEC. 1998

UNIFORM STANDARDS: CLEVELAND --- CUYAHOGA COUNTY --- NORTHEAST OHIO REGIONAL SEWER DISTRICT

Sheet No. 9-8/27

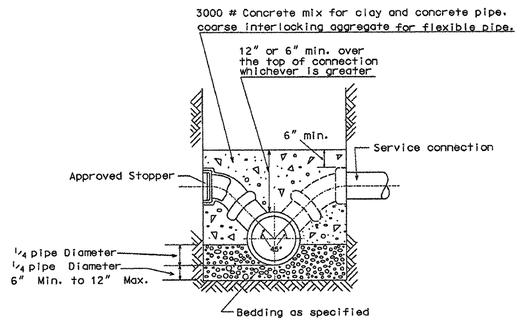


TYPICAL SLANT DETAIL

NOTE:

Concrete and Clay pipe- Concrete shall extend along sewer trenches 24" each way from service connection.

Core Bore seal shall meet ASTM C - 923 and ASTM C- 167



TYPICAL Y - BRANCH DETAIL

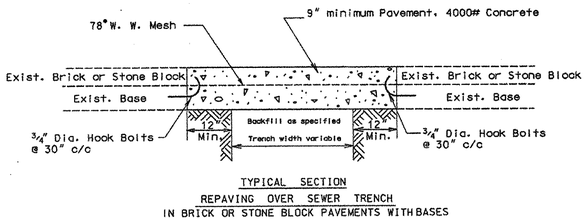
Encasement in concrete is required if ground cover is less than 3 feet for all pipes.

SLANT AND Y - BRANCH DETAILS

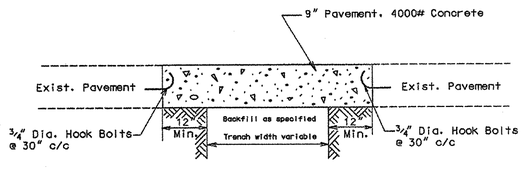
REVISIONS:	SCALE NO SCALE	DATE : DEC. 1998

UNIFORM STANDARDS: CLEVELAND --- CUYAHOGA COUNTY --- NORTHEAST OHIO REGIONAL SEWER DISTRICT

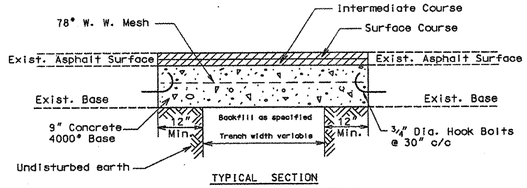
Sheet No. 10/27



TYPICAL SECTION
REPAVING OVER SEWER TRENCH
IN BRICK OR STONE BLOCK PAVEMENTS WITH BASES



TYPICAL SECTION
REPAVING OVER SEWER TRENCH
IN PAVEMENTS WITHOUT BASES



TYPICAL SECTION
REPAVING OVER SEWER TRENCH
IN ASPHALT PAVEMENT

NOTE:

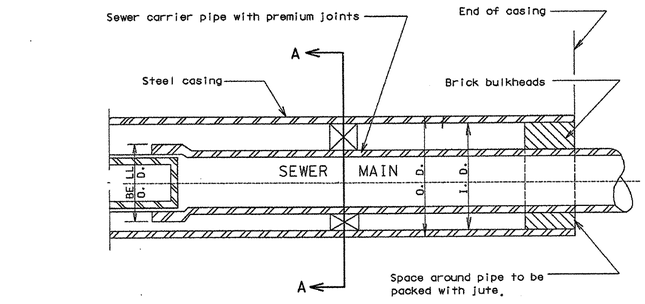
Hook bolts shall be required when existing pavement or base is concrete. Drill and grout Hook Bolts.

REPAVING OVER SEWER TRENCH

REVISIONS:	SCALE NO SCALE	DATE : DEC. 1998

UNIFORM STANDARDS: CLEVELAND --- CUYAHOGA COUNTY --- NORTHEAST OHIO REGIONAL SEWER DISTRICT

Sheet No. 12/27

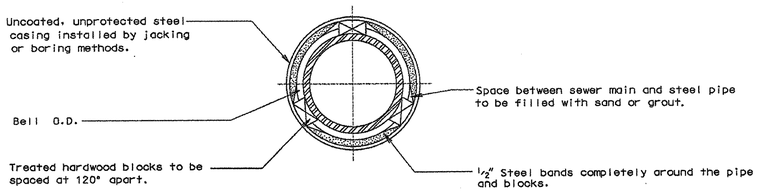


NOTE:

Casing pipe to have I.D. Minimum of 2" larger than bell O.D. of carrier pipe. Casing pipe to have a Minimum wall thickness of 0.250.

BLOCKS:

3 sets of treated hardwood blocks per 18' length of pipe.
4 sets of treated hardwood blocks per 20' length of pipe.
Two blocks spaced 30" from joints. Additional blocks evenly spaced.



SECTION A - A

BORING DETAILS FOR PAVED AREAS

REVISIONS:	SCALE NO SCALE	DATE : DEC. 1998

UNIFORM STANDARDS: CLEVELAND --- CUYAHOGA COUNTY --- NORTHEAST OHIO REGIONAL SEWER DISTRICT

Sheet No. 26/27

MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

101
146

PJK 3/90/07 PLOT 1=1

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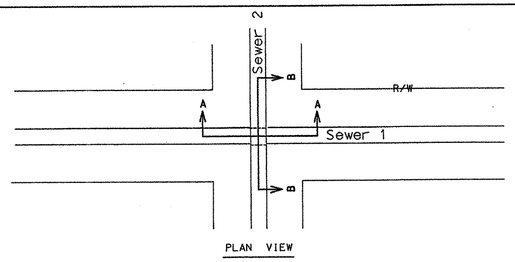
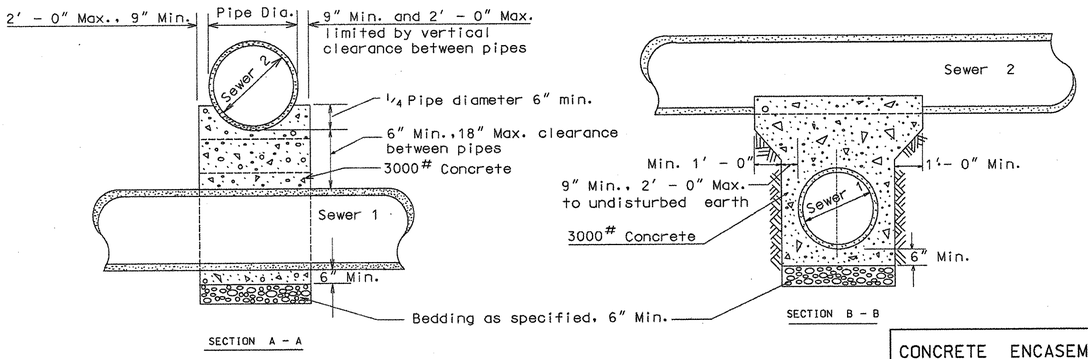
NOTE :

Encasement required when pipe clearance is less than 18"



PLAN VIEW



SECTION A - A

SECTION B - B

CONCRETE ENCASEMENT

MONOLITHIC CRADLING OF UPPER PIPE

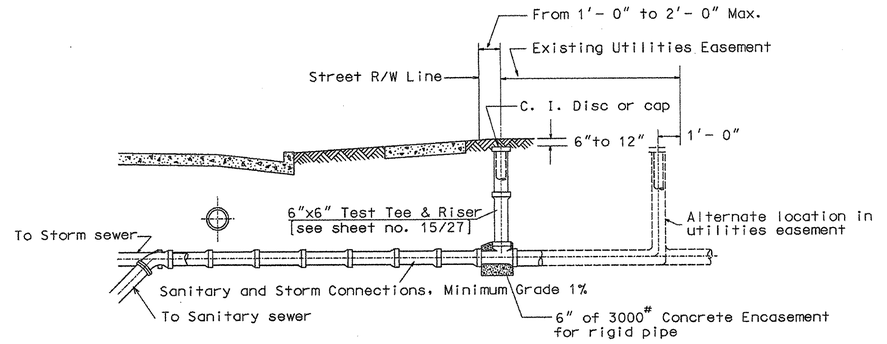
REVISIONS:

SCALE NO SCALE

DATE : DEC. 1998

UNIFORM STANDARDS: CLEVELAND --- CUYAHOGA COUNTY --- NORTHEAST OHIO REGIONAL SEWER DISTRICT

Sheet No.13/27



NOTE:

House connections shall be connected into the top half of the sewer pipe.

six inch, class 200, cast iron pipe is required for all bored sewer service connections including slip on rubber joints with an ANSI thickness classification No.25, also 6 inch, ductile iron cement lined pipe may be used including slip on rubber joints with an ANSI thickness classification No. 53.

LATERAL CONNECTIONS

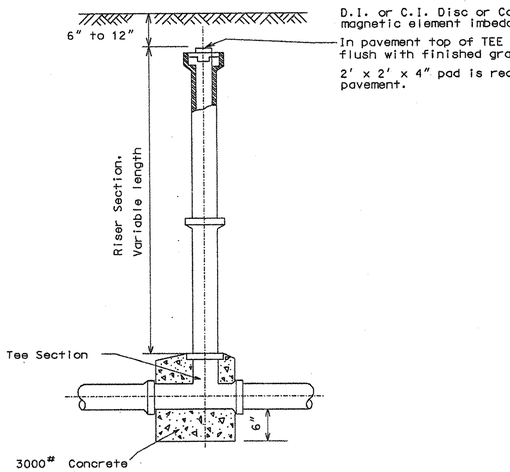
REVISIONS:

SCALE NO SCALE

DATE : DEC. 1998

UNIFORM STANDARDS: CLEVELAND --- CUYAHOGA COUNTY --- NORTHEAST OHIO REGIONAL SEWER DISTRICT

Sheet No.14/27



NOTES:

The test tee riser section shall be installed when the connection is extended to the building.
Risers shall be furnished with stoppers upon which shall be placed a cast or ductile iron disc.
Cast or ductile iron disc shall be painted yellow on sanitary sewers.
Concrete encasement for Test Tees is required if ground cover to "T" elevation is less than 3' - 0". If greater than 3' - 0" use coarse interlocking aggregates.

6" X 6" TEST TEE & 6" RISER FOR STORM AND SANITARY SEWERS.

TEST TEE

REVISIONS:

SCALE NO SCALE

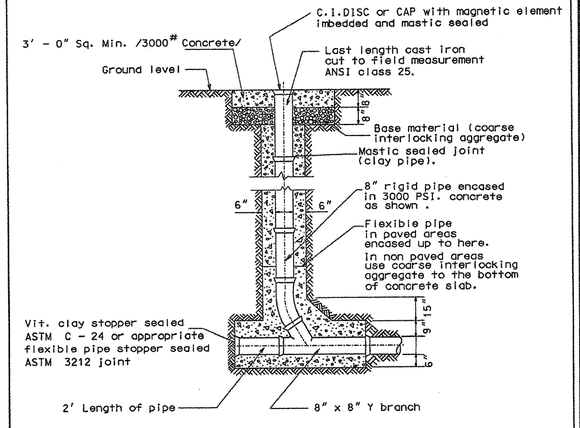
DATE : DEC. 1998

UNIFORM STANDARDS: CLEVELAND --- CUYAHOGA COUNTY --- NORTHEAST OHIO REGIONAL SEWER DISTRICT

Sheet No.15/27

NOTE:

8" Clean out shall be used for 8" sewer and larger
Smaller size sewers and lamp holes shall have same size pipe.



CLEANOUT

MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

P.J.K. 3/22/07 PLOT 1:1

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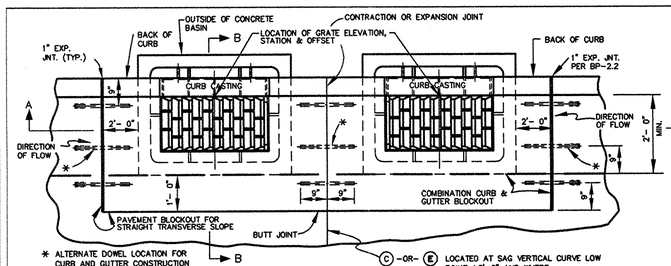
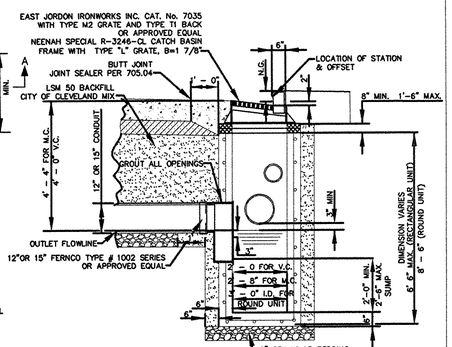
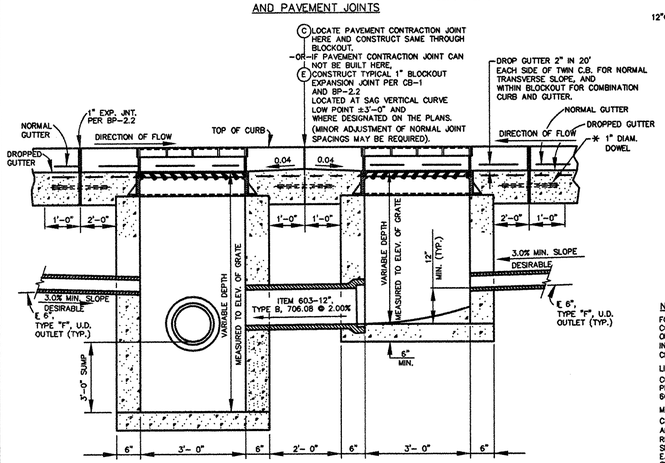


PLAN OF CATCH BASINS AND PAVEMENT JOINTS





SECTON A-A

NOTES

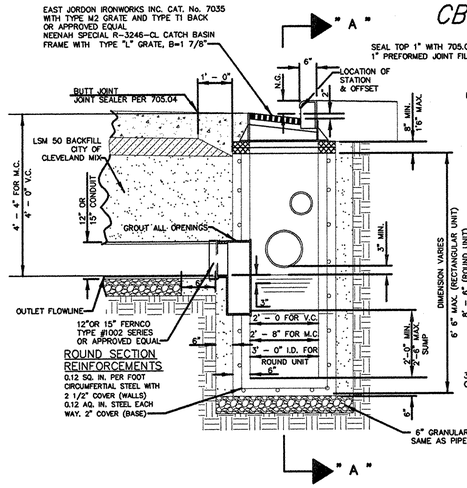
FOR SUPPLEMENTAL DETAILS/NOTES GOVERNING THE CONSTRUCTION OF THIS INSTALLATION, SEE THE CITY OF CLEVELAND CONSTRUCTION DRAWING CB-1. EACH INSTALLATION SHALL CONSIST OF TWO (2) CLEVELAND CB-1 CATCH BASINS AND SIX (6) LINEAR FEET OF TWELVE **(12) INCH TYPE B CONDUIT (603). PAYMENT SHALL BE MADE AT THE PER EACH CONTRACT UNIT PRICE BID FOR ITEM 604-CLEVELAND TWIN NO. 1 CATCH BASIN.

MEASURED FROM CENTER TO CENTER OF ** CATCH BASINS, THE SIX (6) LIN. FT. MEASUREMENT AND THE TWELVE (12) INCH DIAMETER SIZE REPRESENTS THE TYPICAL/MINIMUM LENGTH AND SIZE OF THE CONNECTING CONDUIT REQUIRED AT EACH IN- STALLATION. THE ACTUAL LENGTH AND SIZE MAY BE MORE.

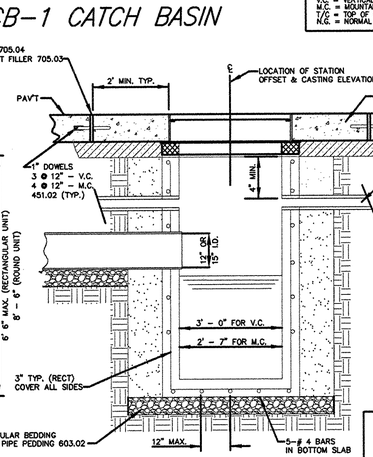
CITY OF CLEVELAND
TWIN CB-1
CATCH BASIN

CB-1 CATCH BASIN

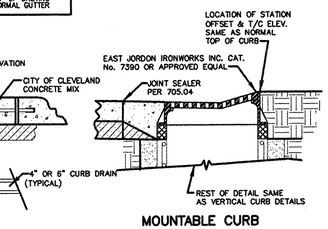
LEGEND
V.C. = VERTICAL CURB
M.C. = MOUNTABLE CURB
T/C = TOP OF CASTING
N.G. = NORMAL GUTTER



VERTICAL CURB



"A"-"A"



MOUNTABLE CURB

NOTES

1. ALL REINFORCING SHALL BE #4 DEFORMED BARS, AS PER ODOT 709, AND SUFFICIENT TO PERMIT SHIPPING AND PLACEMENT WITHOUT DAMAGE TO RECTANGULAR SHAPE.
2. CONCRETE SHALL BE ODOT 499 CLASS "C" 4000 PSI IN 28 DAYS.
3. BOX-OUT SHALL BE PAID FOR AS PAVEMENT IN PORTLAND CEMENT CONCRETE PAVEMENT AND AS PART OF THE CATCH BASIN IN ASPHALTIC CONCRETE PAVEMENT WITH NO REDUCTION IN PAVEMENT OR CURB QUANTITY BECAUSE OF CASTING.

FOR FULL WIDTH ASPHALTIC CONCRET PAVEMENT CONSTRUCT A PORTLAND CEMENT CONCRET APRON.

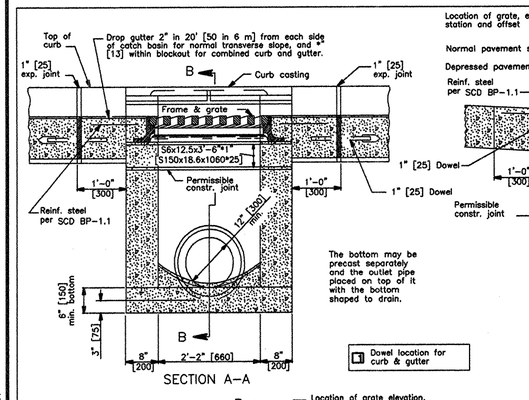
ALTERNATE BASIN SHAPE

A ROUND PRECAST CONCRETE UNIT MAY BE USED IN LIEU OF RECTANGULAR UNIT.
THE ROUND SECTION SHALL BE 36" I.D. UNIT WITH INTEGRAL BASE AND PECAST TOP TRANSITION SECTION (ROUND TO RECTANGULAR) TO FIT CASTING BEING USED.
THE TRANSITION UNIT REQUIRES A # 5 REBAR AT CORNERS OF THE RECTANGULAR SHAPED SECTION AND 3 X 8 W8 X W5 WELDED WIRE FABRIC IN VERTICAL SECTION.
ALSO, IF APPROVED BY THE ENGINEE, 8" THICK MASONRY WALL MAY BE USED IN LIEU OF PRECAST UNITS.

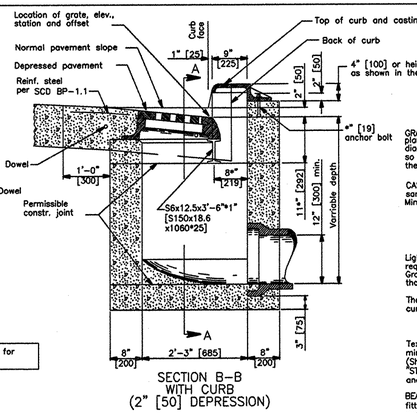
CITY OF CLEVELAND
DIRECTOR OF PUBLIC SERVICE - MARK RICCHIUTO
DIVISION OF ENGINEERING & CONSTRUCTION
STANDARD RECTANGULAR PRECAST CONCRETE CATCH BASIN
(NOT TO SCALE)

DRAWN BY: R. PLODZINSKAS DATE 2-23-2005
SUBMITTED BY: WILLIAM MCLAUGHLIN DATE 2-23-2005
APPROVED BY: RANDALL F. DEVAUL DATE 4-29-05
RANDALL F. DEVAUL, P.E., COMMISSIONER

CONSTRUCTION DRWG. CB-1



SECTION A-A



SECTION B-B
WITH CURB
(2" [50] DEPRESSION)

NOTES

GRATE: The Grate "V" shall be provided unless the plans specifically require the diagonal grate. If the diagonal grate is specified, it shall be placed so that the diagonal bars direct drainage flow toward the curb. (See Sht. 2/2.)

CASTINGS: The design shall be essentially the same and equally as strong as those shown. Minimum weight [mass]:

Curb Casting	170 lbs. [77 kg]
Standard Grate	127 lbs. [57 kg],
Frame	320 lbs. [145 kg], and
Grate "V"	105 lbs. [47 kg].

Lighter weight frames and grates that meet the requirements of CMS 711.14 may also be provided. Grate openings and dimensions shall not differ from those shown unless otherwise shown in the plans.

The following text shall be cast into the top of the curb casting:

"DUMP NO WASTE" and "DRAINS TO WATERWAY"

Text shall be printed in bold, capital letters with a minimum height of *". See example on Plan (Sht. 2/2). "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

BEARING AREAS: The frame and grate shall be so fitted and finished as to provide a firm and even seat. No projections shall exist on bearing areas of either casting and the grate shall seat in its frame without rocking.

WALLS: When used in place of concrete, brick side walls shall be 8" [200] nominal thickness.

PRECAST CONSTRUCTION: Permitted, except for the apron. Concrete shall meet the requirements of CMS 706.13. Precast walls shall have a minimum thickness of 6" [150] and reinforcing shall be sufficient to permit shipping and placement without damage. The wall thickness reduction shall be from the outside.

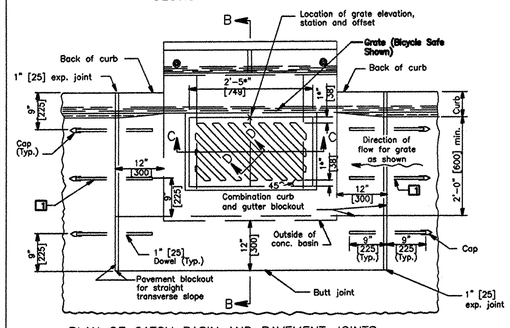
MINIMUM DEPTH: The minimum depth is per the cover requirements for that pipe type.

OPENINGS: Pipe openings shall be the O.D. of the pipe being supplied plus 2" [50] when fabricated or field cut. Fill any voids per CMS 601.

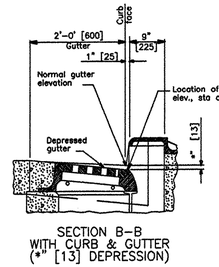
DOWELS: Four 1"x18" [25x450] dowels are required for concrete pavement or gutter blockout. See SCD BP-2.2 for dowel details.

BLOCKOUT: Blockouts shall be paved with Class C concrete in PCC pavement or gutter and paid for as a part of the pavement or gutter with no deduction in pavement, curb or gutter quantities because of the castings. A Class C concrete apron the size of the 2'-0" [600] gutter shall be cast-in-place in asphalt pavement (no dowels required) with the cost included in the catch basin bid price. No deduction to be made in curb quantities.

PAYMENT: All materials and labor, including excavation and backfilling, shall be paid for under Item 604 - Catch Basin, No. 3A.



PLAN OF CATCH BASIN AND PAVEMENT JOINTS
(For SECTIONS C-C and D-D, see Sht. 2/2)



SECTION B-B
WITH CURB & GUTTER
(*" [13] DEPRESSION)

CATCH BASIN No. 3A

STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASIN No. 3A

OHIO DEPARTMENT OF TRANSPORTATION
STATE HYDRAULIC ENGINEER

DATE
7-20-01
7-19-02
7-15-05

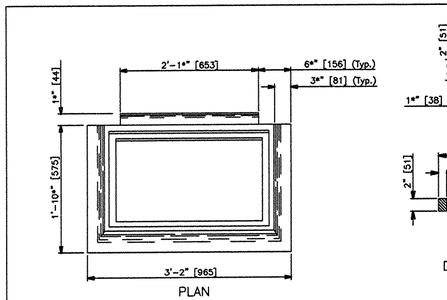
HYDRAULIC ENGINEER
M. Wenzelberger

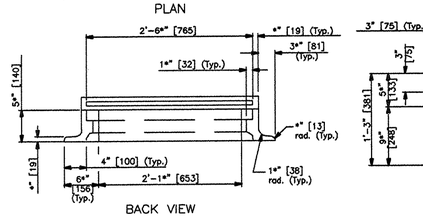
All metric dimensions [in brackets] are millimeters unless otherwise noted.

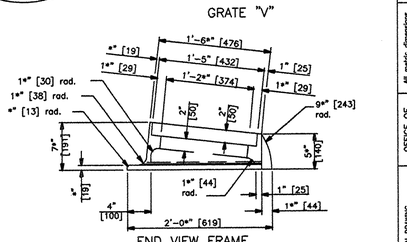
OFFICE OF STRUCTURAL ENGINEERING

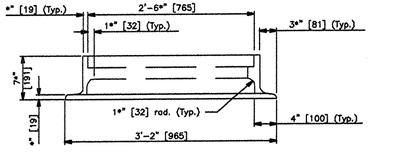
NUMBER CB-2.2

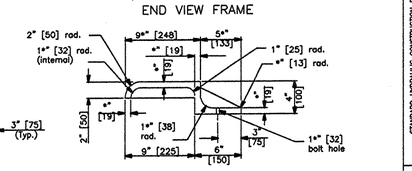
1/2











STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASIN No. 3A

OHIO DEPARTMENT OF TRANSPORTATION
STATE HYDRAULIC ENGINEER

DATE
7-20-01
7-19-02
7-15-05

HYDRAULIC ENGINEER
M. Wenzelberger

All metric dimensions [in brackets] are millimeters unless otherwise noted.

OFFICE OF STRUCTURAL ENGINEERING

NUMBER CB-2.2

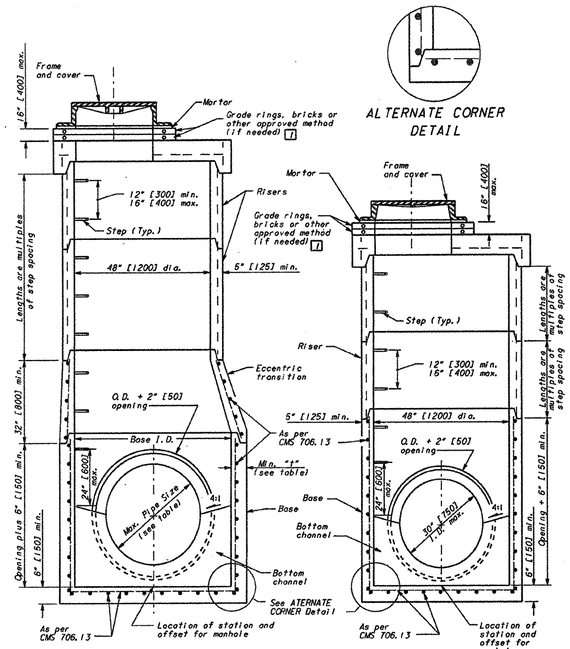
2/2

MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

103
146

F:\JOBS\665\MD\665MD03A.DWG P.W. 3/20/07 PLOT 1:1



ALTERNATE CORNER DETAIL

60" to 108" [1500 to 2750] PRECAST BASE

SEE TABLE FOR MAXIMUM PIPE SIZES

48" [1200] PRECAST BASE

FOR 30" [750] AND SMALLER PIPE

SECTION VIEWS OF REINFORCED PRECAST MANHOLES

NOTES

GENERAL: With normal soil and site conditions this standard precast manhole may be used for any required manhole depth.

Sections of the precast manhole shall be cast and assembled with either all tongue or all groove ends up. Lift holes may be provided in each section for handling.

Handling device for the flat slab shall be left in place.

TOP: This section shall be a flat slab unless an eccentric cone is specified.

TRANSITION (OR REDUCER): This section can be either eccentric cone or flat slab.

BASE: Manhole No. 3 is shown with a monolithic floor and riser which may be cast in one or two operations. A permissible alternate is to cast and ship the floor and barrel separately. Openings for inlet and outlet pipes shall be provided, either when the unit is cast or later, to meet project requirements. Bottom channels may be formed of concrete, precast in the base or field constructed as shown on SCD MH-1.1 and MH-3.1.

RISER SECTIONS: Openings for 18" [450] and smaller inlet pipes may be either prefabricated, or cut in the field provided the sides of the pipe at the springline do not project into the manhole.

CONNECTIONS: Connections between precast manhole sections and pipes on sanitary sewers may be sealed with resilient connectors conforming to ASTM C 923.

JOINT SEAL: Seal between precast manhole sections on sanitary sewers shall be resilient and flexible gasket joints per CMS 706.11.

OPENINGS: The maximum pipe opening shall be the O.D. of the pipe being supplied plus 2" [50] when fabricated or field cut. Fill any voids per CMS 601.

MATERIALS: Materials for bases and other precast sections, including reinforcement not specified hereon, shall comply with the requirements of CMS 706.13.

DROP PIPE: When specified on the plans, drop pipe shall be constructed as shown on SCD MH-3.1.

STEPS, FRAMES AND COVERS: Shall comply with the requirements set forth on SCD MH-1.1.

TOP SLAB REBAR: Reinforcing steel used within the top slab shall be epoxy coated.

LEGEND

7 Reconstruction to grade only. Approved materials are kept on file by the Office of Materials Management.

MAXIMUM PIPE SIZES		
BASE I.D.	MIN. "t"	MAX. PIPE SIZE
60" [1500]	5" [125]	36" [900]
72" [1800]	6" [150]	48" [1200]
84" [2100]	7" [175]	54" [1350]
90" [2250]	7½" [190]	60" [1500]
96" [2400]	8" [200]	66" [1650]
108" [2750]	9" [230]	72" [1800]

ONLY DEPARTMENT OF TRANSPORTATION — ENGINEER OF BRIDGES

DATE 7-20-01, 7-19-02, 7-15-05, 1-20-06

HYDRAULIC ENGINEER M. Knuckhorst

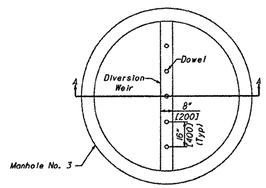
All metric dimensions (in brackets [ ]) are soft conversions unless otherwise noted.

OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING — MANHOLE No. 3

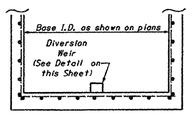
NUMBER MH-1.2

1 / 2



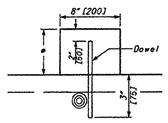
MANHOLE NO. 3 W/ __" BASE I.D. AND __" WEIR

(NTS)



SECTION A-A

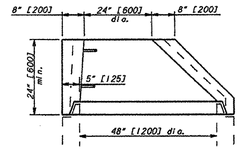
(NTS)



* Furnish weir height as shown in plans.

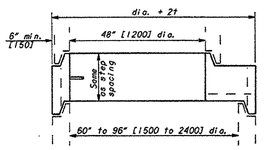
DIVERSION WEIR DETAIL

(NTS)

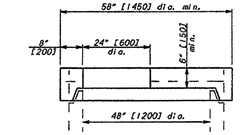


ALTERNATE ECCENTRIC CONE TOP

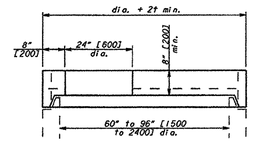
(Only if specified)



FLAT SLAB TRANSITION



FLAT SLAB TOP



FLAT SLAB TOP

NOTES

MANHOLE NO. 3 W/ __" BASE I.D. AND __" DIVERSION WEIR: Furnish manhole base with precast diversion weir or construct diversion weir from Structure Concrete, Class C or Brick and Masonry Units conforming to CMS 604. A bottom channel section for the manhole is not required when a diversion weir is specified on the plans.

Place diversion weir perpindicular to flow of inflowing trunk sewer. Dowel concrete or masonry units into the base of the manhole to a depth of 3" [75] using epoxy coated #4 reinforcing bars. Start dowels at the center of the diversion weir and and space 16" [400] on center across the entire weir.

All materials and labor, including excavation and backfill, shall be paid for at the contract price for **ITEM 604 - MANHOLE NO. 3 WITH __" BASE I.D. AND __" DIVERSION WEIR.**

ONLY DEPARTMENT OF TRANSPORTATION — ENGINEER OF BRIDGES

DATE 7-20-01, 7-19-02, 7-15-05, 1-20-06

HYDRAULIC ENGINEER M. Knuckhorst

All metric dimensions (in brackets [ ]) are soft conversions unless otherwise noted.

OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING — MANHOLE No. 3

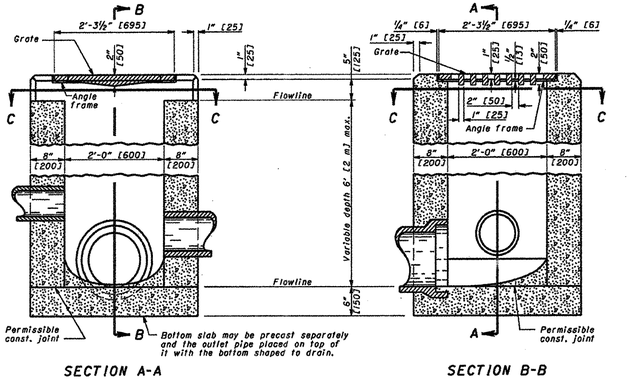
NUMBER MH-1.2

2 / 2

MISCELLANEOUS DETAILS

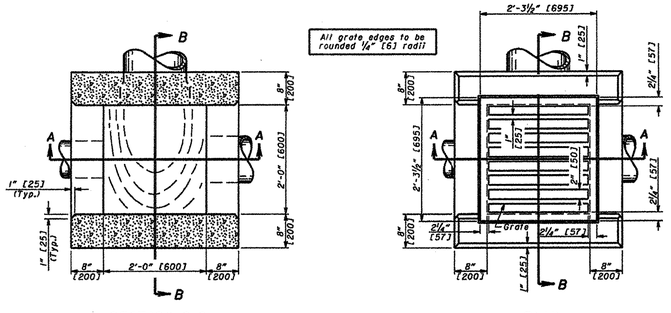
CUY-WEST 150th STREET

104 / 146



SECTION A-A

SECTION B-B



SECTION C-C

PLAN

CATCH BASIN No. 2-2A

NOTES

GENERAL: Catch Basins 2-2A and 2-2B are not intended for traffic bearing applications.

CATCH BASINS 2-2A & B: This sheet depicts Catch Basin 2-2A. See Sheet 2 of 2 for Catch Basin 2-2B.

GRATE AND FRAME: The design shall be essentially the same and equally as strong as the one shown (see Construction Information table), or meet the requirements of CMS 711.14. Grate openings and dimensions shall not differ from those shown here unless otherwise shown in the plans.

As of January 1, 2003, the following text shall be cast into the top of the grate:

"DUMP NO WASTE" and **"DRAINS TO WATERWAY"**

Text shall be printed in bold, capital letters with a minimum height of ½". "WATERWAY" may be substituted with "STREAM","RIVER","LAKE", etc. Actual placement and logo may vary per manufacturer.

WALLS: Brick or cast-in-place walls have a nominal thickness of 8" [200]. Precast walls shall have a minimum thickness of 6" [150] and be reinforced sufficiently to permit shipping and handling without damage. Brick shall not be used above the flow line of the side opening for Type 2-2A.

CONCRETE: Cast-in-place concrete is to be Class C. All precast concrete shall meet the requirements of CMS 706.13 and marked with the catch basin number.

PRECAST BASE: If a precast base is used, it shall be set deep enough so that the top can be placed on the base to provide the grate elevation specified in the plans. Layers of brick shall not be used to adjust the top elevation.

LOCATION AND ELEVATION: When given on the plans, location is the top center of the grate and the elevation is the flow line of the side inlet.

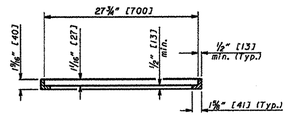
MINIMUM DEPTH: The minimum depth of CB No. 2-2A shall be the outside diameter (O.D.) of the outlet pipe plus 7" [175].

OPENINGS: Pipe openings shall be the O.D. of the pipe being supplied plus 2" [50] when fabricated or field cut. Fill any voids per CMS 601.

2-2A SIDE INLETS: Inlets shall be provided on both sides of the No. 2-2A catch basin in sags and on upstream side only where the ditch has a continuous down grade past the catch basin. CB 2-2A's shall not be used within the Clear Zone. The flow line should be 4" to 6" [100 to 150] below normal ditch returning to normal 10' to 15' [3 m to 5 m] each side of the inlet.

PAYMENT: All materials and labor, including excavation and backfilling, shall be paid for under **Item 604 - Catch Basin, No. 2-2A.**

CONSTRUCTION INFORMATION
Minimum weight (mass) of grate, 120 lbs. (54 kg)
Minimum weight (mass) of frame, 40 lbs. (18 kg)



SECTION THRU ANGLE FRAME FOR STANDARD No. 2-2A CATCH BASIN

ONLY DEPARTMENT OF TRANSPORTATION — ENGINEER OF BRIDGES

DATE 7-20-01, 7-19-02, 7-15-05

STATE HYDRAULIC ENGINEER

HYDRAULIC ENGINEER M. Knuckhorst

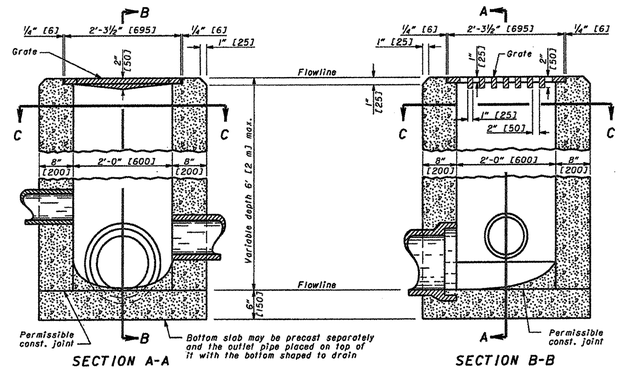
All metric dimensions (in brackets [ ]) are soft conversions unless otherwise noted.

OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING — CATCH BASINS No's 2-2A & B

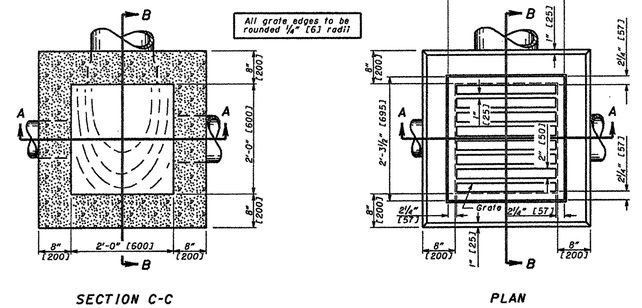
NUMBER CB-1.1

1 / 2



SECTION A-A

SECTION B-B



SECTION C-C

PLAN

CATCH BASIN No. 2-2B

NOTES

CATCH BASINS 2-2A & B: This sheet depicts Catch Basin 2-2B. See Sheet 1 of 2 for Catch Basin 2-2A.

GRATE: The design shall be essentially the same and equally as strong as the one shown (see construction information table), or meet the requirements of CMS 711.14. Grate openings and dimensions shall not differ from those shown unless otherwise shown in the plans.

If necessary, bicycle safe grates shall be specified in the plans. Bicycle safe grates shall be Neenah No. R-4855-C or East Jordan No. 5110 Type M3 or approved equals.

As of January 1, 2003, the following text shall be cast into the top of the grate:

"DUMP NO WASTE" and **"DRAINS TO WATERWAY"**

Text shall be printed in bold, capital letters with a minimum height of ½". "WATERWAY" may be substituted with "STREAM","RIVER","LAKE", etc. Actual placement and logo may vary per manufacturer.

WALLS: Brick or cast-in-place walls have a nominal thickness of 8" [200]. Precast walls shall have a minimum thickness of 6" [150] and be reinforced sufficiently to permit shipping and handling without damage.

CONCRETE: Cast-in-place concrete is to be Class C. All precast concrete shall meet the requirements of CMS 706.13 and be marked with the catch basin number.

PRECAST BASE: If a precast base is used, it shall be set deep enough so that the top can be placed on the base to provide the grate elevation specified in the plans. Layers of brick shall not be used to adjust the top elevation.

LOCATION AND ELEVATION: When given on the plans, location and elevation are at the top center of the grate. When side openings are provided, the elevation shall be at the flow line of the side inlet.

MINIMUM DEPTH: The minimum depth for CB No. 2-2B shall be the O.D. of the outlet pipe plus 4" [100].

2-2B GRATE ELEVATION: Grate elevation is to be placed 4" to 6" [100 to 150] below normal ditch returning to normal 10' to 15' [3 m to 5 m] each side of inlet.

OPENINGS: Pipe openings shall be the O.D. of the pipe being supplied plus 2" [50] when fabricated or field cut. Fill any voids per CMS 601.

PAYMENT: All materials and labor, including excavation and backfilling, shall be paid for under **Item 604 - Catch Basin, No. 2-2B.**

CONSTRUCTION INFORMATION
Minimum weight (mass) of grate, 120 lbs. (54 kg)

CATCH BASIN	OUTLET PIPE SIZE
2-2A	12" to 21" (300 to 525)
2-2B	12" to 21" (300 to 525)

ONLY DEPARTMENT OF TRANSPORTATION — ENGINEER OF BRIDGES

DATE 7-20-01, 7-19-02, 7-15-05

STATE HYDRAULIC ENGINEER

HYDRAULIC ENGINEER M. Knuckhorst

All metric dimensions (in brackets [ ]) are soft conversions unless otherwise noted.

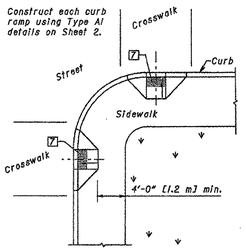
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING — CATCH BASINS No's 2-2A & B

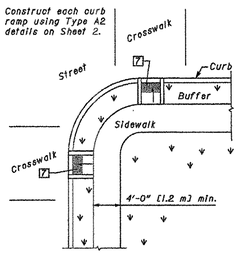
NUMBER CB-1.1

2 / 2

F:\JOBS\665\MD\665MD04.DWG PJK 3/22/07 PLOT 1:1

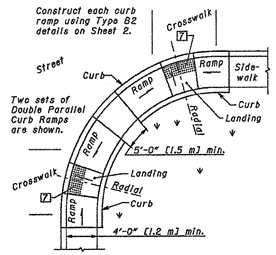


Use curb ramps with flared sides at locations with wide sidewalks.



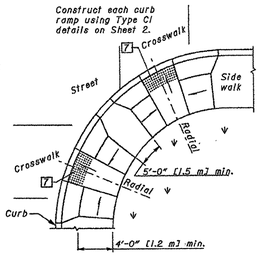
Use curb ramps with returned curbs where buffer is wide enough to accommodate ramp slope.

PERPENDICULAR CURB RAMPS



Place on streets having wide turning radius and where sidewalks are narrow.

PARALLEL CURB RAMPS



Curb ramp placement where streets have wide turning radius, and sufficient sidewalks width.

COMBINATION CURB RAMPS

PREFERRED CONSTRUCTION PLACEMENT

CURB RAMP NOTES

GENERAL: This drawing shows curb ramp types details and placement examples for new curb ramp construction, including the installation of truncated domes. To retrofit existing curb ramps with truncated domes, see SCD BP-7.2.

Curb ramp types are shown on Sheet 2 and include Perpendicular, Parallel, and Combined types as specified to be constructed in the locations shown on the project plans. The contractor may adjust the placement of curb ramps if existing field conditions warrant, according to CONSTRUCTION PLACEMENT details (this sheet), and with the approval of the Engineer.

DETECTABLE WARNINGS: Install Truncated Domes on each curb ramp with approved materials, as shown on Sheet 3. Install these proprietary products as per manufacturer's written instructions.

DRAINAGE: Contractor is to ensure the base of each constructed curb ramp allows for proper drainage, without exceeding allowable grass slope or ramp slopes. Vertical change in level exceeding ½" [13] between the 1) pavement and gutter, and 2) gutter and ramp, are not allowed.

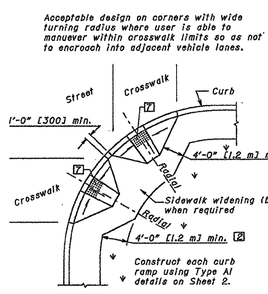
SURFACE TEXTURE: Texture of concrete surfaces by coarse brooming transverse to the ramp slopes and is to be rougher than the adjacent walk.

JOINTS: Provide expansion joints in the curb ramp as extensions of walk joints and consistent with Item 608.03 requirements for a new concrete walk. Provide a ½" [13] Item 705.03 expansion joint filler around the edge of ramps built in existing concrete walks. Lines shown on this drawing indicate the ramp edges and slope changes, and do not necessarily indicate joint lines.

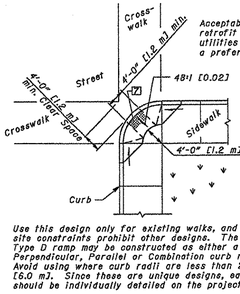
PAYMENT: Measure Walk and Curb, Items 608 and 609, through the curb ramp area paid for under their respective items. Removal of existing curb, walk (or existing curb ramps) are paid under Item 202.

New curb ramps constructed in curb and walks are paid for under Item 608 - Curb Ramp, Type ____ (AI, A2, BI, B2, CI, or C2), Each and includes the cost of any additional materials and installation (including truncated domes), grading, forming and finishing. Curb ramps constructed in existing curb and walk are paid under Item 608 - Curb Ramp, Type____ (AI, A2, BI, B2, CI, C2, or D) Square Foot [Meter], includes the cost of furnishing and installing all materials, (including truncated domes), grading, forming, and finishing of the curb and walk of the curb ramp.

For LEGEND, See Sheet 2.



PERPENDICULAR RAMPS



DIAGONAL RAMP (Type D)

ACCEPTABLE CONSTRUCTION PLACEMENT

THIS DRAWING REPLACES BP-7.1 DATED 7-28-00.
STANDARD ROADWAY CONSTRUCTION DRAWING
NEW CURB RAMPS
(with Truncated Domes)
NUMBER BP-7.1
1 / 3
ROADWAY ENGINEERING SERVICES
All metric dimensions in brackets [ ] are in millimeters unless otherwise noted.
STDS. ENGR. D. Focke
OHIO DEPARTMENT OF TRANSPORTATION
1-19-07 DATE
ROADWAY DESIGN ENGINEER

LEGEND

[1] Dimension may be reduced to 3'-0" [915] in existing sidewalks if the landing is unconstrained along the back edge.

[2] May be reduced to 3'-4" [1.02 m] in existing sidewalks to better fit the walk configuration or where site conditions are restricted by narrow walks, pole foundations, drainage inlets, etc. The width may be tapered.

[3] Where landing width (D) has been reduced to 3'-0" [915] the flared sides shall have a maximum slope of 12:1 [0.083].

Flared sides are not required where the edges of a curb ramp are protected by landscaping or other barriers to travel by wheel chair users or pedestrians across the edge of the curb ramp. However, if the flared sides are used in these areas, they may be of any slope.

[4] The slope of the ramp toward the curb is preferred to be 12:1 [0.083] or flatter related to the horizontal.

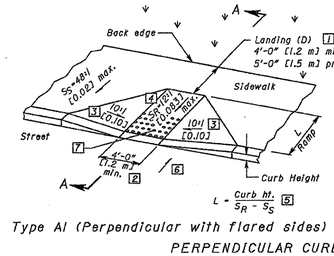
In existing sidewalks, where the maximum ramp slope (S_R) is not feasible, it may be reduced as follows:

A) 10:1 [0.10] for a max. rise of 6" [150],
B) 8:1 [0.125] for a max. rise of 3" [75],
C) 6:1 [0.167] over a max. run of 2'-0" [610] for historic areas where a flatter slope is not feasible.

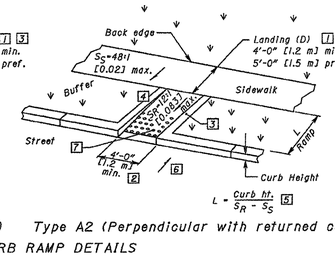
[5] The minimum length of a perpendicular ramp is 6' [2.0 m] from the back of a 6" [150] curb and may be increased where feasible to obtain a flatter ramp slope or to better blend with the walk configuration.

[6] Gutter counter slopes at the foot of perpendicular curb ramps should not exceed 20:1 [0.05] over a distance of 2'-0" [610] from the curb.

[7] Detectable Warnings (truncated domes) are to be installed in the location shown. Dimensions of the domes are 24" [610] from the back of the curb by the width of the ramp. See DETECTABLE WARNINGS NOTES on Sheet 3.

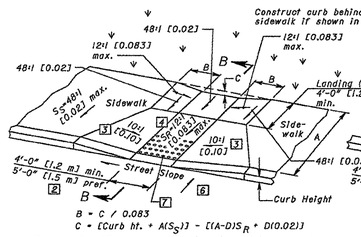


Type AI (Perpendicular with flared sides)

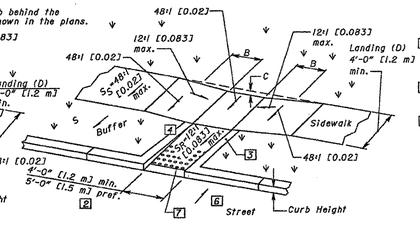


Type A2 (Perpendicular with returned curb)

PERPENDICULAR CURB RAMP DETAILS

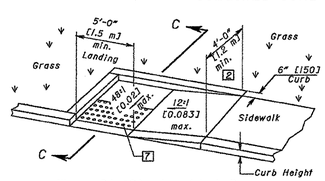


Type CI (Combined with flared sides)



Type C2 (Combined with returned curb)

COMBINED CURB RAMP DETAILS



Type BI (Single sided Parallel)

Street Slope	Ramp Length @ 1"/ft [0.083]	
	L LOW SIDE *	L HIGH SIDE *
0.01	5'-5" [1.6 m]	6'-10" [2.1 m]
0.02	4'-10" [1.5 m]	7'-11" [2.4 m]
0.03	4'-5" [1.3 m]	9'-5" [2.9 m]
0.04	4'-1" [1.2 m]	11'-8" [3.6 m]
0.05	3'-9" [1.1 m]	15'-2" [4.6 m]

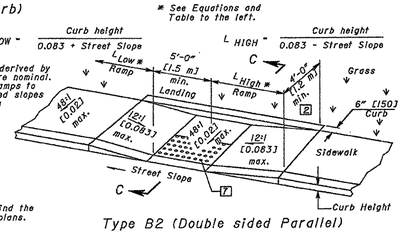
* Measured along the back of a 6" [150] high curb.

For Parallel Ramps construct curb behind the sidewalk if required elsewhere in the plans.

Dimensions derived by equations are nominal. Construct ramps to meet required slopes and existing conditions.

$L_{LOW} = \frac{\text{Curb height}}{0.083 + \text{Street Slope}}$ * See Equations and Table to the left.

$L_{HIGH} = \frac{\text{Curb height}}{0.083 - \text{Street Slope}}$

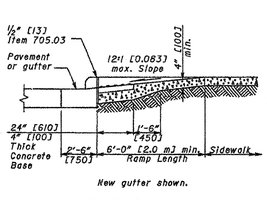


Type B2 (Double sided Parallel)

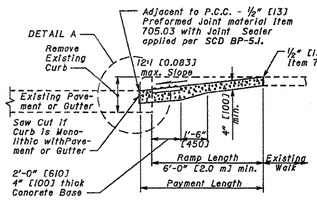
PARALLEL CURB RAMP DETAILS

See Sheet 3 for Sections.

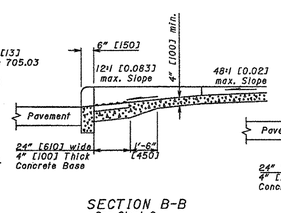
THIS DRAWING REPLACES BP-7.1 DATED 7-28-00.
STANDARD ROADWAY CONSTRUCTION DRAWING
NEW CURB RAMPS
(with Truncated Domes)
NUMBER BP-7.1
2 / 3
ROADWAY ENGINEERING SERVICES
All metric dimensions in brackets [ ] are in millimeters unless otherwise noted.
STDS. ENGR. D. Focke
OHIO DEPARTMENT OF TRANSPORTATION
1-19-07 DATE
ROADWAY DESIGN ENGINEER



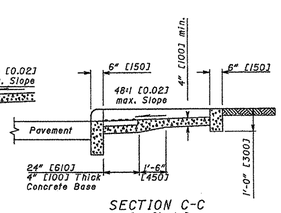
SECTION A-A
NORMAL DETAIL
See Sheet 2.



SECTION A-A
EXISTING WALK DETAIL
See Sheet 2.



SECTION B-B
See Sheet 2.



SECTION C-C
See Sheet 2.

DETECTABLE WARNINGS NOTES

PLACEMENT: Truncated domes are to be installed at any location where pedestrians might cross paths with vehicular traffic lanes, such as the base of curb ramps or at blended curbs. A 24" [610] strip of domes is to be installed for the full width of the ramp. Typical street corner placement locations are shown on Sheet 1.

Ramp cross sections underneath truncated domes are a 4" [100] thick concrete base. Ramp cross sectional details shown here depict nominal 2" [50] thick pavers. Increase base thickness to maintain the 4" [50] thickness if using deeper pavers. Do not decrease thickness for thinner products. See DETAIL A.

ALIGNMENT: Truncated domes should be aligned with the primary direction of pedestrian travel as shown on the DOME ALIGNMENT Detail. Normally the domes should be flush with the back of the curb, but in skewed conditions can be up to 6" [150] to 8" [200] behind the curb, as shown on the DOME ALIGNMENT ON RADIUSED CURB Detail. For non-standard layouts, dome materials may have to be mitered and placed segmentally (see TREATMENT AT BLENDED CURBS Detail on SCD BP-7.2).

VISUAL CONTRAST: Color of the truncated domes should contrast with surrounding concrete walk and ramp. Use of a red blend is recommended for concrete curb ramps. Black is not an acceptable color.

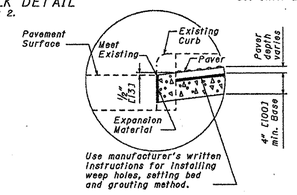
PRODUCTS: Approved products include clay and concrete pavers, cast iron, and cast-in-place engineered plastics and a listing of them may be found on the Office of Roadway Engineering Service's Truncated Domes Approved List (at www.dot.state.oh.us/roadwayengineering/index.asp). Install products as per manufacturer's printed instructions, with added instructions for pavers shown below.

If using pavers, setting bed and joints to be grouted in accordance with manufacturer's written instructions and provide written copies to the Engineer. If the installation method requires a grout bed, bonding group or other cementatious materials, provide documentation that the materials have freeze thaw resistance equal to the pavers.

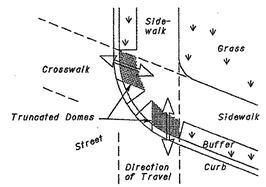
Mortared joints are to be flush with top surface and struck so as to give a smooth surface. Pavers shall be laid such that joints are level with adjoining joints to provide a smooth transition from brick to brick and brick to concrete surface.

The width of paver joints are to be between 5/32" [4] and 1/16" [1.5]. Pavers should not directly touch each other unless they have spacing bars.

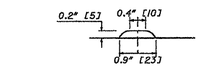
The surface of any two adjacent units should not differ by more than ½" [3] in height. Place pavers in a running bond pattern. Face of all pavers are to be clean of cement and protected to avoid chipping during installation.



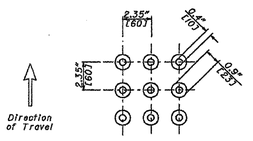
DETAIL A



DOME ALIGNMENT

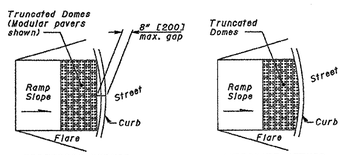


HEIGHT AND DIAMETER



SQUARE PATTERN, PARALLEL ALIGNMENT

TRUNCATED DOMES DETAILS



PREFERRED METHOD

ALTERNATE METHOD

Use Preferred Method for aligning truncated domes unless curb curvature would produce gap more than 8" [200] from front of curb to the domes. If gap will be greater than 8" [200] miter truncated dome product to match the back of the curb as shown in the Alternate Method. NOTE: Some approved Truncated Domes products are easier to miter than others.

DOME ALIGNMENT ON RADIUSED CURB

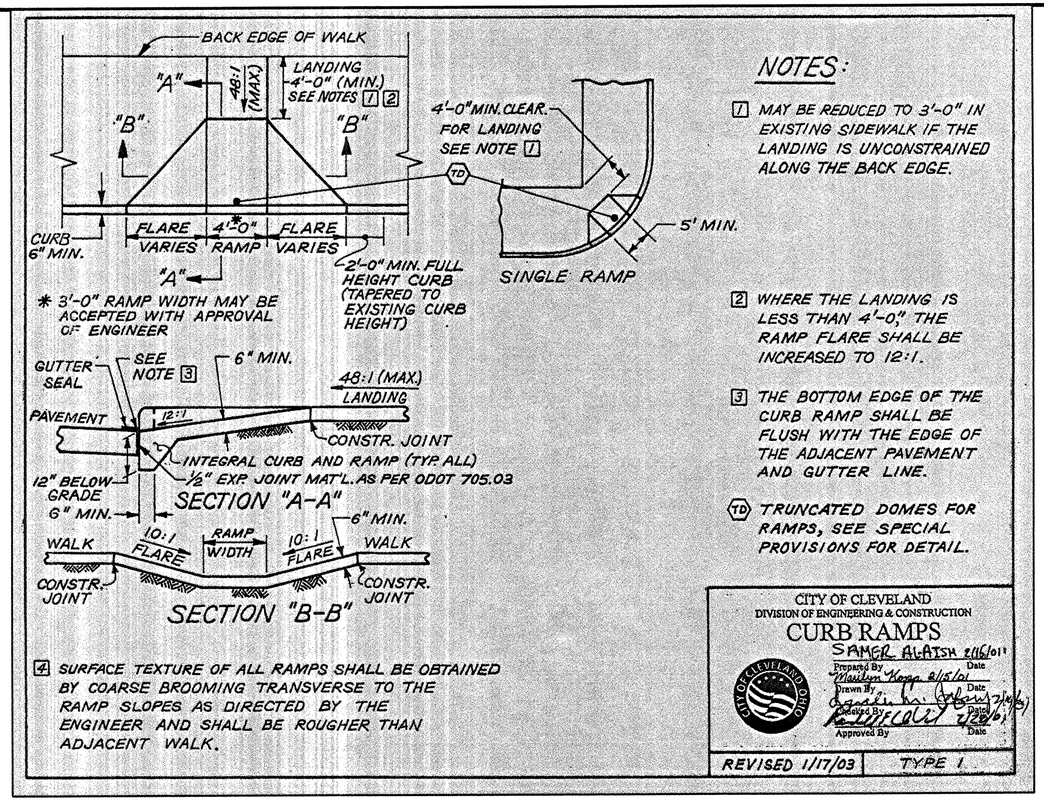
THIS DRAWING REPLACES BP-7.1 DATED 7-28-00.
STANDARD ROADWAY CONSTRUCTION DRAWING
NEW CURB RAMPS
(with Truncated Domes)
NUMBER BP-7.1
3 / 3
ROADWAY ENGINEERING SERVICES
All metric dimensions in brackets [ ] are in millimeters unless otherwise noted.
STDS. ENGR. D. Focke
OHIO DEPARTMENT OF TRANSPORTATION
1-19-07 DATE
ROADWAY DESIGN ENGINEER

F:\JOBS\665\MD\665MD05.DWG PJK 3/22/07 PLOT 1:1

MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

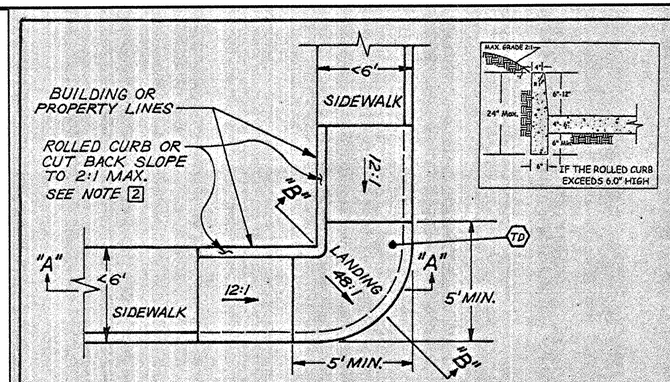
104A
146



NOTES:

1. MAY BE REDUCED TO 3'-0" IN EXISTING SIDEWALK IF THE LANDING IS UNCONSTRAINED ALONG THE BACK EDGE.
2. WHERE THE LANDING IS LESS THAN 4'-0," THE RAMP FLARE SHALL BE INCREASED TO 12:1.
3. THE BOTTOM EDGE OF THE CURB RAMP SHALL BE FLUSH WITH THE EDGE OF THE ADJACENT PAVEMENT AND GUTTER LINE.
TD TRUNCATED DOMES FOR RAMPS, SEE SPECIAL PROVISIONS FOR DETAIL.
4. SURFACE TEXTURE OF ALL RAMPS SHALL BE OBTAINED BY COARSE BROOMING TRANSVERSE TO THE RAMP SLOPES AS DIRECTED BY THE ENGINEER AND SHALL BE ROUGHER THAN ADJACENT WALK.

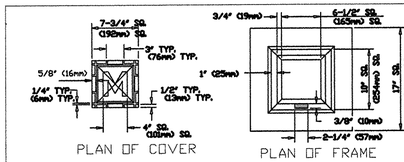
CITY OF CLEVELAND
DIVISION OF ENGINEERING & CONSTRUCTION
CURB RAMPS
SAMER ALATSH 2/16/01 Prepared By Date
Marilyn Kapp 2/15/01 Drawn By Date
Approved By Date
REVISED 1/17/03 | TYPE 1

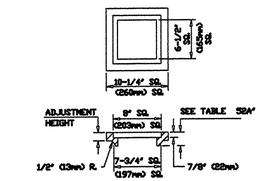


NOTES:

1. THE BOTTOM EDGE OF THE LANDING SHALL BE FLUSH WITH THE EDGE OF THE PAVEMENT AND GUTTER LINE
2. WHERE A ROLLED CURB EXCEEDS SIX INCHES ABOVE THE WALK, THE CONTRACTOR SHALL INSTALL TYPE 'G' CURB. ROLLED CURB SHALL BE INSTALLED ONLY AT THE DIRECTION OF THE ENGINEER.
3. SURFACE TEXTURE OF ALL RAMPS SHALL BE OBTAINED BY COARSE BROOMING TRANSVERSE TO THE RAMP SLOPES AS DIRECTED BY THE ENGINEER AND SHALL BE ROUGHER THAN ADJACENT WALK.
TD TRUNCATED DOMES FOR RAMPS, SEE SPECIAL PROVISIONS FOR DETAIL.

CITY OF CLEVELAND
DIVISION OF ENGINEERING & CONSTRUCTION
CURB RAMPS
SAMER AL-ATSH 2/15/01 Prepared By Date
Marilyn Kapp 2/15/01 Drawn By Date
Approved By Date
REVISED 1/17/03 | TYPE 7

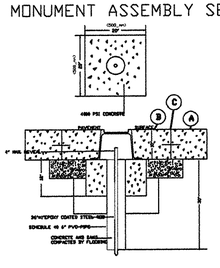




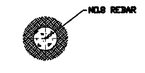
NOTE: ADJUSTING RING IS TO BE TACK WELDED TO THE FRAME BY AT LEAST TWO (2) POINTS OF AN APPROVED METHOD.

ADJUSTMENT HEIGHT	DIMENSION 'B'A'	MINIMUM WEIGHTS
1-1/8" (29mm)	2" (51mm)	14-LBS. (6.4kg)
1-1/2" (38mm)	2-3/8" (60mm)	20-LBS. (9.1kg)
2-1/2" (64mm)	3-3/8" (86mm)	27-LBS. (12.2kg)
3" (76mm)	3-7/8" (98mm)	30-LBS. (13.6kg)
3-1/2" (89mm)	4-3/8" (111mm)	32-LBS. (14.5kg)

MONUMENT ASSEMBLY SECTION

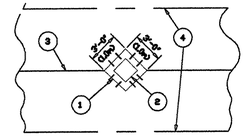


ROADWAY MONUMENT ASSEMBLY



RIGHT OF WAY MONUMENT

(A) NEW OR EXISTING PAVEMENT, A.P.P.
(B) NEW 3" ASPHALT OVER 7" CONCRETE OR 10" CONCRETE AS DETERMINED BY THE ABUTTING PAVEMENT.
(C) 4" GUTTER SEAL AS PER IDOT 404.13 FOR ASPHALT SURFACES OR JOINT SEALER AS PER IDOT 407.13 FOR CONCRETE SURFACE DO NOT SEAL THE COVER TO FRAME



(1) MONUMENT ASSEMBLY BLOCK OUT OR FULL DEPTH SAW CUT CONSTRUCTION JOINT. W/12" (305mm) LONG 1-1/4" (32mm) DIA. DOWELS. CITY CONTRACTORD, MAY BE OMITTED IF THE EXISTING CONCRETE BASE, IF ANY IS LESS THAN 6" IN THICKNESS.
(2) MONUMENT BOX CITY CONTRACTORD
(3) TYPICAL LONGITUDINAL JOINT
(4) NEW CONRETE OR ASPHALT OVER CONCRETE PAVEMENT; OR EXISTING PAVEMENT.

TYPICAL BLOCK OUT IN NEW RIGID PAVEMENT OR MINIMUM FULL DEPTH SAW CUT IN EXISTING PAVEMENT.

NOTES

CASTINGS SHALL MINIMALLY MEET THE REQUIREMENTS OF 604.02-7THRU 12 ASTM A 48, CLASS 35 GRAY IRON OR 7THRU 12 DUCTILE IRON.
THE ASSEMBLY SHALL BE ESSENTIALLY THE SAME AND EQUALLY AS STRONG AS THESE SHOWN HEREIN.

MINIMUM WEIGHTS:
FRAME ——— 94 LBS. (42.6 kg)
COVER ——— 16 LBS. (7.3 kg)
PROVIDED THEY COMPLY WITH THE SPECIFICATIONS, DETAILS, DIMENSIONS AND MINIMUM WEIGHTS.
EAST JORDAN MOG360
OR APPROVED EQUAL CASTINGS ARE ACCEPTABLE.

BEARING AREAS SHALL BE FINISHED AS TO PROVIDE A FIRM AND EVEN SEAT SO THAT COVER SHALL EXTEND THE ENTIRE BEARING AREA AND THE COVER SHALL SEAT IN ITS FRAME WITHOUT ROCKING.

PRIOR TO CONSTRUCTION OF PAVEMENT, THE FRAME SHALL BE SET TO GRADE IN SUCH A MANNER THAT WILL PREVENT ANY PAVEMENT MATERIAL FROM ENTERING THE CASTING.

CONTACT CITY OF CLEVELAND SURVEY DEPT. AT (216) 664-3427 AT LEAST TWO (2) WEEKS PRIOR TO THE DISTURBANCE OF ANY EXISTING MONUMENTS.

ALL MONUMENTS ARE TO BE SET UNDER THE SUPERVISION OF A REGISTERED SURVEYOR. REF. O.A.C. 4733-37-03)

WHERE CLEVELAND REGIONAL GEODETIC SURVEY (C.R.G.S.) MONUMENT ASSEMBLIES ARE MARKED ON THE PLANS TO BE ABANDONED, THE CONTRACTOR SHALL CAREFULLY REMOVE AND STORE THE MONUMENT CASTINGS AND BRONZE C.R.G.S. MARKERS FOR SALVAGE BY THE COUNTY. THE CONTRACTOR SHALL ALSO NOTIFY THE REGIONAL GEODETIC SURVEY OFFICE AT (216) 348-3946, SO THAT THE MONUMENT CASTINGS AND BRONZE C.R.G.S. MARKERS MAY BE PICKED UP. PAYMENT SHALL BE MADE UNDER ITEM 202-MONUMENT ASSEMBLY ABANDONED, C.R.G.S. MONUMENT.

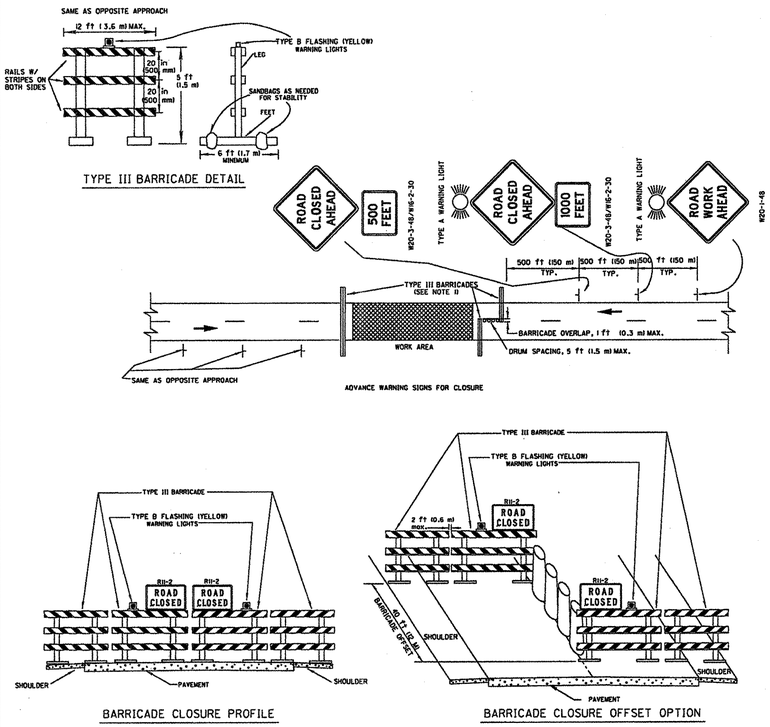
ITEM 202- MONUMENT ASSEMBLY ABANDONED, C.R.G.S. MONUMENT
ITEM 604- CITY OF CLEVELAND MONUMENT BOX
ITEM 604- CITY OF CLEVELAND ROADWAY MONUMENT ASSEMBLY
ITEM 604- CITY OF CLEVELAND RIGHT OF WAY MONUMENT
ITEM 604- MONUMENT BOX ADJUSTED TO GRADE, AS PER PLAN ONLY WHEN EXISTING MONUMENT BOX CONFORMS TO MB-1C AND IS SUITABLE FOR REUSE)

LEGEND
CONCRETE, 4000P.S.I. AS PER CONCRETE MIX
SAND (703.02), COMPACTED AS REQUIRED
SUBBASE/AGGREGATE BASE PER THE PLANS. (6" MINIMUM INCREASE IF REQUIRED, TO MATCH THE BOTTOM OF THE NEW OR EXISTING SUBBASE)
UNDISTURBED EARTH OR SUITABLE BACKFILL AND FILM FOUNDATION IN ACCORDANCE WITH 604.04 AND TO THE SATIFACTION OF THE ENGINEER.

CITY OF CLEVELAND
MONUMENT BOX & ASSEMBLIES
REVISIONS
STANDARD CONSTRUCTION DRAWING MB-1C
APPROVED_____DATED_____

MISCELLANEOUS DETAILS
CUY-WEST 150th STREET
105
146

F:\JOBS\665\MD\665MD05A.DWG JLN 4/11/07 PLOT 1:1



GENERAL NOTES

BARRICADE USE

1A. Barricades shall be NCHRP 350 compliant and shall be erected according to details shown. When the road is closed to traffic, barricades shall be used to effectively close the entire roadway, including the paved or aggregate shoulder.

1B. Barricades along adjacent lanes may be offset from each other as shown, with drums used to close the resulting gap. Maximum drum spacing shall be 5 feet (1.5 m).

BARRICADE REFLECTORIZATION AND COLOR

2A. In construction or maintenance areas, all rails of the barricades shall be reflectorized with orange and white reflectorized Type C sheeting in 6 inch (150 mm) wide alternate stripes which slope downward toward the center line of the road at an angle of 45°. All three rails of the barricade shall be striped on both sides. Legs and feet shall be either all-white or may display the natural color of the material used.

2B. Barricades used in permanent or semi-permanent application shall differ only in that they shall use red and white stripes.

SIGNS

3A. Where the road is closed to traffic by the erection of barricades, ROAD CLOSED (RII-2) signs shall be mounted laterally as shown.

3B. The Advance Warning Signs shown on this drawing are intended for use when the travelled way is brought to an end with no direction given to traffic. Where traffic has been directed from the permanent roadway at or just in advance of the barricades, advance signing should be provided as shown in Standard Construction Drawing MT-95.70 or OMUTCD Figure 6H-7 as appropriate.

3C. Advance Warning Signs approaching a lane closure, as shown on these plans, shall consist of two ROAD CLOSED AHEAD (W20-3) signs with distance plaques placed about 500 feet (150 m) and 1000 feet (300 m) from the closure, and a ROAD WORK AHEAD (W20-1) sign placed about 1500 feet (450 m) from the closure. The signs shall be placed on both sides of the roadway for 4-lane divided highways or when required by the plans.

FLASHING WARNING LIGHTS

4A. Type A Flashing Warning Lights are required on the ROAD WORK AHEAD (W20-1) sign and on the first ROAD CLOSED AHEAD (W20-3) sign.

4B. Type B Flashing Warning Lights shall be provided on Type III Barricades, one light per each closed lane. Each light shall be conspicuously visible at all distances up to 1000 feet (300 m) under normal atmospheric conditions. The light shall be in operation at all times during the period the highway is closed.

OPERATION ON 2-LANE 2-WAY ROADWAYS

5A. Where the barricade runs across the entire roadway without longitudinally offsetting sections, the Contractor will normally open only the left side of the barricade as necessary to allow the construction vehicle to enter, and then shall immediately close it. The entire barricade will not normally be opened at the same time. The Contractor shall assign an employee to assure that the barricade is closed at the end of each workday.

5B. Where the sections of the barricade are offset from each other with drums provided to close the gap (see note 1B), the Contractor may move the drums as necessary to allow the construction vehicle to enter, and then shall immediately replace the drums. The Contractor shall assign an employee to assure that the drums are in place at the end of each workday.

ROAD CLOSURE USING TYPE III BARRICADES

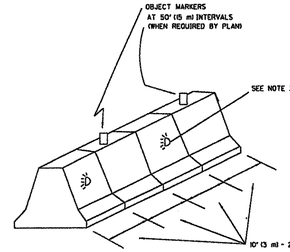
9-05-06 (REV 9-20-06) | OFFICE OF TRAFFIC ENGINEERING | MT-101.60 | 1/1

1. PCB SHALL BE DELINEATED AS FOLLOWS:

PCB TYPE	DELINEATION
32" (813 mm) HIGH WITHOUT GLARE SCREEN	BARRIER REFLECTORS @ 50' (15 m) C-C (MAX.) TOP MOUNTED OBJECT MARKERS 6"X12" (150 X 300 mm) @ 50' (15 m) C-C (MAX.)
32" (813 mm) HIGH WITH GLARE SCREEN	BARRIER REFLECTORS @ 50' (15 m) C-C VERTICAL STRIPES ON PADDLES 2"X12" (50 X 300 mm) @ 50' (7.6 m) C-C (MAX.)
50" (1270 mm) HIGH	BARRIER REFLECTORS @ 25' (7.6 m) C- C (MAX.)
TAPERED END SECTION AND EXPOSED END	OBJECT MARKERS 6"X12" (150 X 300 mm) TOP MOUNTED @ EACH END

2. DRAWING SHALL BE USED WHEN PCB IS SPECIFIED IN THE PLANS.

3. THE TOP OF THE BARRIER REFLECTOR SHALL BE MOUNTED AT 26 INCHES (660 mm) FROM THE BASE.



PORTABLE CONCRETE BARRIER (PCB)

PORTABLE CONCRETE BARRIER DELINEATION | 10-18-02

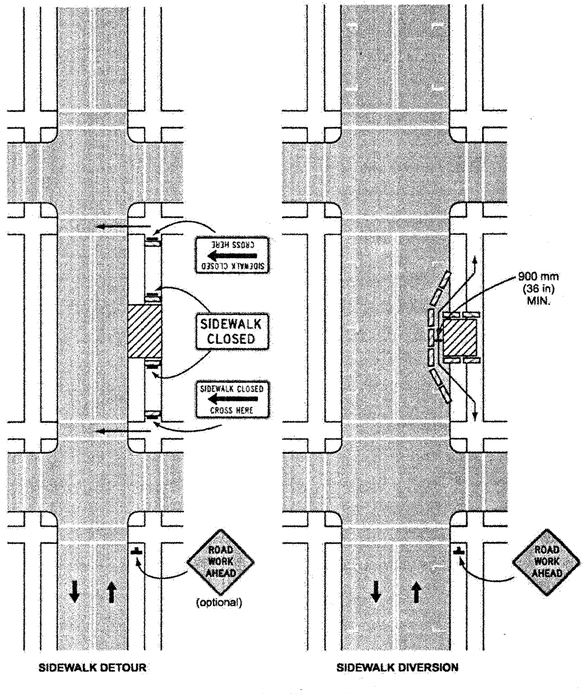
OFFICE OF TRAFFIC ENGINEERING | MT-101.70 | 1/1

MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

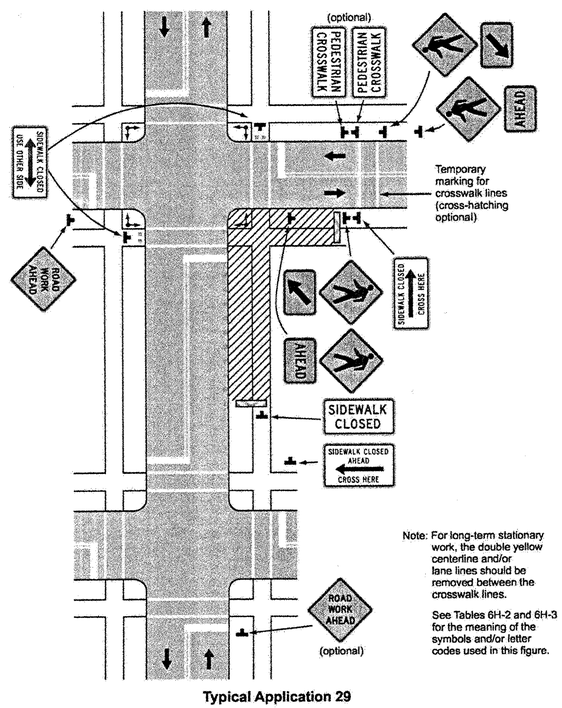
105A
146

Figure 6H-28. Sidewalk Detour or Diversion (TA-28)

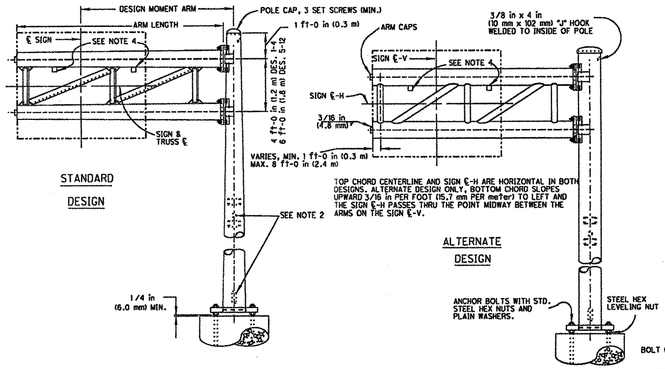


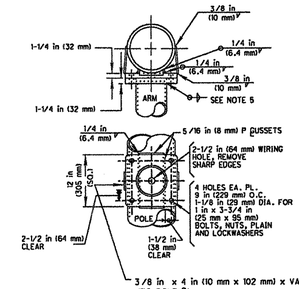
Typical Application 28

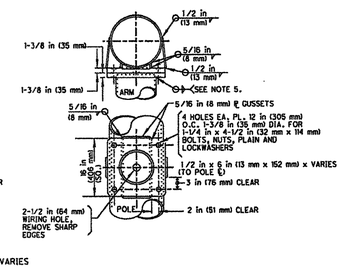
Figure 6H-29. Crosswalk Closures and Pedestrian Detours (TA-29)



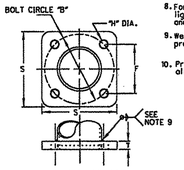
Typical Application 29



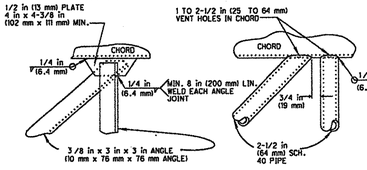




ARM ATTACHMENT DETAIL



POLE BASE DETAIL



ACCEPTABLE TRUSS JOINTS

NOTES

1. Unless otherwise noted, dimensions and instructions apply to both the standard and alternate designs.
2. For sign attachment assemblies to be furnished with this support, construction details and location of handholes and switch enclosure mounting brackets, see Standard Construction Drawings TC-22.10 and TC-22.20.
3. For foundation details, see Standard Construction Drawing TC-21.20.
4. For signs under 20 feet-0 inches (6.0 m) long, weld one threaded steel 1-1/4 inch (32 mm) pipe coupling to the top chord approximately 12 inches (300 mm) outboard of the first sign bracket. For signs 20 feet-0 inches (6.0 m) long or over, weld a second threaded steel 1-1/4 inch (32 mm) pipe coupling 12 inches (300) outboard of the second pipe bracket. Remove all sharp edges inside the chord and pipe coupling.
5. Weld the arm attachment plate inside and outside with fillet welds. Each fillet weld shall be equal to the wall thickness of the respective tubing.
6. For designs 11 and 12 change the 1/2 x 6 inches (13 x 152 mm) plates to 3/4 x 6 inches (19 x 152 mm), the 1/2 inch (13 mm) fillet welds to 3/4 inch (19 mm), the 1-1/4 x 4-1/2 inch (32 mm x 114 mm) bolts to 1-3/8 x 4-3/4 inches (35 mm x 121 mm) and 1-3/8 inch (35 mm) DIA. holes to 1-1/2 inch (38 mm) DIA. holes. All other notes and dimensions to be held.
7. Sign support arms under 18 feet-0 inches (5.5 m) do not require trussing.
8. For modification of the pole to support roadway lighting, see Standard Construction Drawings TC-22.10 and ML-10.12.
9. Weld the base plate to two ply poles with AWS prequalified welds in conformance with 730.04.
10. Provide a removable galvanized cast iron plug for all unused couplings and wire outlets.

1-19-07 | CANTILEVER OVERHEAD SIGN SUPPORT | OFFICE OF TRAFFIC ENGINEERING | TC-12.30 | 1/2

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED		
DESIGN NUMBER	OUTSIDE DIAMETERS	
	POLE SIZE	ARM SIZE
1	2 PLY.179 x 10 x 6.50 x 25 ft-0 in	.179 x 6 x 3.76 x 16 ft-0 in
1 ALT.	8-5/8 x .500 WALL x 25 ft-0 in	5-9/16 x .258 WALL x 16 ft-0 in
2	2 PLY.179 x 10 x 6.50 x 25 ft-0 in	.239 x 6 x 4.60 x 20 ft-0 in
2 ALT.	8-5/8 x .562 WALL x 25 ft-0 in	5-9/16 x .344 WALL x 20 ft-0 in
3	.299 x 13 x 9.22 x 27 ft-0 in	.179 x 8 x 5.76 x 16 ft-0 in
3 ALT.	10-3/4 x .438 WALL x 27 ft-0 in	6-5/8 x .250 WALL x 16 ft-0 in
4	.299 x 13 x 9.22 x 27 ft-0 in	.179 x 9 x 6.20 x 20 ft-0 in
4 ALT.	10-3/4 x .500 WALL x 27 ft-0 in	6-5/8 x .344 WALL x 20 ft-0 in
5	.299 x 15" x 11.08 x 28 ft-0 in	.179 x 9-1/2 x 6.42 x 22 ft-0 in
5 ALT.	12-3/4 x .500 WALL x 28 ft-0 in	8-5/8 x .250 WALL x 22 ft-0 in
6	2 PLY.179 x 15 x 11.08 x 28 ft-0 in	.239 x 10 x 6.36 x 26 ft-0 in
6 ALT.	12-3/4 x .562 WALL x 28 ft-0 in	8-5/8 x .322 WALL x 26 ft-0 in
7	2 PLY.179 x 16.5 x 12.58 x 28 ft-0 in	.239 x 10 x 6.64 x 24 ft-0 in
7 ALT.	14 x .562 WALL x 28 ft-0 in	8-5/8 x .322 WALL x 24 ft-0 in
8	2 PLY.239 x 16.5 x 12.58 x 28 ft-0 in	.239 x 11 x 7.08 x 28 ft-0 in
8 ALT.	14 x .594 WALL x 28 ft-0 in	10-3/4 x .279 WALL x 28 ft-0 in
9	2 PLY.239 x 16.5 x 12.30 x 30 ft-0 in	.239 x 11 x 7.36 x 26 ft-0 in
9 ALT.	14 x .688 WALL x 30 ft-0 in	10-3/4 x .279 WALL x 26 ft-0 in
10	2 PLY.239 x 18" x 13.80 x 30 ft-0 in	.239 x 13 x 8.80 x 30 ft-0 in
10 ALT	16 x .656 WALL x 30 ft-0 in	10-3/4 x .438 WALL x 30 ft-0 in
11	2 PLY.239 x 18 x 13.80 x 30 ft-0 in	.239 x 12-1/2 x 8.86 x 26 ft-0 in
11 ALT.	16 x .656 WALL x 30 ft-0 in	10-3/4 x .365 WALL x 26 ft-0 in
12	2 PLY.299 x 18 x 13.80 x 30 ft-0 in	.299 x 13 x 8.80 x 30 ft-0 in
12 ALT.	16 x .884 WALL x 30 ft-0 in	10-3/4 x .500 WALL x 30 ft-0 in

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED							
DESIGN NUMBER	DESIGN SIZE (SQ FT)	DESIGN MOMENT ARM (FT)	F	S	T	BOLT CIRCLE B	ANCHOR BOLTS	H
1	67	12	10-5/8	15-5/8	2	15	1-3/4 x 84	2-1/8
2	67	16	10-5/8	15-5/8	2	15	1-3/4 x 84	2-1/8
3	100	12	12-3/4	18-1/2	2	18	2 x 90	2-3/8
4	100	16	12-3/4	18-1/2	2	18	2 x 90	2-3/8
5	150	14	15-1/2	23	2	22	2 x 90	2-3/8
6	150	18	15-1/2	23	2	22	2 x 90	2-3/8
7	200	14	16-5/8	24-1/2	2-1/2	23-1/2	2-1/2 x 114	2-7/8
8	200	18	16-5/8	24-1/2	2-1/2	23-1/2	2-1/2 x 114	2-7/8
9	250	15-1/2	16-5/8	24-1/2	2-1/2	23-1/2	2-1/2 x 114	2-7/8
10	250	19-1/2	18	26-1/2	2-1/2	25-1/2	2-1/2 x 114	2-7/8
11	300	15-1/2	18	26-1/2	2-1/2	25-1/2	2-1/2 x 114	2-7/8
12	300	19-1/2	18	26-1/2	3	25-1/2	3 x 138	3-3/8

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED		
DESIGN NUMBER	OUTSIDE DIAMETERS	
	POLE SIZE	ARM SIZE
1	2 PLY 4.55 x 254 x 165 x 7.6 m	4.55 x 152 x 96 x 4.9 m
1 ALT.	219 x 13 WALL x 7.6 m	141 x 6.6 WALL x 4.9 m
2	2 PLY 4.55 x 254 x 165 x 7.6 m	6.07 x 152 x 117 x 6.1 m
2 ALT.	219 x 14 WALL x 7.6 m	141 x 9 WALL x 6.1 m
3	7.59 x 330 x 234 x 8.2 m	4.55 x 203 x 146 x 4.9 m
3 ALT.	273 x 11 WALL x 8.2 m	168 x 6.4 WALL x 4.9 m
4	7.59 x 330 x 234 x 8.2 m	4.55 x 229 x 157 x 6.1 m
4 ALT.	273 x 13 WALL x 8.2 m	168 x 9 WALL x 6.1 m
5	7.59 x 381 x 281 x 8.5 m	4.55 x 241 x 163 x 6.7 m
5 ALT.	324 x 13 WALL x 8.5 m	219 x 6.4 WALL x 6.7 m
6	2 PLY 4.55 x 381 x 281 x 8.5 m	6.07 x 254 x 162 x 7.9 m
6 ALT.	324 x 14 WALL x 8.5 m	219 x 8 WALL x 7.9 m
7	2 PLY 4.55 x 419 x 320 x 8.5 m	6.07 x 254 x 169 x 7.3 m
7 ALT.	356 x 14 WALL x 8.5 m	219 x 8 WALL x 7.3 m
8	2 PLY 6.07 x 419 x 320 x 8.5 m	6.07 x 279 x 180 x 8.5 m
8 ALT.	356 x 15 WALL x 8.5 m	273 x 7 WALL x 8.5 m
9	2 PLY 6.07 x 419 x 312 x 9.1 m	6.07 x 279 x 187 x 7.9 m
9 ALT.	356 x 17 WALL x 9.1 m	273 x 7 WALL x 7.9 m
10	2 PLY 6.07 x 457 x 351 x 9.1 m	6.07 x 330 x 224 x 9.1 m
10 ALT.	406 x 17 WALL x 9.1 m	273 x 11 WALL x 9.1 m
11	2 PLY 6.07 x 457 x 351 x 9.1 m	6.07 x 318 x 225 x 7.9 m
11 ALT.	406 x 17 WALL x 9.1 m	273 x 9 WALL x 7.9 m
12	2 PLY 7.59 x 457 x 351 x 9.1 m	7.59 x 330 x 224 x 9.1 m
12 ALT.	406 x 22 WALL x 9.1 m	273 x 13 WALL x 9.1 m

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED							
DESIGN NUMBER	DESIGN SIZE (m^2)	DESIGN MOMENT ARM (m)	F	S	T	BOLT CIRCLE B	ANCHOR BOLTS	H
1	6.2	3.7	270	397	51	381	45 x 2.1 m	54
2	6.2	4.9	270	397	51	381	45 x 2.1 m	54
3	9.3	3.7	324	470	51	457	51 x 2.3 m	60
4	9.3	4.9	324	470	51	457	51 x 2.3 m	60
5	13.9	4.3	394	584	51	559	51 x 2.3 m	60
6	13.9	5.5	394	584	51	559	51 x 2.3 m	60
7	18.6	4.3	422	622	64	597	64 x 2.9 m	73
8	18.6	5.5	422	622	64	597	64 x 2.9 m	73
9	23.2	4.7	422	622	64	597	64 x 2.9 m	73
10	23.2	5.9	457	673	64	648	64 x 2.9 m	73
11	27.9	4.7	457	673	64	648	64 x 2.9 m	73
12	27.9	5.9	457	673	76	648	76 x 3.5 m	86

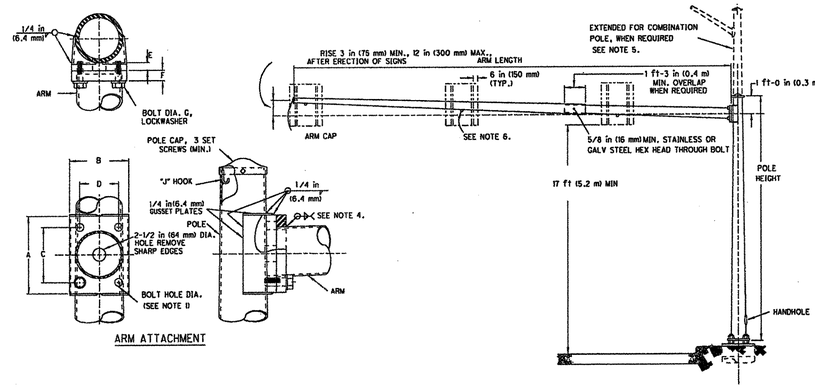
1-19-07 | CANTILEVER OVERHEAD SIGN SUPPORT | OFFICE OF TRAFFIC ENGINEERING | TC-12.30 | 2/2

MISCELLANEOUS DETAILS

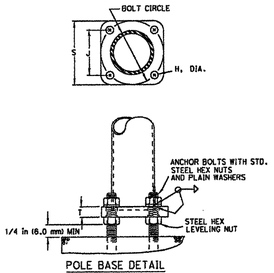
CUY-WEST 150th STREET

105B / 146

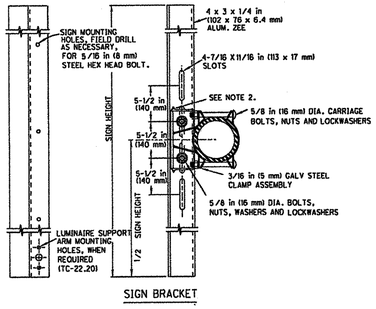
F:\JOBS\665\MD\665MD06A.DWG JEN 3/12/07 PLOT 1:1



ARM ATTACHMENT



POLE BASE DETAIL



SIGN BRACKET

NOTES

1. Arm plate hole diameter to be bolt diameter plus 1/8 inch (3.2 mm). Pole plate tapped hole to have threads with 75% min. full profile height. Threads may be retapped after galvanizing.
2. Prevent contact between aluminum and galvanized parts with a minimum 1/16 inch (1.6 mm) thick chloroprene gasket or approved equal.
3. For foundation details, see Standard Construction Drawing TC-21.20.
4. Weld the arm attachment plate inside and outside with fillet welds. Each weld shall be equal to the wall thickness of the respective tubing.
5. For modification of pole to support roadway lighting, see Standard Construction Drawings TC-22.10 and HL-10.12.
6. Weld one threaded steel 1-1/4 inch (32 mm) pipe coupling or short nipple to the arm behind each sign. Remove all sharp edges inside the arm and pipe coupling.
7. For location of handholes, see Standard Construction Drawing TC-22.10.
8. Provide a removable galvanized cast iron plug for all unused couplings and wire outlets.

01-19-07

SINGLE ARM OVERHEAD SIGN SUPPORT

OFFICE OF TRAFFIC ENGINEERING

TC-16.20

1/2

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

DESIGN NO.	POLE WALL THK.	POLE SIZE	ARM WALL THK.	ARM SIZE	TWO PIECE ARM WALL THK.	TWO PIECE ARM SIZE	ARM ATTACHMENT A	B	C	D	E	F	G	ANCHOR BASE BOLT CIRCLE	S	J	T	H	ANCHOR BOLT DIA.	L
UNLIGHTED																				
1	.179	10x7.06x21 ft	.179	7x3.78x23 ft			14-1/2	12	10-1/2	8	1-1/4	1-1/4	1-1/4	13-1/2	14-1/8	9-9/16	1-1/2	3-1/4	1-1/2	54
2	.179	11x8.06x21 ft	.179	8x3.66x31 ft			14-1/2	12	10-1/2	8	1-1/4	1-1/2	1-1/4	15	15-5/8	10-5/8	1-1/2	3-1/4	1-1/2	54
3	.179	12x9.06x21 ft	.179	9x4.10x35 ft			14-1/2	12	10-1/2	8	1-1/4	1-1/2	1-1/4	16	17	11-5/16	1-1/2	3-1/4	1-1/2	54
4	.239	13x10.06x21 ft	.239	10x3.98x43 ft	.239 .179	10x7.67x15 ft-3 in+ 8.44x4.38x29 ft	16-1/2	14-1/2	12-1/2	9-1/2	1-1/4	2	1-1/4	18	18-1/2	12-3/4	2	2-1/8	3-1/4	84
LIGHTED																				
5	.239	11x8.06x21 ft	.239	8x4.64x24 ft			14-1/2	12	10-1/2	8	1-1/4	1-1/2	1-1/4	15	15-5/8	10-5/8	2	2-1/8	3-1/4	84
6	.239	11x8.06x21 ft	.239	8x4.22x27 ft			14-1/2	12	10-1/2	8	1-1/4	1-1/2	1-1/4	15	15-5/8	10-5/8	2	2-1/8	3-1/4	84
7	.239	11x8.06x21 ft	.239	8x3.80x30 ft			14-1/2	12	10-1/2	8	1-1/4	1-1/2	1-1/4	15	15-5/8	10-5/8	2	2-1/8	3-1/4	84
8	.239	12x9.06x21 ft	.239	9x4.38x33 ft			14-1/2	12	10-1/2	8	1-1/4	1-1/2	1-1/4	16	17	11-5/16	2	2-1/8	3-1/4	84
9	.239	13x10.06x21 ft	.239	10x4.96x36 ft			16-1/2	14-1/2	12-1/2	9-1/2	1-1/4	2	1-1/4	18	18-1/2	12-3/4	2	2-1/8	3-1/4	84
10	.239	14x11.06x21 ft	.239	11x5.54x39 ft			16-1/2	14-1/2	12-1/2	9-1/2	1-1/4	2	1-1/4	20	20-1/2	14-1/8	2	2-1/8	3-1/4	84
11	.239	14x11.06x21 ft	.239	11x5.12x42 ft	.239 .179	11x8.62x17 ft+ 9.19x5.52x26 ft-3 in	16-1/2	14-1/2	12-1/2	9-1/2	1-1/4	2	1-1/4	20	20-1/2	14-1/8	2	2-1/8	3-1/4	84
12	.299	14x11.06x21 ft			.299 .179	11x8.62x17 ft+ 9.19x5.10x29 ft-3 in	16-1/2	14-1/2	12-1/2	9-1/2	1-1/4	2	1-3/8	20	20-1/2	14-1/8	2	2-3/8	2	90

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

DESIGN NO.	POLE WALL THK.	POLE SIZE	ARM WALL THK.	ARM SIZE	TWO PIECE ARM WALL THK.	TWO PIECE ARM SIZE	ARM ATTACHMENT A	B	C	D	E	F	G	ANCHOR BASE BOLT CIRCLE	S	J	T	H	ANCHOR BOLT DIA.	L
UNLIGHTED																				
1	4.55	254X179X6.4 m	4.55	178X98X7 m			368	305	267	203	32	32	32	343	359	243	38	45	38	1.4 m
2	4.55	279X205X6.4 m	4.55	203X93X9.4 m			368	305	267	203	32	38	32	381	397	270	38	45	38	1.4 m
3	4.55	305X230X6.4 m	4.55	229X104X10.7 m			368	305	267	203	32	38	32	406	432	287	38	45	38	1.4 m
4	6.07	330X256X6.4 m	6.07	254X101X13.1 m	6.07 4.55	254X200X4.6 m+ 241X111X6.8 m	419	368	318	241	32	51	32	457	470	324	51	54	45	2.1 m
LIGHTED																				
5	6.07	279X205X6.4 m	6.07	203X118X7.3 m			368	305	267	203	32	38	32	381	397	270	51	54	45	2.1 m
6	6.07	279X205X6.4 m	6.07	203X107X8.2 m			368	305	267	203	32	38	32	381	397	270	51	54	45	2.1 m
7	6.07	279X205X6.4 m	6.07	203X97X9.1 m			368	305	267	203	32	38	32	381	397	270	51	54	45	2.1 m
8	6.07	305X230X6.4 m	6.07	229X111X10 m			368	305	267	203	32	38	32	406	432	287	51	54	45	2.1 m
9	6.07	330X256X6.4 m	6.07	254X126X11 m			419	368	318	241	32	51	32	457	470	324	51	54	45	2.1 m
10	6.07	356X281X6.4 m	6.07	279X141X11.9 m			419	368	318	241	32	51	32	508	521	359	51	54	45	2.1 m
11	6.07	356X281X6.4 m	6.07	279X130X12.8 m	6.07 4.55	279X219X5.2 m+ 233X104X8.0 m	419	368	318	241	32	51	32	508	521	359	51	54	45	2.1 m
12	7.59	356X281X6.4 m			7.59 4.55	279X219X5.2 m+ 233X130X8.9 m	419	368	318	241	32	51	35	508	521	359	51	60	51	2.3 m

01-19-07

SINGLE ARM OVERHEAD SIGN SUPPORT

OFFICE OF TRAFFIC ENGINEERING

TC-16.20

2/2

NOTES

1. Use 1/2 in (13 mm) preformed joint filler as per 705.03 between foundations and adjacent paved areas.
2. A special foundation design will be required when soil with load bearing capacity of less than 2000 LB/FT² (9700 KG/M²) is encountered.
3. In lieu of providing reinforcing steel in the embedded pole foundation, the pole butt may be extended to within 3 in (76 mm) of the foundation bottom. The pole base diameter as specified in the plans is the diameter of the pole at the groundline.
4. Provide all anchor bolts with standard steel hex nuts, leveling nuts, and plain washers. The nuts shall be capable of developing the full strength of the anchor bolts.
5. At locations where the existing slope is 6:1 or greater, the buried depth of foundation shall apply to the low side of the slope. Set the top of the foundation 2 in (50 mm) above the existing surface on the high side of the slope. The additional depth of foundation necessary to meet these requirements shall be added to the formed top.

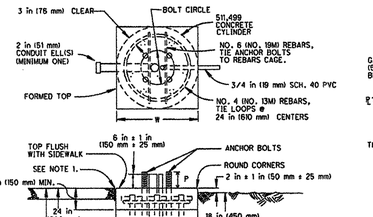
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

DIA.	LENGTH	THREAD LENGTH	℄ THICK	℄ SIDE	THREADS PER INCH
1-1/4	42	8	1-1/2	4	7
1-1/2	54	9	1-1/2	4	6
1-3/4	84	9	2	5	5
2	90	9	2	5	4-1/2
2-1/4	90	10	2-1/2	6	4-1/2
2-1/2	114	10	2-1/2	6	4
3	138	12	3	7	4

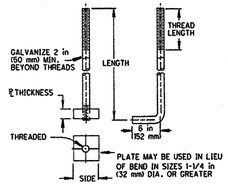
ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

DIA.	LENGTH (meters)	THREAD LENGTH	℄ THICK	℄ SIDE	mm PER THREAD
32	1.1	203	38	102	3.6
38	1.4	229	38	102	4.2
45	2.1	229	51	127	5.1
51	2.3	229	51	127	5.6
57	2.3	254	64	152	5.6
64	2.9	254	64	152	6.4
76	3.5	305	76	178	6.4

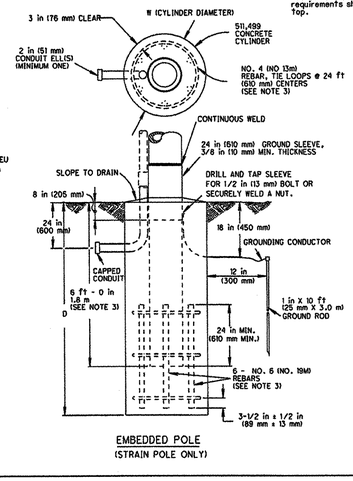
ANCHOR BOLTS



ANCHOR BASE



ANCHOR BOLTS



EMBEDDED POLE
(STRAIN POLE ONLY)

01-19-07

FOUNDATIONS

OFFICE OF TRAFFIC ENGINEERING

TC-21.20

1/2

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

TC-9.10 TYPE SUPPORTS DESIGN NO.	D (feet)	W	ANCHOR BOLTS SIZE	CIRCLE	P
1	8	30	1-1/2 X 54	13-1/2	6-3/4
2	8	30	1-1/2 X 54	13-1/2	6-3/4
3	9	36	1-3/4 X 84	16	7-3/4
TC-9.30 TYPE SUPPORTS					
1	8	30	1-1/2 X 54	13-1/2	6-3/4
2	9	36	1-3/4 X 84	15	7-3/4
3	10	36	2 X 90	20	8-1/2
4	11	36	2-1/4 X 90	22	9
5	11	36	2-1/4 X 90	22	9

TC-16.20 & TC-81.20 TYPE SUPPORTS DESIGN NO.	D (feet)	W	ANCHOR BOLTS SIZE	CIRCLE	P
1	8	30	1-1/2 X 54	13-1/2	6-3/4
2	8	30	1-1/2 X 54	15	6-3/4
3	9	30	1-1/2 X 54	16	6-3/4
4	10	36	1-3/4 X 84	18	7-3/4
5	9	36	1-3/4 X 84	15	7-3/4
6	9	36	1-3/4 X 84	15	7-3/4
7	9	36	1-3/4 X 84	15	7-3/4
8	9	36	1-3/4 X 84	16	7-3/4
9	10	36	1-3/4 X 84	18	7-3/4
10	10	36	1-3/4 X 84	20	7-3/4
11	10	36	1-3/4 X 84	20	7-3/4
12	11	36	2 X 90	20	8-1/2

TC-17.10 & 81.10 TYPE SUPPORTS DESIGN NO.	D (feet)	W	ANCHOR BOLTS SIZE	CIRCLE	P
1	7	30	1-1/4 X 42	10	5-3/4
2	7	30	1-1/2 X 54	12-1/2	6-3/4
3	8	30	1-1/2 X 54	13-1/2	6-3/4
4	8	36	1-3/4 X 84	15	7-3/4
5	9	36	1-3/4 X 84	16	7-3/4
6	9	36	1-3/4 X 84	16	7-3/4
7	10	36	2 X 90	18	8-1/2
8	10	36	2 X 90	20	8-1/2
9	10	36	2 X 90	22	8-1/2
10	11	36	2-1/4 X 90	22	9
11	11	36	2-1/4 X 90	22	9
12	12	36	2-1/2 X 114	23-1/2	9-3/4

TC-12.30 TYPE SUPPORTS DESIGN NO.	D (feet)	W	ANCHOR BOLTS SIZE	CIRCLE	P
1	9	36	1-3/4 X 84	15	7-3/4
2	9	36	1-3/4 X 84	15	7-3/4
3	11	36	2 X 90	18	8-1/2
4	11	36	2 X 90	18	8-1/2
5	11	36	2 X 90	22	8-1/2
6	11	36	2 X 90	22	8-1/2
7	15	36	2-1/2 X 114	23-1/2	9-3/4
8	15	36	2-1/2 X 114	23-1/2	9-3/4
9	15	36	2-1/2 X 114	23-1/2	9-3/4
10	17	36	2-1/2 X 114	25-1/2	9-3/4
11	17	36	2-1/2 X 114	25-1/2	9-3/4
12	18	36	3 X 138	25-1/2	11-1/4

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

TC-9.10 TYPE SUPPORTS DESIGN NO.	D (meters)	W	ANCHOR BOLTS SIZE	CIRCLE	P
1	2.4	762	38 X 1.4 m	343	171
2	2.4	762	38 X 1.4 m	343	171
3	2.7	914	45 X 2.1 m	406	197
TC-9.30 TYPE SUPPORTS					
1	2.4	762	38 X 1.4 m	343	171
2	2.7	914	45 X 2.1 m	381	197
3	3.1	914	51 X 2.3 m	508	216
4	3.4	914	57 X 2.3 m	559	229
5	3.4	914	57 X 2.3 m	559	229

TC-16.20 & TC-81.20 TYPE SUPPORTS DESIGN NO.	D (meters)	W	ANCHOR BOLTS SIZE	CIRCLE	P
1	2.4	762	38 X 1.4 m	343	171
2	2.4	762	38 X 1.4 m	381	171
3	2.7	762	38 X 1.4 m	406	171
4	3.1	914	45 X 2.1 m	457	197
5	2.7	914	45 X 2.1 m	381	197
6	2.7	914	45 X 2.1 m	381	197
7	2.7	914	45 X 2.1 m	381	197
8	2.7	914	45 X 2.1 m	406	197
9	3.1	914	45 X 2.1 m	457	197
10	3.1	914	45 X 2.1 m	508	197
11	3.1	914	45 X 2.1 m	508	197
12	3.4	914	51 X 2.3m	508	216

TC-17.10 & 81.10 TYPE SUPPORTS DESIGN NO.	D (meters)	W	ANCHOR BOLTS SIZE	CIRCLE	P
1	2.1	762	32 X 1.1 m	254	146
2	2.1	762	38 X 1.4 m	318	171
3	2.4	762	38 X 1.4 m	343	171
4	2.4	914	45 X 2.1 m	381	197
5	2.7	914	45 X 2.1 m	406	197
6	2.7	914	45 X 2.1 m	406	197
7	3.1	914	51 X 2.3 m	457	216
8	3.1	914	51 X 2.3 m	508	216
9	3.1	914	51 X 2.3 m	559	216
10	3.4	914	57 X 2.3 m	559	229
11	3.4	914	57 X 2.3 m	559	229
12	3.7	914	64 X 2.9 m	597	248

TC-12.30 TYPE SUPPORTS DESIGN NO.	D (meters)	W	ANCHOR BOLTS SIZE	CIRCLE	P
1	2.7	914	45 X 2.1 m	381	197
2	2.7	914	45 X 2.1 m	381	197
3	3.4	914	51 X 2.3 m	457	216
4	3.4	914	51 X 2.3 m	457	216
5	3.4	914	51 X 2.3 m	559	216
6	3.4	914	51 X 2.3 m	559	216
7	4.6	914	64 X 2.9 m	597	248
8	4.6	914	64 X 2.9 m	597	248
9	4.6	914	64 X 2.9 m	597	248
10	5.2	914	64 X 2.9 m	648	248
11	5.2	914	64 X 2.9 m	648	248
12	5.5	914	76 X 3.5 m	648	286

01-19-07

FOUNDATIONS

OFFICE OF TRAFFIC ENGINEERING

TC-21.20

2/2

MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

105C 146

PJK 3/22/07 PLOT 1:1

F:\JOBS\665\MD\665MD07.DWG

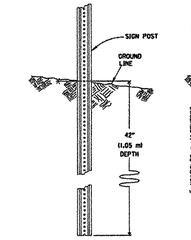
TYPE P

TYPE F

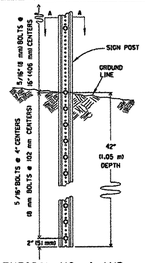
TYPE S

POST NO.	TYPE	LB/FT	POST DIMENSIONS (INCHES) A	B	C	ANCHOR DIMENSIONS A	B	C	NUMBER OF POSTS PERMITTED IN SEVEN FOOT PATH IN EXPOSED LOCATIONS
1	F	1.12	0.875	2.063	0.813				
	P	2.00	1.469	3.063	1.281				2
2	F	2.00	1.516	3.125	1.250				2
	S		1.750	1.750	0.083	2.000	2.000	0.105	2
	P	3.00	1.875	3.500	1.313				2
3	F	3.00	1.750	3.500	1.625				2
	S		2.00	2.00	0.083	2.250	2.250	0.105	2
	P	4.00	TWO NO.2 POST						0
4	F	4.00	TWO NO.2 POST						0
	S		2.500	2.500	0.105	3.000	3.000	0.188	1
	P	6.00	TWO NO.3 POST						0
6	F	6.00	TWO NO.3 POST						0

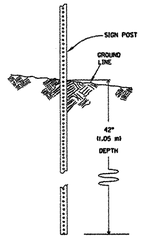
POST NO.	TYPE	Kg/m	POST DIMENSIONS (mm) A	B	C	ANCHOR DIMENSIONS A	B	C	NUMBER OF POSTS PERMITTED IN 2.1m PATH IN EXPOSED LOCATIONS
1	F	1.7	22	52	21				
	P	3.0	37	78	33				2
2	F	3.0	39	79	32				2
	S		44	44	2.1	51	51	2.7	2
	P	4.5	48	89	33				2
3	F	4.5	44	89	41				2
	S		51	51	2.1	57	57	2.7	2
	P	6.0	TWO NO.2 POST						0
4	F	6.0	TWO NO.2 POST						0
	S		63	63	2.7	76	76	4.8	1
	P	9.0	TWO NO.3 POST						0
6	F	9.0	TWO NO.3 POST						0



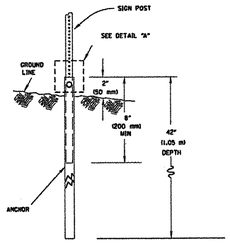
TYPICAL NO. 1, NO. 2 AND NO. 3 U - CHANNEL DRIVEN INSTALLATION



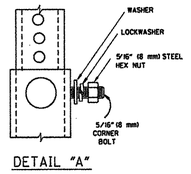
TYPICAL NO. 4 AND NO. 6 U - CHANNEL DRIVEN INSTALLATION



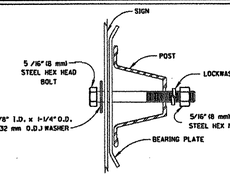
TYPICAL SQUARE POST DRIVEN INSTALLATION



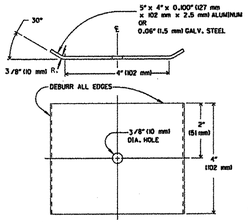
TYPICAL SQUARE POST ANCHOR BASE INSTALLATION



DETAIL "A"

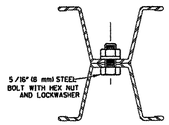


U - CHANNEL SIGN ATTACHMENT DETAIL



BEARING PLATE

SQUARE POST SIGN ATTACHMENT DETAIL

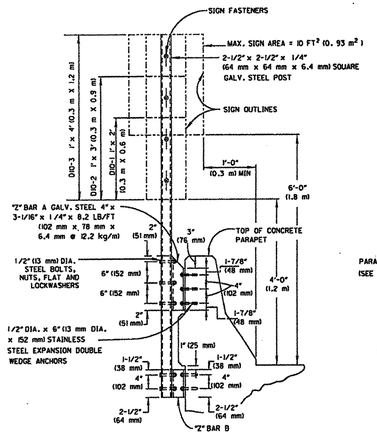


SECTION A - A

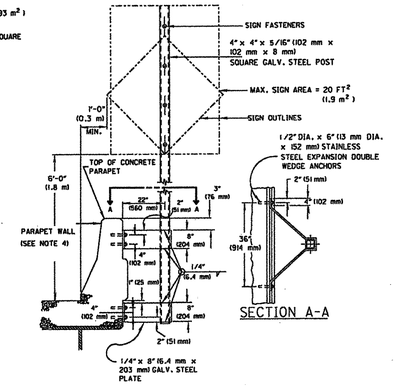
NOTES

1. Install number 4 type P and F posts, and number 6 type P and F posts, only in protected locations (e.g. behind guardrail). Install two post installations of number 4 type S posts within 1 foot (2.1 m) path only in protected locations.
2. Use of anchor base with No. 2 and No. 3 square post is optional. Use of anchor base with No. 4 square post is required.
3. Square post may have die-cut knockouts or open holes.

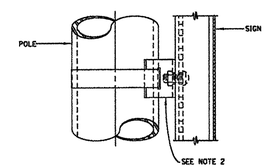
01-19-01 | YIELDING POST | OFFICE OF TRAFFIC ENGINEERING | TC-41.20 | 1/1



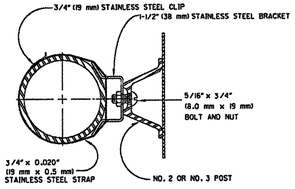
SIGN SUPPORT ASSEMBLY, BRIDGE MOUNTED, TYPE 1



SIGN SUPPORT ASSEMBLY, BRIDGE MOUNTED, TYPE 2

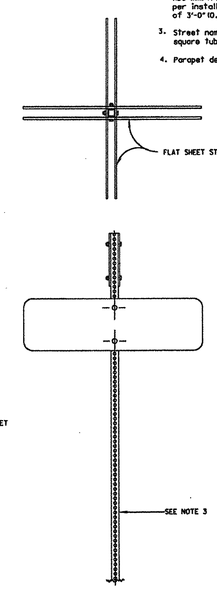


SIGN SUPPORT ASSEMBLY, POLE MOUNTED



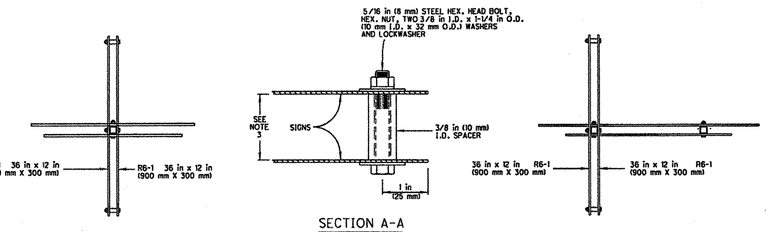
NOTES

1. This support is intended for use with concrete bridge railing parapet types shown on drawings BR-1, BR-2-98, and SBR-1-99.
2. Use a minimum of 2 brackets located 6" (150 mm) from top and bottom of sign per installation with maximum spacing of 3'-0" (0.9 m).
3. Street name sign supports shall be square tubular steel.
4. Parapet design may vary.



STREET NAME SIGN SUPPORT

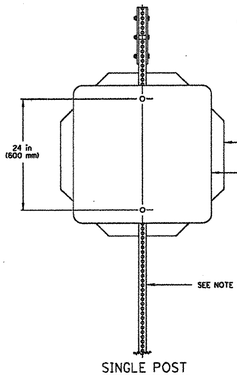
07-16-04 | SPECIAL SIGN ATTACHMENTS AND SUPPORTS | OFFICE OF TRAFFIC ENGINEERING | TC-41.40 | 1/1



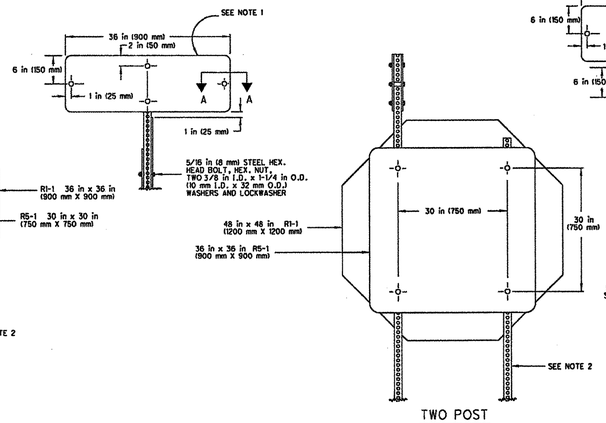
SECTION A-A

NOTES

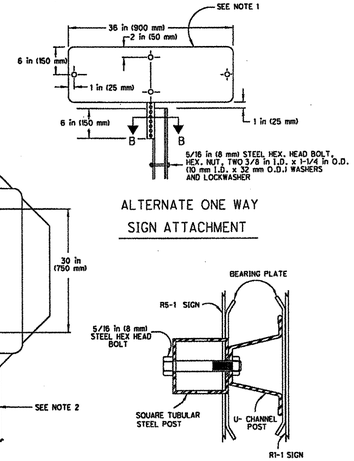
1. In special situations, a 54 x 18 inch (1350 x 450 mm) R6-1 sign may be used in lieu of the 36 x 12 inch (900 x 300 mm) R6-1 sign.
2. All supports shall be square tubular steel; however, in lieu of square tubular steel, u-channel supports may be used with the alternate ONE WAY sign attachment arrangement.
3. Length of spacer shall be equal to post size.
4. For post(s) installation details, see Standard Construction Drawing TC-41.20.



SINGLE POST



TWO POST



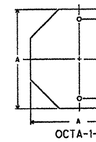
ALTERNATE ONE WAY SIGN ATTACHMENT

SECTION B-B

01-19-07 | ONE WAY SIGN SUPPORT DETAILS | OFFICE OF TRAFFIC ENGINEERING | TC-41.50 | 1/1

NOTES

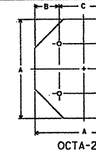
1. For each detail shown, the top table is in inches and the lower table is in millimeters unless otherwise noted.
2. All bolt holes shall be 3/8 inches (10 mm) in diameter, and may be drilled or punched to finished size.
3. Dimensions between bolt holes shall be to tolerance of ± 1/32 inch (± 0.8 mm).
4. All route shields shall be 0.080 inches (2.0 mm) thick and attached to extruheet signs with aluminum blind rivets.
5. For back-to-back mounting of STOP and DO NOT ENTER sign, follow details shown on Standard Construction Drawing TC-41.50.



A	B	C	THICKNESS	AREA (FT²)
18	3	12	0.080	2.25
24	3	18	0.080	4.00
30	3	24	0.080	6.25
36	3	30	0.080	9.00

A	B	C	THICKNESS	AREA (m²)
450	75	300	2.0	0.20
600	75	450	2.0	0.36
750	75	600	2.0	0.56
900	75	750	2.0	0.81

OCTA-1-2



A	B	C	THICKNESS	AREA (FT²)
18	3	12	0.080	2.25
24	3	18	0.080	4.00
30	3	24	0.080	6.25
36	3	30	0.080	9.00

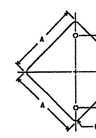
A	B	C	THICKNESS	AREA (m²)
450	75	300	2.0	0.20
600	75	450	2.0	0.36
750	75	600	2.0	0.56
900	75	750	2.0	0.81

OCTA-2-4

A	B	C	THICKNESS	AREA (FT²)
48	9	30	0.100	16.00

A	B	C	THICKNESS	AREA (m²)
1200	225	750	2.5	1.44

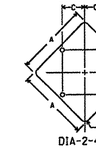
SHAPE — NO. BOLTS REQUIRED
OCTA-2-4
NO. SUPPORTS REQUIRED



A	B	C	THICKNESS	AREA (FT²)
18	9	1.5	0.080	2.25
24	12	1.5	0.080	4.00
30	15	1.875	0.080	6.25
36	18	2.25	0.080	9.00

A	B	C	THICKNESS	AREA (m²)
450	225	40	2.0	0.20
600	300	50	2.0	0.36
750	375	50	2.0	0.56
900	450	60	2.0	0.81

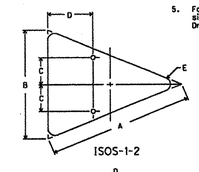
DIA-1-2



A	B	C	D	THICKNESS	AREA (FT²)
48	15	15	3	0.100	16.00
60	18	18	3.75	0.100	25.00

A	B	C	D	THICKNESS	AREA (m²)
1200	375	375	70	2.5	1.44
1500	450	450	70	2.5	2.25

DIA-2-4



A	B	C	D	E	THICKNESS	AREA (FT²)
40	30	7.5	12.875		0.080	3.86
48	36	9	15	2.25	0.100	5.56

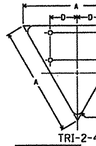
A	B	C	D	E	THICKNESS	AREA (m²)
1000	750	187.500			2.0	0.35
1200	900	225	375	60	2.5	0.50

ISOS-1-2

A	B	C	D	THICKNESS	AREA (FT²)
24	2	14	1.5	0.080	1.73
30	3	18	1.5	0.080	2.71
36	3	21	2	0.080	3.90

A	B	C	D	THICKNESS	AREA (m²)
600	50	350	50	2.0	0.16
750	75	450	50	2.0	0.24
900	75	525	60	2.0	0.35

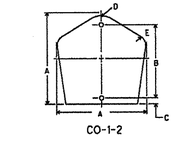
TRI-1-2



A	B	C	D	E	THICKNESS	AREA (FT²)
48	3	12	12	3	0.100	6.93
60	3	18	15	4	0.100	10.83

A	B	C	D	E	THICKNESS	AREA (m²)
1200	75	300	300	70	2.5	0.62
1500	75	450	375	70	2.5	0.97

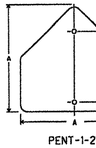
TRI-2-4



A	B	C	D	E	THICKNESS	AREA (FT²)
18	15	1	5	2	0.080	2.25
24	18	2	5.313	2.688	0.080	4.00
30	24	2	6.825	3.375	0.080	5.25

A	B	C	D	E	THICKNESS	AREA (m²)
450	375	25	125	50	2.0	0.20
600	450	50	133	67	2.0	0.36
750	600	50	165	85	2.0	0.56

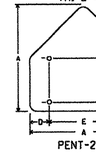
CO-1-2



A	B	C	D	THICKNESS	AREA (FT²)
30	21	3	7.875	0.080	6.25
36	24	3	2.25	0.080	9.00

A	B	C	D	THICKNESS	AREA (m²)
750	525	75	50	2.0	0.56
900	600	75	60	2.0	0.81

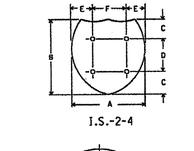
PENT-1-2



A	B	C	D	E	F	THICKNESS	AREA (FT²)
48	18	6	9	30	3	0.100	16.00

A	B	C	D	E	F	THICKNESS	AREA (m²)
1200	450	150	225	750	70	2.5	1.44

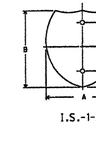
PENT-2-4



A	B	C	D	E	F	THICKNESS	AREA (FT²)
48	48	9	30	9	30	0.100	16.00
60	48	9	30	12	36	0.100	20.00

A	B	C	D	E	F	THICKNESS	AREA (m²)
1200	1200	225	750	225	750	2.5	1.44
1500	1200	225	750	300	900	2.5	1.80

I.S.-2-4



A	B	C	D	THICKNESS	AREA (FT²)
24	24	3	18	0.080	4.00
24	30	3	18	0.080	5.00
30	30	3	24	0.080	6.25
37.5	30	3	24	0.080	7.81
36	36	6	24	0.080	9.00
45	36	6	24	0.080	11.25

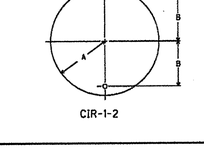
A	B	C	D	THICKNESS	AREA (m²)
600	600	75	450	2.0	0.20
600	750	75	450	2.0	0.36
750	750	75	600	2.0	0.56
938	750	75	600	2.0	0.70
900	900	150	600	2.0	0.81
1125	900	150	600	2.0	1.01

I.S.-1-2

A	B	THICKNESS	AREA (FT²)
24	15	0.100	16.00

A	B	THICKNESS	AREA (m²)
600	375	2.5	1.44

CIR-2-4



A	B	THICKNESS	AREA (FT²)
9	6	0.080	2.26
12	9	0.080	4.00
15	12	0.080	6.25
18	15	0.080	9.00

A	B	THICKNESS	AREA (m²)
225	150	2.0	0.20
300	225	2.0	0.36
375	300	2.0	0.56
450	375	2.0	0.81

CIR-1-2

01-19-07 | SIGN BLANK DETAILS I | OFFICE OF TRAFFIC ENGINEERING | TC-52.10 | 1/1

RM-RHM

CUY-WEST 150th STREET

105D / 146

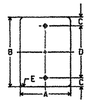
F:\JOBS\665\MOD\665MD08.DWG PJK 3/22/07 PLOT 1:1

NOTES

1. For each detail shown, the top table is in inches and the bottom table is in millimeters unless otherwise noted.
2. All bolt holes shall be 3/8 inches (10mm) in diameter, and may be drilled or punched to finished size.
3. Dimensions between bolt holes shall be to tolerance of ± 1/32 inches (± 0.8 mm).
4. For back to back mounting of STOP and DO NOT ENTER sign, follow details shown on Standard Construction Drawing TC-41.50.

SHAPE — V-REC-2-4 — NO. BOLTS REQUIRED
NO. SUPPORTS REQUIRED

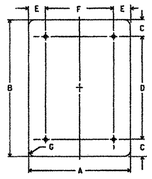
V-REC-1-2



A	B	C	D	E	THICKNESS	AREA (FT²)
6	54	9	36	1.5	0.080	2.25
9	12	1.5	9	1.5	0.080	0.75
10	12	1.5	10	1.5	0.080	0.83
12	15	1.5	12	1.5	0.080	1.25
12	16	1.5	13	1.5	0.080	1.33
12	18	1.5	15	1.5	0.080	1.50
12	24	3	18	1.5	0.080	2.00
12	30	3	24	1.5	0.080	2.50
12	36	3	30	1.5	0.080	3.00
12	48	6	36	1.5	0.080	4.00
14	48	6	36	1.5	0.080	4.67
18	24	3	18	1.5	0.080	3.00
18	60	6	48	1.5	0.100	7.50
24	30	3	24	1.5	0.080	5.00
24	36	3	30	1.5	0.080	6.00
24	38	3	32	1.5	0.080	6.33
24	42	6	30	1.5	0.080	7.00
24	48	6	36	1.5	0.100	8.00
30	36	3	30	1.875	0.080	7.50
30	42	6	30	1.875	0.080	8.75
30	48	6	36	1.875	0.100	10.00

A	B	C	D	E	THICKNESS	AREA (m²)
150	1350	225	900	40	2.0	0.20
225	300	37.5	225	40	2.0	0.07
250	300	37.5	250	40	2.0	0.08
300	175	37.5	300	40	2.0	0.11
300	400	37.5	325	40	2.0	0.12
300	450	37.5	375	40	2.0	0.14
300	600	75	450	40	2.0	0.18
300	750	75	600	40	2.0	0.23
300	900	75	750	40	2.0	0.27
300	1200	150	900	40	2.0	0.36
350	1200	150	900	40	2.0	0.42
450	600	75	450	40	2.0	0.27
450	1500	150	1200	40	2.5	0.68
600	750	75	600	40	2.0	0.45
600	900	75	750	40	2.0	0.54
600	950	75	800	40	2.0	0.57
600	1050	150	750	40	2.0	0.63
600	1200	150	900	40	2.5	0.72
750	900	75	750	50	2.0	0.68
750	1050	150	750	50	2.0	0.79
750	1200	150	900	50	2.5	0.90

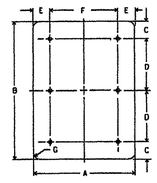
V-REC-2-4



A	B	C	D	E	F	G	THICKNESS	AREA (FT²)
36	42	6	30	6	24	2.25	0.080	10.50
36	48	6	36	6	24	2.25	0.100	12.00
36	54	6	42	6	24	2.25	0.100	13.50
36	60	6	48	6	24	2.25	0.100	15.00
36	72	12	48	6	24	2.25	0.100	18.00
36	75	13.5	48	6	24	2.25	0.100	18.75
42	60	6	48	9	24	2.25	0.100	17.50
48	60	6	48	9	30	3	0.100	20.00

A	B	C	D	E	F	G	THICKNESS	AREA (m²)
900	1050	150	750	150	600	60	2.0	0.95
900	1200	150	900	150	600	60	2.5	1.08
900	1350	150	1050	150	600	60	2.5	1.22
900	1500	150	1200	150	600	60	2.5	1.35
900	1600	300	1200	150	600	60	2.5	1.62
900	1875	338	1200	150	600	60	2.5	1.69
1050	1200	150	1200	225	600	60	2.5	1.26
1200	1500	150	1200	225	750	75	2.5	1.80

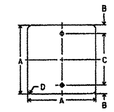
V-REC-2-6



A	B	C	D	E	F	G	THICKNESS	AREA (FT²)
48	72	6	30	9	30	3	0.100	24.00
48	76	6	30	9	30	3	0.100	25.33
48	84	12	30	9	30	3	0.100	28.00
48	96	12	36	9	30	3	0.100	32.00

A	B	C	D	E	F	G	THICKNESS	AREA (m²)
1200	1800	150	750	225	750	75	2.5	2.25
1200	1900	200	750	225	750	75	2.5	2.28
1200	2100	300	750	225	750	75	2.5	2.52
1200	2400	300	900	225	750	75	2.5	2.88

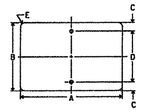
SQ-1-2



A	B	C	D	THICKNESS	AREA (FT²)
6	1.5	3	1.5	0.080	0.25
9	1.5	6	1.5	0.080	0.56
12	1.5	9	1.5	0.080	1.00
15	1.5	12	1.5	0.080	1.56
15	1.5	13	1.5	0.080	1.78
18	3	12	1.5	0.080	2.25
24	3	18	1.5	0.080	4.00
30	3	24	1.875	0.080	6.25
36	3	30	2.25	0.080	9.00

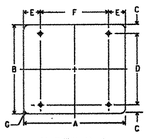
A	B	C	D	THICKNESS	AREA (m²)
150	37.5	75	40	2.0	0.02
225	37.5	150	40	2.0	0.05
300	37.5	225	40	2.0	0.09
375	37.5	300	40	2.0	0.14
400	37.5	325	40	2.0	0.16
450	75	300	40	2.0	0.20
600	75	450	40	2.0	0.36
750	75	600	50	2.0	0.56
800	75	750	60	2.0	0.81

H-REC-1-2



A	B	C	D	E	THICKNESS	AREA (FT²)
12	4	1	2	1.5	0.080	0.33
12	6	1.5	3	1.5	0.080	0.50
12	6.5	1.5	3.5	1.5	0.080	0.54
12	9	1.5	6	1.5	0.080	0.75
15	8	1.5	5	1.5	0.080	0.83
15	12	1.5	9	1.5	0.080	1.25
18	6	1.5	3	1.5	0.080	0.75
18	9	1.5	6	1.5	0.080	1.12
18	12	1.5	9	1.5	0.080	1.50
20	18	3	12	1.5	0.080	2.50
21	15	1.5	12	1.5	0.080	2.19
24	6	1.5	3	1.5	0.080	1.00
24	8	1.5	5	1.5	0.080	1.33
24	9	1.5	6	1.5	0.080	1.50
24	10	1.5	7	1.5	0.080	1.67
24	12	1.5	9	1.5	0.080	2.00
24	18	3	12	1.5	0.080	3.00
30	8	1.5	5	1.5	0.080	1.67
30	9	1.5	6	1.5	0.080	1.88
30	12	1.5	9	1.5	0.080	2.50
30	15	1.5	12	1.5	0.080	3.12
30	18	3	12	1.5	0.080	3.75
30	24	3	18	1.5	0.080	5.00
36	6	1.5	3	1.5	0.080	1.50
36	8	1.5	5	1.5	0.080	2.00
36	9	1.5	6	1.5	0.080	2.25
36	12	1.5	9	1.5	0.080	3.00
36	14	1.5	11	1.5	0.080	3.50
36	15	1.5	12	1.5	0.080	3.75
36	18	3	12	1.5	0.080	4.50
36	20	3	14	1.5	0.080	5.00
36	24	3	18	1.5	0.080	6.00
36	30	3	24	1.875	0.080	7.50
37.5	30	3	24	1.875	0.080	7.81
48	8	1.5	5	1.5	0.100	2.67
48	10	1.5	7	1.5	0.100	3.33
48	12	1.5	9	1.5	0.100	4.00
48	14	1.5	11	1.5	0.100	4.67
48	16	1.5	13	1.5	0.100	5.33
48	18	3	12	1.5	0.100	6.00

H-REC-2-4

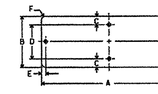


A	B	C	D	E	F	G	THICKNESS	AREA (FT²)
40	20	3	14	6	28	1.5	0.080	5.56
42	24	3	18	9	24	1.5	0.080	7.00
42	30	3	24	9	24	1.875	0.080	8.75
42	36	6	24	9	24	2.25	0.080	10.50
45	36	6	24	9	27	2.25	0.080	11.25
48	20	3	14	9	30	1.5	0.100	6.67
48	24	3	18	9	30	1.5	0.100	8.00
48	30	3	24	9	30	1.875	0.100	10.00
48	36	6	24	9	30	2.25	0.100	12.00
48	42	6	30	9	30	2.25	0.100	14.00
54	30	3	24	9	36	1.875	0.100	11.25
54	36	6	24	9	36	2.25	0.100	13.50
60	12	1.5	9	12	36	1.5	0.100	5.00
60	18	3	12	12	36	1.5	0.100	7.50
60	24	3	18	12	36	1.5	0.100	10.00
60	30	3	24	12	36	1.875	0.100	12.50
60	36	6	24	12	36	2.25	0.100	15.00
60	48	6	36	12	36	3	0.100	20.00
66	24	3	18	12	42	1.5	0.100	11.00
66	36	6	24	12	42	2.25	0.100	16.50
72	12	1.5	9	12	48	1.5	0.125	6.00
72	15	1.5	12	12	48	1.5	0.125	7.50
72	24	3	18	12	48	1.5	0.125	12.00
72	36	6	24	12	48	2.25	0.125	18.00
72	48	6	36	12	48	3	0.125	24.00
78	24	3	18	12	54	1.5	0.125	13.00

A	B	C	D	E	THICKNESS	AREA (m²)
300	100	25	50	40	2.0	0.03
300	150	37.5	75	40	2.0	0.05
300	162	37.5	87	40	2.0	0.05
300	225	37.5	150	40	2.0	0.07
375	200	37.5	125	40	2.0	0.08
375	300	37.5	225	40	2.0	0.11
450	150	37.5	75	40	2.0	0.07
450	225	37.5	150	40	2.0	0.10
450	300	37.5	225	40	2.0	0.14
500	450	75	300	40	2.0	0.23
525	375	37.5	300	40	2.0	0.20
600	150	37.5	75	40	2.0	0.09
600	200	37.5	125	40	2.0	0.12
600	225	37.5	150	40	2.0	0.14
600	250	37.5	175	40	2.0	0.15
600	300	37.5	225	40	2.0	0.18
600	450	75	300	40	2.0	0.27
750	200	37.5	125	40	2.0	0.15
750	225	37.5	150	40	2.0	0.17
750	300	37.5	225	40	2.0	0.23
750	375	37.5	300	40	2.0	0.28
750	450	75	300	40	2.0	0.34
750	600	75	450	40	2.0	0.45
900	150	37.5	75	40	2.0	0.14
900	200	37.5	125	40	2.0	0.18
900	225	37.5	150	40	2.0	0.20
900	300	37.5	225	40	2.0	0.27
900	350	37.5	275	40	2.0	0.32
900	375	37.5	300	40	2.0	0.34
900	450	75	300	40	2.0	0.41
900	500	75	350	40	2.0	0.45
900	600	75	450	40	2.0	0.54
900	750	75	600	50	2.0	0.68
938	750	75	600	50	2.0	0.70
1200	200	37.5	125	40	2.5	0.24
1200	250	37.5	175	40	2.5	0.30
1200	300	37.5	225	40	2.5	0.36
1200	350	37.5	275	40	2.5	0.42
1200	400	37.5	325	40	2.5	0.48
1200	450	75	300	40	2.5	0.54

A	B	C	D	E	THICKNESS	AREA (m²)
1000	600	75	350	150	100	40	2.0	0.50
1050	600	75	450	225	600	40	2.0	0.63
1050	750	75	600	225	600	50	2.0	0.79
1050	900	150	600	225	600	50	2.0	0.95
1125	900	150	600	225	675	50	2.0	1.01
1200	500	75	350	225	750	40	2.0	0.60
1200	600	75	450	225	750	40	2.5	0.72
1200	750	75	600	225	750	50	2.5	0.90
1200	900	150	600	225	750	60	2.5	1.08
1200	1050	150	750	225	750	60	2.5	1.26
1350	750	75	600	225	900	50	2.5	1.01
1350	900	150	600	225	900	60	2.5	1.22
1500	300	37.5	225	300	900	40	2.5	0.45
1500	450	75	300	300	900	40	2.5	0.58
1500	600	75	450	300	900	40	2.5	0.90
1500	750	75	600	300	900	50	2.5	1.13
1500	900	150	600	300	900	60	2.5	1.35
1500	1200	150	900	300	900	70	2.5	1.80
1650	600	75	450	300	1050	40	2.5	0.99
1650	900	150	600	300	1050	60	2.5	1.49
1800	300	37.5	225	300	1200	40	3.1	0.54
1800	375	37.5	300	300	1200	40	3.1	0.68
1800	600	75	450	300	1200	40	3.1	1.08
1800	900	150	600	300	1200	60	3.1	1.62
1800	1200	150	900	300	1200	70	3.1	2.16
1950	600	75	450	300	1350	40	3.1	1.17

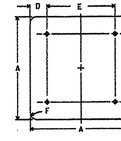
H-REC-1-4 (ONE WAY)



A	B	C	D	E	F	THICKNESS	AREA (FT²)
36	12	1.5	9	1	1.5	0.080	3.00
54	18	3	12	1.5	1.5	0.100	6.75

A	B	C	D	E	F	THICKNESS	AREA (m²)
900	300	37.5	225	25	40	2.0	0.27
1350	450	75	300	37.5	40	2.5	0.61

SQ-2-4



A	B	C	D	E	F	THICKNESS	AREA (FT²)
36	6	24	6	24	2.25	0.080	9.00
42	6	30	9	24	2.25	0.080	12.25
48	6	36	9	30	3	0.100	16.00

A	B	C	D	E	F	THICKNESS	AREA (m²)
900	150	600	150	600	50	2.0	0.81
1050	150	750	225	600	60	2.0	1.10
1200	150	900	225	750	75	2.5	1.44

MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

105E
146

TWO PART CLAMP OR U-BOLT AND CLAMP, SEE NOTE 5

RISE, 3"(76 mm) MIN., 12"(305 mm) MAX., AFTER ERECTION OF SIGNALS

EXTENDED FOR COMBINATION POLE, WHEN REQUIRED . SEE NOTE 7

ARM LENGTH

1'-3"(380 mm) MIN. OVERLAP WHEN REQUIRED

1'-6" (0.46 m) (TYP.)

12"(300 mm) TYP.

6"(150 mm) TYP.

MAST ARM

3/8" (35 mm) DIA. HOLE, WITH 1" (25mm) CROMAET OR BUSHING

1/2" (13 mm) MIN. STAINLESS OR GALV. STEEL HEX HEAD THROUGH BOLT

POLE HEIGHT

ARM CAP

18'-5 m) MAX.
16'-4.9 m) MIN.

HANDHOLE

CLAMP
SEE NOTE 6.

BOLT CIRCLE

H (DIA.)

S

BASE PLATE

1/4"(6.4 mm)

MAST ARM

BOLT DIA.-5, LOCKWASHER

POLE CAP, 3 SET SCREWS MINIMUM

"J" HOOK

POLE

1/4"(6.4 mm)

SEE NOTE 4.

1/4" (6.4 mm) GUSSET PLATES

2 1/2" (64 mm) DIA. HOLE, REMOVE SHARP EDGES

BOLT HOLE DIA., SEE NOTE 1.

MAST ARM

OPENING FOR GALVANIZING

ARM ATTACHMENT

ANCHOR BOLTS WITH STANDARD STEEL HEX NUTS, PLAIN AND LOCKWASHERS (SEE NOTE 8)

1/4" (6 mm) MIN.

POLE DETAILS

NOTES

1. Arm plate hole diameter shall be bolt diameter plus 1/8" (3.2 mm). Pole plate tapped hole shall have threads with 75% min.) full profile height. Threads may be retapped after galvanizing.
2. For sign mounting details, see drawings TC-16.20 and TC-41.41.
3. For foundation details, see drawing TC-21.20.
4. The arm attachment plate shall be welded inside and outside with fillet welds. Each fillet weld shall be equal to the wall thickness of the tubing.
5. The mast arm clamp shall have a minimum strength at yield to support a 2000 pound (90.0 Kilogram) load.
6. For signal attachment details, see drawing TC-85.20.
7. For modification of pole to suport roadway lighting, see drawings TC-22.10 and HL-10.12.
8. A minimum of one bolt thread shall remain above the anchor nut.
9. All unused couplings shall be provided with a removable galvanized cast iron plug.
10. For pole and base plate dimensions, see sheet 2.
11. The wire entrance port of the signal head may be oriented in any direction to keep the cable drip loop from rubbing on the signal head. the signal head shall hang level and plumb.
12. For consteuction details and location of handholes, see drawing TC-22.10.

ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

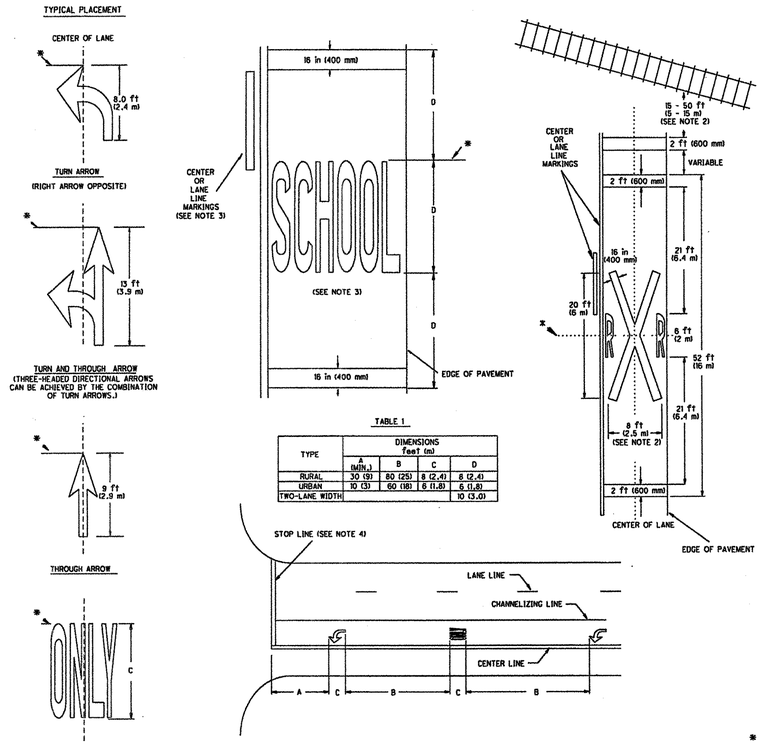
DESIGN NO.	POLE		ARM		TWO PIECE ARM		ARM ATTACHMENT						ANCHOR BASE					ANCHOR BOLT	
	WALL THICK	SIZE	WALL THICK	SIZE	WALL THICK	SIZE	A	B	C	D	E	F	G	BOLT CIRCLE	S	J	T	H	DIA.	L
1	.179	10X6.78X23'	.179	7X3.50X25'			14½	12	10½	8	1¼	1¼	1¼	13½	14⅛	9⅜	½	1¾	½	54
2	.179	11X7.78X23'	.179	8X3.52X32'			14½	12	10½	8	1¼	1½	1¼	15	15⅜	10⅝	½	1¾	½	54
3	.179	12X8.78X23'	.179	9X3.68X38'			14½	12	10½	8	1¼	1½	1¼	16	17	11⅝	½	1¾	½	54
4	.239	13X9.78X23'	.239	10.32X5.00X38'			16½	14½	12½	9½	1¼	2	1¼	18	18½	12¾	2	2⅛	1¾	84
11	.239	14X10.78X23'	TOT. LENGTH = 45'		.239	11X8.62X17' + 9.19X5.10X29'-3"	16½	14½	12½	9½	1¼	2	1¼	20	20½	14⅛	2	2⅛	1¾	84
					.179															
12	.299	14X10.78X23'	TOT. LENGTH = 48'		.299	11X8.62X17' + 9.19X4.68X32'-3"	16½	14½	12½	9½	1¼	2	1⅜	20	20½	14⅛	2	2⅛	2	90
					.179															

ENGLISH UNITS

ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.

DESIGN NO.	POLE		ARM		TWO PIECE ARM		ARM ATTACHMENT							ANCHOR BASE					ANCHOR BOLT	
	WALL THICK	SIZE	WALL THICK	SIZE	WALL THICK	SIZE	A	B	C	D	E	F	G	BOLT CIRCLE	S	J	T	H	DIA.	L
1	4.55	254x172x7.0 m	4.55	178x89x7.6 m			368	305	267	203	32	32	32	343	359	243	38	44	38	1.37 m
2	4.55	279x198x7.0 m	4.55	203x89x9.8 m			368	305	267	203	32	38	32	381	397	270	38	44	38	1.37 m
3	4.55	305x223x7.0 m	4.55	229x93x11.6 m			368	305	267	203	32	38	32	406	432	287	38	44	38	1.37 m
4	6.07	330x248x7.0 m	6.07	262x127x11.6 m			419	368	318	241	32	51	32	457	470	324	51	54	44	2.13 m
11	6.07	356x274x7.0 m	TOTAL LENGTH = 13.7 m		6.07	279x219x5.2 m +	419	368	318	241	32	51	32	508	521	359	51	54	44	2.13 m
					4.55	233x130x8.9 m														
12	7.59	356x274x7.0 m	TOTAL LENGTH = 14.6 m		7.59	279x219x5.2 m +	419	368	318	241	32	51	35	508	521	359	51	60	51	2.29 m
					4.55	233x119x9.8 m														

METRIC UNITS



NOTES

1. On multi-lane approaches, the transverse lines used with the railroad symbols shall extend across all approach lanes, and the RXR symbols shall be placed in each approach lane.
2. The railroad symbol shall be located so that the W10-1, Railroad Advance Warning sign, is within the two transverse boundary lines of the railroad symbol. The stop line shall be located for best sight distance within 15 to 50 feet (5 to 15 m) of the near edge of the tracks. The stop line shall be approximately 8 feet (2.4 m) from a gate (if present). Width of the "X" may vary according to lane width.
3. The SCHOOL marking shall be installed on paved approaches in advance of all School Zones. It should be placed at least 100 feet (30 m) in advance of the School Zone. The preferred placement of the SCHOOL marking is adjacent to the School Zone Advance sign.

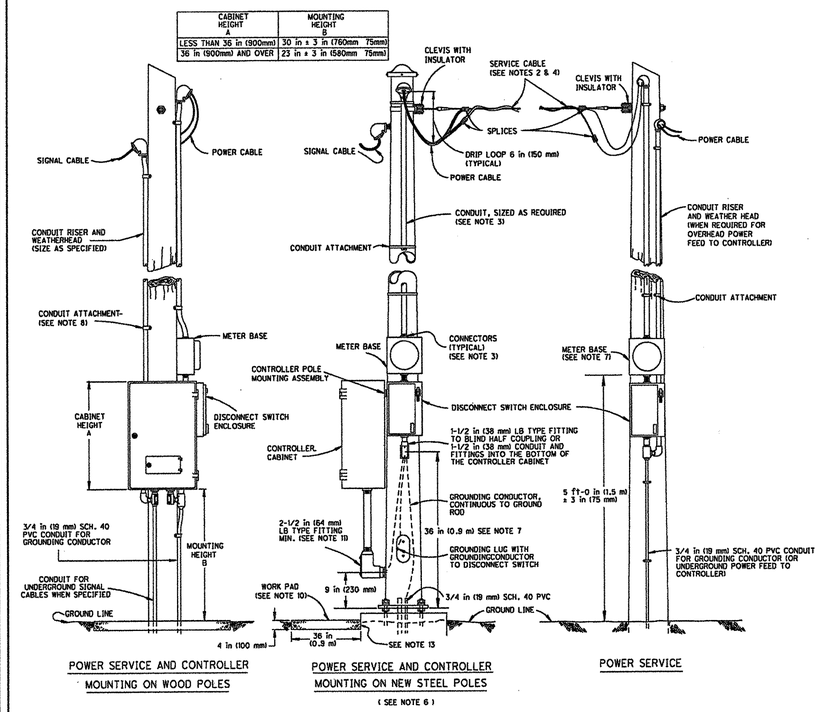
   On two-way, two-lane highways when the approach lane is 11 feet (3.4 m) or more in width, the SCHOOL word marking and transverse lines shall be contained in, and centered in, the lane. The character height shall be 6 feet (1.8 m) for urban areas and 8 feet (2.4 m) for rural areas, and when the approach lane to the School Zone is less than 11 feet (3.4 m) in width, the SCHOOL word marking and transverse lines shall extend across both lanes of traffic and the characters should be 10 feet (3.0 m) or more in height.

   On two-way, multilane highways when the approach lanes are 11 feet (3.4 m) or more in width, the SCHOOL word marking and transverse lines shall be contained in, and centered in, each lane, and the character height shall be 6 feet (1.8 m) for urban areas and 8 feet (2.4 m) for rural areas and when the approach lanes to the School Zone are less than 11 feet (3.4 m) in width, the SCHOOL word marking shall extend to the width of two approach lanes and transverse lines shall extend across all approach lanes of traffic and the characters should be 10 feet (3.0 m) or more in height.

   Center or lane lines shall not pass through the SCHOOL word marking.
4. The stop line should be placed where cross-corner vision is maximum, but in no case more than 30 feet (9 m) or less than 4 feet (1.2 m) from the nearest edge of the intersecting roadway. For normal intersections the maximum distance should be 10 feet (3 m). If a marked crosswalk is present, the stop line should be placed 4 feet (1.2 m) in advance of, and parallel to, the nearest crosswalk line.
5. The ONLY word marking is optional. Where used, the spacing between ONLY and arrow markings shall be based on Table 1. When lane-use arrow markings are used and the ONLY marking is not, an additional lane-use arrow should be used in its place to retain the spacing shown in Table 1.
6. Lane-use arrow markings are optional except where a through traffic lane at approaching an intersection becomes a mandatory turn lane(s). Where used, the spacing between markings shall be based on Table 1. However, where the turn-bay length is limited, the spacing between the markings shall be adjusted and a minimum of two arrows shall be provided.

* - INDICATES STATION REFERENCE POINT

WORD AND SYMBOL PAVEMENT MARKINGS | 01-19-07 | OFFICE OF TRAFFIC ENGINEERING | TC-71.10 | 1/1



POWER SERVICE AND CONTROLLER MOUNTING ON WOOD POLES

POWER SERVICE AND CONTROLLER MOUNTING ON NEW STEEL POLES (SEE NOTE 6)

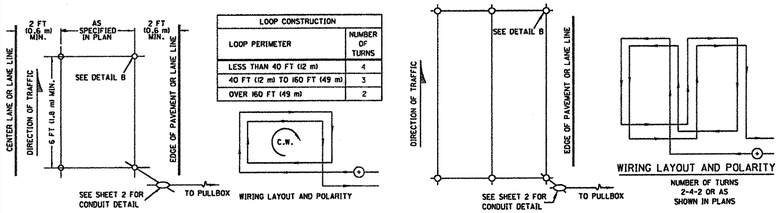
POWER SERVICE

NOTES

1. All conduit fitting entries for controllers and power service equipment in proposed steel poles shall be attached by a blind half coupling welded into the pole prior to galvanizing.
2. Service cable attachment on wood poles shall be by a 5/8 inch (15 mm) thru-bolt and clevis on steel poles by a banded clevis.
3. If both the meter and disconnect switch are not required on a steel pole, the power cable shall enter the controller through a conduit riser, external to the pole.
4. The service cable and cable splices to the power cable for the incoming power supply shall be installed by the power supplying agency unless otherwise specified. The pole attachment hardware shall be furnished and installed by the Contractor.
5. Orientation of the cabinet, meter and disconnect switch enclosure shall be arranged to minimize exposure to the street side and also minimize encroachment on sidewalks, unless otherwise shown on the plans.
6. Power and controller service added to existing steel poles shall be similar to that shown for the wood pole with the exception of the attachment hardware.
7. The top of the meter base shall not exceed 6 feet (1.8 m) above the ground. The mounting height of the LB type fitting may be decreased in order to accomodate a larger meter base.
8. Conduit attachment shall be by means of two hole conduit straps with a maximum spacing of 5 feet (1.5 m) minimum fastener requirements are as follows: wood poles- 1/4 x 3 inch (6.4 x 76 mm) long lag screws, No. 14 x 3 inch (76 mm) long round head screws, or 2nd spikest steel poles- 1/4 inch (6.4 mm) screws, self tapping or with drilled and tapped hole, in lieu of conduit clamps, 3/4 inch (19 mm) wide passivated stainless steel bonding may be used on steel poles.
9. Conduit connections at the top and bottom of the disconnect switch enclosure and meter base shall be watertight and shall use the hubs listed on the enclosure and meter base U. L. labels. Conduit shall be bent to allow the conduit to enter straight into the enclosure or meter base, and to provide space for the weatherhead when the riser is pulled tight against the pole.
10. A 48 inch x 36 inch x 4 inch (1.2 m x 0.9 m x100 mm) work pad shall be located below each pole mounted controller cabinet unless located in an otherwise paved area. When required, this item shall be paid for under Item 833, controller work pads. In level areas, the top of the pad shall be 1 inch (25 mm) above the ground line. In steeply sloped areas, the pad's location shall be adjusted to provide access and drainage while complying with the required controller cabinet mounting height.
11. The horizontal orientation of the handhole relative to the 2-1/2 inch (64 mm) blind half coupling for the controller shall be as required by the plans except they shall not be closer than 90°. Install LB fitting before erecting pole.
12. When conduit risers are required to be attached to utility company wood poles, and the utility company's policy requires non-metallic conduit, the conduit risers shall conform with Mema standards publication No. TC-2 for PVC conduit type EPC-40.
13. 1/2 inch (13 mm) preformed joint filler as per 705.03 shall be used between foundations and adjacent paved areas.

POLE MOUNTINGS FOR CONTROLLERS AND POWER SERVICE | 01-19-07 | OFFICE OF TRAFFIC ENGINEERING | TC-83.10 | 1/1

MISCELLANEOUS DETAILS



TYPICAL DETECTOR LOOP DETAILS

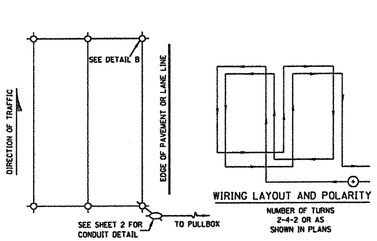
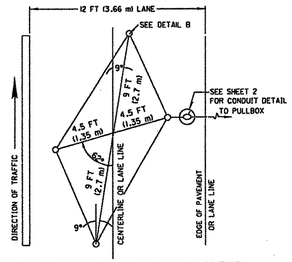
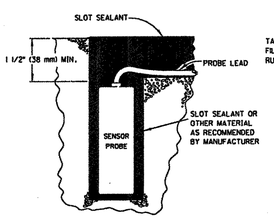


FIGURE 8 (QUADRUPOLE) LOOP DETAILS



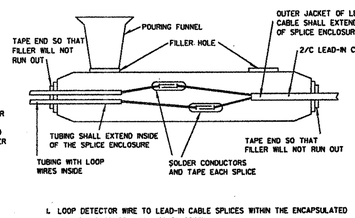
OTHER SIZES CAN BE DESIGNATED AS LONG AS THE ANGLES REMAIN THE SAME AS SHOWN AND THE DIMENSION RATIO REMAINS 2H.

ANGULAR DESIGN DETECTION LOOP DETAIL



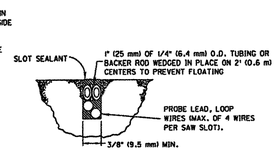
THE MAGNETOMETER HOLE SIZE SHALL BE APPROXIMATELY 3/4" (19 mm) LARGER THAN THE DETECTOR PROBE DIAMETER AND A DEPTH AS RECOMMENDED BY THE MANUFACTUER OR AS DIRECTED BY THE ENGINEER.

MAGNETOMETER SENSOR PROBE DETAIL



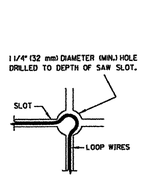
1. LOOP DETECTOR WIRE TO LEAD-IN CABLE SPLICES WITHIN THE ENCAPSULATED SPLICE ENCLOSURE SHALL BE SOLDERED.
2. IF A PULLBOX IS NOT SPECIFIED IN THE PLANS, THE WATERPROOF SPLICE ENCLOSURE SHALL BE LOCATED IN THE FIRST ENTERED POLE OR PEDESTAL, EXCEPT IF THE CONTROLLER CABINET IS MOUNTED ON THAT POLE OR PEDESTAL, IN WHICH CASE THE LOOP WIRES SHALL BE ROUTED DIRECTLY INTO THE CABINET.
3. VISIBLE AIR BUBBLES (VOIDS) OF 1/4" (6 mm) OR GREATER MAY BE CAUSE FOR REJECTION OF THE SPLICE.

SPLICE ENCLOSURE DETAIL



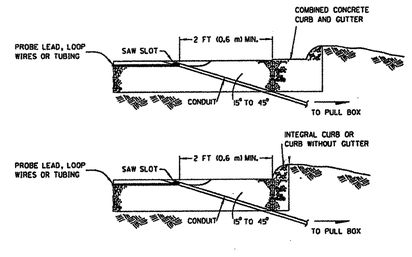
1. MINIMUM SAW SLOT DEPTH: ASPHALT 4" (100 mm), CONCRETE 2" (50 mm)
2. LOOP DETECTOR WIRE IN TUBING SHALL BE AS SPECIFIED IN CMS TABLE 732.09-1.
3. LOOP DETECTOR SEALANT SHALL BE A PREQUALIFIED PRODUCT IN ACCORDANCE WITH SUPPLEMENT 1048.
4. SAW SLOTS AND PROBE HOLES SHALL BE THOROUGHLY CLEANED AND DRIED PRIOR TO INSTALLATION OF SEALANT.
5. WIRE INSTALLATIONS IN NEW ASPHALT MAY BE SAWED AND EMBEDDED WITH SEALANT IN A SUB-SURFACE COURSE WITH SUBSEQUENT COVERING BY THE SURFACE COURSE, SUBJECT TO APPROVAL OF THE ENGINEER.

SLOT DETAIL



DETAIL B

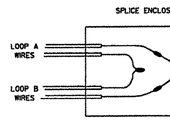
VEHICLE DETECTOR INSTALLATION DETAILS | 04-19-02 | OFFICE OF TRAFFIC ENGINEERING | TC-82.10 | 1/2



NO TRENCHING OR UNDERCUTTING CLOSER THEN 2 FEET (0.6 m) FROM THE EDGE OF PAVEMENT. BACKFILL TRENCH UNDER BERM WITH LOW STRENGTH MORTAR.

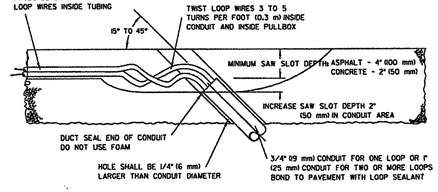
1. THE DRILLED HOLE SHALL BE LOCATED AS SHOWN ABOVE AND WITHIN THE FULL DEPTH PAVEMENT. IT SHALL NOT BE DRILLED OR CUT THROUGH THE PAVED BERM, CURB OR CURB AND GUTTER SECTION.
2. IN AREAS OF POOR PAVEMENT CONDITION, THE SAW SLOT DEPTH SHALL BE INCREASED TO INSURE ADEQUATE WIRE EMBEDMENT. ALL FIELD ADJUSTMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

TYPICAL DRILLED HOLE LOCATIONS

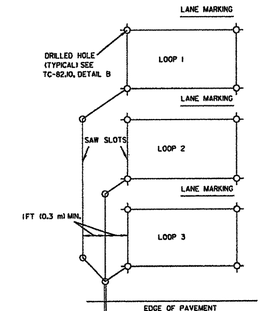


1. WHERE MULTIPLE LOOPS USE A SINGLE LEAD-IN CABLE, SERIES CONNECTIONS SHALL BE USED.
2. A MAXIMUM OF 2 LOOPS (3 WIRE SPLICES) SHALL BE USED IN ANY ENCAPSULATED SPLICE KIT.

SERIES CONNECTIONS

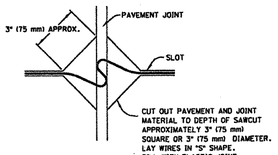


CONDUIT DRILLED HOLE DETAIL



1. ONLY ONE SET OF LOOP WIRES SHALL BE RUN IN A SAW SLOT OVER TO THE CONDUIT HOLE LOCATION.
2. ALL ADJACENT SAW SLOTS SHALL HAVE A MINIMUM DISTANCE OF 1FOOT (0.3 m) BETWEEN THEM. NO SAW SLOT SHALL BE LOCATED WITHIN 1FOOT (0.3 m) OF A LONGITUDINAL OR TRANSVERSE JOINT IN P.C.C. PAVEMENTS IF THE SLOT IS PARALLEL TO THE JOINT.

MULTIPLE LOOP LAYOUT



JOINT CROSSING DETAIL IN P.C.C. PAVEMENTS

VEHICLE DETECTOR INSTALLATION DETAILS | 04-19-02 | OFFICE OF TRAFFIC ENGINEERING | TC-82.10 | 2/2

CUY-WEST 150th STREET

105F
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P.JK 3/22/07 PLOT 1:1

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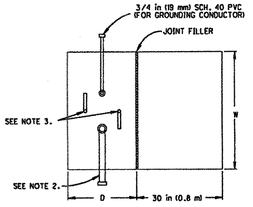
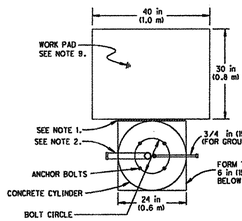




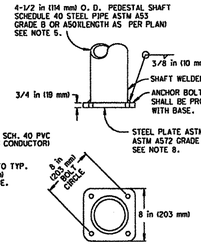
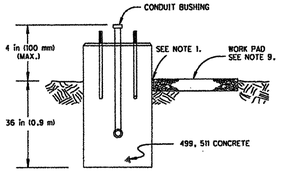
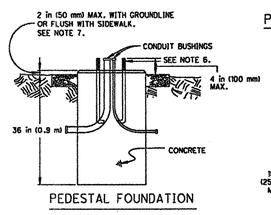
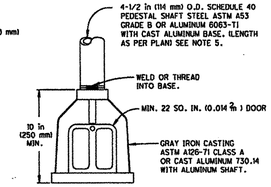


PLATE PEDESTAL BASE





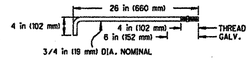
PEDESTAL FOUNDATION



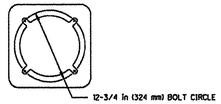
TYPE	W	D	FOUNDATION CONCRETE	WORK PAD
1	40 in (1.0 m)	24 in (0.6 m)	0.82 C.Y. (0.63 m³)	0.86 S.Y. (0.80 m²)
2	50 in (1.3 m)	36 in (0.9 m)	1.54 C.Y. (1.18 m³)	1.24 S.Y. (1.04 m²)

GROUND MOUNTED NEMA CABINET FOUNDATION

FOUNDATION CONCRETE	WORK PAD
0.42 C.Y. (0.32m³)	0.96 S.Y. (0.80m²)



PEDESTAL ANCHOR BOLT
ASTM A307 STEEL



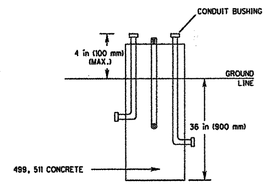
TRANSFORMER TYPE PEDESTAL BASE

NOTES

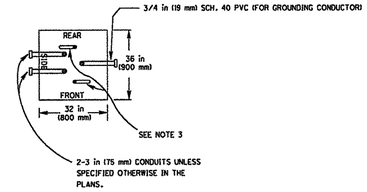
1. 1/2 inch (13 mm) preformed joint filler as per 705.03 shall be used between foundations and adjacent paved areas.
2. The size, number and orientation of conduit ells shall be as shown in the plan, except that an 3/4 inch (19 mm) Schedule 40 PVC shall be installed in each foundation.
3. The size, number and location of anchor bolts shall be in accordance with the manufacturer's recommendations.
4. All pedestals shall be provided with a method of securely attaching a 4 AWG insulated copper grounding conductor to the pedestal or anchor bolt. No cables or connections shall be external to the pedestal.
5. The pedestal shaft length as shown in the plans includes the pedestal base height for either base design.
6. The pedestal base shall set on the foundation top without grouting, preformed fillers or leveling nuts under the base. Steel shims may be used under the base for leveling the installation.
7. The foundation area of contact with the pedestal base shall be level. If adjacent paved areas slope, the remainder of the foundation top shall be beveled to meet the adjacent elevations.
8. A cast steel anchor base of equivalent strength may be used in lieu of the plate base.
9. A 4 inch (100 mm) thick work pad shall be provided unless in an otherwise paved area. When required, this item shall be paid for under item 633 Controller Work Pad. In level areas the top of the pad shall be 1 inch (25 mm) above the ground line. In steeply sloped areas the pad's location shall be adjusted to provide access and drainage.
10. Ground mounted controller cabinets shall be sealed to the foundation with a flexible weatherproof clear, silicon caulking compound.

01-19-07 | CABINET FOUNDATIONS AND PEDESTALS | OFFICE OF TRAFFIC ENGINEERING | TC-83.20 | 1/2

332/336 CABINET FOUNDATION

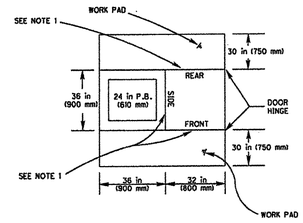


ELEVATION VIEW



PLAN VIEW

332/336 CONTROLLER WORK PAD (SEE NOTE 9)

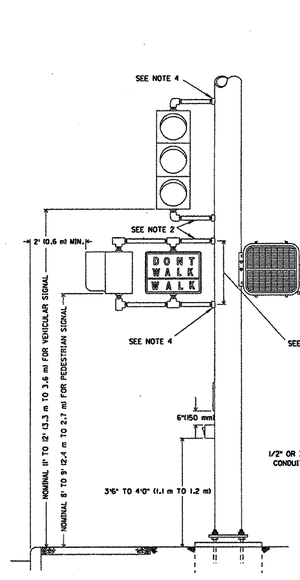


PLAN VIEW

NOTE: PULLBOX SHALL BE PLACED ON OPPOSITE SIDE OF DOOR HINGE

01-19-07 | CABINET FOUNDATIONS AND PEDESTALS | OFFICE OF TRAFFIC ENGINEERING | TC-83.20 | 2/2

MISCELLANEOUS DETAILS



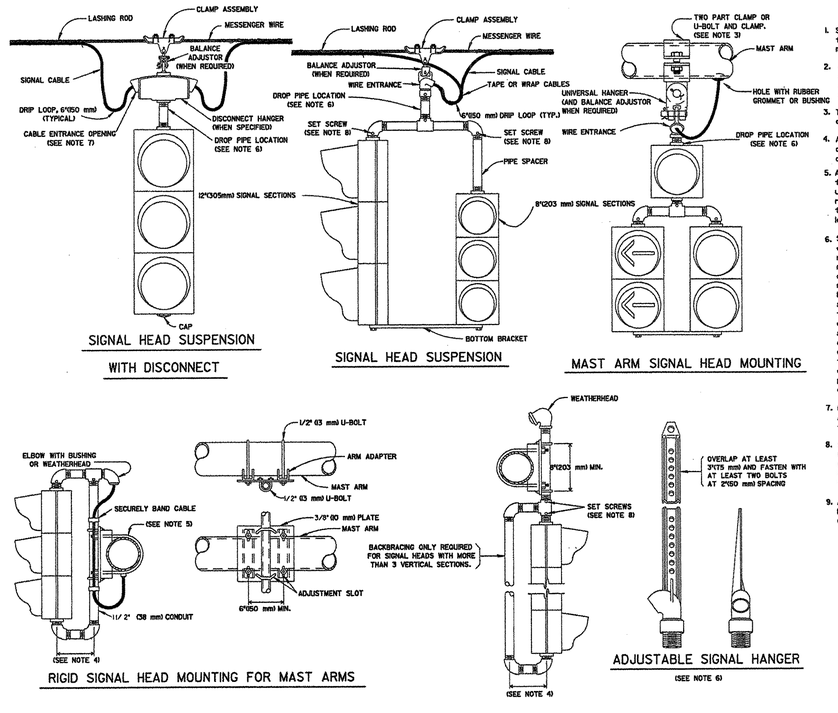
NOTES

1. Vehicular signal heads shall utilize mounting brackets similar to those shown for pedestrian signal heads.
2. Signal head conduit brackets and conduit fittings shall be galvanized and painted (except pole clamps or bands) to match the body of the signal head.
3. For embedded steel poles, external conduit shall be similar to that shown in wood pole detail. External grounding will not be required unless specifically noted on the plans.
4. The signal head bracket arms shall be attached to steel poles by one of the following methods:
   a. 1-1/2" (38 mm) blind half coupling welded into the pole prior to galvanizing.
   b. Bracket arm hub plates attached to the pole as per note 7.
   c. Pole clamp with threaded hub.

   Field installation of the wiring holes for signal heads and pushbuttons will be permitted provided that the holes are drilled or hole sawn. No torch cutting or field welding will be permitted, but surfaces shall be filed smooth and covered with two coats of zinc rich paint. Grommets or wiring guides shall be installed in the holes.
5. Vertical spacing between bracket fittings shall be determined by the Contractor, and shall be the dimension from centerline to centerline of the bracket arms necessary to accommodate the vertical height of the signal head plus not more than 10" (250 mm).
6. The following minimum size fasteners shall be used for the attachment of the indicated hardware to wood poles:
   a. CONDUIT BRACKET ARM HUB PLATES: 1/2" (13 mm) dia. X 3"(127 mm) long lag screws (two screws per hub plate).
   b. CONDUIT STRAPS (Two hole): 1/4" x 3" (6.4 mm x 76 mm) long lag screws, #14 x 3" (76 mm) long round head wood screws, or 20d spikes.
   c. PUSHBUTTON SIGN with brackets - 3/8" x 3" (10 mm x 76 mm) long lag screws (two per bracket); without brackets - 3/8" x 3" (10 mm x 76 mm) long lag screws with 7/16" (11 mm) I.D. x 1" (25 mm) O.D. flat washer between the sign and pole (two per sign).
   d. PUSHBUTTON: #14 X 3" (76 mm) long round head wood screws or 1/4" x3" (6.4 mm x 76 mm) long lag screws (two per pushbutton).
7. The following minimum size fasteners shall be used for the attachment of the indicated hardware to steel poles:
   a. CONDUIT BRACKET ARM HUB PLATES: 1/2" (13 mm) dia. screw or 3/4"(19 mm) wide passivated stainless steel band (two fasteners or bands per hub plate).
   b. CONDUIT: two hole conduit straps with 1/4" (6.4 mm) dia. screws or 3/4" (19 mm) wide passivated stainless steel bands.
   c. PUSHBUTTON SIGN: 3/8" (10 mm) dia. screws (two per sign).
   d. PUSHBUTTON: 1/4" (6.4 mm) dia. screws (two per pushbutton).

   The screws shall utilize a drilled and tapped hole or be the self-tapping type.

04-19-02 | POLE MOUNTINGS FOR SIGNAL HEADS | OFFICE OF TRAFFIC ENGINEERING | TC-85.10 | 1/1



NOTES

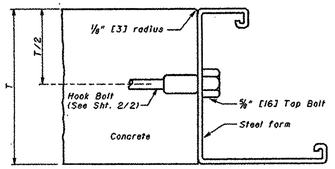
1. Signal head conduit brackets and conduit fittings shall be galvanized and painted to match the body of the signal head.
2. All signal head assemblies shall be installed in a plumb position and perpendicular to the approach lane. Balance adjustors or other approved methods may be used if necessary.
3. The mast arm clamp shall have a minimum strenght at yield to support a 200 pound (900 Kg) load.
4. A minimum of 17 in. (430 mm) is required for optically programmed signal heads and a minimum of 6 in. (150 mm) for standard signal heads.
5. Alternate rigid signal head mounting devices for mast arms may be approved by the Engineer upon demonstration that they provide adequate rigidity, equal range of adjustment and can be tightened sufficiently to prevent movement and loosening under vibrat
6. Signal heads shall be installed with a clearance above pavement elevation at the center of the roadway of 15 ft. (4.9 m) minimum, 18 ft. (5.5 m) maximum. It is intended that this clearance be obtained without the use of drop pipes, but rather by the careful selection of foundation heights, attachment heights, arm rise, span wire sag and other factors during the construction of the installation. If the installation cannot be adjusted to the proper clearance the Contractor shall advise the Engineer of all signals which exceed the maximum. The Engineer will, in consultation with the maintaining agency, direct the use of drop pipes or valve the maximum clearance requirement for each head. If drop pipes are necessary, adjustable signal hangers as detailed may be used.
7. Cable entrance openings on disconnect hangers shall rigidly clamp cable to prevent movement of the cable within the enclosure.
8. Signal head rotation shall be prevented by the use of serrated rings, set screws or other positive devices incorporated in the signal housing and at critical locations in the supporting hardware.
9. All conductors shall have adequate clearance between hangers, thimbles, bushings, etc. in order to avoid damage from rubbing.

5-01-00 | OVERHEAD SIGNAL ATTACHMENTS | OFFICE OF TRAFFIC ENGINEERING | TC-85.20 | 1/1

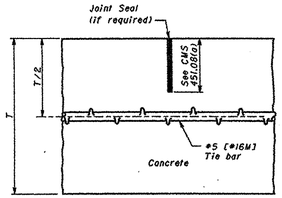
CUY-WEST 150th STREET

105G
146

F:\JOBS\695\MD\65MD11.DWG PJK 3/22/07 PLOT 1:1



ACCEPTABLE METHOD OF FORMING JOINT



SAWED JOINT

NOTES

GENERAL: Longitudinal joints shall be used when specified on the typical section and shall be constructed as shown on this drawing in Items 451 and 452 Pavement and Item 305 Base.

The joint shall be on the centerline of the pavement unless otherwise shown on the plans. Where the pavement width exceeds 16' [5.0 m], an additional longitudinal joint shall be introduced into the jointing details as directed by the Engineer.

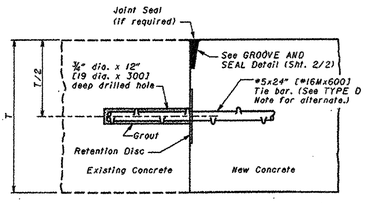
Tie bars shall be #5 (#16M) deformed bars. A satisfactory device shall be used to hold the tie bars in proper position or they may be installed by a mechanical installing device. Tie bars shall be centered on the longitudinal joint as nearly as practical.

BUTT JOINT: The longitudinal joint between adjoining slabs poured in separate operations shall be a butt joint with hook bolts or tie bars, unless otherwise shown on the plans. Bent tie bars shall not be permitted.

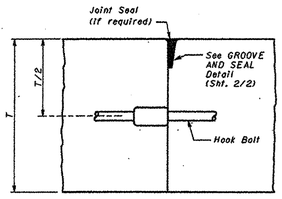
TYPE D (DRILLED TIED LONGITUDINAL) JOINT: Type D joints shall be constructed in accordance with CMS 255.05. The nylon or plastic retention disc shall be clear or opaque white in color. Grout shall meet the requirements of CMS 255.02. 3/8" [16] expansion anchors, FF-S-325, Group VIII, Type I or Group II Type 4, Class 1 may be used lieu of the #5x24" [#16Mx600] deformed bar and shall be installed according to the manufacturer's recommendations.

The use of self drilling expansion shield anchors, FF-S-325, Group III, Type I (a) and (c) shall not be permitted.

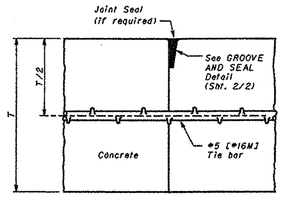
See Sheet 2/2 for additional details.



TYPE D (DRILLED TIED LONGITUDINAL) JOINT



BUTT JOINT w/ HOOK BOLT

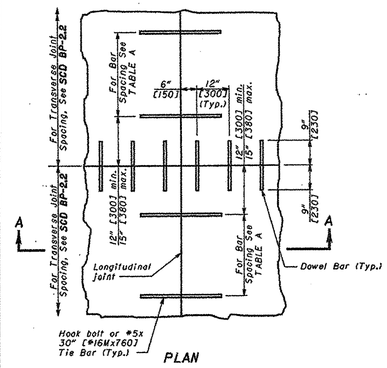


BUTT JOINT w/ TIE BAR

THIS DRAWING REPLACES BP-2.1 DATED 7-28-00.

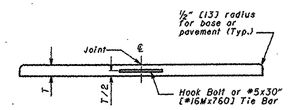
NUMBER	STANDARD ROADWAY CONSTRUCTION DRAWING	ROADWAY ENGINEERING SERVICES	All metric dimensions in brackets [] are approximate unless otherwise noted.	STDS. ENGR. D. Foote	DOHQ DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN ENGINEER	7-16-04 DATE
BP-2.1	LONGITUDINAL PAVEMENT JOINTS					

1/2



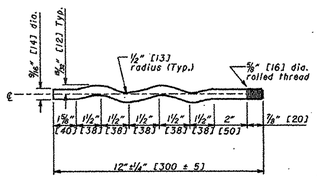
PLAN

TABLE A			
Thickness of Pavement	Transverse Joint Spacing	Number of Tie Bars per Slab	Max. spacing between Tie Bars
10" [250] or less	15' [4.6 m]	7	26" [660]
	21' [6.5 m]	10	26" [660]
Greater than 10" [250]	15' [4.6 m]	9	20" [508]
	21' [6.5 m]	13	20" [508]

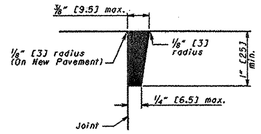


SECTION A-A

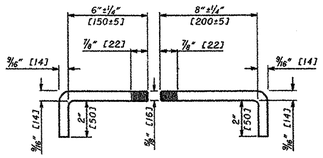
TIE BAR OR HOOK BOLT SPACING



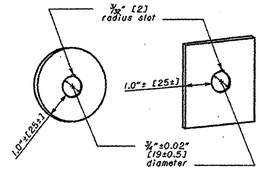
HOOK BOLT ALTERNATE



GROOVE AND SEAL DETAIL



HOOK BOLT



NYLON OR PLASTIC GROUT RETENTION DISCS FOR DOWEL/TIE BARS
(1/16" [1.61 min. thick)

NOTES

GROOVES: Grooves for sealing expansion bolt or butt joints in Item 451 or 452 pavements shall be formed by depressing a device or bar into the newly deposited concrete adjacent to the existing or previously poured lane. The device or bar shall be removed as soon as the concrete is in such condition as to preclude distortion of the concrete.

Adjoining slabs adjacent to grooved joints shall be edged with a thin metal edger having a radius of 1/8" [3]. Any impression left in the surface of the pavement by the flat part of the edging tool shall be eliminated.

In lieu of the above method the longitudinal joint may be constructed in accordance with CMS 451.08(a).

After the joint is formed it shall be protected from dirt and foreign matter until the joint seal is placed.

SEALING JOINTS: Sawed or hand-formed joints may be sealed with CMS 705.04 or 705.11 joint sealer.

HOOK BOLTS: Threaded hook bolts and alternates shall be turned to a tight fit when installed in couplings.

METAL STRENGTH: Tie bars, hook bolt assemblies and the hook bolt alternate shall have a minimum strength of 11,000 pounds [48.9 kN].

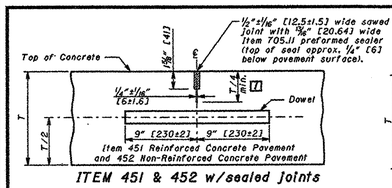
SPACING: Tie bars shall not be located within 12" [300] of any transverse joint.

THIS DRAWING REPLACES BP-2.1 DATED 7-28-00.

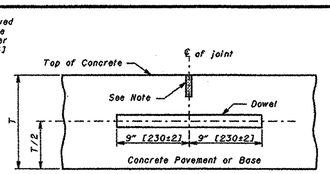
NUMBER	STANDARD ROADWAY CONSTRUCTION DRAWING	ROADWAY ENGINEERING SERVICES	All metric dimensions in brackets [] are approximate unless otherwise noted.	STDS. ENGR. D. Foote	DOHQ DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN ENGINEER	7-16-04 DATE
BP-2.1	LONGITUDINAL PAVEMENT JOINTS					

2/2

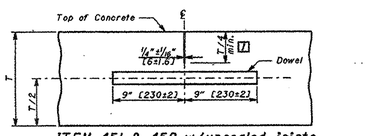
MISCELLANEOUS DETAILS



ITEM 451 & 452 w/sealed joints

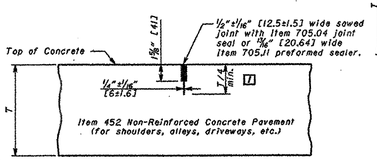


SECTION THROUGH CONSTRUCTION JOINT

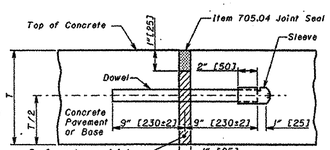


ITEM 451 & 452 w/unsealed joints
(Dowel Bar omitted for shoulders, alleys, driveways, etc.)

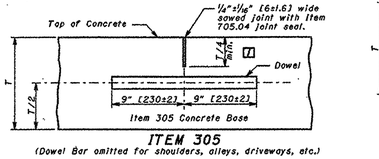
CONSTRUCTION JOINT



ITEM 452 w/sealed joints

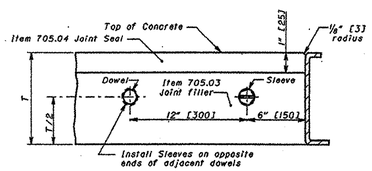


SECTION THROUGH EXP. JOINT



ITEM 305
(Dowel Bar omitted for shoulders, alleys, driveways, etc.)

CONTRACTION JOINTS SECTIONS



SIDE ELEVATION OF EXP. JOINT
(through Concrete Pavement or Base)

EXPANSION JOINTS

NOTES

GENERAL: Notes and details shown on this drawing shall be considered in conjunction with and supplemental to the pertinent specifications for portland cement concrete pavement and bases, and related incidentals.

JOINT COMPONENTS: This drawing is intended for use with a uniform depth pavement. When the project involves the placing of variable depth pavement, the joint components shall be held in place in accordance with the method shown in the plans or as approved by the Engineer.

CONTRACTION JOINTS: Contraction joints in Item 305 Concrete Base shall be doweled where they are located in mainline pavement, ramps, acceleration/deceleration lanes, or collector/distributor lanes, or in shoulders within 500' [150 m] of a pressure relief joint.

Contraction joints in Item 305 Concrete Base shall not be doweled in alleys, private drives, or commercial drives.

Contraction joints of the type specified shall be spaced in accordance with the CONTRACTION JOINT SPACING Table.

CONTRACTION JOINT SPACING	
Types of Pavement or Base	Maximum Spacing Between Joints
Item 451 Reinforced Concrete Pavement	21' [6.5 m]
Item 452 Non-Reinforced Concrete Pavement	15' [4.6 m]
Item 305 Concrete Base	15' [4.6 m]

CONSTRUCTION JOINTS: In Item 305 Concrete Base, a construction joint shall not be located closer than 6' [1.8 m] to another parallel joint.

Kerf and seal conforming in all respects to details shown for contraction joints shall be provided at each construction joint in concrete pavement and base.

SEALING BASE CONTRACTION JOINTS: All contraction joints for concrete base shall be sealed as detailed on this drawing and the cost included in the unit price bid for Item 305.

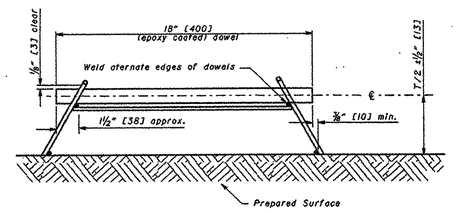
LEGEND

☑ Where T > 10" [255], the sawcut depth shall be T/3.

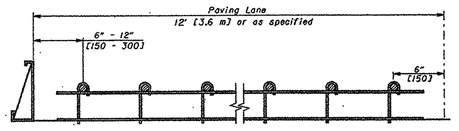
THIS SHEET REPLACES BP-2.2 DATED 7-28-00.

NUMBER	STANDARD ROADWAY CONSTRUCTION DRAWING	ROADWAY ENGINEERING SERVICES	All metric dimensions in brackets [] are approximate unless otherwise noted.	STDS. ENGR. D. Foote	DOHQ DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN ENGINEER	7-16-04 DATE
BP-2.2	TRANSVERSE PAVEMENT JOINTS (Universal Welded Dowel Basket Assembly)					

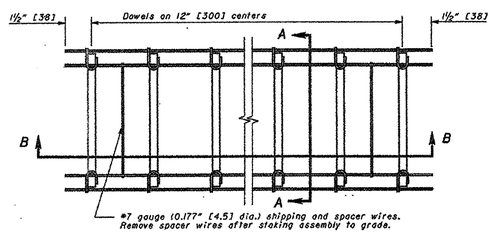
1/2



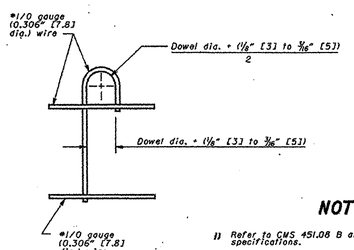
SECTION A-A



SECTION B-B



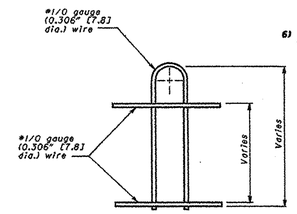
PLAN VIEW



J-LEG DETAIL
(ALTERNATE)

NOTES

1) Refer to CMS 451.08 B and 709.13 for dowel specifications.
2) Wire sizes shown are minimum required.
3) All wire intersections are to be welded.
4) Stakes typically applied at working ends of dowel.
5) TOLERANCES:
   A) ±1/4" per foot [±20 mm per meter] unless otherwise specified.
   B) Centerline of individual dowels shall be parallel to each other, the surface and the centerline of the slab.
   C) On centers should be ±1/2" [±13].
   D) Dowels should be placed at mid-depth of slab.
6) J-Leg or U-Leg to be installed on inside or outside of subframe.



U-LEG DETAIL

NEW SHEET.

NUMBER	STANDARD ROADWAY CONSTRUCTION DRAWING	ROADWAY ENGINEERING SERVICES	All metric dimensions in brackets [] are approximate unless otherwise noted.	STDS. ENGR. D. Foote	DOHQ DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN ENGINEER	7-16-04 DATE
BP-2.2	TRANSVERSE PAVEMENT JOINTS (Universal Welded Dowel Basket Assembly)					

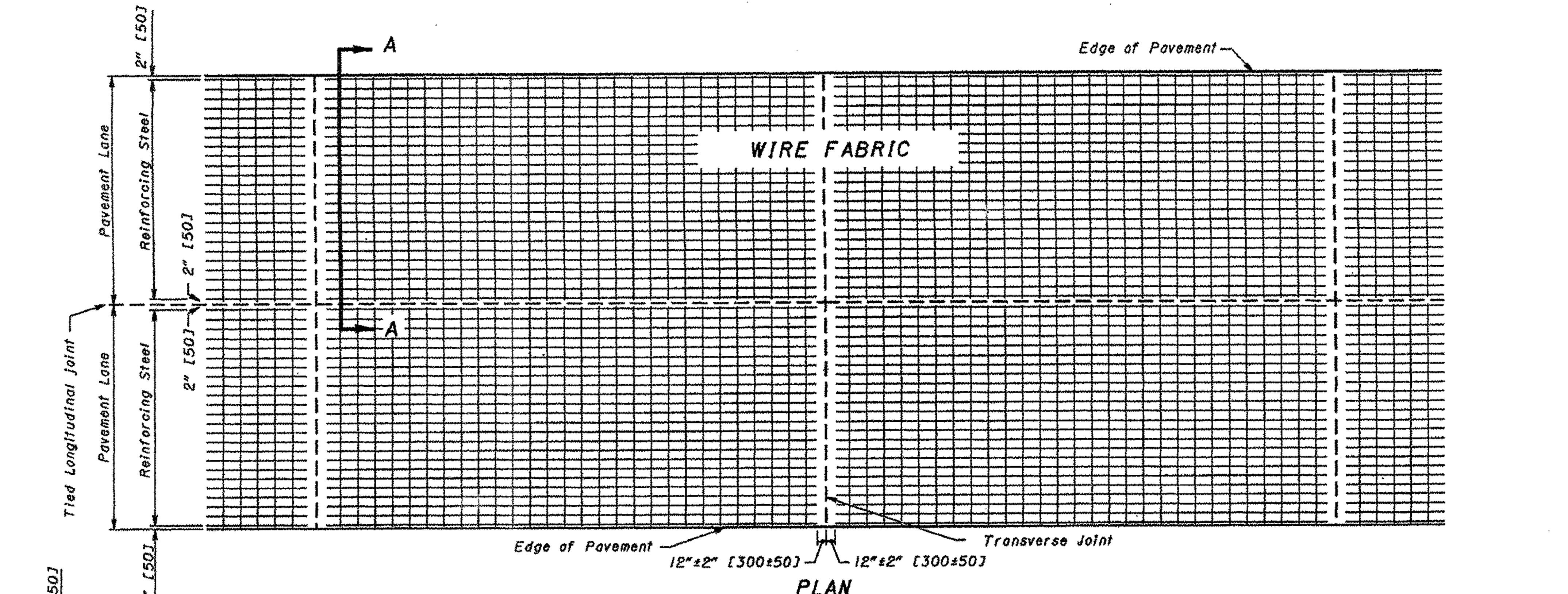
2/2

CUY-WEST 150th STREET

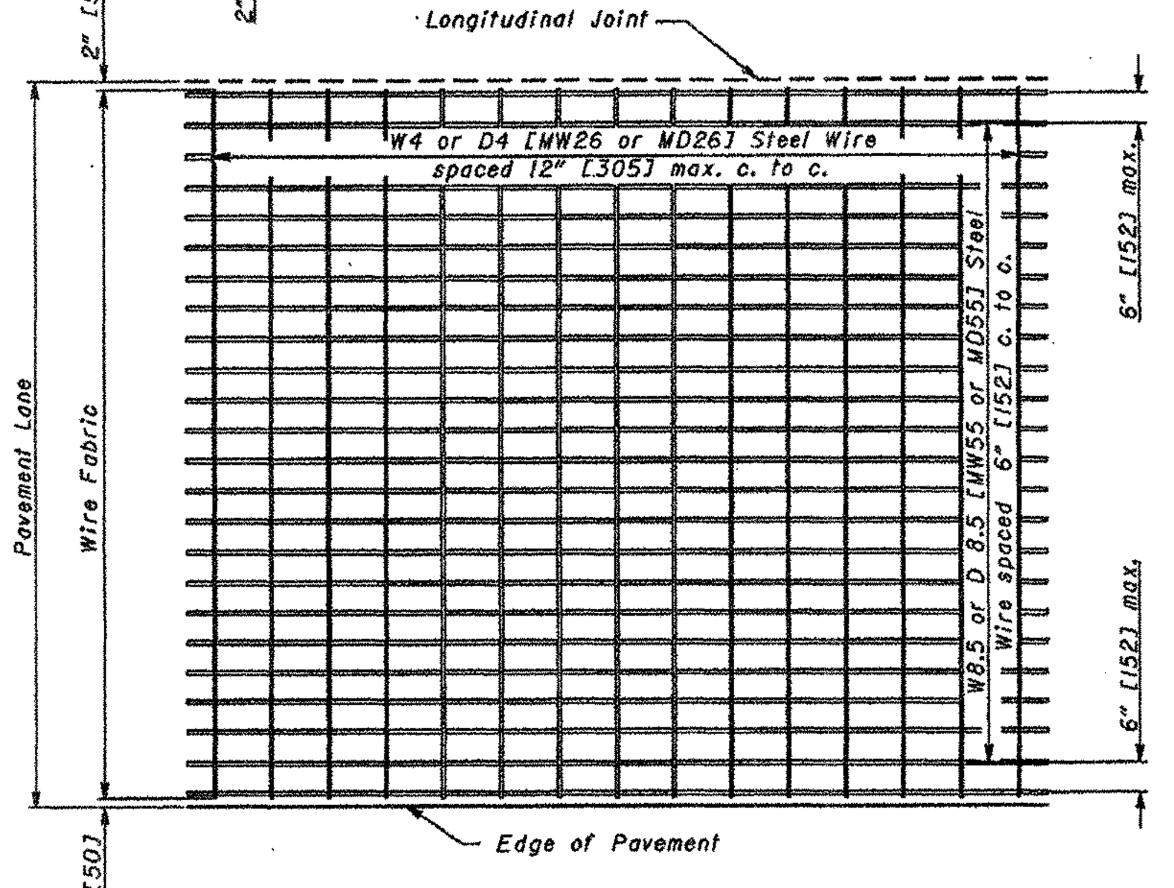
105H
146

P:\K 3/22/07 PLOT 1:1

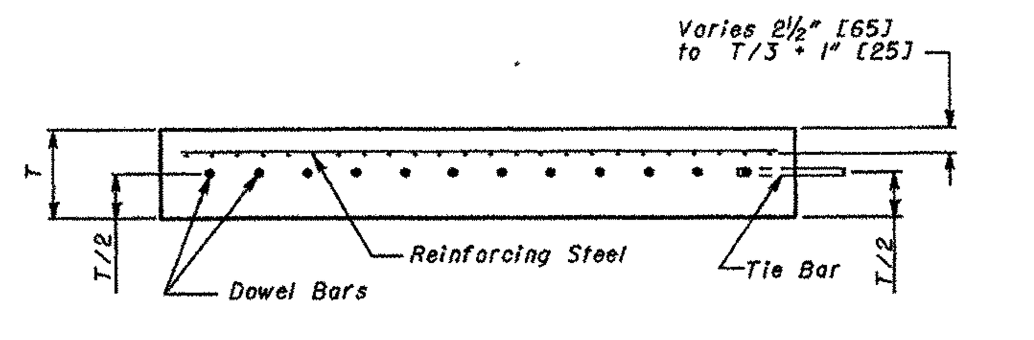
F:\JOBS\695\MD\695MD12.DWG



PLAN



WIRE FABRIC DETAIL



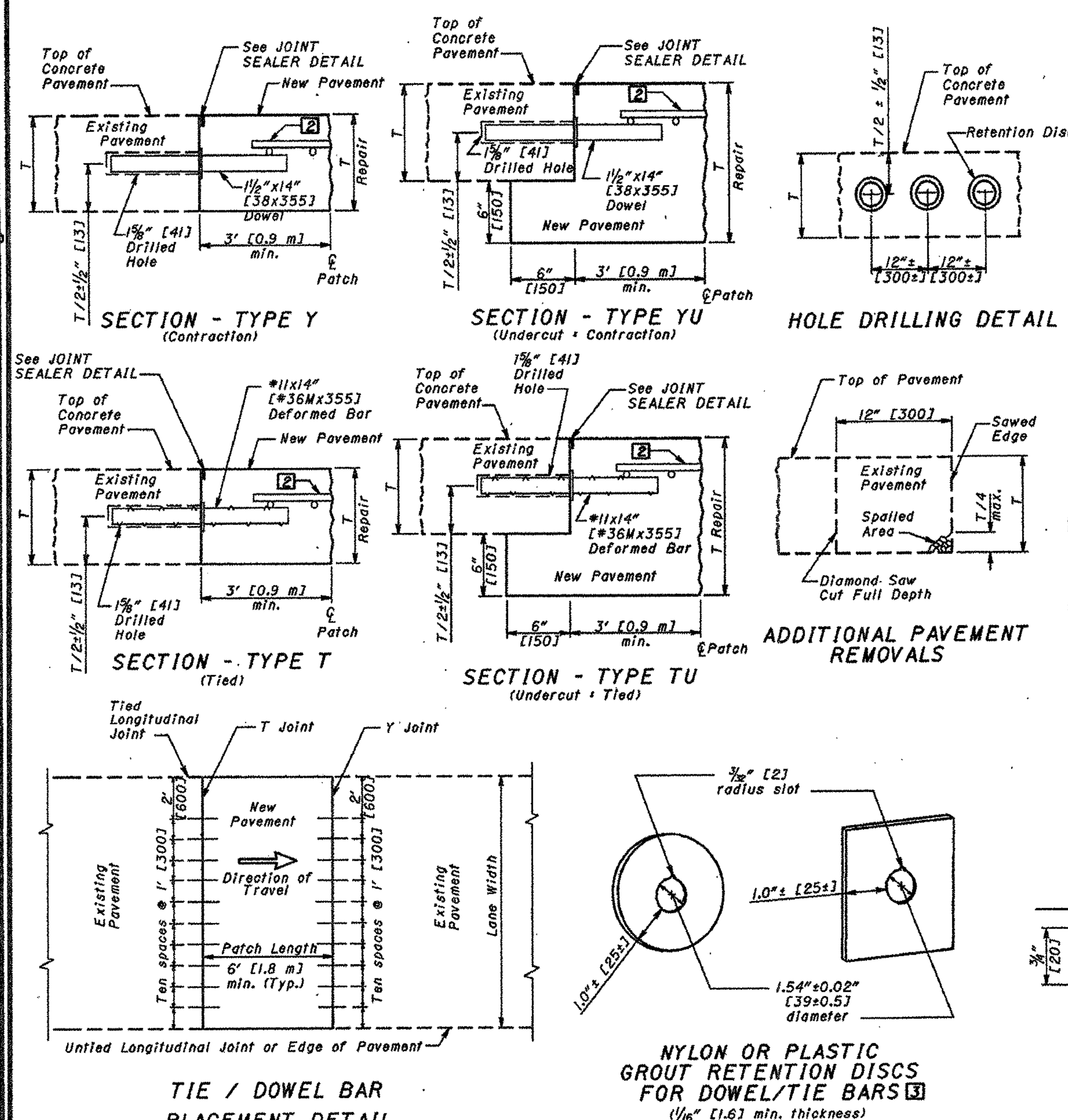
SECTION A-A

NOTES

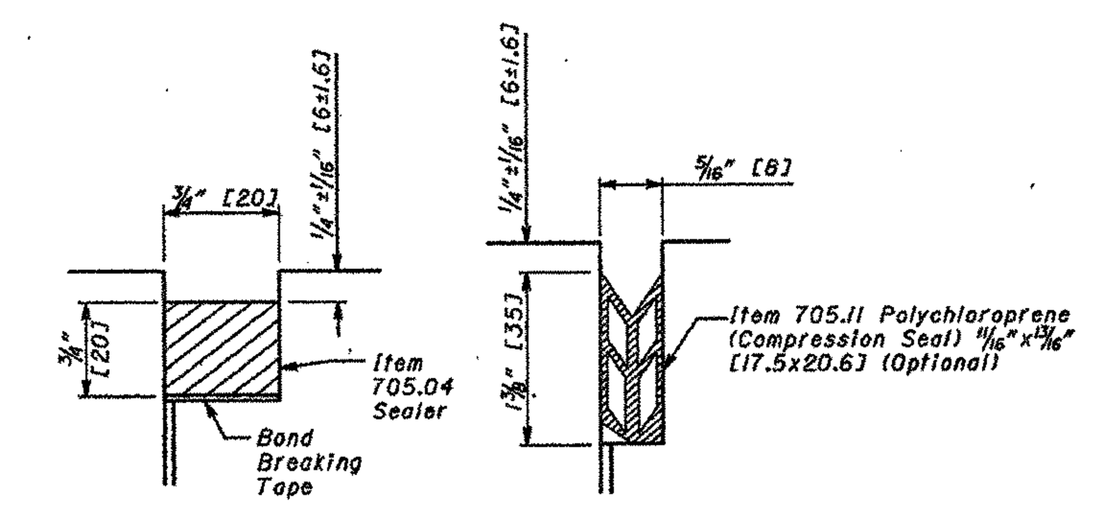
STEEL REINFORCING: In normal or wider lane widths, reinforcing may consist of two units with an approved longitudinal hinge. The hinge shall consist of W4 or D4 [MW26 or MD26] steel wires connecting the two units such that the longitudinal members on either side of the hinge will be properly spaced when the reinforcing is in the final position.

Reinforcing steel in final position shall not touch either the dowels or tie bars.

THIS DRAWING REPLACES BP-1.1M DATED 10-28-94.
STANDARD ROADWAY CONSTRUCTION DRAWING — CONCRETE PAVEMENT REINFORCING — NUMBER BP-1.1 — 1/1



SECTION - TYPE Y (Contraction) · SECTION - TYPE YU (Undercut + Contraction) · HOLE DRILLING DETAIL · SECTION - TYPE T (Tied) · SECTION - TYPE TU (Undercut + Tied) · ADDITIONAL PAVEMENT REMOVALS · TIE / DOWEL BAR PLACEMENT DETAIL (See [1] for Bar Placement) · NYLON OR PLASTIC GROUT RETENTION DISCS FOR DOWEL/TIE BARS [3] (1/16" [1.6] min. thickness)



JOINT SEALER DETAIL

NOTES

GENERAL: All joints shall be constructed normal to the centerline of the pavement lane unless otherwise specified in the plans.

All dowel holes shall be drilled by a mechanical device that will allow independent adjustment of all drill shafts in the horizontal and vertical direction. The device shall be capable of drilling a minimum of three holes at a time.

All smooth dowels shall be coated with a thin layer of oil or other "bond-breaking" material after they have been installed in the existing pavement and just prior to placing the patch. All dowels shall be placed parallel to the pavement surface and the centerline of the pavement lane.

This standard drawing is intended for use in repairing both concrete and composite pavements. For clarity, asphalt overlays are not shown.

When Prefabricated Edge Drains are used, they shall be placed after joint repairs are completed.

TYPE N JOINT: Joints referred to as Type N joints on the plan shall be constructed as contraction joints per **SCD BP-2.2.**

ADDITIONAL PAVEMENT REMOVAL: If, after the sawing and removal of the pavement from the area to be repaired, the face of the remaining pavement is spalled or deteriorated for a height greater than one-fourth (1/4) the thickness of the rigid pavement, an additional saw cut shall be made as shown and as directed by the Engineer. This additional work shall be measured for additional payment for full depth pavement sawing, rigid pavement removal and replacement.

LONGITUDINAL JOINT: For patches 10' [3.0 m] or greater in length, the longitudinal joint shall be constructed per **SCD BP-2.1.**

The tie bars or hook bolts shall be spaced at no more than 30" [760] nor less than 24" [610] on center.

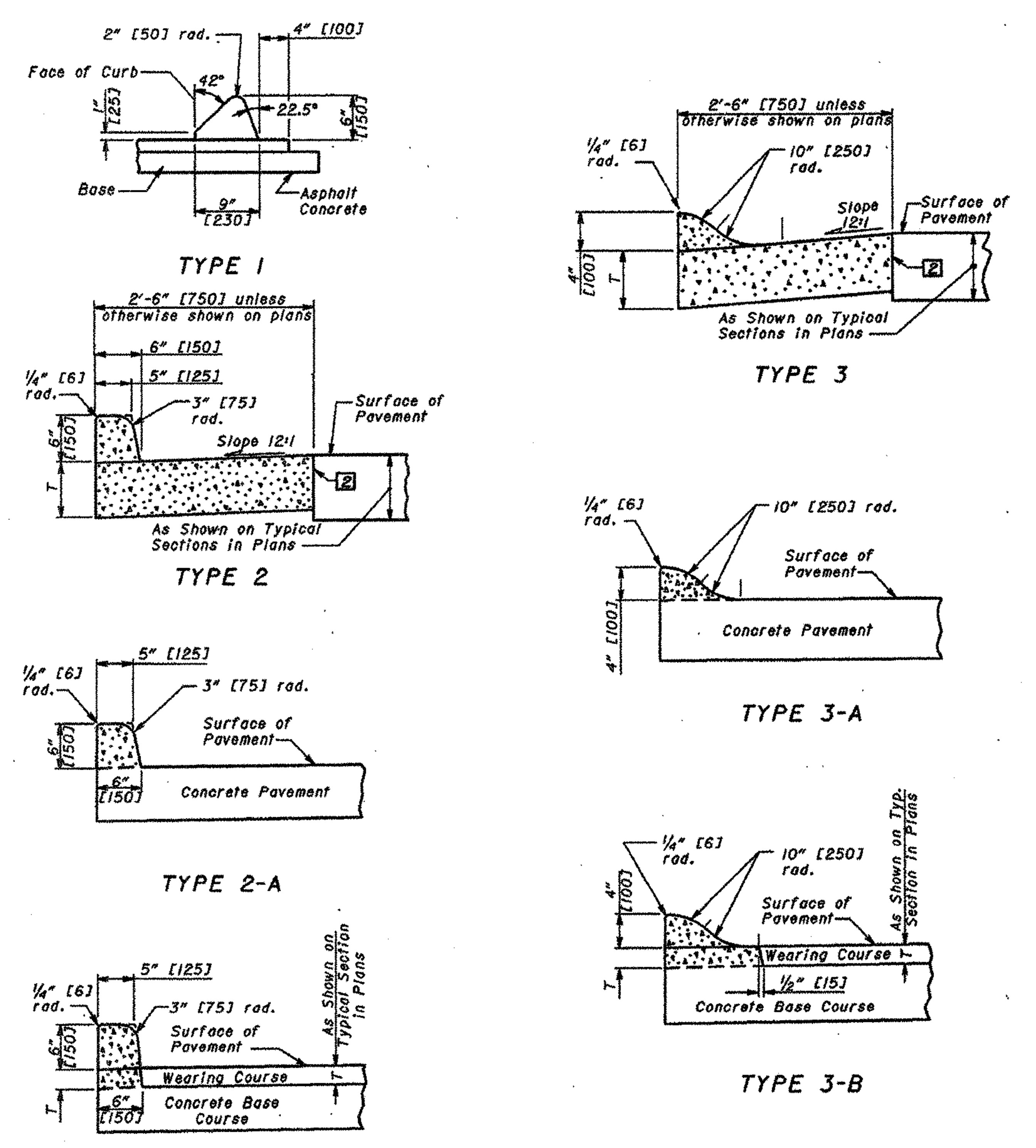
LEGEND

[1] Bars shall be placed 2' [600] from the tied longitudinal joint and continue across with a 1' [300] spacing to the edge of pavement or an untied longitudinal joint. Where lane widths are between two tied longitudinal joints, begin bars 2' [600] from each tied longitudinal joint and continue across with a 1' [300] spacing.

[2] Reinforcement will be required for all repairs greater than 10' [3.0 m] in length or for repairs that will be opened to traffic within 24 hours of placement. The fabric shall consist of W8.5 or D8.5 [MW55 or MD55] longitudinal wires spaced 6" [150] c/c and W4 or D4 [MW26 or MD26] transverse wires spaced 12" [300] c/c. The clearance from the end of the wire fabric to the edge of pavement or new transverse joint shall be 4"±2" [100±50].

[3] Nylon or plastic grout retention discs shall be clear or opaque white in color.

THIS DRAWING REPLACES BP-2.5M DATED 4-8-97.
STANDARD ROADWAY CONSTRUCTION DRAWING — RIGID REPLACEMENT — NUMBER BP-2.5 — 1/1



TYPE 1 · TYPE 2 · TYPE 2-A · TYPE 2-B · TYPE 3 · TYPE 3-A · TYPE 3-B

NOTES

GENERAL: This drawing shows alternate types of curb that may be used on various types of pavement. The typical section of the project shows the type to be used, also the thickness of the edge of the pavement or the edge of the curb and gutter section.

JOINTS: 1" [25] expansion joints shall extend up to the top of the curb and shall be constructed in the curb and gutter section in such a manner that the joint seal will extend the full width of the gutter and into the curb face a sufficient distance to seal the joint to an elevation of at least 2" [50] above the flow line of the gutter. Dowel bars shall be used in the curb and gutter section at expansion joints and to the surface fo the pavement.

Transverse expansion joint material shall meet the requirements of Item 705.03.

GUTTER PLATE THICKNESS: Thickness of gutter plate "T" shall be 9" [230] unless otherwise shown on the plans.

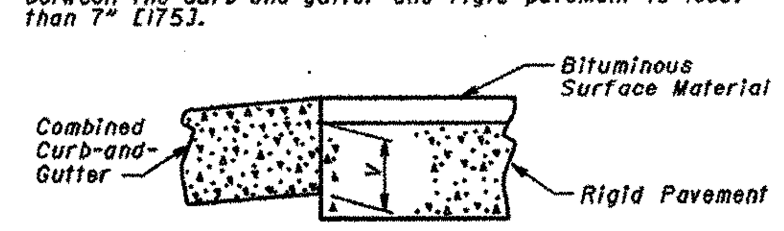
TOLERANCES: Dimensional tolerances are as follows:
Curbs: -1/32" to +1/4" [-1 to +5],
Gutters: 0 to +1/2" [0 to +12].

LEGEND

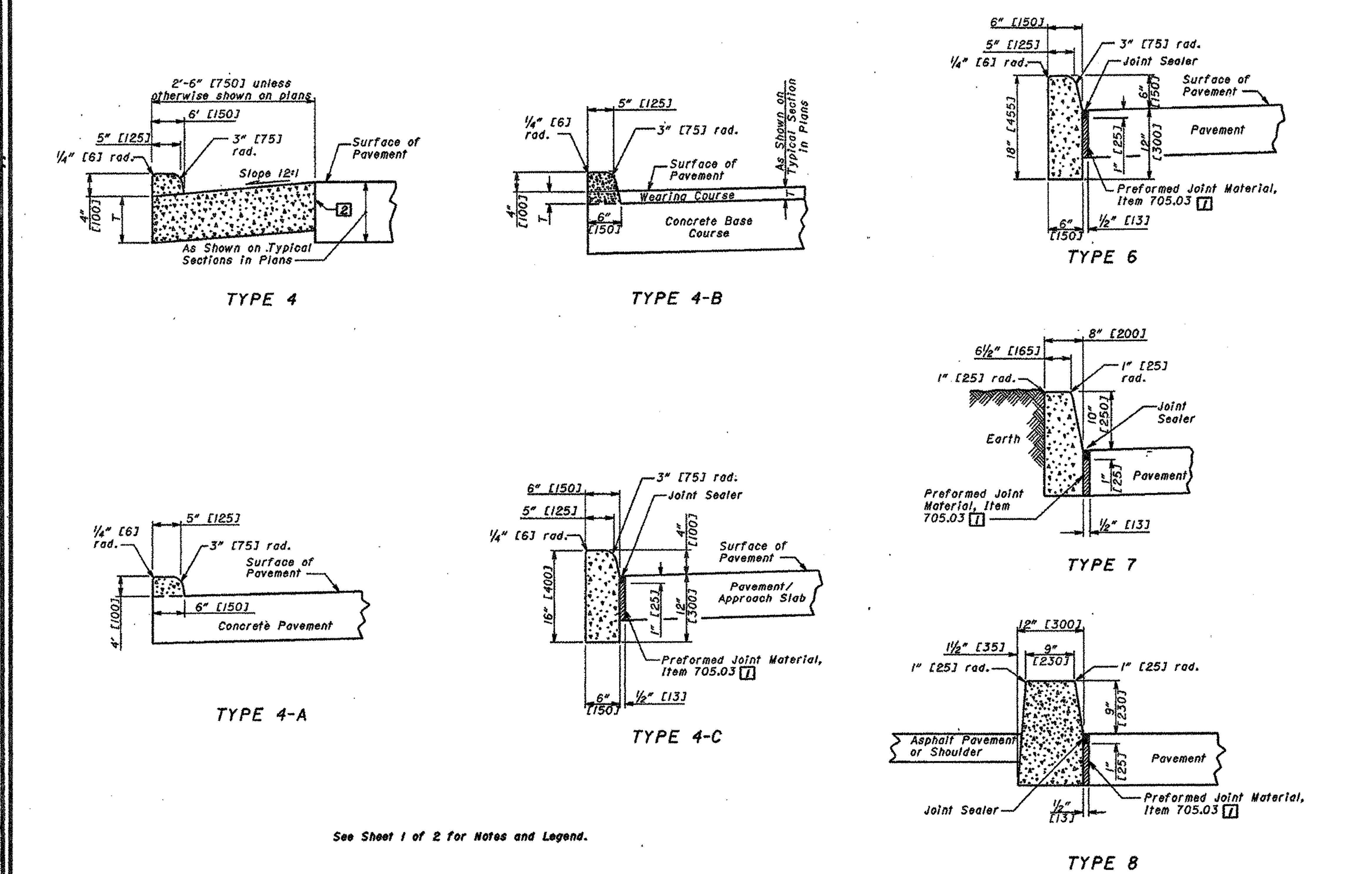
[1] Expansion joint material and joint sealer are not required for the portion of the curb that is adjacent to a flexible pavement type. Both materials are required, as detailed, for the full height of rigid pavement and concrete bases.

[2] Butt joints shall be provided between combined curb-and-gutter and new or existing rigid pavements, with tie bars or hook bolts provided at intervals of 5' [1.5 m]. See **SCD BP-2.1** for details of tie bars and hook bolts.

If the combined curb-and-gutter adjoins a new rigid base or an existing rigid base or pavement that is to be surfaced with bituminous material, a butt joint shall also be provided. However, tie bars or hook bolts shall be omitted when the vertical overlap ("V" in detail below) between the curb-and-gutter and rigid pavement is less. than 7" [175].



THIS DRAWING REPLACES BP-5.1M DATED 10-28-94.
STANDARD ROADWAY CONSTRUCTION DRAWING — CONCRETE CURBS AND COMBINED CURB AND GUTTERS — NUMBER BP-5.1 — 1/2



TYPE 4 · TYPE 4-A · TYPE 4-B · TYPE 4-C · TYPE 6 · TYPE 7 · TYPE 8

See Sheet 1 of 2 for Notes and Legend.

THIS DRAWING REPLACES BP-5.1M DATED 10-28-94.
STANDARD ROADWAY CONSTRUCTION DRAWING — CONCRETE CURBS AND COMBINED CURB AND GUTTERS — NUMBER BP-5.1 — 2/2

OHIO DEPARTMENT OF TRANSPORTATION — ROADWAY DESIGN ENGINEER — 7-28-00 — ROADWAY ENGINEERING SERVICES — STDS. ENGR. M. Evans — DRAWN D. Focke — All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

MISCELLANEOUS DETAILS

CUY-WEST 150th STREET

SHEET NO.	REF. NO.	LOCATION	STATION		SIDE	646								
						LANE LINE	CENTER LINE, SOLID AND BROKEN DOUBLE	CENTER LINE, SOLID DOUBLE	CHANNELIZING LINE	STOP LINE	CROSSWALK LINE	TRANSVERSE DIAGONAL LINE, WHITE	LANE ARROW	DOTTED LINE, WHITE
			FROM	TO		FT	FT	FT	FT	FT	FT	FT	EACH	FT
110	LL1	SMITH – W 150	45+85	59+00	LT	1315								
110	LL2	W 150	50+68	59+00	RT	832								
110	CL1	SMITH	45+85	46+90	℄			115						
110	CL2	SMITH	45+85	49+44	℄			359						
110	CL3	W 150	50+68	55+35	℄			467						
110	CL4	W 150	54+25	55+35	℄			110						
110	CL5	W 150	55+35	59+00	℄		365							
110	CL6	W 150	55+35	59+00	℄		365						2	
110	CH1	SMITH	46+90	49+42	RT				252				5	
110	CH2	SMITH	46+90	49+42	RT				252					
110	CH3	W 150	50+70	54+45	LT				375				7	
110	CH4	W 150	50+70	53+95	LT				325				6	
110	SL1	SMITH	49+44	–	RT					40				
110	SL2	W 150	50+68	–	LT					49				
110	SL3	BROOKPARK	19+17	–	RT					12				
110	SL4	BROOKPARK	20+65	–	LT					31				
110	SL5	BROOKPARK	20+85	–	LT					12				
110	CW1	SMITH	49+50	49+58	RT/LT						171			
110	CW2	W 150	50+68	50+80	RT/LT						158			
110	CW3	BROOKPARK	19+42	19+50	RT/LT						170			
110	CW4	BROOKPARK	20+46	20+54	RT/LT						161			
110	TL1	SMITH	46+90	49+42	RT							119		
110	DL1	BROOKPARK – W 150	20+46	50+56	RT/LT									102
111	LL3	W 150	59+00	63+60	LT	460								
111	CL7	W 150	59+00	70+00	LT		1100						4	
111	CL8	W 150	59+00	70+00	RT		1100							
111	SL6	W 150	60+00	–	RT					23				
111	SL7	W 150	61+75	–	LT					23				
111	SL8	I–480 RAMP	524+87	–	RT/LT					53			2	
111	CW5	W 150	60+12	60+19	RT/LT						92			
111	CW6	I–480 RAMP	524+76	524+83	RT/LT						130			
112	CL9	W 150	70+00	71+90	LT		190						2	
112	CL10	W 150	70+00	71+90	RT		190							
112	CL11	W 150	71+90	72+50	RT/LT			60						
112	CL12	W 150	71+90	74+80	LT			290						
112	CL13	W 150	76+95	78+60	RT			165						
112	CL14	W 150	78+00	78+60	RT/LT			60						
112	CL15	W 150	78+60	79+00	LT			40						
112	CL16	W 150	78+60	79+00	RT			40						
112	CL17	INDUSTRIAL PKWY.	16+25	18+86	LT			261						
112	CL18	INDUSTRIAL PKWY.	20+81	21+21	RT			40						
112	SL9	W 150	74+80	–	RT					12				
112	SL10	W 150	75+53	–	RT					14				
112	SL11	W 150	76+57	–	LT					16				
112	SL12	W 150	76+95	–	LT					12				
112	SL13	INDUSTRIAL PKWY.	18+86	–	RT					12				
112	SL14	INDUSTRIAL PKWY.	19+28	–	RT					19				
112	SL15	INDUSTRIAL PKWY.	20+81	–	LT					23				
112	CH5	W 150	72+80	75+53	RT				273				5	
112	CH6	W 150	76+57	77+70	LT				113				2	
112	CH7	INDUSTRIAL PKWY.	17+05	19+28	RT				223				9	
112	CH8	INDUSTRIAL PKWY.	20+81	21+21	LT				40				1	
112	CW7	W 150	75+57	75+63	RT/LT						142			
112	CW8	W 150	76+47	76+53	RT/LT						137			
112	CW9	INDUSTRIAL PKWY.	19+32	19+38	RT/LT						107			
112	CW10	INDUSTRIAL PKWY	20+66	20+77	RT/LT						80			
110	LL4	SMITH	46+12	49+42	RT	330								
110	DL2	SMITH – W 150	49+54	50+56	LT									102
110	DL3	SMITH – W 150	49+60	50+56	RT									96
111	DL4	W 150	60+19	61+75	LT									156
111	TL2	W 150	61+77	62+02	RT							46		
		TOTAL				2937	3310	2007	1853	351	1348	165	45	456

CALCULATED JEN CHECKED EPS

PAVEMENT MARKING SUB-SUMMARY

CUY-WEST 150 STREET

106 / 146

P.W. 3/26/07 PLOT 1:1

(JOBS\665\TP\665TPSS01

SH. NO.	REF. NO.	STATION	SIDE	CODE	SIZE (INCHES)	625		630																		
						GROUND ROD		ONE WAY SUPPORT NO. 3 POST	GROUND MOUNTED SUPPORT, NO. 2 POST	GROUND MOUNTED SUPPORT, NO. 3 POST	SIGN, SINGLE FACED, STREET NAME, TYPE G, AS PER PLAN, D-51 (20")	SIGN, FLAT SHEET, TYPE G	SIGN ERECTED, FLAT SHEET	SIGN SUPPORT ASSEMBLY, POLE MOUNTED		OVERHEAD SIGN SUPPORT, TYPE TC-16.20 DESIGN NO. 12	RIGID OVERHEAD SIGN SUPPORT FOUNDATION		REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	REMOVAL OF GROUND MOUNTED SIGN AND REERECTION	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	REMOVAL OF POLE MOUNTED SIGN AND DISPOSAL	REMOVAL OF POLE MOUNTED SIGN AND REERECTION		
						EACH		FT	FT	FT	SF	SF	SF	EACH		EACH	EACH			EACH	EACH	EACH	EACH	EACH		
110	S1	46+37 SMITH	LT																				1			
110	S2	46+50 SMITH	LT	R7-1	12 X 18				12.0			1.50														
110	S3	46+88 SMITH	LT						13.0				5.00							1						
110	S4	49+30 SMITH	LT	R10-10L	24 X 30					14.0		5.00		1												
110	S5	48+20 SMITH	LT	R2-1	24 X 30				13.0			5.00														
110	S6	48+21 SMITH	LT																	1		1				
110	S7	48+69 SMITH	LT							14.5			7.88								3					
110	S8	48+73 SMITH	LT																	1		1				
110	S9	48+75 SMITH	LT	R7-1	12 X 18				12.0			1.50														
110	S10	49+30 SMITH	LT										13.33	1										1		
110	S11	49+36 SMITH	LT																				2			
110	S12	19+35 BROOKPARK	RT	M4-5	30 X 15					15.0		3.13														
	S13			M1-1	30 X 24							5.00														
	S14			M6-3	21 X 15							2.19														
110	S15	18+71 BROOKPARK	LT	M3-4	24 X 12							2.00		1												
	S16			M1-5	24 X 24							4.00		1												
110	S17	19+12 BROOKPARK	LT																				2			
110	S18	50+71 W 150	LT																	1		2				
110	S19	51+25 W 150	LT	M4-5	30 X 15					15.0		3.13														
	S20			M1-1	30 X 24							5.00														
	S21			M6-1	21 X 15							2.19														
110	S22	51+25 W 150	RT	W4-2R	30 X 30					14.0		6.25											1			
110	S23	51+50 W 150	RT																				3			
110	S24	52+22 W 150	RT																	1		2				
110	S25	19+40 BROOKPARK	RT										16.00	1										1		
110	S26	50+54 W 150	LT										13.33	1										1		
110	S27	50+56 W 150	RT																				2			
110	S28	52+30 W 150	LT																							
110	S29	52+65 W 150	LT	R7-1	12 X 18				12.0			1.50														
110	S30	52+65 W 150	RT	R7-1	12 X 18				12.0			1.50														
110	S31	53+18 W 150	LT																				2			
110	S32	53+50 W 150	RT	R2-1	24 X 30				13.0			5.00														
110	S33	53+78 W 150	RT																				2			
110	S34	54+00 W 150	LT	R3-5L	30 X 36	1										1	1									
	S35			R3-5L	30 X 36																					
	S36			R3-5A	30 X 36																					
	S37			R3-6R	30 X 36																					
110	S38	55+00 W 150	LT	R7-1	12 X 18				12.0			1.50														
110	S39	55+00 W 150	RT	R7-1	12 X 18				12.0			1.50														
110	S40	55+12 W 150	LT																				1			
110	S41	55+34 W 150	RT																				1			
110	S42	55+34 W 150	RT																				1			
110	S43	55+58 W 150	RT	R3-9b	24 X 30				13.5			5.00														
	S44			R3-H9j	24 X 6							1.00														
110	S45	55+90 W 150	LT	R3-H9k	24 X 6				13.5			1.00														
	S46			R3-9b	24 X 30							5.00														
110	S47	56+72 W 150	RT																				1			
110	S48	57+00 W 150	RT	R7-1	12 X 18				12.0			1.50														
110	S49	57+00 W 150	LT	R7-1	12 X 18				12.0			1.50														
110	S50	57+48 W 150	RT																				2			
110	S51	57+50 W 150	RT	W1-6	36 X 18				12.0			4.50														
110	S52	57+78 W 150	RT																	1		1				
111	S53	59+50 W 150	RT	R7-1	12 X 18				12.0			1.50														
111	S54	59+50 W 150	LT	R7-1	12 X 18				12.0			1.50														
111	S55	59+82 W 150	RT																	2		1				
111	S56	60+50 W 150	LT	W1-7	48 X 24				12.5-12.5			8.00														
111	S57	60+57 W 150	LT																				1			
111	S58	524+70 I-480 RAMP	RT					14.5					15.00								3	1				
111	S59	524+80 I-480 RAMP	LT					14.5					15.00								3	1				
		TOTAL				1		29.0	223.0	72.5		87.39	85.54	6		1	1			7	10	10	22	3		

CALCULATED JEN
CHECKED EPS

SIGN SUB-SUMMARY

CUY-WEST 150 STREET

107
146

PLOT 1:1
PJK 3/23/07
(JOBS\665\TP\665TPS01

SH. NO.	REF. NO.	STATION	SIDE	CODE	SIZE (INCHES)	625		630																		
						GROUND ROD		ONE WAY SUPPORT NO. 3 POST	GROUND MOUNTED SUPPORT, NO. 2 POST	GROUND MOUNTED SUPPORT, NO. 3 POST	SIGN, SINGLE FACED, STREET NAME, TYPE G AS PER PLAN, D-51 (20")	SIGN, FLAT SHEET, TYPE G	SIGN ERECTED, FLAT SHEET	SIGN SUPPORT ASSEMBLY, POLE MOUNTED		OVERHEAD SIGN SUPPORT, TYPE TC-16.20 DESIGN NO. 12	RIGID OVERHEAD SIGN SUPPORT FOUNDATION		REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	REMOVAL OF GROUND MOUNTED SIGN AND REERECTION	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	REMOVAL OF POLE MOUNTED SIGN AND DISPOSAL	REMOVAL OF POLE MOUNTED SIGN AND REERECTION		
						EACH		FT	FT	FT	SF	SF	SF	EACH		EACH	EACH		EACH	EACH	EACH	EACH	EACH		
~~111~~	S60	524+04 I-480 RAMP	LT										4.00							2	1				
111	S61	61+05 W 150	LT	M4-5	30 X 15					15.0		3.13													
	S62			M1-1	30 X 24							5.00													
	S63			M6-3	21 X 15							2.19													
111	S64	61+75 W 150	LT															1		1					
111	S65	61+78 W 150	RT																		1				
111	S66	62+00 W 150	RT	R7-1	12 X 18				12.0			1.50													
111	S67	62+00 W 150	LT	R7-1	12 X 18				12.0			1.50													
111	S68	60+99 W 150	RT															1		2					
111	S69	62+45 W 150	RT																		4				
111	S70	62+80 W 150	LT																		2				
111	S71	62+80 W 150	LT																		2				
111	S72	63+10 W 150	LT																		1				
111	S73	63+69 W 150	RT															1		1					
111	S74	64+25 W 150	LT																		2				
111	S75	64+30 W 150	RT																		1				
111	S76	64+50 W 150	RT	R7-1	12 X 18				12.0			1.50													
111	S77	64+50 W 150	LT	R7-1	12 X 18				12.0			1.50													
111	S78	64+80 W 150	RT	W12-2	36 X 36					15.0		9.00													
111	S79	65+60 W 150	LT	W12-2	36 X 36					15.0		9.00													
111	S80	65+85 W 150	LT																		1				
111	S81	66+50 W 150	LT	R7-1	12 X 18				12.0			1.50													
111	S82	66+50 W 150	RT	R7-1	12 X 18				12.0			1.50													
111	S83	66+80 W 150	RT																		2				
111	S84	67+41 W 150	LT																		1				
111	S85	67+41 W 150	LT																		2				
111	S86	67+92 W 150	RT																		1				
111	S87	68+44 W 150	LT															1		1					
111	S88	68+50 W 150	LT	R7-1	12 X 18				12.0			1.50													
111	S89	68+50 W 150	RT	R7-1	12 X 18				12.0			1.50													
111	S90	69+00 W 150	LT	W3-3	36 X 36					15.0		9.00													
111	S91	69+17 W 150	RT																		2				
112	S92	70+40 W 150	RT																		1				
112	S93	70+50 W 150	RT	R7-1	12 X 18				12.0			1.50													
112	S94	70+50 W 150	LT	R7-1	12 X 18				12.0			1.50													
112	S95	72+00 W 150	RT	R3-H8bh	36 X 30				13.0-13.0			7.50													
112	S96	72+17 W 150	RT																		1				
112	S97	72+50 W 150	RT	R7-1	12 X 18				12.0			1.50													
112	S98	72+50 W 150	LT	R7-1	12 X 18				12.0			1.50													
112	S99	72+63 W 150	LT																		1				
112	S100	73+20 W 150	RT															1		1					
112	S101	73+92 W 150	RT																		1				
112	S102	73+92 W 150	RT																		1				
112	S103	74+50 W 150	RT	R7-1	12 X 18				12.0			1.50													
112	S104	74+50 W 150	LT	R7-1	12 X 18				12.0			1.50													
112	S105	75+23 W 150	LT																		2				
112	S106	75+24 W 150	RT																		1				
112	S107	75+24 W 150	RT																		1				
112	S108	75+48 W 150	RT	R3-H8bh	36 X 30				13.0-13.0			7.50													
112	S109	75+48 W 150	LT	D3-H2	96 X 20						13.33			1											
112	S110	75+67 W 150	RT	D3-H2	96 X 20						13.33			1											
112	S111	76+27 W 150	LT																		2				
112	S112	76+50 W 150	RT	D3-H2	96 X 20						13.33			1											
112	S113	76+59 W 150	LT	D3-H2	96 X 20						13.33			1											
112	S114	76+71 W 150	RT																		1				
112	S115	76+86 W 150	LT																		1				
112	S116	76+86 W 150	LT																		2				
112	S117	77+94 W 150	RT																		2				
112	S118	78+00 W 150	RT	R7-1	12 X 18				12.0			1.50													
		TOTAL							232.0	60.0	53.32	74.82		4				5	2	7	39				

CALCULATED JEN
CHECKED EPS

SIGN SUB-SUMMARY

CUY-WEST 150 STREET

108
146

P:\K 3/23/07 PLOT 1:1

(JOBS\665\TP\665TP502

SH. NO.	REF. NO.	STATION	SIDE	CODE	SIZE (INCHES)	625		630																		
						GROUND ROD		ONE WAY SUPPORT NO. 3 POST	GROUND MOUNTED SUPPORT, NO. 2 POST	GROUND MOUNTED SUPPORT, NO. 3 POST	SIGN, SINGLE FACED, STREET NAME, TYPE G, AS PER PLAN, D-51 (20")	SIGN, FLAT SHEET, TYPE G	SIGN ERECTED, FLAT SHEET	SIGN SUPPORT ASSEMBLY, POLE MOUNTED		OVERHEAD SIGN SUPPORT, TYPE TC-16.20 DESIGN NO. 12	RIGID OVERHEAD SIGN SUPPORT FOUNDATION		REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	REMOVAL OF GROUND MOUNTED SIGN AND REERECTION	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	REMOVAL OF POLE MOUNTED SIGN AND DISPOSAL	REMOVAL OF POLE MOUNTED SIGN AND REERECTION		
						EACH		FT	FT	FT	SF	SF	SF	EACH		EACH	EACH		EACH	EACH	EACH	EACH	EACH		
112	S119	77+75 W 150	LT	R7-1	12 X 18				12.0			1.50													
112	S120	78+12 W 150	LT																1		1				
112	S121	78+50 W 150	LT	R3-H8bh	36 X 30				13.0-13.0			7.50													
112	S122	16+30 INDUSTRIAL PKWY.	LT	R7-1	12 X 18				12.0			1.50													
112	S123	16+35 INDUSTRIAL PKWY.	RT	R3-H8bj	36 X 30				13.0-13.0			7.50													
112	S124	16+60 INDUSTRIAL PKWY.	RT	R7-1	12 X 18				12.0			1.50													
112	S125	18+20 INDUSTRIAL PKWY.	RT																			1			
112	S126	18+20 INDUSTRIAL PKWY.	RT																			1			
112	S127	18+20 INDUSTRIAL PKWY.	LT																			1			
112	S128	18+25 INDUSTRIAL PKWY.	LT	R7-1	12 X 18				12.0			1.50													
112	S129	18+50 INDUSTRIAL PKWY.	RT	R7-1	12 X 18				12.0			1.50													
112	S130	19+02 INDUSTRIAL PKWY.	RT																2		1				
112	S131	75+69 W 150	RT	R3-H8bj	36 X 30							7.50		1											
112	S132	20+80 INDUSTRIAL PKWY.	RT																1		1				
112	S133	20+90 INDUSTRIAL PKWY.	RT	W14-2	30 X 30					14.0		6.25													
112	S134	76+59 W 150	RT	R3-H8bh	36 X 30							7.50		1											
110	S135	49+30 W 150	LT	R10-10L	24 X 30							5.00		1											
110	S136	47+80 SMITH	RT	W16-2	24 X 18					15.5		3.00													
	S137			W9-1R	30 X 30							6.25													
110	S138	50+56 W 150	RT	R10-10L	24 X 30							5.00		1											
110	S139	54+00 W 150	LT	M4-5	30 X 15							3.13		1											
110	S140	54+00 W 150	LT	M1-1	30 X 24							5.00		1											
110	S141	54+00 W 150	LT	M5-1	21 X 15							2.19		1											
111	S142	60+27 W 150	LT	R3-2	24 X 24							4.00		1											
111	S143	60+98 W 150	LT	D3-H2	96 X 20						13.33			1											
111	S144	62+20 W 150	RT	W1-4L	36 X 36					15.0		9.00													
112	S145	71+00 W 150	RT	OM-H3R	12 X 36				13.5			3.00													
112	S146	71+01 W 150	RT																1		1				
112	S147	71+23 W 150	LT																1		1				
112	S148	71+25 W 150	LT	OM-H3R	12 X 36				13.5			3.00													
112	S149	71+75 W 150	LT	R3-9b	24 X 30				13.5			5.00													
	S150			R3-H9j	24 X 6							1.00													
111	S151	60+98 W 150	LT	R10-12	24 X 30							5.00		1											
		TOTAL							152.5	44.5	13.33	103.32		10					6		5	3			

CALCULATED JEN
CHECKED EPS

SIGN SUB-SUMMARY

CUY-WEST 150 STREET

109
146

P.JK 3/23/07 PLOT 1:1

(JOBS\665\PP\665TPS03

TRAFFIC CONTROL PLAN
W. 150th STREET

CUY-WEST 150th STREET

CALCULATED JEN
CHECKED EPS

SCALE IN FEET 0 50 100

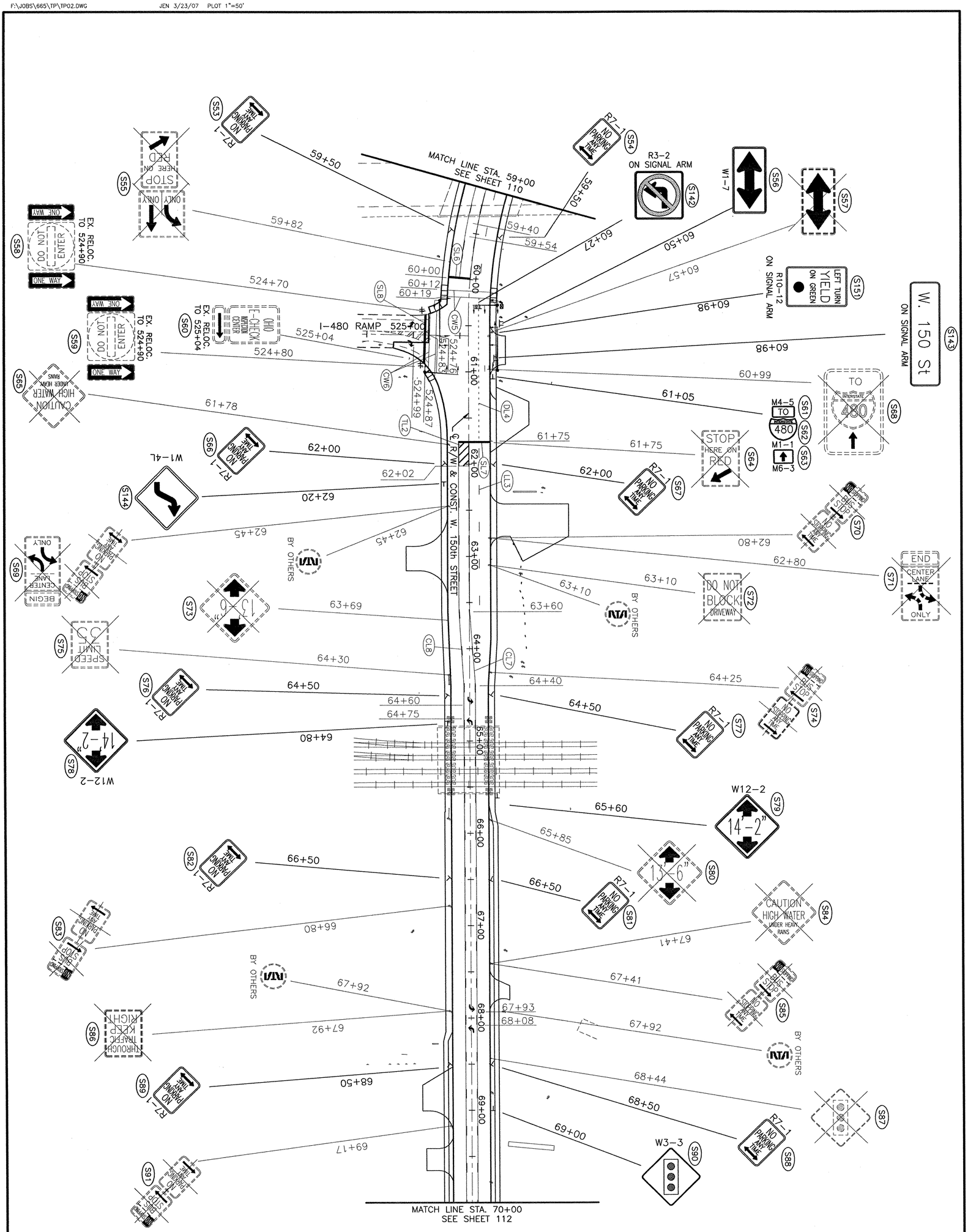
110
146

LEGEND

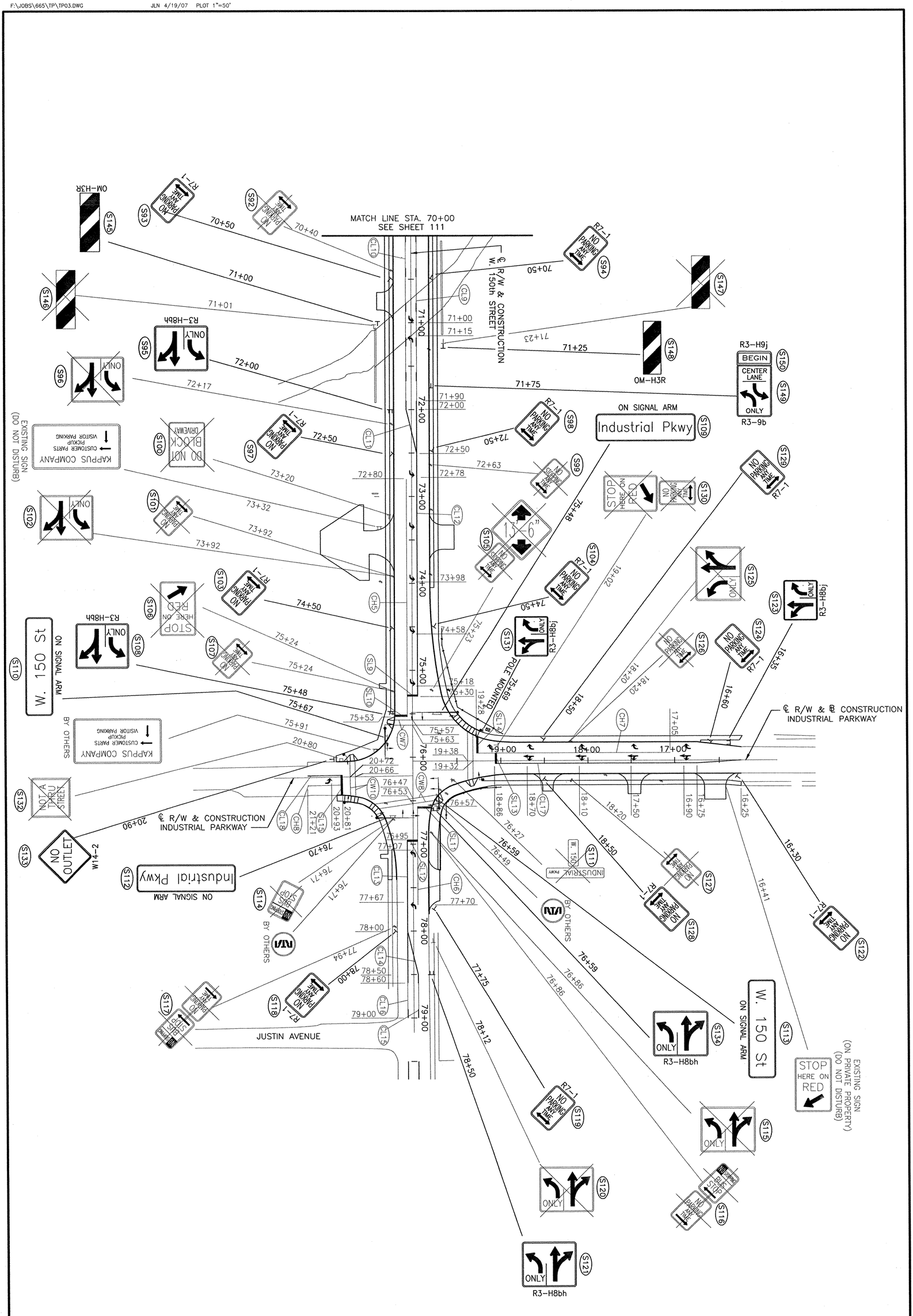
- (EL) EDGE LINE
- (LL) LANE LINE
- (DL) DOTTED LINE
- (CH) CHANNELIZING LINE (WHITE)
- (TL) TRANSVERSE LINE (24" YELLOW)
- (CL) CENTER LINE, SOLID DOUBLE
- (SL) STOP LINE
- (CL) CENTER LINE, SOLID AND BROKEN DOUBLE
- (CW) CROSSWALK LINE
- (RR) RAILROAD SYMBOL
- (SM) SCHOOL MARKING
- (S) SIGN
- EXISTING TO REMAIN
- EXISTING TO BE REMOVED
- PROPOSED

F:\JOBS\ 665\TP\TP01.DWG JEN 3/23/07 PLOT 1"=50'

F:\JOBS\665\TP\TP02.DWG JEN 3/23/07 PLOT 1"=50'



111 / 146	CUY-WEST 150th STREET	TRAFFIC CONTROL PLAN W. 150th STREET	CALCULATED JEN CHECKED EPS	0 50 100 SCALE IN FEET



112 / 146	CUY-WEST 150th STREET	TRAFFIC CONTROL PLAN W. 150th STREET	CALCULATED JEN CHECKED EPS	0 50 100 SCALE IN FEET	N

POWER SUPPLY FOR TRAFFIC SIGNALS

ELECTRIC POWER SHALL BE OBTAINED FROM THE FIRST ENERGY CORPORATION AT THE LOCATION(S) INDICATED ON THE PLANS. POWER SUPPLIED SHALL BE 120 VOLTS.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 120 DAYS FOLLOWING COMPLETION OF THE 10-DAY PERFORMANCE TEST. IN THE EVENT OF UNSATISFACTORY OPERATION, THE CONTRACTOR SHALL CORRECT FAULTY INSTALLATION, MAKE REPAIRS AND REPLACE DEFECTIVE PARTS WITH NEW PARTS OF EQUAL OR BETTER QUALITY. EQUIPMENT, MATERIAL AND LABOR COSTS INCURRED IN CORRECTING AN UNSATISFACTORY OPERATION SHALL BE BORNE BY THE CONTRACTOR.

THE GUARANTEE SHALL COVER THE FOLLOWING ITEMS OF THE TRAFFIC CONTROL SYSTEM: CONTROLLERS AND ASSOCIATED EQUIPMENT, DETECTOR UNITS, SIGNALS, INTERCONNECTION ITEMS AND MASTER CONTROL EQUIPMENT. CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING ITEMS SHALL BE TURNED OVER TO THE CITIES OF BROOK PARK AND CLEVELAND.

THE COST GUARANTEEING THE TRAFFIC CONTROL SYSTEM WILL BE INCIDENTAL TO AND INCLUDED IN THE CONTRACT UNIT PRICE OF THE VARIOUS ITEMS IN THE SYSTEM.

ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR

A UNIFORMED CITY OF BROOK PARK OR CLEVELAND POLICE OFFICER AND AN OFFICIAL PATROL CAR WITH TOP-MOUNTED FLASHING LIGHTS OPERATING SHALL BE PRESENT WHENEVER LANE BLOCKAGE IS REQUIRED FOR THE ERECTION OF SIGNAL EQUIPMENT OR SIGNAL SHUTDOWN IS REQUIRED AS SPECIFIED UNDER ITEM 614 MAINTAINING TRAFFIC. THE USE OF THE LAW ENFORCEMENT OFFICE (L.E.O.) SHALL BE APPROVED BY THE ENGINEER. ARRANGEMENTS AND PAYMENTS FOR THE SERVICES OF THE L.E.O. WILL BE MADE BY THE CONTRACTOR.

ITEM 625 - CONDUIT, 725.05, BY SIZE, TYPE EB, CONCRETE ENCASED

THIS ITEM SHALL CONSIST OF FURNISHIING AND INSTALLING, 2-3-INCH PLASTIC CONDUITS AT THE LOCATIONS SHOWN ON THE CONTRACT PLANS.

THE CONDUITS SHALL BE OF THE KIND, SIZE, AND LENGTH CALLED FOR ON THE PLANS, CONFORMING TO THESE SPECIFICATIONS AT SUCH PLACES AS ARE DESIGNATED ON THE PLANS AND IN CONFORMITY WITH THE LINES AND GRADES GIVEN.

THIS ITEM COVERS THE FOLLOWING TYPE OF PLASTIC DUCT FOR INSTALLATION UNDERGROUND FOR TRAFFIC SIGNAL WIRE AND CABLE.

TYPE EB, DESIGNED TO BE ENCASED IN CONCRETE WHEN INSTALLED.

PLASTIC DUCTS SHALL BE MADE OF PVC COMPOUNDS CAPABLE OF MEETING THE PERFORMANCE REQUIREMENTS OF THIS SPECIFICATION, THE COMPOUNDS MAY CONTAIN STABILIZERS, LUBRICANTS, DYES, PIGMENTS, AND FILLERS. REGROUND MATERIAL MAY BE USED PROVIDED THE END PRODUCT MEETS THE REQUIREMENTS OF NEMA STANDARD TC-6 1971 FOR UNDERGROUND PLASTIC UTILITIES DUCT.

PLASTIC DUCTS MAY HAVE BELL ENDS IN ACCORDANCE WITH THE DIMENSIONS SPECIFIED IN ASTM D-2672, D-2750, FOR PROVIDING TIGHT JOINTS BETWEEN SECTIONS.

THE CONDUITS AND FITTINGS SHALL BE FREE FROM ALL SUBSTANCES THAT INJURIOUSLY AFFECT ANY WIRE OR CABLE COVERING AS IS USED ON RUBBER COVERED WIRE, POLYCHLOROPRENE-SHEATHED CABLE AND WEATHERPROOF WIRE. THE DUCT AND FITTINGS SHALL BE CORROSION RESISTANT AND NOT BE ADVERSELY AFFECTED BY CHEWING INSECTS AND GNAWING RODENTS OR BY ACIDS, ALKALIES, SALTS, BACTERIA, AND ORGANIC MATTERS THAT WOULD BE ENCOUNTERED IN THE GROUND.

CONDUITS AND FITTINGS SHALL BE SO JOINTED BY MEANS OF A SPECIAL SOLVENT WELDING CEMENT OR OTHER APPROVED METHODS AS TO PROVIDE A WATERTIGHT AND ROOTPROOF JOINT.

ALL PLASTIC CONDUITS SHALL BE ENCASED IN CLASS "C" CONCRETE ENVELOPED WITH A MINIMUM 3-INCH THICK COVER ON ALL SIDES.

ALL PLASTIC CONDUIT SHALL BE PROVIDED WITH A TERMINAL ADAPTER, FOR CONNECTION TO METAL CONDUIT, RIGHT AT THE CONCRETE LINE WHEN THEY EXIT FROM THE CONCRETE ENVELOPE. ALL TERMINAL ADAPTERS THAT DO NOT HAVE METAL CONDUIT EXTENSIONS SHALL BE PROVIDED WITH CONDUIT CAPS THREADED IN PLACE.

ALL DUCTS THAT ARE TO BE TEMPORARILY TERMINATED BELOW GRADE SHALL BE PLUGGED WITH PLASTIC CAPS OF THE SAME MATERIALS AS THE DUCT.

ALL NEW CONDUIT SHALL BE PROVIDED WITH 1/4 INCH JET LINE TWISTED POLY PULL ROPE T.S. 1,000 LBS.

WHEN EACH SECTION OF THE CONDUIT IS APPROVED BY THE ENGINEER, THE CONTRACTOR SHALL BE PERMITTED TO PULL WIRES ACCORDING TO THESE PLANS AND SPECIFICATIONS.

PAYMENT SHALL BE AT THE CONTRACT PRICE BID PER LINEAR FOOT FOR ITEM 625 - CONDUIT, 725.05, BY SIZE, TYPE EB, CONCRETE ENCASED.

THE PRICE PAID SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM AS SPECIFIED INCLUDING ALL EXCAVATION, ENCASEMENT, AND BACKFILLING.

ITEM 625 - PULL BOX, 13" x 24" x 18"

PULL BOX COVERS SHALL HAVE THE WORD "TRAFFIC" IMPRINTED ON THE COVER FOR TRAFFIC CONTROL AND "LIGHTING" FOR LIGHTING CIRCUITS. PULL BOXES SHALL BE FURNISHED AND INSTALLED AS DETAILED ON SHEET NO. 113B.

ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND INCIDENTALS NECESSARY TO PERFORM THE REQUIRED WORK SHALL BE INCLUDED IN THE CONTRACT PRICE BID PER EACH FOR ITEM 625-PULL BOX, 13" x 24" x 18".

ITEM 632 - VEHICULAR SIGNAL HEAD (BY TYPE), LED

SECTION 732.01 OF THE SPECIFICATIONS IS MODIFIED FOR THIS PROJECT AS FOLLOWS:

A) SIGNAL HEADS AND VISORS SHALL BE CONSTRUCTED OF INJECTION MOLDED, UV STABILIZED, POLYCARBONATE PLASTIC AND MEET I.T.E. SPECIFICATIONS.
B) PLASTIC LENSES SHALL BE USED.
C) PIPE, SPACERS, AND FITTINGS CONSTRUCTED OF POLYCARBONATE PLASTIC MAY BE USED IN LIEU OF GALVANIZED STEEL OR ALUMINUM.
D) PROPER EXTERIOR COLORS SHALL BE OBTAINED BY USE OF COLORED PLASTIC MATERIAL RATHER THAN PAINTING.
E) SIGNALS SHALL BE ATTACHED TO MAST ARMS USING RIGID MOUNTING ASTROBRAC FIXTURES. THE CENTERLINE OF THE RED LENS SHALL MATCH THE CENTERLINE OF THE MAST ARM.
F) "DIOLUX" LED TRAFFIC LAMP-12" RED-"D12R4A-A4" OR AN APPROVED EQUAL SHALL BE FURNISHED AND INSTALLED.

ITEM 625 - 3" CONDUIT, STA. 49+57, 55' LT. AND STA. 50+39, 60' RT.

THE CONTRACTOR SHALL EXTEND THE EXISTING CONDUIT AT TWO LOCATIONS AT THE BROOKPARK ROAD INTERSECTION:

1) FROM EXISTING PULL BOX AT STA. 49+57, 55' LT. TO PROPOSED PULL BOX AT STA. 49+57, 72' LT.

2) FROM EXISTING PULL BOX AT STA. 50+39, 60' RT. TO PROPOSED PULL BOX AT STA. 50+51, 60' RT.

THE CONTRACTOR SHALL PROVIDE A COUPLING, AS REQUIRED, TO CONNECT THE EXISTING AND PROPOSED SINGLE 3", 725.05 CONDUIT.

PAYMENT FOR THE WORK SHALL BE PAID AT THE UNIT BID PRICE PER FOOT FOR ITEM 625, 3" CONDUIT, 725.05, TYPE EB, CONCRETE ENCASED WHICH PRICE SHALL INCLIDE THE COUPLING, MATERIALS AND INCIDENTALS TO COMPLETE THE WORK.

ITEM 632 - PEDESTRIAN SIGNAL HEAD, TYPE D2, LED

SECTION 732.05 OF THE SPECIFICATIONS IS MODIFIED FOR THIS PROJECT AS FOLLOWS:

A) PEDESTRIAN SIGNAL HOUSINGS MAY BE CONSTRUCTED OF POLYCARBONATE PLASTIC AND MEET I.T.E. SPECIFICATIONS, OTHERWISE SHALL BE ALUMINUM.
B) PLASTIC LENSES SHALL BE USED.
C) PIPE, SPACERS, AND FITTINGS CONSTRUCTED OF POLYCARBONATE PLASTIC MAY BE USED IN LIEU OF GALVANIZED STEEL OR ALUMINUM.
D) INSTALLATION SHALL BE PER ODOT STANDARD CONSTRUCTION DRAWING TC-85.10 WITH THE EXCEPTION THAT "CLAM SHELLS" SHALL NOT BE USED.
E) THE INTERNATIONAL PALM AND PEDESTRIAN SYMBOLS SHALL BE SOLID SYMBOLS, DO NOT USE OUTLINES.

ITEM 632 - LOOP DETECTOR UNITS, DELAY AND EXTENSION TYPE WITH TIMING AND ACCU COUNT OUTPUTS, OR AN APPROVED EQUAL

IN TO THE REQUIREMENTS OF 632 AND 732.07 OR 732.08, LOOP UNITS SHALL HAVE THE FOLLOWING REQUIREMENTS OR FEATURES:

A) OUTPUT DEVICE SHALL BE A RELAY AND ALL CONTACT SHALL BE INCLUDED IN THE WIRING HARNESS.
B) THE UNIT SHALL BE SELF TUNING.
C) THE UNIT'S ELECTRICAL CONNECTION PLUGS OR WIRING HARNESS SHALL ALLOW READY REPLACEMENT WITH A SINGLE CHANNEL AMPLIFIER AS DESCRIBED IN THE FINAL PARAGRAPH OF 732.07.
D) UNITS SHALL HAVE A DUAL OUTPUT FOR SYSTEM PURPOSES AND PRESENCE PHASE CALLING PURPOSES.

ITEM 632 - REMOVAL OF TRAFFIC SIGNAL INSTALLATION

CONTRACTOR SHALL REMOVE THE EXISTING TRAFFIC SIGNAL SYSTEM AT THE FOLLOWING LOCATIONS:

- INTERSECTION OF WEST 150TH STREET AND BROOKPARK ROAD
- INTERSECTION OF WEST 150TH STREET AND THE I-480 RAMP
- INTERSECTION OF WEST 150TH STREET AND INDUSTRIAL PARKWAY

THE REMOVAL SHALL INCLUDE SIGNAL HEADS, CABLE, MESSENGER WIRE, STRAIN POLES, CABINETS, CONTROLLERS, PULL BOXES, CONDUITS AND OTHER INCIDENTALS UNLESS OTHERWISE NOTED IN THE PLANS

FOR THE INTERSECTIONS OF WEST 150TH STREET WITH THE I-480 RAMP AND WEST 150TH STREET WITH INDUSTRIAL PARKWAY, THE CONTRACTOR SHALL NOTIFY THE CITY OF CLEVELAND, DIVISION OF TRAFFIC ENGINEERING, AT 216-664-3194, OR 420-8273, 48 HOURS BEFORE REMOVAL OF ANY EXISTING TRAFFIC SIGNAL EQUIPMENT. THE CITY SHALL RECEIVE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT. ALL REMOVALS SHALL BE IN ACCORDANCE WITH 632.25 AND PERFORMED IN THE PRESENCE OF A DESIGNATED REPRESENTATIVE OF THE CITY OF CLEVELAND, DIVISION OF TRAFFIC ENGINEERING. REMOVED ITEMS SHALL BE DELIVERED TO THE CITY OF CLEVELAND SIGNAL SHOP LOCATED AT:

4150 E. 49TH ST.
BLDG. #4
SIGNAL UNIT

FOR THE INTERSECTION OF WEST 150TH STREET AND BROOKPARK ROAD, THE CONTRACTOR SHALL NOTIFY THE CITY OF BROOK PARK SERVICE DEPARTMENT AT 216-433-7192, 48 HOURS BEFORE REMOVAL OF ANY TRAFFIC SIGNAL EQUIPMENT. THE CITY SHALL RECIEVE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT. REMOVED ITEMS SHALL BE DELIVERED TO THE SERVICE DEPARTMENT OF BROOK PARK LOCATED AT:

19065 HOLLAND ROAD
BROOK PARK, OHIO 44142

IN ACCORDANCE WITH 614.03, WHEN AN EXISTING SIGNAL OPERATION MUST BE INTERRUPTED FOR A PERIOD, THE CONTRACTOR SHALL PROVIDE A TEMPORARY TRAFFIC CONTROL METHOD APPROVED BY THE ENGINEER AND THE CITY OF CLEVELAND.

CALCULATED MMP CHECKED EPS

TRAFFIC SIGNAL NOTES

CUY-WEST 150th STREET

PJK 3/21/07 PLOT 1:1

F:\JOBS\660\CP\CP13.DWG

ITEM 633 – CONTROLLER, 8 PHASE, ACTUATED, TS–2, TYPE 1

THE FOLOWING SHALL APPLY TO THE TWO INTERSECTIONS IN THE CITY OF CLEVELAND: WEST 150TH STREET AND I–480; WEST 150TH STREET AND INDUSTRIAL PARKWAY.

1) THE CABINET SHALL BE BASE MOUNTED.

I. CABINETS SHALL BE CONSTRUCTED TO APPROXIMATELY THE FOLLOWING DIMENSIONS 2'–6" x 1'–4" x 5' H.

II. THE CONTROLLER FOUNDATION SHALL BE A TYPE 1 AS PER STANDARD DRAWING TC–83.20.

2) THE CABINET SHALL BE DELIVERED PREWIRED AND SHALL INCLUDE 4 ADDITIONAL LOOP DETECTOR WIRING HARNESSES AND TWO BIU COMPONENTS FOR FUTURE USE.

3) THE CABINET SHALL BE DELIVERED COATED DARK BRONZE IN COLOR.

SURFACE PREPARATION:

THE EXTERIOR STEEL SURFACE SHALL BE BLAST CLEANED TO STEEL STRUCTURES PAINTING COUNCIL SURFACE PREPARATION SPECIFICATION No. 6 (SSPC–SP6) REQUIREMENTS UTILIZING CAST STEEL ABRASIVES CONFORMING TO THE SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) RECOMMENDED PRACTICE J827, THE BLAST METHOD USED IS A RECIRCULATING, CLOSED CYCLE CENTRIFUGAL WHEEL SYSTEM WITH ABRASIVE CONFORMING TO SAE SHOT NUMBER S280.

EXTERIOR COATING:

ALL EXTERIOR SURFACES SHALL BE COATED WITH A URETHANE OR TRIGLYCIDYL ISOCYANURATE (TGIC) POLYESTER POWDER TO A MINIMUM FILM THICKNESS OF 2.0 MILS (0.002"). THE COATING SHALL BE ELECTROSTATICALLY APPLIED AND CURED IN A GAS FIRED CONVECTION OVEN BY HEATING THE STEEL SUBSTRATE TO A MINIMUM OF 350 DEGREES FAHRENHEIT AND A MAXIMUM OF 400 DEGREES FAHRENHEIT. THE THERMOSETTING POWDER RESIN SHALL PROVIDE BOTH INTERCOAT AS WELL AS SUBSTRATE FUSION ADHESION THAT MEETS 5A OR 5B CLASSIFICATIONS OF ASTM 03359.

4) THE FOLLOWING SWITCHES SHALL BE ACCESSIBLE VIA THE POLICE DOOR PANEL:

A) SIGNAL SHUTDOWN
B) FLASH CONTROL
C) AUTOMATIC/MANUAL TRANSFER

5) THE FOLLOWING SWITCHES SHALL BE MOUNTED ON THE SWITCH PANEL IN THE CABINET:

A) RUN/STOP TIME
B) CONTROLLER SHUTDOWN
C) DETECTOR TEST

6) OVERLAP PROGRAMMING SHALL BE BY USE OF A INTERCHANGEABLE PLUG–IN PRINTED CIRCUIT BOARD ASSEMBLY AS DESCRIBED IN PART OF NEMA TS–1, 1983.

7) IN ADDITION TO NEMA REQUIREMENTS THE CONFLICT MONITOR SHALL ALSO HAVE EXTENDED MONITORING IN ACCORDANCE WITH 733.04, PART 38. THE MONITOR SHALL ALSO HAVE AUTO LOGGING AND CENTRAL OFFICE COMPUTER DATA TRANSFER CAPABILITIES.

8) THE CONTROLLER SHALL BE COMPATIBLE– WITH ONE OF THE EXISTING CITY OF CLEVELAND CLOSE LOOP SYSTEMS AND SHALL INCLUDE ALL COMMUNICATION AND INTERFACE EQUIPMENT THAT WILL ENABLE TRANSMISSION AND RECEPTION OF ALL REQUIRED PATTERN AND COMMAND DATA TO AND FROM THE CENTRAL OFFICE COMPUTER, THE MASTER CONTROLLER AND THE LOCAL INTERSECTION CONTROLLERS.

9) THE CONTROLLER SHALL BE LIMITED TO ONE OF THE FOLLOWING TWO MANUFACTURERS.

1) EPAC 300 SERIES EAGLE/AUTOMATIC SIGNAL "MARC" CLOSED
2) ECONOLITE ASC/25–2100

PAYMENT FOR "ITEM 633 CONTROLLER, ACTUATED, 8 PHASE, TS–2, TYPE 1" WILL BE AT THE CONTRACT BID PRICE PER EACH COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS TESTED AND ACCEPTED.

ITEM 633 – CONTROLLER WORK PAD

REFERENCES TO ITEM 608 4 INCH CONCRETE WALK FOR CONTROLLER WORK PADS ON THE STANDARD CONSTRUCTION DRAWINGS IN THESE PLANS SHALL BE CONSIDERED TO READ AS REFERENCES TO ITEM 633 CONTROLLER WORK PAD.

ITEM 632 – SIGNAL SUPPORT, TYPE TC–81.20 AND TYPE TC–12.30, BY DESIGN

SIGNAL MAST ARMS SHALL BE SPECIFIC TC–81.20 AND TYPE TC–12.30, BY DESIGN. THE MAST ARM SIGNAL SUPPORTS SHALL BE OF THE SPECIFIC HEIGHT, STRENGTH, AND/OR LENGTH AS INDICATED. POLES AND MAST ARMS SHALL BE A TRUE ROUND CONTINUOUS TAPER.

FOR THE TWO INTERSECTIONS IN THE CITY OF CLEVELAND (AT I–480 AND INDUSTRIAL PARKWAY); SIGNAL MAST ARM POLES ARE TO BE DELIVERED WITH ALL GALVANIZED EXTERIOR SURFACES COATED WITH A URETHANE OR TRIGLYCIDYLE ISOCYANURATE (TGIC) POLYESTER POWDER TO A MINIMUM FILM THICKNESS OF 2.0 MILS (0.002 INCH). THE POWDER SHALL BE DARK BRONZE (DARK ORION BROWN), COLOR F–283. PRIOR TO APPLICATION, THE SURFACES TO BE POWDER COATED SHALL BE MECHANICALLY ETCHED BY BRUSH BLASTING (REF. SSPC–SP7) AND THE ZINC COATED SUBSTRATE PREHEATED TO 450 DEGREES FAHRENHEIT FOR A MINIMUM OF ONE HOUR IN A GAS FIRED CONVECTION OVEN. THE COATING SHALL BE ELECTROSTATICALLY APPLIED AND CURED IN A GAS FIRED CONVECTION OVEN BY HEATING THE ZINC COATED SUBSTRATE TO A MINIMUM OF 350 DEGREES FAHRENHEIT AND A MAXIMUM OF 400 DEGREES FAHRENHEIT. THE THERMOSETTING POWDER RESIN SHALL PROVIDE BOTH INTERCOAT AS WELL AS SUBSTRATE FUSION ADHESION THAT MEETS 5A OR 5B CLASSIFICATIONS OF ASTM D3359.

FOR THE BROOKPARK ROAD INTERSECTION IN THE CITY OF BROOK PARK, ALL ITEMS OF ODOT CMS 632 SHALL BE MET EXCEPT THE SUPPORTS AND PEDESTALS SHALL NOT BE GALVANIZED. SUPPORTS, POLES AND PEDESTALS SHALL BE PRIMED AND PAINTED USING THE PROCESS AND MATERIAL DESCRIBED BELOW. PRIME AND FINISH PAINT PROCESSING SHALL BE DONE AT THE MANUFACTURER'S FACILITIES. PEDESTALS SHALL NOT BE FABRICATED OF ALUMINUM.

PRIME AND PAINT PROCESS (FOR BROOKPARK ROAD INTERSECTION):
THIS SHALL CONSIST OF PAINTING ONE COAT OF ENSIGN 197 B RUST INHIBITIVE COATING OR EQUIVALENT TO THE INTERIOR OF THE SUPPORT OR PEDESTAL. THE EXTERIOR SHALL BE SANDBLASTED TO A SSPC–SP–6 FOLLOWED BY A PRIME COAT OF AMERLOCK 400 TYPE PRIMER OR EQUIVALENT. FINISH COAT OF SHERWIN WILLIAMS AMERSHIELD POLYURETHANE ENAMEL COROTHANE, OR HI SOLIDS POLYURETHANE 2–3 MILLS D.F.T. OR AN EQUIVALENT V.O.C. COMLIANT URETHANE. THE ENTIRE SUPPORT OR PEDESTAL SHALL BE WRAPPED IN PAPER AND CARDBOARD AND LOADED FOR DIRECT SHIPMENT. THE FINISH COAT SHALL BE THE LATEST REVISION OF FEDERAL STANDARD 595B, COLOR NUMBER 30040 DARK BROWN (BRONZE). A PAINT CHIP SHALL BE SUBMITTED TO THE CITY OF BROOK PARK FOR APPROVAL BEFORE THE SUPPORTS, POLES AND PEDESTALS ARE PAINTED.

MAST ARMS SIGNAL SUPPORTS SHALL BE SUPPLIED COMPLETE WITH PROPER ANCHOR BOLTS AND REBAR CAGES.

ALL MAST ARM SIGNAL SUPPORTS SHALL BE PRE–DRILLED FOR INSPECTION PLATES, PUSHBUTTON INSTALLATIONS, PEDESTRIAN SIGNALS, AND TRAFFIC SIGNALS AS SPECIFIED ON THE POLE ORIENTATION DIAGRAM.

ITEM 632 – VEHICULAR SIGNAL HEAD, BY SIZE, AS PER PLAN
ITEM 632 – SIGNAL SUPPORT, BY TYPE AND DESIGN, AS PER PLAN

AT THE TWO INTERSECTIONS IN THE CITY OF CLEVELAND, I–480 AND INDUSTRIAL PARKWAY, THE CONTRACTOR SHALL PROVIDE THE MATERIALS ONLY FOR THE FOLLOWING:

VEHICULAR SIGNAL HEAD, BY SIZE

SIGNAL SUPPORT, BY TYPE AND DESIGN

THE CONTRACTOR SHALL PERFORM ALL UNDERGROUND WORK – INCLUDING FOUNDATIONS, LOOPS, LOOP LEAD–IN CABLES, INTERCONNECT, ETC. AND PULL ALL WIRING TO EACH MAST ARM POLE AND SIGNAL CONTROL BOX.

THE CLEVELAND TRAFFIC SIGNAL DEPARTMENT WILL INSTALL THE VEHICULAR SIGNAL HEADS AND THE MAST ARMS AT THE INTERSECTIONS OF WEST 150th STREET/I–480 AND WEST 150th STREET/INDUSTRIAL PARKWAY.

ITEM 633 – ACOUSTIC PREEMPT DETECTOR, SINGLE CHANNEL, ONE DIRECTION
ITEM 633 – PREEMPT CONFRIMATION LIGHT

THE CONTRACTOR SHALL PROVIDE AN ACOUSTIC PREEEMPT DETECTOR, SINGLE CHANNEL, ONE DIRECTION ON THE MAST ARMS AT THE INTERSECTION OF BROOKPARK ROAD AND WEST 150th STREET. ALSO AT THIS INTERSECTION THE CONTRACTOR SHALL PROVIDE PREEMPT CONFIRMATION LIGHTS.

THE PREEMPT DETECTOR AND CONFIRMATION LIGHT SHALL BE COMPATIBLE WITH THE CITYWIDE SIGNAL SYSTEM OF THE CITY OF BROOK PARK.

ITEM 732.22 – BACKPLATES

FURNISH BACK[PLATES CONSTRUCTED OF WROUGHT SHEET ALUMINUM, .050 INCH (1.3 mm) MINIMUM THICKNESS. BACKPLATE BASE METAL SHALL BE ANODIZED TO MAXIMIZE PAINT ADHESION ACCORDING TO Mil–A–8625, TYPE II OR TYPE I. FURNISH BACKPLATES PAINTED ON SIDES WITH AT LEAST TWO COATS OF FLAT BLACK ALKYD ENAMEL PAINT CLOSELY MATCHING FED–STD–595b–37038. FURNISH A BACKPLATE THAT EXTENDS 5 INCHES (152 mm) BEOYND THE OUTIDE OF THE SIGNAL ASSEMBLY ON ALL SIDES. THE OVERALL OUTSIDE SHAPE OF THE INSTALLEDBACKPLATE SHALL BE RECTANGULAR. THE BACKPLATE SHALL ALLOW NO GAPS BETWEEN THE BACKPLATE AND THE SIGNAL HEAD OR BETWEEN SIGNAL SECTIONS. A 2–INCH (50mm) WIDE CONTINUOUS OUTSIDE BORDER OF YELLOW REFLECTIVE SHEETING SHALL BE APPLIED TO THE FRONT FACE OF THE BACKPLATE. REFLECTIVE SHEETING SHALL BE TYPE H OR J LISTED ON THE DEPARTMENT'S QUALIFIED PRODUCTS LIST. ALL ASSEMBLY AND MOUNTING HARDWARE SHALL BE STAINLESS STEEL. IF USED, MACHINE NUTS SHALL BE THREAD–DEFORMING OR NYLON LOCKNUTS. A MINIMUM OF FOUR MOUNTING POINTS SHALL BE USED ON EACH SIGNAL SECTION FOR ATTACHING THE BACKPLATE. FURNISH ALL MOUNTING HARDWARE. PAYMENT FOR ITEM 732.22 – BACKPLATES, SHALL BE INCLUDED UNDER THE CONTRACT BID ITEM FOR VEHICULAR SIGNAL HEAD, BY SIZE, AS PER PLAN.

CALCULATED MMP
CHECKED EPS

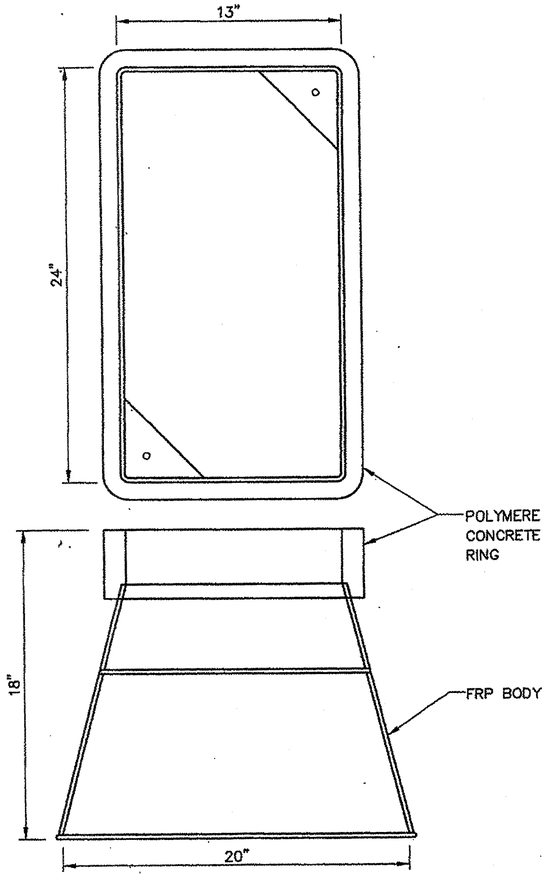
TRAFFIC SIGNAL NOTES

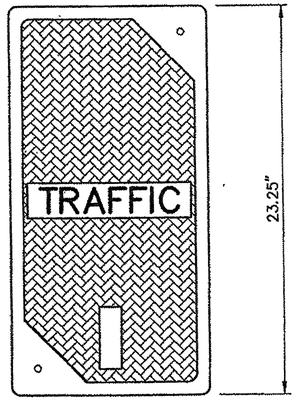
CUY-WEST 150th STREET

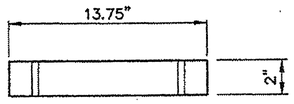
113A
146

PJK 3/21/07 PLOT 1:1

FJOBS/660/CP/CP14.DWG







MOLDED
COVER

BOX: 13" X 24" X 18"
BOTTOM INSIDE: 20" X 29.5"
COVER: 13.75" X 23.25" X 2"

ITEM 625 – PULL BOX, 13"X 24"X 18", AS PER PLAN

SIZE:

BOX – 13" X 24" X 18" DEEP (NOMINAL)
BOX TO TAPER OUTWARD FROM TOP TO THE OPEN BOTTOM
INSIDE BOTTOM DIMENSIONS 20"W X 29 1/2"L MINIMUM.

COVER – 13 3/4" X 23 1/4" X 2" OVERALL WEIGHT 50 LBS.

LOAD CAPACITY:

15,000 LBS. ON A 10" X 10" AREA TESTED IN ACCORDANCE WITH WESTERN UNDERGROUND COMMITTEE GUIDE 3.6. COVER DEFLECTION TO BE LESS THAN 1/2" AT DESIGN LOAD AND SHOW NO SIGNS OF DAMAGE AFTER 10 CYCLES AT DESIGN LOAD.

MATERIAL AND CONSTRUCTION:

BOX – THE BODY SHALL BE MADE WITH OF FIBERGLASS REINFORCED POLYMER (FRP) WITH ISOPTHALIT POLYESTER USING THE SPRAY–UP AND ROLL CONSTRUCTIONS METHOD. THE MATERIAL MUST HAVE STABILIZERS TO RESIST UV DEGRADATION IN ACCORDANCE WITH ASTM D–790 AND ASTM D–1501–71 SECTION 6, PROCEDURE B. THE TOP RING OF THE BOX WILL BE MADE OF POLYMER CONCRETE USING A POLYESTER BINDER WITH AGGREGATE FILLERS AND CHOPPED FIBERGLASS WITH A MINIMUM TENSILE STRENGTH OF 1900 PSI. THE RING MUST HAVE THE SAME UV RESISTANCE AS THE FRP MATERIAL. THE THREADED INSERTS (2) FOR THE COVER BOLTS MUST BE STAINLESS STEEL.

COVER – THE COVER SHALL BE MADE WITH A THICK MOLDING COMPOUND (TMC) USING THE COMPRESSION MOLDING METHOD. THE TMC SHALL CONSIST OF A MINIMUM 10% FIBERGLASS IN A CALCIUM CARBONATE AND POLYESTER RESIN MATRIX. THE COVER MUST BE MARKED "TRAFFIC" HAVE A NON–SKID SURFACE AND THE SAME UV RESISTANCE AS THE FRP MATERIAL. TWO RECESSED HEX HEAD STAINLESS STEEL BOLTS AND WASHERS WILL BE USED TO SECURE THE COVER TO THE BOX.

CALCULATED MMP
CHECKED EPS

TRAFFIC SIGNAL DETAILS

CUY-WEST 150th STREET

113B
146

F:\JOBS\660\CP\CP15.DWG PJK 3/21/07 PLOT 1:1

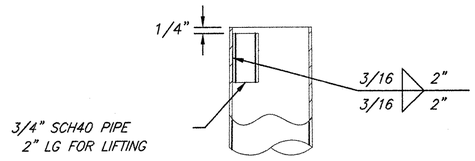
POLE DES. NO. AND SIZE DATA		MAST ARM DATA				ARM FLANGE CONN. DATA							BASE DATA CHART							FLAT WASH.
ODOT TC-12.30 DESIGN NUMBER	POLE SIZE	ARM SPREAD	ARM SIZE		TELESCOPIC FIELD JOINT	"H"	"W"	"Y"	"X"	"PPL"	"APL"	BOLT DIA.	"B.C."	"SQ"	"F"	"T"	"H"	"P"	A. BOLT DATA	
5 AS PER PLAN 1	0E-15.00x10.38x21'-0"	49'-6"	3E-12.50x8.34x29'-9"	7E-8.98x5.97x21'-6"	1'-9"	19"	23"	15"	19"	2"	2 ¼"	1 ½"	22"	23"	15 ½"	2"	2 ⅜"	8 ½"	2"x90"x6"	3 ¾" O.D.
5 AS PER PLAN 2		58'-6"	3E-12.50x8.34x29'-9"	7E-8.98x4.71x30'-6"	1'-9"															
5 AS PER PLAN 3		53'-0"	3E-12.50x8.34x29'-9"	7E-8.98x5.48x25'-0"	1'-9"															

0E=.3125
3E=.25
7E=.1793
7+7E=.3586
E= ROUND STEEL MONOTUBE
@ .14 in/ft TAPER

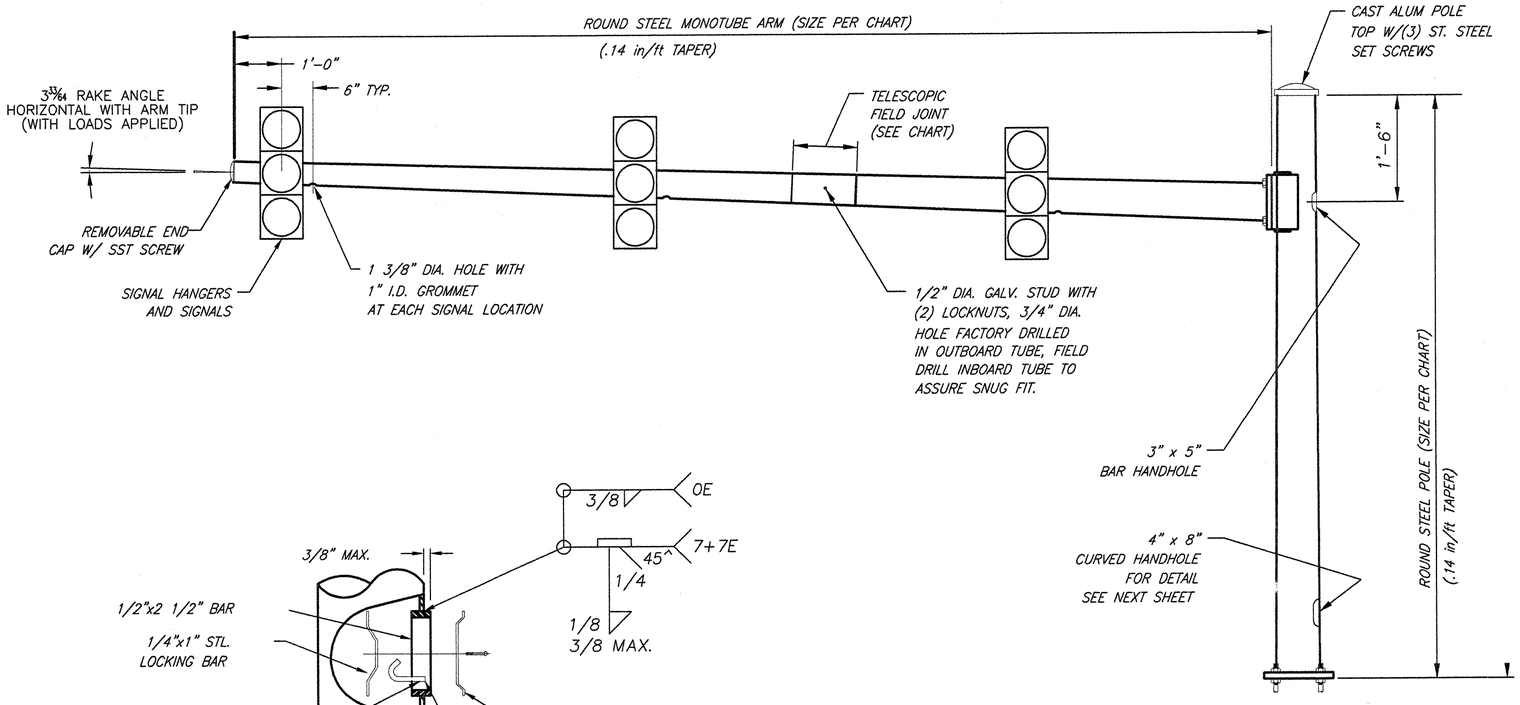
Note: Supports over 32' in arm length, shall be designed per 1994 AASHTO specifications for 90 mph combined stress ratio less than 0.90; in accordance with ODOT STD 12.30

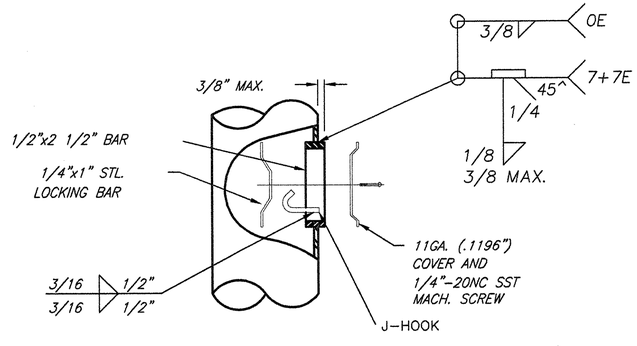
NOTE:

FOR MAST ARMS WITH 32'-0" TO 48'-0" SPREAD SEE ODOT STANDARD DRAWING FOR SINGLE ARM OVERHEAD SIGNAL SUPPORTS TC-81.20.



TOP OF POLE DETAIL





3" x 5" HANDHOLE DETAIL

MATERIAL SPECIFICATIONS	
POLES & ARMS	ASTM-A595 GR A
PLATES	ASTM-A36
HANDHOLE FRAME (FORGED)	ASTM-A576
HANDHOLE FRAME (BAR)	ASTM-A36 or ASTM-A529 GR. 50 or ASTM-A572 GR. 50 or ASTM-A709 GR. 50
MAST ARM CAP	ASTM-B26 (319-F) ALUM.
HI STRGTH FLG. BOLTS & NUTS	ASTM-A325
ANCHOR BOLTS	ASTM-F1554 GR 105
ANCHOR BOLT NUTS	ASTM-A563 GR. DH
ST. STEEL HARDWARE	AISI-300 SERIES (18-8)
STRUCTURE FINISH	H.D. GALV TO ASTM-A123
HARDWARE FINISH	H.D. GALV TO ASTM-A153
FLAT WASHERS	ASTM-F436
BOLT & NUT OVER 1/2" DIA. GALV.	ASTM-A153
BOLT & NUT UNDER 1/2" ST. STEEL	AISI-300 SERIES

GENERAL NOTES:

1. DESIGNED IN ACCORDANCE WITH STANDARD CONSTRUCTION DWG TC-12.30
2. THE EXPOSED LENGTH OF THE ANCHOR BOLT BETWEEN THE TOP OF THE FOUNDATION AND THE BOTTOM OF THE LEVELING NUT SHOULD NOT EXCEED ONE BOLT DIAMETER.

CALCULATED MMP CHECKED EPS

SIGNAL DETAILS

CUY-WEST 150th STREET

113C
146

MMP 4/19/07 PLOT 1:20
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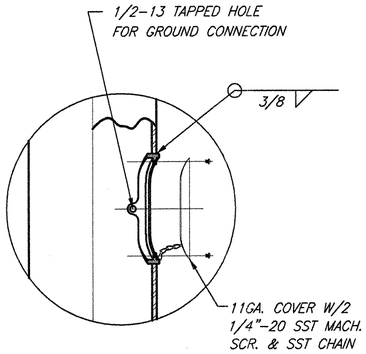
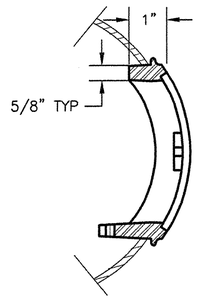
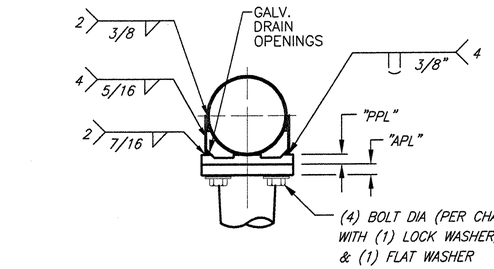
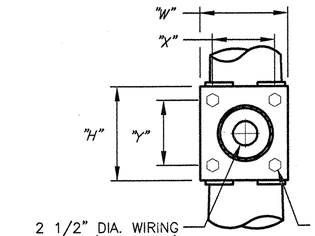


DETAIL A

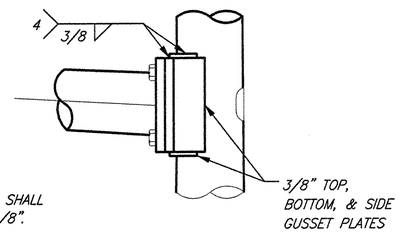


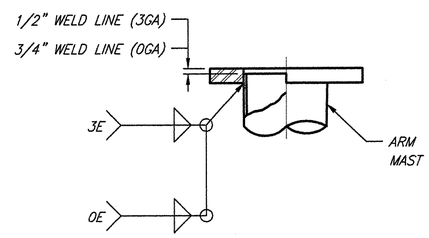
CURVED HANDHOLE FRAME
SECTION DETAIL





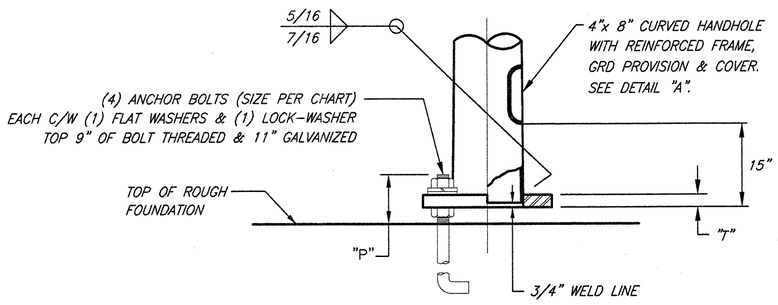
ARM PLATE HOLE DIAMETER SHALL BE BOLT DIAMETER PLUS 1/8". POLE PLATE TAPPED HOLE SHALL HAVE THREADS WITH 75% (MIN.) FULL PROFILE HEIGHT. THREADS MAY BE RETAPPED AFTER GALVANIZING.

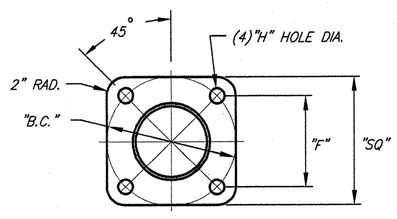




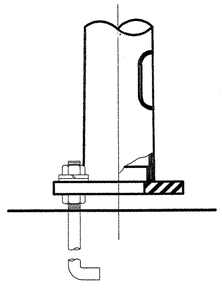
MAST ARM
WELD DETAIL

ARM ATTACHMENT DETAIL
(SIZE PER CHART ON PREVIOUS SHT.)

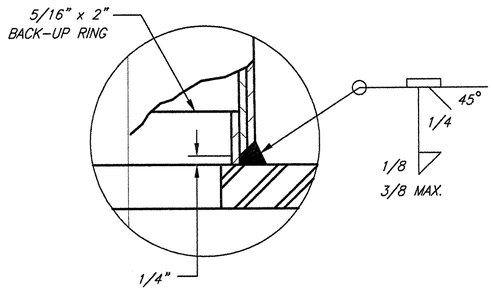




BASE DETAIL
(SIZE PER CHART ON PREVIOUS SHT.)



TWO PLY POLE WELD DETAIL
(DESIGN Y4 & Y5)



CALCULATED MMP
CHECKED EPS

SIGNAL DETAILS

CUY-WEST 150th STREET

113D
146

MMP 4/19/07 PLOT 1:20

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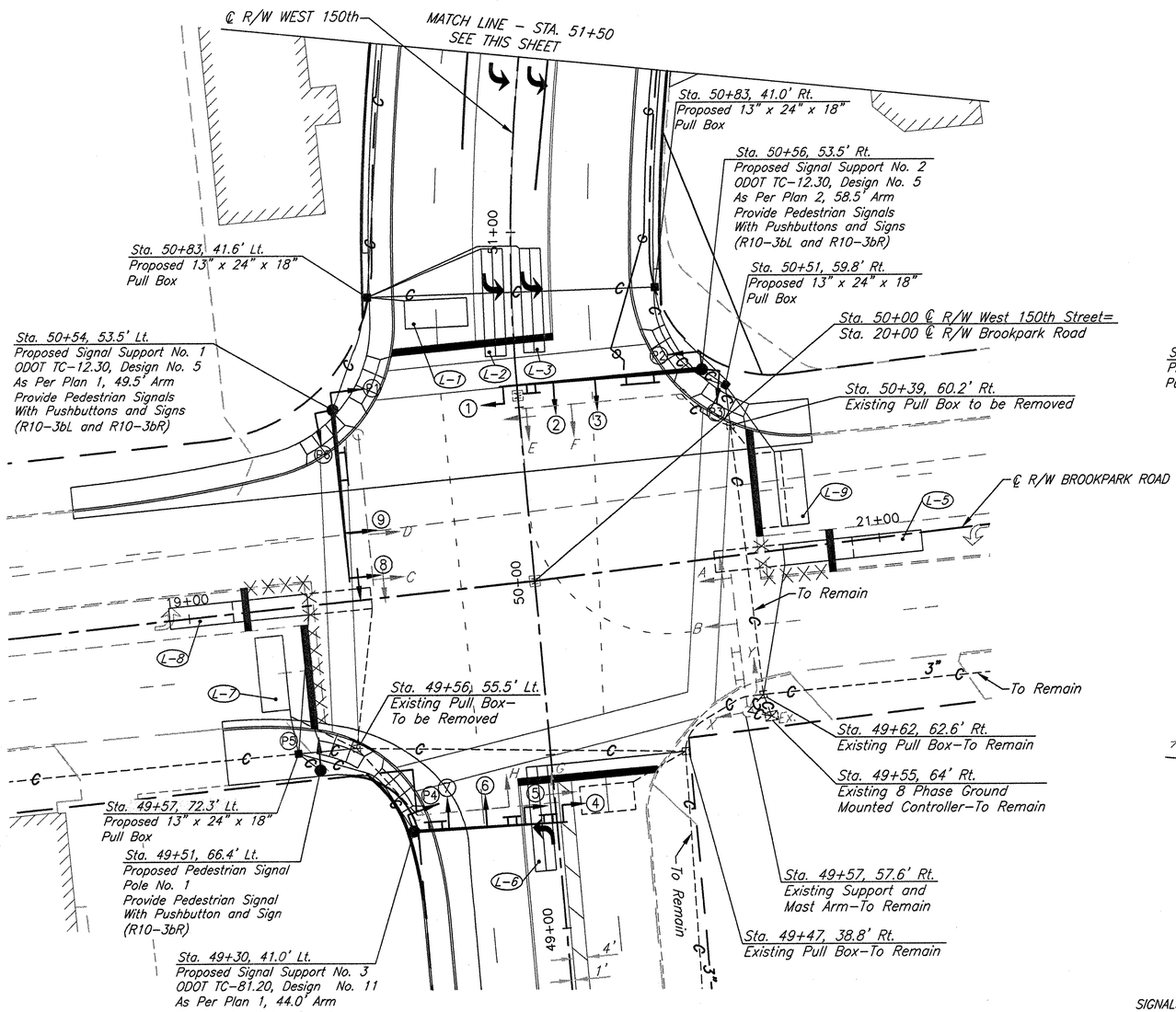
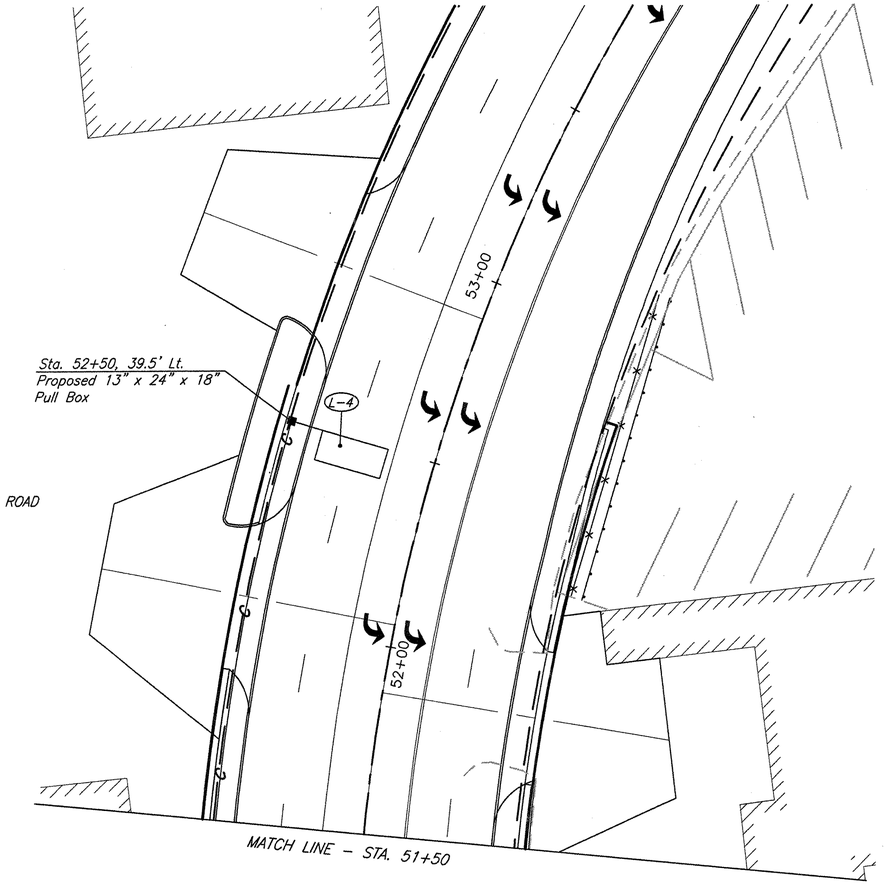


WEST 150th STREET AND BROOKPARK ROAD



SIGNALS B, D, F & H SIGNALS A, C, E & G PEDESTRIAN SIGNALS

EXISTING SIGNAL HEAD ARRANGEMENT

All 12" Lens

SIGNALS 1, 4 & 5 SIGNALS 2, 3, 6, 7 & 8 SIGNAL 8

TYPE D2 SIGNALS P1, P2 P3, P4, P5 & P6 R10-3bR-9 R10-3bL-9

PROPOSED SIGNAL HEAD ARRANGEMENT

LOOP DETECTOR CHART

LOOP DESIGNATOR	LOCATION FROM	LOCATION TO	SIZE (FT)	NO. OF TURNS	SHAPE	MODE	DELAY (SEC)	CONNECT TO DETECTOR UNIT NO.	ASSOCIATED CONTROLLER PHASE
L-1	50+74, 22.0' Lt.	50+82, 22.0' Lt.	8 X 18	3	RECTANGLE	PULSE	0	1	4
L-2	50+65, 5.5' Lt.	50+95, 5.5' Lt.	30 X 6	2-4-2	RECTANGLE	PRESENCE	2	2	7
L-3	50+65, 5.5' Rt.	50+95, 5.5' Rt.	30 X 6	2-4-2	RECTANGLE	PRESENCE	2	3	7
L-4	52+42, 22' Lt.	52+50, 22' Lt.	8 X 18	3	RECTANGLE	PULSE	0	4	4
L-5	20+72, 1.5' Rt.	21+12, 2.5' Rt.	40 X 6	3	RECTANGLE	PRESENCE	0	5	1
L-6	49+17, 4.5' Lt.	49+47, 4.5' Lt.	30 X 6	2-4-2	RECTANGLE	PRESENCE	7	6	3
L-7	19+18, 18' Rt.	19+26, 18' Rt.	8 X 22	3	RECTANGLE	PULSE	0	7	2
L-8	18+94, 0.5' Lt.	19+34, 0.5' Lt.	40 X 6	3	RECTANGLE	PRESENCE	2	8	5
L-9	20+72, 77' Lt.	20+80, 77' Lt.	8 X 22'	3	RECTANGLE	PULSE	0	9	2

LEGEND FOR SIGNALS AND SUPPORT

	NEW	EXISTING
Mast Arm Support		
Sign on Span Wire Support		
Signal Head, Std.-1-Way		
Signal Head with Arrow		
Conduit	2-3" C	3" G
Pullbox		
Controller		Ex.
Loop Detectors		

SCALE IN FEET 20 0 20

CALCULATED MMP CHECKED

SIGNAL PLAN
WEST 150th STREET/BROOKPARK ROAD INTERSECTION

CUY-WEST 150th STREET

114
146

MMP 4/19/07 PLOT 1:20

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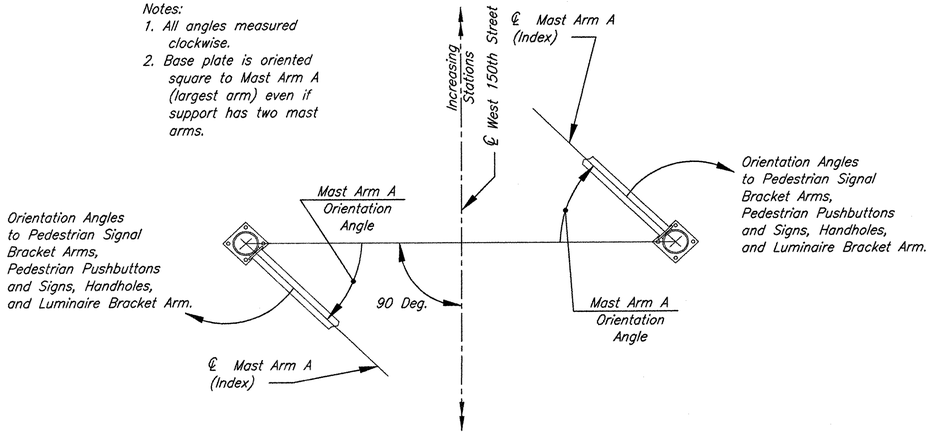
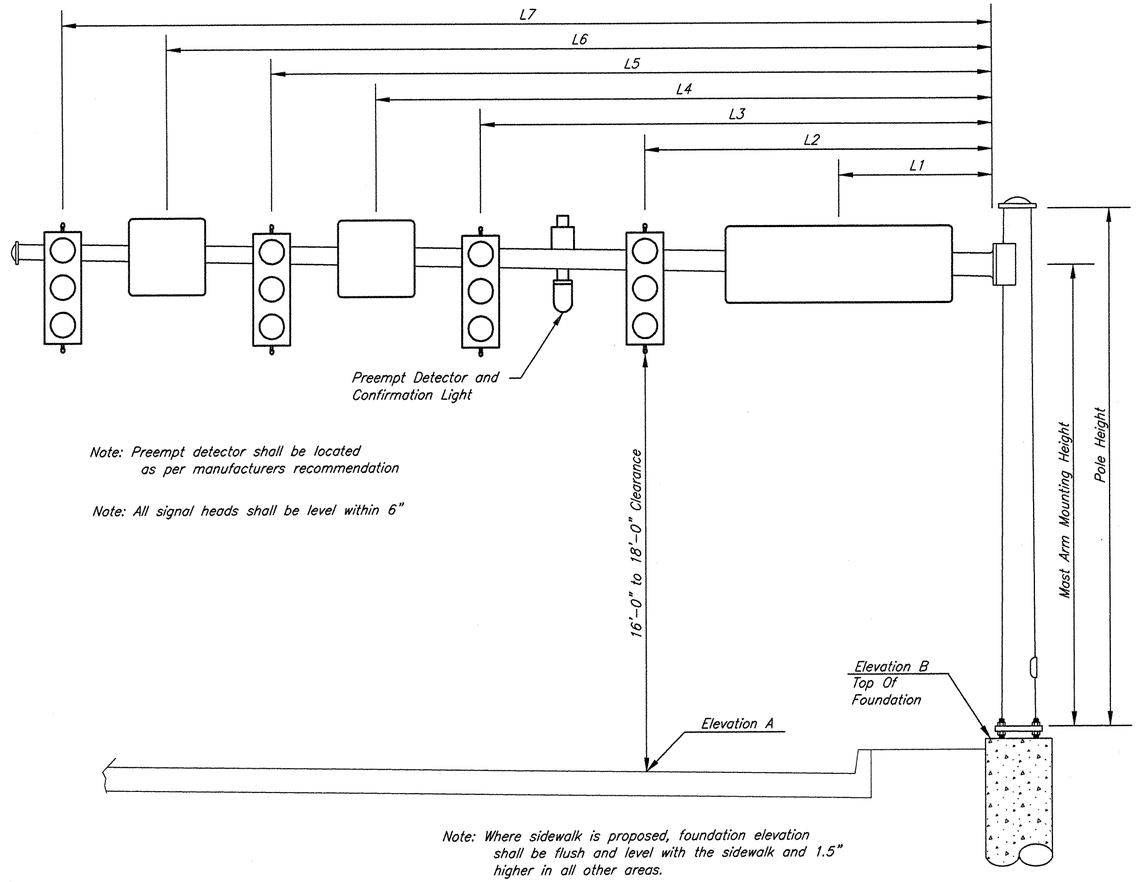


SIGNAL POLE ORIENTATION



Note: Preempt detector shall be located as per manufacturers recommendation

Note: All signal heads shall be level within 6"

Note: Where sidewalk is proposed, foundation elevation shall be flush and level with the sidewalk and 1.5" higher in all other areas.

TRAFFIC SIGNAL COORDINATION TIMING			
	Dial 1	Dial 2	Dial 3
Cycle Length (SEC.)			
Phase 1 Split			
Phase 2 Split			
Phase 3 Split			
Phase 4 Split			
Phase 5 Split			
Phase 6 Split			
Phase 7 Split			
Phase 8 Split			
Permissive			
Offest			
Time of Day Schedule			

TRAFFIC SIGNAL TIMING CHART West 150th Street and Brookpark Road									
		CONTROLLER MOVEMENT NO.							
Interval or Feature		ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
Minimum Green (Initial)	(SEC).								
Passage Time (Preset Gap)	(SEC).								
Maximum Green I	(SEC).								
Maximum Green II	(SEC).								
Yellow Change	(SEC).								
All Red Clearance	(SEC).								
Walk	(SEC).								
Pedestrian Clearance	(SEC).								
Recall – Maximum	(ON/OFF)								
Recall – Minimum	(ON/OFF)								
Recall – Pedestrian	(ON/OFF)								
Memory	(ON/OFF)								
Maximum Initial	(SEC).								
Added Initial	(SEC).								
Minimum Gap	(SEC).								
TBR	(SEC).								
TTR	(SEC).								

ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

TC-81.20 DESIGN NO.	POLE		TWO PIECE ARM		ARM ATTACHMENT							ANCHOR BASE					ANCHOR BOLT	
	WALL THICK	SIZE	WALL THICK	SIZE	A	B	C	D	E	F	G	BOLT CIRCLE	S	J	T	H	DIA.	L
11 AS PER PLAN 1	.239	14x11.20x21'-0"	.239	11x8.55x17'-6"	16½	14½	12½	9¼	1¼	2	1¼	20	20½	14¼	2	2⅜	1¼	84
			.179	9.19x5.24x28'-3"														

Signal Support Type TC-81.20												Elevation		Mast Arm Angle (Deg.)	Orientation Angles (Deg.) From Mast Arm A			
Signal Support	Design No.	Pole Height, Ft.	Mast Arm Mounting Height, Ft.	L1. Ft.	L2. Ft.	L3. Ft.	L4. Ft.	L5. Ft.	L6. Ft.	L7. Ft.	Arm Length (L.) Ft.	A	B		Pedestrian Signal	Pedestrian Button	Power Service	Handhole
1	5*	21.0	19.5	9.0	N/A	N/A	N/A	35.5	N/A	48.5	49.5	779.79	779.60	90	90/180	90/180	N/A	180
2	7**	21.0	19.5	9.0	N/A	31.0	N/A	43.0	54.5	57.5	58.5	779.11	779.83	0	90/180	0/270	N/A	180
3	11	21.0	19.5	5.0	10.0	21.0	29.0	32.0	40.0	43.0	44.0	778.38	779.05	0	0/270	0/270	N/A	180

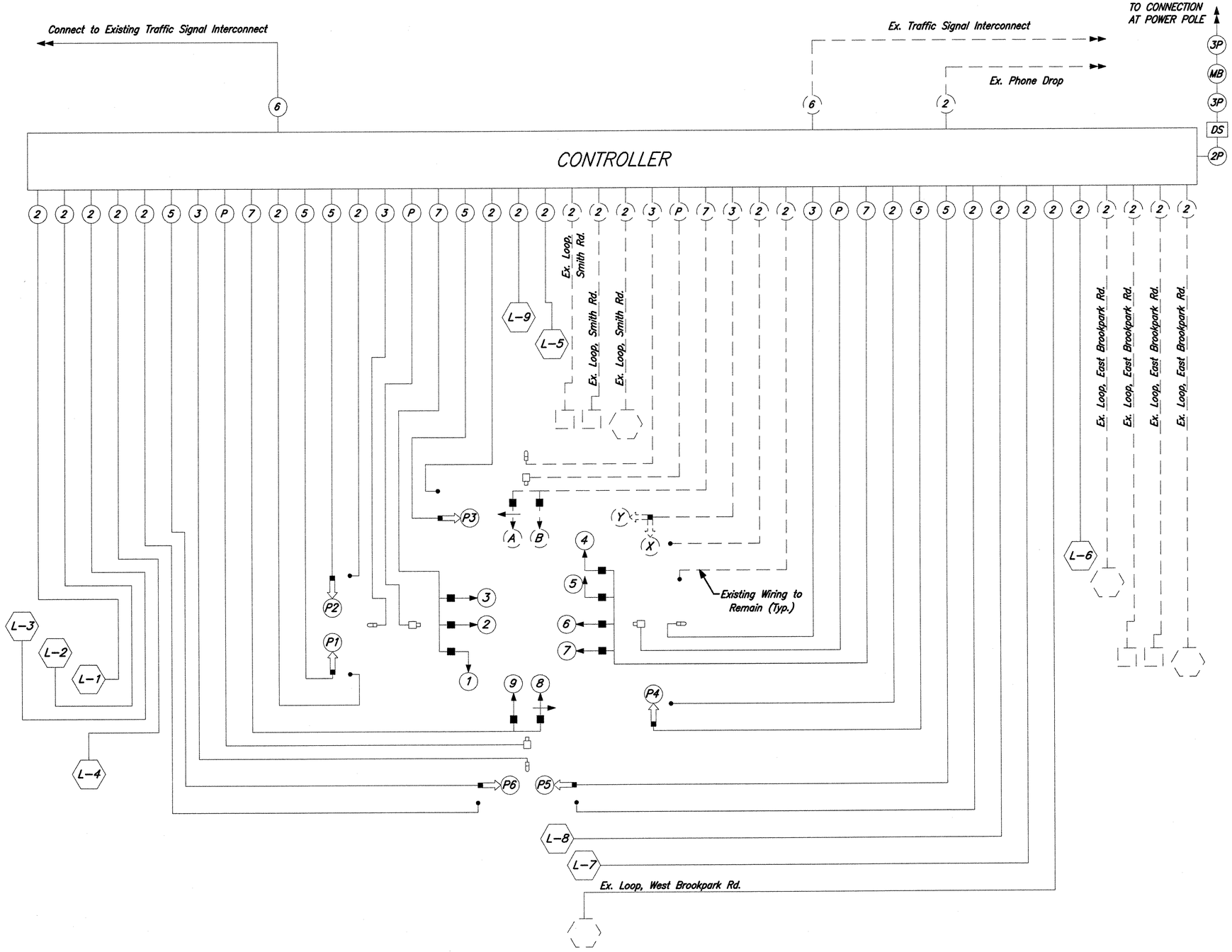
* Signal Support, ODOT Type TC-12.30, Design No. 5, As Per Plan 1. See sheets 113C/146 and 113D/146 for details.
** Signal Support, ODOT Type TC-12.30, Design No. 5, As Per Plan 2. See sheets 113C/146 and 113D/146 for details.

CALCULATED MMP
CHECKED EPS

SIGNAL DETAILS
WEST 150th STREET/BROOKPARK ROAD INTERSECTION
CUY-WEST 150th STREET

114A
146

F:\JOBS\665\CP\CP03.DWG MMP 4/19/07 PLOT 1:20



WIRING DIAGRAM

LEGEND

- Vehicular Signal Head
- Vehicular Signal Head With Turn Arrow
- 2P — 2/C #6 AWG (Power)
- 3P — 3/C #6 AWG (Power)
- 2 — 2/C #12 AWG Jacked and Shielded (LEAD-IN CABLE)
- 3 — 3/C #12 AWG
- 5 — 5/C #12 AWG
- 7 — 7/C #12 AWG
- 6 — 6 Pair PE-38 Interconnect
- P — Preempt Detector Cable
- Preempt Detector
- Preempt Confirmation Light
- L-2 — Vehicle Loop Detector
- MB — Meter Base
- DS — Disconnect Switch
- Pedestrian Push Button
- Pedestrian Signal
- System Loop

CALCULATED MMP
CHECKED EPS

SIGNAL DETAILS
WEST 150th STREET/BROOKPARK ROAD INTERSECTION

CUY-WEST 150th STREET

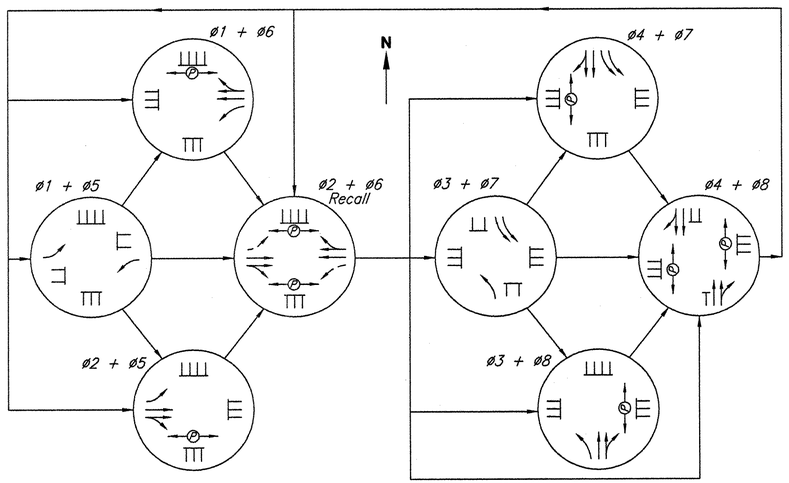
WEST 150th STR

115
146

PJK 3/21/07 PLOT 1:1

(F:\JOBS\360\CP\CP04.DWG)

Item	Total	Unit	Description
625	29	Feet	Conduit, 3" 725.05, Type EB, Concrete Encased
625	564	Feet	Conduit, 2-3" 725.05, Type EB, Concrete Encased
625	593	Feet	Trench
625	5	Each	Pull Box, 13" x 24" x 18"
625	4	Each	Ground Rod
632	8	Each	Vehicular Signal Head, (LED) 3-Section, 12" Lens, 1-Way
632	1	Each	Vehicular Signal Head, (LED) 5-Section, 12" Lens, 1-Way
632	9	Each	Covering of Vehicular Signal Head
632	6	Each	Pedestrian Signal Head
632	6	Each	Covering of Pedestrian Signal Head
632	6	Each	Pedestrian Pushbutton
632	8	Each	Detector Loop
632	8	Each	Loop Detector Unit, Delay and Extention Type
632	1177	Feet	Signal Cable, 2 Conductor, No. 12 AWG
632	1201	Feet	Signal Cable, 5 Conductor, No. 12 AWG
632	865	Feet	Signal Cable, 7 Conductor, No. 12 AWG
632	1791	Feet	Loop Detector Lead-in Cable
632	1791	Feet	Interconnect Cable, 6 Pair, PE-38
632	1	Each	Pedestal Foundation
632	3	Each	Signal Suport Foundation
632	1	Each	Signal Support, ODOT Type TC-12.30, Design No. 5, As Per Plan 1 with 49.5' Mast Arm
632	1	Each	Signal Support, ODOT Type TC-12.30, Design No. 5, As Per Plan 2 with 58.5' Mast Arm
632	1	Each	Signal Support, ODOT Type TC-81.20, Design No. 11, As Per Plan 1 with 44.0' Mast Arm
632	1	Each	Pedestal, 8'
632	1	Each	Removal of Traffic Signal Installation
632	779	Feet	Preempt Detector Cable
633	3	Each	Acoustic Preempt Detector, Single Channel, One Direction
633	3	Each	Preempt Confirmation Light



PROPOSED 8 PHASE ACTUATED CONTROLLER
PHASE DIAGRAM

Preempt Channels:

Channel 1 = ø2 & ø5 (Eastbound only)
Channel 2 = ø4 & ø7 (Southbound only)
Channel 3 = ø1 & ø6 (Westbound only)
Channel 4 = ø3 & ø8 (Northbound only)

Preempt Notes:

1. *Active "Walk" indications shall immediately go to "Dont Walk" upon recieving preemption signal.*
2. *If active phase conflicts with preempt phase called it shall immediately time its yellow and all red clearences.*
3. *If active phase = the preempt phase then the phase shall hold for the duration of the preempt signal.*
4. *After release from preempt, yellow and all red clearance shall be displayedand return phase shall be ø2 & ø6.*
5. *If preempt phases = return phases (ø 2 & ø6) then yellow and all red clearance after preempt shall not be displayed.*

SIGNAL DISPLAY CHART

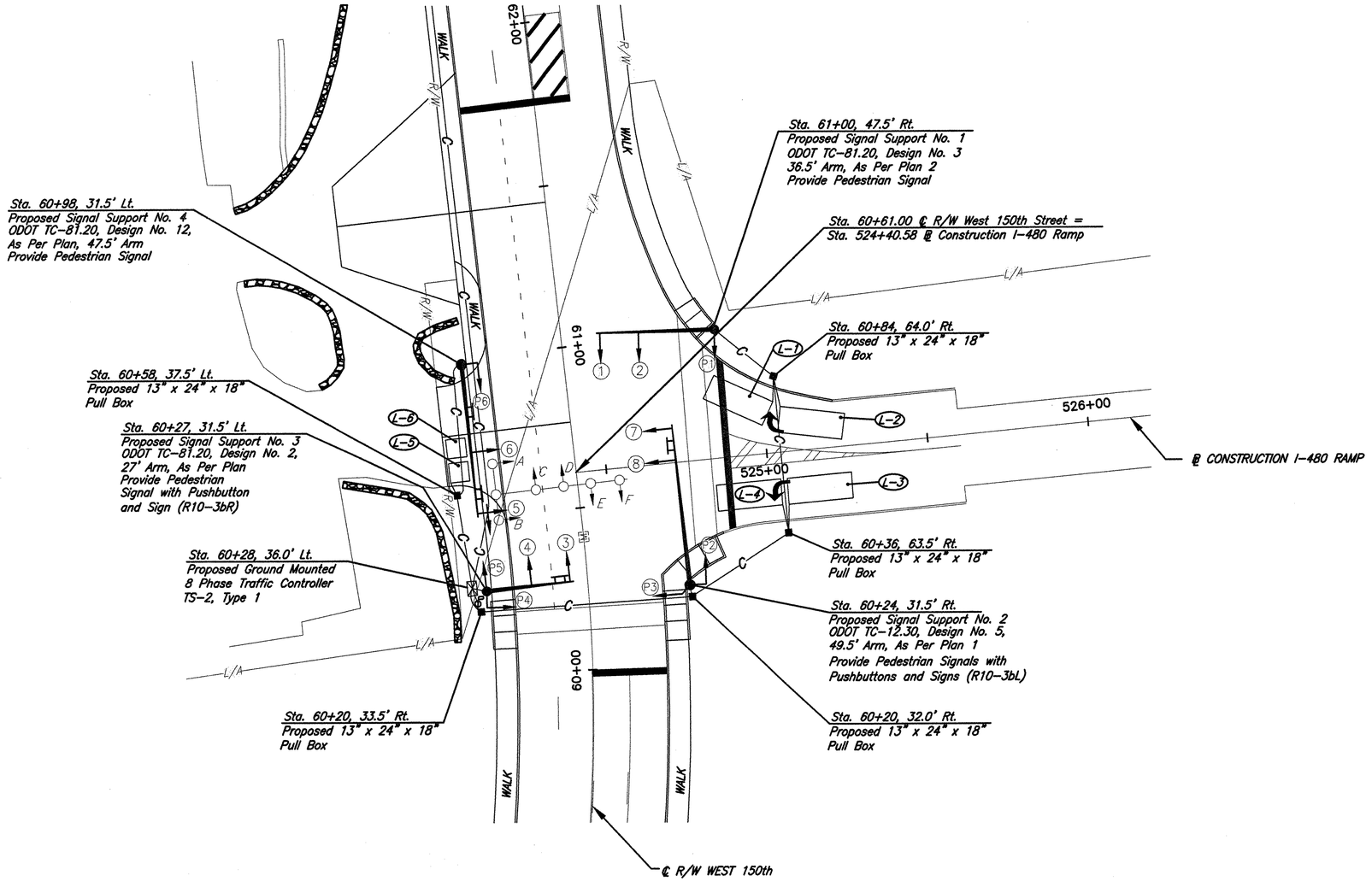
Signal	ø1 + ø5				ø1 + ø6				ø2 + ø5				ø2 + ø6				ø3 + ø7				ø3 + ø8				ø4 + ø7				ø4 + ø8				Flash
Heads	R/W		Clear		R/W		Clear		R/W		Clear		R/W		Clear		R/W		Clear		R/W		Clear		R/W		Clear		R/W		Clear		Operation
1	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	~~G~~ R	~~G~~ R	~~YR~~ ③	R ③	~~G~~ G	~~G~~ G	~~Y~~ G	G	R	R	R	R	R	R	R	R	R
2	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	G	G	R	R	R	R	G	G	Y	R	R
3	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	G	G	R	R	R	R	G	G	Y	R	R
4	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	~~G~~ R	~~G~~ R	~~YR~~ ④	R ④	R	R	R	R	~~G~~ G	~~G~~ G	~~Y~~ G	G	R	R	R	R	R
5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	~~G~~ R	~~G~~ R	~~YR~~ ④	R ④	R	R	R	R	~~G~~ G	~~G~~ G	~~Y~~ G	G	R	R	R	R	R
6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	G	G	G	G	Y	R	R
7	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	G	G	G	G	Y	R	R
8	~~G~~ R	~~G~~ R	~~YR~~ ①	R ①	~~G~~ G	~~G~~ G	~~Y~~ G	G	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
9	R	R	R	R	G	G	G	G	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
A	~~G~~ R	~~G~~ R	~~YR~~ ②	R ②	R	R	R	R	~~G~~ G	~~G~~ G	~~Y~~ G	G	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
B	R	R	R	R	R	R	R	R	G	G	G	G	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
P1	DW	DW	DW	DW	W	W	W	W	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
P2	DW	DW	DW	DW	W	W	W	W	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
P3	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	W	W	W	DW	DW	DW	DW	W	FDW	DW	DW	OFF
P4	DW	DW	DW	DW	DW	DW	DW	DW	W	W	W	W	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
P5	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	W	W	W	W	FDW	DW	DW	OFF
P6	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	W	W	W	W	FDW	DW	DW	OFF
X	DW	DW	DW	DW	DW	DW	DW	DW	W	W	W	W	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OFF
Y	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	W	W	W	DW	DW	DW	DW	W	FDW	DW	DW	OFF

① *Remains ~~G~~ R if ø1 + ø6 is next.*
② *Remains ~~G~~ R if ø2 + ø5 is next.*
③ *Remains ~~G~~ R if ø3 + ø8 is next.*
④ *Remains ~~G~~ R if ø4 + ø7 is next.*

CALCULATED MMP
CHECKED EPS

SIGNAL DETAILS
WEST 150th STREET/BROOKPARK ROAD INTERSECTION
CUY-WEST 150th STREET

MMP 4/19/07 PLOT 116
(F:\JOBS\360\CP\CP05.DWG)

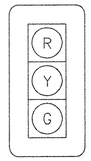


INTERSECTION OF WEST 150th STREET AND I-480 RAMP

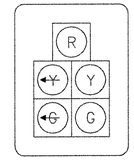
Type D2
Signals P1, P2, P3 & P4
LED

R10-3bR-9

R10-3bL-9

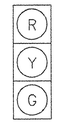


Signals 1, 2, 3, 4, 6, 7 & 8, LED



Signal 5, LED

PROPOSED SIGNAL HEAD ARRANGEMENT



Signals A, B, C, D, E & F

EXISTING SIGNAL HEAD ARRANGEMENT

LEGEND FOR SIGNALS AND SUPPORT

	NEW	EXISTING		NEW	EXISTING
Mast Arm Support	●	○	Conduit	2-3"C	3" C
Sign on Support			Pullbox		
Signal Head, Std.-1-Way	●	○	Controller	⊠	⊠ Ex.
Signal Head with Arrow	●	○	Loop Detectors		

LOOP DETECTOR CHART

LOOP DESIGNATOR	LOCATION FROM	LOCATION TO	SIZE (FT)	NO. OF TURNS	SHAPE	MODE	DELAY (SEC)	CONNECT TO DETECTOR UNIT NO.	ASSOCIATED CONTROLLER PHASE
L-1	524+84, 22' Lt.	525+01, 12' Lt.	20 X 8	3	RECTANGLE	PRESENCE	5	1	8
L-2	525+05, 10' Lt.	525+24, 6' Lt.	20 X 8	3	RECTANGLE	PRESENCE	5	2	8
L-3	524+84, 12' Rt.	525+04, 12' Rt.	20 X 8	3	RECTANGLE	PRESENCE	0	3	3
L-4	525+06, 12' Rt.	525+26, 12' Rt.	20 X 8	3	RECTANGLE	PRESENCE	0	4	3
L-5	60+65, 33' Lt.	60+65, 39' Lt.	6 X 6	3	RECTANGLE	PRESENCE	5	5	4
L-6	60+73, 33' Lt.	60+73, 39' Lt.	6 X 6	3	RECTANGLE	PRESENCE	5	6	4

N

SCALE IN FEET
20 0 20

CALCULATED MMP
CHECKED EPS

SIGNAL PLAN
WEST 150th STREET/I-480 RAMP INTERSECTION
CUY-WEST 150th STREET

117
146

MMP 3/27/07 PLOT 1:20

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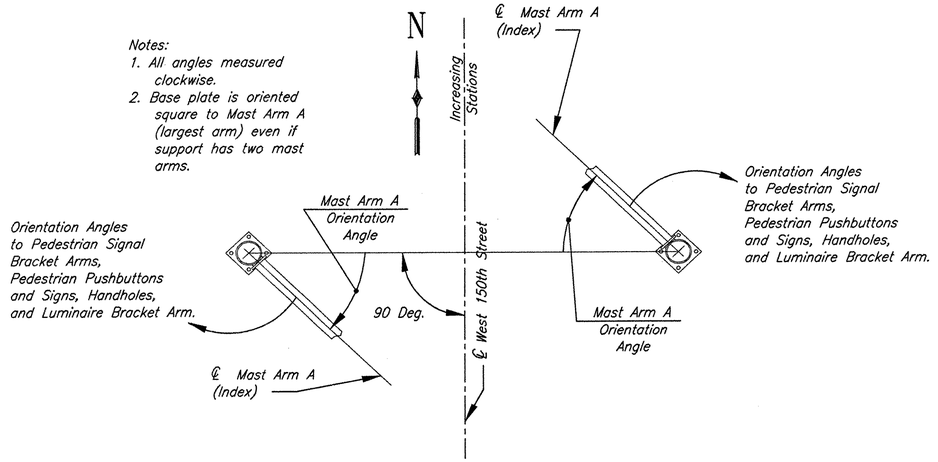
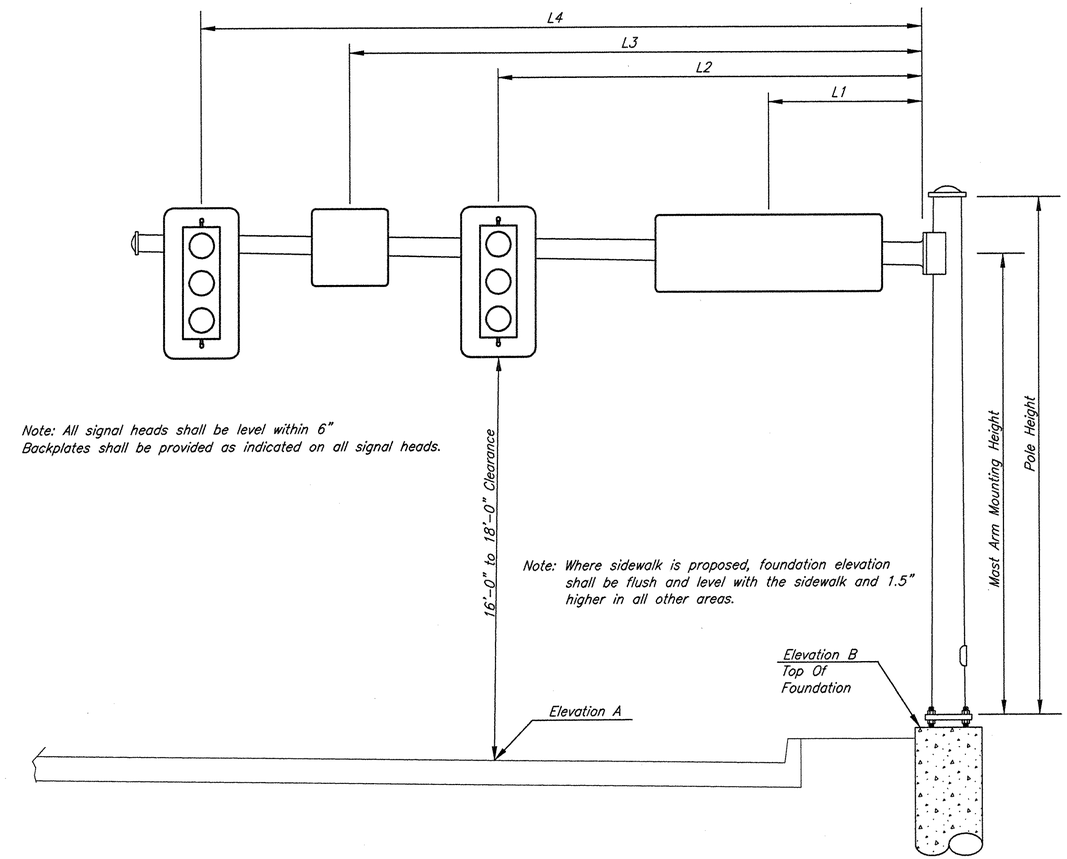


SIGNAL POLE ORIENTATION

TRAFFIC SIGNAL COORDINATION TIMING			
	Dial 1	Dial 2	Dial 3
Cycle Length (SEC.)			
Phase 1 Split			
Phase 2 Split			
Phase 3 Split			
Phase 4 Split			
Phase 5 Split			
Phase 6 Split			
Phase 7 Split			
Phase 8 Split			
Permissive			
Offest			
Time of Day Schedule			

TRAFFIC SIGNAL TIMING CHART West 150th Street and I-480 Ramp			CONTROLLER MOVEMENT NO.		
Interval or Feature			ø2 + ø6	ø3 + ø8	ø4 + ø8
Minimum Green (Initial)		(SEC).			
Passage Time (Preset Gap)		(SEC).			
Maximum Green I		(SEC).			
Maximum Green II		(SEC).			
Yellow Change		(SEC).			
All Red Clearance		(SEC).			
Walk		(SEC).			
Pedestrian Clearance		(SEC).			
Recall	Maximum	(ON/OFF)			
	Minimum	(ON/OFF)			
	Pedestrian	(ON/OFF)			
Memory		(ON/OFF)			
Maximum Initial		(SEC).			
Added Initial		(SEC).			
Minimum Gap		(SEC).			
TBR		(SEC).			
TTR		(SEC).			



ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

TC-81.20 DESIGN NO.	POLE		ARM		TWO PIECE ARM		ARM ATTACHMENT							ANCHOR BASE					ANCHOR BOLT	
	WALL THICK	SIZE	WALL	SIZE	WALL THICK	SIZE	A	B	C	D	E	F	G	BOLT CIRCLE	S	J	T	H	DIA.	L
2 AS PER PLAN	.179	11x8.20x21'-0"	.179	8.0x4.22x27'-0"			14½	12	10½	8	1¼	1½	1¼	15	16	10⅝	1½	1¾	1½	54
3 AS PER PLAN 1	.179	12x9.20x21'-0"	.179	9.0x3.89x36'-6"			14½	12	10½	8	1¼	1½	1¼	16	17	11⅜	1½	1¾	1½	54
12 AS PER PLAN	.239	14x11.20x21'-0"	TOT. LENGTH = 47.5'		.239	11x8.55x17'-6"	16½	14½	12½	9½	1¼	2	1⅜	20	20½	14½	2	2⅜	2	90
					.179	9.19x4.75x31'-9"														

Signal Support Type TC-81.20									Elevation		Mast Arm Angle (Deg.)	Orientation Angles (Deg.) From Mast Arm A			
Signal Support	Design No.	Pole Height, Ft.	Mast Arm Mounting Height, Ft.	L1. Ft.	L2. Ft.	L3. Ft.	L4. Ft.	Arm Length (L.) Ft.	A	B		Pedestrian Signal	Pedestrian Button	Power Service	Handhole
1	3	21.0	20.0	N/A	23.5	N/A	35.5	36.5	781.65	782.31	0	270	N/A	N/A	180
2	5*	21.0	20.0	N/A	38.5	45.0	48.5	49.5	782.50	783.92	88	90/270	180	N/A	180
3	2	21.0	20.0	14.0	23.0	N/A	26.0	27.0	782.31	783.07	0	90/270	90	N/A	180
4	12	21.0	20.0	14.0	27.5	43.0	46.5	47.5	783.59	783.92	90	0	N/A	N/A	180

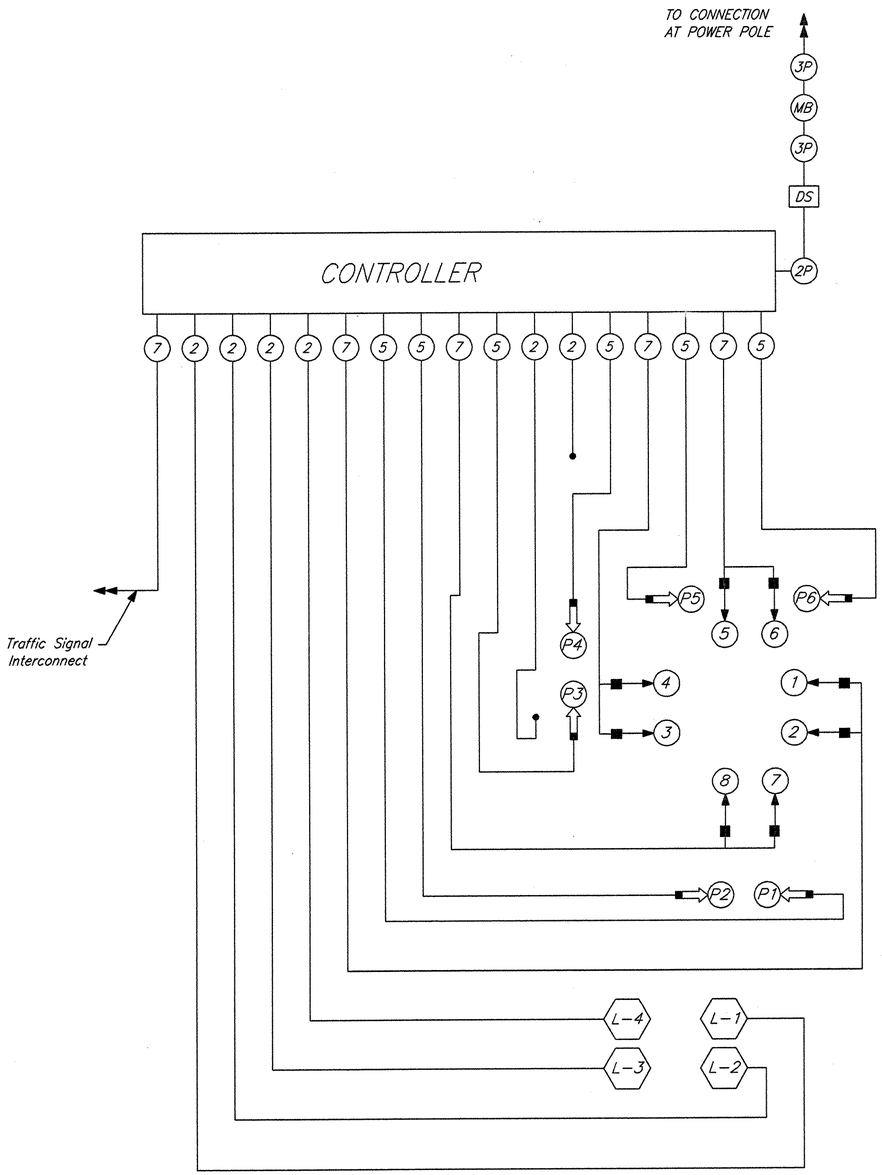
* Signal Support, ODOT Type TC-12.30, Design No. 5, As Per Plan 1. See sheets 113C/146 and 113D/146 for details.

CALCULATED MMP
CHECKED EPS

SIGNAL DETAILS
CUY-WEST 150th STREET
WEST 150th STREET/I-480 RAMP INTERSECTION

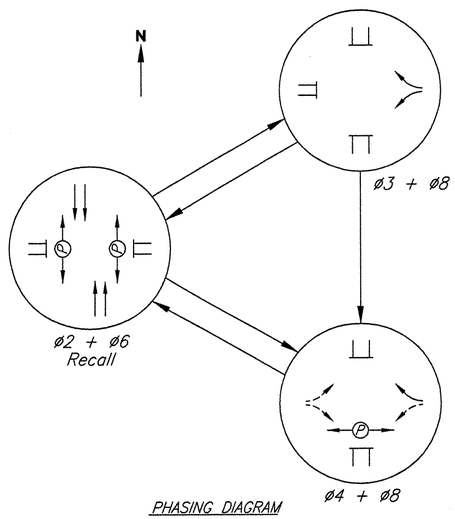
MMP 4/19/07 PLOT 1:20
F:_JOBS\665\CP\CP07.DWG

Item	Total	Unit	Description
625	256	Feet	Conduit, 2–3" 725.05, Type EB, Concrete Encased
625	256	Feet	Trench
625	4	Each	Pull Box, 13" x 24" x 18"
625	4	Each	Ground Rod
632	7	Each	Vehicular Signal Head, (LED) 3–Section, 12" Lens, 1–Way , As Per Plan
632	1	Each	Vehicular Signal Head, (LED) 5–Section, 12" Lens, 1–Way , As Per Plan
632	8	Each	Covering of Vehicular Signal Head
632	6	Each	Pedestrian Signal Head
632	6	Each	Covering of Pedestrian Signal Head
632	2	Each	Pedestrian Pushbutton
632	6	Each	Detector Loop
632	6	Each	Loop Detector Unit, Delay and Extention Type
632	126	Feet	Signal Cable, 2 Conductor, No. 12 AWG
632	541	Feet	Signal Cable, 5 Conductor, No. 12 AWG
632	653	Feet	Signal Cable, 7 Conductor, No. 12 AWG
632	670	Feet	Loop Detector Lead–in Cable
632	45	Feet	Power Cable, 3 Conductor, No. 6 AWG
632	1	Each	Power Service
632	4	Each	Signal Suport Foundation
632	1	Each	Signal Support, ODOT Type TC–81.20, Design No. 2, As Per Plan with 27.0' Mast Arm
632	1	Each	Signal Support, ODOT Type TC–81.20, Design No. 3, As Per Plan 1 with 36.5' Mast Arm
632	1	Each	Signal Support, ODOT Type TC–81.20, Design No. 12, As Per Plan with 47.5' Mast Arm
632	1	Each	Signal Support, ODOT Type TC–12.30, Design No. 5, As Per Plan 1 with 49.5' Mast Arm
632	1	Each	Removal of Traffic Signal Installation
633	1	Each	Controller, Actuated, 8 Phase, TS–2, Type 1, with Secondary Coordinating Unit
633	1	Each	Cabinet Foundation
633	1	Each	Controller Work Pad



WIRING DIAGRAM

Signal Number	Normal Signal Phasing												Flashing Operation
	ø2 + ø6				ø8 + ø3				ø4 + ø8				
	R/W		Clear		R/W		Clear		R/W		Clear		
1	G	G	Y	R	R	R	R	R	R	R	R	R	Y
2	G	G	Y	R	R	R	R	R	R	R	R	R	Y
3	G	G	Y	R	R	R	R	R	R	R	R	R	Y
4	G	G	Y	R	R	R	R	R	R	R	R	R	Y
5	R	R	R	R	G	G	Y	R	G	G	Y	R	R
6	R	R	R	R	G	G	Y	R	G	G	Y	R	R
7	R	R	R	R	R	R	R	R	G	G	Y	R	R
8	R	R	R	R	R	R	R	R	G	G	Y	R	R
P1	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	Off
P2	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	Off
P3	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	Off
P4	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	Off
P5	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	Off
P6	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	Off



PHASING DIAGRAM

LEGEND

- Vehicular Signal Head
- Vehicular Signal Head With Turn Arrow
- 2P — 2/C #6 AWG (Power)
- 3P — 3/C #6 AWG (Power)
- 2 — 2/C #12 AWG Jacked and Shielded (LEAD–IN CABLE)
- L–2 — Vehicle Loop Detector
- 5 — 5/C #12 AWG
- 7 — 7/C #12 AWG
- MB — Meter Base
- DS — Disconnect Switch
- Pedestrian Push Button
- Pedestrian Signal

CALCULATED MMP
CHECKED EPS

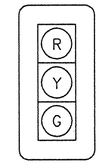
SIGNAL DETAILS
WEST 150th STREET/I-480 RAMP INTERSECTION

CUY-WEST 150th STREET

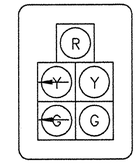
Signals A, B, D, E & F

Signal C

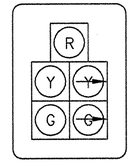
EXISTING SIGNAL HEAD ARRANGEMENT



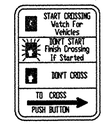
Signals 1, 2 4, 5, 7 & 8 LED



Signal 3, LED



Signal 6, LED

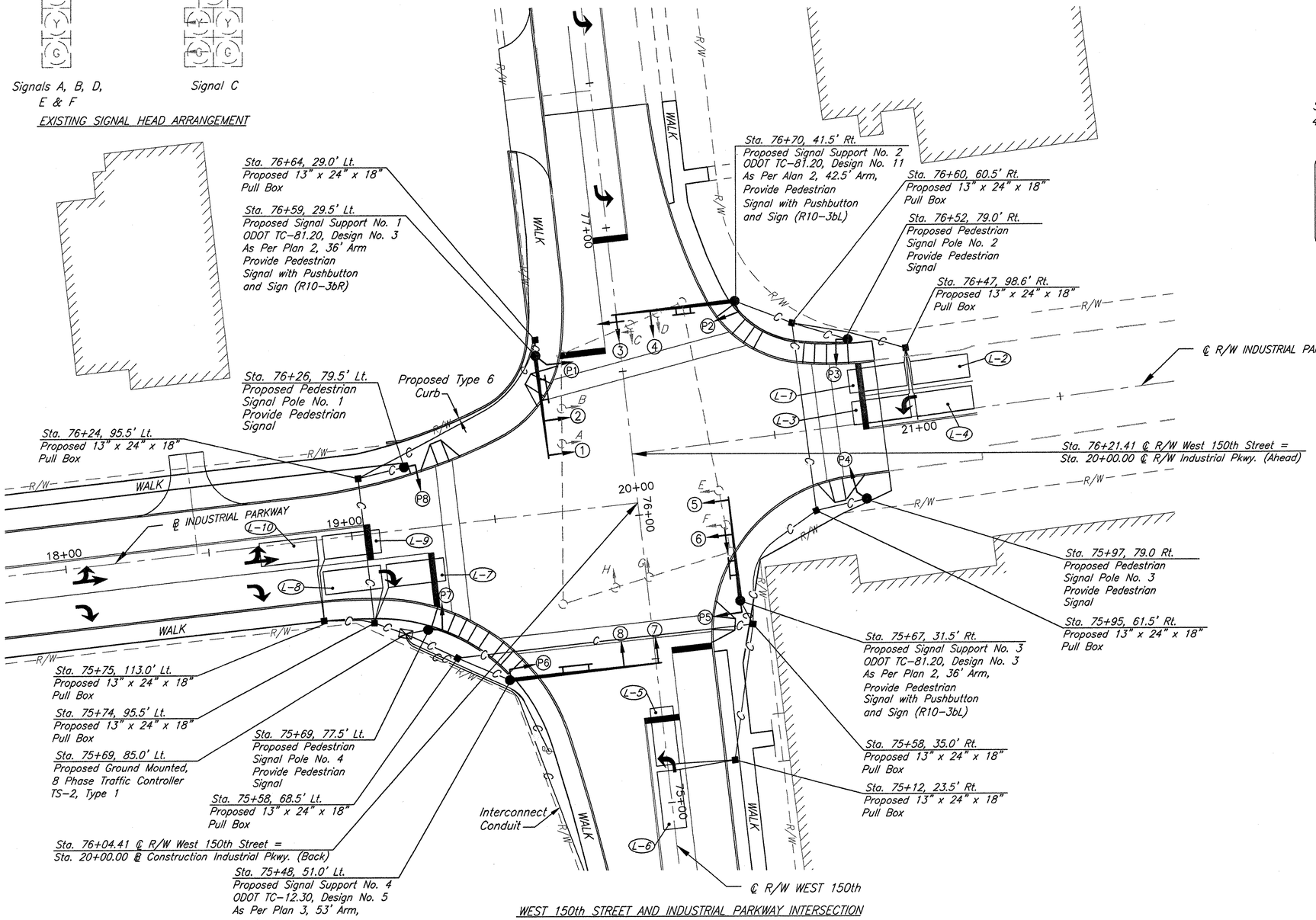


R10-3bR-9

R10-3bL-9

Type D2 Signals P1, P2, P3, P4, P5, P6, P7 & P8 LED

PROPOSED SIGNAL HEAD ARRANGEMENT



LEGEND FOR SIGNALS AND SUPPORT

	NEW	EXISTING
Mast Arm Support	● ——	○ — —
Span Wire Support	●——●	○—○
Sign on Support	——	— —
Signal Head, Std.-1-Way	●	○
Signal Head with Arrow	●	○

	NEW	EXISTING
Conduit	2" C	3" C
Pullbox	■	□
Controller	⊠	⊠ Ex.
Loop Detectors	▭	⊏ ⊐

LOOP DETECTOR CHART

LOOP DESIGNATOR	LOCATION FROM	LOCATION TO	SIZE (FT)	NO. OF TURNS	SHAPE	MODE	DELAY (SEC)	CONNECT TO DETECTOR UNIT NO.	ASSOCIATED CONTROLLER PHASE
L-1	20+78, 15' Rt.	20+98, 15' Lt.	20 X 8	3	RECTANGLE	PRESENCE	8 Sec.	1	3
L-2	21+00, 15' Lt.	21+20, 15' Lt.	20 X 8	3	RECTANGLE	PRESENCE	8 Sec.	2	3
L-3	20+78, 4' Lt.	20+98, 4' Lt.	20 X 8	3	RECTANGLE	PRESENCE	0 Sec.	3	3
L-4	21+00, 4' Lt.	21+20, 4' Lt.	20 X 8	3	RECTANGLE	PRESENCE	0 Sec.	4	3
L-5	75+33, ℄	75+13, ℄	20 X 8	3	RECTANGLE	PRESENCE	5 Sec.	5	1
L-6	75+11, ℄	74+91, ℄	20 X 8	3	RECTANGLE	PRESENCE	5 Sec.	6	1
L-7	19+11, 15' Rt.	19+31, 15' Rt.	20 X 8	3	RECTANGLE	PRESENCE	5 Sec.	7	4
L-8	18+89, 15' Rt.	19+09, 15' Rt.	20 X 8	3	RECTANGLE	PRESENCE	5 Sec.	8	4
L-9	18+90, 3' Rt.	19+10, 3' Rt.	20 X 8	3	RECTANGLE	PRESENCE	0 Sec.	9	4
L-10	18+68, 3' Rt.	18+88, 3' Rt.	20 X 8	3	RECTANGLE	PRESENCE	0 Sec.	10	4

N

SCALE IN FEET 20 0 20

CALCULATED MMP

CHECKED EPS

SIGNAL PLAN
CUY-WEST 150th STREET
WEST 150th STREET/INDUSTRIAL PARKWAY INTERSECTION

120
146

MMP 4/19/07 PLOT 1:20

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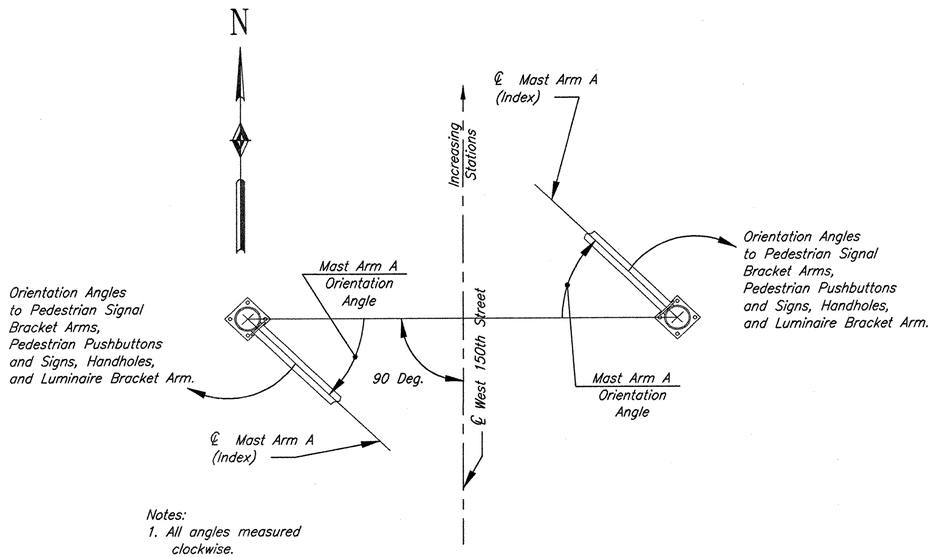
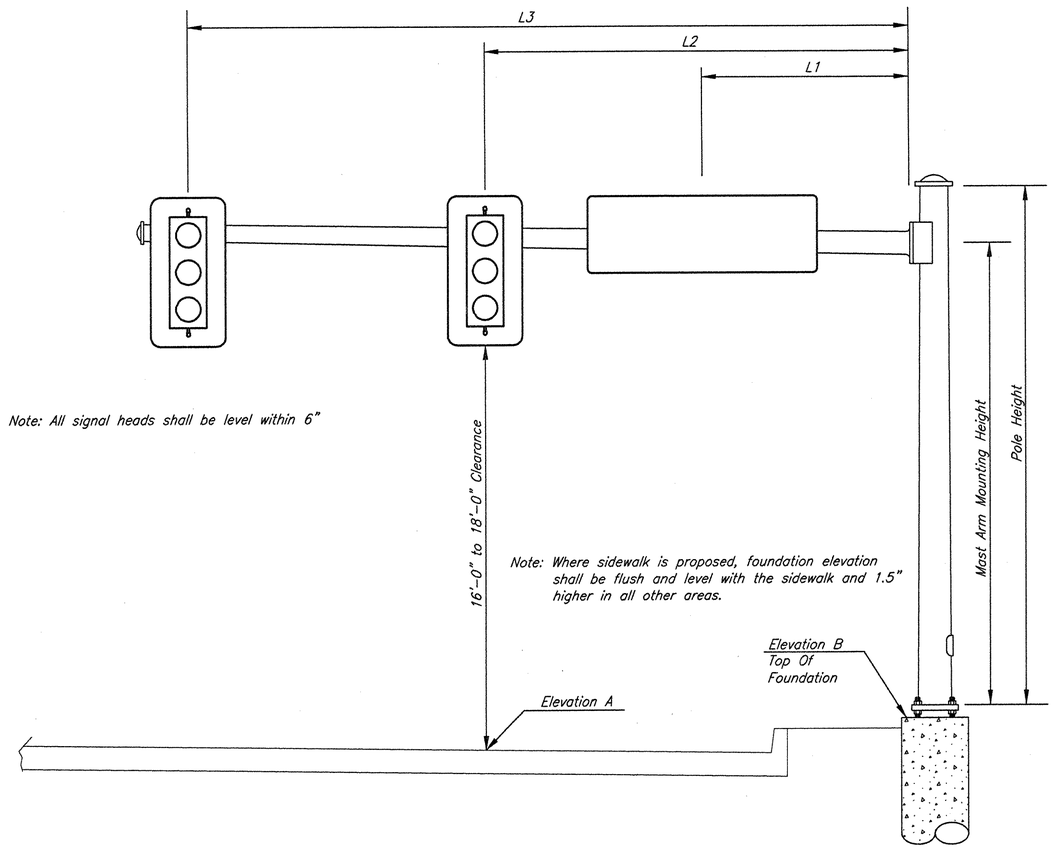


Notes:
1. All angles measured clockwise.
2. Base plate is oriented square to Mast Arm A (largest arm) even if support has two mast arms.

SIGNAL POLE ORIENTATION



ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

TC-81.20 DESIGN NO.	POLE		ARM		TWO PIECE ARM		ARM ATTACHMENT							ANCHOR BASE					ANCHOR BOLT	
	WALL THICK	SIZE	WALL	SIZE	WALL THICK	SIZE	A	B	C	D	E	F	G	BOLT CIRCLE	S	J	T	H	DIA.	L
3 AS PER PLAN 2	.179	12x9.20x21'-0"	.179	9.0x3.96x36'-0"			14½	12	10½	8	1¼	1½	1¼	16	17	11⅛	1½	1¾	1½	54
11 AS PER PLAN 2	.239	14x11.20x21'-0"	TOT. LENGTH = 42.5'		.239	11x8.55x17'-6"	16½	14½	12½	9½	1¼	2	1¼	20	20½	14⅛	2	2¾	1¾	84
					.179	9.19x5.45x26'-9"														

TRAFFIC SIGNAL TIMING CHART
West 150th Street and Industrial Parkway

Interval or Feature			CONTROLLER MOVEMENT NO. ø1	ø2	ø3	ø4
Minimum Green (Initial)		(SEC).				
Passage Time (Preset Gap)		(SEC).				
Maximum Green I		(SEC).				
Maximum Green II		(SEC).				
Yellow Change		(SEC).				
All Red Clearance		(SEC).				
Walk		(SEC).				
Pedestrian Clearance		(SEC).				
Recall	Maximum	(ON/OFF)				
	Minimum	(ON/OFF)				
	Pedestrian	(ON/OFF)				
Memory		(ON/OFF)				
Maximum Initial		(SEC).				
Added Initial		(SEC).				
Minimum Gap		(SEC).				
TBR		(SEC).				
TTR		(SEC).				

TRAFFIC SIGNAL COORDINATION TIMING

	Dial 1	Dial 2	Dial 3
Cycle Length (SEC.)			
Phase 1 Split			
Phase 2 Split			
Phase 3 Split			
Phase 4 Split			
Phase 5 Split			
Phase 6 Split			
Phase 7 Split			
Phase 8 Split			
Permissive			
Offest			
Time of Day Schedule			

Signal Support Type TC-81.20								Elevation			Orientation Angles (Deg.) From Mast Arm A			
Signal Support	Design No.	Pole Height, Ft.	Mast Arm Mounting Height, Ft.	L1. Ft.	L2. Ft.	L3. Ft.	Arm Length (L.) Ft.	A	B	Mast Arm Angle (Deg.)	Pedestrian Signal	Pedestrian Button	Power Service	Handhole
1	3	21.0	19.5	9.0	23.0	35.0	36.0	779.53	780.93	90	0	0	N/A	180
2	11	21.0	19.5	9.0	29.5	41.5	42.5	780.58	780.77	0	270	720	N/A	180
3	3	21.0	19.5	9.0	23.0	35.0	36.0	779.46	780.93	90	180	180	N/A	180
4	5*	21.0	19.5	9.0	40.0	52.0	53.0	779.49	780.93	0	270	270	90	180
PED. 1	PED.	8.0	N/A	N/A	N/A	N/A	N/A	N/A	780.62	N/A	90	0	N/A	270
PED. 2	PED.	8.0	N/A	N/A	N/A	N/A	N/A	N/A	781.10	N/A	270	0	N/A	90
PED. 3	PED.	8.0	N/A	N/A	N/A	N/A	N/A	N/A	781.16	N/A	90	0	N/A	270
PED. 4	PED.	8.0	N/A	N/A	N/A	N/A	N/A	N/A	780.24	N/A	270	0	N/A	90

* Signal Support, ODOT Type TC-12.30, Design No. 5, As Per Plan 3. See Sheets 113C/146 and 113D/416 for details.

CALCULATED MMP | CHECKED EPS

SIGNAL DETAILS
WEST 150th STREET/INDUSTRIAL PARKWAY INTERSECTION

CUY-WEST 150th STREET

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MMP 4/19/07 PLOT 1:20

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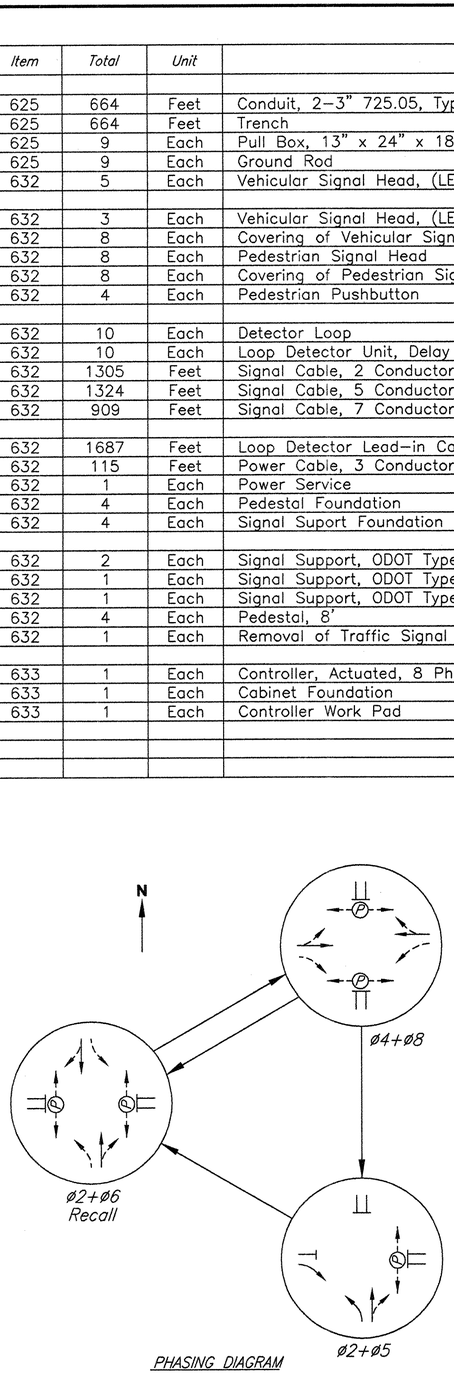
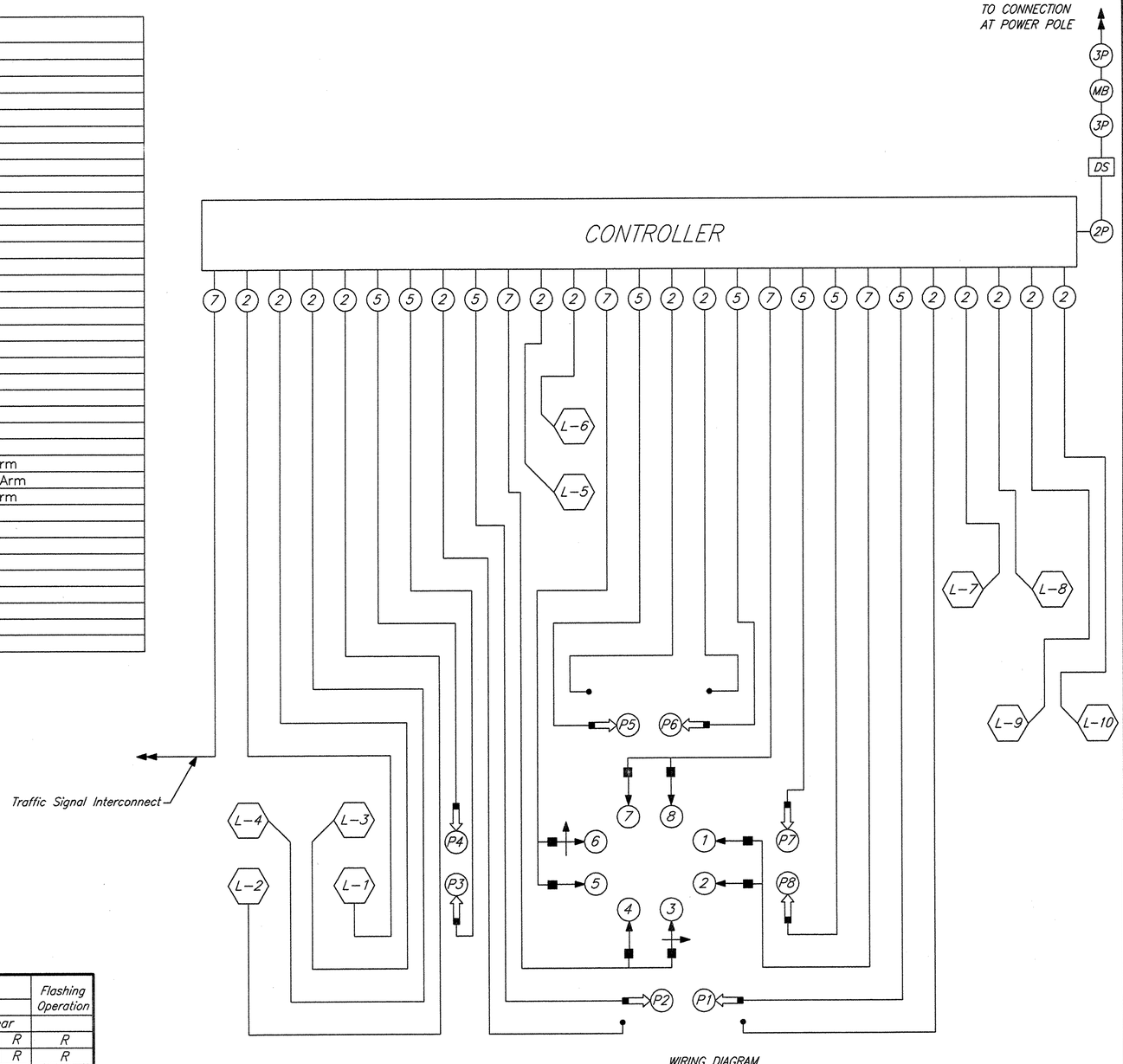
Item	Total	Unit	Description
625	664	Feet	Conduit, 2–3" 725.05, Type EB, Concrete Encased
625	664	Feet	Trench
625	9	Each	Pull Box, 13" x 24" x 18"
625	9	Each	Ground Rod
632	5	Each	Vehicular Signal Head, (LED) 3–Section, 12" Lens, 1–Way, As Per Plan
632	3	Each	Vehicular Signal Head, (LED) 5–Section, 12" Lens, 1–Way, As Per Plan
632	8	Each	Covering of Vehicular Signal Head
632	8	Each	Pedestrian Signal Head
632	8	Each	Covering of Pedestrian Signal Head
632	4	Each	Pedestrian Pushbutton
632	10	Each	Detector Loop
632	10	Each	Loop Detector Unit, Delay and Extention Type
632	1305	Feet	Signal Cable, 2 Conductor, No. 12 AWG
632	1324	Feet	Signal Cable, 5 Conductor, No. 12 AWG
632	909	Feet	Signal Cable, 7 Conductor, No. 12 AWG
632	1687	Feet	Loop Detector Lead–in Cable
632	115	Feet	Power Cable, 3 Conductor, No. 6 AWG
632	1	Each	Power Service
632	4	Each	Pedestal Foundation
632	4	Each	Signal Suport Foundation
632	2	Each	Signal Support, ODOT Type TC–81.20, Design No. 3, As Per Plan 2 with 36.0' Mast Arm
632	1	Each	Signal Support, ODOT Type TC–81.20, Design No. 11, As Per Plan 2 with 42.5' Mast Arm
632	1	Each	Signal Support, ODOT Type TC–12.30, Design No. 5, As Per Plan 3 with 53.0' Mast Arm
632	4	Each	Pedestal, 8'
632	1	Each	Removal of Traffic Signal Installation
633	1	Each	Controller, Actuated, 8 Phase, TS–2, Type 1, with Master Coordinating Unit
633	1	Each	Cabinet Foundation
633	1	Each	Controller Work Pad



PHASING DIAGRAM

Signal Number	Normal Signal Phasing												Flashing Operation
	ø2+ø6 (Recall)				ø2+ø6				ø4+ø8				
	R/W		Clear		R/W		Clear		R/W		Clear		
1	R	R	R	R	R	R	R	R	G	G	Y	R	R
2	R	R	R	R	R	R	R	R	G	G	Y	R	R
3	G	G	Y	R	~~G~~ G	~~G~~ G	~~Y~~ G	G	R	R	R	R	Y
4	G	G	Y	R	G	G	G	G	R	R	R	R	Y
5	R	R	R	R	R	R	R	R	G	G	Y	R	R
6	R	R	R	R	R ~~G~~	R ~~G~~	R ~~Y~~	R	G	G	Y	R	R
7	G	G	Y	R	R	R	R	R	R	R	R	R	Y
8	G	G	Y	R	R	R	R	R	R	R	R	R	Y
P1	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	Off
P2	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	Off
P3	W	FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	Off
P4	W	FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	Off
P5	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	Off
P6	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	Off
P7	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	Off
P8	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	Off



WIRING DIAGRAM

LEGEND

- Vehicular Signal Head
- Vehicular Signal Head With Turn Arrow
- 2P — 2/C #6 AWG (Power)
- 3P — 3/C #6 AWG (Power)
- 3 — 3/C #12 AWG
- L–2 — Vehicle Loop Detector
- 5 — 5/C #12 AWG
- 7 — 7/C #12 AWG
- MB — Meter Base
- DS — Disconnect Switch
- 2 — 2/C #12 AWG Jacked and Shielded (LEAD–IN CABLE)
- Pedestrian Push Button
- Pedestrian Signal

CALCULATED MMP
CHECKED EPS

SIGNAL DETAILS
WEST 150th STREET/INDUSTRIAL PARKWAY INTERSECTION

CUY-WEST 150th STREET

122
146

MMP 4/19/07 PLOT 1:1

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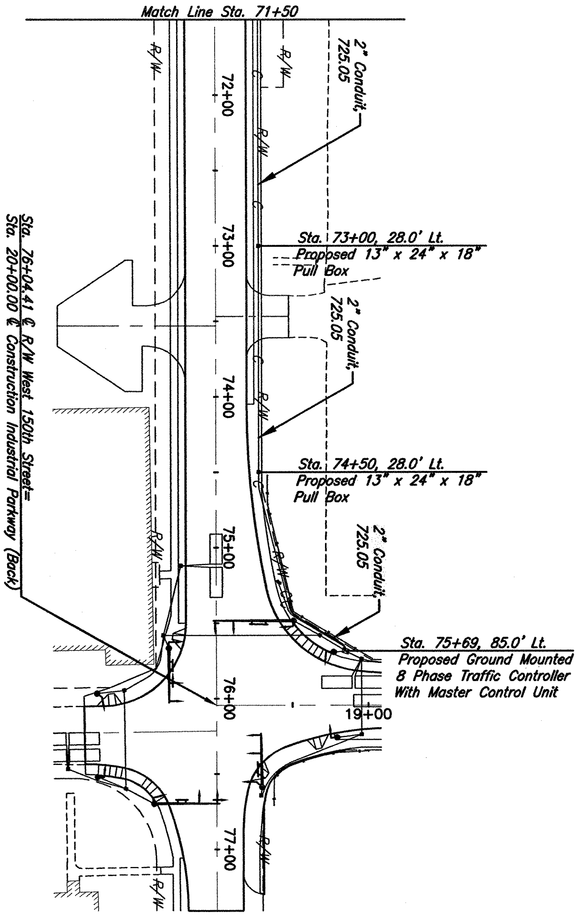
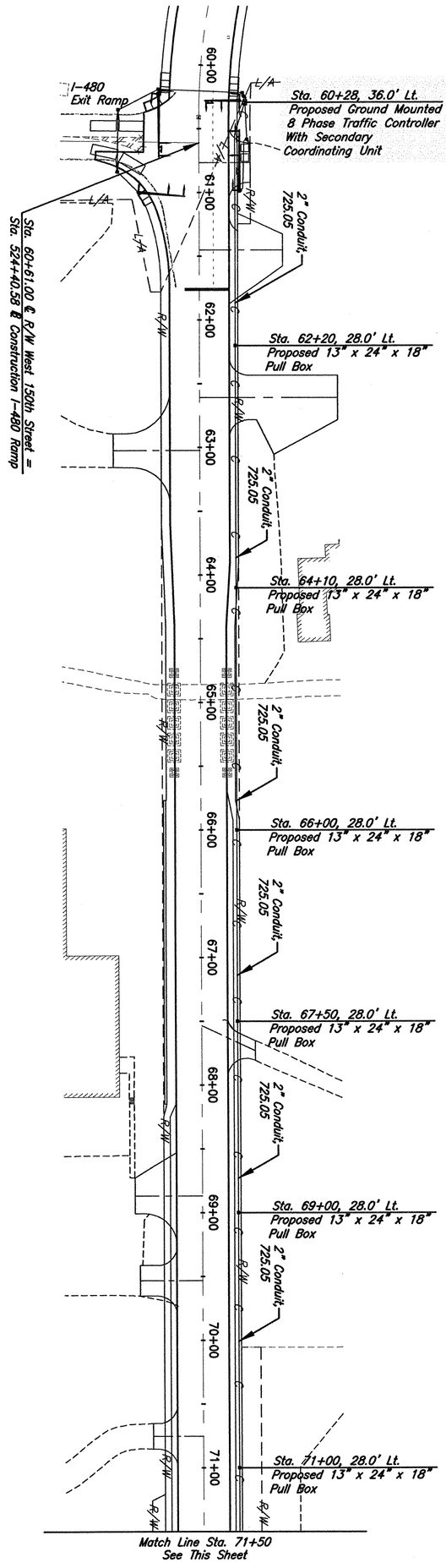
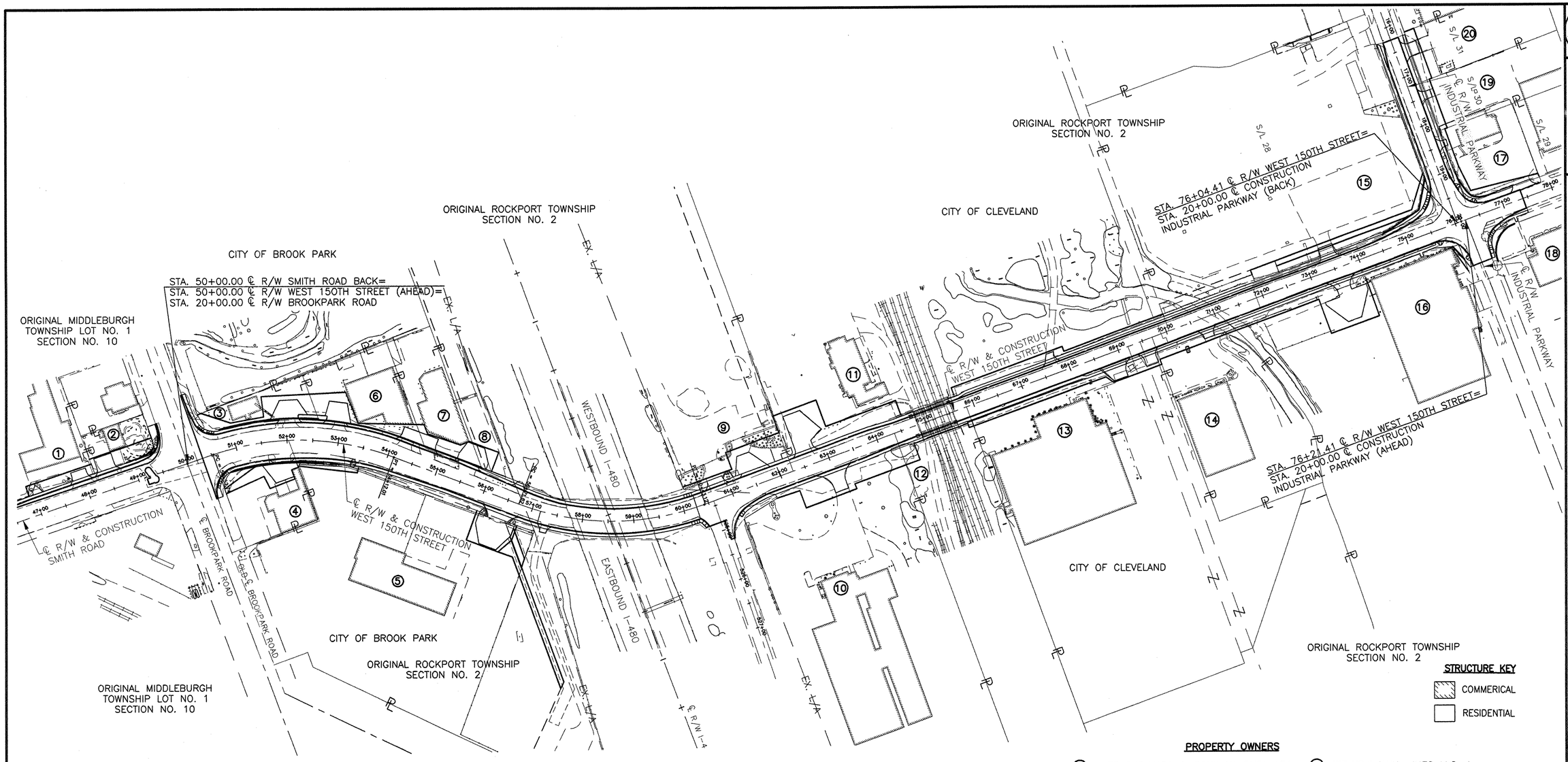




Location			Item 632	Item 625		
From	To	Side	Interconnect Cable, 7 Conductor No. 12 AWG	Conduit, 2" 725.05 Type EB Concrete Encased	Trench	Pull Box, 13" x 24" x 18"
			Ft.	Ft.	Ft.	Each
60+28, 36.0' Lt.	62+20, 28.0' Lt.	Lt.	200	195	195	
62+20, 28.0' Lt.	64+10, 28.0' Lt.	Lt.	195	190	190	1
64+10, 28.0' Lt.	66+00, 28.0' Lt.	Lt.	195	190	190	1
66+00, 28.0' Lt.	67+50, 28.0' Lt.	Lt.	155	150	150	1
67+50, 28.0' Lt.	69+00, 28.0' Lt.	Lt.	155	150	150	1
69+00, 28.0' Lt.	71+00, 28.0' Lt.	Lt.	205	200	200	1
71+00, 28.0' Lt.	73+00, 28.0' Lt.	Lt.	205	200	200	1
73+00, 28.0' Lt.	74+50, 28.0' Lt.	Lt.	155	150	150	1
74+50, 28.0' Lt.	75+69, 85.0' Lt.	Lt.	146	141	141	1
Total			1606	1566	1566	8



PROPERTY MAP

STRUCTURE KEY

- COMMERICAL
- RESIDENTIAL

PROPERTY OWNERS

1. ANTE SUSNJARA & GORDANA SUSNJARA
2. 15201 BROOKPARK ROAD, LTD. AN OHIO LIMITED LIABILITY COMPANY
3. PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY
4. HUGO LAND COMPANY
5. CMMV PROPERTIES, LLC
6. PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY
7. PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY
8. PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY
9. KARAS BROS. CO., INC.
10. 3856 LTD., AN OHIO LIMITED LIABILITY COMPANY
11. PENNSYLVANIA LINES LLC, A DELAWARE LIMITED LIABILITY COMPANY
12. PENNSYLVANIA LINES LLC, A DELAWARE LIMITED LIABILITY COMPANY
13. ADALET & SCOTT FETZER COMPANY A DELAWARE CORPORATION
14. SCOTT FETZER COMPANY A DELAWARE CORPORATION
15. WINNETKA ENTERPRISES, INC.
16. WORLD WEST LIMITED PARTNERSHIP, OHIO LIMITED PARTNERSHIP
17. KHALED M. TABBA FAMILY TRUST
18. WORLD WEST LIMITED PARTNERSHIP, OHIO LIMITED PARTNERSHIP
19. A&K GRAPHICS, AN OHIO PARTNERSHIP
20. EVA E. GRADY TRUSTEE OF THE EVA E. GRADY TRUST

UTILITY OWNERS

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

TIME WARNER
ENGINEERING AND CONSTRUCTION
8179 DOW CIRCLE
STRONGSVILLE, OHIO 44136
ATTN : SCOTT DOMPIER
(216) 575-8016

BP PIPELINE
4421 BRADLEY ROAD
CLEVELAND, OHIO 44109
ATTN: NORBERT BRUENING
(216) 912-2573

CAVALIER TELEPHONE
6777 ENGLE ROAD SUITE G
MIDDLEBURG HEIGHTS, OHIO 44130
ATTN : WILLIAM PARK
(440) 260-0102

AT&T OHIO
ENGINEERING DEPARTMENT
13630 LORAIN AVENUE ROOM 350
CLEVELAND, OHIO 44111
ATTN : ERIC WESTERBURG
(216) 476-6148

CITY OF CLEVELAND WATER DEPARTMENT
1201 LAKESIDE AVENUE
CLEVELAND, OHIO 44114
ATTN : GUY SINGER
(216) 664-2444

VERIZON
120 RAVINE STREET
AKRON, OHIO 44303
ATTN : AL GUEST
(330) 253-8267

DOMINION EAST OHIO GAS
1201 EAST 55TH STREET
CLEVELAND, OHIO 44103
ATTN : MIKE ANTONIUS
(216) 736-6675

QUEST COMMUNICATION
930 15TH STREET ROOM 150
DENVER, CO. 80202
ATTN : KIM JORDAN
(800) 283-4237

THE ILLUMINATING COMPANY
6896 MILLER ROAD
BRECKSVILLE, OHIO 44141
ATTN : FRANK DIBBS
(440) 546-8748

NEORSD
3826 EUCLID AVENUE
CLEVELAND, OHIO 44115-2504
ATTN : RICHARD SWITALSKI
(972) 656-6016

NORFOLK SOUTHERN CORP.
1200 PEACHTREE NE
ATLANTA, GEORGIA 30309
ATTN : DAVE WYATT
(404) 529-1641

OHIO DEPARTMENT OF TRANSPORTATION
DISTRICT 12
5500 TRANSPORTATION BOULEVARD
GARFIELD HEIGHTS, OHIO 44125-5303
(216) 581-2100

REV. BY	DATE	DESCRIPTION
DATE COMPLETED		

CUY-WEST 150TH STREET

1 / 19

124
146

F:\JOBS\665\RM\665RM01.DWG PLOT 1"=100' RJK 3/22/07

NET RESIDUE = RECORD AREA – TOTAL PRO – NET TAKE

GRANTEE WILL BE THE CITY OF BROOKPARK AND THE CITY OF CLEVELAND UNLESS OTHERWISE NOTED

PARCEL NO.	OWNER	SHEET NO.	OWNERS RECORD BOOK	OWNERS RECORD PAGE	AUDITOR'S PARCEL	RECORD AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUC-TURE	NET RESIDUE LEFT	NET RESIDUE RIGHT	TYPE FUND	REMARKS AND PERSONALTY	AS ACQUIRED BOOK	AS ACQUIRED PAGE
1–T	ANTE SUSNJARA & GORDANA SUSNJARA	4–5	200308200991		343–11–014	1.72		0.062		0.062					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
2–WD	15201 BROOKPARK ROAD, LTD. AN OHIO LIMITED LIABILITY COMPANY	4–5	98–04540	59	343–11–010	0.231	0.002	0.003	0.0019	0.0011		0.230			GRANTEE: CITY OF BROOK PARK		
2–T		4–5						0.084		0.084					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
3–WD	PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY	6–7	200103020810		344–35–019	0.297		0.013		0.013		0.284			GRANTEE: CITY OF BROOK PARK		
3–T		6–7						0.140		0.140					GRADING OPERATIONS, CONSTRUCT DRIVEWAY & INSTALL SANITARY TEST TEE AND RISER		
4–WD	HUGO LAND CO.	6–7	200006060017		344–35–020	0.754	0.279	0.288	0.279	0.009			0.745		GRANTEE: CITY OF BROOK PARK		
4–U		6–7						0.020		0.020					GRANTEE: THE ILLUMINATING COMPANY		
4–T		6–7						0.108		0.108					GRADING OPERATIONS, CONSTRUCT DRIVEWAY & INSTALL SANITARY TEST TEE AND RISER		
5–WD	CMMV PROPERTIES, LLC	6–7	200012280318		344–35–021	6.478		0.004		0.004			6.474		GRANTEE: CITY OF BROOK PARK		
5–T1		6–7						0.030		0.030					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
5–T2		8–9						0.109		0.109					GRADING OPERATIONS, CONSTRUCT DRIVEWAY & INSTALL SANITARY TEST TEE AND RISER		
5–T3		8–9						0.075		0.075					CONSTRUCT 60" SANITARY SEWER		
6–WD	PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY	6–7	200103020809		344–35–018	0.594		0.005		0.005			0.589		GRANTEE: CITY OF BROOK PARK		
6–T		6–7						0.149		0.149					GRADING OPERATIONS, CONSTRUCT DRIVEWAY & INSTALL SANITARY TEST TEE AND RISER		
7–WD	PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY	6–9	200103020808		344–35–017	0.525		0.003		0.003		0.522			GRANTEE: CITY OF BROOK PARK		
7–T		6–9						0.080		0.080					GRADING OPERATIONS, CONSTRUCT DRIVEWAY & INSTALL SANITARY TEST TEE AND RISER		
8–T	PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY	8–9	200103020807		028–19–010	0.50		0.035		0.035					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
9–T	KARAS BROS. CO. INC.	10–11	91–6523	51	028–19–001	5.76		0.137		0.137					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		

NOTES:

UNDER NO CIRCUMSTANCES ARE TEMPORARY EASEMENTS TO BE USED FOR STORAGE OF MATERIAL OR EQUIPMENT BY THE CONTRACTOR UNLESS NOTED OTHERWISE.

ALL TEMPORARY PARCELS TO BE OF 24 MONTHS DURATION.

ALL AREAS IN ACRES.

REV. BY	DATE	DESCRIPTION
FIELD REVIEW BY		xxx
OWNERSHIP VERIFIED BY		xxx
PLAN COMPLETED		xxx

SUMMARY OF ADDITIONAL RIGHT OF WAY

CUY-WEST 150th STREET

2 / 19

125 / 146

F:\JOBS\665\RB\SUMMARY1.DWG PLOT SCALE: 1"=1' PJK 3/27/07

NET RESIDUE = RECORD AREA – TOTAL PRO – NET TAKE

GRANTEE WILL BE THE CITY OF BROOKPARK AND THE CITY OF CLEVELAND UNLESS OTHERWISE NOTED

PARCEL NO.	OWNER	SHEET NO.	OWNERS RECORD BOOK	OWNERS RECORD PAGE	AUDITOR'S PARCEL	RECORD AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUC-TURE	NET RESIDUE LEFT	NET RESIDUE RIGHT	TYPE FUND	REMARKS AND PERSONALTY	AS ACQUIRED BOOK	AS ACQUIRED PAGE
10–T	3856 LTD., AN OHIO LIABILITY COMPANY	10–11	200003291111		023–24–009	7.32		0.203		0.203					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
11	PENNSYLVANIA LINES LLC, A DELAWARE		200208200162		028–13–004	49.13	0.52										
	LIMITED LIABILITY COMPANY																
11–T1		10–11						0.275		0.275					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
11–T2		12–15						0.103		0.103					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
12–T	PENNSYLVANIA LINES LLC, A DELAWARE	10–13	200208200162		023–24–004	4.61		0.029		0.029					GRADING OPERATIONS		
	LIMITED LIABILITY COMPANY																
13	ADALET & SCOTT FETZER CO., A DELAWARE		87–0395	07	023–24–001	0.82	0.02										
	CORPORATION				023–24–002	0.36	0.02										
					023–24–020	5.03	0.23										
	GRAND TOTAL					6.21	0.27						6.20				
13–T		12–13						0.124		0.124					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
14–T	SCOTT FETZER CO., A DELAWARE CORPORATION	12–15	87–70394	65	023–24–013	1.751	0.098	0.053		0.053					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
15–WD	WINNETKA ENTERPRISES, INC.	14–19	200208260253		028–22–012	5.40		0.048		0.048		5.352			GRANTEE: CITY OF CLEVELAND		
15–U		14–17						0.085		0.085					GRANTEE: THE ILLUMINATING COMPANY		
15–T		14–19						0.196		0.196					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
16–WD	WORLD WEST LIMITED PARTNERSHIP, OHIO	16–17	98–00373	57	023–24–012	7.39		0.004		0.004			7.386		GRANTEE: CITY OF CLEVELAND		
	LIMITED PARTNERSHIP																
16–T1		14–15						0.192		0.192					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
16–T2		16–17						0.006		0.006					GRADING OPERATIONS		
17–WD	KHALED M. TABBA FAMILY TRUST	16–17	200006120202		028–22–002	0.52		0.006		0.006		0.514			GRANTEE: CITY OF CLEVELAND		
17–T		16–19						0.068		0.068					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
18–WD	WORLD WEST LIMITED PARTNERSHIP, OHIO	16–17	94–43115	23	023–24–011	5.38		0.015		0.015			5.365		GRANTEE: CITY OF CLEVELAND		
	LIMITED PARTNERSHIP																
19–T	A&K GRAPHICS, AN OHIO PARTNERSHIP	18–19	93–35288	28	028–22–004	0.64		0.034		0.034					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
20–T	EVA E. GRADY TRUSTEE OF THE	18–19	200610300959		028–22–005	0.64		0.046		0.046					GRADING OPERATIONS & CONSTRUCT DRIVEWAY		
	EVA E. GRADY TRUST																

NOTES:

UNDER NO CIRCUMSTANCES ARE TEMPORARY EASEMENTS TO BE USED FOR STORAGE OF MATERIAL OR EQUIPMENT BY THE CONTRACTOR UNLESS NOTED OTHERWISE.

ALL TEMPORARY PARCELS TO BE OF 24 MONTHS DURATION.

ALL AREAS IN ACRES.

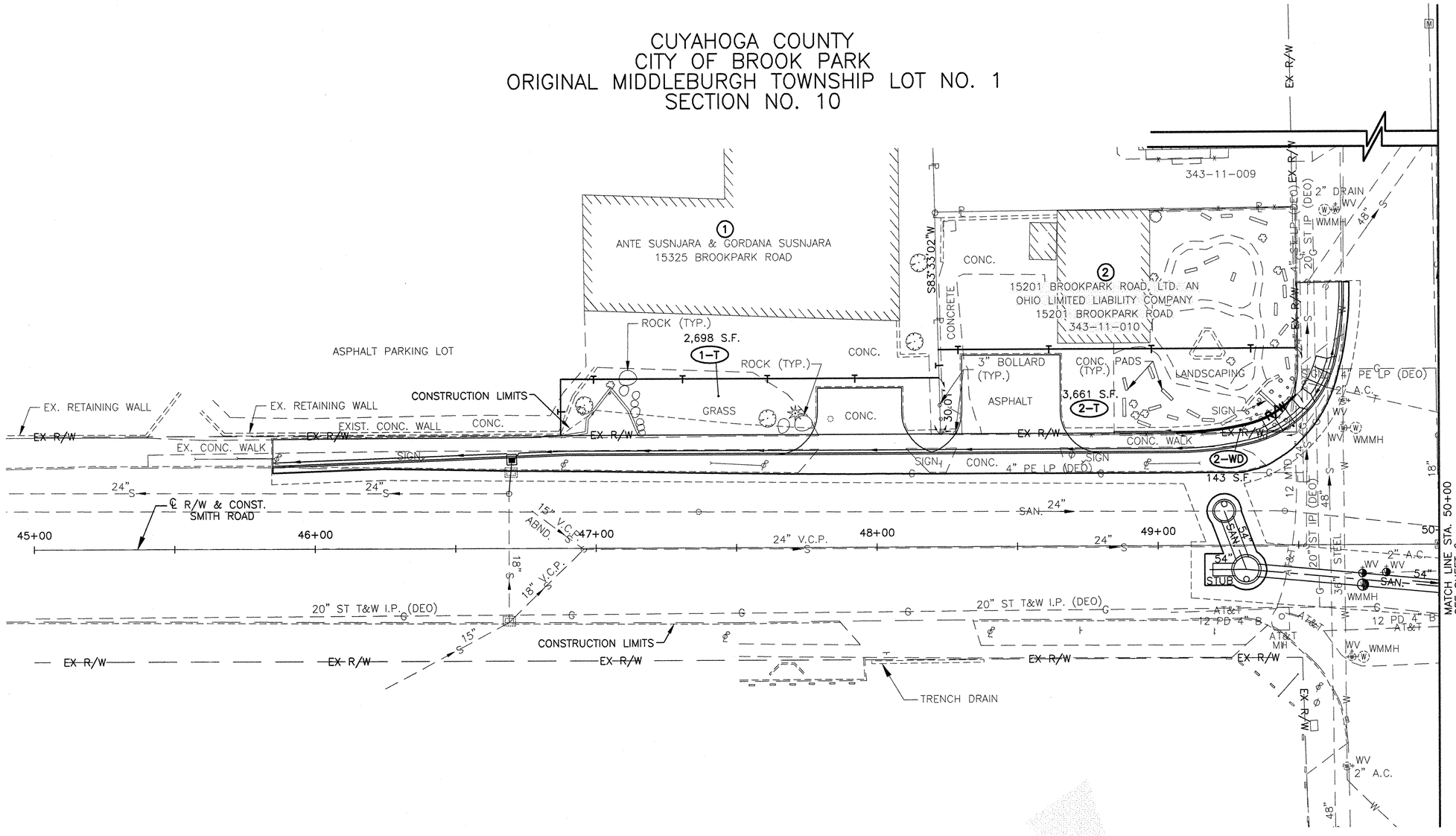
REV. BY	DATE	DESCRIPTION
FIELD REVIEW BY		xxx
OWNERSHIP VERIFIED BY		xxx
PLAN COMPLETED		xxx

SUMMARY OF ADDITIONAL RIGHT OF WAY

CUY-WEST 150th STREET

F:\JOBS\665\RB\SUMMARY2.DWG PLOT SCALE: 1"=1' PJK 3/27/07

CUYAHOGA COUNTY
CITY OF BROOK PARK
ORIGINAL MIDDLEBURGH TOWNSHIP LOT NO. 1
SECTION NO. 10



NOTE: FOR MONUMENTATION, EXISTING EASEMENT DESIGNATIONS, STATIONS, OFFSETS, BEARINGS AND DISTANCES FOR THIS SHEET, SEE SHEET 5.

STRUCTURE KEY

- COMMERCIAL
- RESIDENTIAL

LEGEND

- P.K.S.∘ P.K. NAIL SET
- I.P.F. o IRON PIN FOUND
- I.P.S. O 3/4" IRON PIN TO BE SET WITH 1 1/2" ALUMINUM CAP
- P.F. ◎ IRON PIPE FOUND
- Ⓜ EXISTING MONUMENT BOX

N

0 20 40 SCALE IN FEET

RIGHT OF WAY PLAN - WEST 150th STREET
STA. 45+00 TO STA. 50+00

CUY - WEST 150th STREET

REV.	DATE	DESCRIPTION
PLAN COMPLETION DATE:		

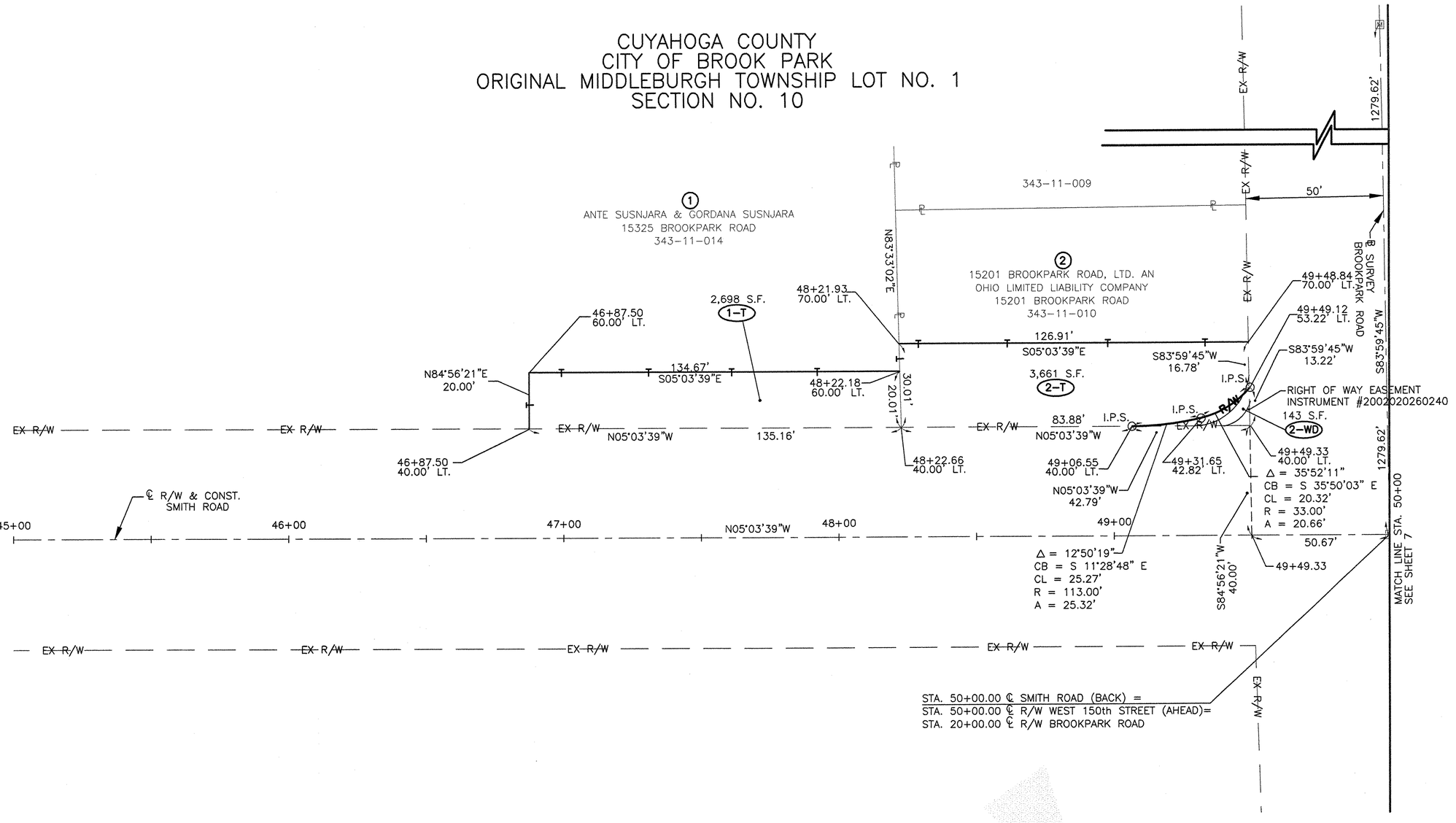
4 / 19

127 / 146

DTB 3/27/07 PLOT 1"=20'

F:\JOBS\665\RB\RB100.DWG

CUYAHOGA COUNTY
CITY OF BROOK PARK
ORIGINAL MIDDLEBURGH TOWNSHIP LOT NO. 1
SECTION NO. 10



FOR LEGEND, SEE SHEET 4.

N

0 20 40
SCALE IN FEET

RIGHT OF WAY PLAN - WEST 150th STREET
STA. 45+00 TO STA. 50+00

CUY - WEST 150th STREET

5 / 19

128
146

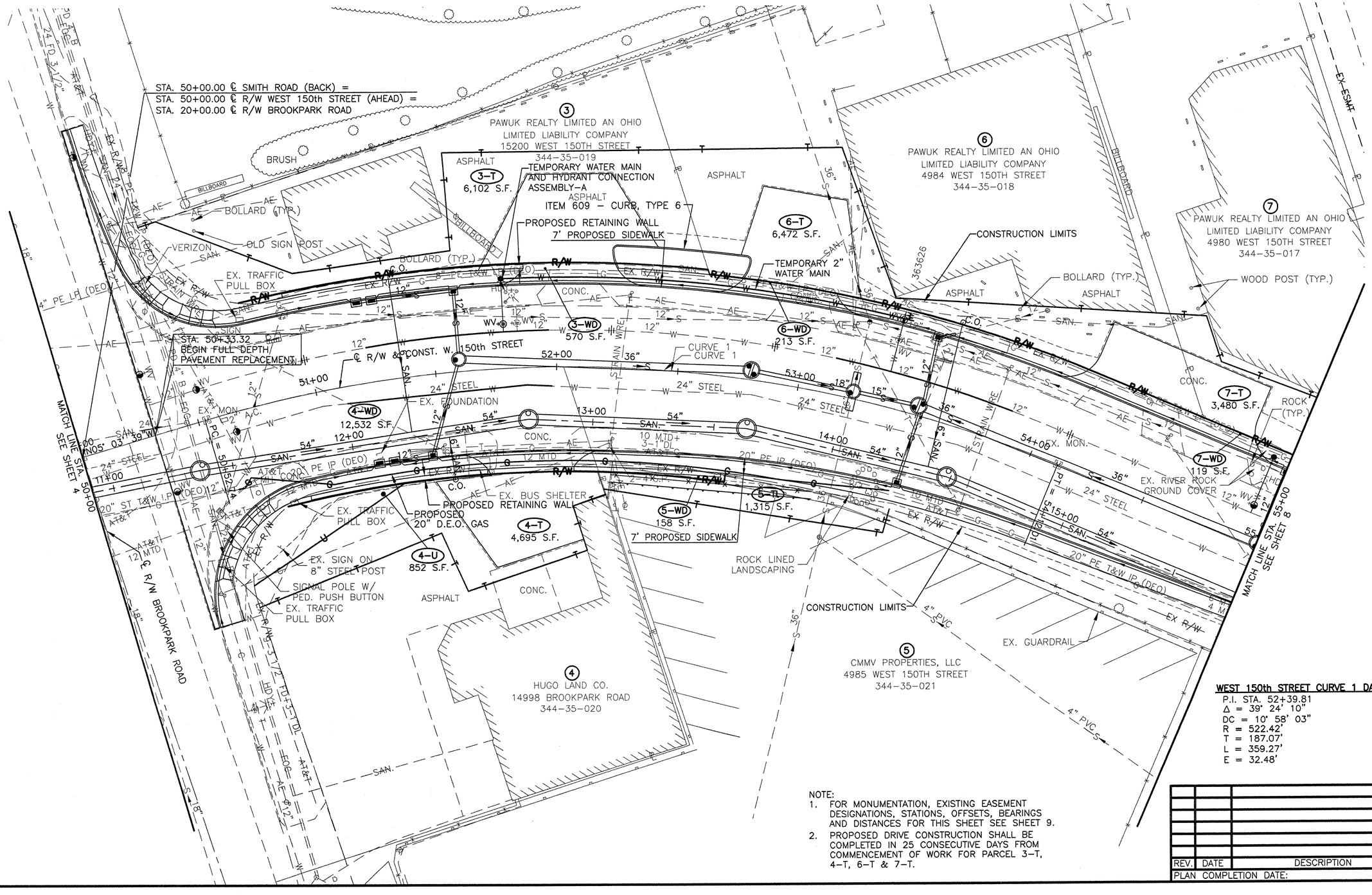
REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

P.M. 3/22/07 PLOT 1"=20'

F:\JOBS\665\RW\WB1004.DWG

CUYAHOGA COUNTY
CITY OF BROOK PARK
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



WEST 150th STREET CURVE 1 DATA
P.I. STA. 52+39.81
Δ = 39° 24' 10"
DC = 10° 58' 03"
R = 522.42'
T = 187.07'
L = 359.27'
E = 32.48'

NOTE:
1. FOR MONUMENTATION, EXISTING EASEMENT DESIGNATIONS, STATIONS, OFFSETS, BEARINGS AND DISTANCES FOR THIS SHEET SEE SHEET 9.
2. PROPOSED DRIVE CONSTRUCTION SHALL BE COMPLETED IN 25 CONSECUTIVE DAYS FROM COMMENCEMENT OF WORK FOR PARCEL 3-T, 4-T, 6-T & 7-T.

REV.	DATE	DESCRIPTION
PLAN COMPLETION DATE:		

N

0 20 40
SCALE IN FEET

RIGHT OF WAY PLAN - WEST 150th STREET
STA. 50+00 TO STA. 55+00

CUY - WEST 150th STREET

6 / 19

129 / 146

F:\JOBS\665\RB\RB101.DWG PJK 3/26/07 PLOT 1"=20'

CUYAHOCA COUNTY
CITY OF BROOK PARK
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2

RIGHT OF WAY PLAN - WEST 150th STREET
STA. 50+00 TO STA. 55+00

CUY - WEST 150th STREET

SCALE IN FEET: 0, 20, 40

DETAIL "A"

DETAIL "B"

DETAIL "C"

DETAIL "D"

SEE DETAIL "A"

SEE DETAIL "B"

SEE DETAIL "C"

SEE DETAIL "D"

CURVE DATA – C1
LEAD–IN (3–WD, 6–WD)
Δ = 22°39'13"
CB = N 06°15'58" E
CL = 205.21'
R = 522.42'
A = 206.55'

CURVE DATA – C2
LEAD–IN (7–WD)
Δ = 39°24'10"
CB = N 14°38'26" E
CL = 352.23'
R = 522.42'
A = 359.27'

CURVE DATA – C3
LEAD–IN (4–U)
Δ = 09°35'04"
CB = S 08°18'52" W
CL = 80.10'
R = 479.42'
A = 80.20'

WEST 150th STREET CURVE 1 DATA
P.I. STA. 52+39.81
Δ = 39° 24' 10"
DC = 10° 58' 03"
R = 522.42'
T = 187.07'
L = 359.27'
E = 32.48'

3 PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY 15200 WEST 150TH STREET 344–35–019

4 HUGO LAND CO. 14998 BROOKPARK ROAD 344–35–020

5 CMMV PROPERTIES, LLC 4985 WEST 150TH STREET 344–35–021

6 PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY 4984 WEST 150TH STREET 344–35–018

7 PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY 4980 WEST 150TH STREET 344–35–017

MATCH LINE STA. 50+00 SEE SHEET 5

MATCH LINE STA. 55+00 SEE SHEET 9

STA. 150+00.00 ℄ SMITH ROAD (BACK) = STA. 150+00.00 ℄ R/W WEST 150th STREET (AHEAD)=
STA. 20+00.00 ℄ R/W BROOKPARK ROAD

℄ R/W & CONST. W. 150th STREET

℄ R/W BROOKPARK ROAD

℄ OLD BROOKPARK ROAD

EX ESMT

REV.	DATE	DESCRIPTION

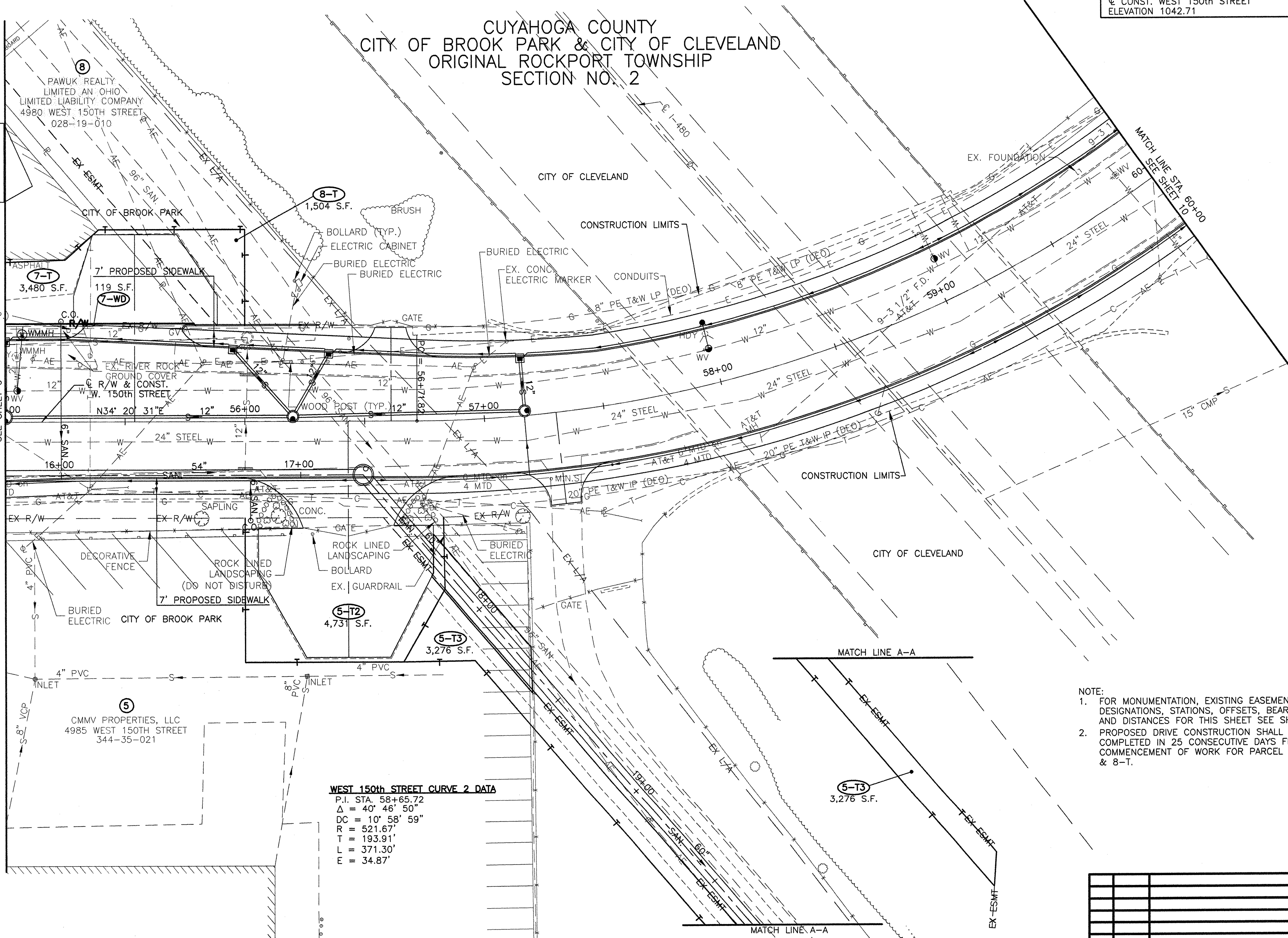
PLAN COMPLETION DATE:

7 / 19

130 / 146

PJK 3/26/07 PLOT 1"=20'

F:\JOBS\665\RB\RB101A.DWG


CUYAHOGA COUNTY
CITY OF BROOK PARK & CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2
PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY 4980 WEST 150TH STREET 028-19-010
PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY 4980 WEST 150TH STREET 344-35-017
CMMV PROPERTIES, LLC 4985 WEST 150TH STREET 344-35-021
CITY OF CLEVELAND
CITY OF BROOK PARK
CONSTRUCTION LIMITS
MATCH LINE STA. 55+00 SEE SHEET 6
MATCH LINE STA. 60+00 SEE SHEET 10
MATCH LINE A-A
8-T 1,504 S.F.
7-T 3,480 S.F.
7-WD
5-T2 4,731 S.F.
5-T3 3,276 S.F.
7' PROPOSED SIDEWALK
EX. FOUNDATION

BENCH MARK NO. 2, PK NAIL IN ASPHALT
@ STA. 70+01.39, 21.67' LT.
℄ CONST. WEST 150th STREET
ELEVATION 1042.71

SCALE IN FEET 0 20 40

WEST 150th STREET CURVE 2 DATA

P.I. STA. 58+65.72
Δ = 40° 46' 50"
DC = 10° 58' 59"
R = 521.67'
T = 193.91'
L = 371.30'
E = 34.87'

NOTE:
1. FOR MONUMENTATION, EXISTING EASEMENT DESIGNATIONS, STATIONS, OFFSETS, BEARINGS AND DISTANCES FOR THIS SHEET SEE SHEET 9.
2. PROPOSED DRIVE CONSTRUCTION SHALL BE COMPLETED IN 25 CONSECUTIVE DAYS FROM COMMENCEMENT OF WORK FOR PARCEL 5-T2 & 8-T.

REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

RIGHT OF WAY PLAN - WEST 150th STREET
STA. 55+00 TO STA. 60+00

CUY - WEST 150th STREET

8/19

131/146

dtb 3/22/07 PLOT 1"=20'
F:\JOBS\665\RB\RB102.DWG

BENCH MARK NO. 2, PK NAIL IN ASPHALT
@ STA. 70+01.39, 21.67' LT.
℄ CONST. WEST 150th STREET
ELEVATION 1042.71

CUYAHOGA COUNTY
CITY OF BROOK PARK & CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2

⑦ PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY 4980 WEST 150TH STREET 344-35-017

⑧ PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY 4980 WEST 150TH STREET 028-19-010

⑤ CMMV PROPERTIES, LLC 4985 WEST 150TH STREET 344-35-021

MATCH LINE STA. 55+00 SEE SHEET 7

MATCH LINE STA. 60+00 SEE SHEET 11

℄ I-480

℄ R/W & CONST. W. 150th STREET

N34° 20' 31"E

135.19' S05°03'39"E

EX L/A

EX R/W

EX ESMT

R/W

I.P.S.

55+39.00 80.00' LT.

55+45.18 80.00' LT.

56+00.00 80.00' LT.

55+25.00 67.50' LT.

S34°20'31"W 6.18'

S34°20'31"W 54.82'

S32°12'18"W 67.05'

S07°25'06"E 18.77'

S83°36'21"W 52.79'

51.47'

7-T 3,480 S.F.

8-T 1,504 S.F.

N55°39'29"W 40.00'

56+00.00 40.00' LT.

N34°20'31"E 118.77'

N34°20'31"E 118.77'

N34°20'31"E 20.37'

7-WD 119 S.F. SEE DETAIL "A"

55+78.77 41.00' LT.

Δ = 1°07'06"
CB = S 33°46'58" W
CL = 10.96'
R = 561.67'
A = 10.96'
○M.N.S.

56+71.82 40.00' RT.

56+82.00 40.00' RT.

56+00.00 40.00' RT.

S34°20'31"W 71.82'

56+57.65 40.00' RT.

N56°46'35"W 29.86'

56+82.00 69.86' RT.

5-T2 4,731 S.F.

S55°39'29"E 60.00'

N25°48'09"W 34.88'

N34°20'31"E 66.00'

N33°26'54"E 29.89'

56+00.00 100.00' RT.

56+66.00 100.00' RT.

56+92.02 100.00' RT.

5-T3 3,276 S.F.

N83°30'08"E 272.52'

S83°30'08"W 292.98'

MATCH LINE A-A

S 83°30'08" W 272.99'

N 83°30'08" E 292.98'

57+99.54 316.40' RT.

57+96.90 330.07' RT.

N52°13'35"W 14.33'

WEST 150th STREET CURVE 2 DATA
P.I. STA. 58+65.72
Δ = 40° 46' 50"
DC = 10° 58' 59"
R = 521.67'
T = 193.91'
L = 371.30'
E = 34.87'

DETAIL "A"

55+78.77 41.00' LT.

1.32'

55+79.63 40.00' LT.

7-WD 119 S.F.

FOR LEGEND, SEE SHEET 4.

SCALE IN FEET 0 20 40

RIGHT OF WAY PLAN - WEST 150th STREET STA. 55+00 TO STA. 60+00

CUY - WEST 150th STREET

REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

9 / 19

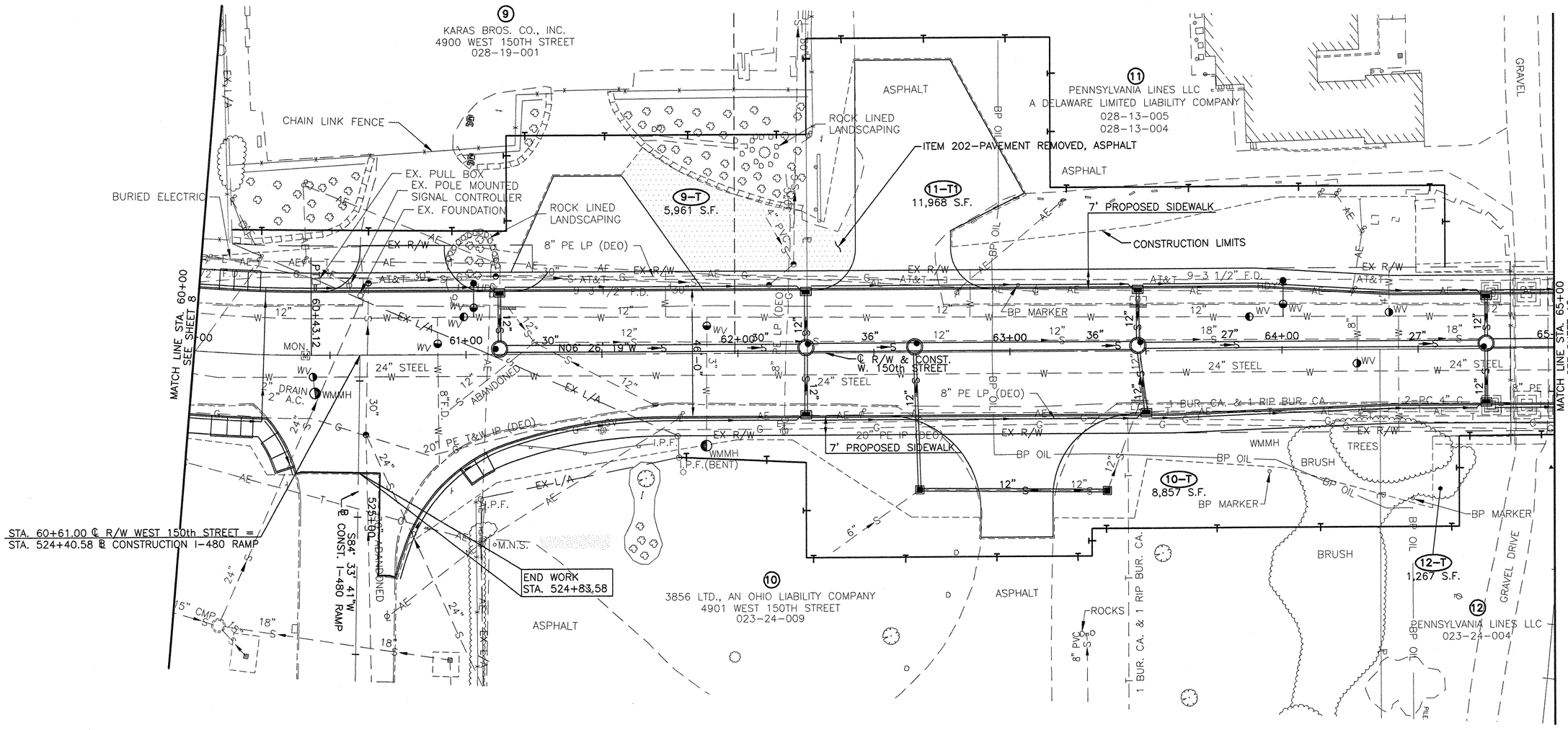
132 / 146

RJK 3/26/07 PLOT 1"=20'

F:\JOBS\665\RB\RB1102A.DWG

BENCH MARK NO. 2, PK NAIL IN ASPHALT
@ STA. 70+01.39, 21.67' LT.
℄ CONST. WEST 150th STREET
ELEVATION 1042.71

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



NOTE:
1. FOR MONUMENTATION, EXISTING EASEMENT DESIGNATIONS, STATIONS, OFFSETS, BEARINGS AND DISTANCES FOR THIS SHEET SEE SHEET 11.
2. PROPOSED DRIVE CONSTRUCTION SHALL BE COMPLETED IN 25 CONSECUTIVE DAYS FROM COMMENCEMENT OF WORK FOR PARCEL 9-T.

REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

SCALE IN FEET 0 20 40

RIGHT OF WAY PLAN - WEST 150th STREET
STA. 60+00 TO STA. 65+00

CUY - WEST 150th STREET

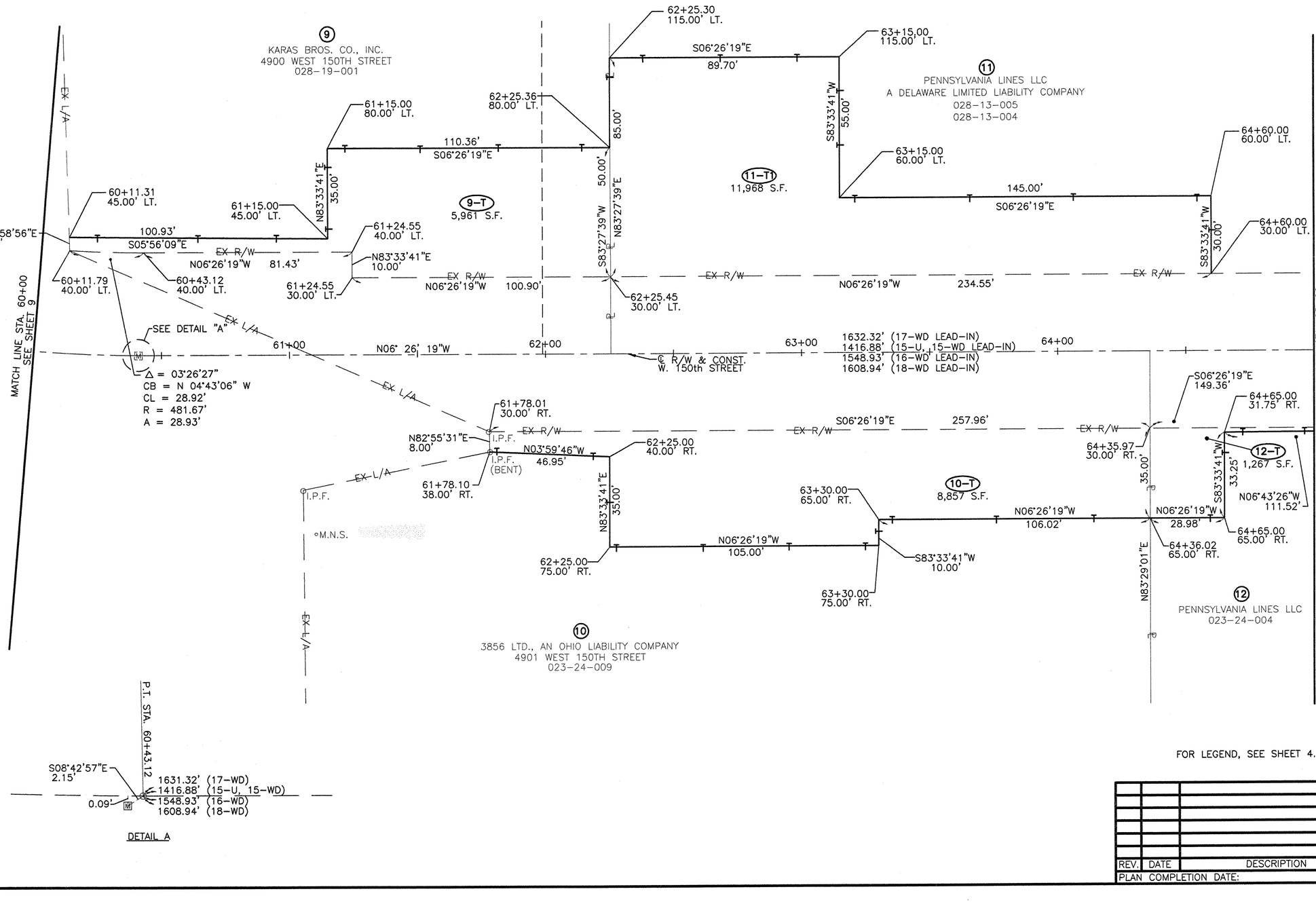
10 / 19

133 / 146

P.K. 3/26/07 PLOT 1"=20'

F:\JOBS\665\PB\RB103.DWG

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



FOR LEGEND, SEE SHEET 4.

N

0 20 40 SCALE IN FEET

RIGHT OF WAY PLAN - WEST 150th STREET STA. 60+00 TO STA. 65+00

CUY - WEST 150th STREET

REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

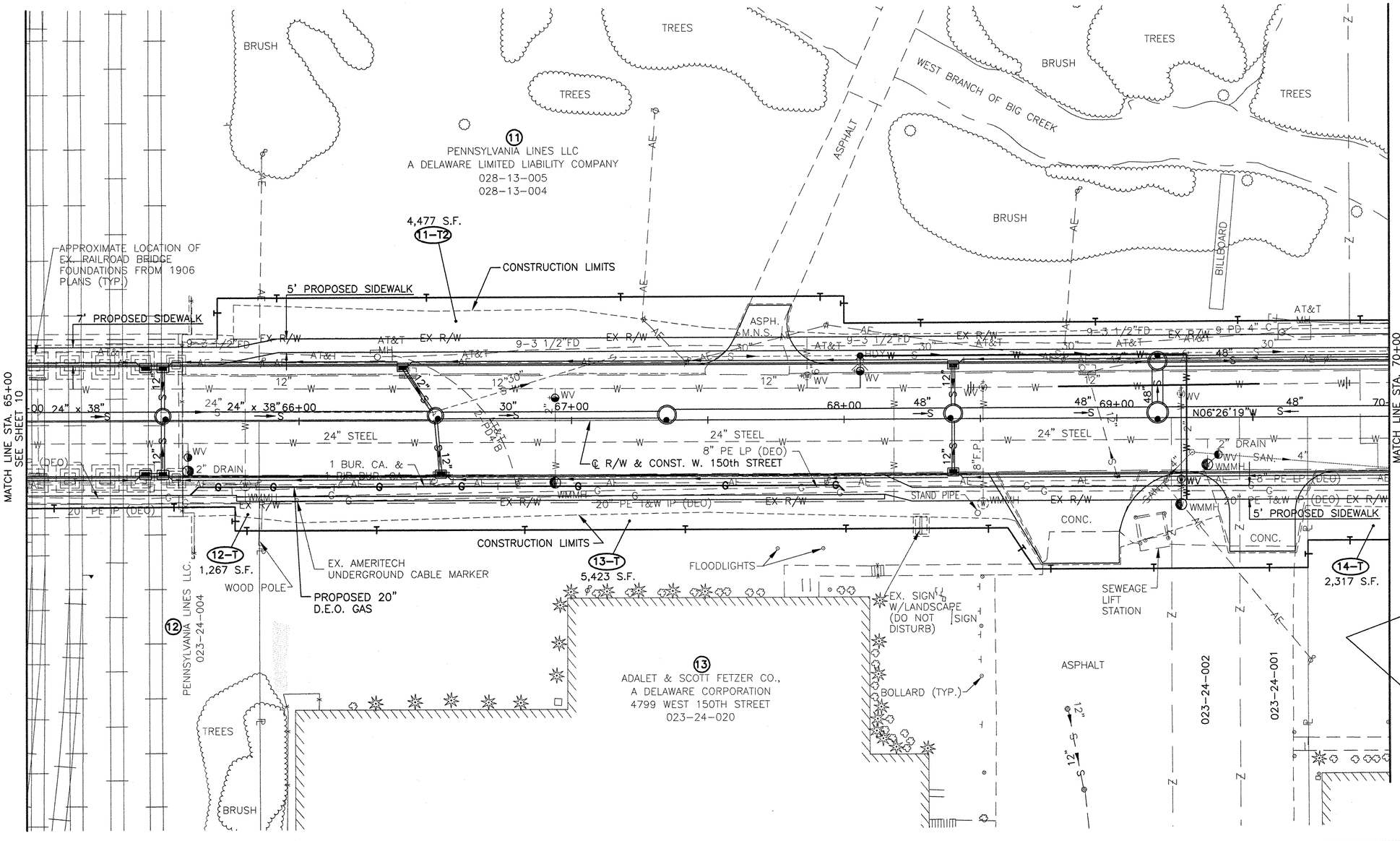
11 / 19

134 / 146

PJK 3/22/07 PLOT 1"=20'

F:\JOBS\665\RBV\RB1034.DWG

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



NOTE: FOR MONUMENTATION, EXISTING EASEMENT DESIGNATIONS, STATIONS, OFFSETS, BEARINGS AND DISTANCES FOR THIS SHEET, SEE SHEET 13.

SCALE IN FEET 0 20 40

RIGHT OF WAY PLAN - WEST 150th STREET STA. 65+00 TO STA. 70+00

CUY - WEST 150th STREET

REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

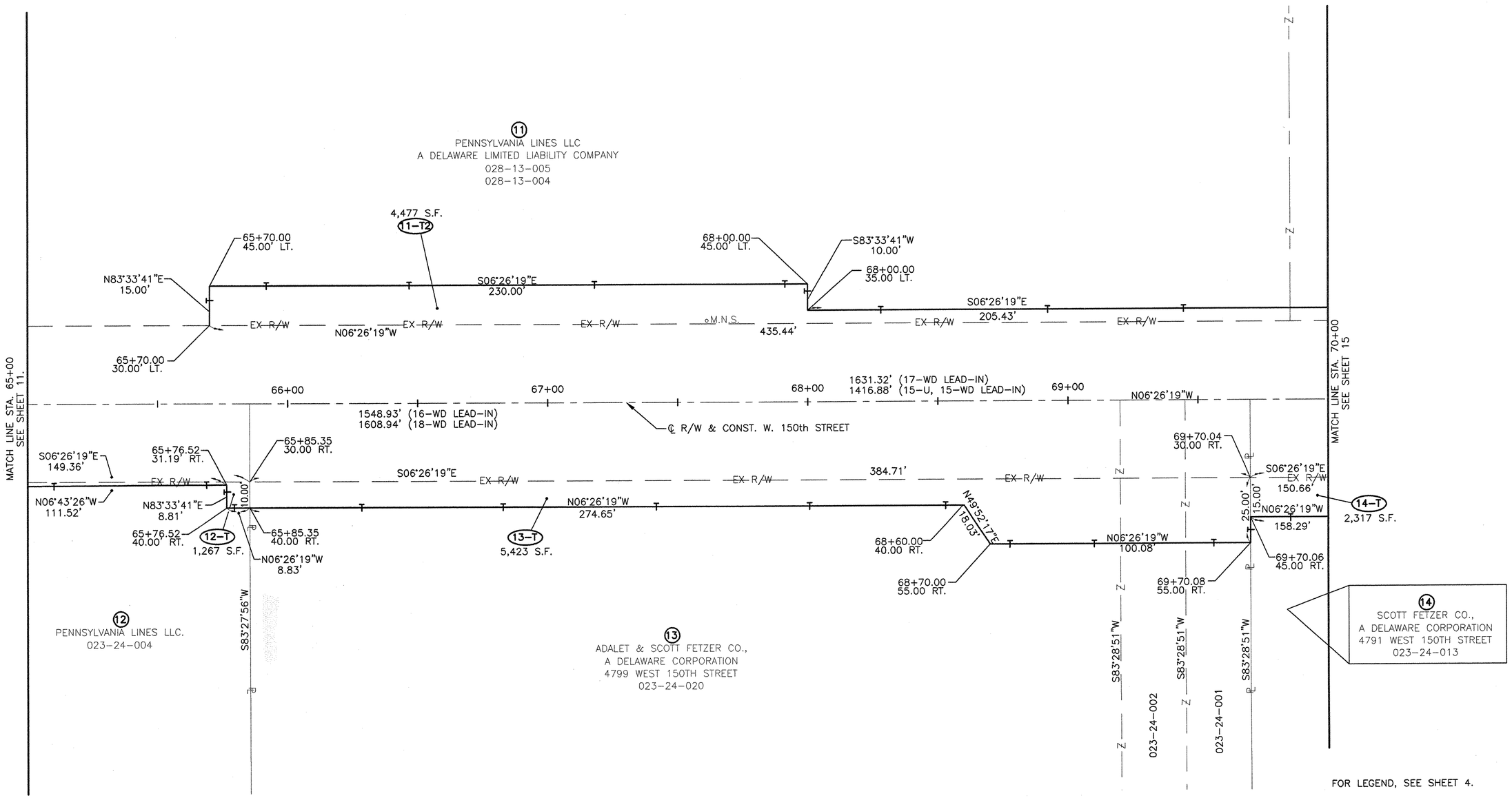
12 / 19

135
146

PJK 3/26/07 PLOT 1"=20'

F:\JOBS\665\RB\RB104.DWG

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



FOR LEGEND, SEE SHEET 4.

N

0 20 40
SCALE IN FEET

RIGHT OF WAY PLAN - WEST 150th STREET STA. 65+00 TO STA. 70+00

CUY - WEST 150th STREET

13 / 19

136 / 146

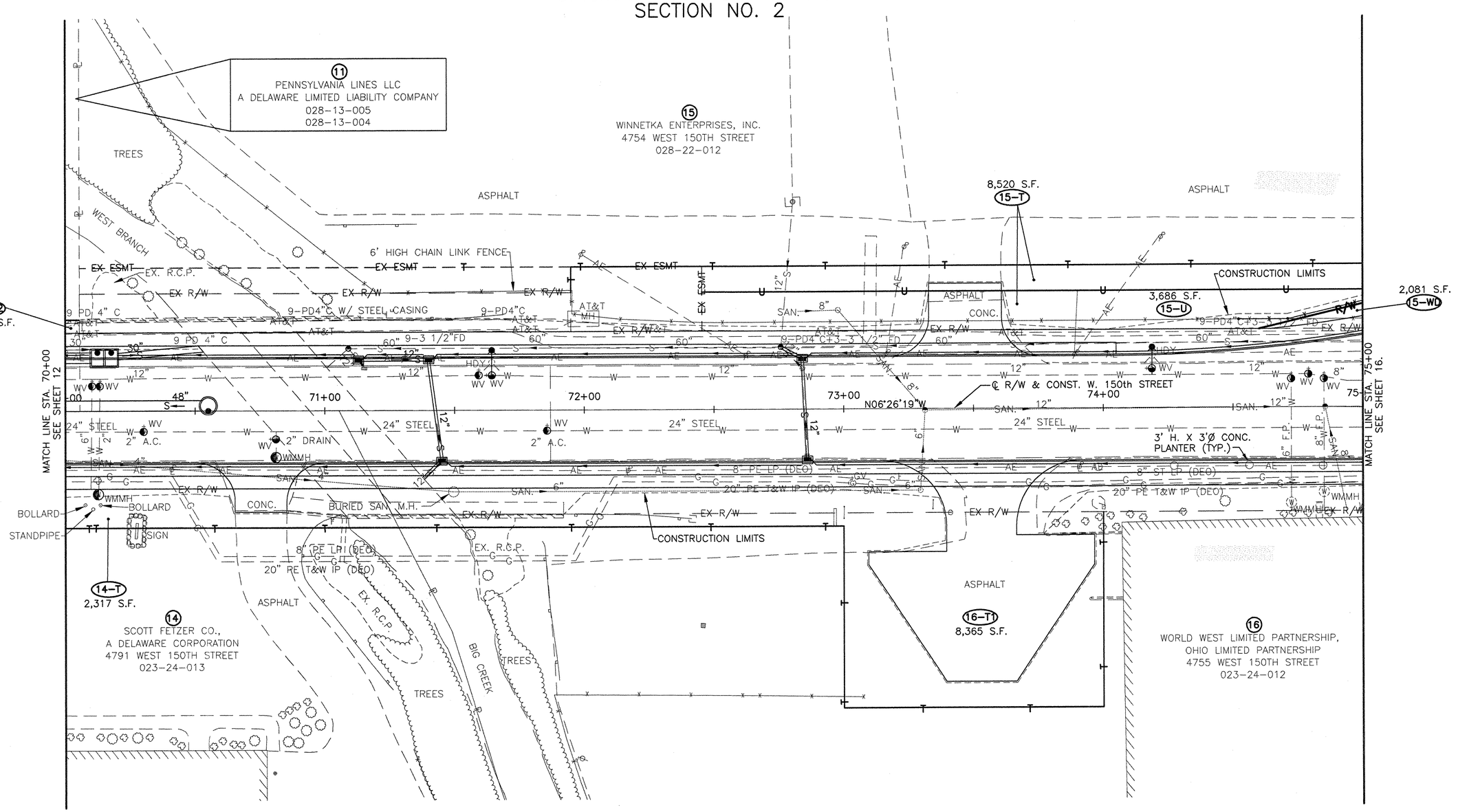
REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

PJK 3/22/07 PLOT 1"=20'

F:\JOBS\665\RB\RB1014A.DWG

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



NOTE: FOR MONUMENTATION, EXISTING EASEMENT DESIGNATIONS, STATIONS, OFFSETS, BEARINGS AND DISTANCES FOR THIS SHEET, SEE SHEET 15.

N

0 20 40 SCALE IN FEET

RIGHT OF WAY PLAN - WEST 150th STREET
STA 70+00 TO STA 75+00

CUY - WEST 150th STREET

14 / 19

137
146

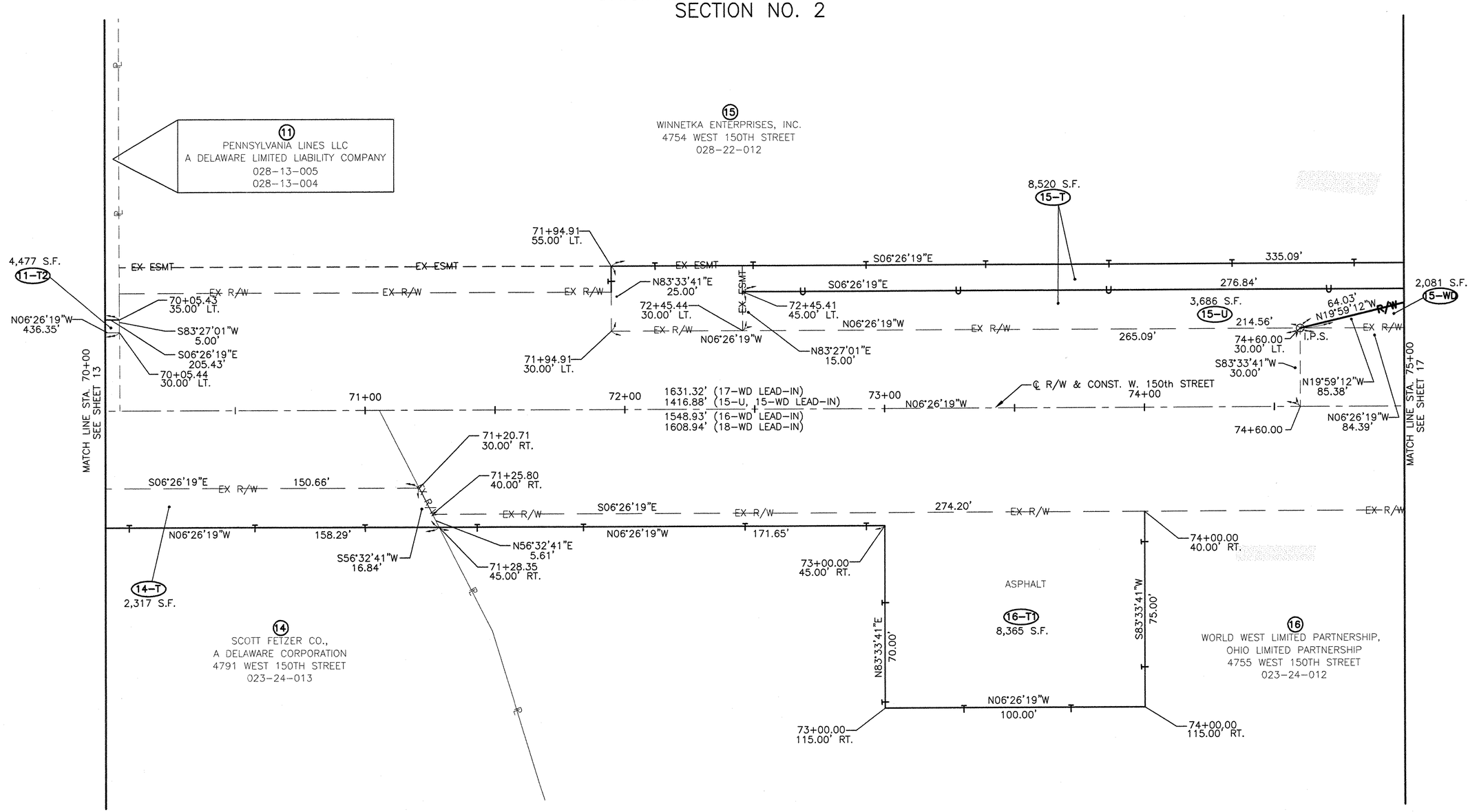
REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

PJK 2/27/07 PLOT 1"=20'

F:\JOBS\665\RB\RB105.DWG

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



FOR LEGEND, SEE SHEET 4.

N

0 20 40
SCALE IN FEET

RIGHT OF WAY PLAN - WEST 150th STREET
STA. 70+00 TO STA. 75+00

CUY - WEST 150th STREET

REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

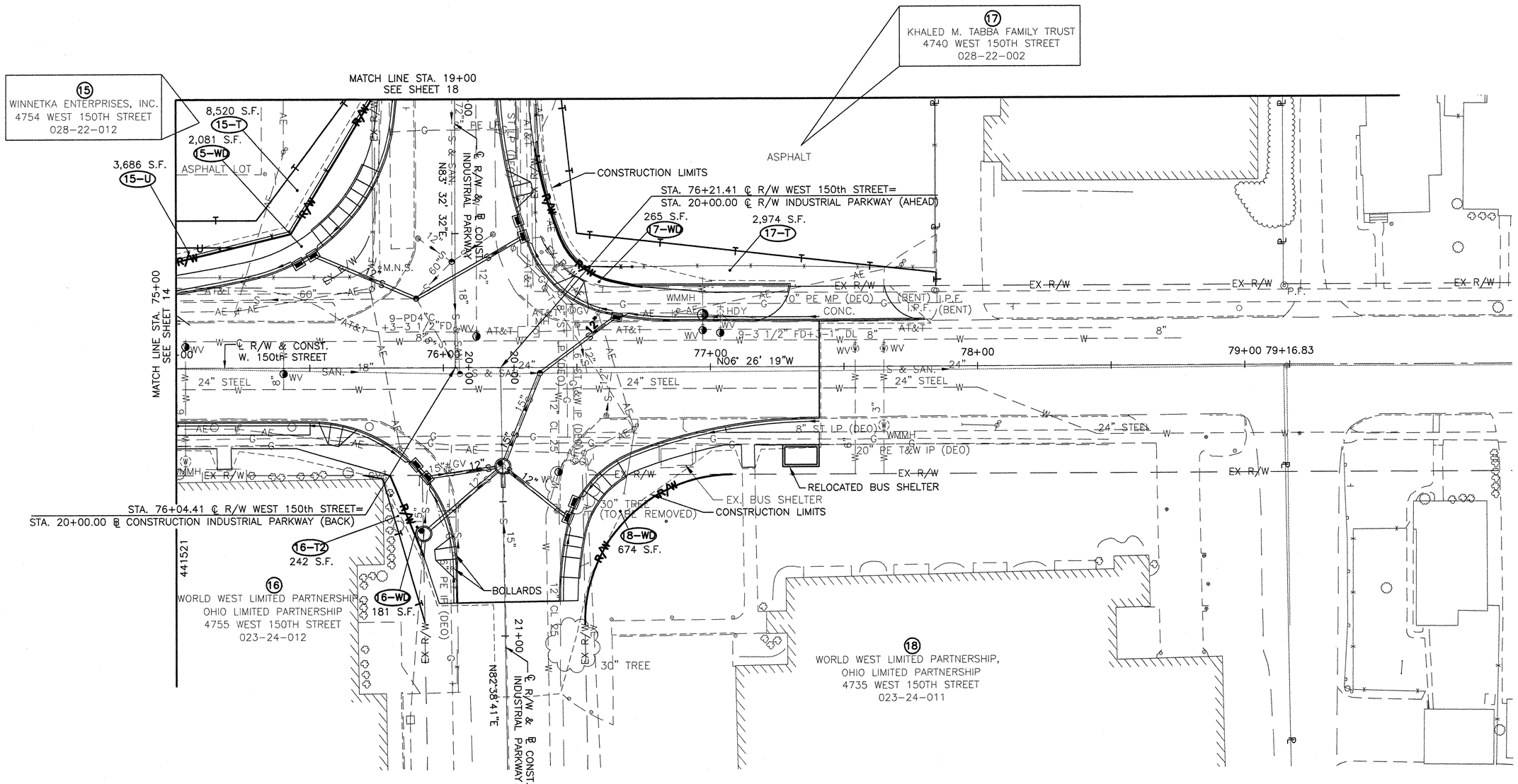
15 / 19

138
146

P.W. 3/22/07 PLOT 1"=20'

F:\JOBS\665\RB\RB105A.DWG

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



NOTE: FOR MONUMENTATION, EXISTING EASEMENT DESIGNATIONS, STATIONS, OFFSETS, BEARINGS AND DISTANCES FOR THIS SHEET, SEE SHEET 17.

REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

SCALE IN FEET 0 20 40

RIGHT OF WAY PLAN - WEST 150th STREET STA. 75+00 TO STA. 80+00

CUY - WEST 150th STREET

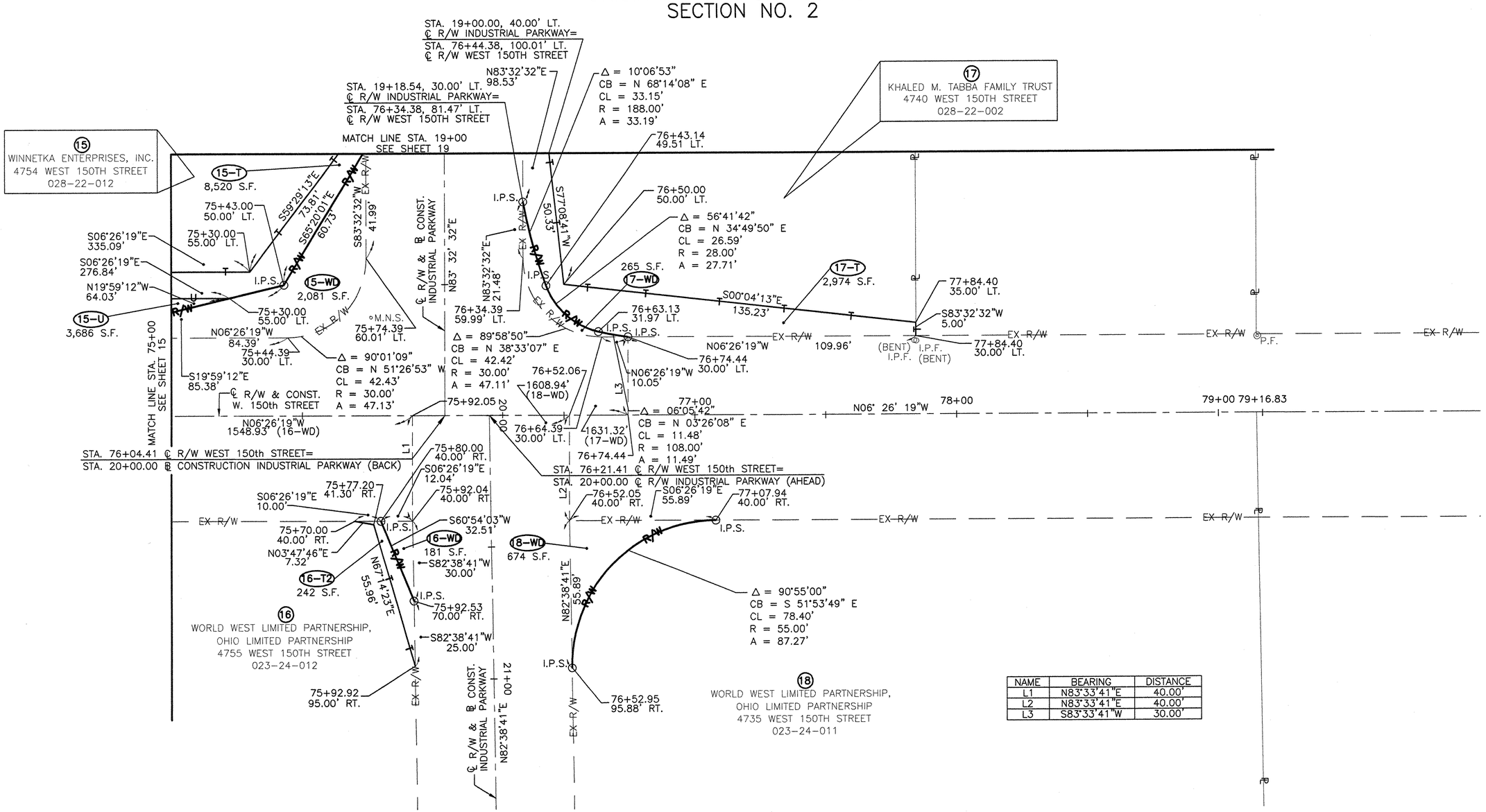
16 / 19

139 / 146

PJK 3/27/07 PLOT 1"=20'

F:\JOBS\665\RB\RB106.DWG

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



NAME	BEARING	DISTANCE
L1	N83°33'41"E	40.00'
L2	N83°33'41"E	40.00'
L3	S83°33'41"W	30.00'

FOR LEGEND, SEE SHEET 4.

SCALE IN FEET
0 20 40

RIGHT OF WAY PLAN - WEST 150th STREET
STA. 75+00 TO STA. 80+00

CUY - WEST 150th STREET

17 / 19

140
146

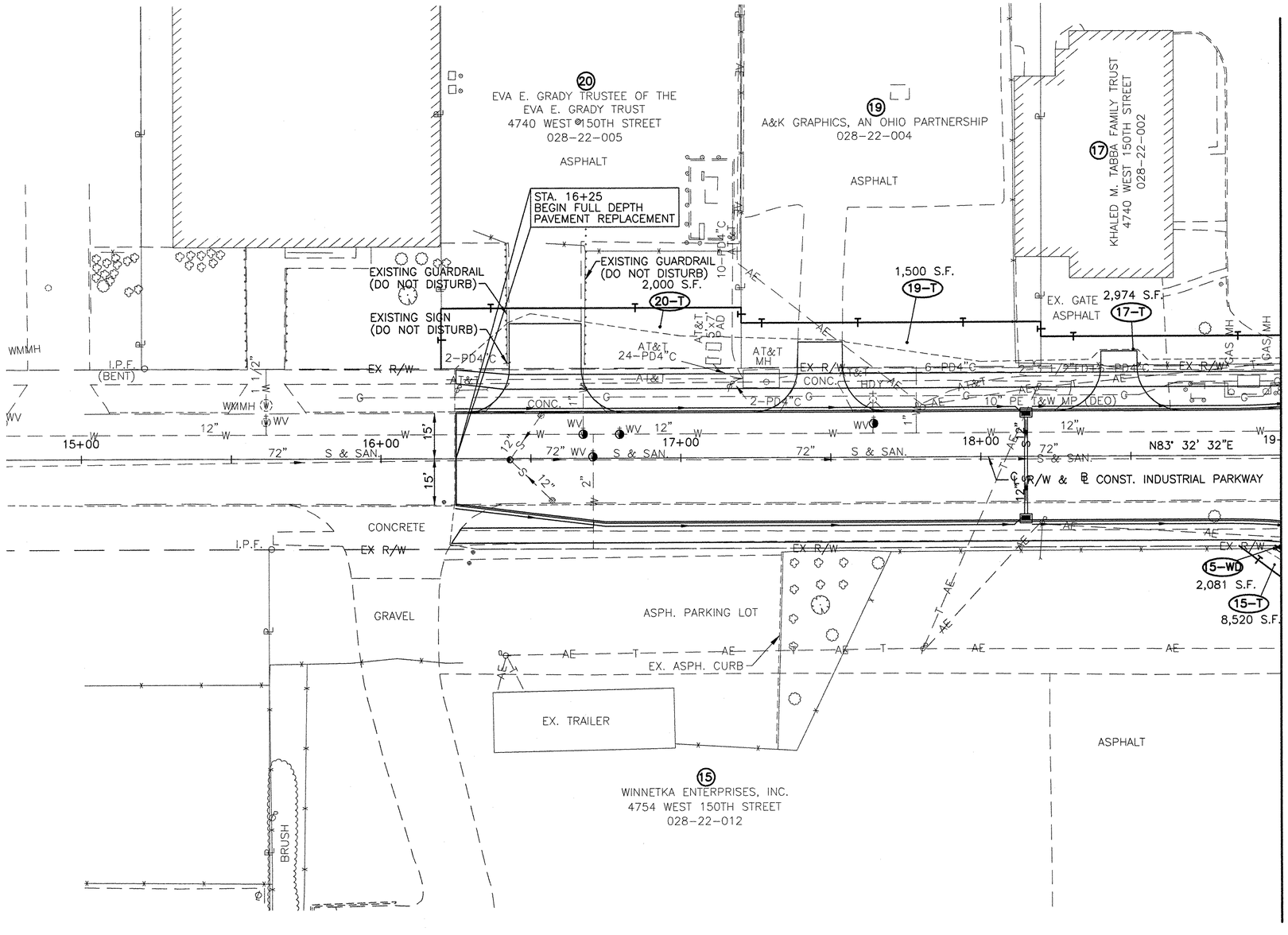
REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

PJK 3/27/07 PLOT 1"=20'

F:\JOBS\665\RB\RB106A.DWG

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2



NOTE: FOR MONUMENTATION, EXISTING EASEMENT DESIGNATIONS, STATIONS, OFFSETS, BEARINGS AND DISTANCES FOR THIS SHEET, SEE SHEET 19.

SCALE IN FEET: 0, 20, 40

RIGHT OF WAY PLAN - INDUSTRIAL PARKWAY
STA. 15+00 TO STA. 19+00

CUY - WEST 150th STREET

18 / 19

141
146

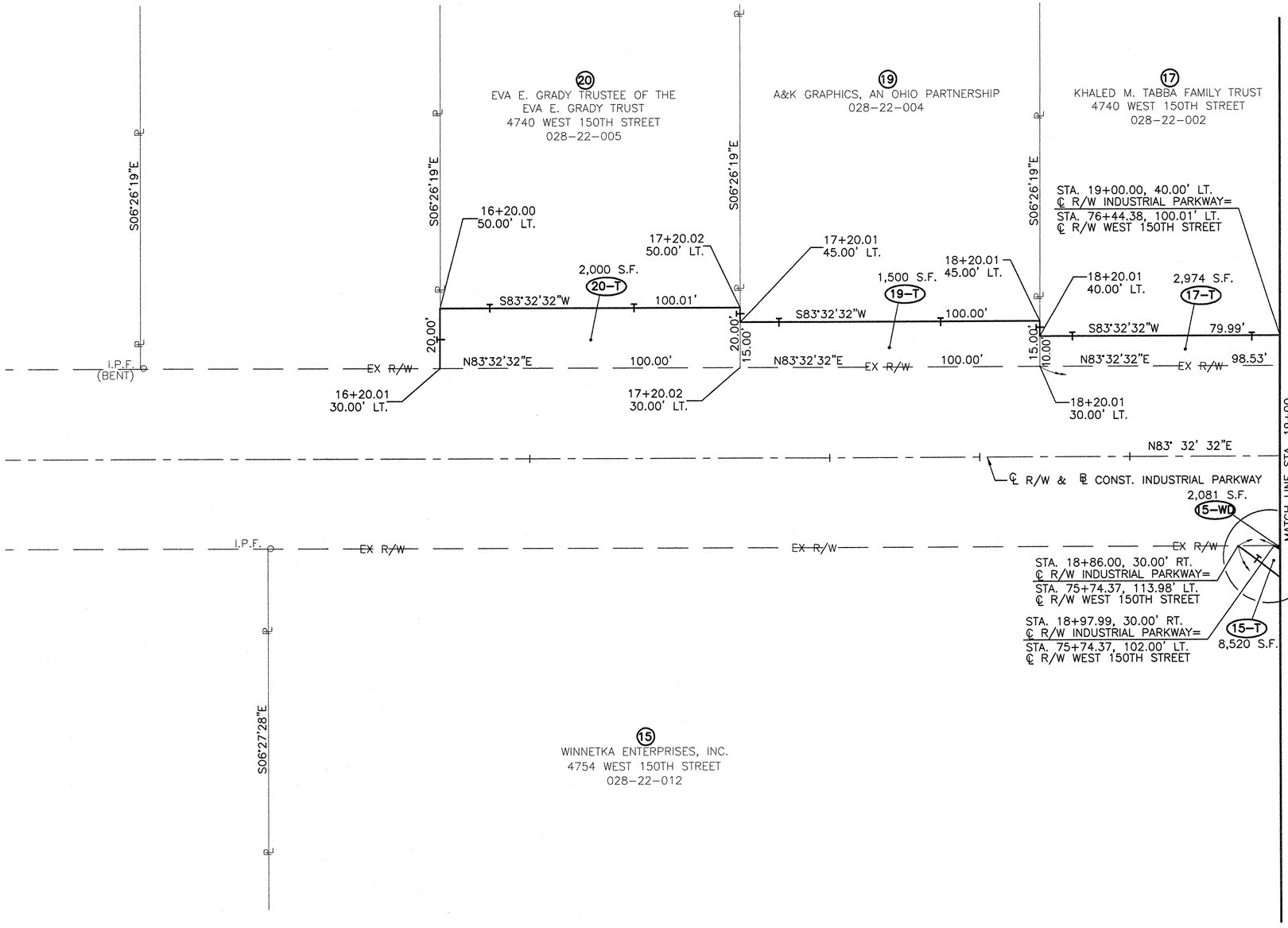
REV.	DATE	DESCRIPTION

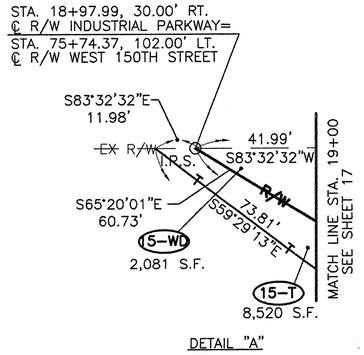
PLAN COMPLETION DATE:

P.JK 3/27/07 PLOT 1"=20'

F:\JOBS\665\RB\RB200.DWG

CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP
SECTION NO. 2





DETAIL "A"

FOR LEGEND, SEE SHEET 4.

N

0 20 40
SCALE IN FEET

RIGHT OF WAY PLAN - INDUSTRIAL PARKWAY
STA. 15+00 TO STA. 19+00

CUY - WEST 150th STREET

19 / 19

142
146

REV.	DATE	DESCRIPTION

PLAN COMPLETION DATE:

PJK 3/27/07 PLOT 1"=20'

F:\JOBS\665\RB\RB200A.DWG

DEDICATION PLAT
FOR
SMITH ROAD, WEST 150TH STREET AND BROOKPARK ROAD

OWNERS ACCEPTANCE

I, OF 15201 BROOKPARK ROAD, LTD. AN OHIO LIMITED LIABILITY COMPANY, OWNER OF PARCEL 343-11-010 AS SHOWN HEREIN, DO HEREBY DEDICATE A PORTION OF SAID PARCEL TO PUBLIC USE FOR STREET PURPOSES.

_____ _____
DATE

STATE OF OHIO S.S.
COUNTY OF CUYAHOGA

BEFORE ME A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED THE ABOVE NAMED OWNER, WHO ACKNOWLEDGED THAT HE DID SIGN THE FOREGOING INSTRUMENT AND THAT IT WAS HIS OWN FREE ACT AND DEED.

IN WITNESS WHEREOF I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL THIS

_____DAY OF_____2007

_____
NOTARY PUBLIC

_____
MY COMMISSION EXPIRES

OWNERS ACCEPTANCE

I, OF PAWUK REALTY LIMITED AN OHIO LIMITED LIABILITY COMPANY, OWNER OF PARCEL 344-35-017, 344-35-018 AND 344-35-019 AS SHOWN HEREIN, DO HEREBY DEDICATE A PORTION OF SAID PARCEL TO PUBLIC USE FOR STREET PURPOSES.

_____ _____
DATE

STATE OF OHIO S.S.
COUNTY OF CUYAHOGA

BEFORE ME A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED THE ABOVE NAMED OWNER, WHO ACKNOWLEDGED THAT HE DID SIGN THE FOREGOING INSTRUMENT AND THAT IT WAS HIS OWN FREE ACT AND DEED.

IN WITNESS WHEREOF I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL THIS

_____DAY OF_____2007

_____
NOTARY PUBLIC

_____
MY COMMISSION EXPIRES

OWNERS ACCEPTANCE

I, OF HUGO LAND CO., OWNER OF PARCEL 344-35-020 AS SHOWN HEREIN, DO HEREBY DEDICATE A PORTION OF SAID PARCEL TO PUBLIC USE FOR STREET PURPOSES.

_____ _____
DATE

STATE OF OHIO S.S.
COUNTY OF CUYAHOGA

BEFORE ME A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED THE ABOVE NAMED OWNER, WHO ACKNOWLEDGED THAT HE DID SIGN THE FOREGOING INSTRUMENT AND THAT IT WAS HIS OWN FREE ACT AND DEED.

IN WITNESS WHEREOF I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL THIS

_____DAY OF_____2007

_____
NOTARY PUBLIC

_____
MY COMMISSION EXPIRES

OWNERS ACCEPTANCE

I, OF CMMV PROPERTIES, LLC, OWNER OF PARCEL 344-35-021 AS SHOWN HEREIN, DO HEREBY DEDICATE A PORTION OF SAID PARCEL TO PUBLIC USE FOR STREET PURPOSES.

_____ _____
DATE

STATE OF OHIO S.S.
COUNTY OF CUYAHOGA

BEFORE ME A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED THE ABOVE NAMED OWNER, WHO ACKNOWLEDGED THAT HE DID SIGN THE FOREGOING INSTRUMENT AND THAT IT WAS HIS OWN FREE ACT AND DEED.

IN WITNESS WHEREOF I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL THIS

_____DAY OF_____2007

_____
NOTARY PUBLIC

_____
MY COMMISSION EXPIRES

APPROVALS

THIS PLAT HAS BEEN APPROVED BY THE COUNCIL OF THE CITY OF BROOK PARK, OHIO BY RESOLUTION NO._____ADOPTED _____, 20___.

_____ _____
COUNCIL PRESIDENT CLERK OF COUNCIL

THIS PLAT HAS BEEN APPROVED BY THE CITY ENGINEER OF THE CITY OF BROOK PARK, OHIO, THIS____DAY OF _____ , 20__.

_____
CITY ENGINEER

THIS PLAT HAS BEEN APPROVED BY THE PLANNING COMMISSION OF THE CITY OF BROOK PARK, OHIO, THIS____DAY OF _____ , 20__.

_____
SECRETARY OF PLANNING COMMISSION

_____
CHAIRMAN OF PLANNING COMMISSION

DEDICATION PLAT

CUY-WEST 150TH STREET

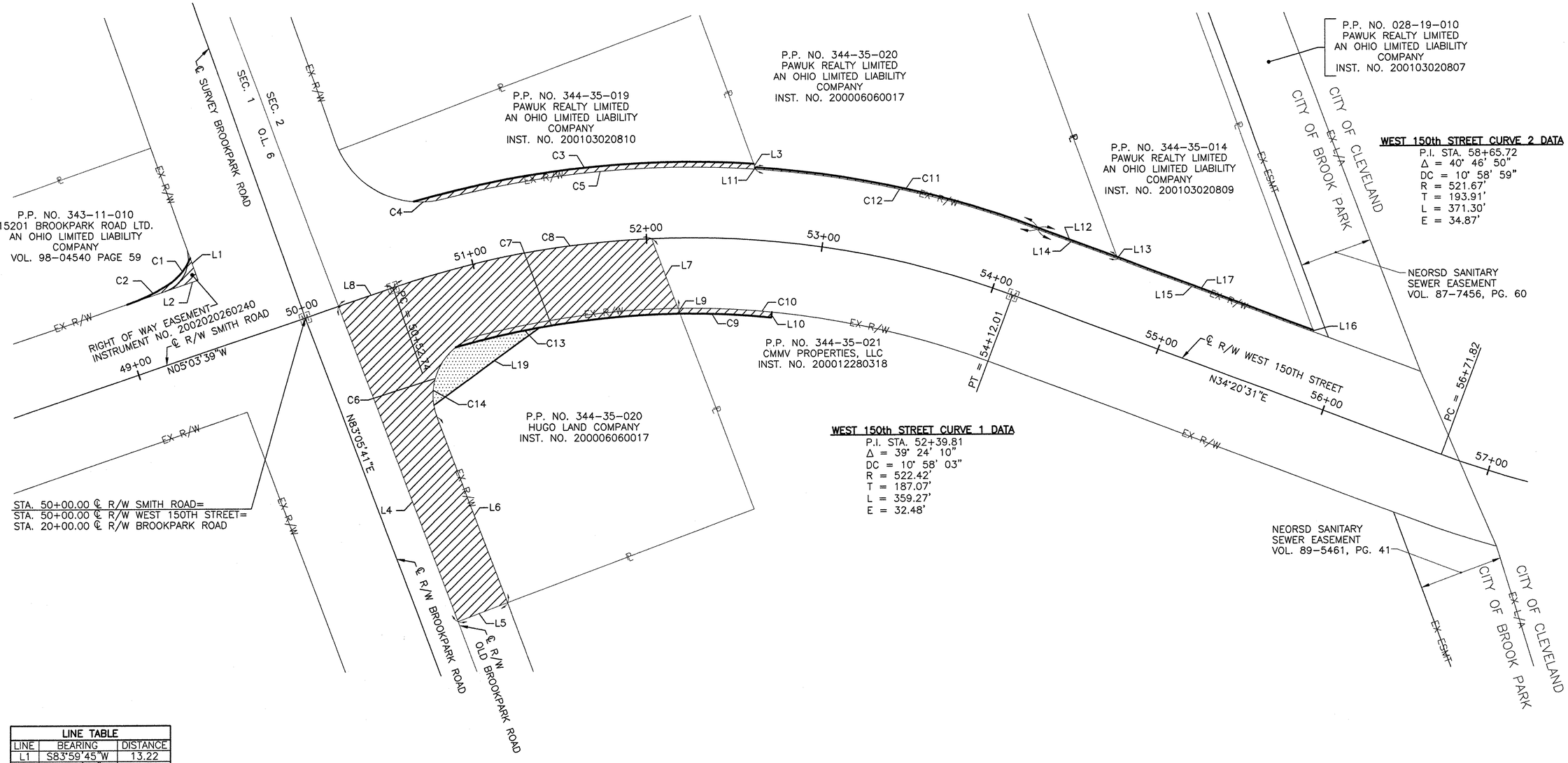
1 / 2

143
146

PJK 3/26/07 PLOT 1"=30'

F:\JOBS\665\RM\665DP03.DWG

CUYAHOGA COUNTY
CITY OF BROOK PARK
ORIGINAL MIDDLEBURGH TOWNSHIP LOT NO. 1, SECTION NO. 10
AND ORIGINAL ROCKPORT TOWNSHIP, SECTION NO. 2



STA. 50+00.00 ℄ R/W SMITH ROAD=
STA. 50+00.00 ℄ R/W WEST 150TH STREET=
STA. 20+00.00 ℄ R/W BROOKPARK ROAD

WEST 150th STREET CURVE 2 DATA
P.I. STA. 58+65.72
Δ = 40° 46' 50"
DC = 10° 58' 59"
R = 521.67'
T = 193.91'
L = 371.30'
E = 34.87'

WEST 150th STREET CURVE 1 DATA
P.I. STA. 52+39.81
Δ = 39° 24' 10"
DC = 10° 58' 03"
R = 522.42'
T = 187.07'
L = 359.27'
E = 32.48'

LINE TABLE

LINE	BEARING	DISTANCE
L1	S83°59'45"W	13.22
L2	N05°03'39"W	42.79
L3	S83°36'21"W	3.28
L4	N83°05'41"E	191.13
L5	N06°54'19"W	30.0
L6	S83°05'41"W	112.64
L7	S83°05'41"W	45.52
L8	S05°03'39"E	32.74
L9	N83°05'41"E	3.19
L10	N70°41'05"W	3.00
L11	S83°36'21"W	1.09
L12	S34°20'31"W	47.98
L13	S83°36'21"W	1.32
L14	N34°20'31"E	48.84
L15	N34°20'31"E	118.77
L16	S83°36'21"W	1.32
L17	S34°20'31"W	118.77
L18	N83°36'21"E	1.32
L19	N22°26'02"W	74.74

CURVE TABLE

LINE	RADIUS	ARC LENGTH	CHORD	CHORD BEARING	DELTA	TANGENT
C1	33.00	20.66	20.32	S35°50'03"E	35°52'11"	10.681
C2	113.00	25.32	25.27	S11°28'48"E	12°50'19"	12.72
C3	565.42	195.52	194.55	N07°33'04"E	19°48'46"	98.75
C4	51.09	16.87	16.79	N08°46'41"E	18°54'55"	8.51
C5	562.42	179.34	178.58	N08°27'28"E	18°16'12"	90.44
C6	35.00	43.69	40.90	N61°08'56"W	71°30'47"	25.20
C7	479.42	129.41	129.01	N05°22'26"E	15°27'55"	65.10
C8	522.42	150.07	149.56	S03°10'07"W	16°27'32"	75.56
C9	479.42	51.95	51.92	N16°12'40"E	06°12'31"	26.00
C10	482.42	53.37	53.34	S16°08'46"W	06°20'18"	26.71
C11	563.42	165.15	164.56	N25°56'41"E	16°47'40"	83.17
C12	562.42	164.41	163.83	N25°58'03"E	16°44'57"	82.80
C13	479.42	49.21	49.19	S00°34'54"W	05°52'51"	24.63
C14	35.00	36.86	35.18	S55°34'00"E	60°20'55"	20.35

SURVEYOR'S CERTIFICATION

THIS PLAT WAS PREPARED FROM A SURVEY DONE BY EUTHENICS INC. AND CERTIFIED BY TERIN J. KAMINSKI, REGISTERED OHIO PROFESSIONAL SURVEYOR NO. 7207. DISTANCES ARE GIVEN IN FEET AND DECIMAL PARTS THEREOF. BEARINGS ARE REFERENCED TO AN ASSUMED MERIDIAN AND ARE INTENDED TO INDICATE ANGLES ONLY. ALL OF WHICH I ACKNOWLEDGE TO BE CORRECT.

STATE OF OHIO · TERIN J. KAMINSKI · 7207 · REGISTERED · PROFESSIONAL LAND SURVEYOR

TERIN J. KAMINSKI — DATE

LEGEND

WARRANTY DEEDS

UTILITY EASEMENTS

HORIZONTAL SCALE IN FEET
0 30 60

DEDICATION PLAT

CUY-WEST 150TH STREET

2 / 2

144 / 146

DTB 3/28/07 PLOT 1"=30'

F:\JOBS\665\RM\6650P01.DWG

DEDICATION PLAT
FOR
WEST 150TH STREET AND INDUSTRIAL PARKWAY

OWNERS ACCEPTANCE

I, OF WINNTKA ENTERPRISES, INC., OWNER OF PARCEL 028-22-012 AS SHOWN HEREIN, DO HEREBY DEDICATE A PORTION OF SAID PARCEL TO PUBLIC USE FOR STREET PURPOSES.

_____ _____
DATE

STATE OF OHIO S.S.
COUNTY OF CUYAHOGA
BEFORE ME A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED THE ABOVE NAMED OWNER, WHO ACKNOWLEDGED THAT HE DID SIGN THE FOREGOING INSTRUMENT AND THAT IT WAS HIS OWN FREE ACT AND DEED.
IN WITNESS WHEREOF I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL THIS

_____DAY OF_____2007

_____
NOTARY PUBLIC

_____
MY COMMISSION EXPIRES

OWNERS ACCEPTANCE

I, OF KHALED M. TABBA FAMILY TRUST, OWNER OF PARCEL 028-22-002 AS SHOWN HEREIN, DO HEREBY DEDICATE A PORTION OF SAID PARCEL TO PUBLIC USE FOR STREET PURPOSES.

_____ _____
DATE

STATE OF OHIO S.S.
COUNTY OF CUYAHOGA
BEFORE ME A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED THE ABOVE NAMED OWNER, WHO ACKNOWLEDGED THAT HE DID SIGN THE FOREGOING INSTRUMENT AND THAT IT WAS HIS OWN FREE ACT AND DEED.
IN WITNESS WHEREOF I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL THIS

_____DAY OF_____2007

_____
NOTARY PUBLIC

_____
MY COMMISSION EXPIRES

OWNERS ACCEPTANCE

I, OF WORLD WEST LIMITED PARTNERSHIP, OHIO LIMITED PARTNERSHIP, OWNER OF PARCEL 023-24-012 AND 023-24-011 AS SHOWN HEREIN, DO HEREBY DEDICATE A PORTION OF SAID PARCEL TO PUBLIC USE FOR STREET PURPOSES.

_____ _____
DATE

STATE OF OHIO S.S.
COUNTY OF CUYAHOGA
BEFORE ME A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED THE ABOVE NAMED OWNER, WHO ACKNOWLEDGED THAT HE DID SIGN THE FOREGOING INSTRUMENT AND THAT IT WAS HIS OWN FREE ACT AND DEED.
IN WITNESS WHEREOF I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL THIS

_____DAY OF_____2007

_____
NOTARY PUBLIC

_____
MY COMMISSION EXPIRES

APPROVED BY THE PUBLIC SERVICE COMMITEE

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

APPROVED BY THE CITY PLANNING COMMISSION

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

RELEASE OF EASEMENTS
AND
PARTIAL RELEASE OF MORTGAGE RELEASES
TO DEDICATED STREET

THE AFORESIGNED, BEING OWNERS, MORTGAGEES, LESSEES, OR A PARTY IN INTEREST, FOR VALUABLE CONSIDERATION, RELEASE, RELINQUISH, ABANDON AND QUIT-CLAIM TO THE CITY OF CLEVELAND ALL OF THEIR RIGHT, TITLE AND INTEREST TO CERTAIN EASEMENTS, RIGHTS OF WAY, RIGHTS OF INGRESS AND EGRESS, LIENS AND LEASES, WHETHER SUCH RIGHTS, TITLES AND INTERESTS ARE RECORDED OR UNRECORDED, IN AND TO THE DEDICATED ROADWAY WHICH IS THE SUBJECT OF THIS PLAT AND SURVEY.

PROVIDED, HOWEVER, THAT THE RELEASE OF LIENS OR LEASES SHALL NOT BE CONSTRUED TO WAIVE OR IN ANY MANNER AFFECT OR INVALIDATE THE LIENS OF THE MORTGAGES AND LEASES AND LEASEHOLD INTEREST, AS THEIR RESPECTIVE INTERESTS MAT APPEAR, ON THE BALANCE OF PROPERTY WHICH IS NOT CONTAINED WITHIN THE DEDICATED STREETS SHOWN ON THIS PLAT AND SURVEY.

FURTHER, THE AFORESIGNED ASSENT TO AND ADOPT THIS PLAT AND SURVEY AND HEREBY DEDICATE THE STREETS SHOWN IN SHADE HEREIN TO PUBLIC USE, AS THEIR RESPECTIVE INTERESTS MAY APPEAR.

APPROVALS

APPROVED BY THE CITY PLANNING COMMISSION.

_____, 2007 _____
DIRECTOR OF CITY PLANNING

THE PORTION OF STREET HEREIN PROPOSED TO BE DEDICATED TO PUBLIC USE IS IN ACCORDANCE WITH THE PLATTING LAWS OF THE STATE OF OHIO AND THE PLATTING RULES AND REGULATIONS OF THE CITY OF CLEVELAND. THE ALIGNMENT AND LOCATION OF THE STREETS SHOWN HEREIN IS APPROVED AND THEY ARE SUFFICIENTLY DEFINED BY MONUMENTS.

_____, 2007 _____
PLATTING COMMISSIONER

THIS PLAT IS IN ACCORDANCE WITH THE RULES OF THE CITY PLANNING COMMISSION AND IS HEREBY APPROVED BY THE DIRECTOR OF PUBLIC SERVICE.

_____, 2007 _____
DIRECTOR OF PUBLIC SERVICE

THE LAND EMBRACED IN WEST 150TH STREET AND INDUSTRIAL PARKWAY AS SHADED AND SHOWN HEREIN AND PROPOSED TO BE DEDICATED TO PUBLIC USE BY THIS PLAT IS FREE FROM ALL ENCUMBRANCES

_____, 2007 _____
DIRECTOR OF LAW

_____, 2007 _____
ASSISTANT DIRECTOR OF LAW

APPROVED BY THE COUNCIL OF THE CITY OF CLEVELAND, OHIO FILE NO. _____ _____, 2007

_____
EMILY LIPOVAN, CLERK OF COUNCIL

DEDICATION PLAT

CUY-WEST 150TH STREET

1 / 2

145
146

P.W. 3/26/07 PLOT 1"=30'

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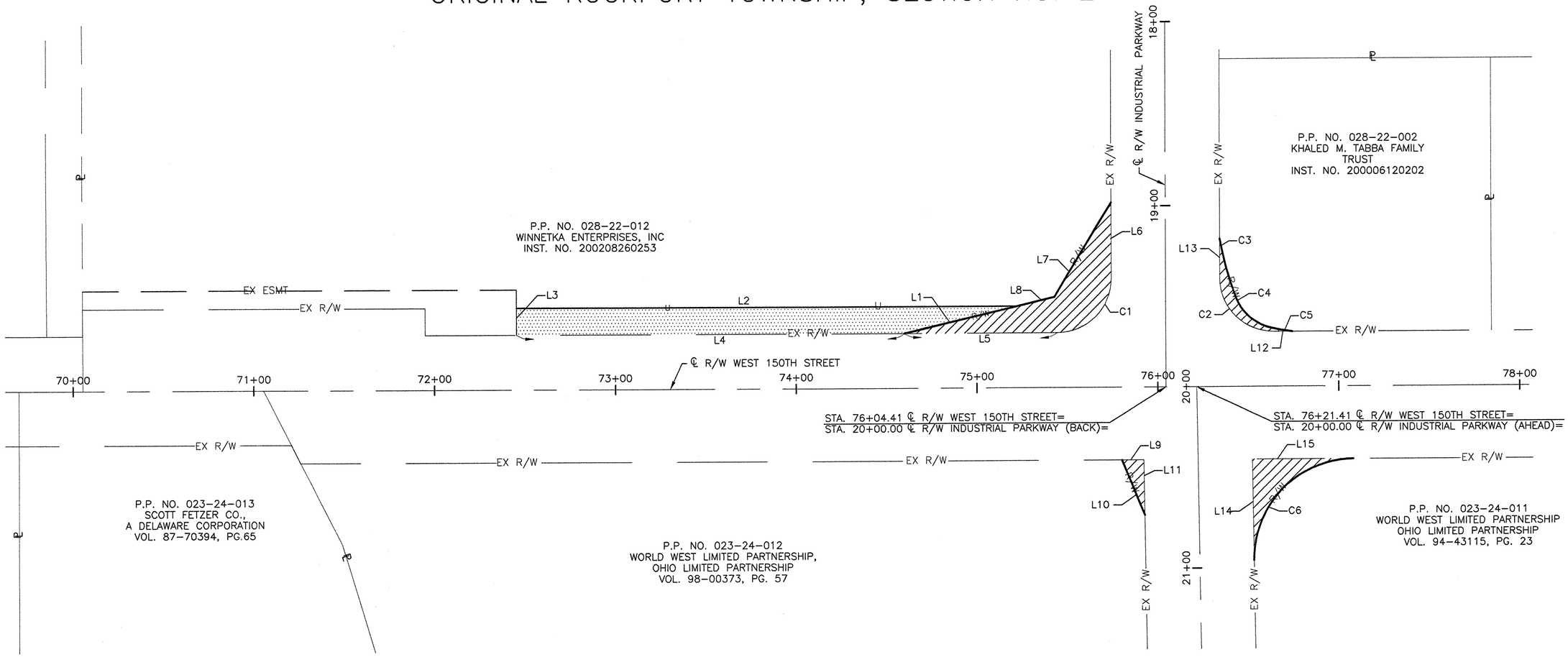
CUYAHOGA COUNTY
CITY OF CLEVELAND
ORIGINAL ROCKPORT TOWNSHIP, SECTION NO. 2



LINE TABLE		
LINE	BEARING	DISTANCE
L1	N19°59'12"W	64.03
L2	S06°26'19"E	276.84
L3	N83°27'01"E	15.00
L4	N06°26'19"W	214.56
L5	N06°26'19"W	84.39
L6	S83°32'32"W	41.99
L7	S65°20'01"E	60.73
L8	S19°59'12"E	85.38
L9	S06°26'19"E	12.04
L10	N60°54'03"E	32.51
L11	S82°38'41"W	30.00
L12	N06°26'19"W	10.05
L13	N83°32'32"E	21.48
L14	N82°38'41"E	55.89
L15	S06°26'19"E	55.89

CURVE TABLE						
LINE	RADIUS	ARC LENGTH	CHORD	CHORD BEARING	DELTA	TANGENT
C1	30.00	47.13	42.43	N51°26'53"W	90°01'09"	30.01
C2	30.00	47.11	42.42	N38°33'07"E	89°58'50"	29.99
C3	188.00	33.19	33.15	S68°14'08"W	10°06'53"	16.64
C4	28.00	27.71	26.59	S34°49'50"W	56°41'42"	15.11
C5	108.00	11.49	11.48	S03°26'08"W	06°05'42"	5.75
C6	55.00	87.27	78.40	N51°53'49"W	90°55'00"	55.89

SURVEYOR'S CERTIFICATION

THIS PLAT WAS PREPARED FROM A SURVEY DONE BY EUTHENICS INC. AND CERTIFIED BY TERIN J. KAMINSKI, REGISTERED OHIO PROFESSIONAL SURVEYOR NO. 7207. DISTANCES ARE GIVEN IN FEET AND DECIMAL PARTS THEREOF. BEARINGS ARE REFERENCED TO AN ASSUMED MERIDIAN AND ARE INTENDED TO INDICATE ANGLES ONLY. ALL OF WHICH I ACKNOWLEDGE TO BE CORRECT.

STATE OF OHIO — TERIN J. KAMINSKI — 7207 — REGISTERED — PROFESSIONAL LAND SURVEYOR

TERIN J. KAMINSKI — DATE

LEGEND

WARRANTY DEEDS

UTILITY EASEMENTS

HORIZONTAL SCALE IN FEET
0 30 60

DEDICATION PLAT

CUY-WEST 150TH STREET

2 / 2

146
146

DTB 3/28/07 PLOT 1"=30'

F:\JOBS\665\RM\665DP02.DWG