CUY-90-14.90

PID 77332/85531

APPENDIX EX-67

Abbey Avenue over GCRTA
(Reference Document)

State of Ohio
Department of Transportation
Jolene M. Molitoris, Director

Innerbelt Bridge
Construction Contract Group 1 (CCG1)

Revision Date: June 7, 2007

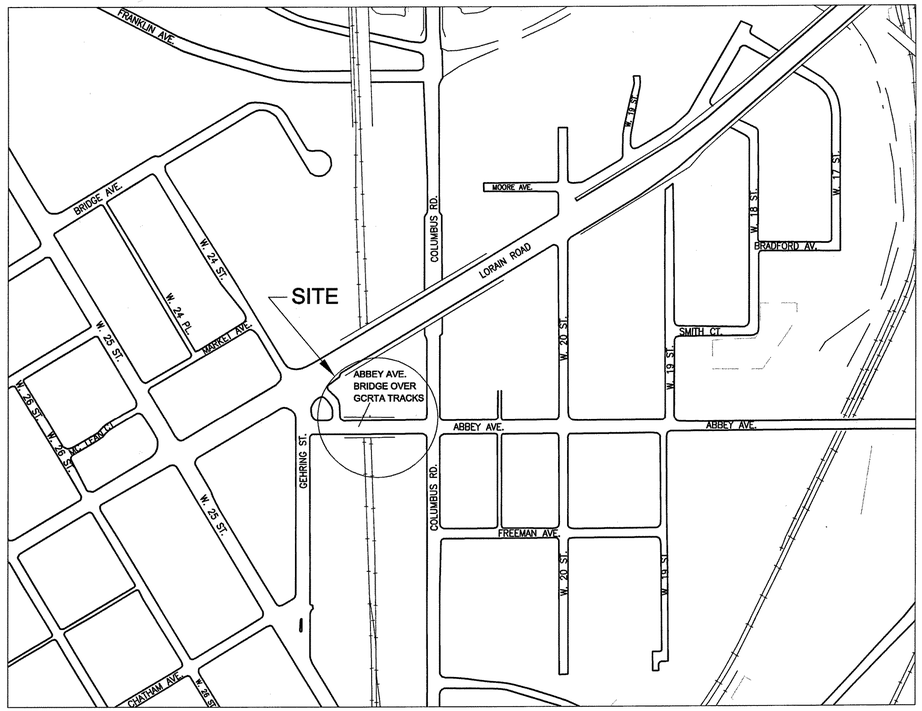
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

THE PREPARATION OF THIS STUDY WAS FINANCED BY THE GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

DRAWING INDEX

PROJECT NO. 29D

REHABILITATION OF ABBEY AVENUE BRIDGE OVER GCRTA TRACKS



LOCATION MAP

N.T.S.

STRUCTURAL AND UTILITY PLANS (EXCEPT SHEETS S-38 TO S-40)
PREPARED BY:
HNTB OHIO, INC.

ENGINEER SEAL:

STATE OF OHIO
RICHARD H. WALTERS
E-46950
REGISTERED PROFESSIONAL ENGINEER

SIGNED:
DATE: 6-7-07

CIVIL PLANS
PREPARED BY:
CENTRAL ENGINEERING, INC.

ENGINEER SEAL:

STATE OF OHIO
CHAU S. CHAN
E-47185
REGISTERED PROFESSIONAL ENGINEER

SIGNED:
DATE: 6-7-07

UNDERGROUND UTILITIES

TWO WORKING DAYS
BEFORE YOU DIG
CALL **1-800-362-2764** (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

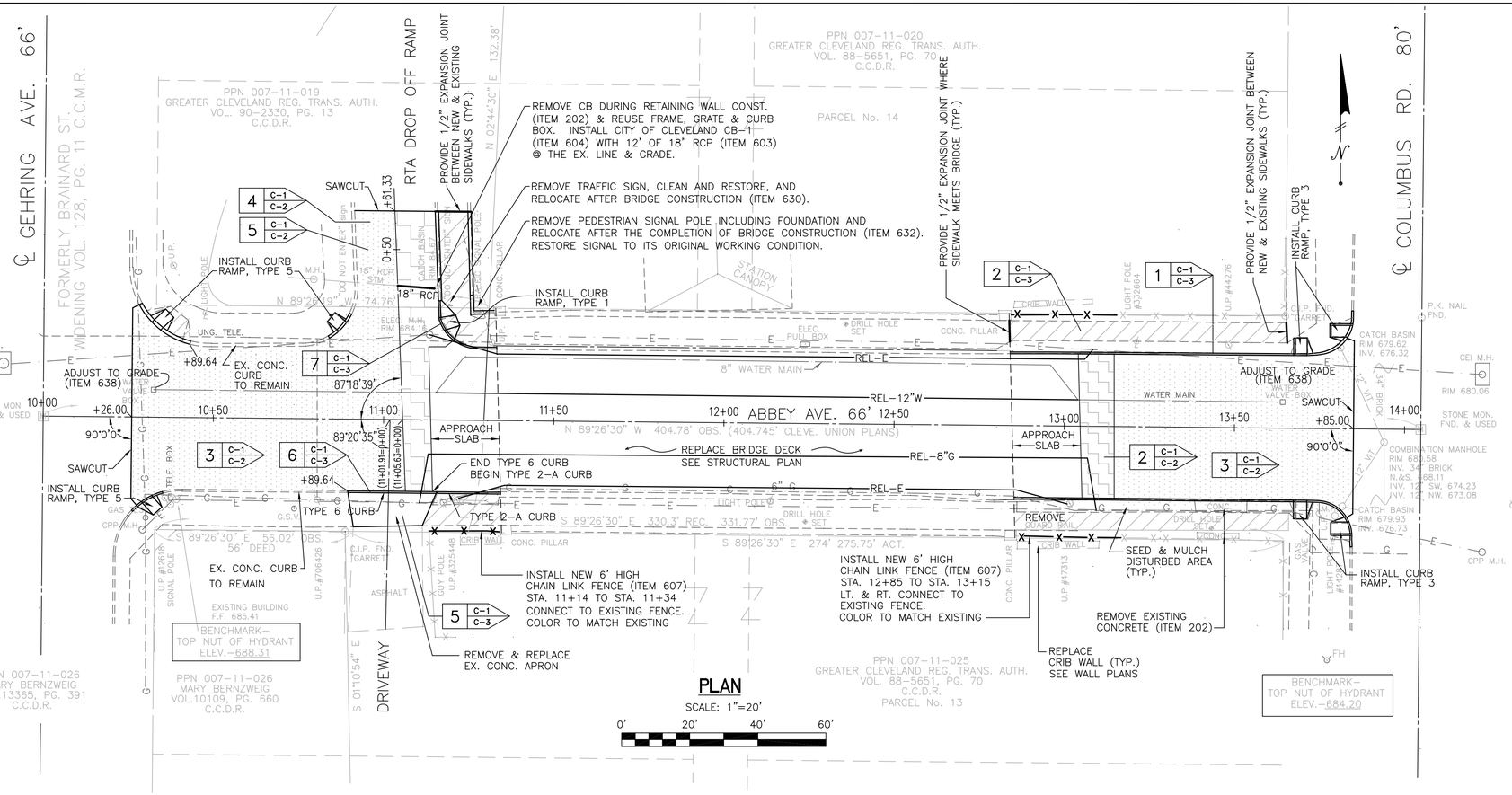
ENGINEERING AND PROJECT MANAGEMENT

ENGINEERS: HNTB OHIO, INC.
SUBCONSULTANTS: CENTRAL ENGINEERING, INC.
PRIME ENGINEERING AND ARCHITECTURE, INC.

NOTE:
CONTRACTOR SHALL ACQUIRE ALL THE NECESSARY PERMITS FROM THE CITY OF CLEVELAND AND NOTIFY THE APPROPRIATE CITY AGENCIES PRIOR TO START OF WORK.

ODOT STANDARD CONSTRUCTION DRAWINGS								CITY OF CLEVELAND		SUPPLEMENTAL SPECIFICATIONS	
								CURB RAMPS			
BP-1.1	7-28-00	MT-101.60	9-20-06	HL-10.11	1-16-04	AS-1-81	7-19-02	TYPE 1*	1-17-03	843	4-18-03
BP-2.1	7-16-04	MT-101.70	10-18-02	HL-10.12	1-19-07	PSBD-1-93	4-20-07	TYPE 3*	1-17-03		
				HL-10.13	1-17-03	PSID-1-99	4-20-07	TYPE 5*	1-17-03		
BP-3.1	7-16-04	RM-4.2	10-20-06	HL-20.11	1-19-07	VPF-1-90	7-19-02	CB-1	4-29-05		
BP-4.1	7-16-04			HL-20.14	1-21-05			* MODIFIED, SEE			
BP-5.1	7-28-04			HL-30.11	1-21-05			SHEET C-1, NOTE 7			
				HL-30.21	1-19-07						
				HL-30.22	1-21-05						
				HL-30.31	1-21-05						
F-1.1	7-16-04			HL-30.32	4-19-02						
				HL-30.33	1-21-05						

G:\05005\PLAN\ABBEY-TITLE.dwg Use general.ctb and generalHalf.ctb to plot this drawing



PLAN

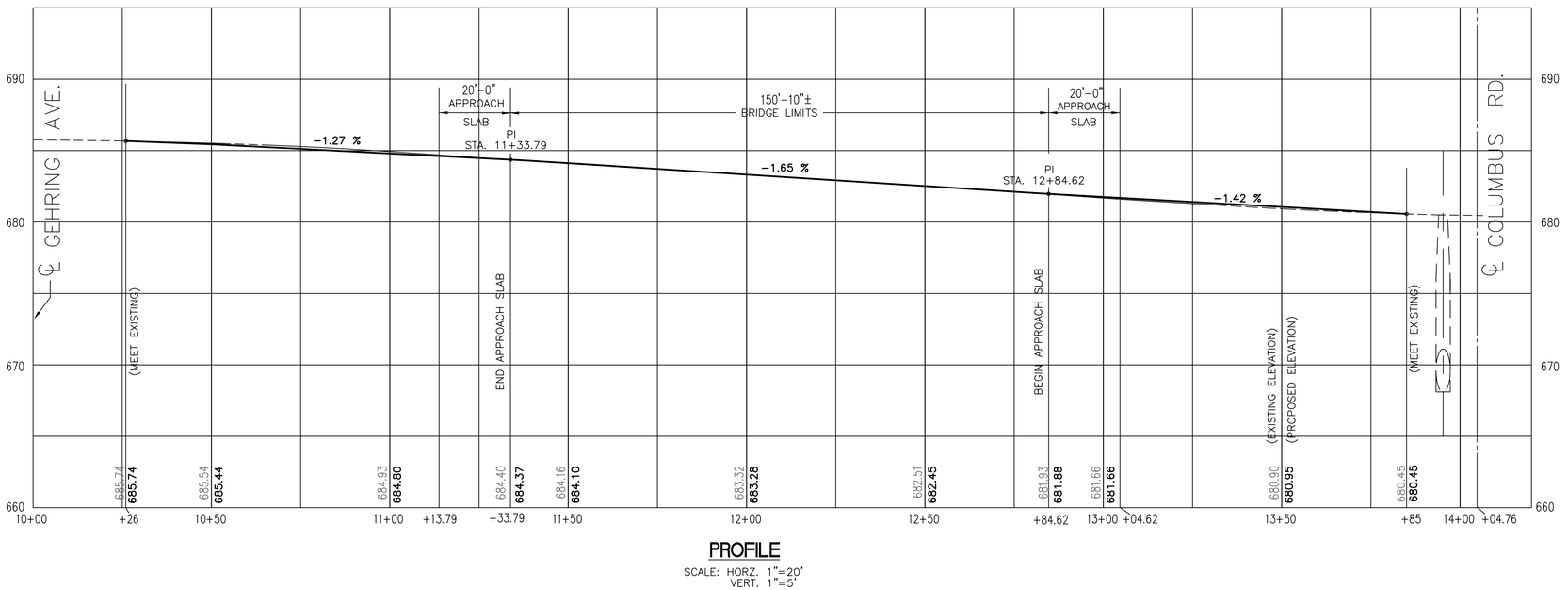
SCALE: 1"=20'

0' 20' 40' 60'

LEGEND

- WELL OR WELL CAP
- SEPTIC
- HYDRANT
- WATER METER
- UTILITY POLE
- U.P. WITH GUY WIRE
- LIGHT POLE
- MAILBOX
- TRAFFIC SIGN
- DRILL HOLE SET
- MON. IRON PIN MONUMENT BOX FOUND
- I.P.F. IRON PIN FOUND
- C.I.P.F. CAPPED IRON PIN FOUND
- I.P.P.F. PIPE FOUND
- C.I.P. CAPPED IRON PIN SET W/YELLOW CAP STAMPED "VEVERKA PS 7513"
- FENCE
- OHW OVERHEAD WIRE
- WATER MAIN
- REPLACE EX. SIDEWALK & CONC. RAMP
- MILL (MIN. 1 1/4") & RESURFACE EX. PAVEMENT
- FULL DEPTH PAVEMENT REPLACEMENT
- PROPOSED CONC. CURB / REPLACE EXISTING

STREET	CURB TRANSITION TABLE			
	STATION	SIDE	HEIGHT	LENGTH
ABBEY AVENUE	11+28.13	L	6"	5'
	11+33.13	L	8"	
	11+29.53	R	6"	5'
	11+34.53	R	8"	
	12+83.89	L	8"	5'
	12+88.89	L	6"	
	12+85.42	R	8"	5'
	12+90.42	R	6"	
RTA DROP OFF RAMP	0+56.33	22'R	6"±	5'
	0+61.33	22'R	EX.	
	0+56.33	12'R	5"±	5'
	0+61.33	12'R	EX.	



PROFILE

SCALE: HORZ. 1"=20'
VERT. 1"=5'

NOTES:

1. TRANSITION SIDEWALK FROM STA. 11+25± TO STA. 11+33.08 LEFT TO MEET PROPOSED CURB RAMP. (SEE CURB RAMP DETAIL 7 ON SHEET C-3)
2. TRANSITION SIDEWALK FROM STA. 11+28 TO STA. 11+34.53 RIGHT TO MEET PROPOSED TYPICAL SECTION.
3. TRANSITION SIDEWALK FROM STA. 12+83.89 & 12+85.42 TO STA. 12+90 LEFT AND RIGHT RESPECTIVELY TO MEET PROPOSED TYPICAL SECTION.
4. CONTRACTOR SHALL ENGAGE AN INDEPENDENT TESTING AGENCY TO ENSURE COMPLIANCE WITH ODOT CMS ITEM 301, ITEM 304, AND ITEM 448. CONTRACTOR SHALL REPORT ALL THE TEST RESULTS AND DATA ANALYSIS TO RTA OR A REPRESENTATIVE OF RTA UNLESS OTHERWISE STATED.
5. CONTRACTOR TO MAINTAIN EXISTING CURB DRAIN.
6. CONTRACTOR TO APPLY PAVEMENT MARKING, ITEM 642 FOR ABBEY AVE. CENTERLINE, STOP LINES AND CROSSWALK LINES ON ABBEY AVE. AT GEHRING AVE. AND COLUMBUS RD., AND STOP LINES AND CROSSWALK LINES ON RTA DROP OFF RAMP AT ABBEY AVE.
7. SLOPE OF THE STANDARD CURB RAMPS IS MODIFIED FROM 12:1 TO 15:1. TRUNCATED DOMES SHALL BE YELLOW IN COLOR & AS MANUFACTURED BY DDA SOLUTIONS, INC. OR APPROVED EQUAL.

REVISIONS:

DRAWN: HW | CHECKED: KS | APPROVED: AP | DATE: 6-1-2007 | JOB NO.:

CENTRAL ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS
13477 PROSPECT ROAD, SUITE 101B
STRONGSVILLE, OHIO 44149

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

SECTIONS SHEET ON WHICH DETAIL IS CUT / SHEET ON WHICH DETAIL APPEARS SECTION OR DETAIL NO.

ROADWAY PLAN & PROFILE

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D | BID PAC

SHEET C-1

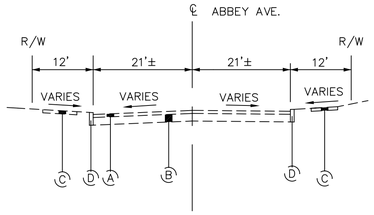
Use general.ctb and generalHalf.ctb to plot this drawing

ABBEY-PLAN.dwg

LEGEND

- (A) EXISTING ASPHALT (VARIABLE THICKNESS)
- (B) GRANITE PAVING STONE & LEVELING COURSE ON TOP OF CONCRETE SLAB
- (C) EXISTING CONCRETE WALK (VARIABLE WIDTH)
- (D) EXISTING SANDSTONE / CONC. CURB
- (E) EXISTING CONCRETE BASE (8"±)

1. ITEM 448 ASPHALT CONCRETE SURFACE COURSE (MIN. 1 1/4"), TYPE 1, PG 64-22
2. ITEM 609 CURB, TYPE 6 MODIFIED (SEE DETAIL, SHEET C-3)
3. ITEM 608 5" CONCRETE WALK (VARIABLE WIDTH) - SEE DETAIL, SHEET C-3.
4. ITEM 202 WEARING COURSE REMOVED (MIN.1 ¼)
5. ITEM 407 TACK COAT
6. ITEM 659 SEEDING & MULCHING
7. ITEM 448 1 3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG 64-22
8. ITEM 301 6" ASPHALT CONCRETE BASE
9. ITEM 304 12" AGGREGATE BASE
10. ITEM 204 SUBGRADE COMPACTION
11. ITEM 305 9" PORTLAND CEMENT CONCRETE BASE
12. ITEM 609 CURB TYPE 8 MODIFIED (SEE DETAIL, SHEET C-3)
13. ITEM 609 12" CURB (SEE DETAIL, SHEET C-3)
14. ITEM 653 TOP SOIL FURNISHED & PLACED (4")
15. ITEM 408 PRIME COAT



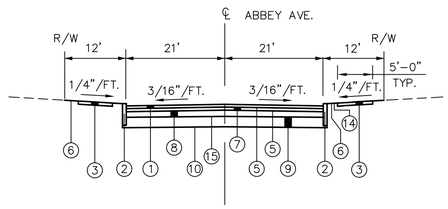
EXISTING TYPICAL SECTION

1 | C-1 | C-2

STA. 10+26.00 TO STA. 11+33.79
STA. 12+84.62 TO STA. 13+85.00

ABBEY AVENUE

N.T.S



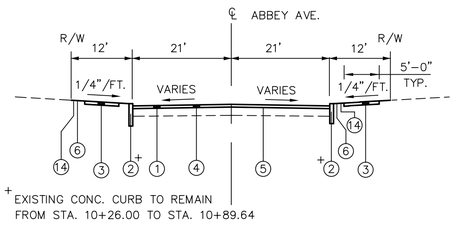
PROPOSED TYPICAL SECTION FULL DEPTH REPLACEMENT

2 | C-1 | C-2

STA. 11+05.63 TO STA. 11+13.79
STA. 13+04.62 TO STA. 13+14.62

ABBEY AVENUE

N.T.S



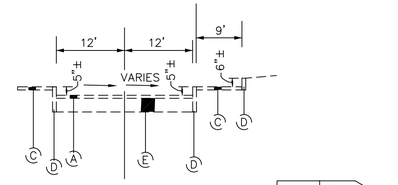
PROPOSED TYPICAL SECTION MILL AND RESURFACE

3 | C-1 | C-2

STA. 10+26.00 TO STA. 11+05.63
STA. 13+14.62 TO STA. 13+85.00

ABBEY AVENUE

N.T.S



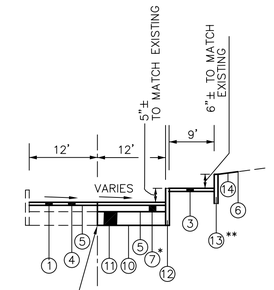
EXISTING TYPICAL SECTION

4 | C-1 | C-2

STA. 0+21.50 TO STA. 0+61.33

RTA DROP OFF RAMP

N.T.S



* 5 3/4"± THICK (SEE NOTE)
** STA. 0+36± TO STA. 0+61.33

NOTE: CONTRACTOR TO ADJUST THICKNESS OF INTERMEDIATE COURSE TO MATCH EXISTING ASPHALT THICKNESS

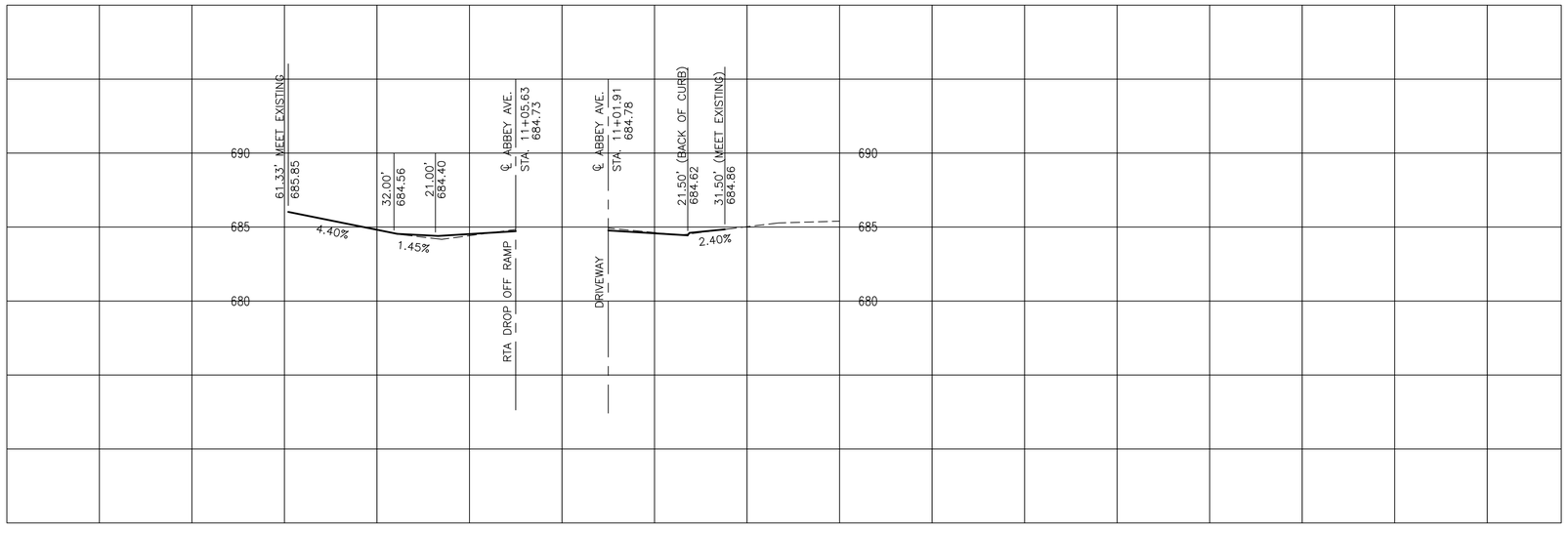
PROPOSED TYPICAL SECTION

5 | C-1 | C-2

STA. 0+21.50 TO STA. 0+61.33

RTA DROP OFF RAMP

N.T.S



DRIVEWAY PROFILES

0' 20' 40' 60'

ABBEY-DRIVE-TYP.dwg Use general.ctb and generalHalf.ctb to plot this drawing

REVISIONS:

DRAWN: HW | CHECKED: KS | APPROVED: AP | DATE: 6-1-2007 | JOB NO.:

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CIVIL & STRUCTURAL ENGINEERS
13477 PROSPECT ROAD, SUITE 101B
STRONGSVILLE, OHIO 44149

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

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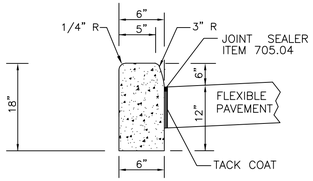
SHEET ON WHICH DETAIL APPEARS SECTION OR DETAIL NO.

TYPICAL SECTIONS AND DRIVEWAY PROFILES

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D | BID PAC

SHEET C-2



ODOT TYPE 6

CURB DETAILS 1 C-1 C-3

N.T.S.

JOINTS: EXPANSION JOINTS SHALL EXTEND UP TO THE SURFACE OF THE RIGID PAVEMENT. ALL JOINTS SHALL BE CONSTRUCTED PERPENDICULAR TO THE SURFACE OF THE PAVEMENT. EPOXY COATED SMOOTH DOWEL BARS SHALL BE USED IN THE CURB SECTION AT EXPANSION JOINTS, GREASE ONE END OF DOWEL BAR.

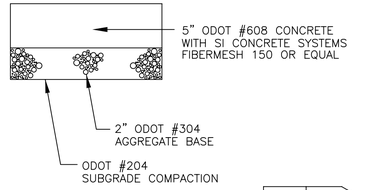
EXPANSION JOINT MATERIAL AND JOINT SEALER ARE REQUIRED FOR THAT PORTION OF THE CURB WHICH IS ADJACENT TO A SIDEWALK.

TRANSVERSE EXPANSION JOINT MATERIAL SHALL MEET THE REQUIREMENTS OF 705.03.

CONTRACTOR TO MAINTAIN EXISTING CURB DRAIN.

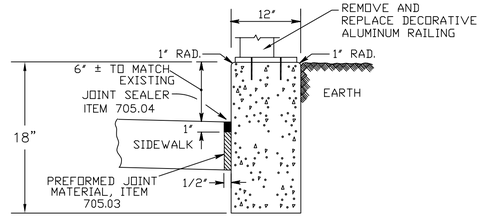
INSTALL JOINT SEALER & 1/2" WIDE PREFORMED JOINT MATERIAL, ITEM 705.03, WHEN THERE IS RIGID PAVEMENT BEHIND CURB.

FOR DETAILS/NOTES NOT SHOWN HERE REFER TO ODOT STANDARD BP-5.1



5" CONCRETE WALK 2 C-1 C-3

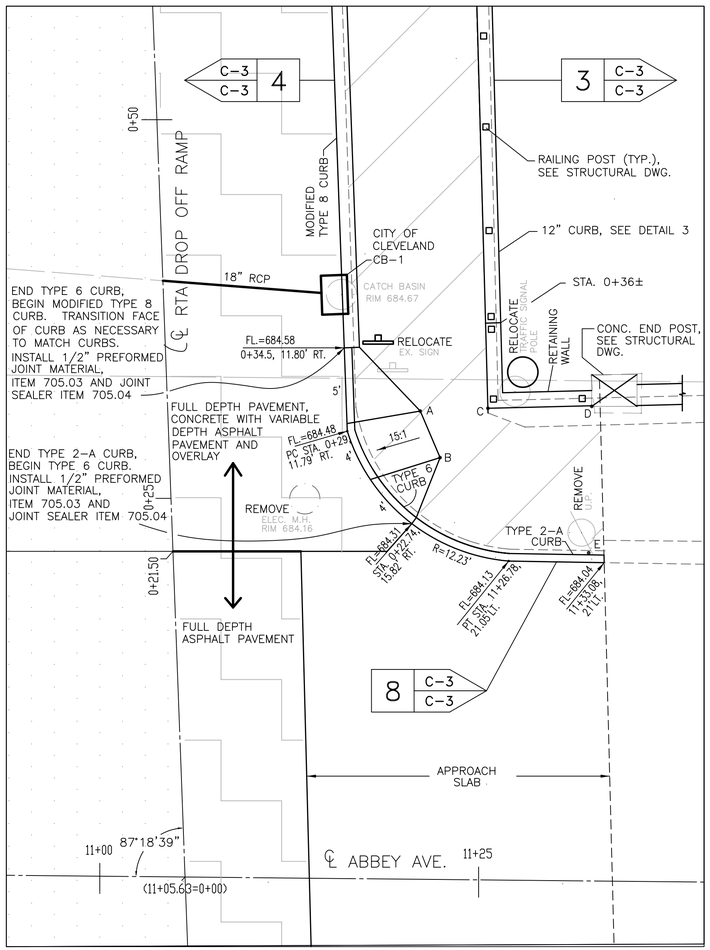
N.T.S.



12" CURB

CURB DETAILS 3 C-3 C-3

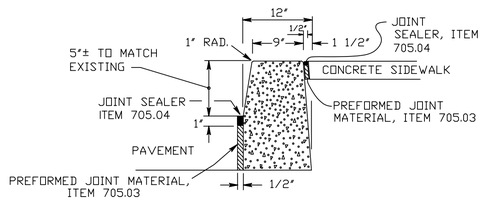
N.T.S.



CURB RAMP DETAIL 7 C-1 C-3

SCALE: 1"=5'

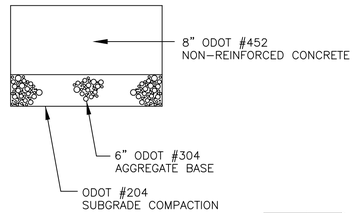
REF. POINTS	STA., OFFSET	ELEVATION
A	11+20.84, 30.9' LT.	684.82
B	11+22.18, 27.8' LT.	684.73
C	11+25.44, 31.3' LT.	684.86
D	11+32.10, 31.3' LT.	684.77
E	11+32.05, 21.5' LT.	684.57



ODOT TYPE 8
MODIFIED

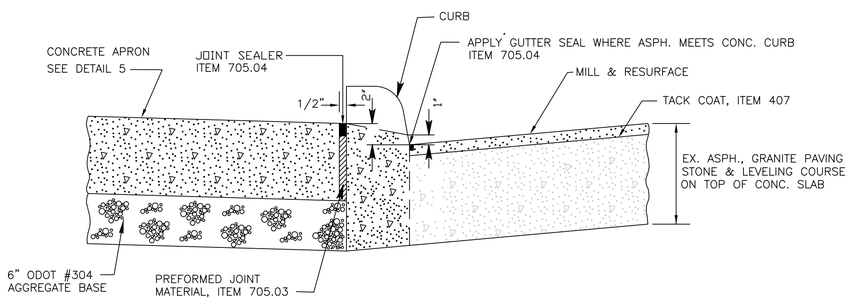
CURB DETAILS 4 C-3 C-3

N.T.S.



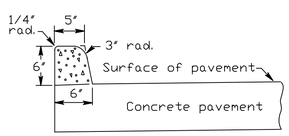
8" CONCRETE APRON 5 C-1 C-3

N.T.S.



DROP CURB AT DRIVEWAYS 6 C-1 C-3

N.T.S.



ODOT TYPE 2-A

CURB DETAILS 8 C-3 C-3

N.T.S.

Use general.ctb and generalHalf.ctb to plot this drawing

ABBEY-DETAIL-1.dwg

REVISIONS:

DRAWN: HW
CHECKED: KS
APPROVED: AP
DATE: 6-1-2007
JOB NO.:

CENTRAL ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS
13477 PROSPECT ROAD, SUITE 101B
STRONGSVILLE, OHIO 44149

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

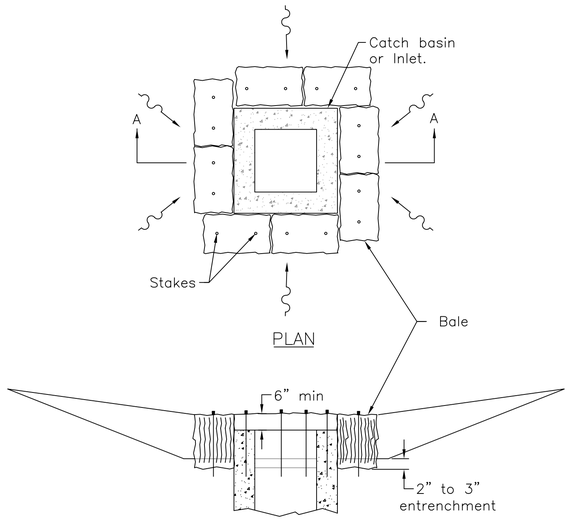
SECTIONS SHEET ON WHICH DETAIL IS CUT
SHEET ON WHICH DETAIL APPEARS SECTION OR DETAIL NO.

DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

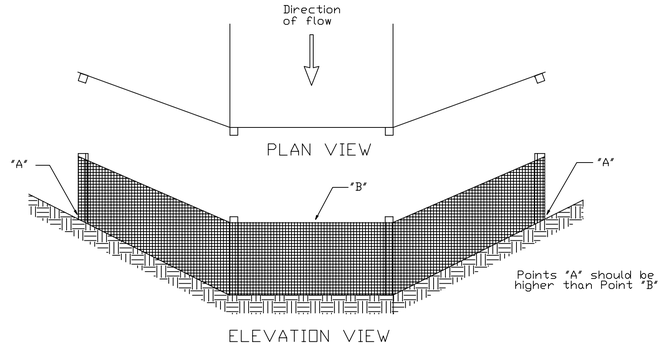
SHEET C-3



SECTION A-A

BALE INLET FILTER 2 C-4 C-4

(N.T.S.)



PLACEMENT AND CONSTRUCTION OF DITCH CHECK FILTER FABRIC FENCE 3 C-4 C-4

(N.T.S.)

NOTES:

BALE PLACEMENT: Bale shall be tightly placed, adjacently, and entrenched 2" to 3" before staking; or a small amount of loose soil shall be lightly compacted along the upstream edge of the bales.

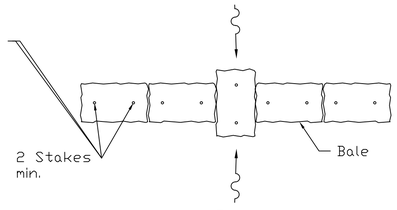
Each bales shall be firmly staked with a minimum of 2 stakes of least 3' in length. Stakes shall be wooden 2"x2", reinforcing bars or fence posts, as approved by the engineer.

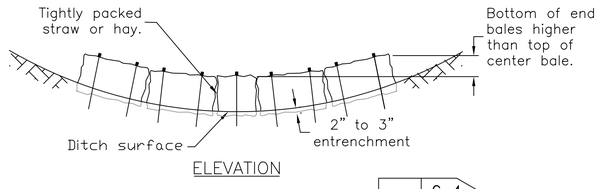
Loose straw or hay shall be scattered for a distance of 10' on the upstream side of each ditch check, and shall be wedged between and under staked bales.

Sediment Control devices shall be installed per the direction of Resident Engineer or site inspector. These measures may be required at the base of both end slopes to protect RTA ditches along the tracks and station platform. Cost to be included with Item TS202, portions of structure removed.

CONSTRUCTION: The bottom of the fabric shall be buried 6" [150] below the ground. The ends of adjacent sections of fence shall be overlapped with the end stake of each section wrapped together prior to installation. The ground elevation of the fence shall be held constant except that the end elevations shall be raised upslope to prevent flow around the end of the fence.

MAINTENANCE: The filter fabric fence shall be maintained to be functional. This shall include removal of trapped sediment and required cleaning, repair, and replacement of the filter fabric.





BALE INLET FILTER 1 C-4 C-4

(N.T.S.)

ROADWAY ESTIMATED QUANTITIES

ITEM	QUANTITY	UNIT	DESCRIPTION
TS 202	1	LS	REMOVAL OF STRUCTURES AND OBSTRUCTIONS
TS 204	320	SY	SUBGRADE COMPACTION
TS 207	100	FT	FILTER FABRIC DITCH CHECK
TS 301	13	CY	ASPHALT CONCRETE BASE
TS 304	39	CY	AGGREGATE BASE
TS 305	51	SY	CONCRETE BASE
TS 407	104	GALL	TACK COAT
TS 408	32	GALL	PRIME COAT
TS 448	7	CY	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG 64-22
TS 448	38	CY	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG 64-22
TS 452	26	SY	NON-REINFORCED CONCRETE PAVEMENT
TS 603	12	FT	18" CONDUIT, TYPE B
TS 604	1	EA	CITY OF CLEVELAND CATCH BASIN CB-1
TS 607	80	FT	FENCE,TYPE CL
TS 608	1445	SF	CONCRETE WALK
TS 608	8	EA	CURB RAMPS, CITY OF CLEVELAND
TS 609	14	FT	CURB, TYPE 2A
TS 609	313	FT	CURB, TYPE 6
TS 609	40	FT	12" CURB
TS 609	27	FT	CURB, TYPE 8 MODIFIED
TS 614	1	LS	MAINTAINING TRAFFIC
TS 622	210	LF	PORTABLE CONCRETE BARRIER, 32"
TS 630	1	EA	REMOVAL OF GROUND MOUNTED SIGN AND REERECTION
TS 632	1	EA	REMOVAL OF PEDESTRIAN SIGNAL AND REERECTION
TS 638	2	EA	WATER VALVE BOX ADJUSTED TO GRADE
TS 642	0.06	MILE	CENTER LINE
TS 642	62	FT	STOP LINE
TS 642	118	FT	CROSSWALK LINE
TS 653	9	CY	TOPSOIL FURNISHED AND PLACED
TS 659	80	SY	SEEDING AND MULCHING

REVISIONS:

DRAWN: HW CHECKED: KS APPROVED: AP DATE: 6-1-2007 JOB NO.:

CENTRAL ENGINEERING, INC.
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13477 PROSPECT ROAD, SUITE 101B
STRONGSVILLE, OHIO 44149

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

SECTIONS
SHEET ON WHICH DETAIL IS CUT

SHEET ON WHICH DETAIL APPEARS
SECTION OR DETAIL NO.

SEDIMENT & EROSION CONTROL DETAILS
ROADWAY QUANTITIES

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

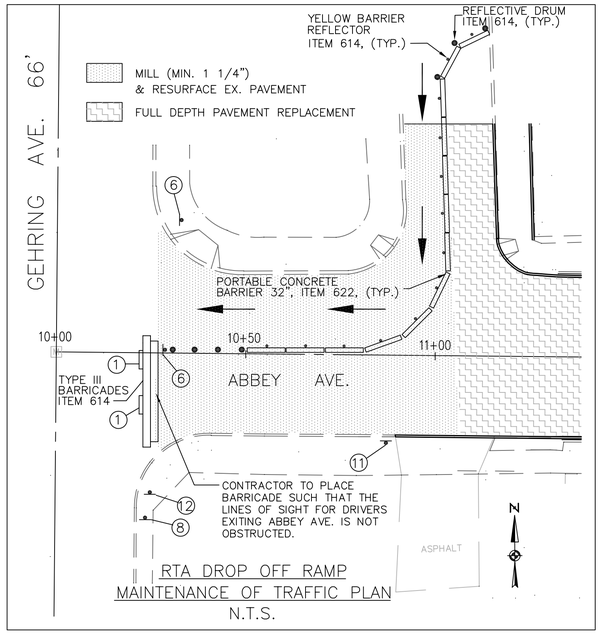
RTA PROJ 29D

BID PAC

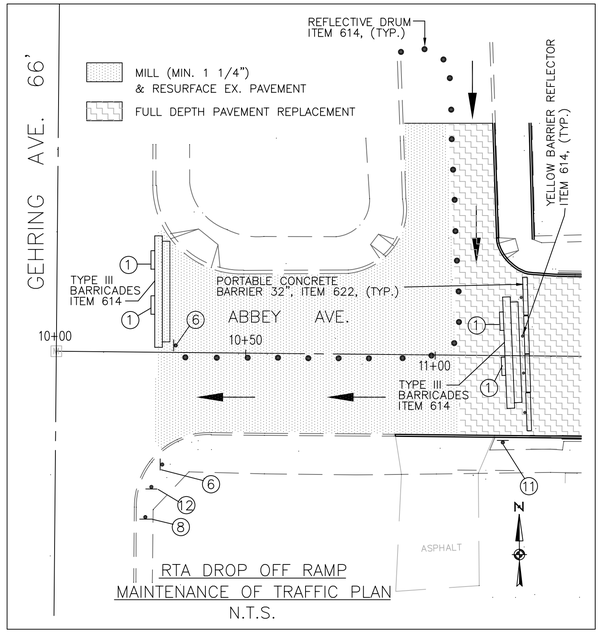
SHEET C-4

Use general.ctb and generalHalf.ctb to plot this drawing

ABBEY-SEDIMENT.dwg

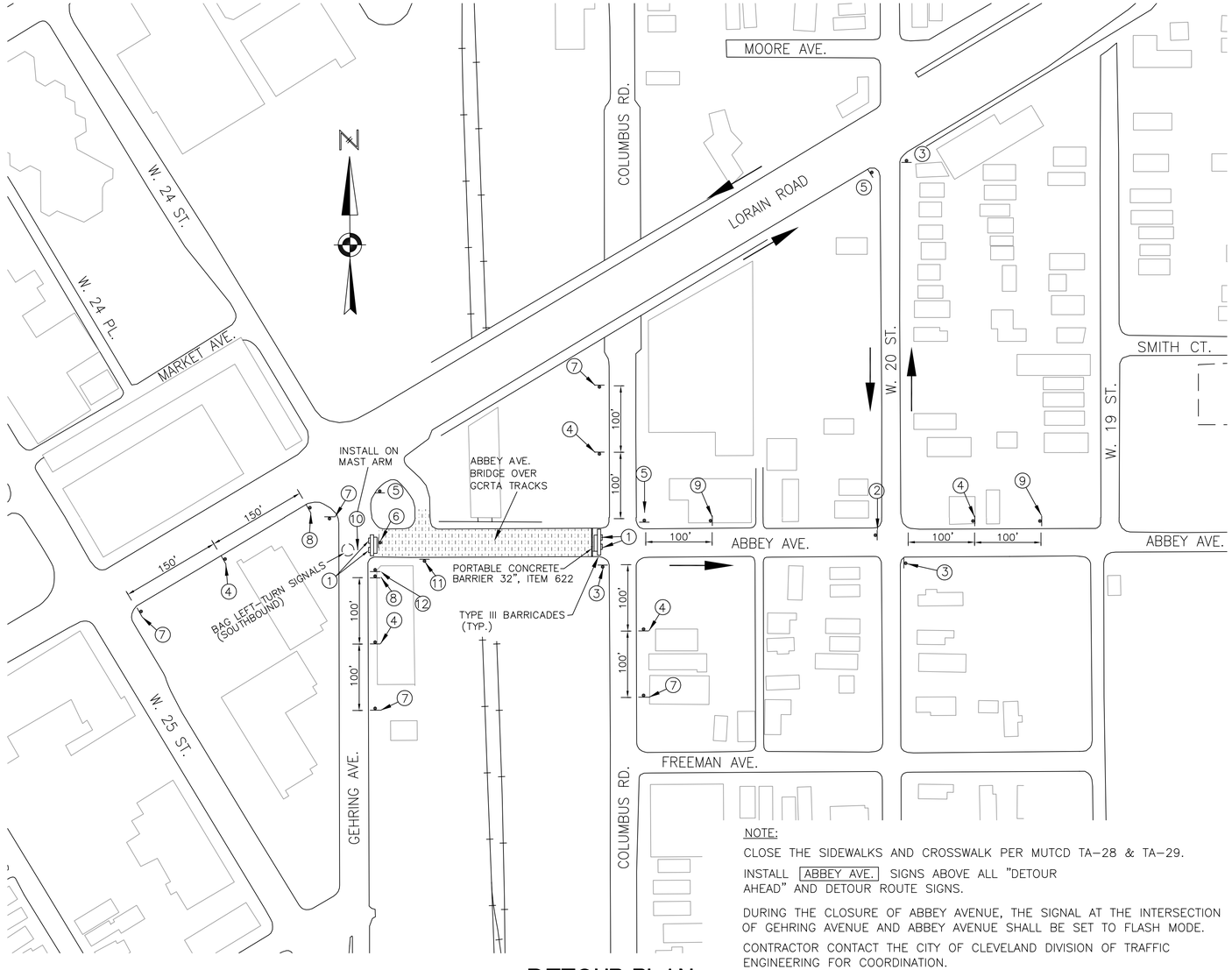


PHASE I



PHASE II

NOTES:
AFTER COMPLETION OF FULL DEPTH PAVT. AREA AND MILLING AND RESURFACING OF SOUTHERN HALF OF ABBEY AVE. (PHASE I), CONTRACTOR SHALL MOVE CONCRETE BARRIER AND MAINTAIN TRAFFIC ON FINISHED PAVEMENT TO COMPLETE MILLING AND RESURFACING (PHASE II).



DETOUR PLAN

N.T.S.

NOTE:

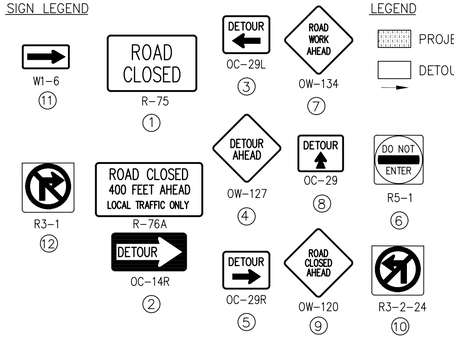
CLOSE THE SIDEWALKS AND CROSSWALK PER MUTCD TA-28 & TA-29.

INSTALL ABBEY AVE. SIGNS ABOVE ALL "DETOUR AHEAD" AND DETOUR ROUTE SIGNS.

DURING THE CLOSURE OF ABBEY AVENUE, THE SIGNAL AT THE INTERSECTION OF GEHRING AVENUE AND ABBEY AVENUE SHALL BE SET TO FLASH MODE.

CONTRACTOR CONTACT THE CITY OF CLEVELAND DIVISION OF TRAFFIC ENGINEERING FOR COORDINATION.

SIGN LEGEND



LEGEND

PROJECT AREA

DETOUR AREA

DETOUR NOTES

TRAFFIC TO GEHRING ST. FROM RTA DROP OFF RAMP SHALL BE MAINTAINED, SEE PLAN THIS SHEET.

MAINTAINING TRAFFIC

ALL CONSTRUCTION TRAFFIC CONTROL DEVICES USED FOR THIS PROJECT SHALL CONFORM TO THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, AND SHALL BE FURNISHED, ERECTED, MAINTAINED AND REMOVED BY THE CONTRACTOR.

DETOUR NOTIFICATION

THE CONTRACTOR SHALL NOTIFY IN WRITING THE FOLLOWING AGENCIES AT LEAST TWO WEEKS IN ADVANCE OF A DETOUR.

CITY OF CLEVELAND DEPARTMENT OF PUBLIC SERVICE

DIVISION OF ENGINEERING AND CONSTRUCTION (216) 664-2391

CITY OF CLEVELAND DEPARTEMENT OF PUBLIC SAFETY

DIVISION OF STREETS	(216) 664-2174
DIVISION OF TRAFFIC ENGINEERING	(216) 664-3194
DIVISION OF FIRE	(216) 664-6370
DIVISION OF POLICE	(216) 623-5188
DIVISION OF EMERGENCY MEDICAL SERVICES	(216) 664-2555
CLEVELAND SCHOOL DISTRICT	(216) 574-8000

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

THE CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL TEMPORARY BUS STOPS WITH RTA. (216) 566-5036

NOTICE OF CLOSURE SIGNS

NOTICE OF CLOSURE SIGNS, AS DETAILED IN THESE PLANS, SHALL BE ERECTED BY THE CONTRACTOR AT LEAST ONE WEEK IN ADVANCE OF THE SCHEDULED CLOSURE. THE SIGNS SHALL BE ERECTED ON THE RIGHT HAND SIDE OF THE ROAD FACING TRAFFIC. THEY SHALL BE PLACED SO AS NOT TO INTERFERE WITH THE VISIBILITY OF ANY OTHER TRAFFIC CONTROL SIGNS.

REVISIONS:

DRAWN: HW
CHECKED: KS
APPROVED: AP
DATE: 6-1-2007
JOB NO.:

CENTRAL ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS
13477 PROSPECT ROAD, SUITE 101B
STRONGSVILLE, OHIO 44149

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

SECTIONS
SHEET ON WHICH DETAIL IS CUT
SHEET ON WHICH DETAIL APPEARS
SECTION OR DETAIL NO.

DETOUR PLAN

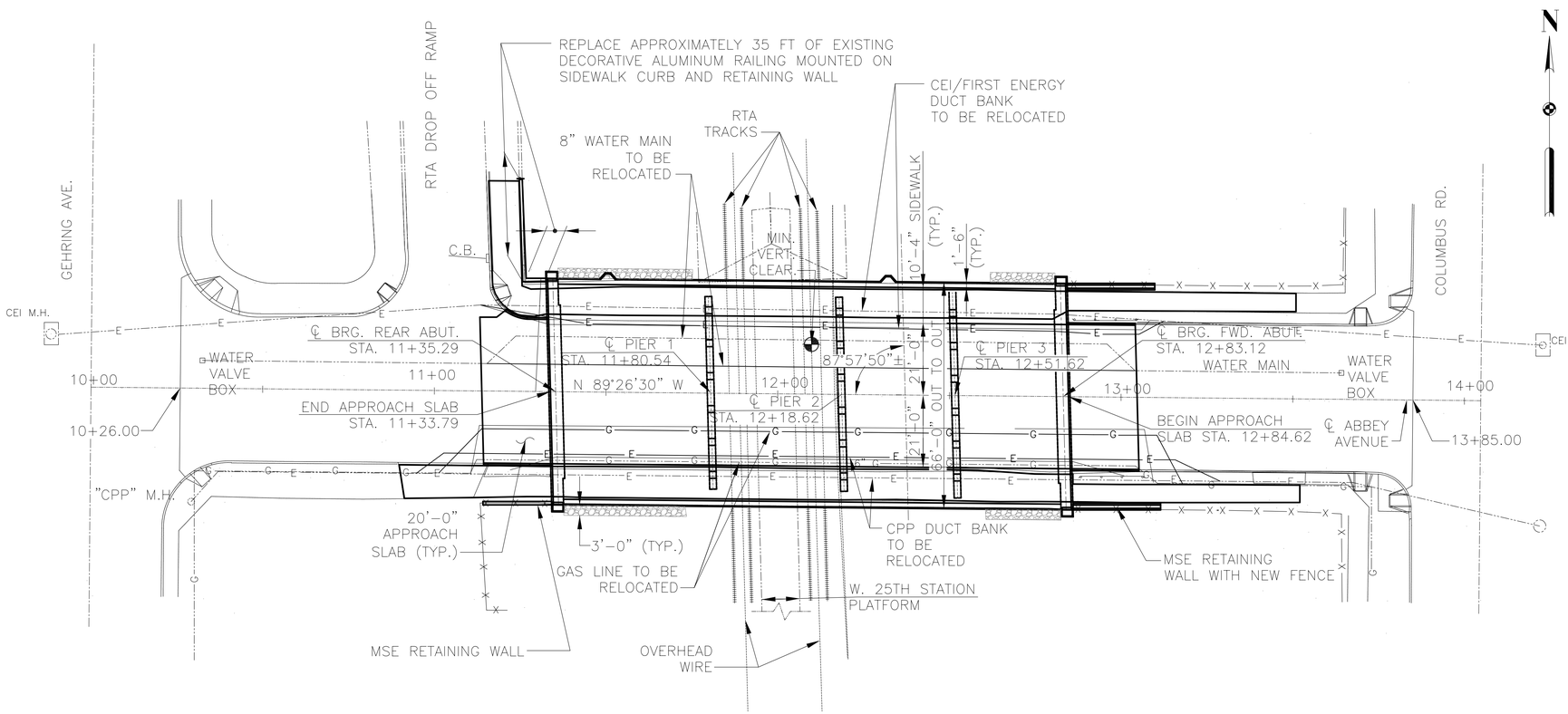
REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET C-5

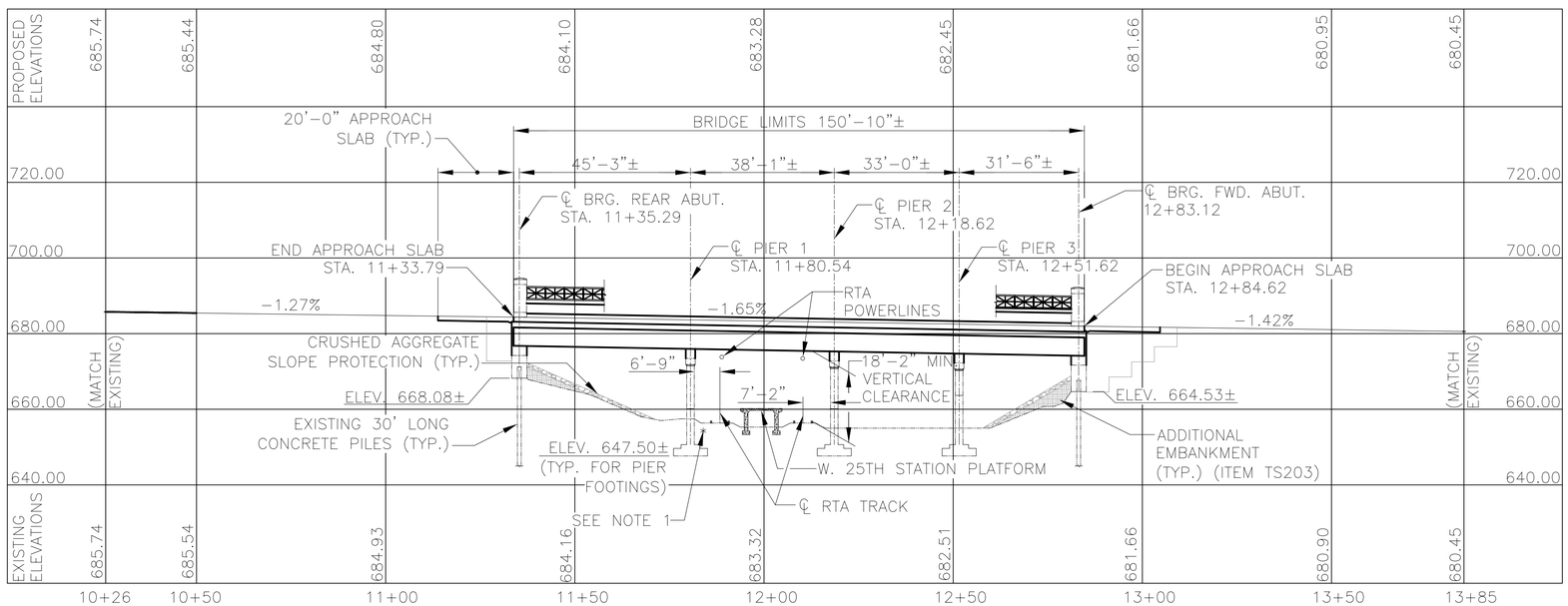
Use general.ctb and generalHalf.ctb to plot this drawing

ABBEY-DETOUR.dwg



PLAN

SCALE: 1"=20'



PROFILE ALONG ℄ ABBEY AVE.

EXISTING STRUCTURE

TYPE: 4 SPAN CONTINUOUS REINFORCED CONCRETE BEAM SUPERSTRUCTURE WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE

SPANS: 45'–3"±, 38'–0"±, 33'–0"±, 31'–6"± MEASURED ALONG ℄ ABBEY AVENUE

ROADWAY: 42'–0" TOE/TOE SIDEWALK

LOADING: 1924 CLEVELAND UNION TERMINAL SPECIFICATIONS FOR VEHICULAR AND LIGHT RAIL

SKEW: 2°–02'–10" RIGHT FORWARD

APPROACH SLABS: NONE

ALIGNMENT: TANGENT

CROWN: 3/16"/FT.

STRUCTURE FILE NUMBER: 1869248

DATE BUILT: 1928

PROPOSED WORK

1. REPLACE EXTERIOR GIRDERS WITH PRECAST CONCRETE GIRDERS
2. REPLACE DECK AND SIDEWALKS
3. REUSE EXISTING DECORATIVE RAILING AND FENCE
4. PATCH AND REPAIR DETERIORATED PIER AND ABUTMENT ELEMENTS AS REQUIRED
5. REPLACE EXISTING WINGWALLS

PROPOSED STRUCTURE

TYPE: 4 SPAN CONTINUOUS REINFORCED CONCRETE BEAM SUPERSTRUCTURE WITH PRECAST CONCRETE FASCIA GIRDERS AND REINFORCED CONCRETE DECK AND SUBSTRUCTURE

SPANS: 45'–3"±, 38'–1"±, 33'–0"±, 31'–6"± MEASURED ALONG ℄ ABBEY AVENUE

ROADWAY: 42'–0" TOE/TOE SIDEWALKS

LOADING: EXISTING SUPERSTRUCTURE HAS BEEN RATED FOR AND NEW GIRDERS DESIGNED FOR HS20, ALTERNATE MILITARY & 60 PSF FUTURE WEARING SURFACE

SKEW: 2°–02'–10" RIGHT FORWARD

APPROACH SLABS: 20'–0" LONG (AS–1–81)

ALIGNMENT: TANGENT

CROWN: 3/16"/FT.

NOTES:

MIN. = MINIMUM
VERT. = VERTICAL

1. POSSIBLE EXISTENCE OF UTILITIES IN TRACK BED, UNKNOWN.

REVISIONS:

DRAWN: GIE
CHECKED: JFM
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

SITE PLAN

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–1

COMPUTED BY : CMM DATE : 11/06
CHECKED BY : JFM DATE : 11/06

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	ABUTS.	PIERS	SUPER	GEN	REF. SHEET NO.	*CONTINGENCY
TS 202	LUMP		PORTIONS OF STRUCTURE REMOVED				LUMP	S-11 S-12 S-13 S-19	
TS 203	65	CU YD	EMBANKMENT					S-17 S-18	65
TS 203	450	CU YD	SELECT GRANULAR BACKFILL				450		
TS 304	10	CU YD	MSE AGGREGATE BASE						10
TS 503	LUMP		COFFERDAMS, CRIBS, AND SHEETING				LUMP		
TS 503	LUMP		UNCLASSIFIED EXCAVATION				LUMP	S-4	
TS 509	113,961	POUND	EPOXY COATED REINFORCING STEEL	6,430	15,238	91,421	872		
TS 510	200	EACH	DOWEL HOLES	92	108				
TS 511	11	CU YD	CLASS C CONCRETE, PIER COLUMNS		11				
TS 511	8	CU YD	CLASS C CONCRETE, RETAINING WALLS				8		
TS 511	141	CU YD	CLASS S CONCRETE, ABUTMENT AND PIER DIAPHRAGMS	76	65				
TS 511	266	CU YD	CLASS S CONCRETE, BRIDGE DECK			266			
TS 511	154	CU YD	CLASS S CONCRETE, BRIDGE SIDEWALK & PARAPET			154			
TS 512	397	SQ YD	SEALING OF CONCRETE SURFACES (NON-EPOXY)			397			
TS 512	3,120	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	169	682	2,204	65	S-26	
TS 513	11	EACH	CROSSFRAMES, CITY OF CLEVELAND DIVISION OF WATER			11			
TS 513	11	EACH	CROSSFRAMES, CLEVELAND PUBLIC POWER			11			
TS 513	LUMP		CROSSFRAMES, FIRST ENERGY			LUMP			
TS 513	LUMP		CROSSFRAMES, DOMINION EAST OHIO GAS			LUMP			
TS 515	16	EACH	PRESTRESSED CONCRETE COMPOSITE BOX BEAM MEMBERS, LEVEL 1, CB17-48			16			
TS 515	8	EACH	STRAIGHT STRAND PRESTRESSED CONCRETE BRIDGE I-BEAM MEMBERS, LEVEL 2, TYPE IV			8			
TS 516	135	FT	INTEGRAL ABUTMENT EXPANSION JOINT SEAL	135					
TS 516	64	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES ONLY (NEOPRENE), BOX BEAM	16	48			S-35	
TS 516	4	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), I BEAM	4				S-34	
TS 516	4	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), ABUTMENT STEM	4				S-34	
TS 517	36	LIN FT	REPLACE DECORATIVE ALUMINUM RAILING			36			
TS 517	292	LIN FT	DECORATIVE-STEEL BRIDGE RAILING-MODIFIED			292			
TS 518	169	CU YD	POROUS BACKFILL WITH FILTER FABRIC	169					
TS 518	211	FT	6" PERFORATED CORRUGATED PLASTIC PIPE, 707.33, TYPE SP	140			71		
TS 518	50	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS, 707.33, TYPE S	50					
TS 519	707	SQ FT	PATCHING CONCRETE STRUCTURES, EXISTING BEAMS			589			118
TS 519	427	SQ FT	PATCHING CONCRETE STRUCTURES, SUBSTRUCTURE	163	192				72
TS 526	193	SQ YD	REINFORCED CONCRETE APPROACH SLABS (T=13")	193				S-36	
TS 530	397	SQ FT	COMPOSITE FIBER WRAP			397			
TS 601	485	SQ YD	CRUSHED AGGREGATE SLOPE PROTECTION	485					
TS 610	810	SQ FT	MSE RETAINING WALLS				810		
TS 690	LUMP		ASBESTOS TESTING				LUMP		
TS 690	LUMP		ASBESTOS ABATEMENT						LUMP

* TO BE USED AS DIRECTED BY THE ENGINEER

REVISIONS:

DRAWN: CMM
CHECKED: JFM
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

ESTIMATED QUANTITIES-1

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-2

6/6/2007 12:43 PM

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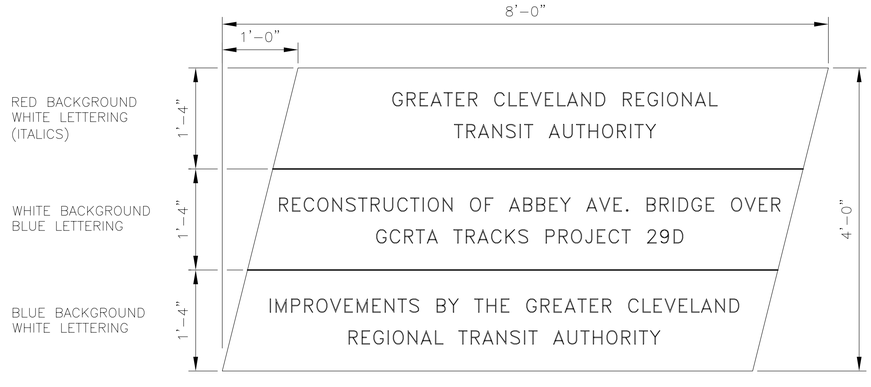
COMPUTED BY : CMM DATE : 11/06
CHECKED BY : JFM DATE : 11/06

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	ABUTS.	PIERS	SUPER	GEN	REF. SHEET NO.	*CONTINGENCY
			WATER WORK						
TS 638	19	LIN FT	8" WATERMAIN, DUCTILE IRON PIPE WITH BOLTLESS RESTRAINED JOINTS				19		
			AND FITTINGS, ANSI CLASS 56						
TS 638	27	LIN FT	12" WATERMAIN, DUCTILE IRON PIPE WITH BOLTLESS RESTRAINED JOINTS				27		
			AND FITTINGS, ANSI CLASS 56						
TS 638	154	LIN FT	12" WATERMAIN, GALVANIZED STEEL PIPE ASTM A53, GRADE B				154		
TS 638	1	EACH	2" AIR RELIEF VALVE WITH VALVE BOX, COMPLETE				1		
TS 638	2	EACH	8" GATE VALVE WITH VALVE BOX, COMPLETE				2		
			POWER WORK						
TS 625	40	LIN FT	CONDUIT MISC.: NON-REINFORCED, CONCRETE ENCASED, 4-5" PVC CONDUIT BANK	40					
TS 625	145	LIN FT	CONDUIT MISC.: NON-ENCASED, STRUCTURE SUPPORTED, 4-5" FIBERGLASS			145			
			REINFORCED EPOXY CONDUIT BANK						
			ROADWAY LIGHTING						
			FOR QUANTITIES SEE SHEET U-29						

* TO BE USED AS DIRECTED BY THE ENGINEER



LETTERING: FUTURA BOLD ITALIC (TOP)
FUTURA BOLD (CENTER)
FUTURA DEMI BOLD (BOTTOM)

PROJECT SIGN

REVISIONS:

DRAWN: CMM
CHECKED: JFM
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

ESTIMATED QUANTITIES-2

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-3

6/6/2007 12:43 PM
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REFERENCES

REFERENCE SHALL BE MADE TO THE FOLLOWING OHIO DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS:

AS-1-81	DATED	07-19-02
PSBD-1-93	DATED	04-20-07
VPF-1-90	DATED	07-19-02
PSID-1-99	DATED	04-20-07

AND TO SUPPLEMENTAL SPECIFICATION: 843 DATED 04-18-03

DESIGN SPECIFICATIONS

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS 17th ADDITION, 2002 AND THE OHIO DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL.

DESIGN LOADING
HS20 AND THE ALTERNATIVE MILITARY LOADING,
FUTURE WEARING SURFACE OF 60 LBS/FT^2.

DESIGN DATA
CONCRETE CLASS C – COMPRESSIVE STRENGTH 4000 PSI (SUBSTRUCTURE)
CONCRETE CLASS S – COMPRESSIVE STRENGTH 4500 PSI (SUPERSTRUCTURE)
REINFORCING STEEL – ASTM A615 OR A996 GRADE 60 MINIMUM YIELD STRENGTH 60,000 PSI

CONCRETE FOR I BEAM – COMPRESSIVE STRENGTH (FINAL) – 5500 PSI
COMPRESSIVE STRENGTH (RELEASE) – 4000 PSI

CONCRETE FOR BOX BEAMS – COMPRESSIVE STRENGTH (FINAL) – 7000 PSI
COMPRESSIVE STRENGTH (RELEASE) – 5000 PSI

PRESTRESSING STRANDS – AREA = 0.153 IN^2
ULTIMATE STRENGTH = 270 KSI
INITIAL STRESS = 202.5 KSI
(LOW RELAXATION STRANDS)

DECK PROTECTION METHOD

EPOXY COATED REINFORCING STEEL, 2½" CONCRETE COVER.

MONOLITHIC WEARING SURFACE

MONOLITHIC WEARING SURFACE IS ASSUMED, FOR DESIGN PURPOSES, TO BE 1 INCH THICK.

APPROVALS

ALL ITEMS IN THE PLANS OR SPECIAL PROVISIONS WHICH REQUIRE APPROVAL BY GCRTA, OR THE OWNER SHALL BE PROCESSED THROUGH THE PROJECT ENGINEER.

CONSTRUCTION CLEARANCE

A CONSTRUCTION CLEARANCE OF 6'-6" HORIZONTALLY FROM THE CENTER OF THE TRACKS AND 16'-0" VERTICALLY FROM A POINT LEVEL WITH THE TOP OF THE HIGH RAIL SHALL BE MAINTAINED AT ALL TIMES.

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK, BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05 AND 105.02.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PRE BID EXAMINATION OF THE EXISTING STRUCTURES BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

ORIGINAL EXISTING STRUCTURE PLANS MAY BE REVIEWED AT THE OFFICES OF THE GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY, 1240 W. 6TH STREET, CLEVELAND OHIO 44113.

FIELD RECORDS

THE CONTRACTOR SHALL MAINTAIN A MARKED UP SET OF PLANS IN THE FIELD, RECORDING AS BUILT CONDITIONS. WHERE A CHANGE ORDER OR ADDITIONAL DRAWINGS OR SKETCHES ARE ISSUED, THEY SHOULD BE CROSS REFERENCED TO THE FIELD SET AND MAINTAINED WITH THAT SET.

TS 202 –PORTIONS OF STRUCTURE REMOVED

THIS WORK SHALL CONSIST OF THE REMOVAL AND DISPOSAL OF PORTIONS OF THE EXISTING STRUCTURE, EXCLUDING PORTIONS OF THE STRUCTURE TO BE REMOVED UNDER OTHER ITEMS OF THE CONTRACT, IN ACCORDANCE WITH THE CONTRACT DRAWINGS AND ODOT CMS ITEM 202 WITH THE FOLLOWING ADDITIONS AND/OR MODIFICATIONS.

THIS ITEM SHALL INCLUDE, BUT NOT BE LIMITED TO:

1. THE COMPLETE REMOVAL OF THE CONCRETE DECK, INCLUDING SIDEWALKS, RAILING, ASPHALT OVERLAY, BRICK PAVERS, CONCRETE BASE AND WATERPROOFING MEMBRANE.
2. REMOVAL OF THE EXTERIOR BEAMS AND UTILITY CHAMBER SLAB.
3. REMOVAL OF EXISTING UTILITIES INCLUDING THOSE SUPPORTED FROM THE BRIDGE AND EMBEDDED IN THE EXISTING BRIDGE BEAMS BEING REMOVED. THIS INCLUDES THE CEI/FIRST ENERGY MANHOLE LOCATED ADJACENT TO THE REAR ABUTMENT.
4. REMOVAL OF THE EXISTING CRIB WALLS AND RETAINING WALL.
5. REMOVAL OF PORTIONS OF THE ABUTMENTS AND PIERS AS NOTED IN THE PLANS.
6. REMOVAL OF ANY DEBRIS AND CONCRETE SLABS ALONG THE END SLOPES BENEATH THE BRIDGE.

PRIOR TO THE REMOVALS, THE CONTRACTOR SHALL SUBMIT PLANS FOR THE PROTECTION OF TRAFFIC (VEHICULAR, PEDESTRIAN OR RAILROAD) ADJACENT TO AND/OR UNDER THE STRUCTURE TO THE GCRTA FOR APPROVAL. THESE PLANS SHALL ALSO INCLUDE PROVISIONS FOR ANY DEVICES AND STRUCTURES THAT MAY BE NECESSARY TO PROTECT THE W25th STREET STATION AND LOADING PLATFORM. THE PLANS SHALL BE PREPARED BY A REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OHIO AND SHALL BEAR HIS SEAL. APPROVAL SHALL NOT RELIEVE THE CONTRACTOR OF HIS FULL RESPONSIBILITY FOR SAFELY EXECUTING WORK. ANY DAMAGE TO THE TRACK STRUCTURE OR STATION AS DETERMINED BY THE GCRTA, WILL BE REPAIRED TO THE SATISFACTION OF THE GCRTA BY THE CONTRACTOR AT HIS EXPENSE.

THE DEMOLITION PROCEDURES SHALL NOT PERMIT REMOVED CONCRETE AND DEBRIS TO DROP TO THE GROUND WITHIN THE GCRTA RIGHT OF WAY. PLANS SHALL INCLUDE INFORMATION AS TO EQUIPMENT AND MATERIALS TO BE USED, PERSONNEL, SUPERVISION, HOURS OF OPERATION AND DURATION OF THE JOB. REMOVAL PLANS SHALL PROVIDE FOR PROTECTION OF THE GCRTA TRACKS DURING DEMOLITION AND CONSTRUCTION. TO PREVENT DAMAGE TO THE TRACK STRUCTURE, THE CONTRACTOR SHALL USE RUBBER WHEELED EQUIPMENT WHEN WORKING AROUND GCRTA TRACKS. IF THE TRACK STRUCTURE IS PROPERLY PROTECTED, STEEL TRACKED EQUIPMENT MAYBE USED WITH THE APPROVAL OF THE ENGINEER.

THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SUPPORTS AS REQUIRED UNDER PORTIONS OF THE EXISTING STRUCTURE TO PERMIT NECESSARY DEMOLITION WORK WHILE MAINTAINING A STABLE STRUCTURE. THE CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORTS, AT HIS EXPENSE, WHEN IN THE OPINION OF THE ENGINEER THEY ARE REQUIRED. THE TEMPORARY STRUCTURE FOR PROTECTION OF GCRTA TRACKS SHALL MAINTAIN 16'-0" MINIMUM VERTICAL CLEARANCE AND 6'-6" MINIMUM HORIZONTAL CLEARANCE FROM CENTERLINE OF TRACK.

ALL PROTECTIVE STRUCTURES AND TEMPORARY SUPPORTS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR WHEN THE CONSTRUCTION IS COMPLETE.

BASIS OF PAYMENT:

PAYMENT FOR THE ITEMS REMOVED AND DISPOSED OF WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID, WHICH PRICE SHALL BE FULL COMPENSATION FOR REMOVALS AND STORAGE OR DISPOSAL OR SUCH ITEMS, INCLUDING EXCAVATION AND BACKFILL INCIDENTAL TO THEIR REMOVAL. ALL REMOVAL ITEMS NOT DESIGNATED FOR REUSE SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF ACCORDANCE WITH CITY, STATE AND FEDERAL REGULATIONS AND SHALL BE INCLUDED IN THE PRICE FOR THIS ITEM.

PAYMENT FOR PROTECTION OF TRAFFIC, W25th STREET STATION, TEMPORARY SUPPORTS AND STRUCTURE REMOVALS SHALL BE INCLUDED WITH ITEM TS 202, PORTIONS OF STRUCTURE REMOVED.

ITEM TS 503, UNCLASSIFIED EXCAVATION

UNCLASSIFIED EXCAVATION SHALL BE IN ACCORDANCE WITH ITEM 503 EXCEPT THAT THE BACKFILL MATERIAL BEHIND THE ABUTMENTS SHALL BE C.M.S. 304 MATERIAL PLACED IN 6 INCH LIFTS. THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY TO PERFORM COMPACTION TESTS.

REVISIONS:

DRAWN: CMM
CHECKED: RHW
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

RTA
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

STRUCTURE GENERAL NOTES

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-4

6/6/2007 12:38 PM
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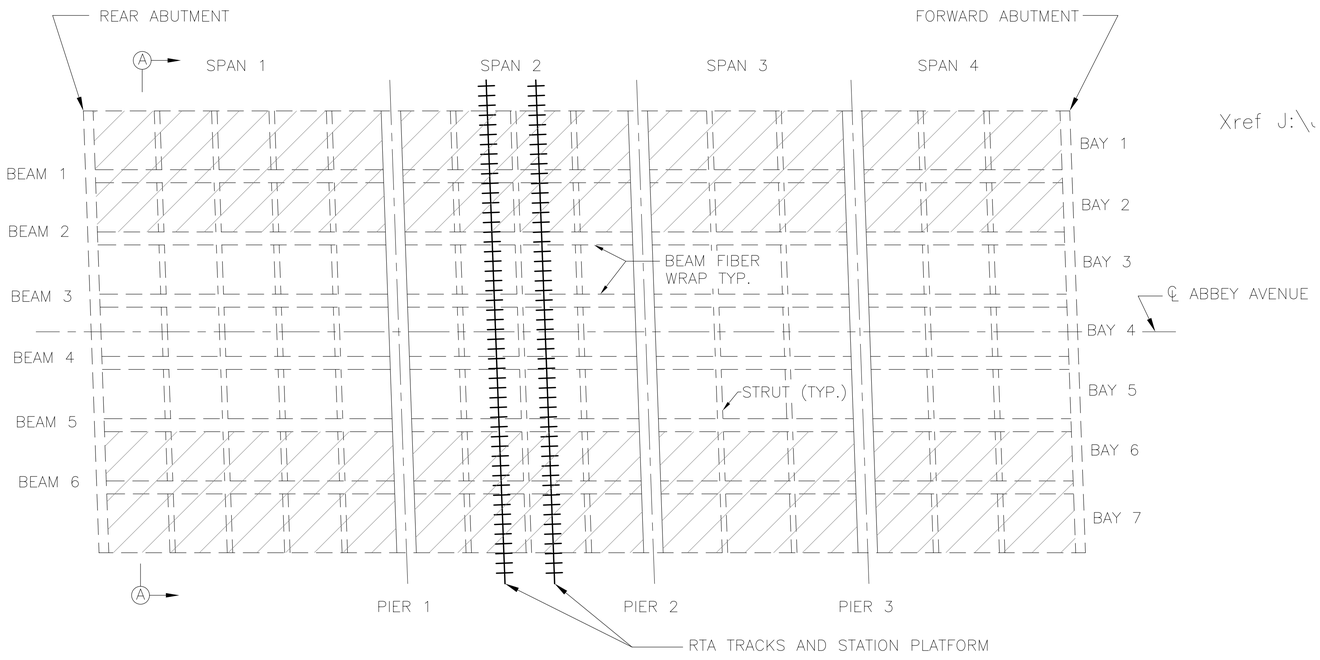

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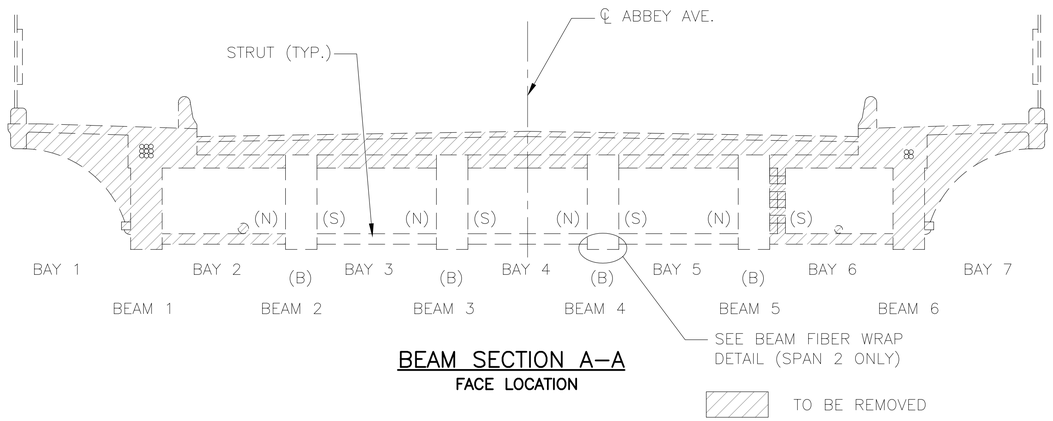
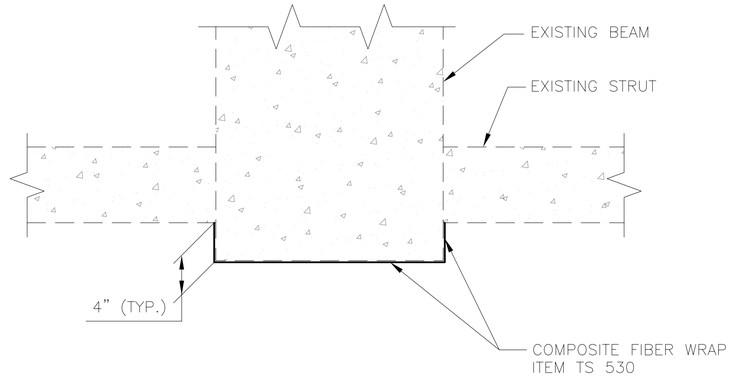
DECK PLAN
PATCH LOCATION



BEAM SECTION A–A
FACE LOCATION



BEAM FIBER WRAP TYPICAL SECTION
BEAMS 2,3,4 & 5

NOTES:

1. BEAM POP OUTS:
MINOR POP OUTS ALONG BOTTOM OF BEAM DUE TO INSUFFICIENT COVER OVER STIRRUPS AND EXPOSED ANGLES THAT WERE USED AS REINFORCING CHAIRS WILL NOT BE PATCHED. REMOVE ALL LOOSE CONCRETE TO SATISFACTION OF ENGINEER. COST OF REMOVAL IS INCIDENTAL TO ITEM TS–519. AREAS WILL BE COATED AND SEALED PER TS 512, SEE SHEET S–26. FOR SPAN 2 BEAMS SEE SPECIAL PROVISION TS 530.

2. STRUT REPAIR:
MINOR POP OUTS ALONG BOTTOM OF STRUTS DUE TO INSUFFICIENT COVER OVER STIRRUPS WILL NOT BE PATCHED. REMOVE ALL LOOSE CONCRETE TO SATISFACTION OF ENGINEER. COST OF REMOVAL IS INCDENTAL TO ITEM TS–519. AREAS WILL BE COATED AND SEALED PER TS 512, SEE SHEET S–26.

3. THE ESTIMATED QUANTITY FOR ITEM TS 519 – PATCHING OF CONCRETE STRUCTURES, HAS BEEN INCREASED 20% OVER FIELD MEASURED AREAS. FINAL AREAS TO BE REPAIRED WILL BE APPROVED BY THE ENGINEER AT THE TIME OF CONSTRUCTION.

BEAM CONCRETE PATCH QUANTITIES

	SPAN 1			SPAN 2			SPAN 3			SPAN 4			
BEAM	NORTH (N)	BOTTOM (B)	SOUTH (S)	NORTH (N)	BOTTOM (B)	SOUTH (S)	NORTH (N)	BOTTOM (B)	SOUTH (S)	NORTH (N)	BOTTOM (B)	SOUTH (S)	TOTAL
	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.
1	----	----	----	----	----	----	----	----	----	----	----	----	REMOVE
2	*35	4	3	*28	38	5	*24	44	16	*24	0	4	225
3	7	0	1	2	9	0	3	17	14	3	4	3	63
4	3	0	5	1	12	0	11	30	11	9	16	12	110
5	1	0	*35	0	30	*28	14	9	*24	4	22	*24	191
6	----	----	----	----	----	----	----	----	----	----	----	----	REMOVE
TOTAL	46	4	44	31	89	33	52	100	65	40	42	43	589
									** ADJUSTED TOTAL				707

* VALUE SHOWN FOR BEAM 2 (NORTH FACE) AND BEAM 5 (SOUTH FACE) ARE APPROXIMATED QUANTITIES DUE TO INACCESSIBLITY OF EXISTING UTILITY CHAMBERS. A CONTINGENCY VALUE OF 15% OF THE SURFACE AREA HAS BEEN INCLUDED.

** SEE NOTE 3.

REVISIONS:

DRAWN: CMM
CHECKED: JAD
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

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CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

BEAM CONCRETE PATCH QUANTITIES

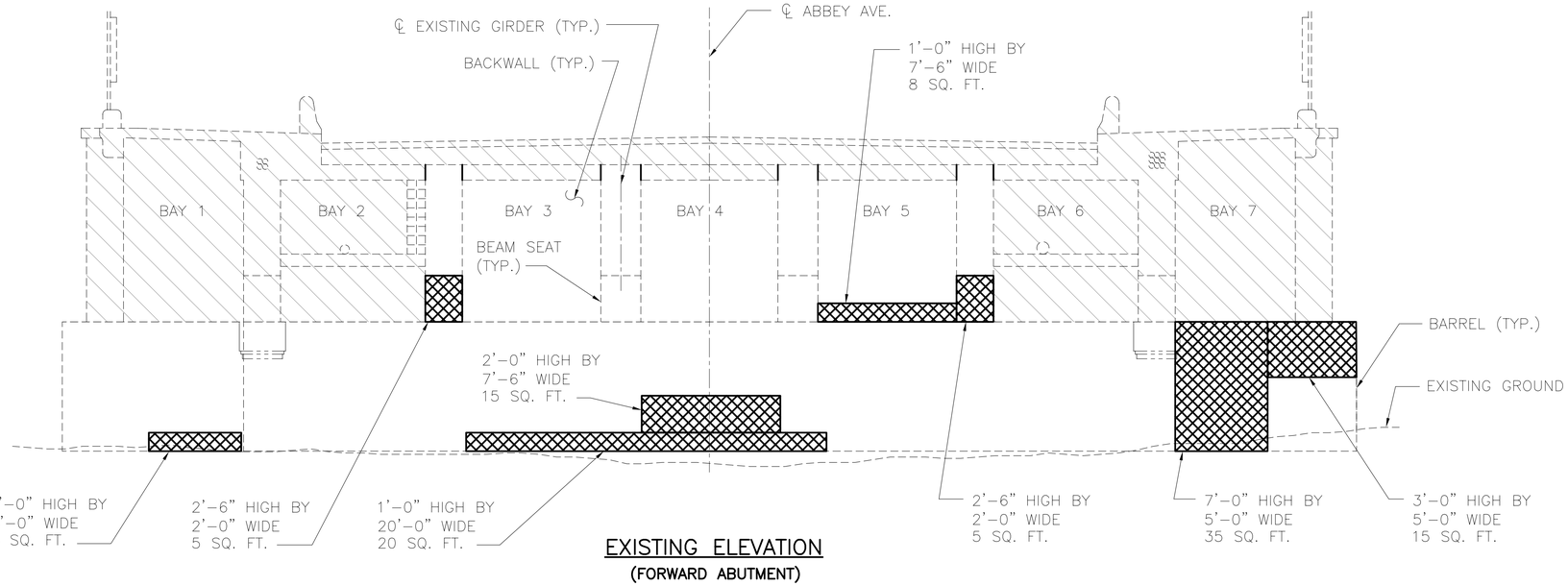
REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–5

6/6/2007 12:32 PM

M:\JOBS\42374\TECHPROD\BRIDGE\Final\Drawings\Beam_Repair.dwg



EXISTING ELEVATION
(FORWARD ABUTMENT)

NOTES:

1. THE ESTIMATED QUANTITY FOR ITEM TS 519 – PATCHING OF CONCRETE STRUCTURES, HAS BEEN INCREASED 20% OVER FIELD MEASURED AREAS. FINAL AREAS TO BE REPAIRED WILL BE APPROVED BY THE ENGINEER AT THE TIME OF CONSTRUCTION.
2. FOR PORTIONS OF STRUCTURE REMOVED NOTE AND EXISTING STRUCTURE VERIFICATION NOTE, SEE STRUCTURE GENERAL NOTES SHEET S–4.
3. MINOR POP OUTS ALONG ABUTMENT FACES DUE TO INSUFFICIENT COVER OVER MISC. REBAR WILL NOT BE PATCHED. REMOVE ALL LOOSE CONCRETE TO SATISFACTION OF ENGINEER. COST OF REMOVAL IS INCIDENTAL TO ITEM TS 519. AREAS WILL BE COATED AND SEALED PER TS 512.

LEGEND:

LIMITS OF REMOVAL

LIMITS OF PATCHING

FORWARD ABUTMENT CONCRETE PATCH QUANTITIES				
	BACKWALL	BARREL	BEAM SEAT	TOTAL
	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.
BAY 1	––	5	––	5
BAY 2	––	0	0	0
BAY 3	0	0	5	5
BAY 4	0	35	0	35
BAY 5	8	0	0	8
BAY 6	––	0	5	5
BAY 7	––	50	––	50
TOTAL	8	90	10	108
		* ADJUSTED TOTAL		130

* SEE NOTE – 1.

REVISIONS:

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CHECKED: JAD
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

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FORWARD ABUTMENT REPAIR CONCRETE PATCH

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–6

6/6/2007 12:25 PM
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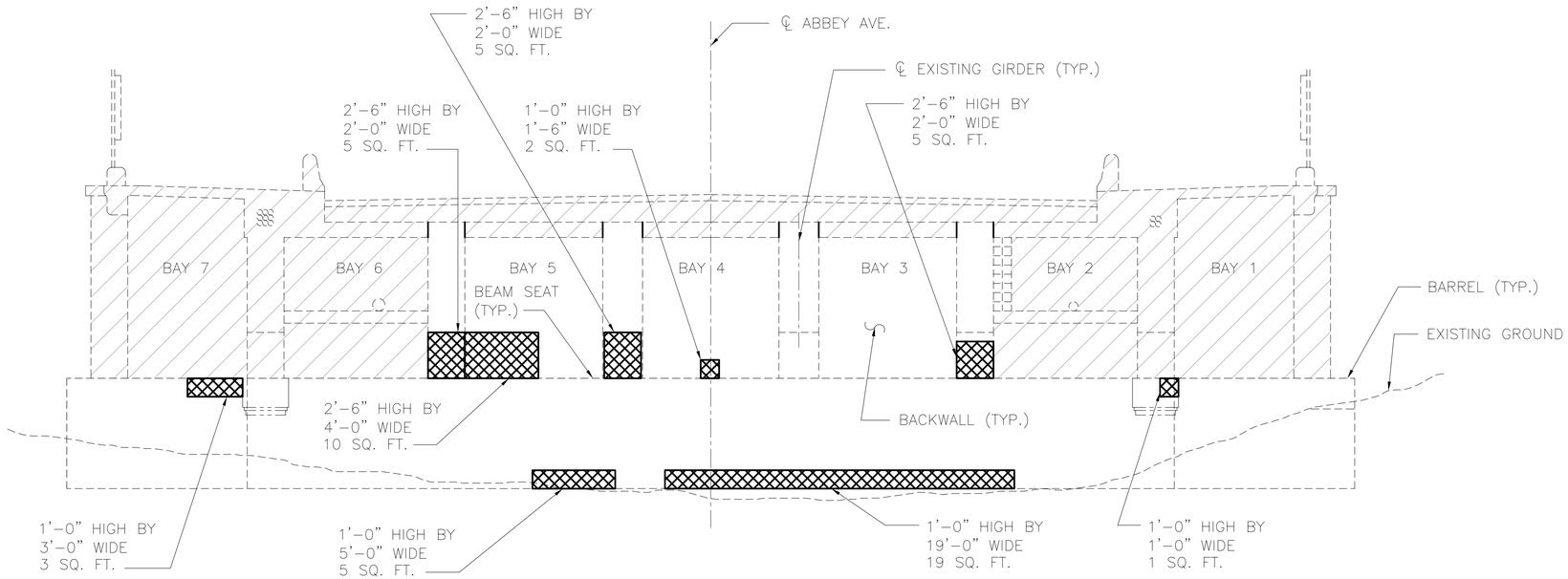

EXISTING ELEVATION
(REAR ABUTMENT)

REAR ABUTMENT CONCRETE PATCH QUANTITIES				
	BACKWALL	BARREL	BEAM SEAT	TOTAL
	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.
BAY 1	––	0	––	0
BAY 2	––	1	––	1
BAY 3	0	19	5	24
BAY 4	2	0	0	2
BAY 5	10	5	5	20
BAY 6	––	0	5	5
BAY 7	––	3	––	3
TOTAL	12	28	15	55
		* ADJUSTED TOTAL		66

* SEE NOTE – 1.

NOTES:

1. THE ESTIMATED QUANTITY FOR ITEM TS 519 – PATCHING OF CONCRETE STRUCTURE, HAS BEEN INCREASED 20% OVER FIELD MEASURED AREAS. FINAL AREAS TO BE REPAIRED WILL BE APPROVED BY THE ENGINEER AT THE TIME OF CONSTRUCTION.
2. FOR PORTIONS OF STRUCTURE REMOVED NOTE AND EXISTING STRUCTURE VERIFICATION NOTE, SEE STRUCTURE GENERAL NOTES SHEET S–4.
3. MINOR POP OUTS ALONG ABUTMENT FACES DUE TO INSUFFICIENT COVER OVER MISC. REBAR WILL NOT BE PATCHED. REMOVE ALL LOOSE CONCRETE TO SATISFACTION OF ENGINEER. COST OF REMOVAL IS INCIDENTAL TO ITEM TS 519. AREAS WILL BE COATED AND SEALED PER TS 512.

LEGEND:

LIMITS OF REMOVAL

LIMITS OF PATCHING

REVISIONS:

DRAWN: CM
CHECKED: JAD
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

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REAR ABUTMENT REPAIR CONCRETE PATCH

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–7

6/6/2007 12:25 PM

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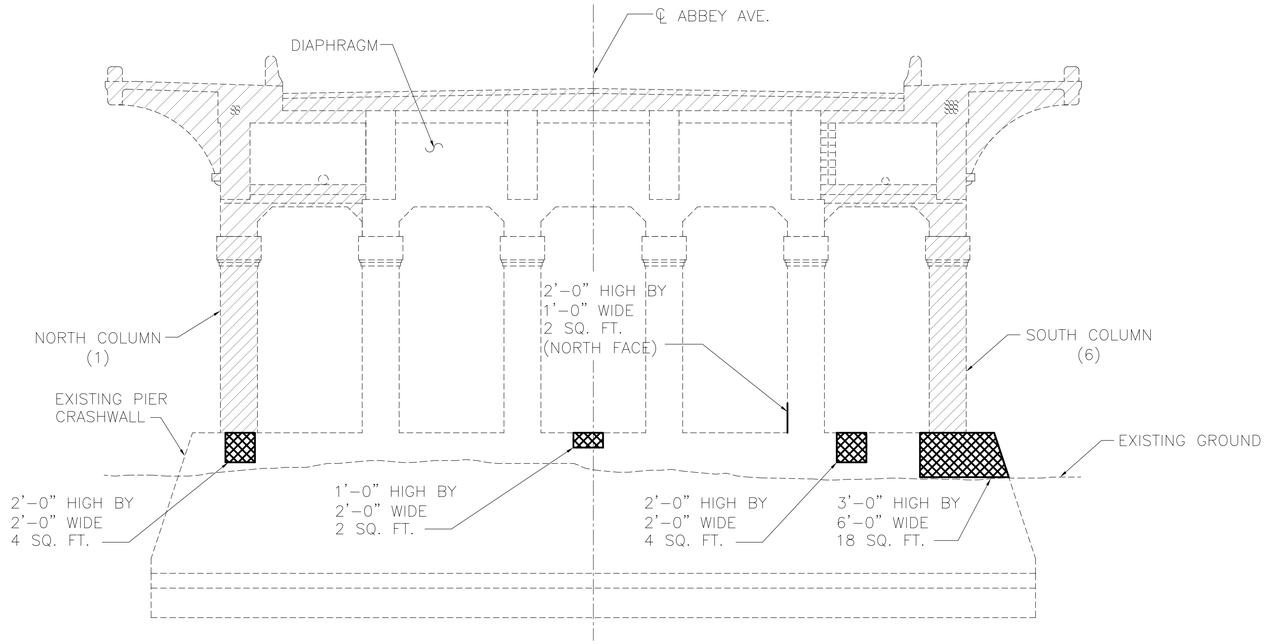


PIER 1 CONCRETE REPAIR
(WEST FACE)

NOTES:

1. PIER POP OUT:
   MINOR POP OUTS ALONG PIER FACES DUE TO INSUFFICIENT COVER OVER MISC. REBAR WILL NOT BE PATCHED. REMOVE ALL LOOSE CONCRETE TO SATISFACTION OF ENGINEER. COST OF REMOVAL IS INCIDENTAL TO ITEM TS 519. AREAS WILL BE COATED AND SEALED PER TS 512.

2. THE ESTIMATED QUANTITY FOR ITEM TS 519 – PATCHING OF CONCRETE STRUCTURE, HAS BEEN INCREASED 20% OVER FIELD MEASURED AREAS. FINAL AREAS TO BE REPAIRED WILL BE APPROVED BY THE ENGINEER AT THE TIME OF CONSTRUCTION.

LEGEND:

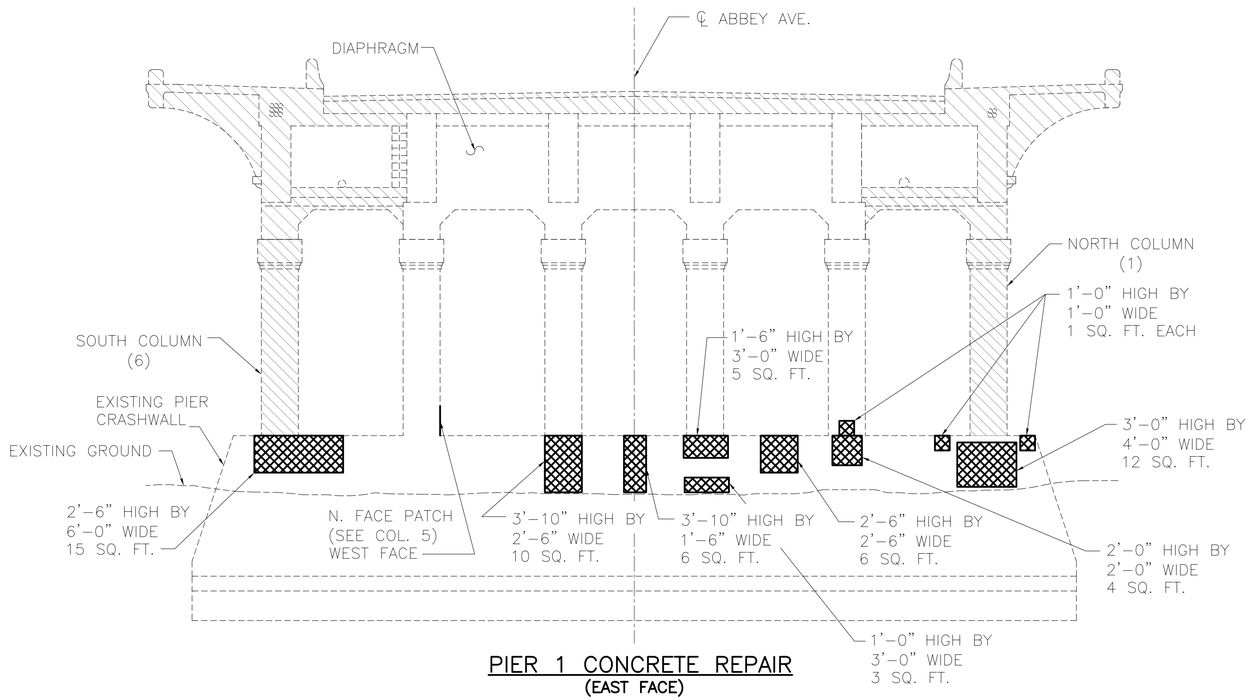
LIMITS OF REMOVAL

LIMITS OF PATCHING

PIER 1 CONCRETE PATCH QUANTITIES

	DIAPHRAM	COLUMN						CRASHWALL	TOTAL
FACE	SQ. FT.	SQ. FT.						SQ. FT.	SQ. FT.
		1	2	3	4	5	6		
NORTH	0	–	0	0	0	2	–	0	2
SOUTH	0	–	0	0	0	0	–	0	0
EAST	0	–	1	0	0	0	–	63	64
WEST	0	–	0	0	0	0	–	28	28
TOTAL	0	–	1	0	0	2	–	91	94
		* ADJUSTED TOTAL							113

* SEE NOTE – 2.



PIER 1 CONCRETE REPAIR
(EAST FACE)

REVISIONS:

DRAWN: CMM
CHECKED: JAD
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
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RTA
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CONCRETE REPAIR
PIER 1

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–8

6/6/2007 12:40 PM
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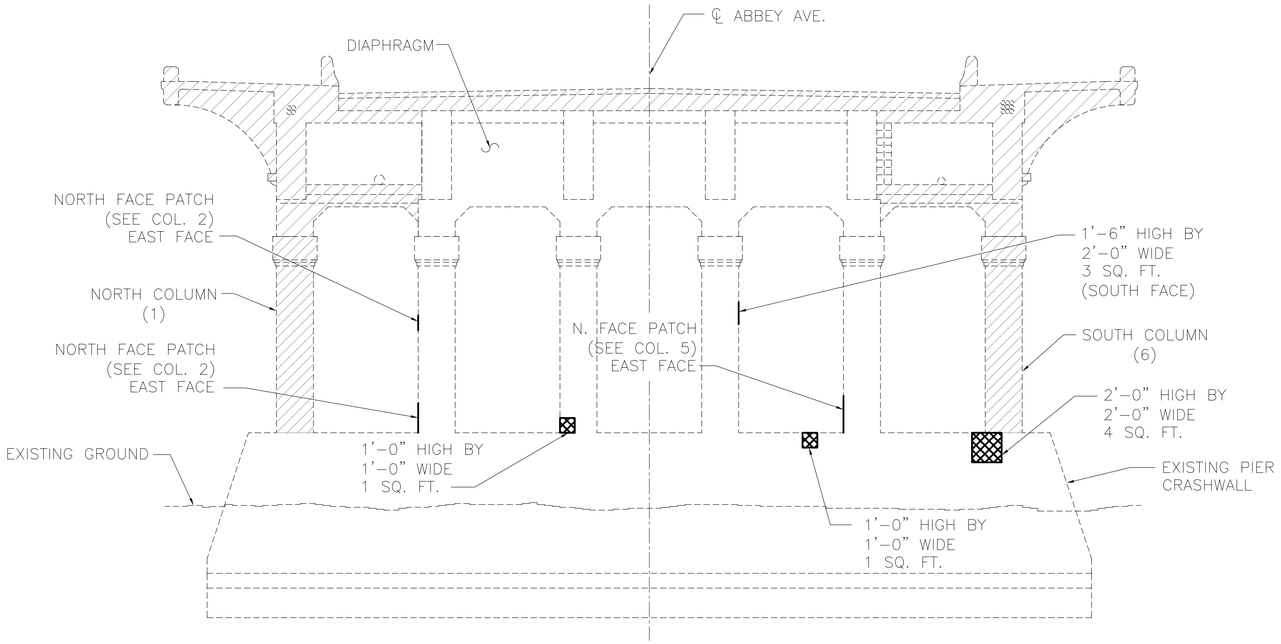
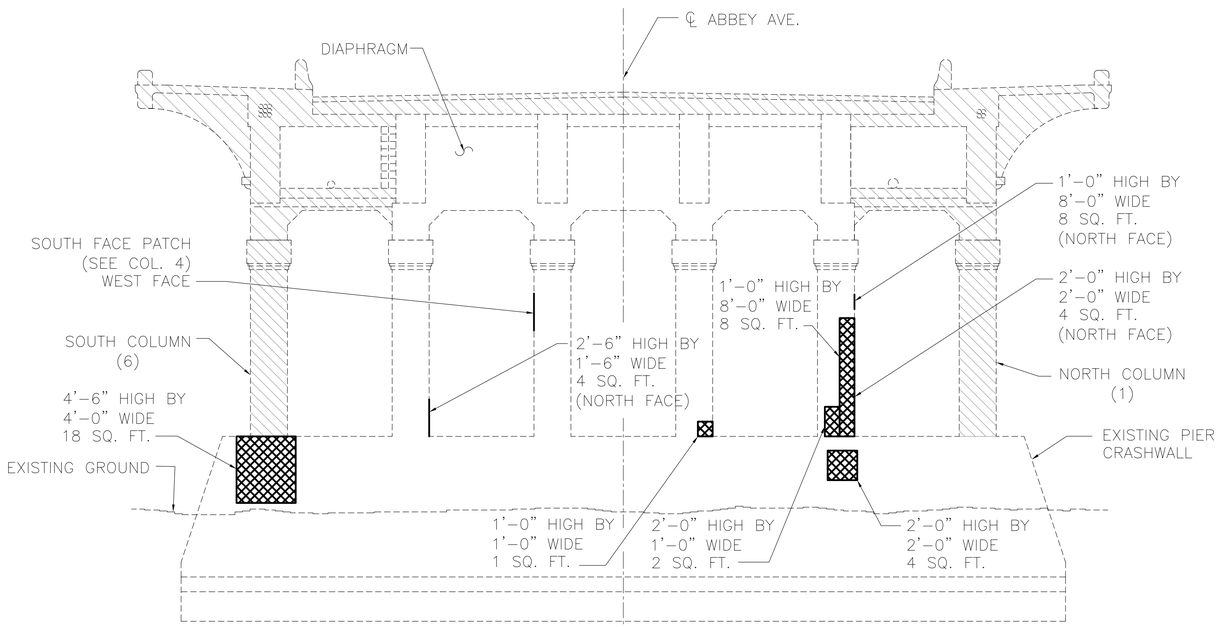


PIER 2 CONCRETE REPAIR
(WEST FACE)



PIER 2 CONCRETE REPAIR
(EAST FACE)

NOTES:

1. PIER POP OUT:
   MINOR POP OUTS ALONG PIER FACES DUE TO INSUFFICIENT COVER OVER MISC. REBAR WILL NOT BE PATCHED. REMOVE ALL LOOSE CONCRETE TO SATISFACTION OF ENGINEER. COST OF REMOVAL IS INCIDENTAL TO ITEM TS 519. AREAS WILL BE COATED AND SEALED PER TS 512.

2. THE ESTIMATED QUANTITY FOR ITEM TS 519 – PATCHING OF CONCRETE STRUCTURE, HAS BEEN INCREASED 20% OVER FIELD MEASURED AREAS. FINAL AREAS TO BE REPAIRED WILL BE APPROVED BY THE ENGINEER AT THE TIME OF CONSTRUCTION.

LEGEND:

LIMITS OF REMOVAL

LIMITS OF PATCHING

PIER 2 CONCRETE PATCH QUANTITIES

	DIAPHRAM	COLUMN						CRASHWALL	TOTAL
FACE	SQ. FT.	SQ. FT.						SQ. FT.	SQ. FT.
		1	2	3	4	5	6		
NORTH	0	–	12	0	0	4	–	0	16
SOUTH	0	–	0	0	3	0	–	0	3
EAST	0	–	10	1	0	0	–	22	33
WEST	0	–	0	1	0	0	–	5	6
TOTAL	0	–	22	2	3	4	–	27	58
		* ADJUSTED TOTAL							70

* SEE NOTE – 2.

REVISIONS:

DRAWN: CMM
CHECKED: JAD
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

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ENGINEERING & PROJECT MANAGEMENT DIVISON

RTA
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CONCRETE REPAIR
PIER 2

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–9

6/6/2007 12:40 PM
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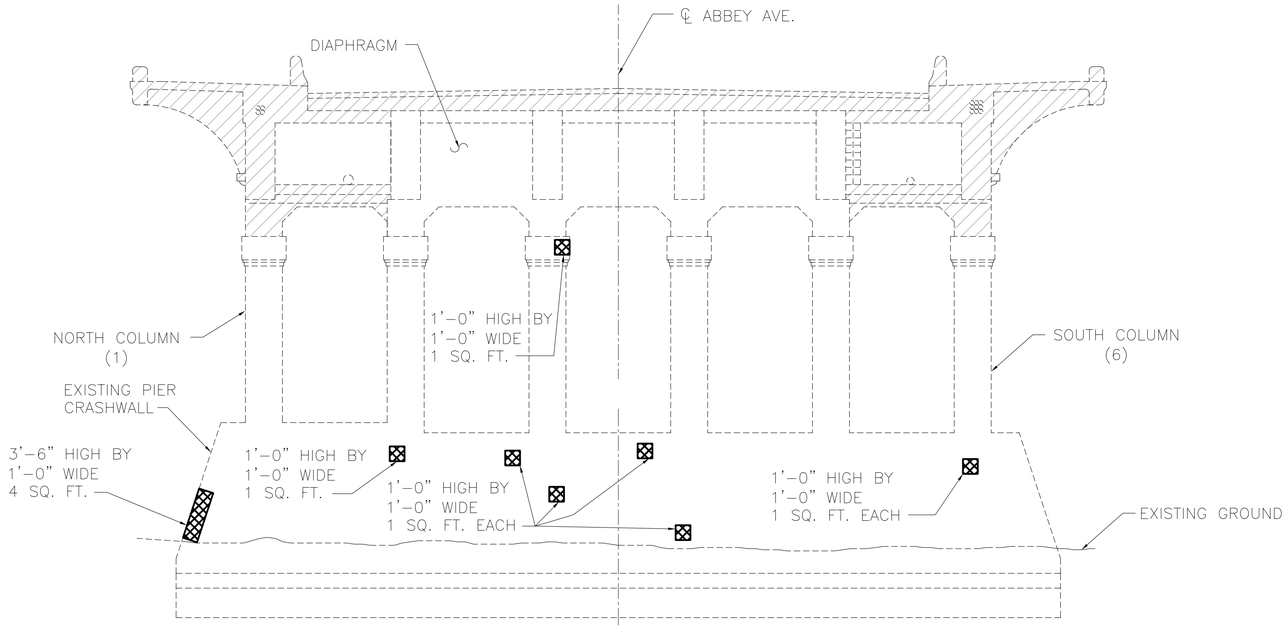


PIER 3 CONCRETE REPAIR
(WEST FACE)

NOTES:

1. PIER POP OUT:
   MINOR POP OUTS ALONG PIER FACES DUE TO INSUFFICIENT COVER OVER MISC. REBAR WILL NOT BE PATCHED. REMOVE ALL LOOSE CONCRETE TO SATISFACTION OF ENGINEER. COST OF REMOVAL IS INCIDENTAL TO ITEM TS 519. AREAS WILL BE COATED AND SEALED PER TS 512.

2. THE ESTIMATED QUANTITY FOR ITEM TS 519 – PATCHING OF CONCRETE STRUCTURE, HAS BEEN INCREASED 20% OVER FIELD MEASURED AREAS. FINAL AREAS TO BE REPAIRED WILL BE APPROVED BY THE ENGINEER AT THE TIME OF CONSTRUCTION.

LEGEND:

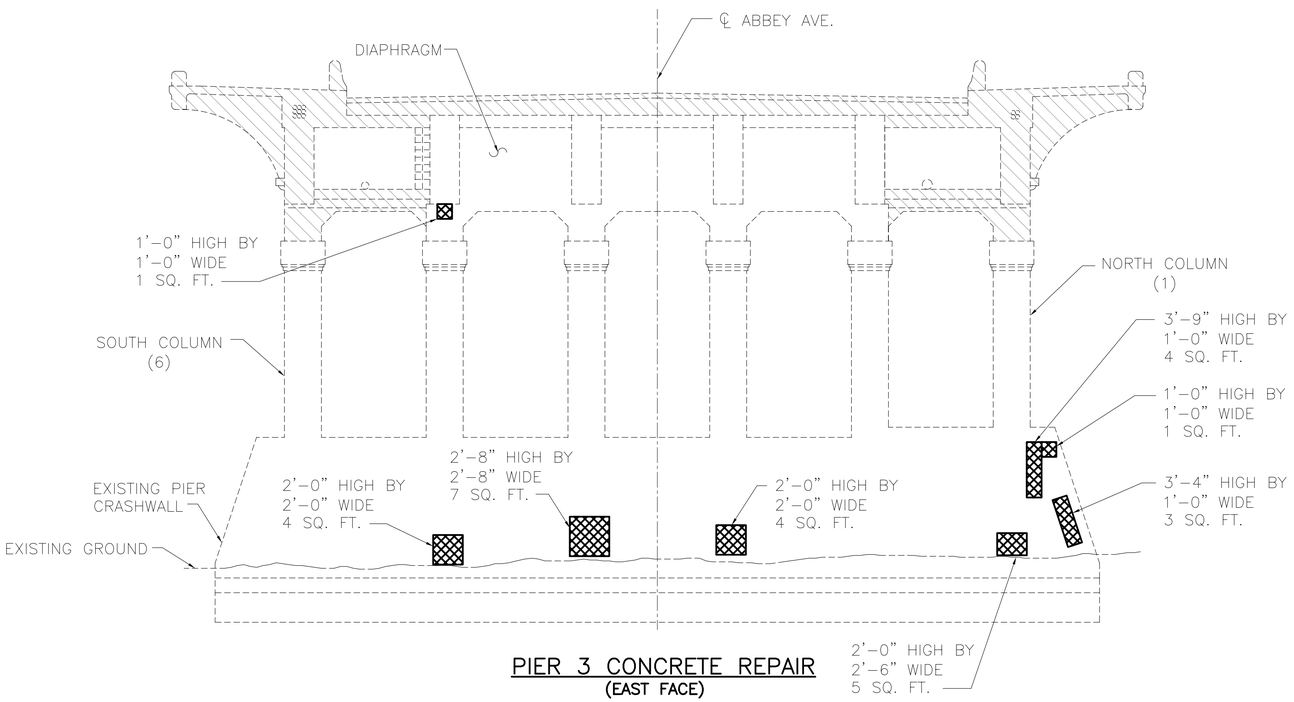
LIMITS OF REMOVAL

LIMITS OF PATCHING

PIER 3 CONCRETE PATCH QUANTITIES

	DIAPHRAM	COLUMN						CRASHWALL	TOTAL
FACE	SQ. FT.	SQ. FT.						SQ. FT.	SQ. FT.
		1	2	3	4	5	6		
NORTH	0	0	0	0	0	0	0	0	0
SOUTH	0	0	0	0	0	0	0	0	0
EAST	1	0	0	0	0	0	0	28	29
WEST	0	0	0	1	0	0	0	10	11
TOTAL	1	0	0	1	0	0	0	38	40
		* ADJUSTED TOTAL							48

* SEE NOTE – 2.



PIER 3 CONCRETE REPAIR
(EAST FACE)

DESIGN AGENCY
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ENGINEERING & PROJECT MANAGEMENT DIVISON

DRAWN: CMM
CHECKED: JAD
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

REVISIONS:

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CONCRETE REPAIR
PIER 3

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–10

6/6/2007 12:41 PM

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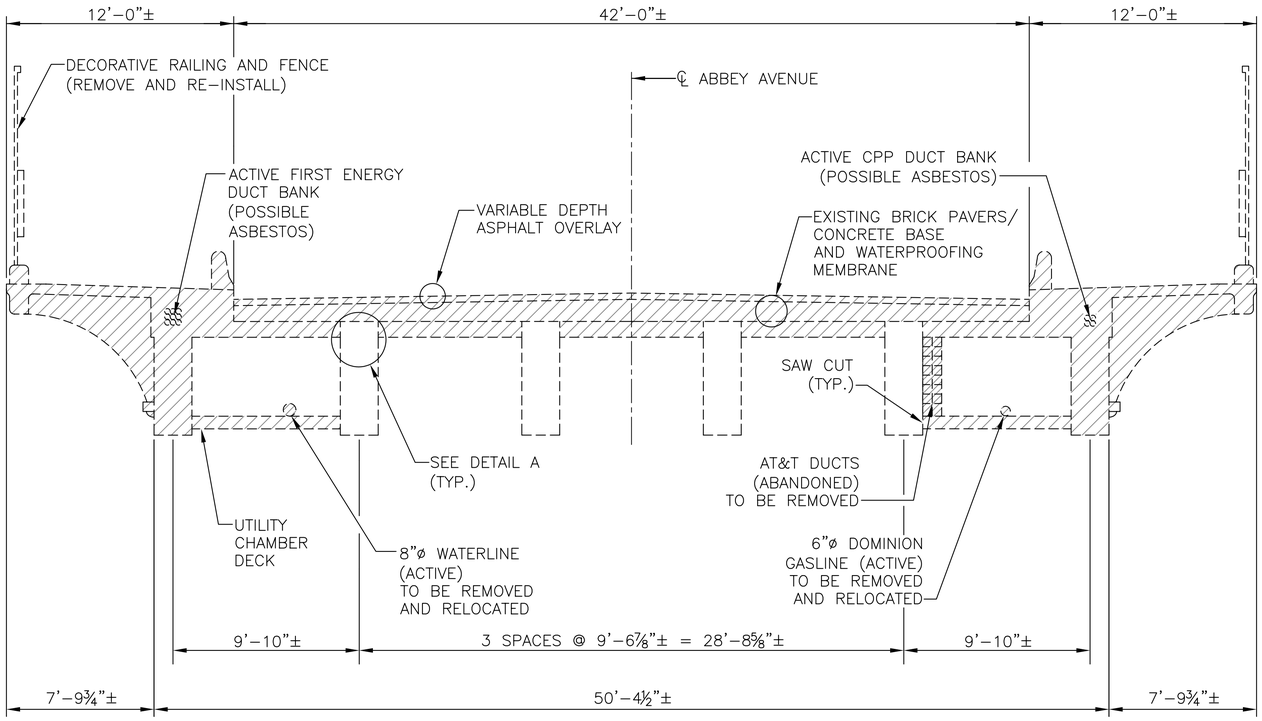
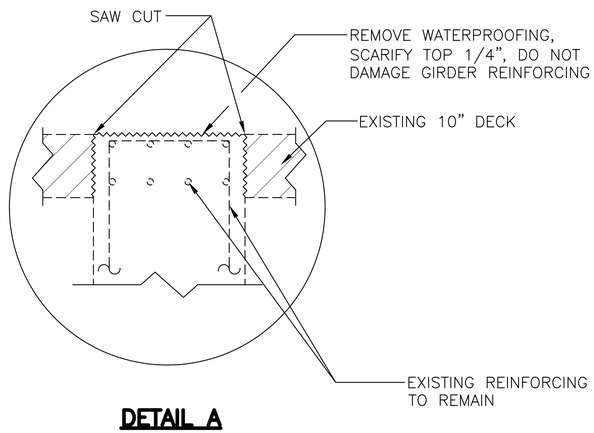


DECK SECTION REMOVAL DETAILS



DETAIL A

TO BE REMOVED

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REVISIONS:

DRAWN: GIE
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APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

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ENGINEERING & PROJECT MANAGEMENT DIVISON

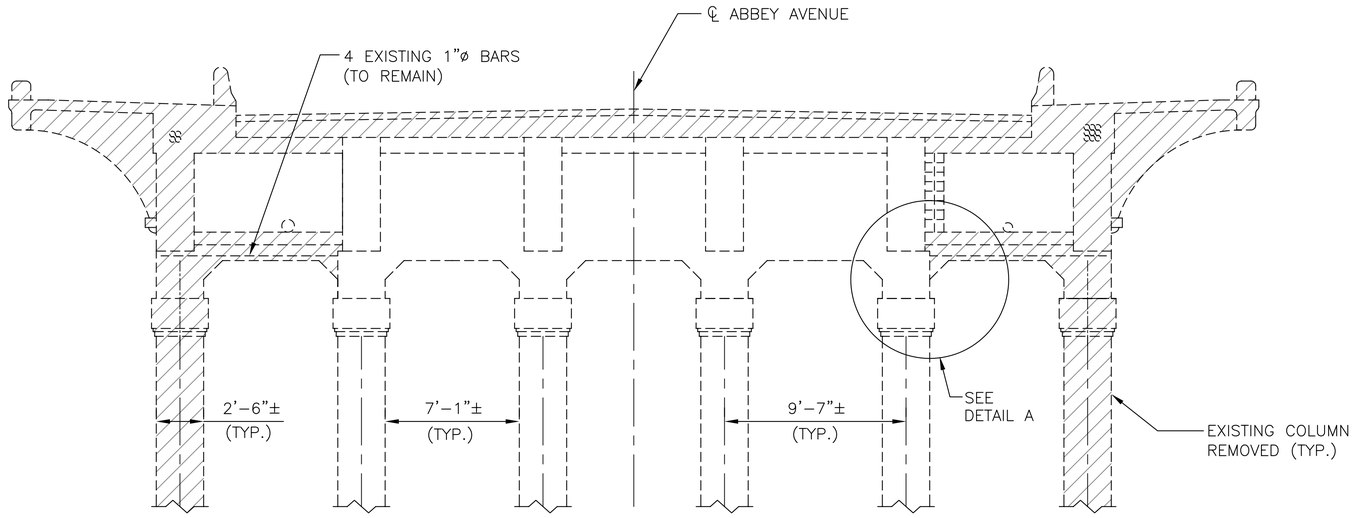
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

DECK REMOVAL DETAILS

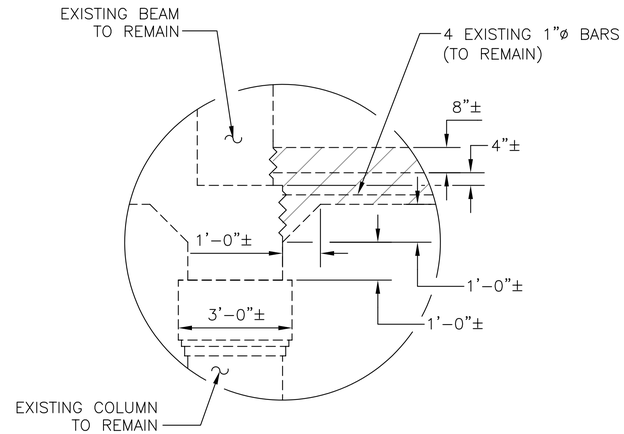
REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

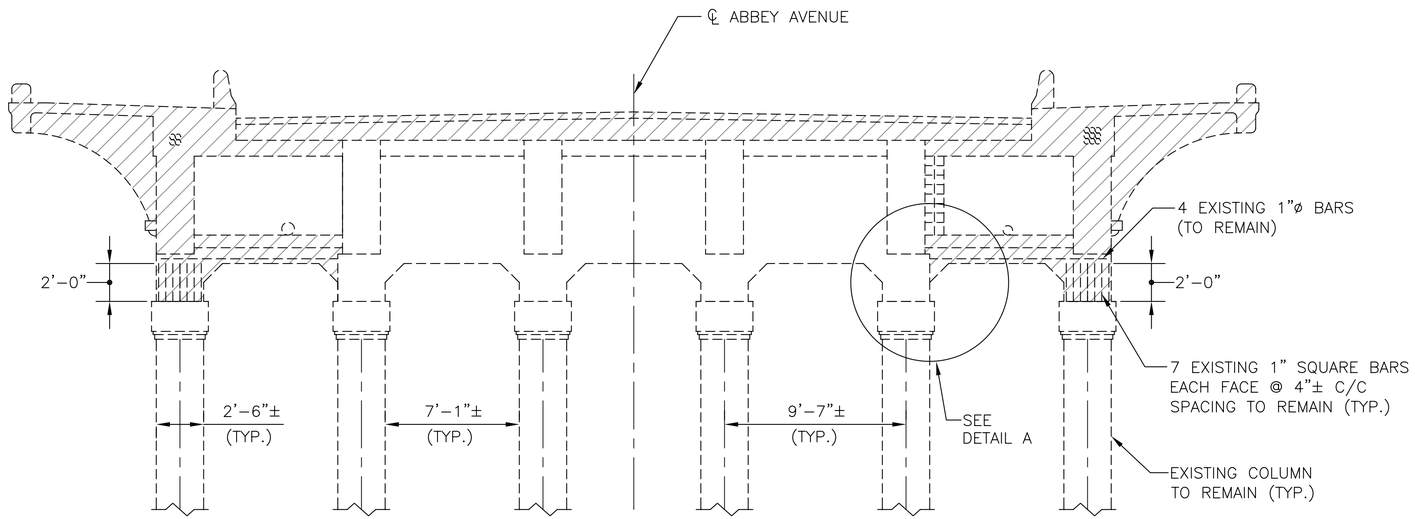
SHEET S–11



PIERS 1 AND 2 DIAPHRAGM REMOVAL



DETAIL A



PIER 3 DIAPHRAGM REMOVAL

LEGEND

TO BE REMOVED

TYP. = TYPICAL

NOTES:

1. FOR PIER DIAPHRAGM REPLACEMENT DETAILS, SEE SHEET S-21.

REVISIONS:

DRAWN: GIE
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
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GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

PIER DIAPHRAGM REMOVAL

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-12

6/6/2007 12:42 PM

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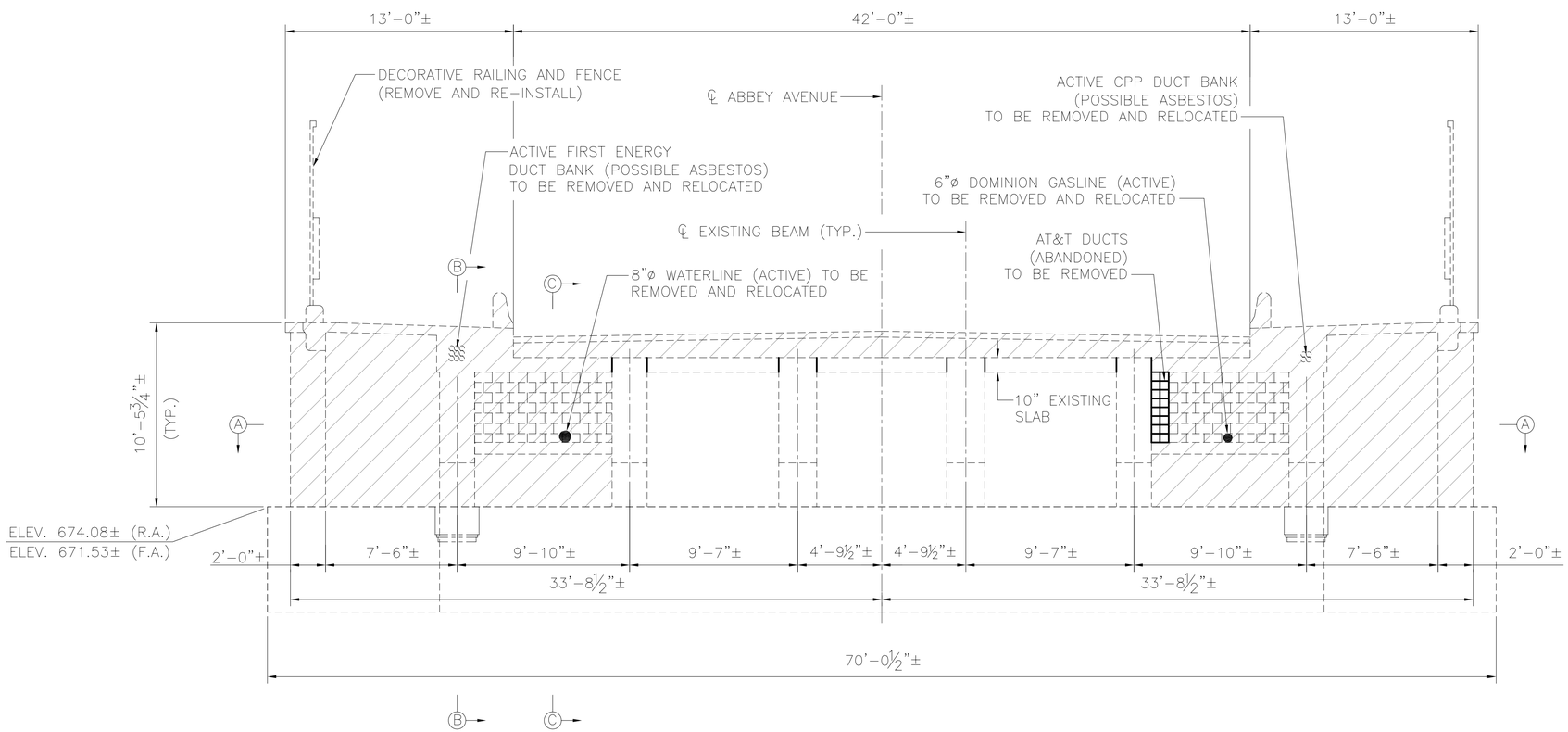
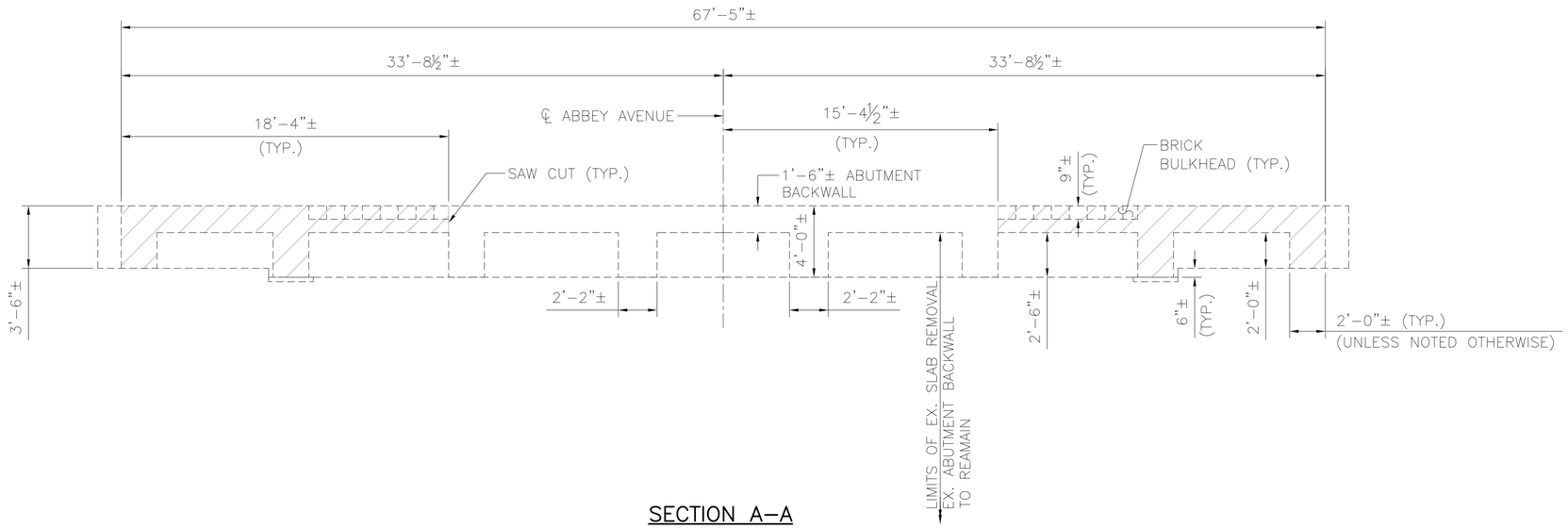


EXISTING ABUTMENT ELEVATION

(REAR ABUTMENT SHOWN; FORWARD ABUTMENT SIMILAR)
(EXISTING PILES NOT SHOWN)

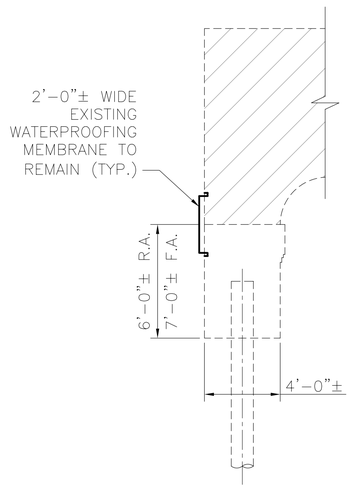
REAR ABUTMENT

FORWARD ABUTMENT

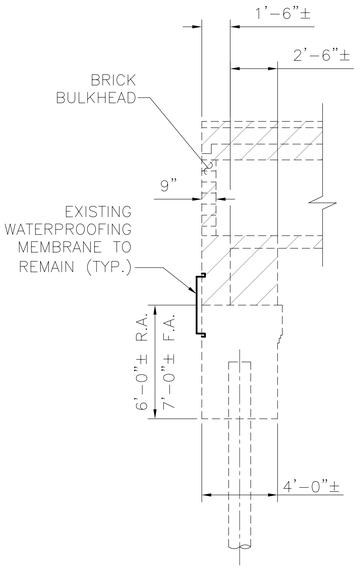


SECTION A-A

(EXISTING PILES NOT SHOWN)



SECTION B-B



SECTION C-C

LEGEND:

TO BE REMOVED

ELEV. = ELEVATION
F.A. = FORWARD ABUTMENT
R.A. = REAR ABUTMENT
TYP. = TYPICAL

NOTES:

1. FOR ABUTMENT REHAB DETAILS, SEE SHEETS S-14, S-15, AND S-16.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
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ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

ABUTMENT REMOVAL DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-13

6/6/2007 12:23 PM

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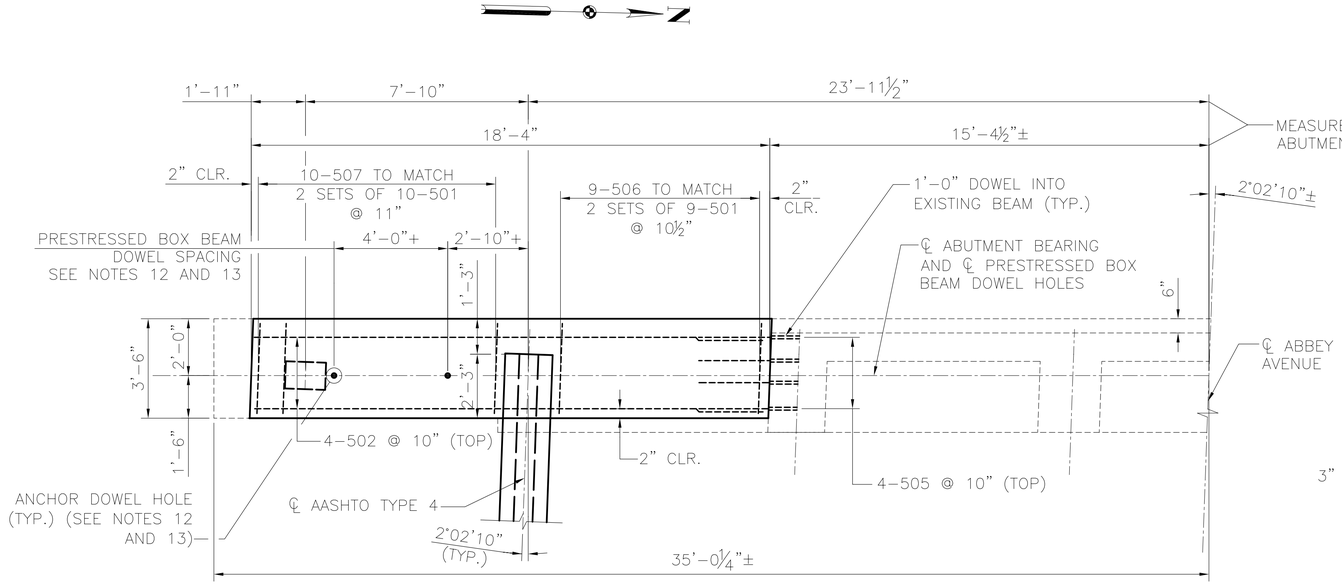
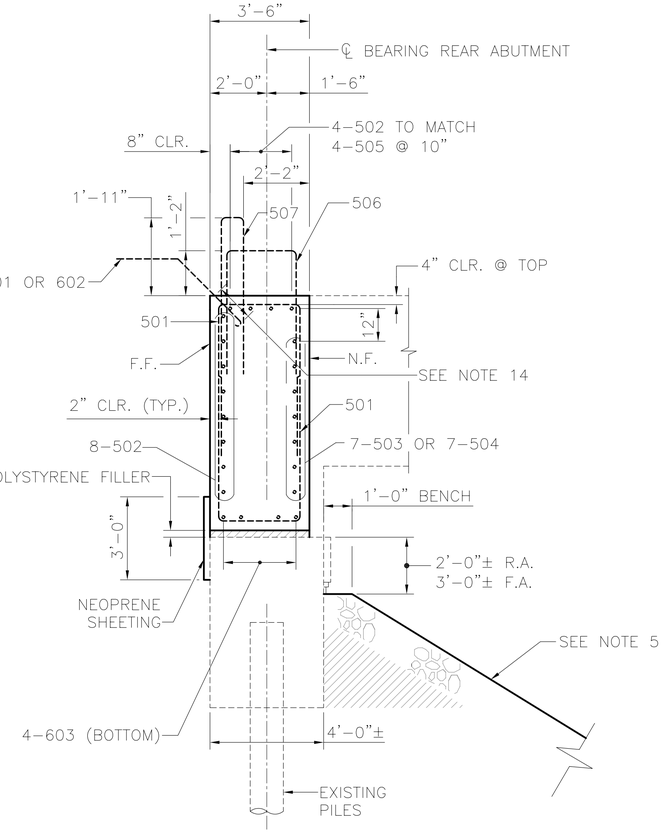


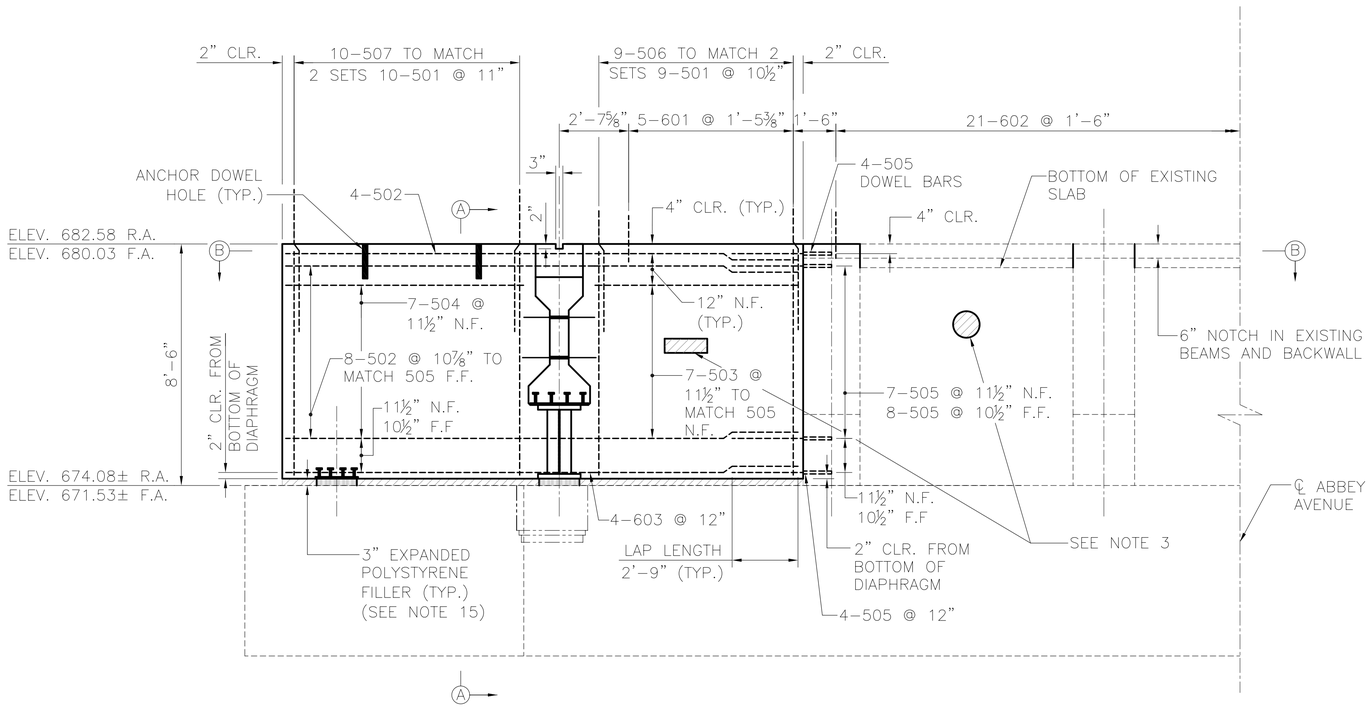
SECTION B–B

(601 AND 602 BARS NOT SHOWN)



SECTION A–A

(POROUS BACKFILL, FILTER FABRIC, 6" C.P.P., BEAM AND BEARING DETAILS NOT SHOWN)



STAGE I CONSTRUCTION (ABUTMENT ELEVATION)

(HORIZONTAL DIMENSIONS MEASURED ALONG ℄ ABUTMENT BEARINGS)
(ENCASE PRESTRESSED I–BEAM AND HP SUPPORT POST)
(REAR ABUTMENT–SOUTH SIDE SHOWN; NORTH SIDE OPPOSITE HAND SYMMETRICAL ABOUT ℄ ABBEY AVENUE)
(FORWARD ABUTMENT SIMILAR) (PILES, NEOPRENE SHEETING, AND HAUNCH REINFORCEMENT NOT SHOWN)

LEGEND:
BOT. = BOTTOM
C.P.P. = CORRUGATED PLASTIC PIPE
CLR. = CLEARANCE
F.A. = FORWARD ABUTMENT
F.F. = FAR FACE
N.F. = NEAR FACE
R.A. = REAR ABUTMENT
TYP. = TYPICAL

ALL REINFORCING BARS FOR THE REAR ABUTMENT SHALL BE PREFIXED RA. ALL REINFORCING BARS FOR THE FORWARD ABUTMENT SHALL BE PREFIXED FA.

NOTES:
1. FOR ABUTMENT REMOVAL DETAILS, SEE SHEET S–13.
2. FOR STAGE II AND III ABUTMENT DETAILS, SEE SHEETS S–15 AND S–16.
3. FOR UTILITY DETAILS, SEE SHEETS U–3, U–4, U–6 AND U–20.
4. FOR PRESTRESSED I–BEAM BEARING DETAILS, SEE SHEET S–34.
5. FOR ABUTMENT DRAINAGE DETAILS, SEE SHEETS S–17 AND S–18.
6. FOR REINFORCING SCHEDULE, SEE SHEET S–41.
7. FOR PRESTRESSED BOX BEAM DETAILS, SEE SHEET S–24.
8. FOR RAILING END POST DETAILS, SEE SHEET S–31.
9. FOR PRESTRESSED I–BEAM DETAILS, SEE SHEET S–23.
10. FOR SIDEWALK DETAILS, SEE SHEET S–30.
11. FOR FRAMING PLAN, SEE SHEET S–22.
12. PRESTRESSED BOX BEAM SEAT REINFORCING, SETTING ANCHOR DOWELS: REINFORCING STEEL IN THE VICINITY OF THE BOX BEAM BRIDGE SEAT SHALL BE ACCURATELY PLACED TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR DOWEL HOLES.
13. FOR PRESTRESSED BOX BEAM CONNECTION AT ABUTMENTS, SEE SHEET S–24.
14. FOR EMBEDMENT LENGTH OF 601 AND 602 BARS, SEE SHEET S–15.
15. EXPANDED POLYSTYRENE FILLER IS TO BE INCLUDED WITH TS511, CLASS S CONCRETE, ABUTMENT AND PIER DIAPHRAGMS.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

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ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

STAGE I ABUTMENT DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–14

6/6/2007 12:28 PM
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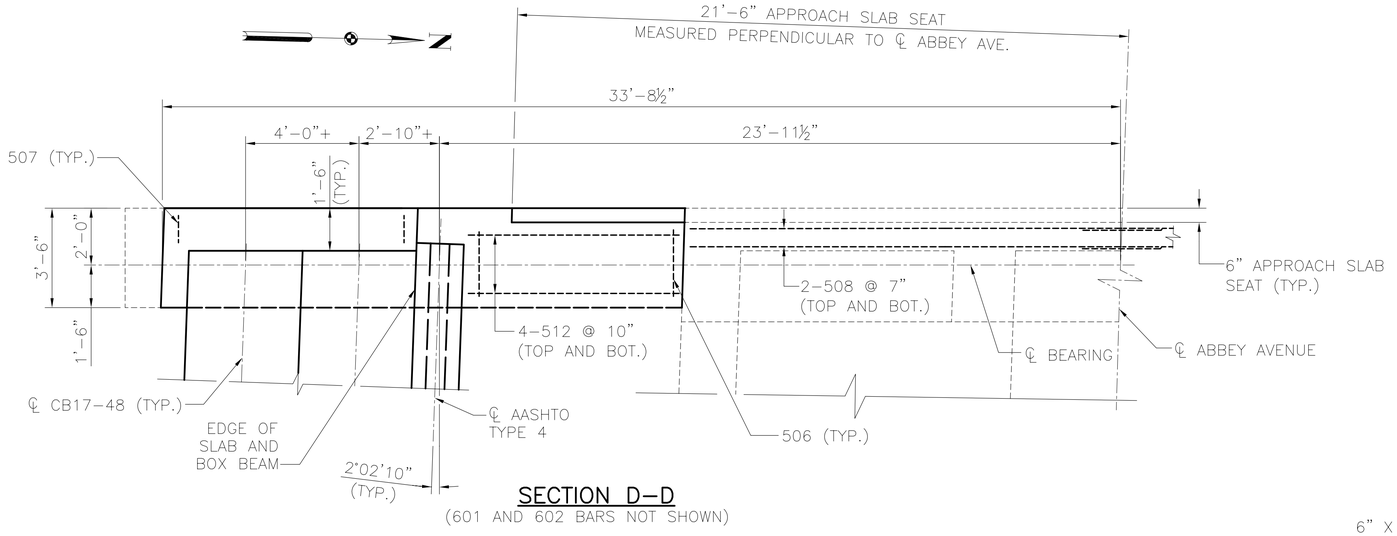
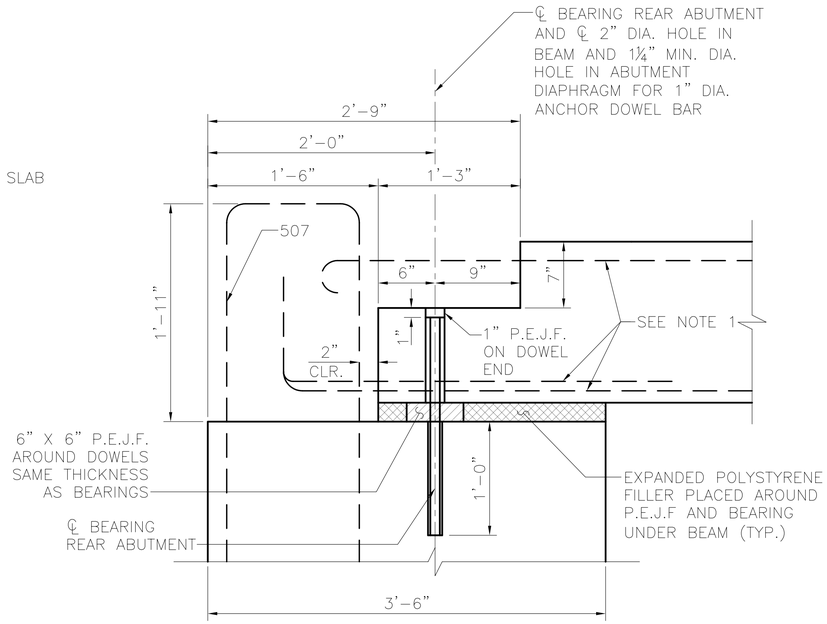
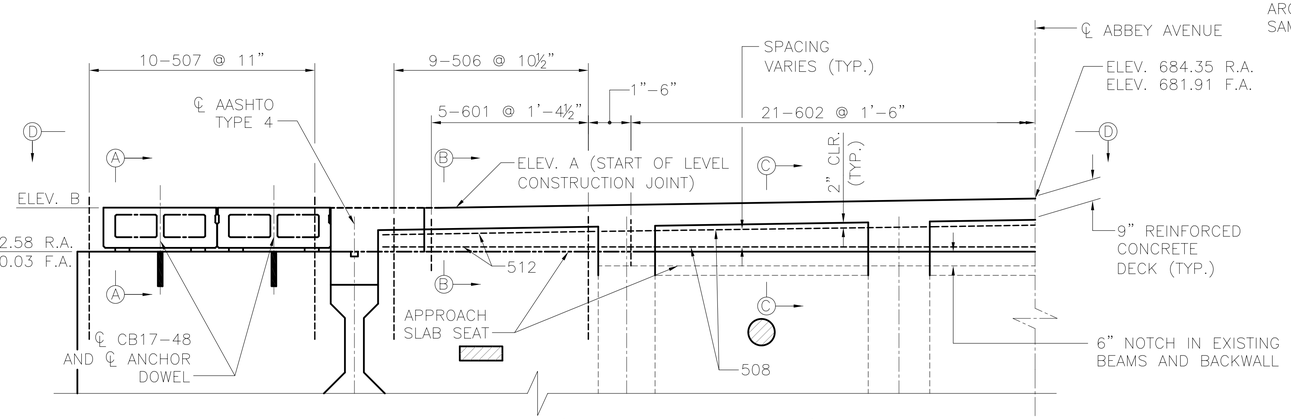


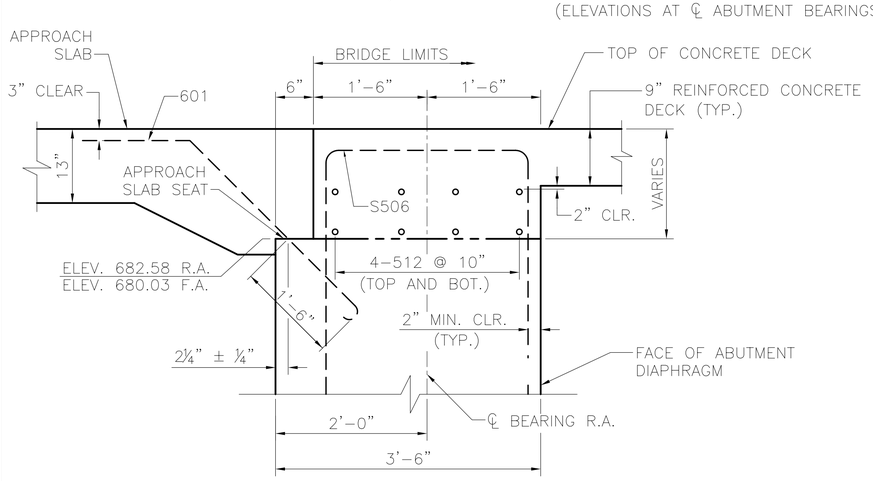
SECTION D-D
(601 AND 602 BARS NOT SHOWN)



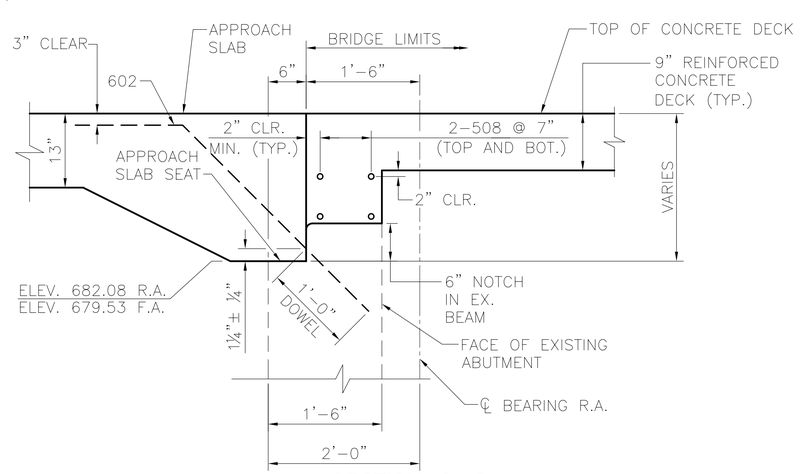
SECTION A-A



STAGE II CONSTRUCTION (ABUTMENT ELEVATION)
(ERECT BOX BEAMS AND POUR CONCRETE DECK)
(REAR ABUTMENT-SOUTH SIDE SHOWN; NORTH SIDE OPPOSITE HAND SYMMETRICAL ABOUT ℄ ABBEY AVENUE)
(FORWARD ABUTMENT SIMILAR) (HAUNCH AND SLAB REINFORCEMENT NOT SHOWN)
(ELEVATIONS AT ℄ ABUTMENT BEARINGS)



SECTION B-B
(SLAB REINFORCEMENT AND POUROUS BACKFILL NOT SHOWN)



SECTION C-C
(SLAB REINFORCEMENT AND POUROUS BACKFILL NOT SHOWN)

LEGEND:
DIA. = DIAPHRAGM
EX. = EXISTING
F.A. = FORWARD ABUTMENT
MIN. = MINIMUM
P.E.J.F. = PREFORMED EXPANSION JOINT FILLER
R.A. = REAR ABUTMENT
TYP. = TYPICAL

NOTES:
1. FOR PRESTRESSED BOX BEAM DETAILS, SEE SHEET S-24.
2. FOR ADDITIONAL NOTES, SEE STAGE I ABUTMENT DETAILS, SHEET S-14.
3. FOR APPROACH SLAB DETAILS, SEE SHEET S-36.

ELEVATIONS AT ℄ ABUTMENT BEARINGS LOOKING UPSTATION				
	REAR ABUTMENT		FORWARD ABUTMENT	
	LEFT	RIGHT	LEFT	RIGHT
ELEV. A	684.03	684.01	681.59	681.57
ELEV. B	684.15	684.15	681.58	681.58

REVISIONS:

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STAGE II
ABUTMENT DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-15

6/6/2007 12:28 PM
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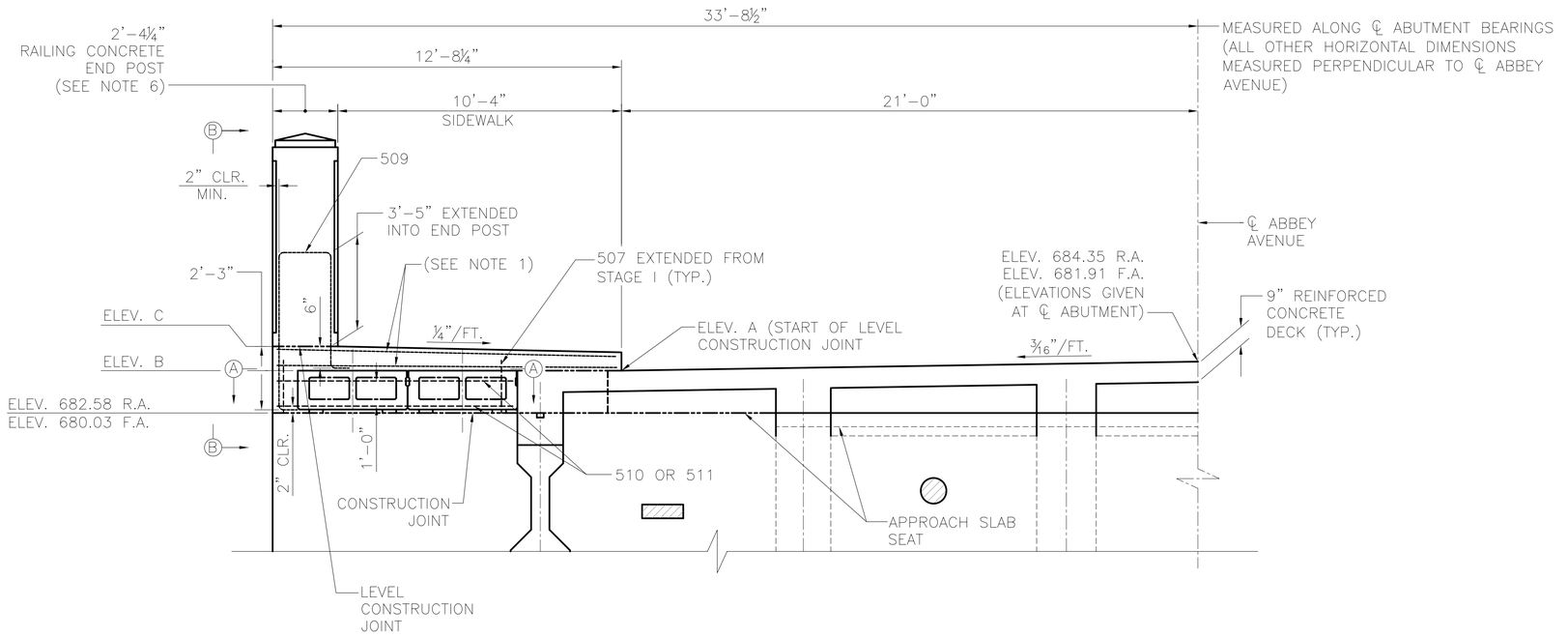
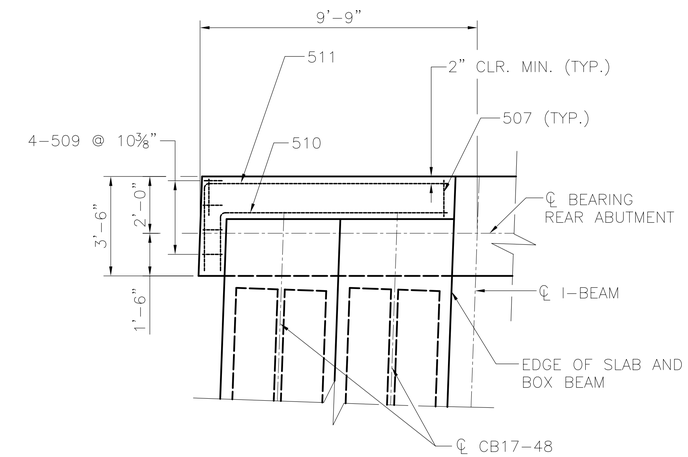
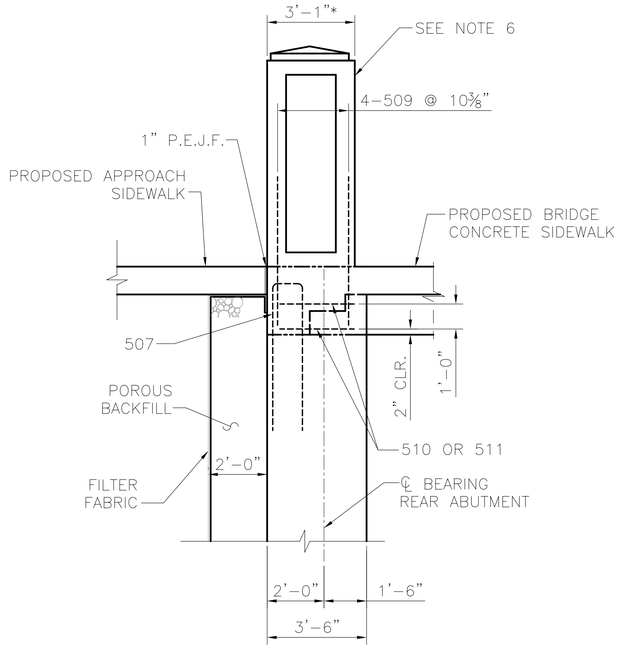


STAGE III CONSTRUCTION (ABUTMENT ELEVATION)

(CONSTRUCT SIDEWALK AND RAILING CONCRETE END POST)
(REAR ABUTMENT–SOUTH SIDE SHOWN; NORTHSIDE OPPOSITE HAND SYMMETRICAL ABOUT ℄ ABBEY AVENUE)
(FORWARD ABUTMENT SIMILAR)
(CONCRETE PARAPET AND DECORATIVE RAILING NOT SHOWN)



SECTION A–A



VIEW B–B

(CONCRETE PARAPET AND DECORATIVE RAILING NOT SHOWN)

LEGEND:
CLR. = CLEARANCE
ELEV. = ELEVATION
F.A. = FORWARD ABUTMENT
MIN. = MINIMUM
R.A. = REAR ABUTMENT
TYP. = TYPICAL

* = FINAL END POST DIMENSION MUST BE COORDINATED WITH REUSE OF EXISTING DECORATIVE RAILING

NOTES:

1. FOR BRIDGE SIDEWALK DETAILS, SEE SHEET S–30.
2. FOR ADDITIONAL NOTES, SEE STAGE I ABUTMENT DETAILS, SHEET S14.
3. ALL REINFORCING BARS FOR THE REAR ABUTMENT SHALL BE PREFIXED RA.
4. ALL REINFORCING BARS FOR THE FORWARD ABUTMENT SHALL BE PREFIXED FA.
5. FOR APPROACH SIDEWALK DETAILS, SEE SHEET C–2.
6. FOR RAILING CONCRETE END POST DETAILS, SEE SHEET S–31.

ELEVATIONS AT ℄ ABUTMENT BEARINGS LOOKING UPSTATION				
	REAR ABUTMENT		FORWARD ABUTMENT	
	LEFT	RIGHT	LEFT	RIGHT
ELEV. A	684.03	684.01	681.59	681.57
ELEV. B	684.15	684.15	681.58	681.58
ELEV. C	684.92	684.88	682.48	682.44

REVISIONS:

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CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

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ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

STAGE III
ABUTMENT DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–16

6/6/2007 12:29 PM
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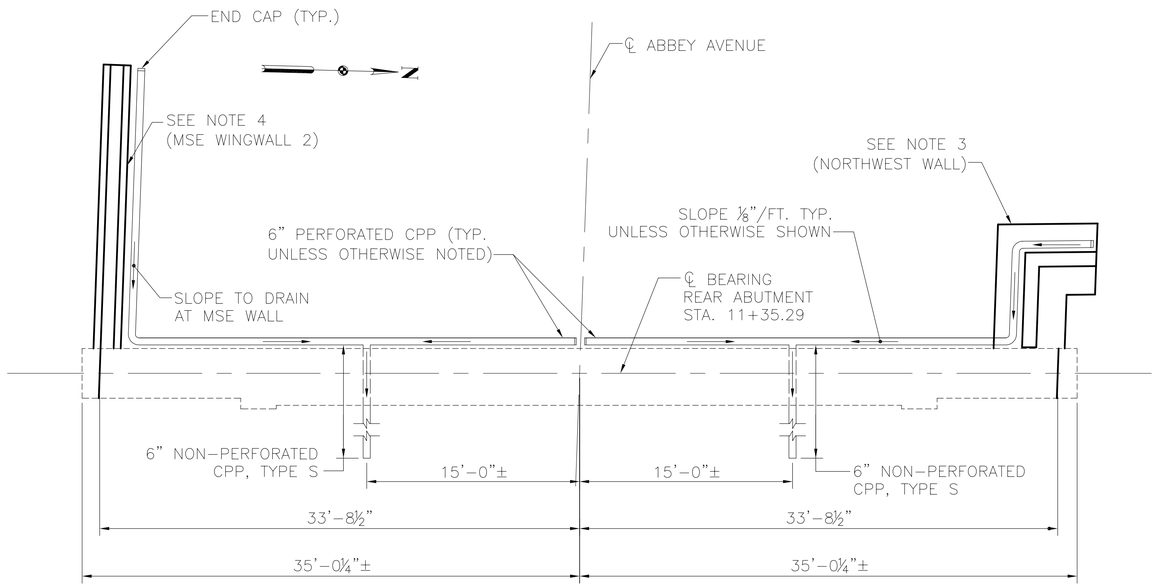
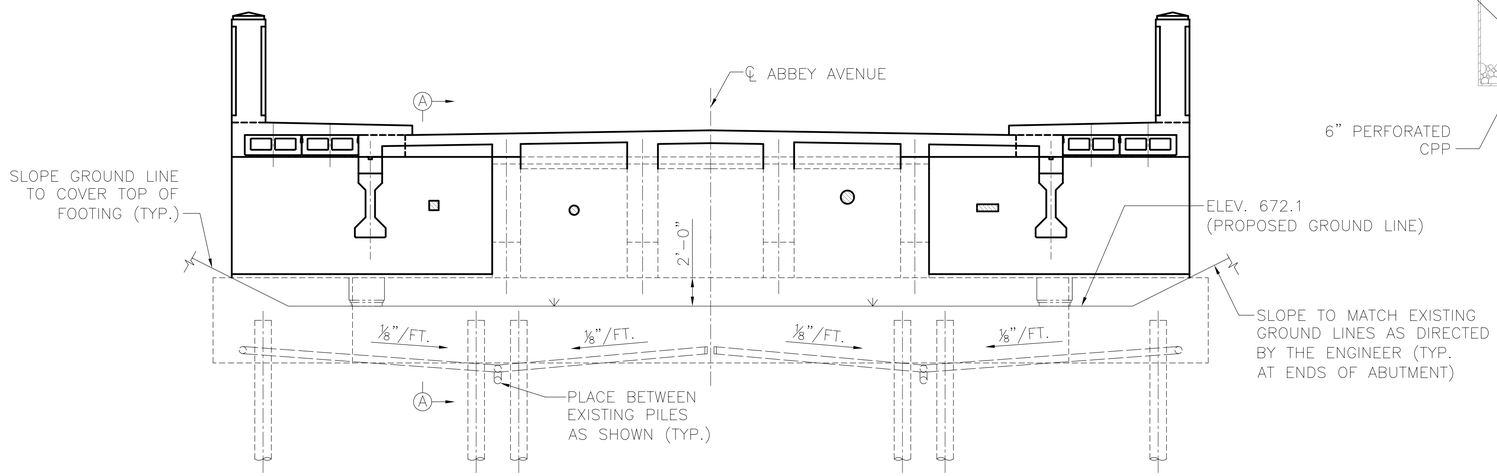
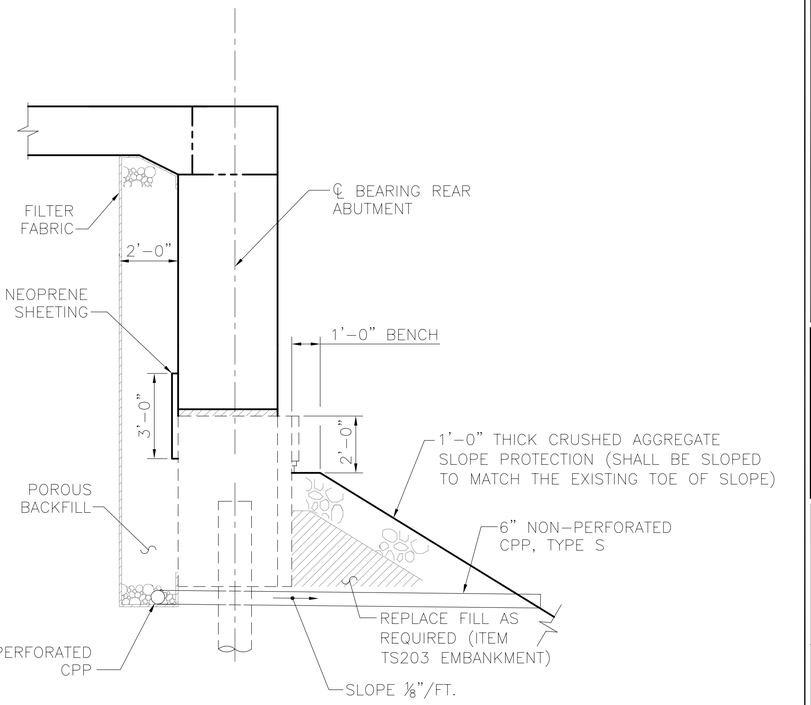


REAR ABUTMENT PLAN



REAR ABUTMENT ELEVATION
(LOOKING BACKSTATION) (ALL PILES NOT SHOWN)



SECTION A–A

LEGEND:
CPP = CORRUGATED PLASTIC PIPE
ELEV. = ELEVATION

NOTES:

1. FOR ABUTMENT DETAILS, SEE SHEETS S–14, S–15, AND S–16.
2. CONTRACTOR SHALL REMOVE ANY EXISTING DEBRIS AND CONCRETE SLOPE PROTECTION AS DIRECTED BY THE ENGINEER AND SHALL BE INCLUDED WITH ITEM TS202.
3. FOR NORTHWEST WALL DETAILS, SEE SHEET S–37.
4. FOR MSE WINGWALL 2 DETAILS, SEE SHEET S–38.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
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ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

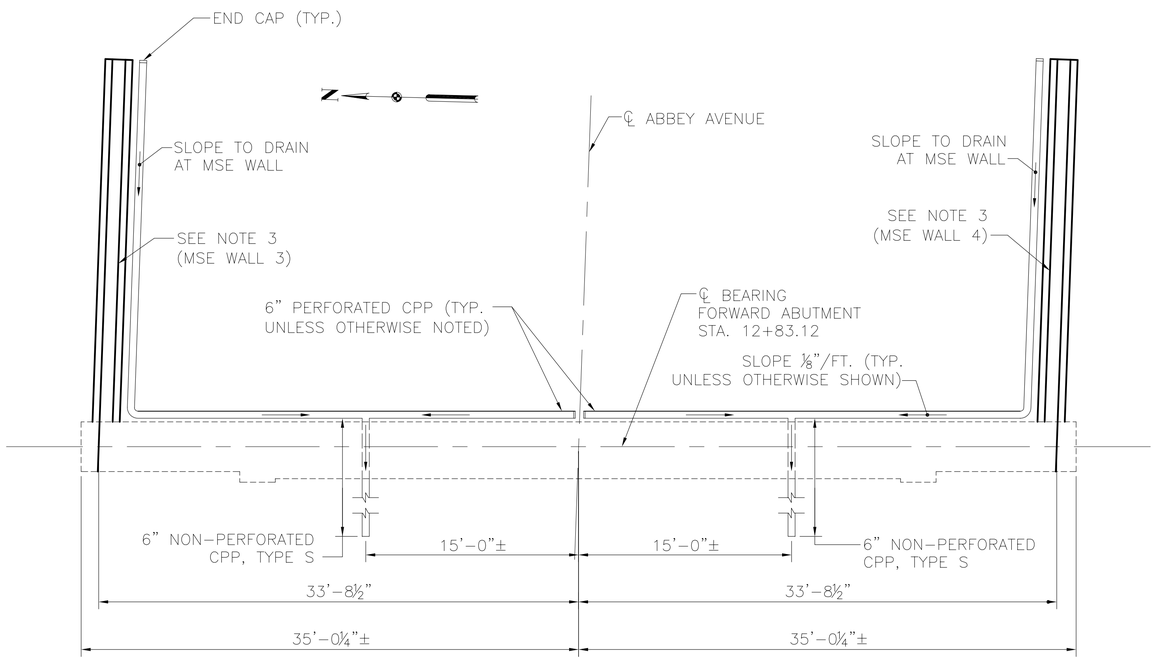
REAR ABUTMENT DRAINAGE DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

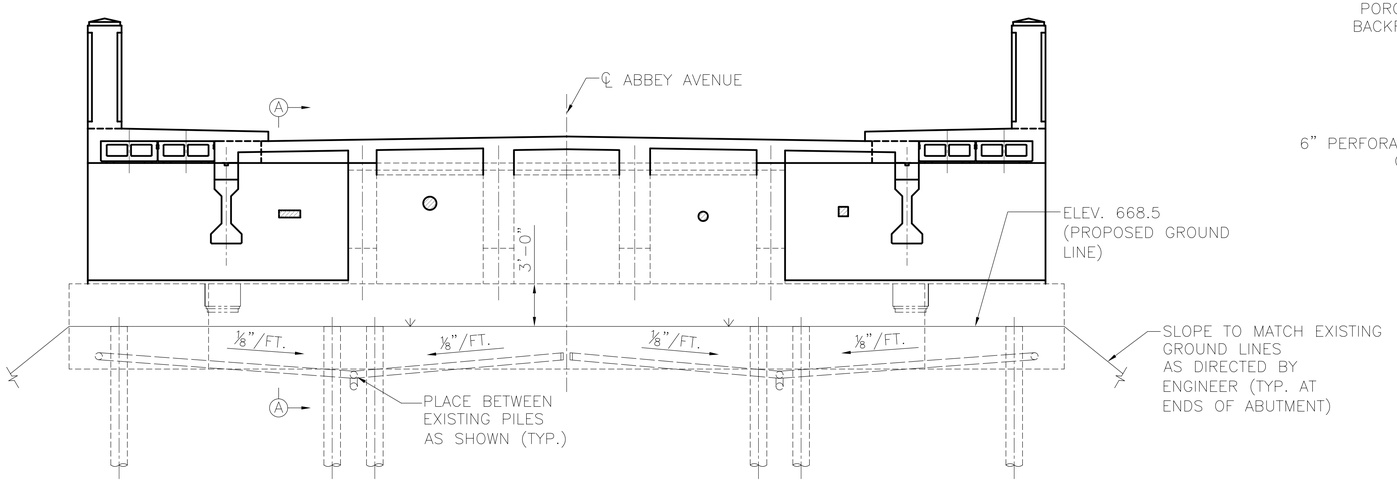
RTA PROJ 29D
BID PAC

SHEET S–17

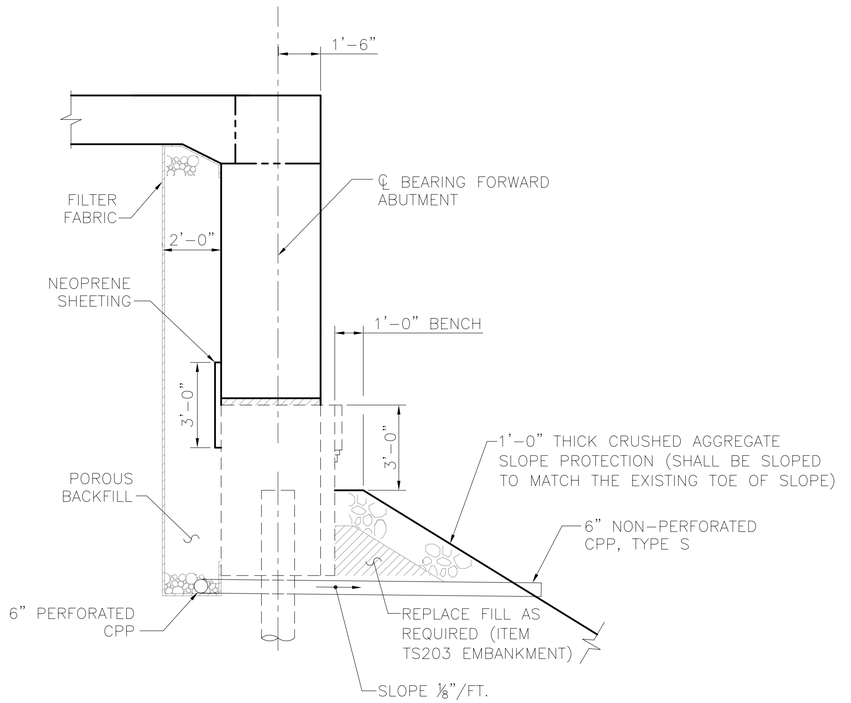
6/6/2007 12:30 PM
M:\JOBS\42374\TECHPROD\BRIDGE\Final\Drawings\Abutment_drainage_Rear.dwg



FORWARD ABUTMENT PLAN



FORWARD ABUTMENT ELEVATION
(LOOKING UPSTATION) (ALL PILES NOT SHOWN)



SECTION A–A

LEGEND:
CPP = CORRUGATED PLASTIC PIPE
ELEV. = ELEVATION

NOTES:

1. FOR ABUTMENT DETAILS, SEE SHEETS S–14, S–15, AND S–16.
2. CONTRACTOR SHALL REMOVE ANY EXISTING DEBRIS AND CONCRETE SLOPE PROTECTION AS DIRECTED BY THE ENGINEER. PAYMENT SHALL BE INCLUDED WITH ITEM TS202.
3. FOR MSE WINGWALL DETAILS, SEE SHEET S–39.

REVISIONS:

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CHECKED: BMG
APPROVED: RHW
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FORWARD ABUTMENT DRAINAGE DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–18

6/6/2007 12:30 PM
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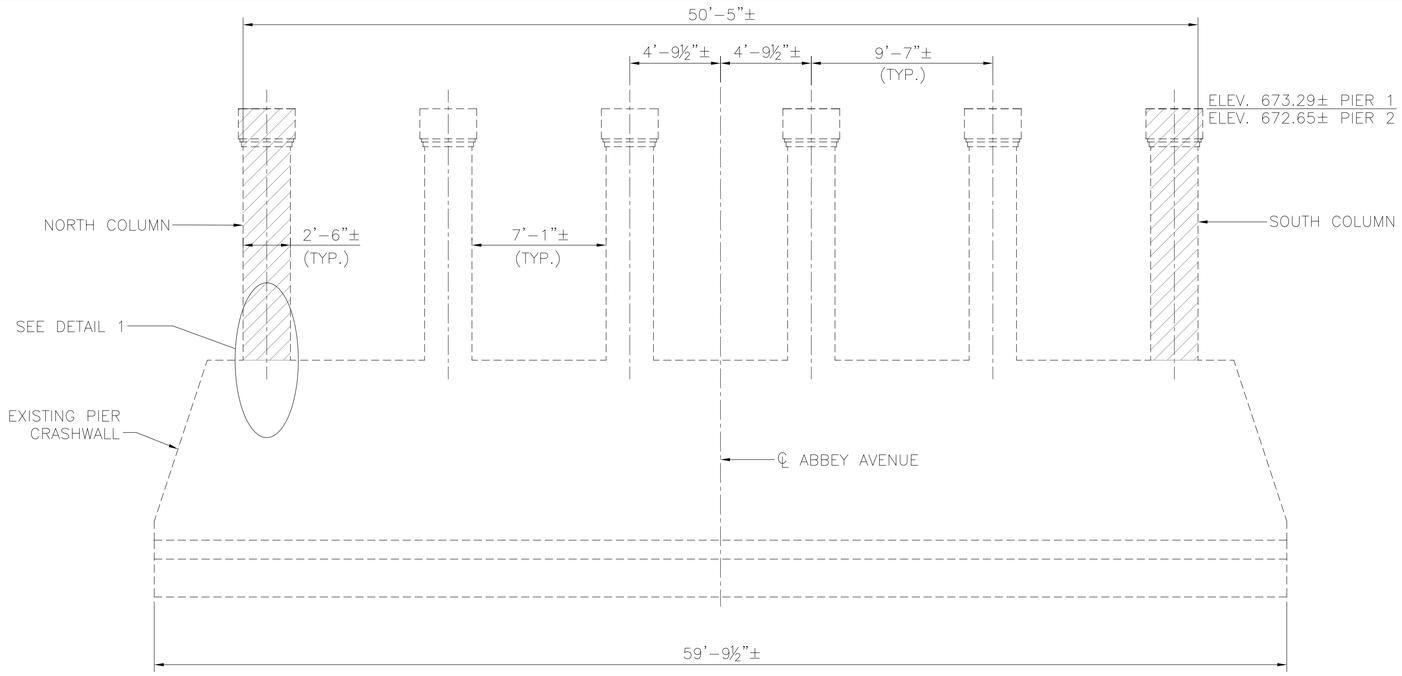
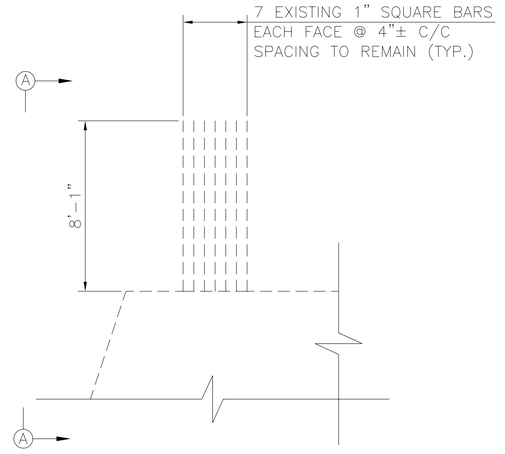


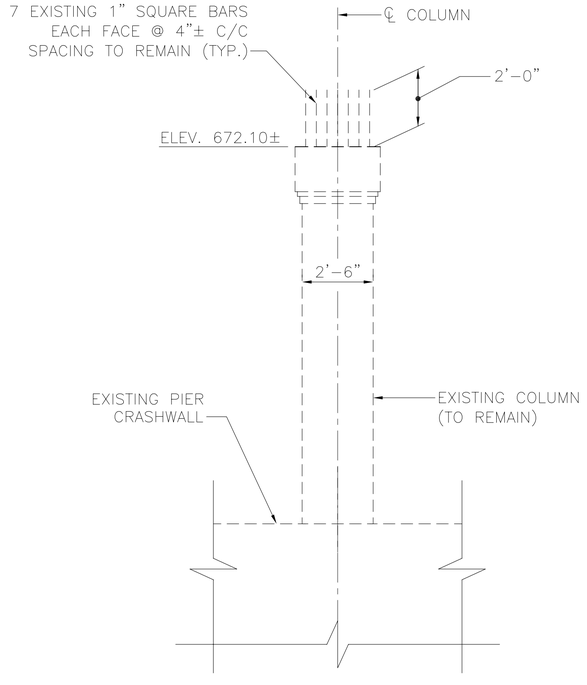
PIERS 1 & 2 COLUMN REMOVAL DETAILS

(ELEVATION VIEW LOOKING UPSTATION)
(PIER 3 COLUMNS TO REMAIN)

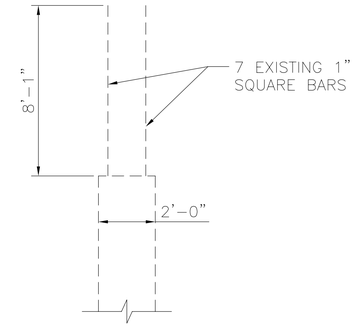


DETAIL 1

(NORTH COLUMN SHOWN; SOUTH COLUMN OPPOSITE HAND)



TYPICAL EXISTING PIER 3 COLUMN ELEVATION



VIEW A–A

LEGEND:

TO BE REMOVED

C/C = CENTER TO CENTER
TYP. = TYPICAL

NOTES:

1. FOR COLUMN REPLACEMENT DETAILS, SEE SHEET S–20.

REVISIONS:

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CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

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CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

COLUMN REMOVAL DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–19

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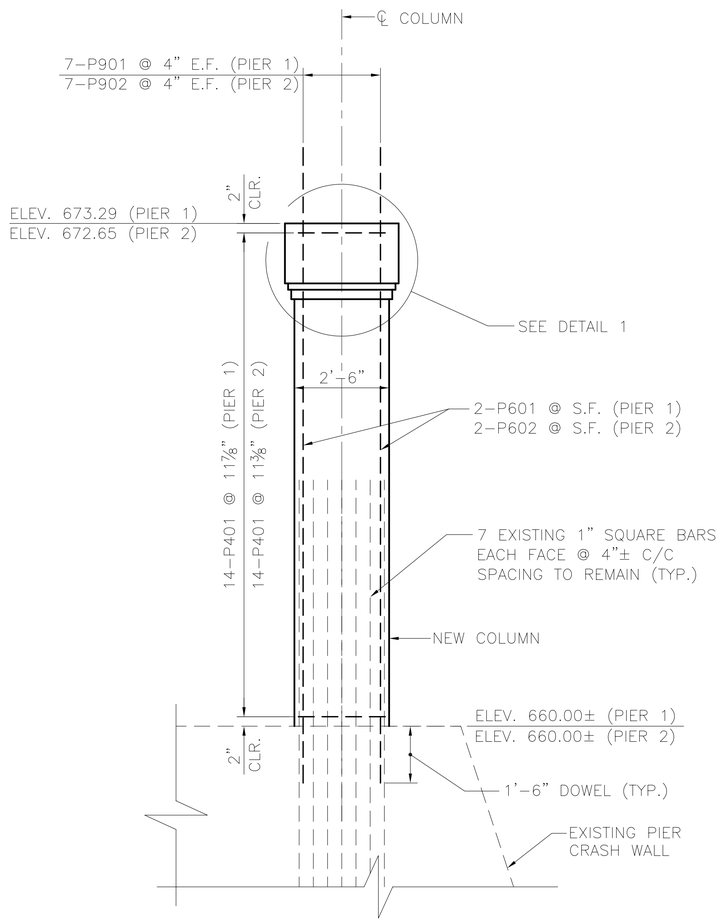
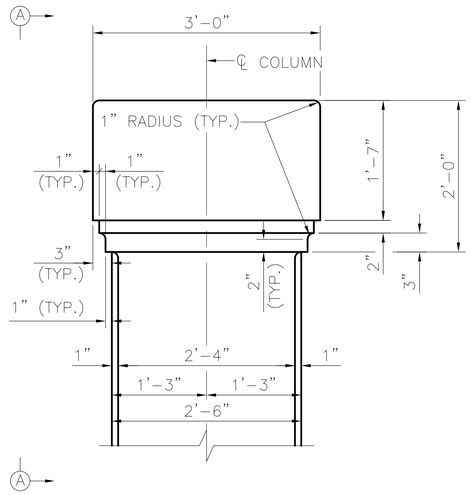


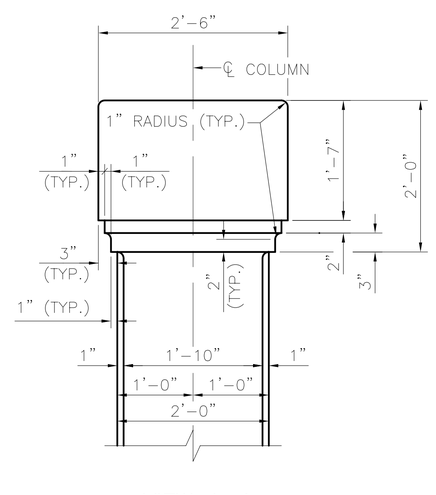
PIERS 1 & 2 COLUMN REPLACEMENT

(SOUTH COLUMN SHOWN; NORTH COLUMN OPPOSITE HAND)
(P603 NOT SHOWN, SEE TYPICAL SECTION
FOR SOUTH COLUMNS)



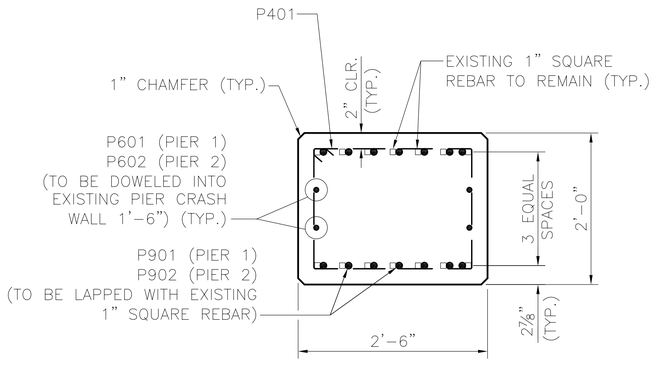
DETAIL 1

NORTH AND SOUTH COLUMNS
(REINFORCING NOT SHOWN)



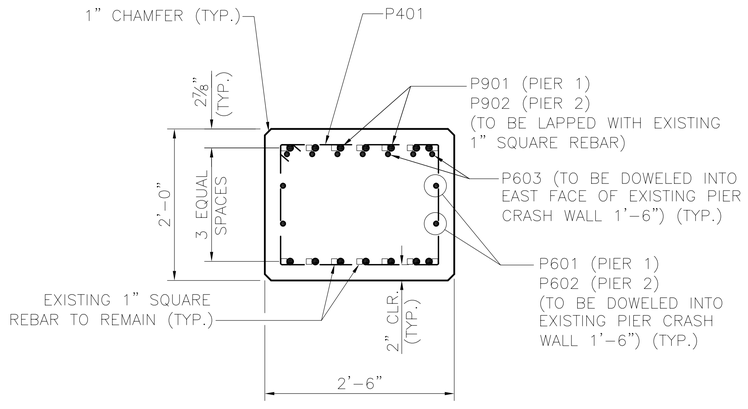
VIEW A–A

NORTH AND SOUTH COLUMNS
(REINFORCING NOT SHOWN)



TYPICAL SECTION

PIER 1 AND PIER 2 NORTH COLUMNS



TYPICAL SECTION

PIER 1 AND PIER 2 SOUTH COLUMNS

LEGEND:

E.F. = EACH FACE
S.F. = SIDE FACE

NOTES:

1. FOR PIER DIAPHRAGM DETAILS, SEE SHEET S–21.
2. FOR REBAR SCHEDULE, SEE SHEET S–41.
3. FOR COLUMN REMOVAL DETAILS, SEE SHEET S–19.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
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DATE: 6–1–2007
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ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

COLUMN REPLACEMENT DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–20

6/6/2007 12:35 PM

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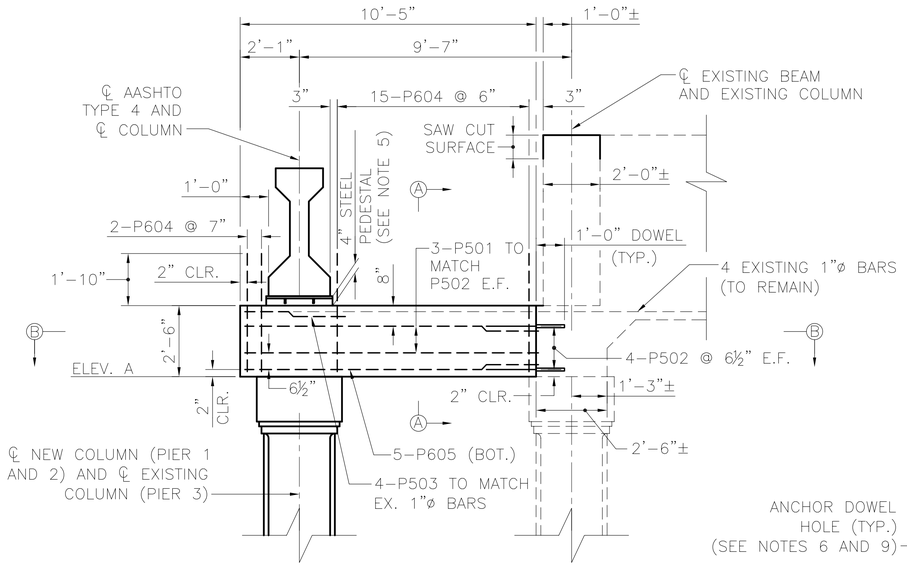
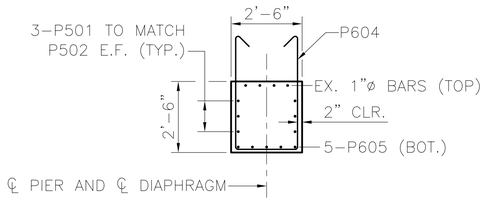
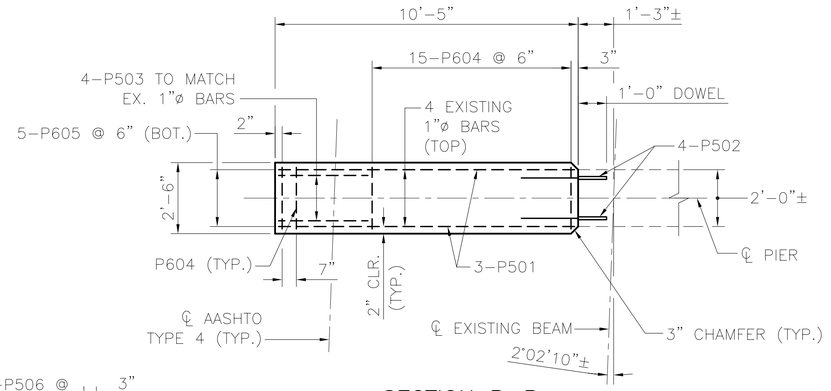


STAGE I CONSTRUCTION
TYPICAL PIER CAP ELEVATION

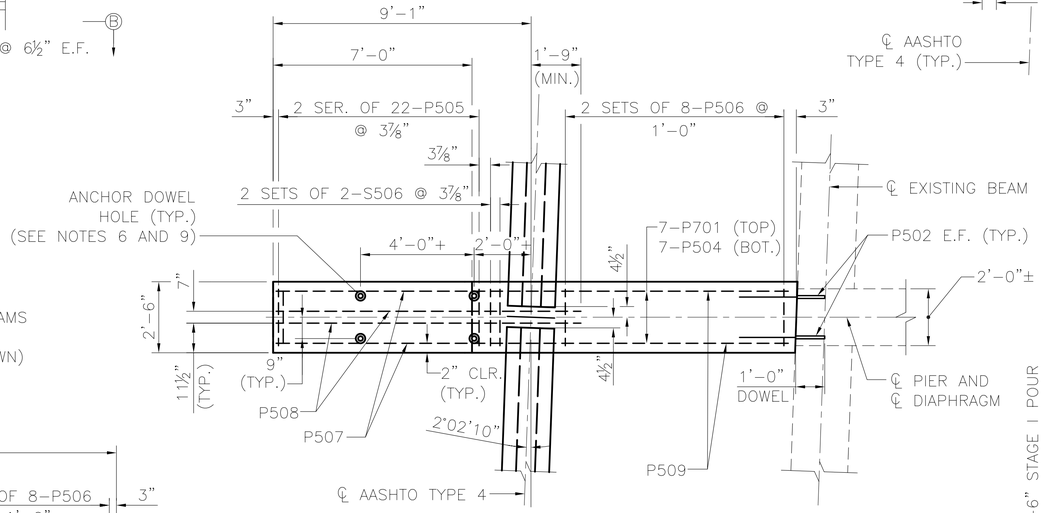
CONSTRUCT PIER CAPS TO ALLOW PLACEMENT OF CONCRETE I-BEAMS
(NORTHSIDE SHOWN; SOUTHSIDE OPPOSITE HAND)
(REINFORCING EXTENDED FROM COLUMN INTO PIER CAP NOT SHOWN)
(HORIZONTAL DIMENSIONS MEASURED ALONG ℄ PIER)



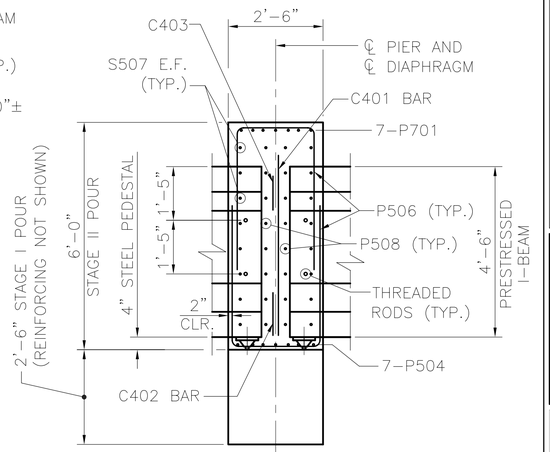
SECTION A-A



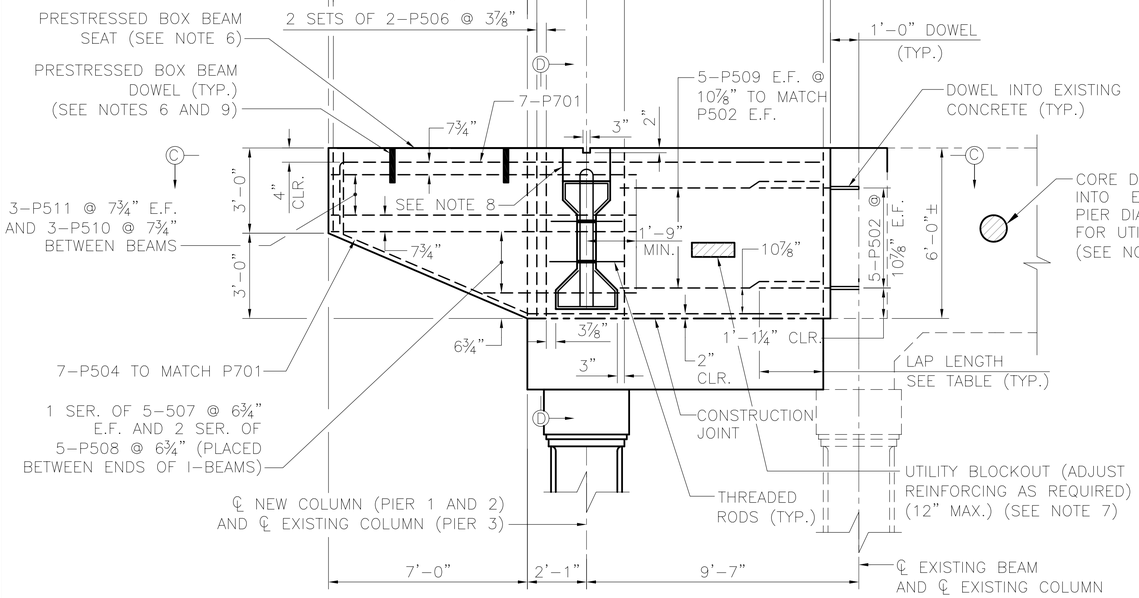
SECTION B-B



SECTION C-C

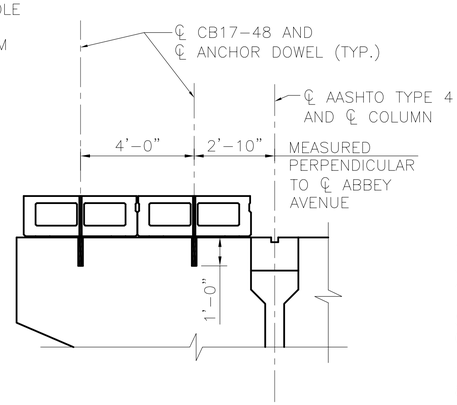


SECTION D-D
(COLUMNS NOT SHOWN)



STAGE II CONSTRUCTION
TYPICAL PIER DIAPHRAGM ELEVATION

CONSTRUCT PIER DIAPHRAGMS AND SIDEWALK SUPPORT BRACKETS
(NORTHSIDE SHOWN; SOUTHSIDE OPPOSITE HAND)
(PIER CAP AND HAUNCH REINFORCEMENT NOT SHOWN)
(HORIZONTAL DIMENSIONS MEASURED ALONG ℄ PIER)



STAGE III CONSTRUCTION
ERECT SIDEWALK BOX BEAMS
(SEE NOTE 6)

REQUIRED MINIMUM LAP LENGTHS	
NO. 5 BARS	2'-6"
NO. 6 BARS	3'-1"

PIER	ELEVATION A
1	673.29
2	672.65
3	672.10

LEGEND:
BOT. = BOTTOM
CLR. = CLEAR
E.F. = EACH FACE
EX. = EXISTING
SER. = SERIES
TYP. = TYPICAL

NOTES:

1. FOR FRAMING PLAN, SEE SHEET S-22.
2. FOR PRESTRESSED I-BEAM DETAILS, SEE SHEET S-23.
3. FOR SLAB PLAN, SEE SHEET S-27.
4. FOR COLUMN REMOVAL AND REPLACEMENT DETAILS, SEE SHEET S-19 AND S-20.
5. FOR PRESTRESSED I-BEAM BEARING DETAILS, SEE SHEET S-34.
6. FOR PRESTRESSED BOX BEAM CONNECTION AT PIER, SEE SHEET S-24.
7. FOR UTILITY DETAILS, SEE SHEETS U-3, U-4, U-6 AND U-20.
8. PLACE HAUNCH POUR FOR THE I-BEAM CONCURRENTLY WITH THE PIER DIAPHRAGM POUR. REBAR IN THE PIER DIAPHGRAM TO BE FIELD ADJUSTED AS NECESSARY TO AVOID INTERFERENCE WITH THE REINFORCING IN THE HAUNCH POUR.
9. PRESTRESSED BOX BEAM SEAT REINFORCING, SETTING ANCHOR DOWELS: REINFORCING STEEL IN THE VICINITY OF THE BOX BEAM BRIDGE SEAT SHALL BE ACCURATELY PLACED TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR DOWEL HOLES.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

RTA
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

PIER DIAPHRAGM DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-21

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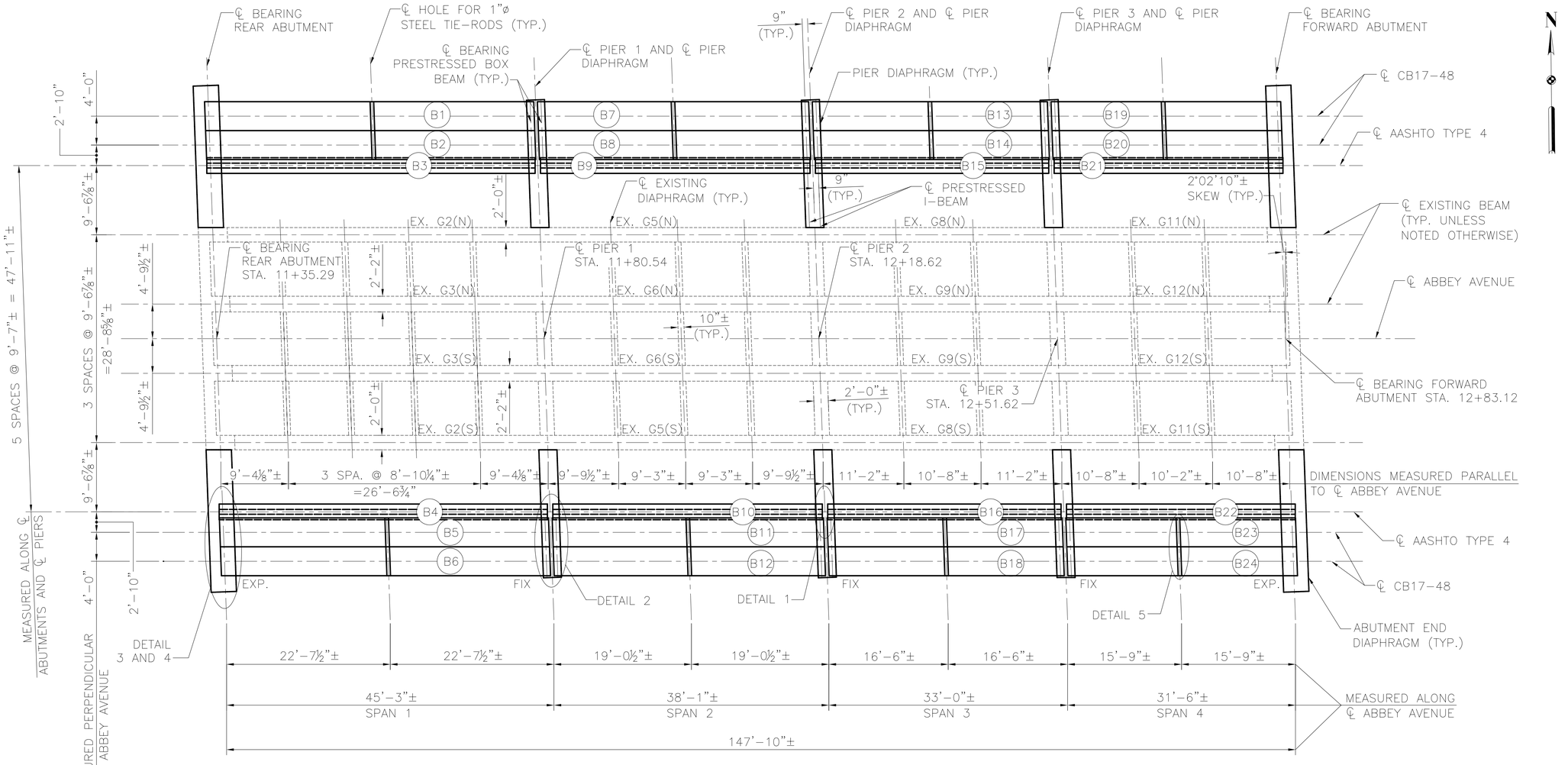

FRAMING PLAN

⅛"=1'-0"

LEGEND:
EX. = EXISTING
N = NORTH
S = SOUTH
TYP. = TYPICAL

NOTES:

1. FOR DETAILS 1, 2, 3, 4 AND 5 SEE SHEET S-25.
2. FOR UTILITY SUPPORT DETAILS, SEE SHEET U-1.
3. FOR PRESTRESSED I-BEAM DETAILS, SEE SHEET S-23.
4. FOR PRESTRESSED BOX BEAM DETAILS, SEE SHEET S-24.
5. FOR PRESTRESSED I-BEAM BEARING DETAILS, SEE SHEET S-34.
6. FOR PRESTRESSED BOX BEAM BEARING DETAILS, SEE SHEET S-35.
7. FOR PIER DIAPHRAGM DETAILS, SEE SHEET S-21.
8. FOR ABUTMENT DIAPHRAGM, SEE SHEET S-14.
9. FOR TRANSVERSE SECTION, SEE SHEET S-26.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

RTA GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

FRAMING PLAN

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-22

6/6/2007 2:26 PM
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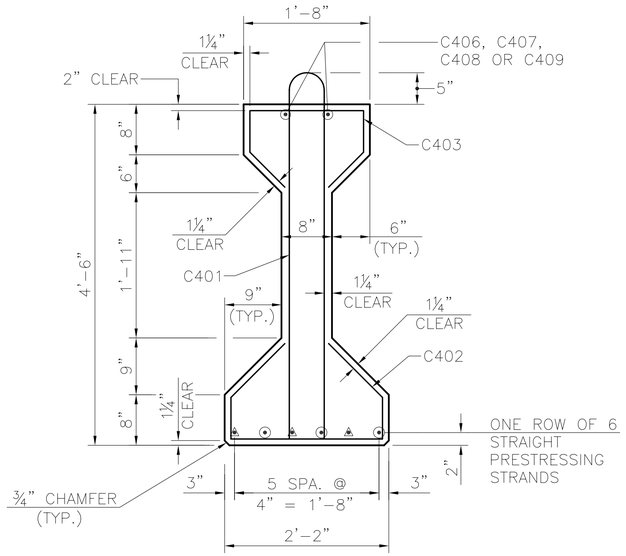
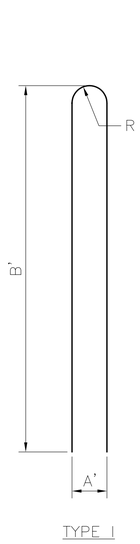


AASHTO TYPE 4 (54") – ALL SPANS

○ – EXTENDED STRAND AT FORWARD STATION ENDS OF BEAMS AT PIERS
△ – EXTENDED STRAND AT BACK STATION ENDS OF BEAMS AT PIERS



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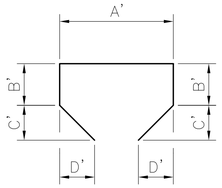

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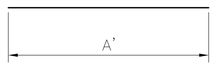

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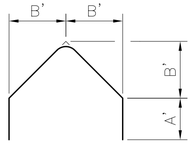

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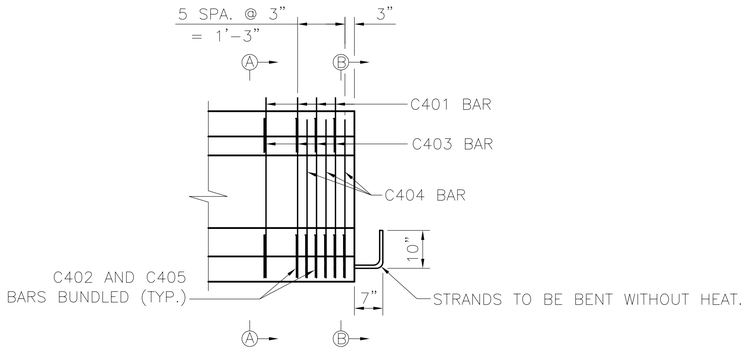
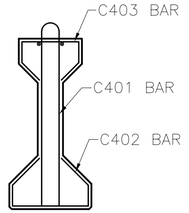
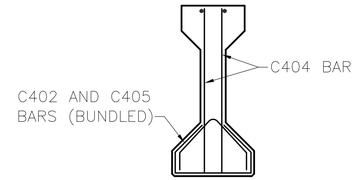


ANCHORAGE REINFORCEMENT DETAIL

DETAIL SHOWN AT PIER 1; ALL OTHER LOCATIONS SIMILAR



SECTION A–A



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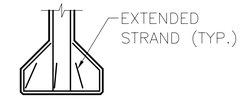
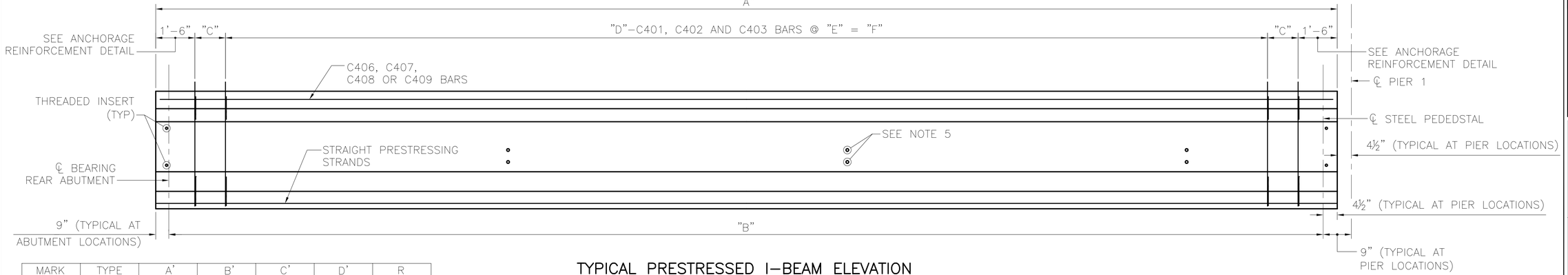


EXTENDED STRANDS SHALL BE FANNED

(SPANS 2 AND 4 SHOWN; SPANS 1 AND 3 SIMILAR)



TYPICAL PRESTRESSED I–BEAM ELEVATION

AASHTO TYPE 4 (54")
(SPAN 1 SHOWN; SPANS 2, 3 AND 4 SIMILAR)

MARK	TYPE	A'	B'	C'	D'	R
C401	1	5½"	4'–10"			2¼"
C402	2	1'–11½"	6¼"	8½"	8½"	
C403	2	1'–5½"	5½"	5½"	5½"	
C404	3	4'–2¾"				
C405	4	6¼"	11¾"			
C406	3	45'–3"				
C407	3	37'–0"				
C408	3	31'–11"				
C409	3	31'–6"				

BEAM DETAILS									
BEAM MARK	SPAN	NO. RQD.	DIMENSIONS A	B	C	D	E	F	APPROXIMATE WEIGHT (LBS.)
B3	1	1	45'–7½"	44'–6"	1'–3¾"	21	2'–0"	40'–0"	37,504
B4	1	1	45'–7½"	44'–6"	1'–3¾"	21	2'–0"	40'–0"	37,504
B9	2	1	37'–4"	36'–7"	1'–2"	17	2'–0"	32'–0"	30,688
B10	2	1	37'–4"	36'–7"	1'–2"	17	2'–0"	32'–0"	30,688
B15	3	1	32'–3"	31'–6"	1'–7½"	14	2'–0"	26'–0"	26,510
B16	3	1	32'–3"	31'–6"	1'–7½"	14	2'–0"	26'–0"	26,510
B21	4	1	31'–10½"	30'–9"	1'–5¼"	14	2'–0"	26'–0"	26,201
B22	4	1	31'–10½"	30'–9"	1'–5¼"	14	2'–0"	26'–0"	26,201

BEAM DETAILS													
BEAM MARK	NO. OF STRANDS	CONCRETE STRENGTHS (psi) f'ci	f'c	C401 BARS RQD.	C402 BARS RQD.	C403 BARS RQD.	C404 BARS RQD.	C405 BARS RQD.	C406 BARS RQD.	C407 BARS RQD.	C408 BARS RQD.	C409 BARS RQD.
SPAN 1													
B3	6	4,000	5,500	27	33	27	12	12	2	0	0	0
B4	6	4,000	5,500	27	33	27	12	12	2	0	0	0
SPAN 2													
B9	6	4,000	5,500	23	29	23	12	12	0	2	0	0
B10	6	4,000	5,500	23	29	23	12	12	0	2	0	0
SPAN 3													
B15	6	4,000	5,500	20	26	20	12	12	0	0	2	0
B16	6	4,000	5,500	20	26	20	12	12	0	0	2	0
SPAN 4													
B21	6	4,000	5,500	20	26	20	12	12	0	0	0	2
B22	6	4,000	5,500	20	26	20	12	12	0	0	0	2

LEGEND:
RQD. = REQUIRED

NOTES:
1. FOR ADDITIONAL DETAILS AND NOTES SEE ODOT STANDARD DRAWING PSID–1–99.
2. ALL STANDARD REINFORCING STEEL SHALL BE EPOXY COATED.
3. FOR GIRDER HAUNCH DETAIL, SEE SHEET S–29.
4. FOR FRAMING PLAN, SEE SHEET S–22.
5. FOR UTILITY SUPPORT DETAILS, SEE SHEET U–1.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

PRESTRESSED I–BEAM DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–23

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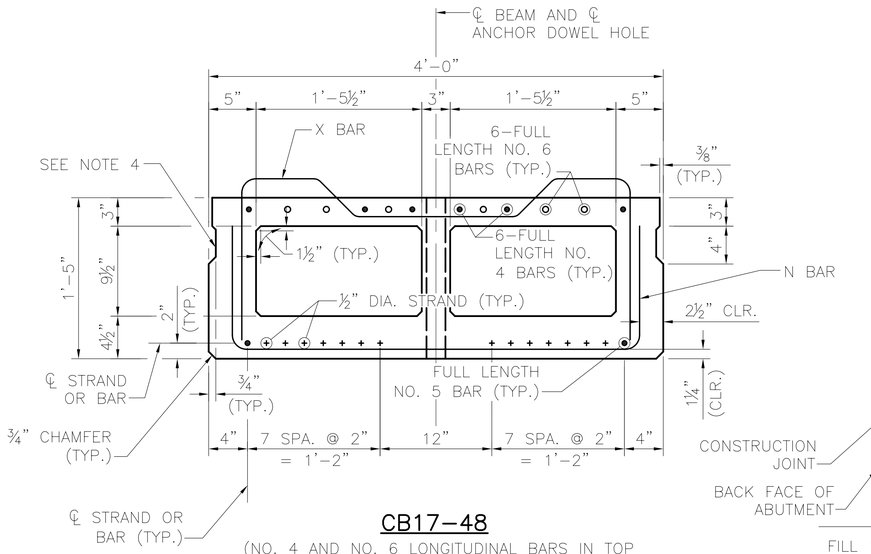
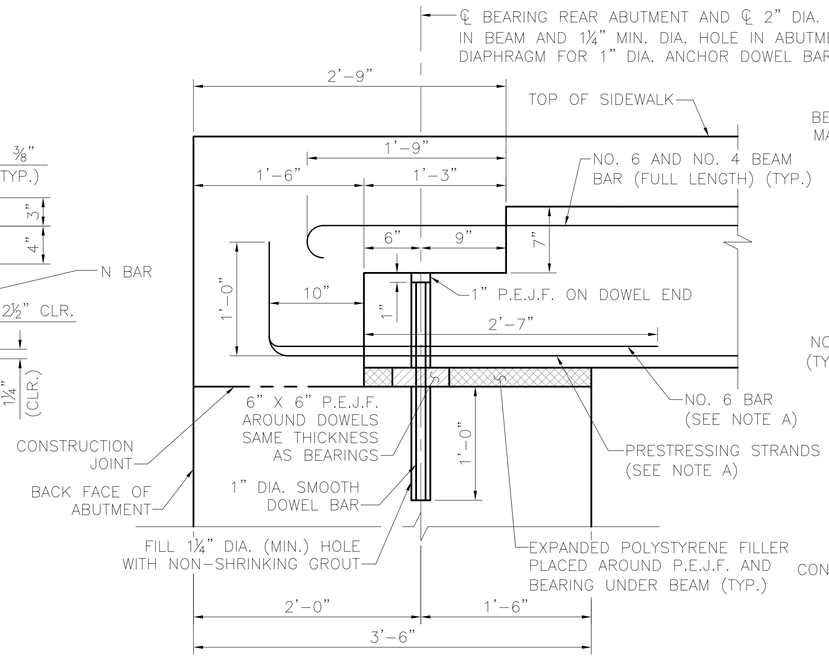


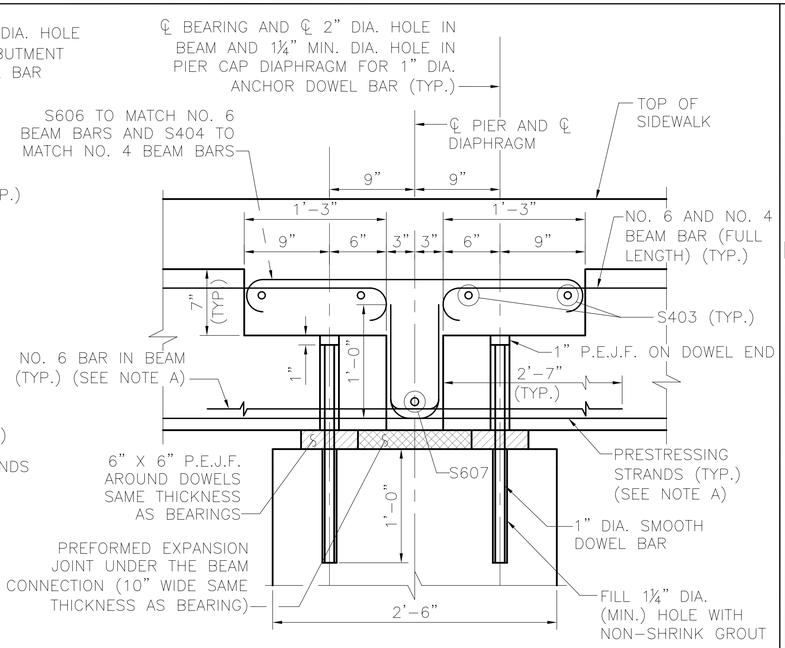
CB17-48

(NO. 4 AND NO. 6 LONGITUDINAL BARS IN TOP OF BEAM SHALL EXTEND FROM END OF BEAM AS SHOWN ON BEAM CONNECTION DETAILS.)
(X AND N BARS SHALL BE NO. 4 SIZE.)



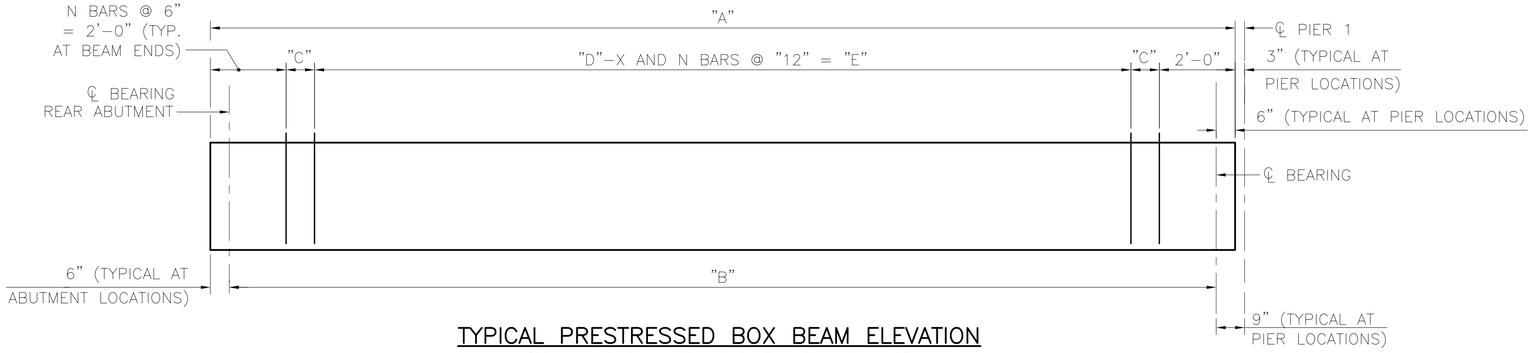
BOX BEAM CONNECTION AT ABUTMENTS

(REAR ABUTMENT SHOWN; FORWARD ABUTMENT SIMILAR)
(SIDEWALK AND ABUTMENT REINFORCING NOT SHOWN)



BOX BEAM CONNECTION AT PIER

(PIER 1 SHOWN; PIERS 2 AND 3 SIMILAR)
(SIDEWALK AND PIER DIAPHRAGM REINFORCING NOT SHOWN)

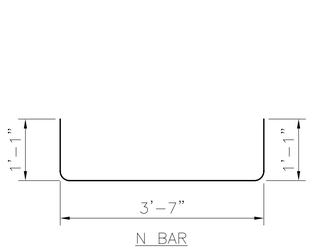


TYPICAL PRESTRESSED BOX BEAM ELEVATION

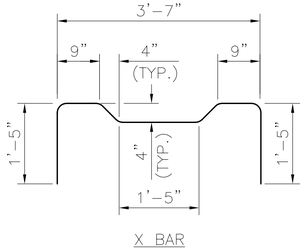
(SPAN 1 SHOWN; SPANS 2, 3 AND 4 SIMILAR)

BEAM DETAILS							
BEAM MARK	SPAN	NO. RQD.	DIMENSIONS				
			A	B	C	D	E
B1	1	1	45'-6"	44'-6"	9"	41	40'-0"
B2	1	1	45'-6"	44'-6"	9"	41	40'-0"
B5	1	1	45'-6"	44'-6"	9"	41	40'-0"
B6	1	1	45'-6"	44'-6"	9"	41	40'-0"
B7	2	1	37'-7"	36'-7"	9½"	33	32'-0"
B8	2	1	37'-7"	36'-7"	9½"	33	32'-0"
B11	2	1	37'-7"	36'-7"	9½"	33	32'-0"
B12	2	1	37'-7"	36'-7"	9½"	33	32'-0"
B13	3	1	32'-6"	31'-6"	9"	28	27'-0"
B14	3	1	32'-6"	31'-6"	9"	28	27'-0"
B17	3	1	32'-6"	31'-6"	9"	28	27'-0"
B18	3	1	32'-6"	31'-6"	9"	28	27'-0"
B19	4	1	31'-9"	30'-9"	10½"	27	26'-0"
B20	4	1	31'-9"	30'-9"	10½"	27	26'-0"
B23	4	1	31'-9"	30'-9"	10½"	27	26'-0"
B24	4	1	31'-9"	30'-9"	10½"	27	26'-0"

DESIGN DATA FOR CB17-48 BOX BEAMS				
	SPAN 1	SPAN 2	SPAN 3	SPAN 4
NO. OF 270ksi ½"ø STRANDS (AREA = 0.153 IN²)	14	14	14	14
STRAND POSITION	SEE DIAGRAM			
TOTAL NUMBER OF DEBONDED STRANDS	0	0	0	0



N BAR



X BAR

LEGEND:
DIA. = DIAMETER
MIN. = MINIMUM
P.E.J.F. = PREFORMED EXPANSION JOINT FILLER
TYP. = TYPICAL

NOTE A:
PROVIDE 6 NO. 6 BARS @ EACH BEAM END. NO. 6 BARS SHALL BE LOCATED ON TOP OF N-BARS AND SHALL BE UNIFORMLY SPACED ACROSS THE BEAM.

AT THE FABRICATOR'S OPTION, STRANDS MAY BE EXTENDED AND BENT UP IN LIEU OF NO. 6 BARS. A MINIMUM OF 6 STRANDS SHALL BE BENT UP FOR EACH BEAM AND SHALL BE STAGGERED IN ABUTTING BEAM ENDS TO AVOID INTERFERENCE.

NOTES:

1. FOR ADDITIONAL DETAILS AND NOTES SEE ODOT STANDARD DRAWING PSBD-1-93.
2. FOR PRESTRESSED BOX BEAM BEARING DETAILS, SEE SHEET S-35.
3. ANCHOR DOWELS FOR PIERS AND ABUTMENTS WILL BE A FIXED DOWEL ANCHOR.
4. OMIT SHEAR KEY ON EXTERIOR FACE OF FASICA BEAMS.
5. FOR FRAMING PLAN, SEE SHEET S-22.
6. ALL REINFORCING BARS PROJECTING FROM THE BEAMS SHALL BE EPOXY COATED.
7. FOR REBAR SCHEDULE, SEE SHEET S-41.
8. FOR TRANSVERSE SECTION, SEE SHEET S-26.
9. ALL PREFORMED EXPANSION JOINT FILLER INCLUDED FOR PAYMENT WITH ITEM TS 515.

REVISIONS:

DRAWN: JFM | CHECKED: BMG | APPROVED: RHW | DATE: 6-1-2007 | JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

PRESTRESSED BOX BEAM DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D | BID PAC

SHEET S-24

6/6/2007 12:34 PM

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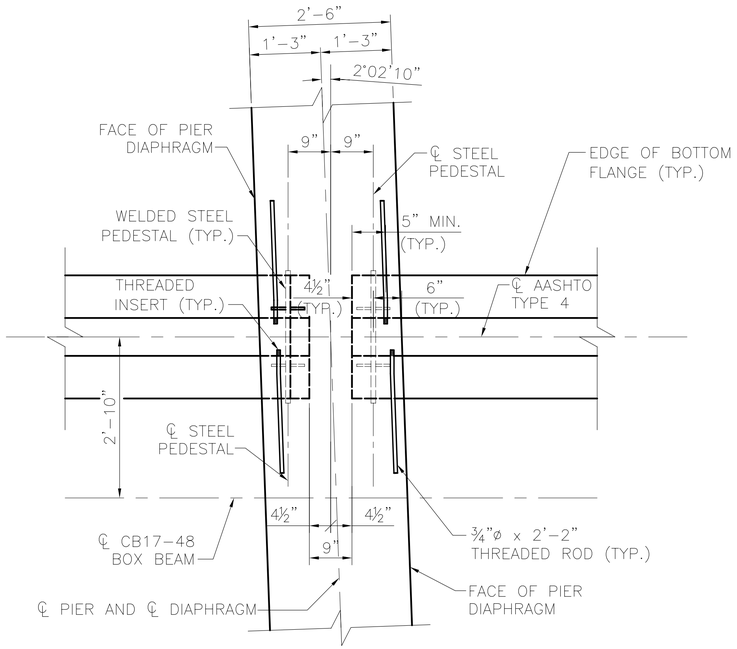
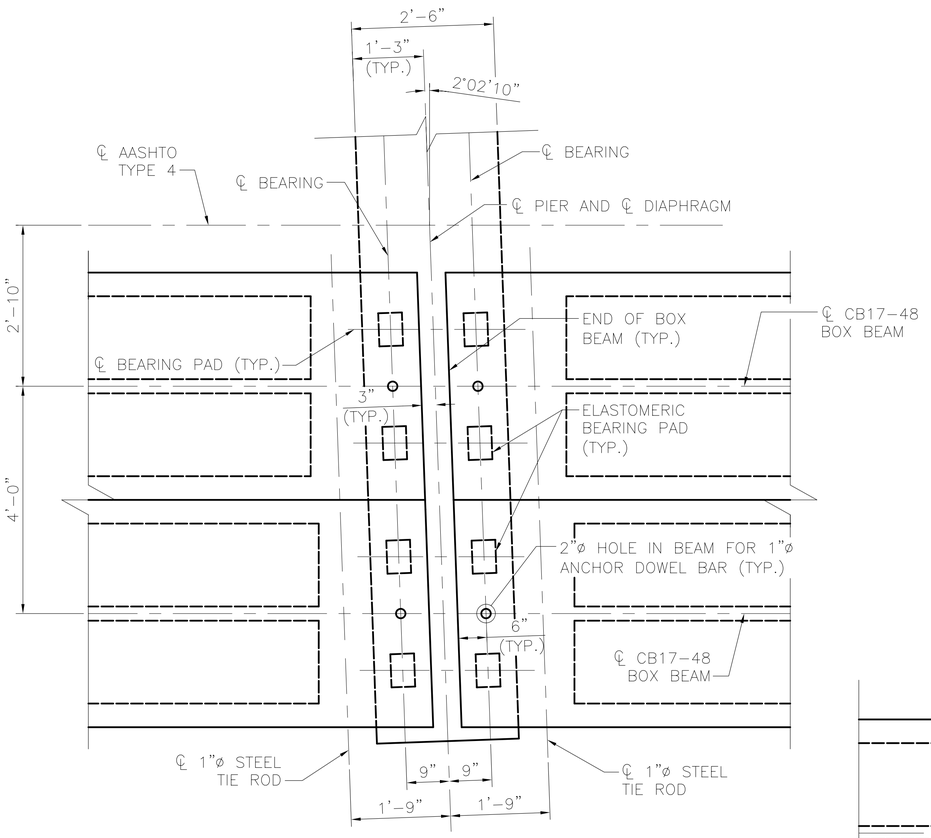


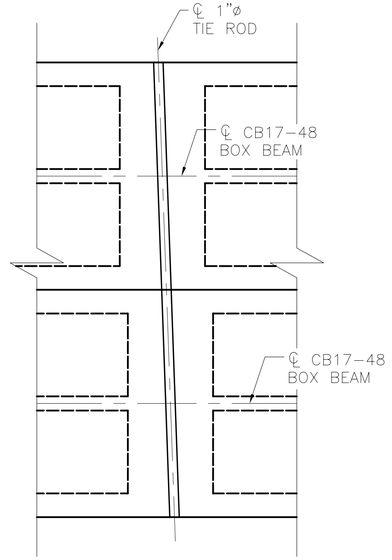
DETAIL 1

(PIER 2 SOUTH SIDE SHOWN, NORTH SIDE OPPOSITE HAND; PIERS 1 AND 3 SIMILAR)
(REINFORCING STEEL NOT SHOWN FOR CLARITY)



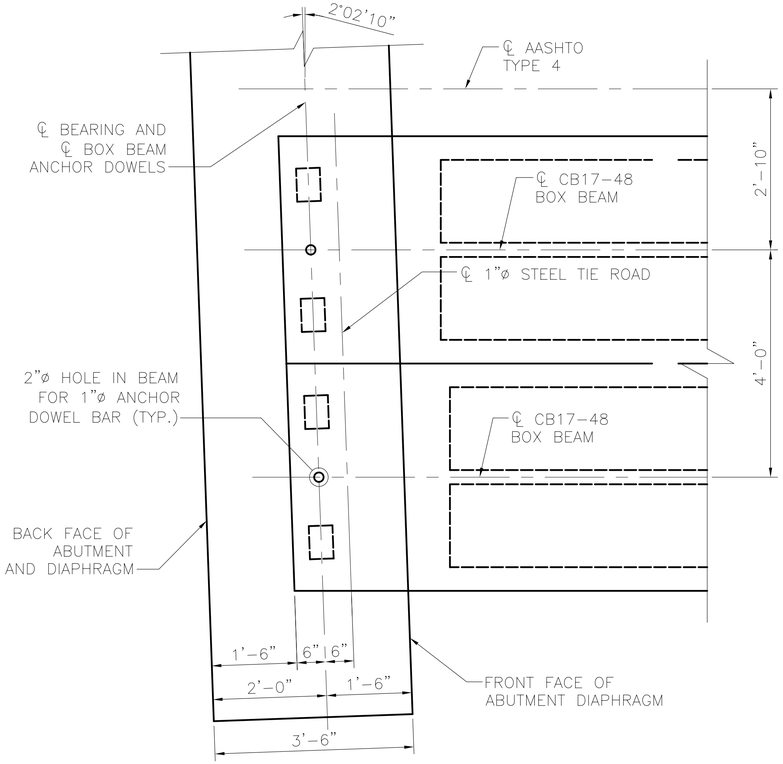
DETAIL 2

(PIER 1 SOUTH SIDE SHOWN, NORTH SIDE OPPOSITE HAND;
PIERS 2 AND 3 SIMILAR)



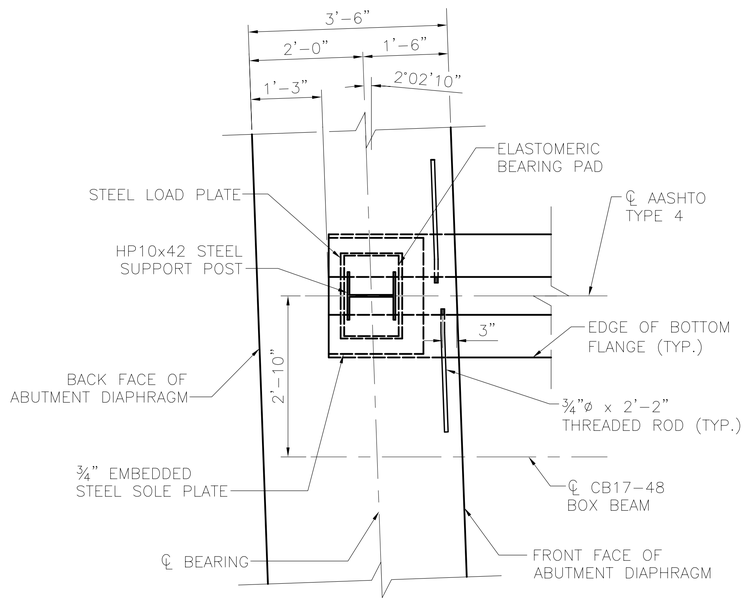
DETAIL 5

(ALL INTERMEDIATE TRANSVERSE TIE RODS SIMILAR)



DETAIL 3

(REAR ABUTMENT SOUTH SIDE SHOWN, NORTH SIDE OPPOSITE HAND; FORWARD ABUTMENT SIMILAR)



DETAIL 4

(REAR ABUTMENT SOUTH SIDE SHOWN, NORTH SIDE
OPPOSITE HAND; FORWARD ABUTMENT SIMILAR)

LEGEND:
MIN. = MINIMUM
TYP. = TYPICAL

NOTES:
1. FOR ADDITIONAL DETAILS AND NOTES, SEE ODOT STANDARD DRAWINGS PSID-1-99 AND PSBD-1-93.
2. FOR PRESTRESSED BOX BEAM BEARING DETAILS, SEE SHEET S-35.
3. FOR FRAMING PLAN, SEE SHEET S-22.
4. FOR ABUTMENT DIAPHRAGM DETAILS, SEE SHEET S-14.
5. FOR PIER DIAPHRAGM DETAILS, SEE SHEET S-21.
6. FOR PRESTRESSED I-BEAM BEARING DETAILS, SEE SHEET S-34.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

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BEAM DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-25

6/6/2007 2:26 PM
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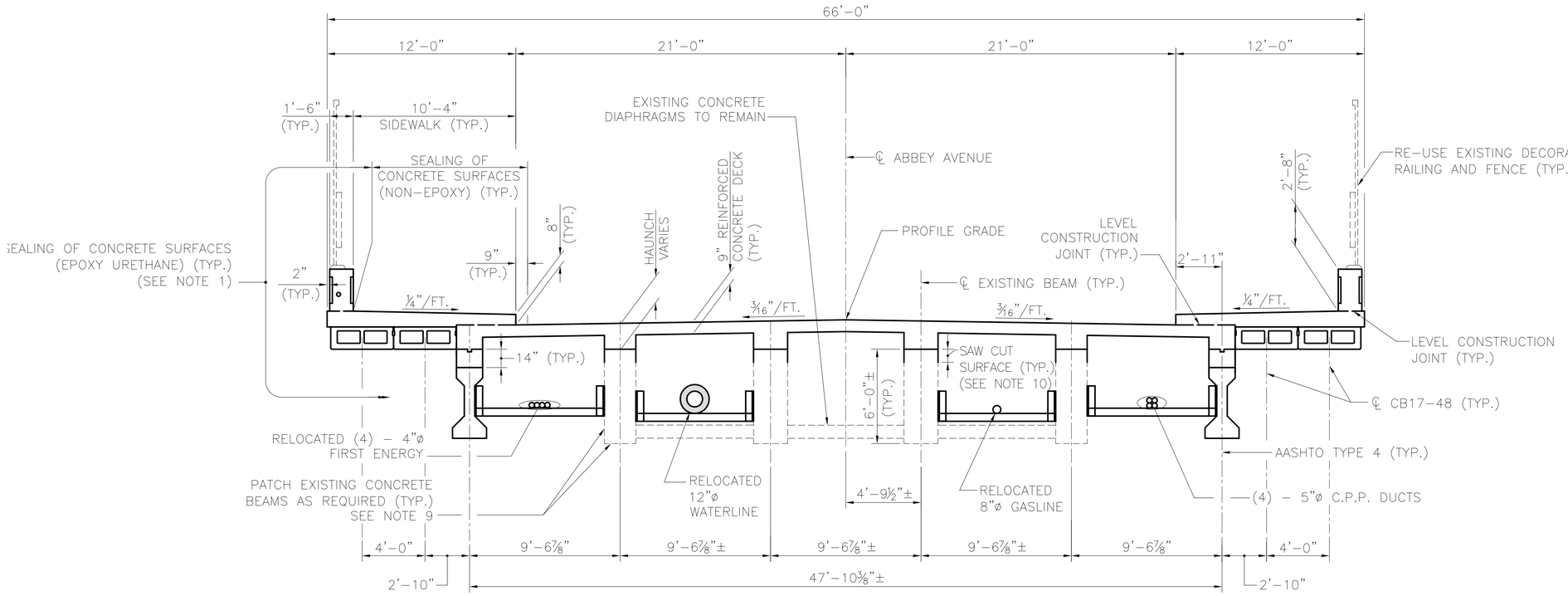

TRANSVERSE SECTION

(PIER DIAPHRAGM AND SIDEWALK SUPPORT BRACKETS NOT SHOWN)

NOTES:

1. SEAL ENTIRE BOTTOM PERIMETER OF SUPERSTRUCTURE EXCLUDING BOTTOM OF DECK.
2. FOR PRESTRESSED I-BEAM DETAILS, SEE SHEET S-23.
3. FOR PRESTRESSED BOX BEAM DETAILS, SEE SHEET S-24.
4. FOR SCREED INFORMATION, SEE SHEET S-28.
5. FOR DECK REINFORCING, SEE SHEET S-27.
6. FOR FRAMING PLAN, SEE SHEET S-22.
7. FOR PARAPET RECESS PANEL INFORMATION AND CRACK CONTROL JOINT SPACING, SEE SHEET S-32.
8. FOR RAILING DETAILS, SEE SHEET S-33.
9. FOR BEAM PATCHING DETAILS, SEE SHEET S-5.
10. FOR DECK REMOVAL DETAILS, SEE SHEET S-11.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
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CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

TRANSVERSE SECTION

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-26

6/6/2007 12:50 PM

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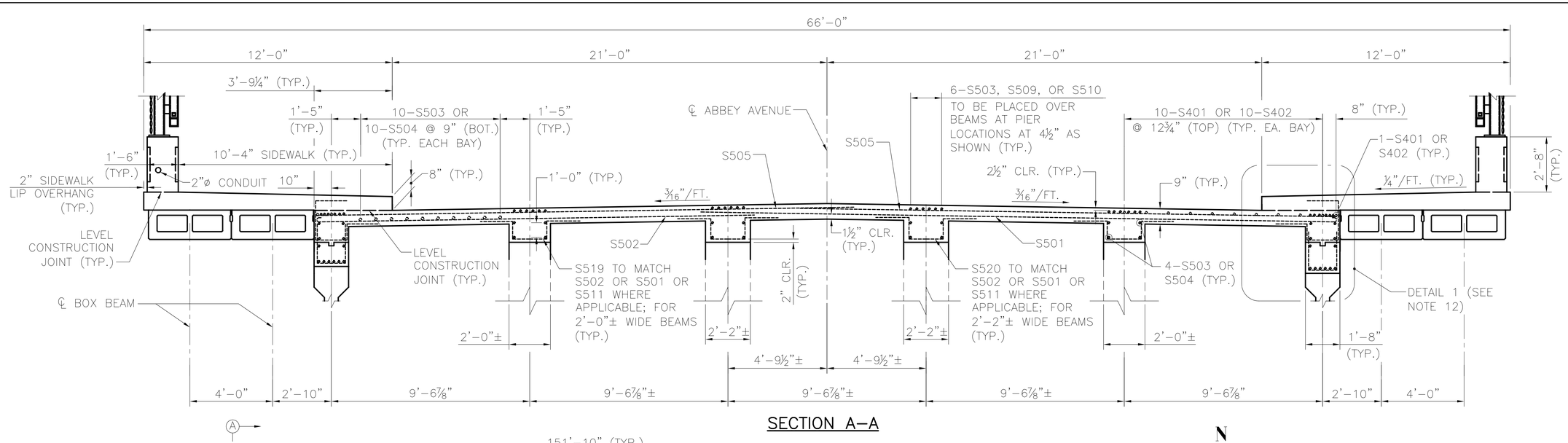
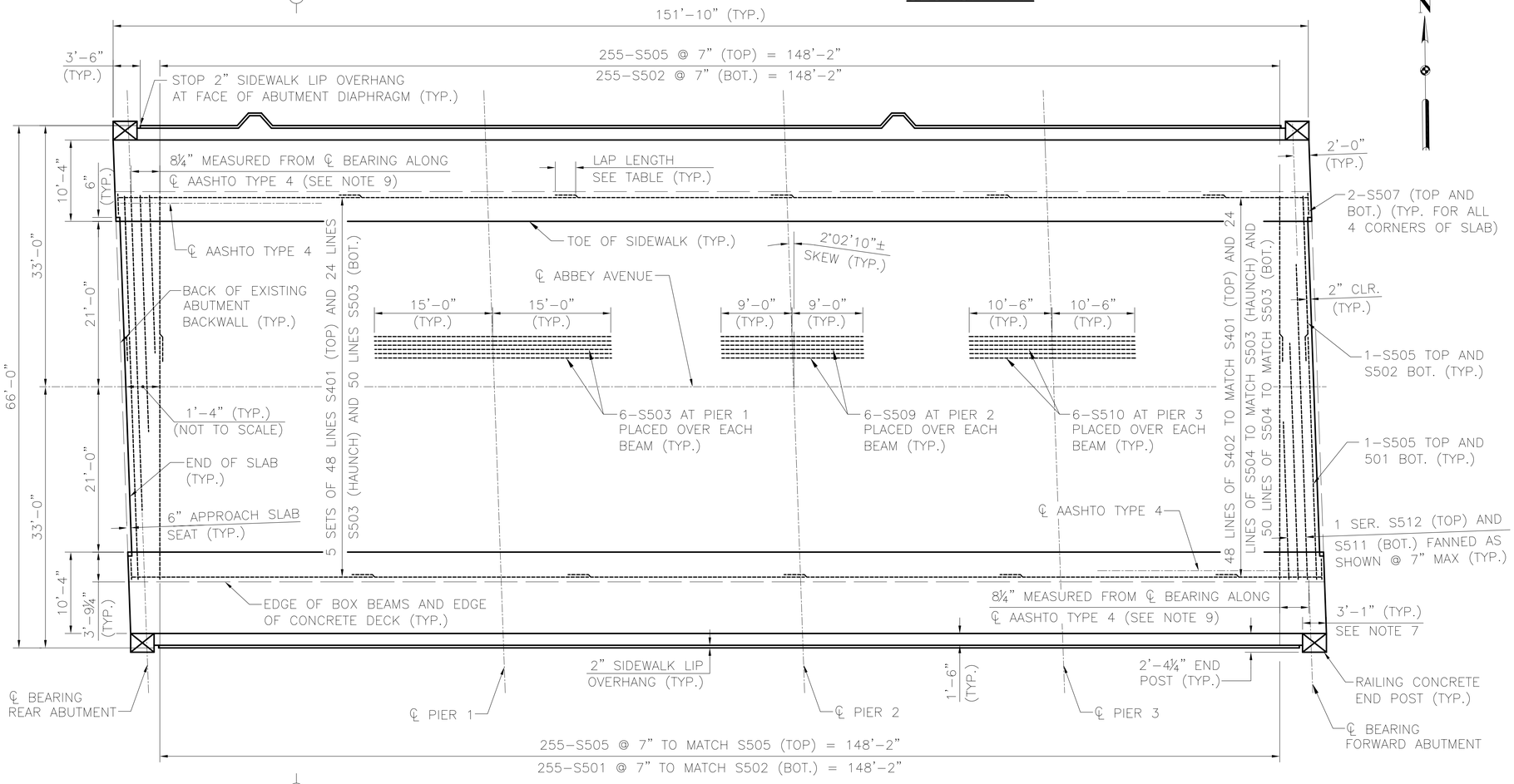


SECTION A–A



SLAB PLAN

(S518, S519, AND S520 HAUNCH REINFORCEMENT NOT SHOWN)

REQUIRED MINIMUM LAP LENGTHS	
NO. 4 BARS	3'–0"
NO. 5 BARS	3'–3"
NO. 6 BARS	3'–3"

LEGEND:
BOT. = BOTTOM
CLR. = CLEAR
EA. = EACH
TYP. = TYPICAL

NOTES:
1. FOR PRESTRESSED I–BEAM BEAM DETAILS, SEE SHEETS S–23.
2. FOR REBAR SCHEDULE, SEE SHEET S–42.
3. FOR PIER DIAPHRAGM DETAILS, SEE SHEET S–21.
4. FOR ABUTMENT DIAPHRAGM DETAILS, SEE SHEET S–14.
5. FOR PARAPET RECESS PANEL INFORMATION WITH THE CONTROL JOINT SPACING, SEE SHEET S–32.
6. FOR SCREED ELEVATIONS, SEE SHEET S–28.
7. FINAL RAILING CONCRETE END POST DIMENSION MUST COORDINATE WITH RE–USE OF EXISTING DECORATIVE RAILING. FOR RAILING CONCRETE END POST REINFORCING INFORMATION, SEE SHEET S–31.
8. FOR SIDEWALK AND PARAPET DETAILS, SEE SHEET S–30.
9. FOR HAUNCH OVER PRESTRESSED I–BEAM DETAILS, SEE SHEET S–29.
10. FOR RAILING DETAILS, SEE SHEET S–33.
11. FOR FRAMING PLAN, SEE SHEET S–22.
12. FOR DETAIL 1, SEE SHEET S–30.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

SLAB PLAN

RTA PROJ 29D
BID PAC

SHEET S–27

6/6/2007 12:49 PM
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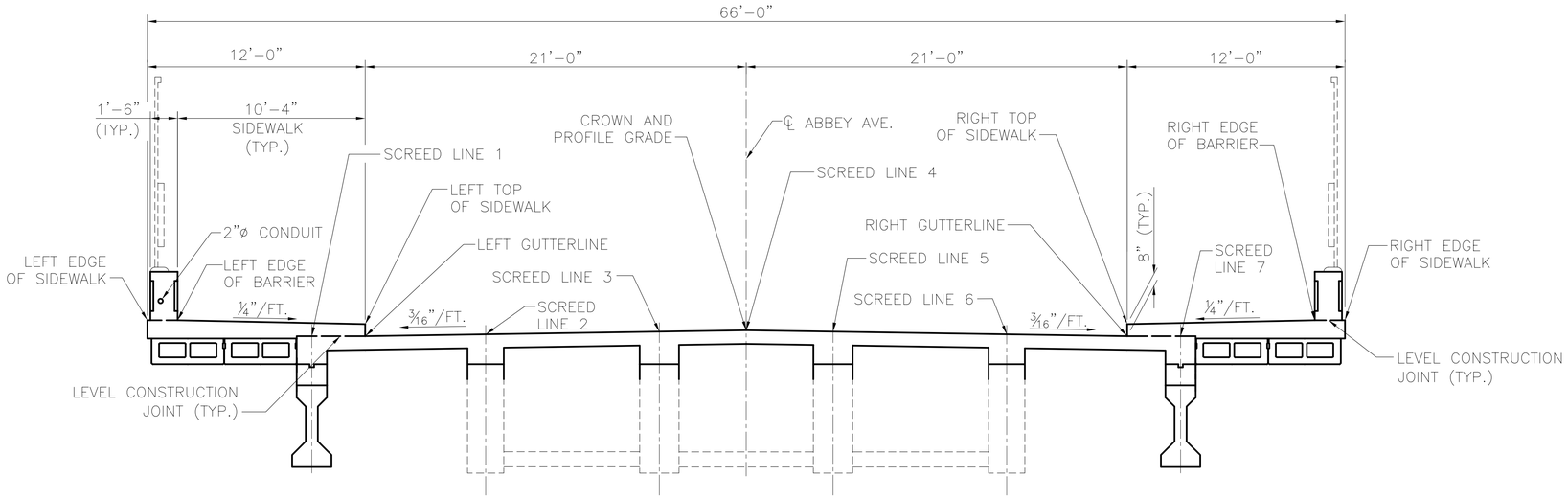

TRANSVERSE SECTION

(POINTS OF SCREED ELEVATION)
(LOOKING UPSTATION)

LOCATION	LEFT EDGE OF SIDEWALK		LEFT EDGE OF BARRIER		SCREED LINE 1		LEFT TOP OF SIDEWALK		LEFT GUTTERLINE		SCREED LINE 2		SCREED LINE 3		SCREED LINE 4	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
℄ BEARING REAR ABUTMENT	11+34.12	684.92	11+34.18	684.92	11+34.44	684.03	11+34.54	684.70	11+34.54	684.03	11+34.78	684.13	11+35.12	684.27	11+35.29	684.35
MID-SPAN 1	11+56.74	684.55	11+56.80	684.54	11+57.06	683.66	11+57.17	684.32	11+57.17	683.66	11+57.40	683.76	11+57.74	683.90	11+57.92	683.97
℄ PIER 1	11+79.37	684.17	11+79.43	684.17	11+79.69	683.29	11+79.79	683.95	11+79.79	683.28	11+80.03	683.38	11+80.37	683.53	11+80.54	683.60
MID-SPAN 2	11+98.41	683.86	11+98.47	683.86	11+98.73	683.97	11+98.83	683.64	11+98.83	682.97	11+99.07	683.07	11+99.41	683.21	11+99.58	683.28
℄ PIER 2	12+17.45	683.54	12+17.51	683.54	12+17.77	682.66	12+17.87	683.32	12+17.87	682.66	12+18.11	682.75	12+18.45	682.90	12+18.62	682.97
MID-SPAN 3	12+33.95	683.27	12+34.01	683.27	12+34.27	682.38	12+34.37	683.05	12+34.37	682.38	12+34.61	682.48	12+34.95	682.63	12+35.12	682.70
℄ PIER 3	12+50.45	683.00	12+50.51	683.00	12+50.77	682.11	12+50.87	682.78	12+50.87	682.11	12+51.11	682.21	12+51.45	682.35	12+51.62	682.43
MID-SPAN 4	12+66.20	682.74	12+66.26	682.74	12+66.52	681.85	12+66.62	682.52	12+66.62	681.85	12+66.86	681.95	12+67.20	682.09	12+67.37	682.17
℄ BEARING FORWARD ABUTMENT	12+81.95	682.48	12+82.01	682.48	12+82.27	681.59	12+82.37	682.26	12+82.37	681.59	12+82.61	681.69	12+82.95	681.83	12+83.12	681.91

LOCATION	SCREED LINE 5		SCREED LINE 6		RIGHT GUTTERLINE		RIGHT TOP OF SIDEWALK		SCREED LINE 7		RIGHT EDGE OF BARRIER		RIGHT EDGE OF SIDEWALK	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
℄ BEARING REAR ABUTMENT	11+35.46	684.27	11+35.80	684.11	11+36.04	684.01	11+36.04	684.67	11+36.14	684.00	11+36.40	684.88	11+36.46	684.88
MID-SPAN 1	11+58.09	683.89	11+58.43	683.74	11+58.66	683.63	11+58.66	684.30	11+58.77	683.63	11+59.03	684.51	11+59.09	684.51
℄ PIER 1	11+80.71	683.52	11+81.05	683.37	11+81.29	683.26	11+81.29	683.93	11+81.39	683.26	11+81.65	684.13	11+81.71	684.13
MID-SPAN 2	11+99.75	683.21	12+00.09	683.05	12+00.33	682.94	12+00.33	683.61	12+00.43	683.94	12+00.69	683.82	12+00.75	683.82
℄ PIER 2	12+18.79	682.89	12+19.13	682.74	12+19.37	682.63	12+19.37	683.30	12+19.47	682.63	12+19.73	683.51	12+19.79	683.51
MID-SPAN 3	12+35.29	682.62	12+35.63	682.47	12+35.87	682.36	12+35.87	683.02	12+35.97	682.36	12+36.23	683.23	12+36.29	683.23
℄ PIER 3	12+51.79	682.35	12+52.13	682.19	12+52.37	682.09	12+52.37	682.75	12+52.47	682.08	12+52.73	682.96	12+52.79	682.96
MID-SPAN 4	12+67.54	682.09	12+67.88	681.93	12+68.12	681.83	12+68.12	682.49	12+68.22	681.82	12+68.48	682.70	12+68.54	682.70
℄ BEARING FORWARD ABUTMENT	12+83.29	681.83	12+83.63	681.67	12+83.87	681.57	12+83.87	682.23	12+83.97	681.56	12+84.23	682.44	12+84.29	682.44

SCREED ELEVATIONS

LEGEND:
ELEV. = ELEVATION

NOTES:

1. SCREED ELEVATIONS ARE FOR THE DECK SLAB SURFACE PRIOR TO CONCRETE PLACEMENT. ALLOWANCE HAS BEEN MADE FOR THE ANTICIPATED CALCULATED DEAD LOAD DEFLECTIONS.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

RTA
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

SCREED ELEVATIONS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-28

6/6/2007 12:47 PM
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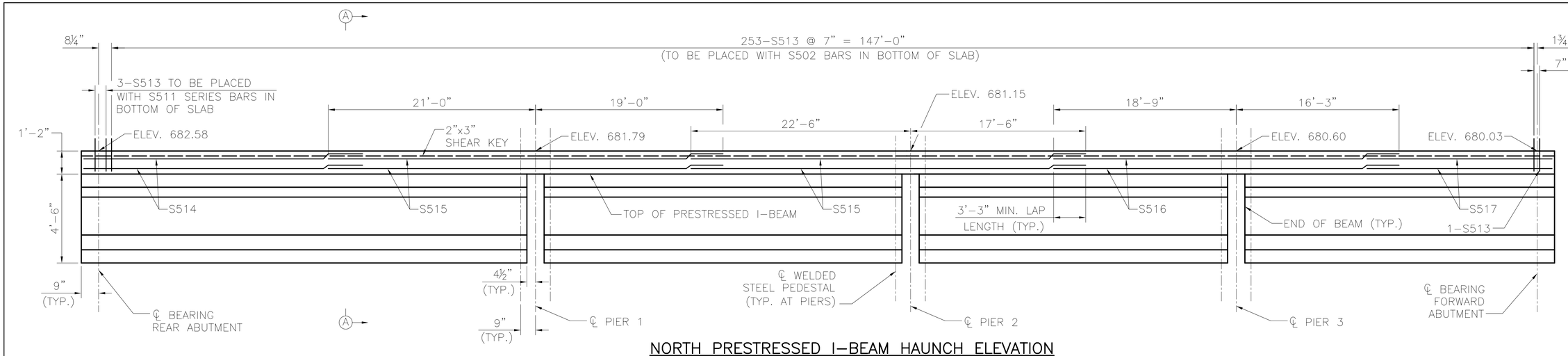
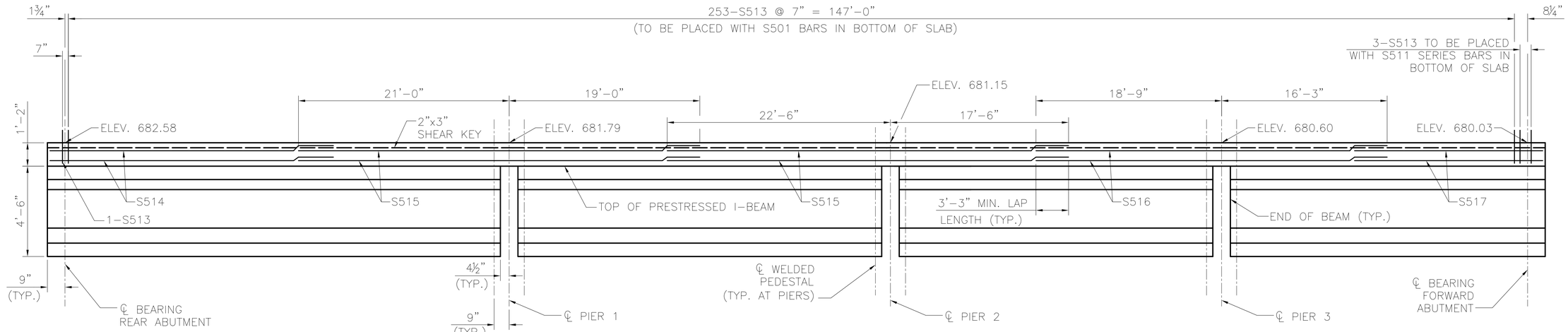


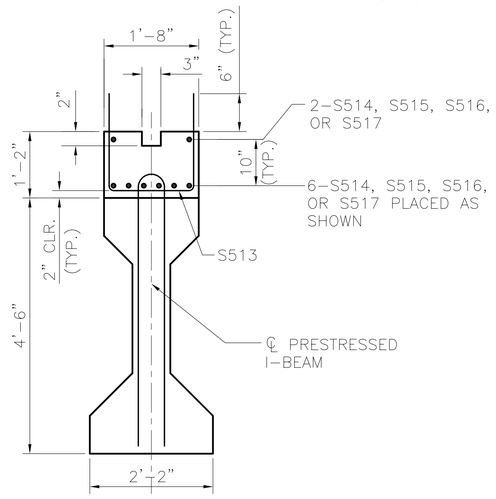
NORTH PRESTRESSED I–BEAM HAUNCH ELEVATION

(ABUTMENT AND PIER DIAPHRAGMS NOT SHOWN)



SOUTH PRESTRESSED I–BEAM HAUNCH ELEVATION

(ABUTMENT AND PIER DIAPHRAGMS NOT SHOWN)



SECTION A–A

(NORTH I–BEAM SHOWN; SOUTH I–BEAM SIMILAR)

LEGEND:

CLR. = CLEAR
ELEV. = ELEVATION
EQ. = EQUAL
SPA. = SPACES
TYP. = TYPICAL

NOTES:

1. FOR FRAMING PLAN, SEE SHEET S–22.
2. FOR PRESTRESSED I–BEAM DETAILS, SEE SHEET S–23.
3. FOR SLAB PLAN, SEE SHEET S–27.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

PRESTRESSED I–BEAM HAUNCH DETAIL

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–29

6/6/2007 12:39 PM
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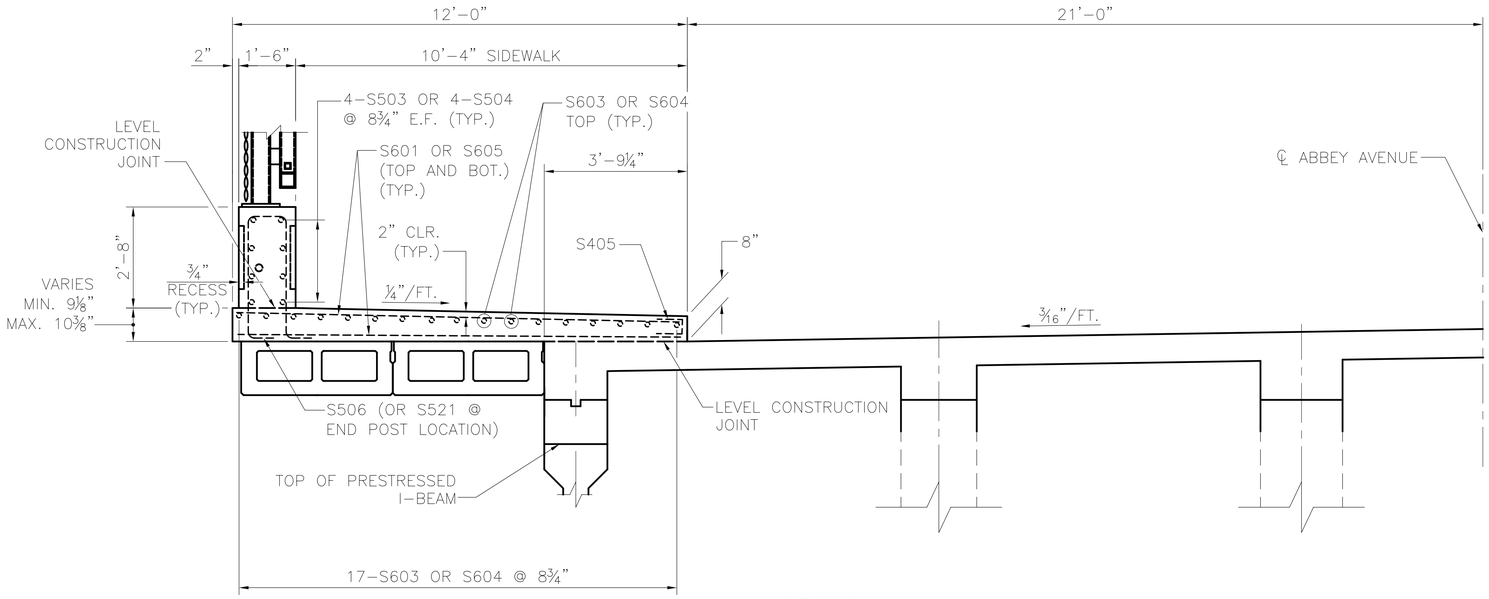
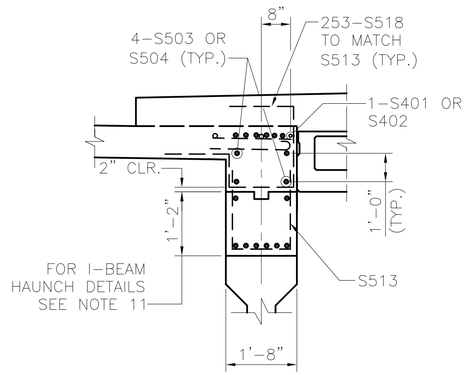


SECTION A-A

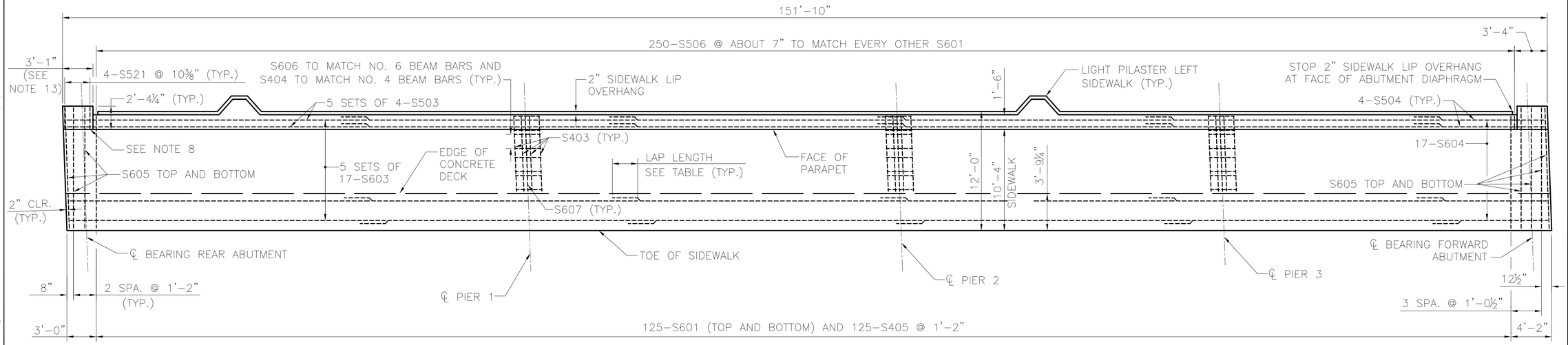
(DECK AND HAUNCH REINFORCEMENT NOT SHOWN)



DETAIL 1

(RIGHT PRESTRESSED I-BEAM SHOWN; LEFT PRESTRESSED I-BEAM OPPOSITE HAND)

Ⓐ



SIDEWALK PLAN

(LEFT SIDEWALK SHOWN; RIGHT SIDEWALK OPPOSITE HAND)
EXCEPT AS NOTED

Ⓐ

N

LEGEND:
BOT. = BOTTOM
CLR. = CLEAR
MAX. = MAXIMUM
MIN. = MINIMUM
TYP. = TYPICAL

REQUIRED MINIMUM LAP LENGTHS	
NO. 4 BARS	3'-0"
NO. 5 BARS	3'-3"
NO. 6 BARS	3'-3"

NOTES:

1. FOR PRESTRESSED I-BEAM DETAILS, SEE SHEETS S-23.
2. FOR PRESTRESSED BOX BEAM DETAILS, SEE SHEET S-24.
3. FOR REBAR SCHEDULE, SEE SHEET S-42.
4. FOR PIER DIAPHRAGM DETAILS, SEE SHEET S-21.
5. FOR ABUTMENT DIAPHRAGM DETAILS, SEE SHEETS S-14.
6. FOR PARAPET RECESS PANEL INFORMATION AND CRACK CONTROL JOINT SPACING, SEE SHEET S-32.
7. FOR SCREED ELEVATIONS, SEE SHEET S-28.
8. FOR RAILING CONCRETE END POST DETAILS, SEE SHEET S-31.
9. VERTICAL PARAPET REINFORCING STEEL SHALL CLEAR THE CONTROL JOINTS BY THREE INCHES MINIMUM. OBTAIN CLEARANCE BY FIELD ADJUSTING THE REINFORCING STEEL SPACING.
10. FOR DECK AND HAUNCH DETAILS, SEE SHEET S-29.
11. FOR SLAB PLAN, SEE SHEET S-27.
12. FOR FRAMING PLAN, SEE SHEET S-22.
13 FINAL END POST DIMENSION MUST BE COORDINATED WITH RE-USE OF EXISTING RAILING.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

SIDEWALK DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-30

6/6/2007 12:49 PM
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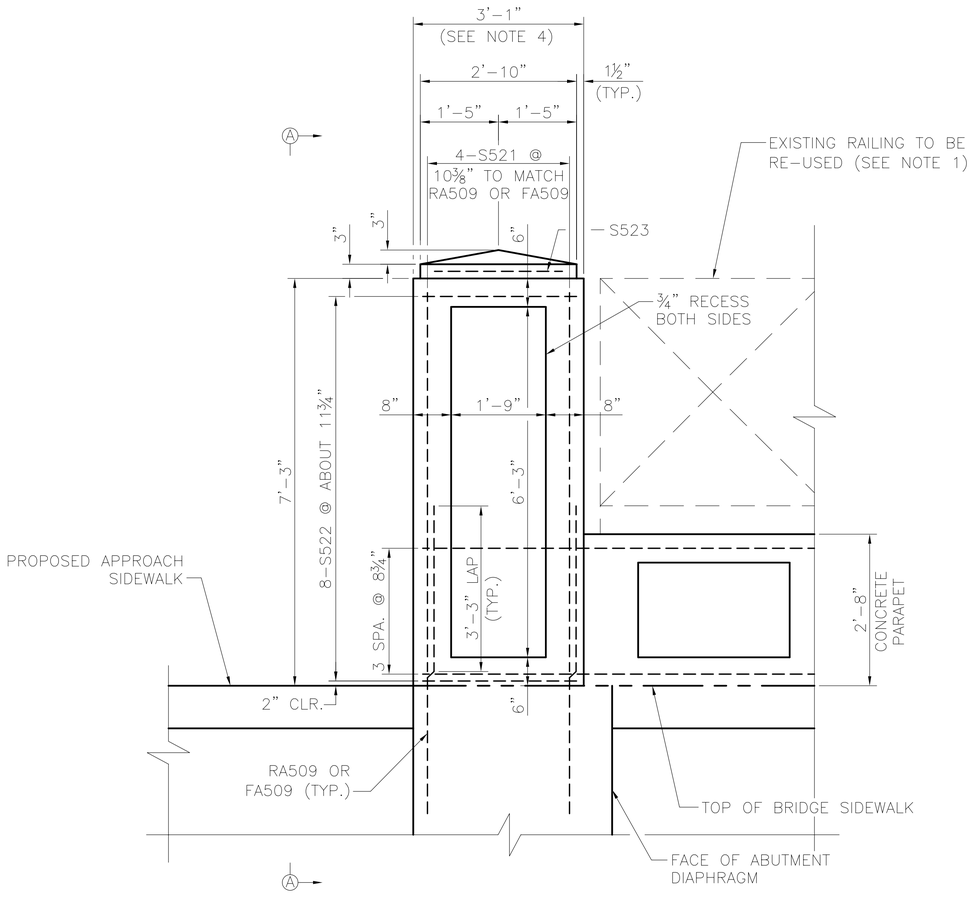
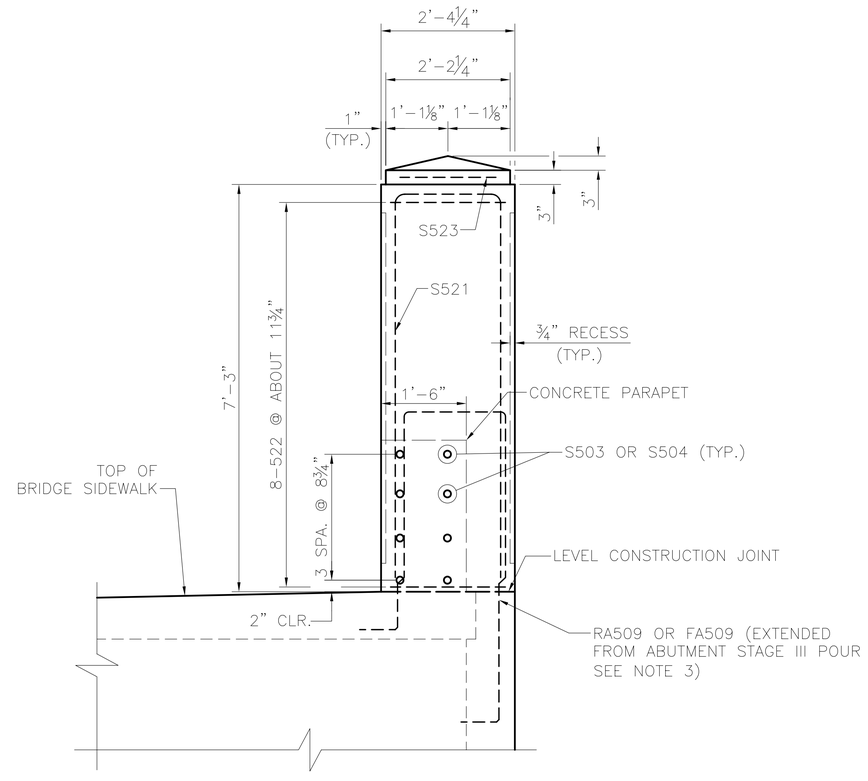


RAILING END POST ELEVATION VIEW

(OUTSIDE FACE OF SOUTHWEST END POST SHOWN; NORTHEAST, NORTHWEST, AND SOUTHEAST END POSTS SIMILAR)
(RAILING CONNECTIONS NOT SHOWN)
(HORIZONTAL DIMENSIONS MEASURED ALONG ℄ ABBEY AVENUE)



VIEW A-A

(HORIZONTAL DIMENSIONS MEASURED PERPENDICULAR TO ℄ ABBEY AVENUE

LEGEND:
N.E. = NORTHEAST
N.W. = NORTHWEST
S.E. = SOUTHEAST
S.W. = SOUTHWEST

ALL REINFORCING BARS FOR THE REAR ABUTMENT SHALL BE PREFIXED RA.

ALL REINFORCING BARS FOR THE FORWARD ABUTMENT SHALL BE PREFIXED FA.

NOTES:

1. FOR RAILING DETAILS, SEE SHEET S-33.
2. FOR FRAMING PLAN, SEE SHEET S-22.
3. FOR ABUTMENT DIAPHRAGM DETAILS, SEE SHEET S-16.
4. FINAL CONCRETE END POST DIMENSION MUST COORDINATE WITH RE-USE OF EXISTING DECORATIVE RAILING

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
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DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

RAILING END POST DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-31

6/6/2007 12:44 PM

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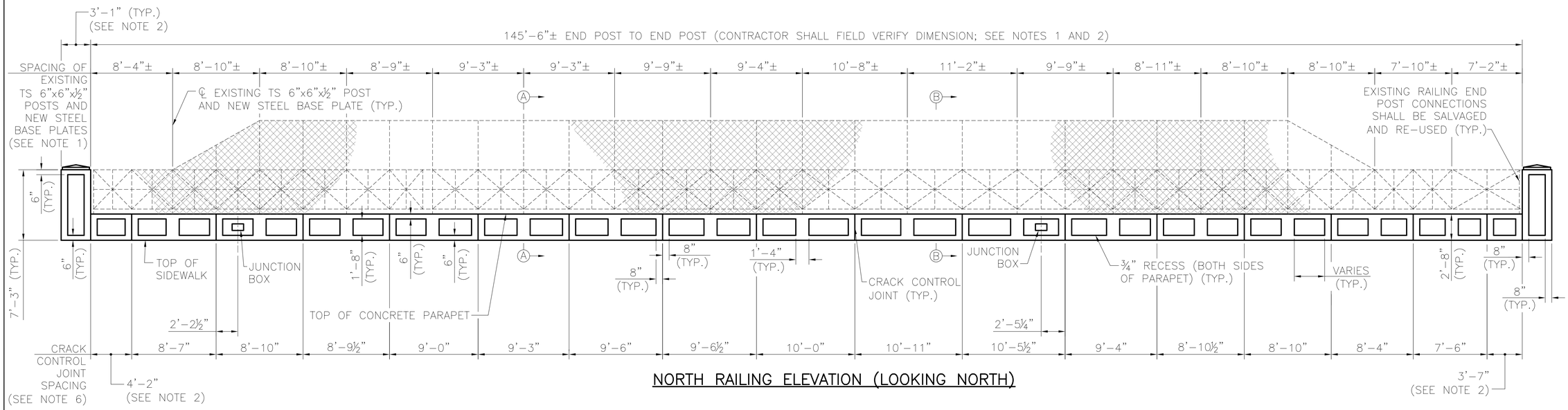
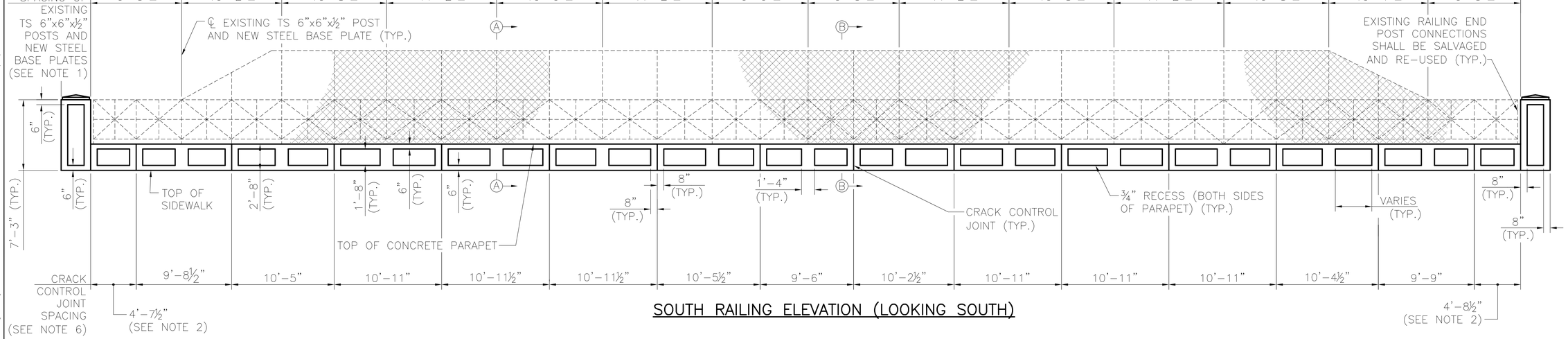


NORTH RAILING ELEVATION (LOOKING NORTH)



SOUTH RAILING ELEVATION (LOOKING SOUTH)

NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND RE-USING THE EXISTING RAILING AS SHOWN IN THESE PLANS, EXCLUDING THE FENCE FABRIC WHICH SHALL BE REPLACED.
2. FINAL CONCRETE END POST DIMENSION MUST COORDINATED WITH RE-USE OF EXISITNG RAILING.
3. FOR SECTIONS A-A AND B-B SEE SHEET S-33
4. FOR RAILING CONCRETE END POST DETAILS, SEE SHEET S-31.
5. FOR PARAPET REINFORCING DETAILS, SEE SHEET S-30.
6. VERTICAL PARAPET REINFORCING STEEL SHALL CLEAR THE CONTROL JOINTS BY THREE INCHES MINIMUM. OBTAIN CLEARANCE BY FIELD ADJUSTING THE REINFORCING STEEL SPACING.

REVISIONS:

DRAWN: JFM/CM
CHECKED: BMG/RHW
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

RAILING DETAILS - 1

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-32

6/6/2007 12:44 PM

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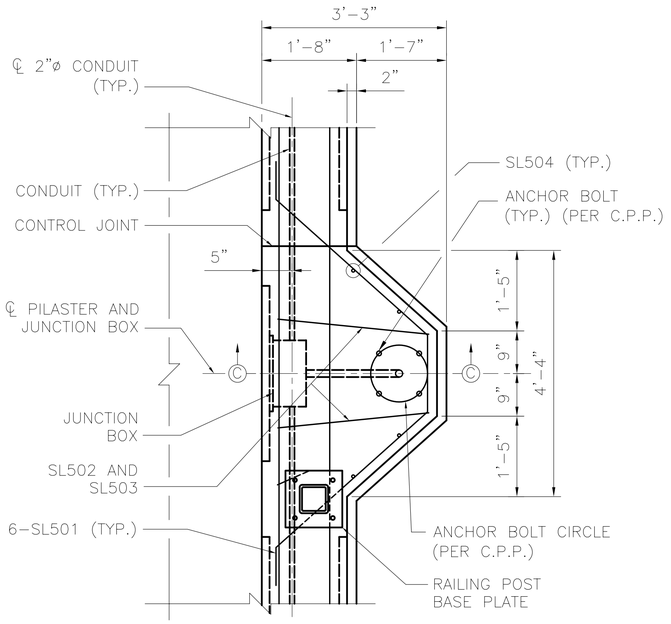
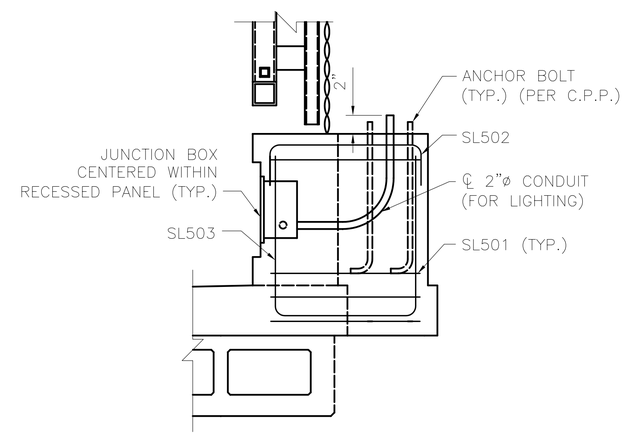


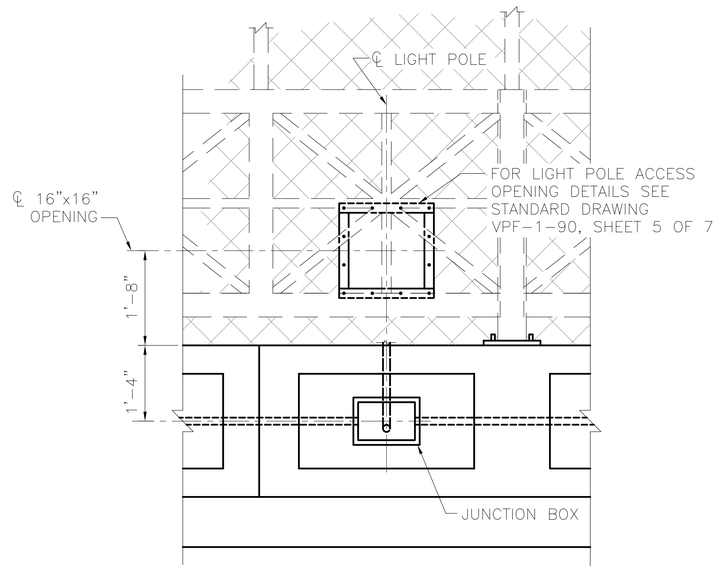
LIGHTING PILASTER AT NORTH PARAPET

PILASTER AT STA. 11+50.2, LT. SHOWN
PILASTER AT STA. 12+31.8, LT. SIMILAR



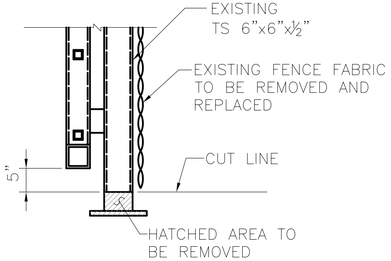
SECTION C-C

(PARAPET AND DECK REINFORCING NOT SHOWN)



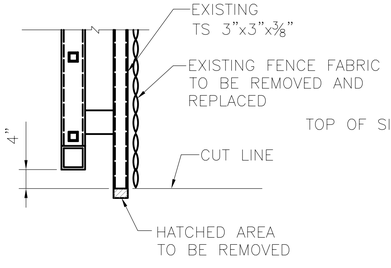
PILASTER AND ACCESS OPENING ELEVATION

(LOOKING NORTH)
STA. 11+50.2 SHOWN
STA. 12+31.8 SIMILAR
(COVER NOT SHOWN)



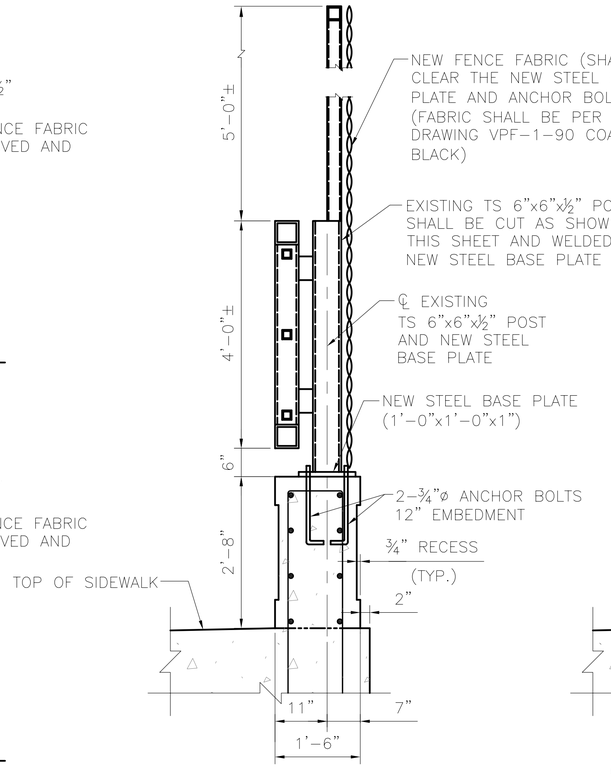
TYPICAL EXISTING TS 6"x6"x½" POST CUTTING DETAIL

(SEE NOTE 1)

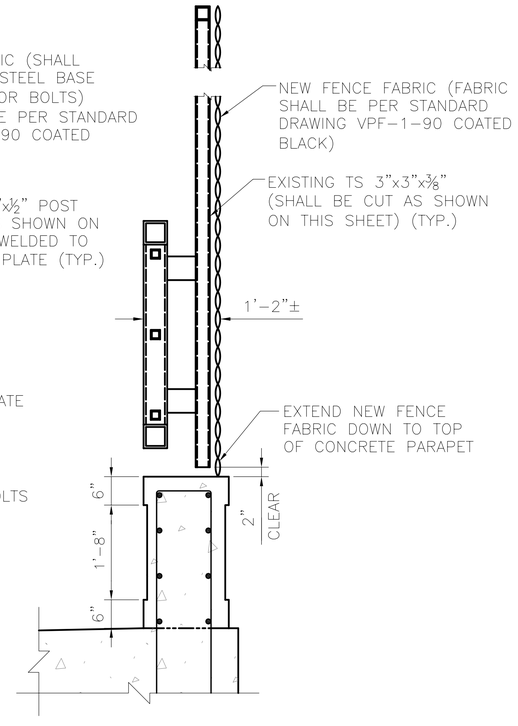


TYPICAL EXISTING TS 3"x3"x⅜" CUTTING DETAIL

(SEE NOTE 1)

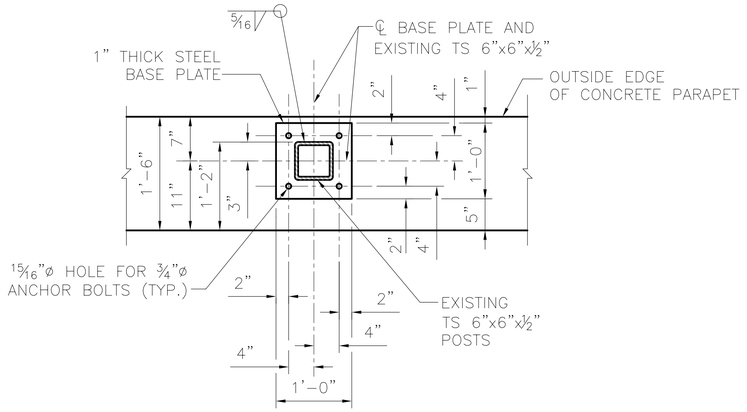


SECTION A-A



SECTION B-B

(FOR DIMENSIONS NOT SHOWN, SEE SECTION A-A)



NEW STEEL BASE PLATE DETAIL

NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND RE-USING THE EXISTING RAILING AS SHOWN IN THESE PLANS, EXCLUDING THE FENCE FABRIC WHICH SHALL BE REPLACED.
2. FOR ADDITIONAL DETAILS AND NOTES SEE SHEET S-32.
3. FOR REINFORCING STEEL LIST SEE SHEET S-42.

REVISIONS:

DRAWN: JFM/CM
CHECKED: BMG/RHW
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

RAILING DETAILS - 2

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-33

6/7/2007 8:44 AM
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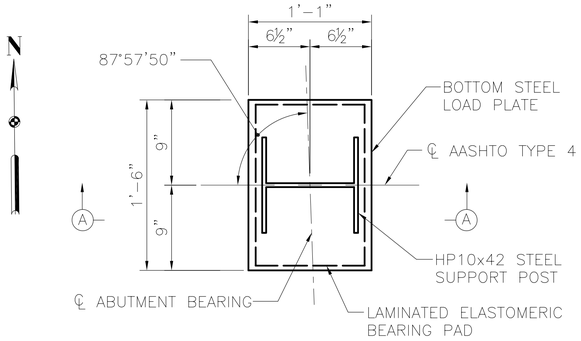
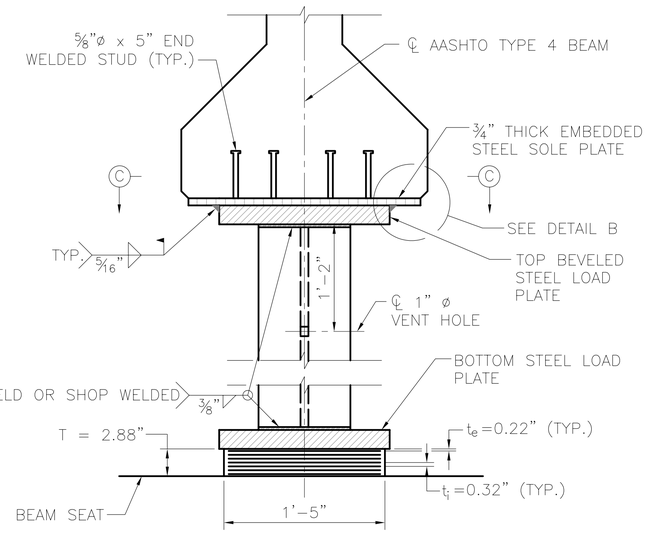


PRESTRESSED I-BEAM BEARING PLAN VIEW

(REAR ABUTMENT SHOWN;
FORWARD ABUTMENT SIMILAR)

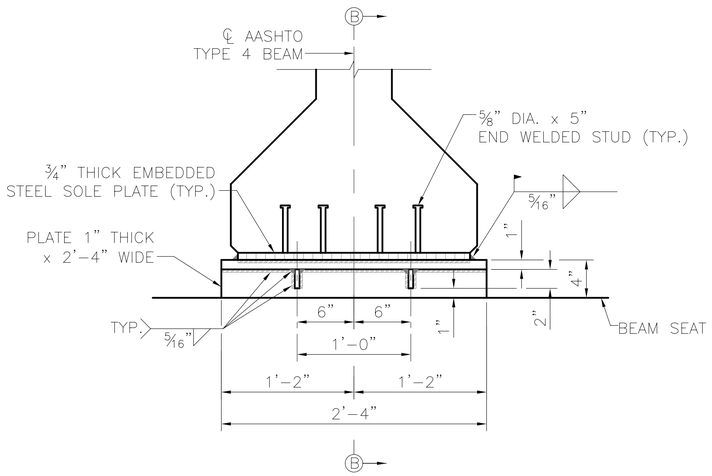


END VIEW AT ABUTMENT

(PAID FOR BY TS516 ELASTOMERIC BEARING
WITH INTERNAL LAMINATES AND LOAD PLATE
(NEOPRENE), I BEAM)

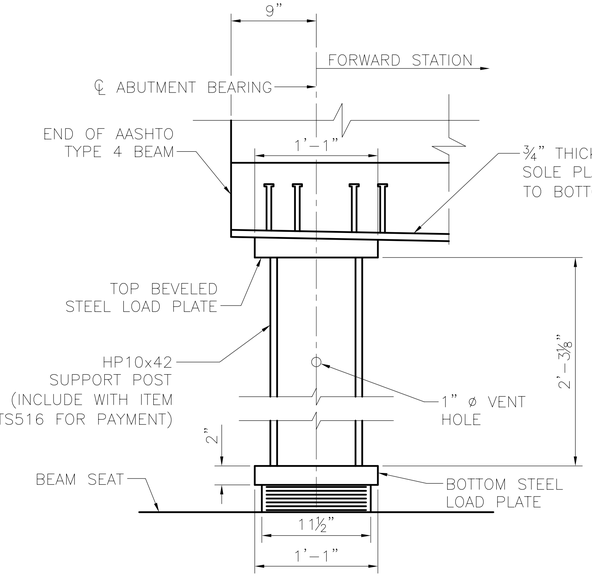
t_i = THICKNESS OF INTERNAL LAYER
t_e = THICKNESS OF EXTERNAL LAYER
T = TOTAL THICKNESS OF ELASTOMERIC BEARING PAD
N = NUMBER OF STEEL LAMINATES = 7
INTERNAL STEEL LAMINATE THICKNESS= 0.0747"
DUROMETER OF ELASTOMER = 50

DL = 122 KIPS
LL = 17 KIPS
MAXIMUM DESIGN LOAD = 139 KIPS

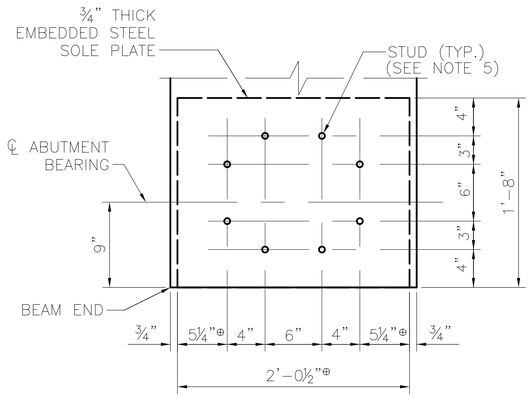


END VIEW AT PIER

(DIMENSIONS MEASURED AT ℄ STEEL PEDESTAL)

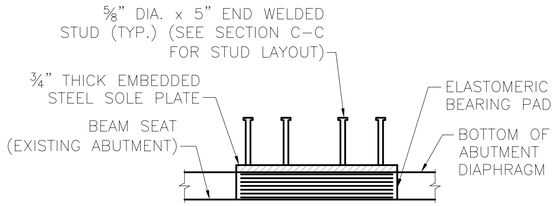


SECTION A-A



SECTION C-C

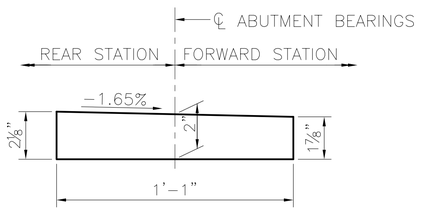
(BEARING PAD, LOAD PLATES, AND HP SECTION NOT SHOWN)
⊕ – IN ORDER TO ALLOW FOR FIT-UP, THE PLATE WIDTH MAY BE DECREASED BY 3/8". THESE DIMENSIONS SHALL BE CORRECTED ACCORDINGLY.



BEARINGS AT CORNER OF ABUTMENTS

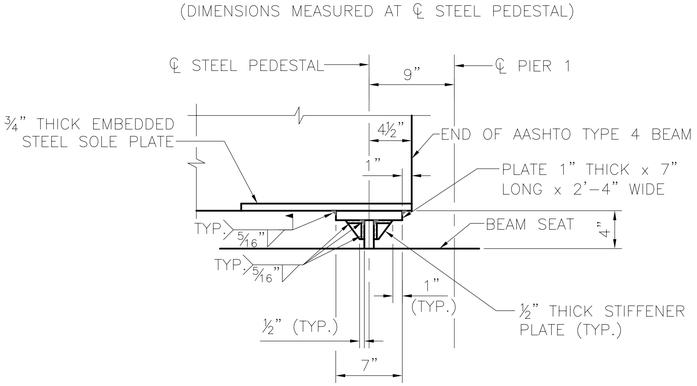
(PAID FOR BY TS516 ELASTOMERIC BEARING
WITH INTERNAL LAMINATES AND LOAD PLATE
(NEOPRENE), ABUTMENT STEM)

(FOR ELASTOMERIC BEARING DETAILS, SEE
"END VIEW AT ABUTMENT" THIS SHEET)



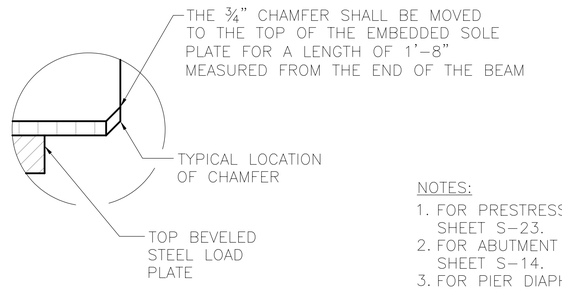
TOP BEVELED STEEL LOAD PLATE DETAIL

(TYPICAL BOTH ABUTMENTS)
(LENGTH = 1'-1"; WIDTH = 1'-6")



SECTION B-B

(DETAIL NOT PAID FOR SEPARATELY; INCIDENTAL TO COST OF TS515)
(REAR STATION OF ℄ PIER 1 SHOWN; FORWARD STATION OPPOSITE HAND)
(PIER 1 SHOWN; PIERS 2 AND 3 SIMILAR)
(STUDS NOT SHOWN; SEE SECTION C-C FOR STUD LAYOUT)



DETAIL B

NOTES:

1. FOR PRESTRESSED I-BEAM DETAILS, SEE SHEET S-23.
2. FOR ABUTMENT DIAPHRAGM DETAILS, SEE SHEET S-14.
3. FOR PIER DIAPHRAGM DETAILS, SEE SHEET S-21.
4. FOR ADDITIONAL DETAILS AND NOTES, SEE ODOT STANDARD DRAWING PSID-1-99.
5. END WELDED STUDS MAY BE MOVED SLIGHTLY IN ORDER TO AVOID REINFORCING STEEL AND PRESTRESSING STRANDS.
6. OTHER NOTES PERTAINING TO THIS SHEET CAN BE FOUND ON SHEET S-35.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
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ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

PRESTRESSED I-BEAM BEARING DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-34

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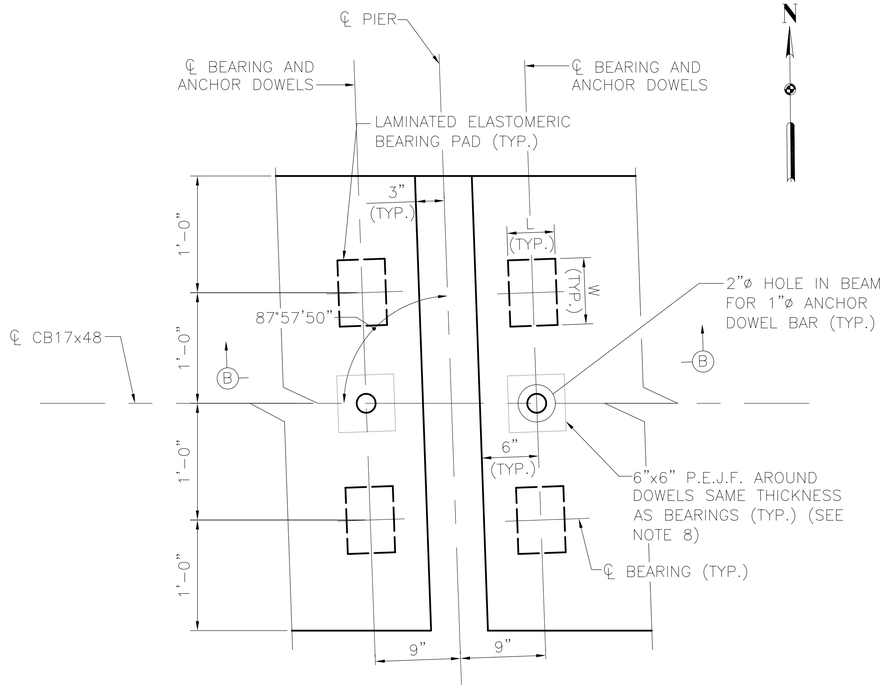
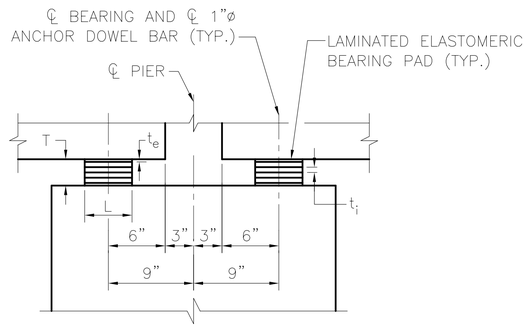


TYPICAL BOX BEAM PIER BEARING PLAN VIEW

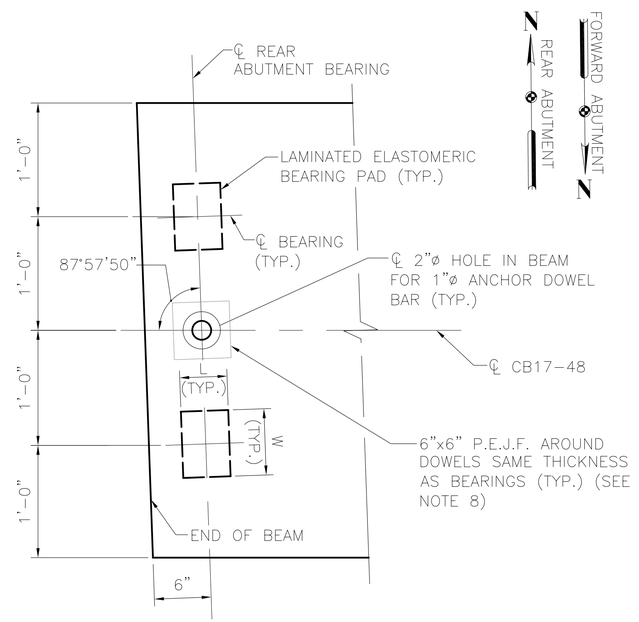


SECTION B–B

ALL BOX BEAM BEARINGS PAID FOR BY TS516
ELASTOMERIC BEARING WITH INTERNAL LAMINATES ONLY
(NEOPRENE), BOX BEAM

t_i = THICKNESS OF INTERNAL LAYER
t_e = THICKNESS OF EXTERNAL LAYER
T = TOTAL THICKNESS OF ELASTOMERIC BEARING
N = NUMBER OF STEEL LAMINATES
INTERNAL STEEL LAMINATE THICKNESS= 0.0747"
DUROMETER OF ELASTOMER = 50

LOCATION	L	W	DL(kips)	LL(kips)	TOTAL(kips)	t_e	t_i	N	T
REAR ABUTMENT	6"	8"	15.4	4.4	19.8	0.14	0.30	5	1.85"
PIER 1	6"	8"	17.7	4.7	22.4	0.14	0.30	5	1.85"
PIER 2	5"	6½"	12.9	4.3	17.2	0.14	0.25	5	1.65"
PIER 3	5"	6½"	12.8	4.4	17.2	0.14	0.25	5	1.65"
FORWARD ABUTMENT	5"	6½"	10.5	3.7	14.2	0.14	0.25	5	1.65"



TYPICAL BOX BEAM ABUTMENT BEARING PLAN VIEW

(REAR ABUTMENT SHOWN; FORWARD ABUTMENT OPPOSITE HAND)

LEGEND:
P.E.J.F. = PREFORMED EXPANSION JOINT FILLER
TYP. = TYPICAL

NOTES:

1. THE ELASTOMER SHALL HAVE A HARDESS OF 50 DUROMETER. THE BEARINGS WERE DESIGNED UNDER DIVISION I, SECTION 14.6.6 (METHOD A) OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.
2. THE COST OF THE PRESTRESSED I–BEAM WELDED STEEL PEDESTAL AT THE PIERS SHALL BE INCLUDED WITH ITEM TS515.
3. IF THE CONCRETE BEAMS ARE ERECTED AT AN AMBIENT TEMPERATURE HIGHER THAN 80° OR LOWER THAN 40° AND THE BEARING SHEAR DEFLECTION EXCEEDS ⅛ OF THE BEARING HEIGHT AT 60°F ± 10°F, THE BEAMS SHALL BE RAISED TO ALLOW THE BEARINGS TO RETURN TO THEIR UNDEFORMED SHAPE AT 60°F ± 10°F.
4. FOR BOX BEAM DETAILS, SEE SHEET S–24.
5. THE STEEL LOAD PLATE SHALL CONFORM TO THE REQUIREMENTS OF ASTM A572 GRADE 50 AND SHALL BE GALVANIZED PER 711.02. THE STEEL LOAD PLATE SHALL BE BONDED BY VULCANIZATION TO THE ELASTOMER DURING THE MOLDING PROCESS. WELDING OF THE LOAD PLATE TO THE SUPERSTRUCTURE SHALL BE CONTROLLED SO THAT THE PLATE TEMPERATURE AT THE ELASTOMER BONDED SURFACE SHALL NOT EXCEED 300°F AS DETERMINED BY THE USE OF PYROMETRIC STICKS OR OTHER TEMPERATURE MONITORING DEVICES.
6. THE UNIT BID PRICE SHALL INCLUDE ALL MATERIALS, LABOR, TESTING, AND INCIDENTALS NECESSARY TO FURNISH AND INSTALL LAMINATED ELASTOMERIC BEARINGS. PAYMENT WILL BE MADE AT THE CONTRACT PRICE FOR ITEM TS516, EACH.
7. FOR FRAMING, SEE SHEET S–22.
8. PREFORMED EXPANSION JOINT FILLER IS TO BE INCLUDED WITH TS511, CLASS S CONCRETE, PIER AND ABUTMENT DIAPHRAGMS.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
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ENGINEERING & PROJECT MANAGEMENT DIVISON

RTA GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

PRESTRESSED BOX BEAM
BOX BEARING DETAILS

REHABILITATION OF ABBEY AVE.
BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–35

6/6/2007 12:33 PM
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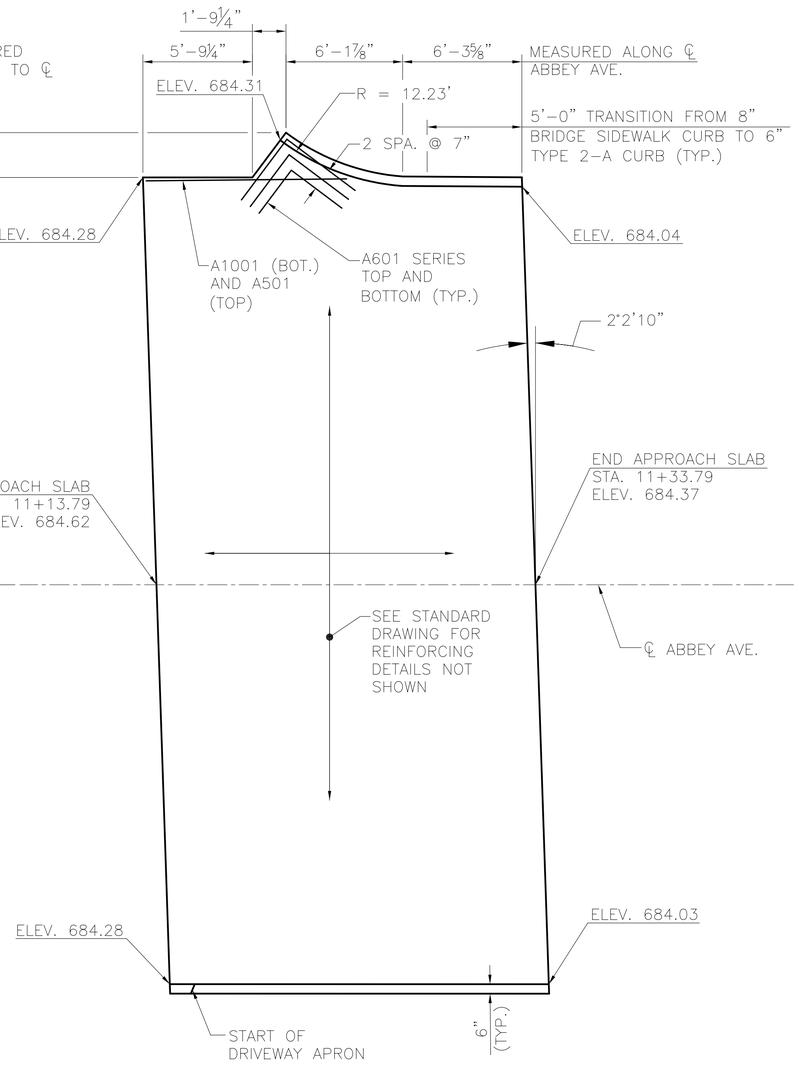
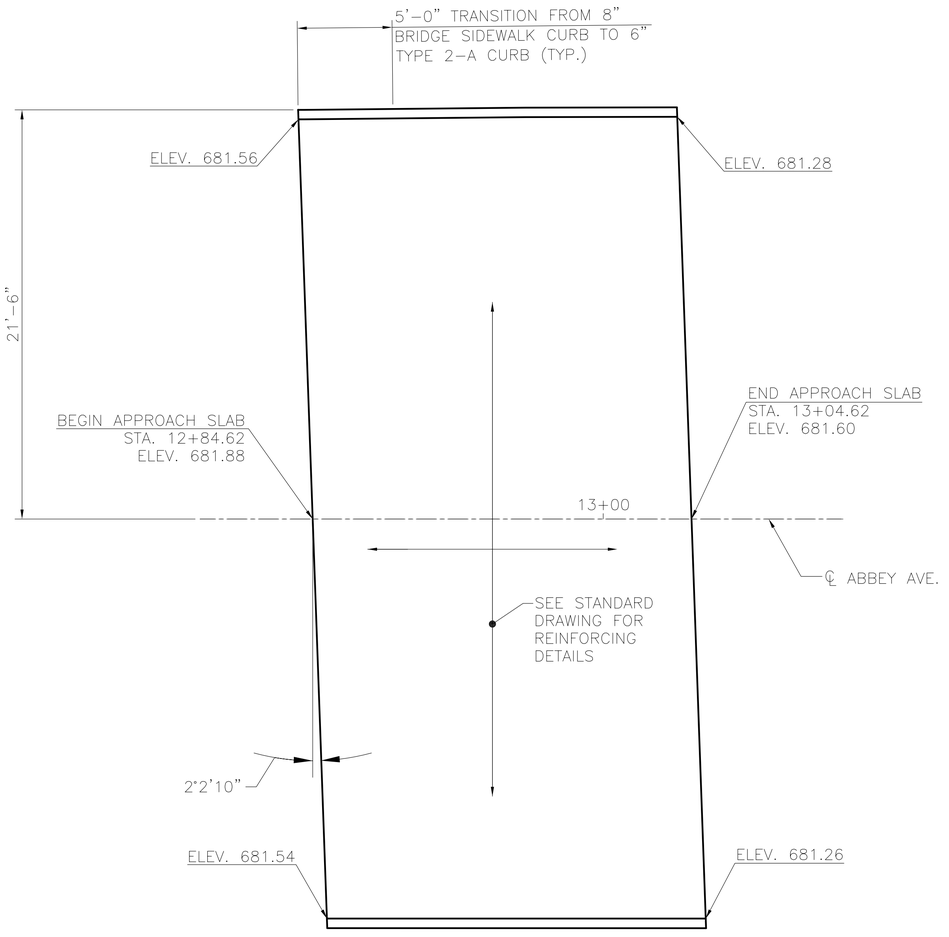
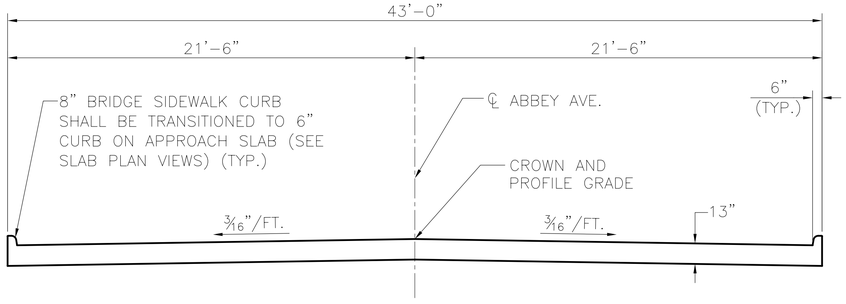


PLAN – REAR APPROACH SLAB



PLAN – FORWARD APPROACH SLAB



TYPICAL APPROACH SLAB SECTION
(LOOKING UPSTATION)
(FORWARD APPROACH SLAB SHOWN; REAR APPROACH SLAB SIMILAR)

LEGEND:
BOT. = BOTTOM

NOTES:

1. FOR ADDITIONAL APPROACH SLAB DETAILS INCLUDING REINFORCING STEEL, SEE ODOT STANDARD DRAWING AS-1-81.
2. PAYMENT FOR ITEM TS526-REINFORCED CONCRETE APPROACH SLAB (T=13"), SHALL INCLUDE ALL THE CONCRETE AND REINFORCING FOR THE APPROACH SLAB AND CURBS.
3. FOR APPROACH SLAB REINFORCEMENT SCHEDULE, SEE SHEET S-43.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
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ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

APPROACH SLAB DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-36

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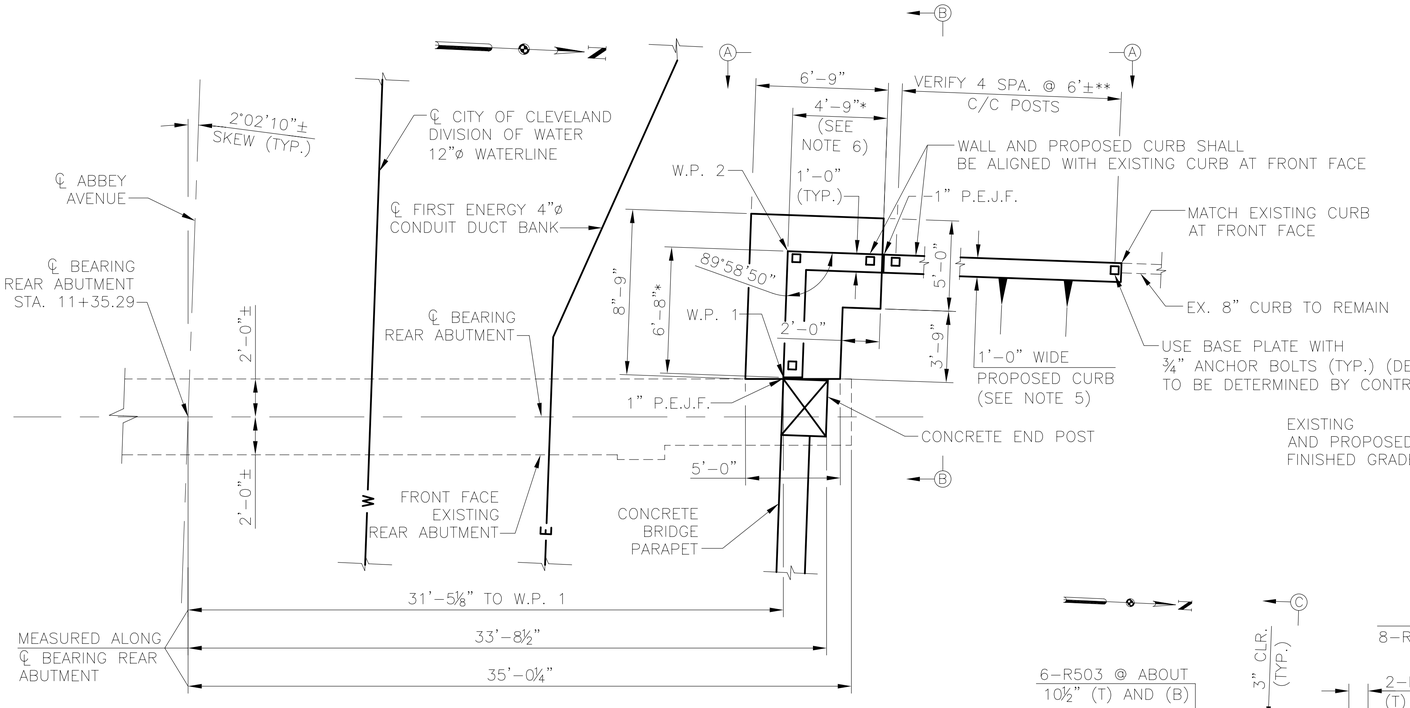
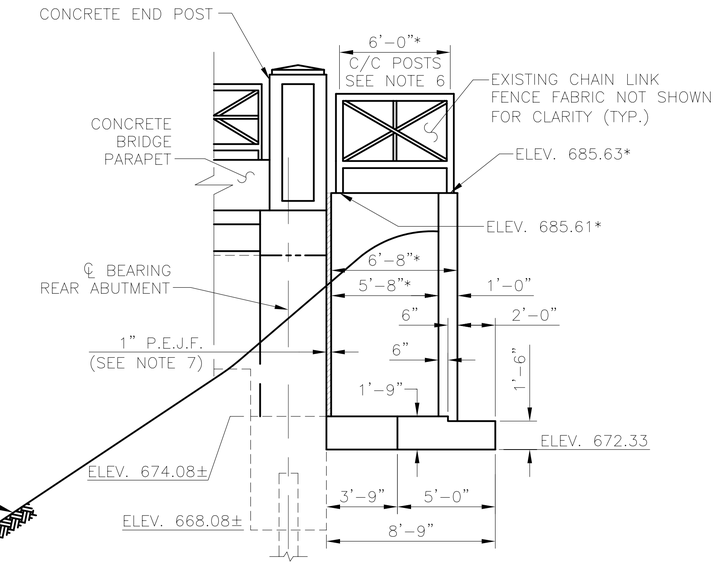
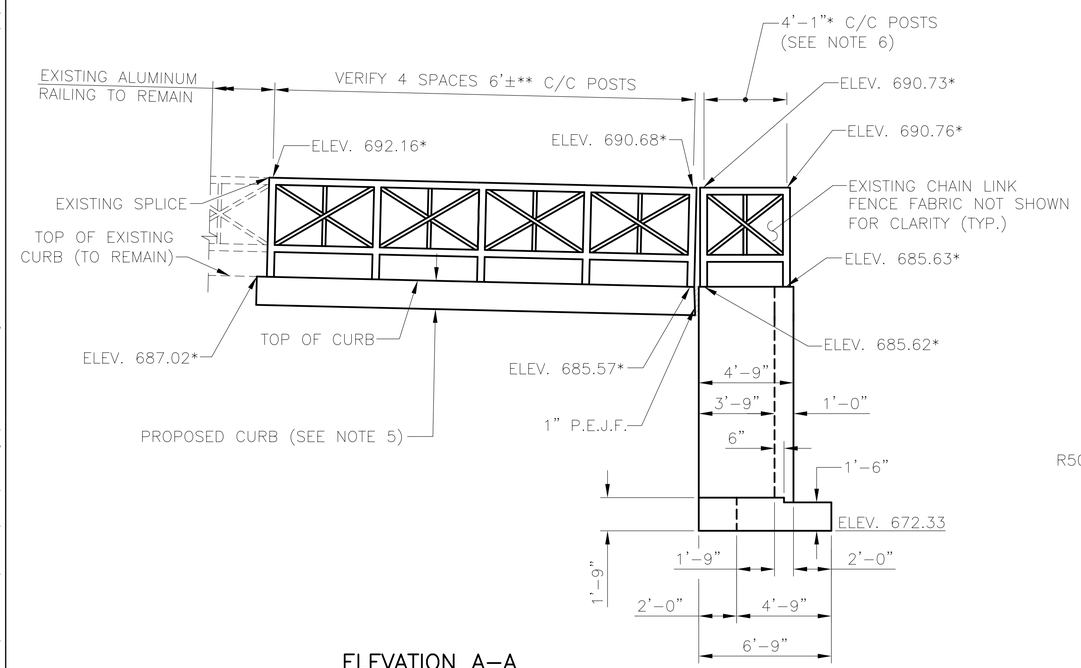


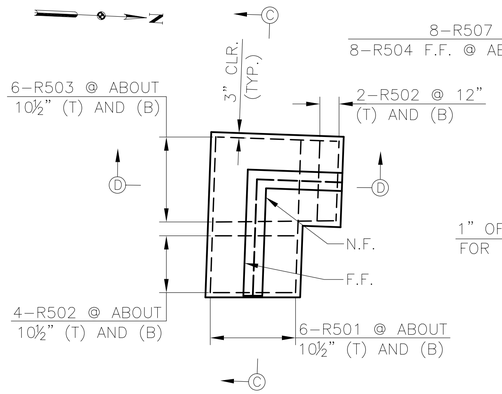
PLAN
(SIDEWALK NOT SHOWN)



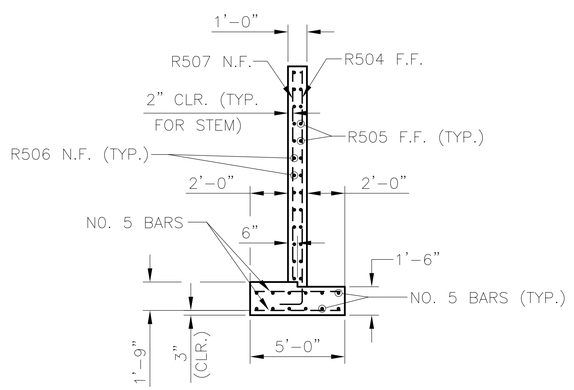
ELEVATION B–B



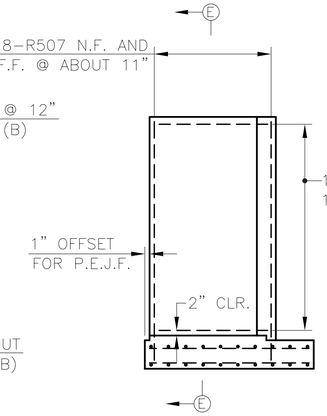
ELEVATION A–A
(REAR ABUTMENT AND END CONCRETE POST NOT SHOWN)
(SIDEWALK NOT SHOWN)



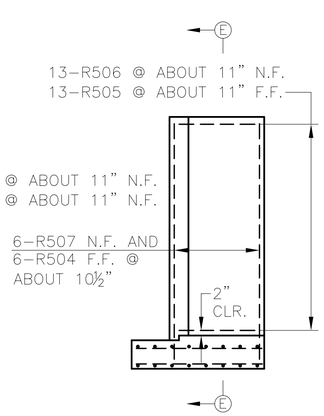
FOOTING REINFORCEMENT



SECTION E–E



ELEVATION C–C
(STEM REINFORCEMENT)



ELEVATION D–D
(STEM REINFORCEMENT)

LEGEND:

(B) = BOTTOM
CLR. = CLEAR
ELEV. = ELEVATION
F.F. = FAR FACE
N.F. = NEAR FACE
P.E.J.F. = PREFORMED EXPANSION JOINT FILLER
(T) = TOP
W.P. = WORK POINT

W.P.	STATION	OFFSET	ELEV.
1*	11+32.10	31.33	685.61
2*	11+25.44	31.33	685.63

* = CONTRACTOR TO FIELD VERIFY DIMENSIONS AND ELEVATIONS TO MATCH EXISTING
** = CONTRACTOR TO REPLACE EXISTING ALUMINUM RAILING AND FENCE FABRIC TO EXISTING SPLICE.

NOTES:

1. FOR ABUTMENT DETAILS, SEE SHEET S–14 TO S–17.
2. FOR BACKFILL REQUIREMENTS, SEE ITEM TS 503 GENERAL NOTES SHEET S–4.
3. FOR BRIDGE RAILING DETAILS, SEE SHEET S–33.
4. FOR CONCRETE END POST DETAILS, SEE SHEET S–31.
5. SEE ROADWAY PLANS, SHEET C–3, FOR 1'–0" WIDE CURB.
6. DIMENSION IS MADE 3"± LESS THAN EXISTING IN ORDER TO MAKE THE PROPOSED WALL FLUSH WITH THE CONCRETE END POST.
7. PREFORMED EXPANSION JOINT FILLER IS TO BE INCLUDED WITH TS511, CLASS S CONCRETE, RETAINING WALLS.

REVISIONS:

DRAWN: JFM | CHECKED: BMG | APPROVED: RHW | DATE: 6–1–2007 | JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

NORTHWEST RETAINING WALL

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D | BID PAC

SHEET S–37

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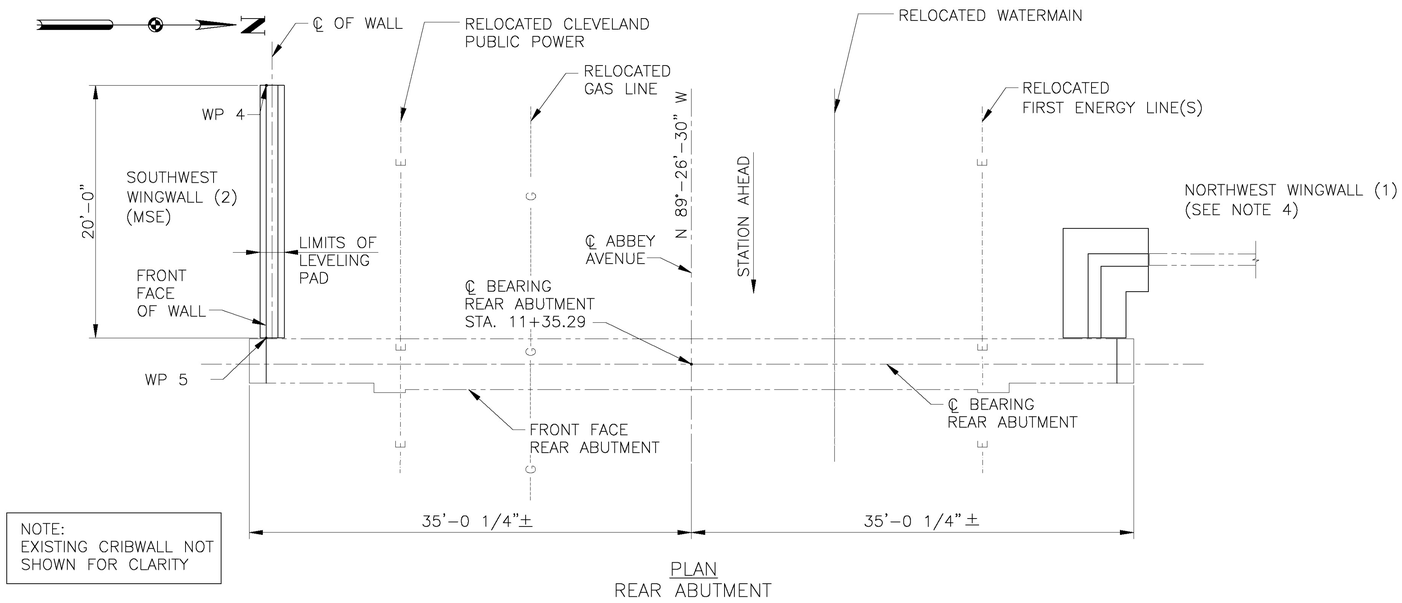
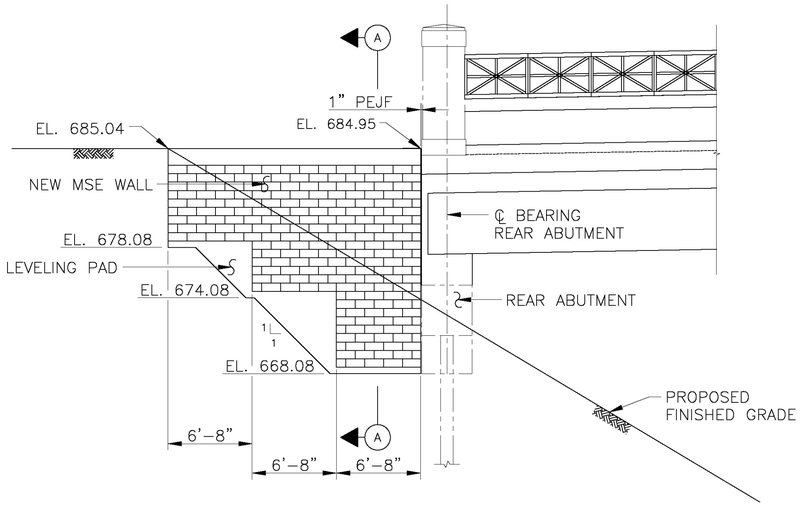


PLAN
REAR ABUTMENT

WORKING POINT	STATION	OFFSET	ELEVATION
WP4	11+14.40	33.67' RT.	685.04
WP5	11+34.40	33.67' RT.	684.95



SOUTHWEST WINGWALL (2) ELEVATION

NOTES:

1. FOR ABUTMENT DETAILS, SEE SHEETS S-14 TO S-18.
2. FOR SECTION A-A, SEE SHEET S-40.
3. EXISTING CRIBWALL AT MSE WALL LOCATIONS TO BE REMOVED IN ITS ENTIRETY.
4. FOR NORTHWEST WINGWALL (1) PLAN, ELEVATION AND DETAILS, SEE SHEET S-37.

LEGEND:

PEJF = PREFORMED EXPANSION JOINT FILLER
EL. = ELEVATION
MSE = MECHANICALLY STABILIZED EARTH

REVISIONS

DRAWN: RHM
CHECKED: KB
APPROVED:
DATE: 6-1-2007
JOB NO.:

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GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

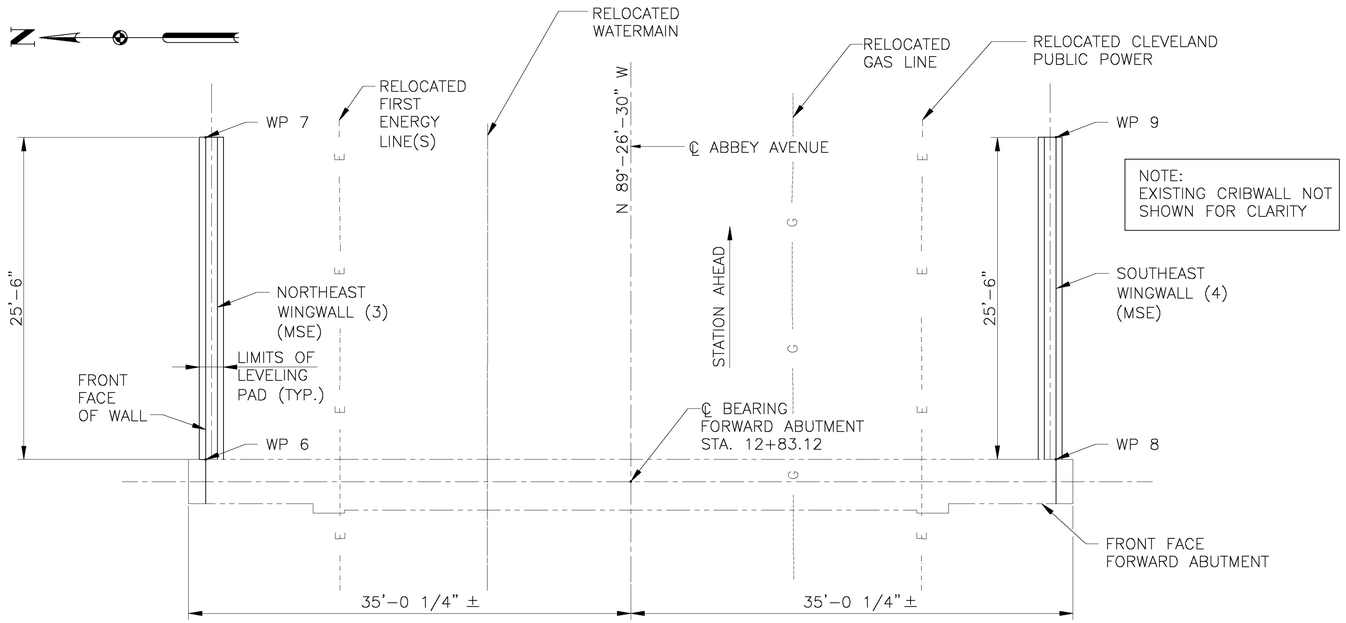
STATE OF OHIO
Selvakumar Guvanendaran
E-61426
REGISTERED
PROFESSIONAL ENGINEER

MSE WINGWALL PLAN - 1

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

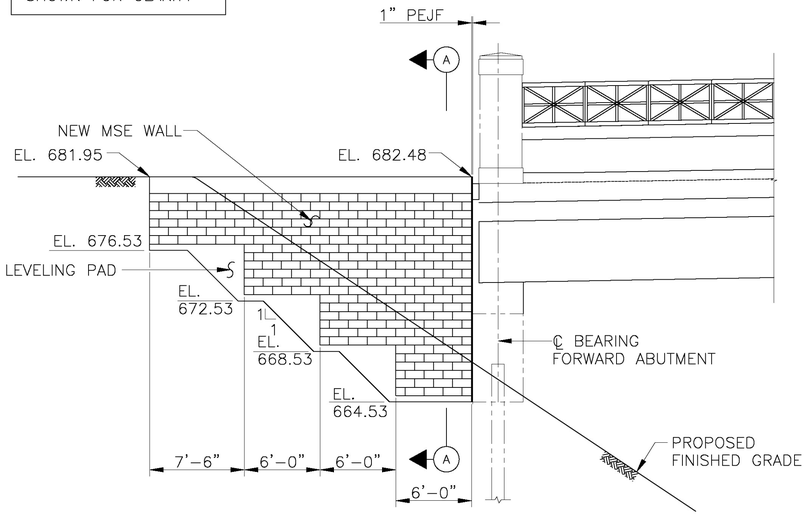
SHEET S-38



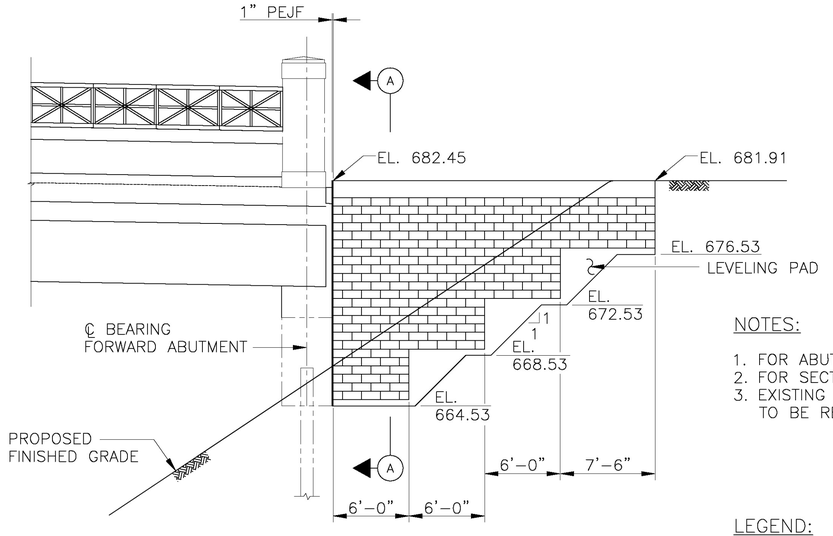
PLAN
FORWARD ABUTMENT

WORKING POINT	STATION	OFFSET	ELEVATION
WP6	12+84.01	33.67' LT.	682.48
WP7	13+09.51	33.67' LT.	681.95
WP8	12+86.40	33.67' RT.	682.45
WP9	13+11.90	33.67' RT.	681.91

NOTE:
EXISTING CRIBWALL NOT SHOWN FOR CLARITY



NORTHEAST WINGWALL (3) ELEVATION



SOUTHEAST WINGWALL (4) ELEVATION

NOTES:

1. FOR ABUTMENT DETAILS, SEE SHEETS S–14 TO S–18.
2. FOR SECTION A–A, SEE SHEET S–40.
3. EXISTING CRIBWALLS AT MSE WALL LOCATIONS TO BE REMOVED IN ITS ENTIRETY.

LEGEND:

PEJF	=	PREFORMED EXPANSION JOINT FILLER
EL.	=	ELEVATION
MSE	=	MECHANICALLY STABILIZED EARTH

REVISIONS:

DRAWN: RHM
CHECKED: KB
APPROVED:
DATE: 6–1–2007
JOB NO.:

PRIME
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BALTIMORE: (410) 265-1956 SHREWSBURY: (717) 235-1428

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

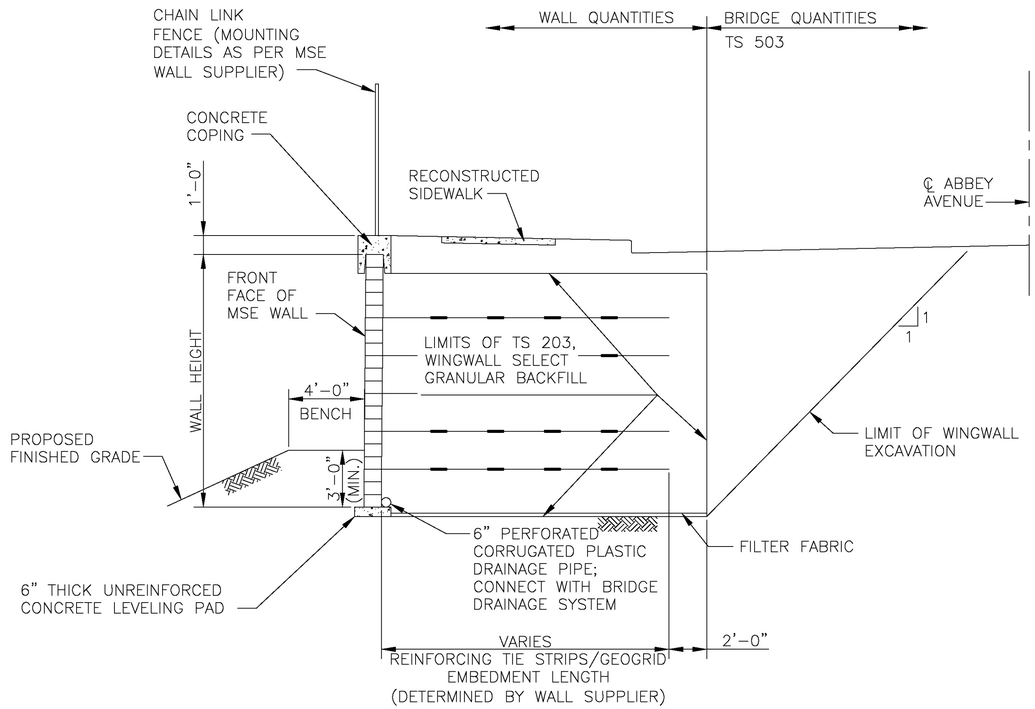
STATE OF OHIO
Selvakumar Buvanendaran
E-61426
REGISTERED PROFESSIONAL ENGINEER

MSE WINGWALL PLAN – 2

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–39



SECTION A–A

(WINGWALL 2, 3 AND 4)

MSE WALL GENERAL NOTES:

DESIGN SPECIFICATIONS:

THE MSE STRUCTURE SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002, AND THE ODOT BRIDGE DESIGN MANUAL.

DESIGN SUBMITTALS:

THE CONTRACTOR IS HEREBY NOTIFIED THAT THE MSE RETAINING WALLS SHALL BE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS PROVIDED IN TS610 SPECIAL PROVISIONS.

ALLOWABLE BEARING PRESSURE:

THE ALLOWABLE BEARING PRESSURE FOR THE DESIGN OF THE MSE WALL IS 3.0 KSF.

REVISIONS:

DRAWN: RHM
CHECKED: KB
APPROVED:
DATE: 6-1-2007
JOB NO.:

PRIME AE
ENGINEERING & ARCHITECTURE, INC.
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BALTIMORE: (410) 265-1956 SHREWSBURY: (717) 235-4218

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

STATE OF OHIO
Selvakumar Buvanendaran
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PROFESSIONAL ENGINEER

MSE WINGWALL DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

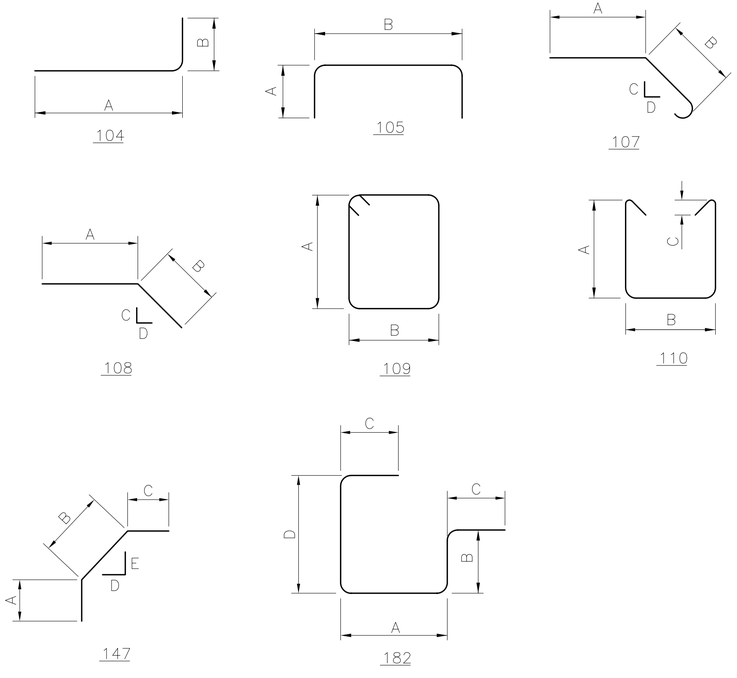
SHEET S-40

REINFORCING STEEL LIST										
MARK	NUMBER REQUIRED	LENGTH	WEIGHT	TYPE	A	B	C	D	E	INCR.
PIERS										
P401	56	8'–2"	305	109	2'–2"	1'–8"				
P501	36	10'–0"	375	STR.						
P502	132	3'–9"	516	STR.						
P503	24	5'–6"	138	STR.						
P504	42	20'–4"	891	147	10'–5"	7'–5"	2'–8"	3	7	
P505	12 SER.	7'–5" TO	2,409	105	2'–9" TO	2'–2"				¾"
	OF 22	10'–1"			4'–1"					
P506	120	10'–1"	1,262	105	4'–1"	2'–2"				
P507	12 SER.	2'–3"	305	STR.						1'–3¾"
	OF 5	TO 7'–6"								
P508	12 SER.	5'–3" TO	501	STR.						1'–4½"
	OF 5	10'–9"								
P509	60	7'–0"	438	STR.						
P510	36	10'–9"	404	STR.						
P511	36	7'–9"	291	STR.						
P601	8	17'–0"	204	STR.						
P602	8	16'–3"	195	STR.						
P603	14	8'–0"	168	STR.						
P604	102	12'–0"	1,838	110	4'–2"	2'–2"	4½"			
P605	30	10'–0"	451	STR.						
P701	42	19'–5"	1,667	104	17'–4"	2'–3"				
P901	28	15'–6"	1,476	STR.						
P902	28	14'–9"	1,404	STR.						
		TOTAL =	15,238	LBS.						

REINFORCING STEEL LIST										
MARK	NUMBER REQUIRED	LENGTH	WEIGHT	TYPE	A	B	C	D	E	INCR.
REAR ABUTMENT										
RA501	76	13'–7"	1,077	105	5'–4"	3'–2"				
RA502	24	18'–0"	451	STR.						
RA503	14	7'–2"	105	STR.						
RA504	14	8'–4"	122	STR.						
RA505	46	4'–0"	192	STR.						
RA506	18	10'–11"	205	105	4'–3"	2'–8"				
RA507	20	10'–11"	228	105	5'–0"	1'–2"				
RA508	8	16'–9"	140	STR.						
RA509	8	12'–1"	101	182	1'–10"	3'–11"	7"	5'–8"		
RA510	4	9'–11"	41	104	8'–0"	2'–0"				
RA511	4	11'–8"	49	104	8'–7"	3'–2"				
RA512	8	7'–3"	60	STR.						
RA601	10	5'–2"	78	107	1'–5"	3'–1"	1	1		
RA602	21	4'–9"	150	108	1'–5"	3'–3"	1	1		
RA603	8	18'–0"	216	STR.						
		TOTAL =	3,215	LBS.						

REINFORCING STEEL LIST										
MARK	NUMBER REQUIRED	LENGTH	WEIGHT	TYPE	A	B	C	D	E	INCR.
FORWARD ABUTMENT										
FA501	76	13'–7"	1,077	105	5'–4"	3'–2"				
FA502	24	18'–0"	451	STR.						
FA503	14	7'–2"	105	STR.						
FA504	14	8'–4"	122	STR.						
FA505	46	4'–0"	192	STR.						
FA506	18	10'–11"	205	105	4'–3"	2'–8"				
FA507	20	10'–11"	228	105	5'–0"	1'–2"				
FA508	8	16'–9"	140	STR.						
FA509	8	12'–1"	101	182	1'–10"	3'–11"	7"	5'–8"		
FA510	4	9'–11"	41	104	8'–0"	2'–0"				
FA511	4	11'–8"	49	104	8'–7"	3'–2"				
FA512	8	7'–3"	60	STR.						
FA601	10	5'–2"	78	107	1'–5"	3'–1"	1	1		
FA602	21	4'–9"	150	108	1'–5"	3'–3"	1	1		
FA603	8	18'–0"	216	STR.						
		TOTAL =	3,215	LBS.						

BAR BENDING DIAGRAMS



REINFORCING STEEL SAMPLES
REFER TO CMS SECTIONS 106.03, 700, 709.00, AND 709.01. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

REBAR SCHEDULE

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–41

6/6/2007 12:46 PM
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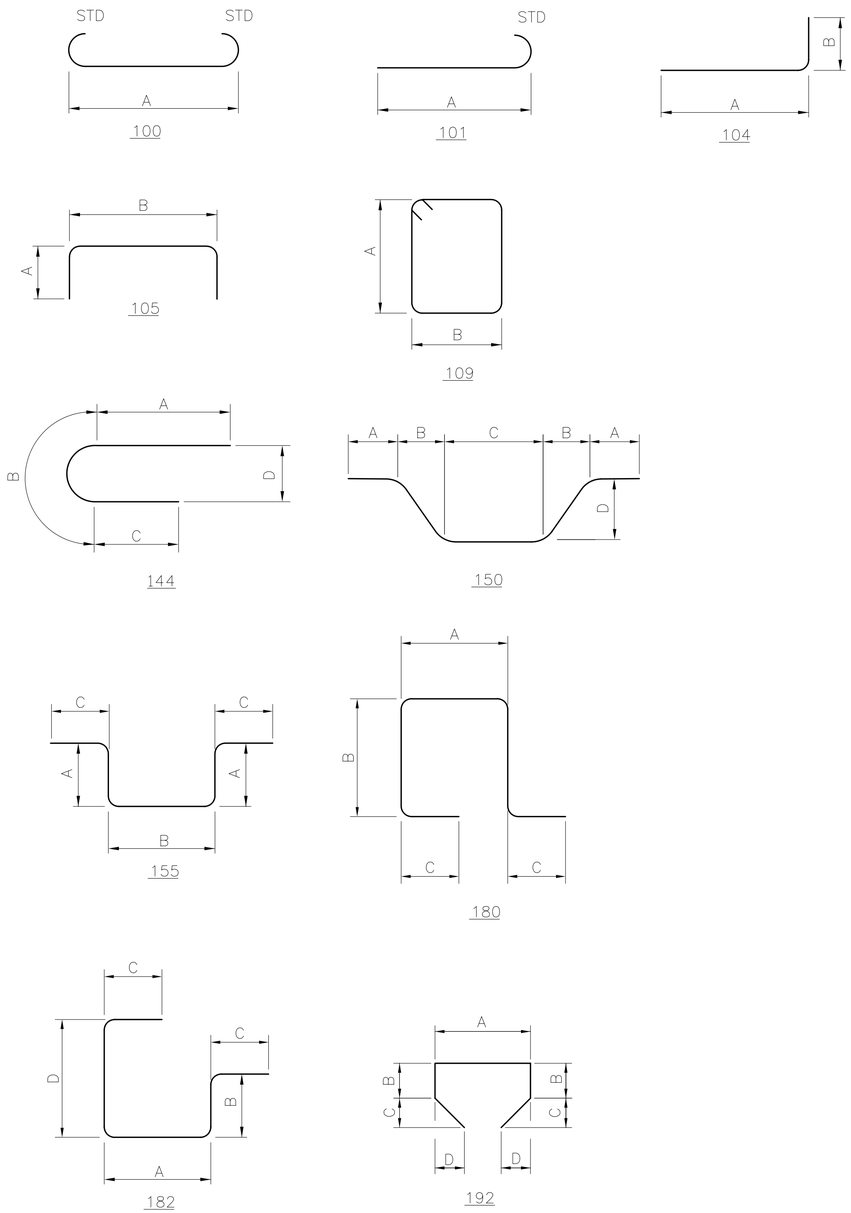
REINFORCING STEEL LIST										
MARK	NUMBER REQUIRED	LENGTH	WEIGHT	TYPE	A	B	C	D	E	INCR.
SUPERSTRUCTURE										
C401	6	9'–11"	40	144	4'–7¼"	8⅝"	4'–7¼"	5½"		
C402	6	4'–10"	19	192	1'–11½"	6¼"	8½"	8½"		
C403	6	3'–6"	14	192	1'–5½"	5½"	5½"	5½"		
S401	240	30'–0"	4,810	STR.						
S402	48	16'–6"	529	STR.						
S403	24	7'–8"	123	STR.						
S404	36	3'–8"	88	100	2'–8"					
S405	250	1'–2"	195	105	6"	4"				
S501	257	31'–10"	8,533	101	31'–3"					
S502	257	22'–1"	5,919	101	21'–6"					
S503	486	30'–0"	15,207	STR.						
S504	90	17'–9"	1,666	STR.						
S505	514	26'–3"	14,073	STR.						
S506	500	7'–10"	4,085	180	1'–0"	3'–0"	8"			
S507	8	3'–5"	29	STR.						
S508	NOT USED									
S509	36	18'–0"	676	STR.						
S510	36	21'–0"	789	STR.						
S511	2 SER.	20'–0"	188	101	19'–5"					10'–0"
	OF 3	40'–0"			39'–5"					
S512	2 SER.	19'–6"	185	STR.						10'–0"
	OF 3	39'–6"								
S513	514	4'–5"	2,368	105	1'–8"	1'–4"				
S514	16	28'–3"	471	STR.						
S515	32	40'–0"	1,335	STR.						
S516	16	35'–0"	584	STR.						
S517	16	19'–3"	321	STR.						
S518	514	6'–4"	3,395	182	1'–4"	10"	1'–6"	1'–8"		
S519	522	6'–2"	3,357	155	1'–0"	1'–8"	1'–6"			
S520	524	6'–4"	3,461	155	1'–0"	1'–10"	1'–6"			
S521	16	15'–3"	254	105	6'–11"	1'–8"				
S522	32	9'–9"	325	109	2'–9"	1'–10"				
S523	4	9'–3"	39	109	1'–10"	2'–6"				
S601	500	11'–8"	8,762	STR.						
S602	NOT USED									
S603	170	30'–0"	7,660	STR.						
S604	34	17'–9"	906	STR.						
S605	28	12'–4"	519	STR.						
S606	36	4'–0"	216	100	2'–8"					
S607	6	7'–8"	69	STR.						
PILASTERS										
SL501	12	10'–0"	125	150	10"	2'–4"	1'–4"	2'–4"		
SL502	4	3'–7"	15	105	8"	2'–6"				
SL503	4	8'–3"	34	105	3'–0"	2'–6"				
SL504	8	4'–5"	37	104	3'–0"	1'–6"				
		TOTAL =	91,421	LBS.						

BAR BENDING DIAGRAMS



REINFORCING STEEL SAMPLES

REFER TO CMS SECTIONS 106.03, 700, 709.00, AND 709.01. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

SUPERSTRUCTURE REINFORCING

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S–42

6/6/2007 12:46 PM

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REINFORCING STEEL LIST										
MARK	NUMBER REQUIRED	LENGTH	WEIGHT	TYPE	A	B	C	D	E	INCR.
RETAINING WALL										
R501	12	8'-3"	103	STR.						
R502	12	4'-6"	56	STR.						
R503	12	6'-3"	78	STR.						
R504	14	13'-10"	202	104	12'-9"	1'-2"				
R505	13	10'-8"	145	104	6'-4"	4'-5"				
R506	13	9'-3"	125	104	5'-8"	3'-9"				
R507	14	11'-2"	163	STR.						
		TOTAL =	872	LBS.						

REINFORCING STEEL LIST										
MARK	NUMBER REQ'D.	LENGTH	WEIGHT	TYPE	A	B	C	D	E	INCR.
REAR APPROACH SLAB										
A501	1	10'-0"	10	STR.						
A601	2 SER.	4'-4"	57	104	2'-0"	2'-6"				2'-0"
	OF 3	8'-4"			4'-0"	4'-6"				
A1001	1	12'-10"	55	101	10'-0"					
		TOTAL =	122*	LBS.						

* = NO PAYMENT; FOR INFORMATION ONLY.
COST TO BE INCLUDED WITH ITEM TS526.

BAR BENDING DIAGRAMS

REINFORCING STEEL SAMPLES
REFER TO CMS SECTIONS 106.03, 700, 709.00, AND 709.01. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

REVISIONS:

DRAWN: JFM
CHECKED: BMG
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

APPROACH SLAB REINFORCING

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET S-43

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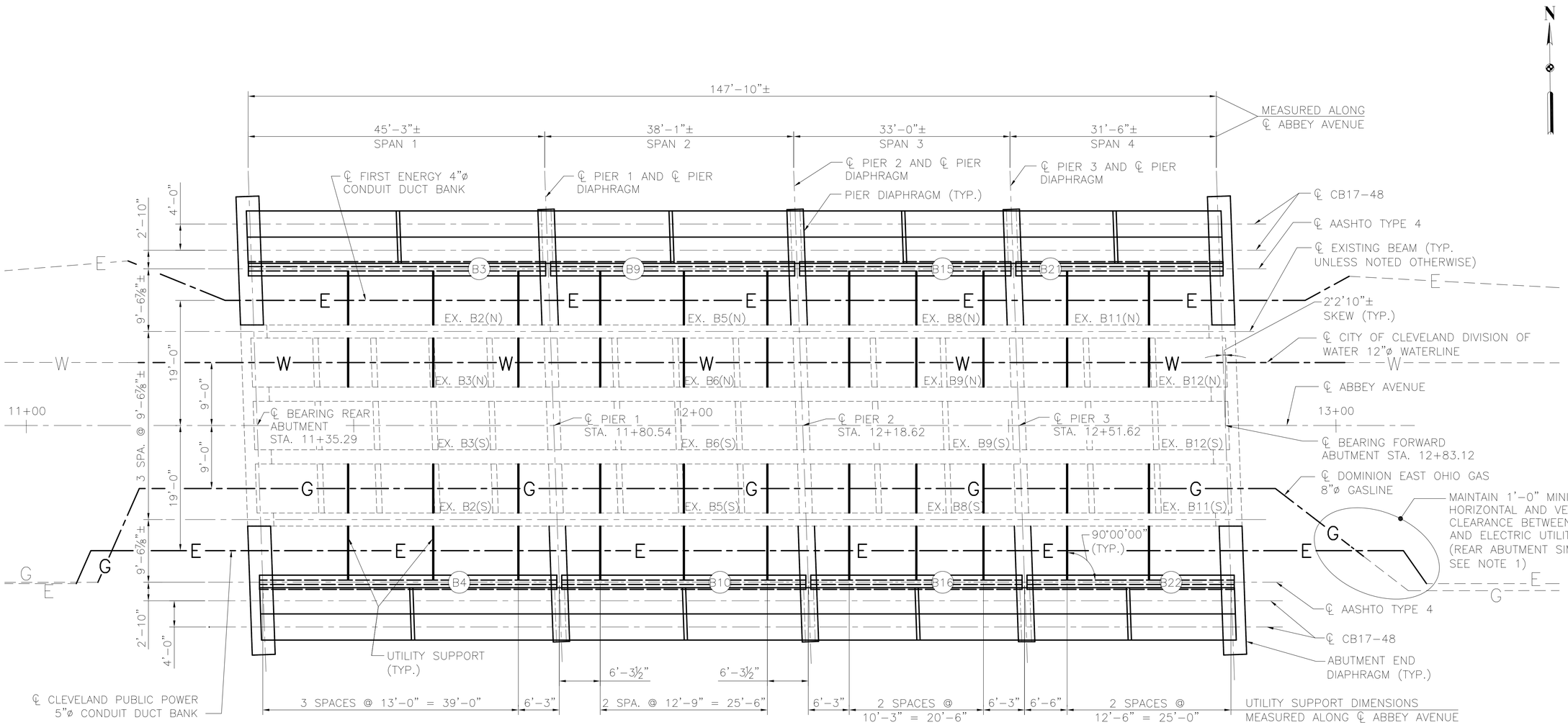

UTILITY SUPPORT CHANNEL LOCATION AND LAYOUT

LEGEND:

EX. = EXISTING	S = SOUTH
N = NORTH	TYP. = TYPICAL
E = ELECTRIC	G = GAS
W = WATER	

NOTES:

1) BASED ON EXISTING PLAN DATA IT APPEARS THE EXISTING DOMINION EAST OHIO GASLINE AND CLEVELAND PUBLIC POWER DUCT BANKS ARE IN CLOSE PROXIMITY TO ONE ANOTHER. CONTRACTOR SHALL COORDINATE PLACEMENT OF ELECTRICAL DUCT BANK WITH GASLINE TO AVOID CONFLICTS.

2) FOR UTILITY SUPPORT DETAILS, SEE SHEET U–2.

REVISIONS:

DRAWN: CMM
CHECKED: JFM
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

UTILITY SUPPORT FRAMING PLAN

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–1

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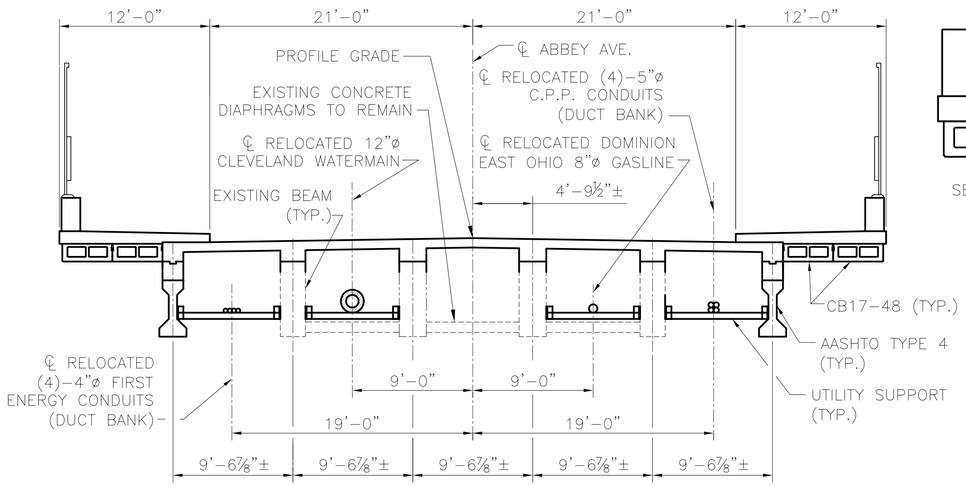
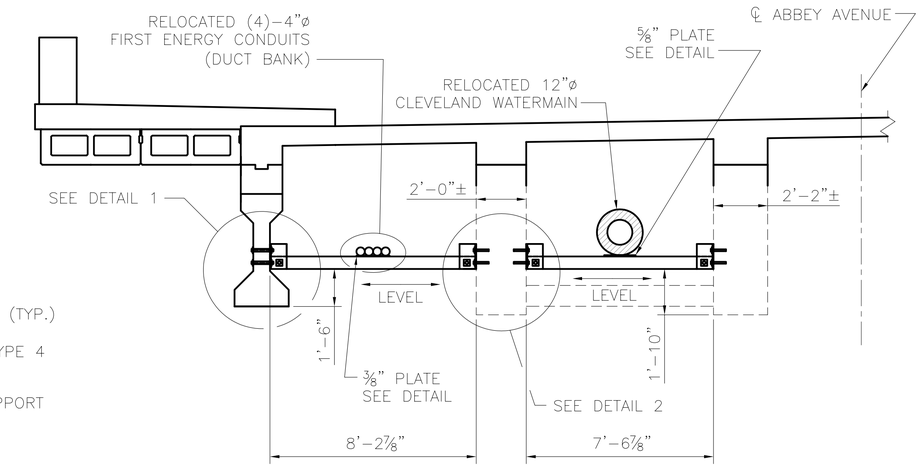


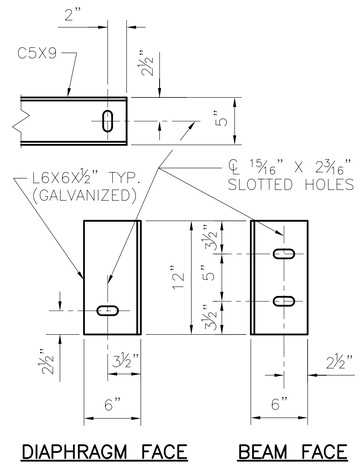
TRANSVERSE SECTION

PIER DIAPHRAGM AND SIDEWALK BRACKETS NOT SHOWN



UTILITY SUPPORTS FOR FIRST ENERGY AND CLEVELAND WATERMAIN

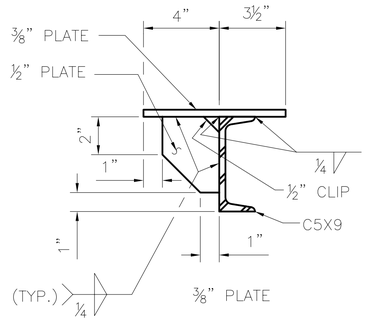
UTILITY SUPPORTS FOR C.P.P. DUCT BANK AND DOMINION EAST OHIO GASLINE SIMILAR



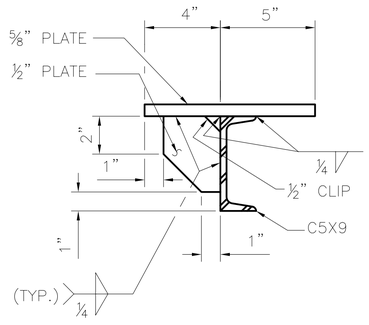
DIAPHRAGM FACE BEAM FACE

DETAIL 3

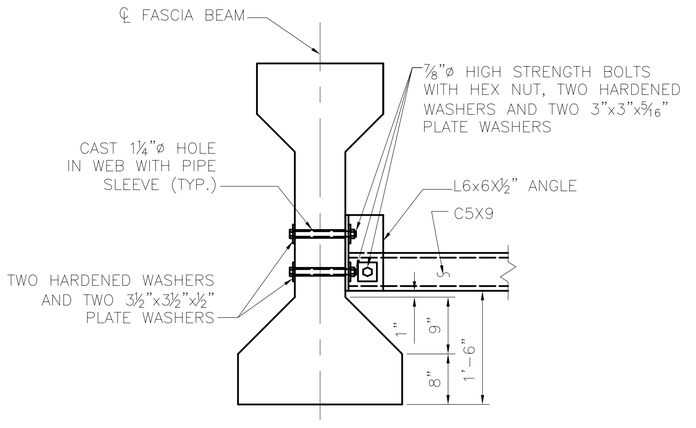
(FASCIA BEAM CHANNEL AND ANGLE DETAILS SIMILAR)



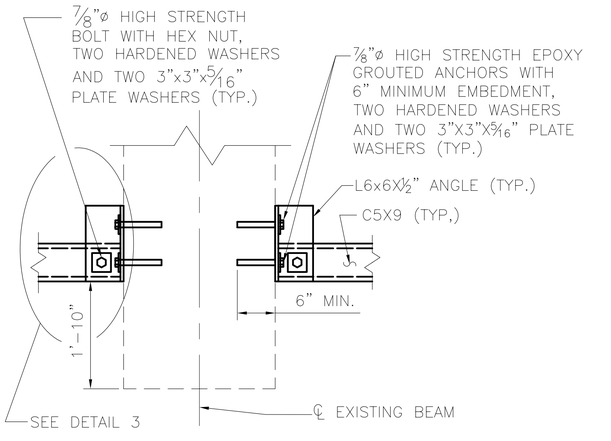
SECTION B–B



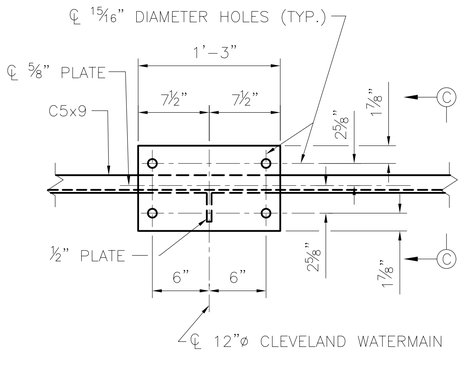
SECTION C–C



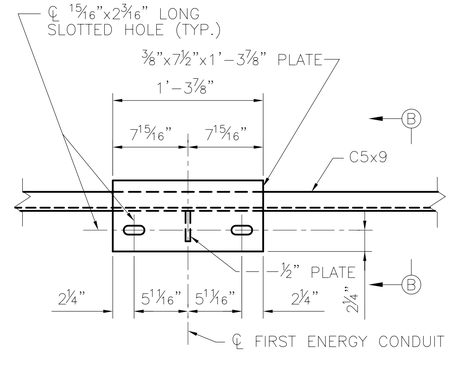
DETAIL 1



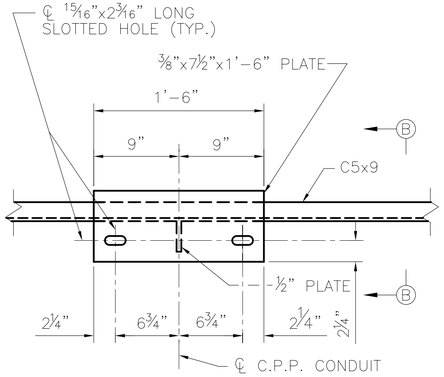
DETAIL 2



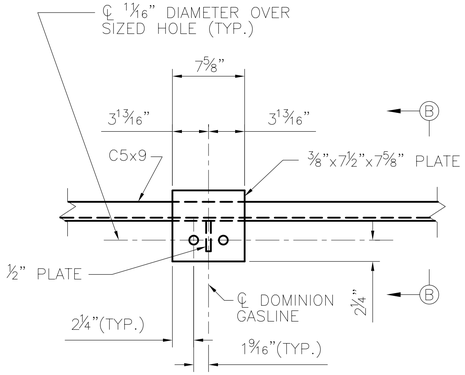
CLEVELAND WATERMAIN SUPPORT DETAIL



FIRST ENERGY DUCT BANK SUPPORT DETAIL



C.P.P. DUCT BANK SUPPORT DETAIL



DOMINION EAST OHIO GASLINE SUPPORT DETAIL

NOTES:

ALL STRUCTURE STEEL, INCLUDING BOLTS, NUTS AND WASHERS, SHALL MEET THE FABRICATION AND ERECTION REQUIREMENTS SPECIFIED IN TS 513.

ALL STRUCTURE STEEL SHALL BE ASTM A709, GRADE 36 OR 50, GALVANIZED ACCORDING TO TS 711.02.

REVISIONS:

DRAWN: CMM
CHECKED: JFM
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

UTILITY SUPPORT DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-2

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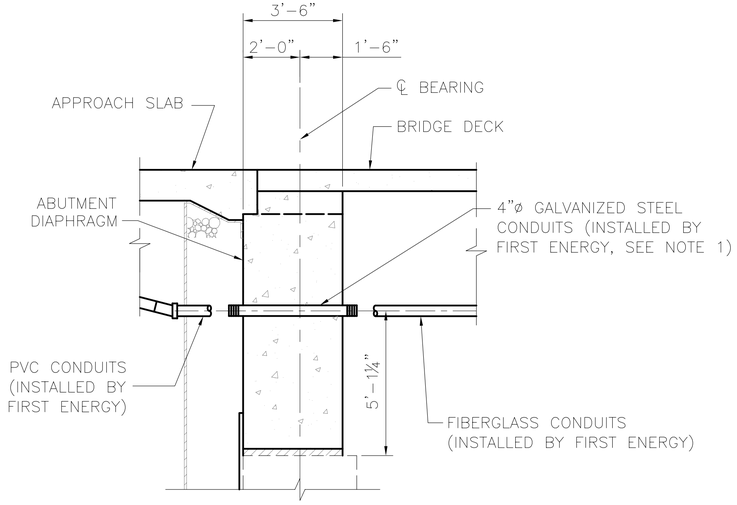
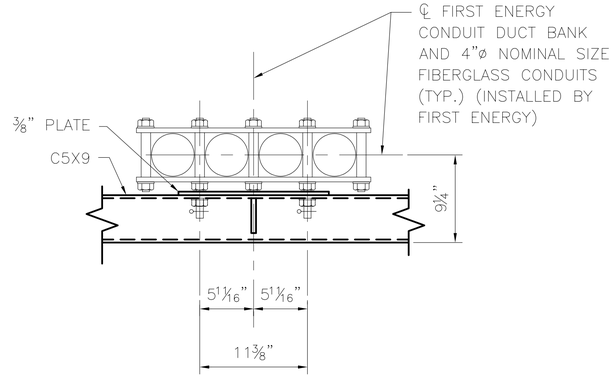


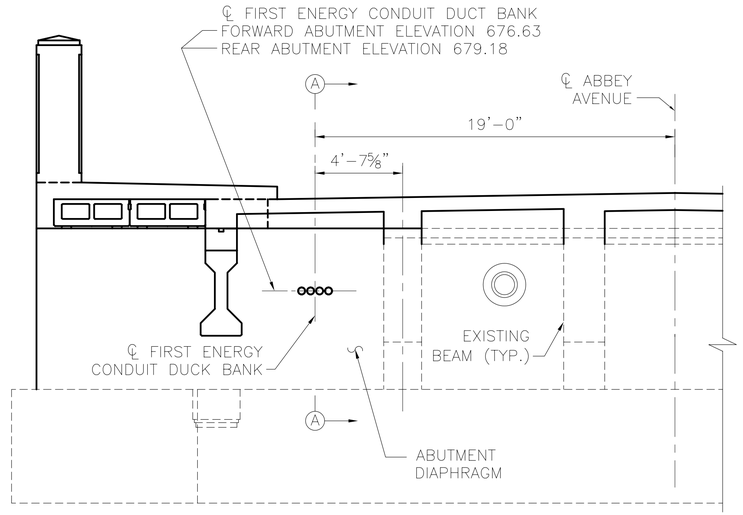
SECTION A–A

FORWARD ABUTMENT SHOWN;
REAR ABUTMENT SIMILAR



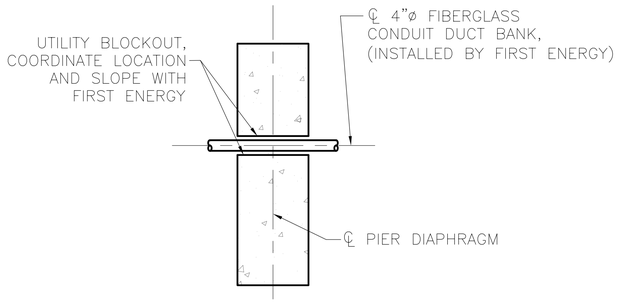
FIRST ENERGY CONDUIT DUCT BANK SUPPORT DETAIL

(DUCT BANK SUPPLIED AND INSTALLED BY FIRST ENERGY)

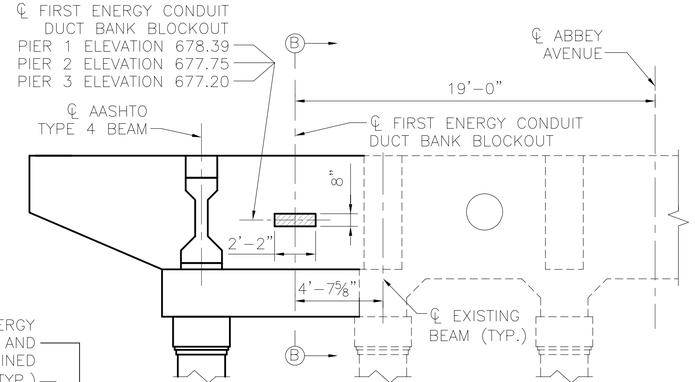


CONDUIT DUCT BANK – ABUTMENT DETAIL

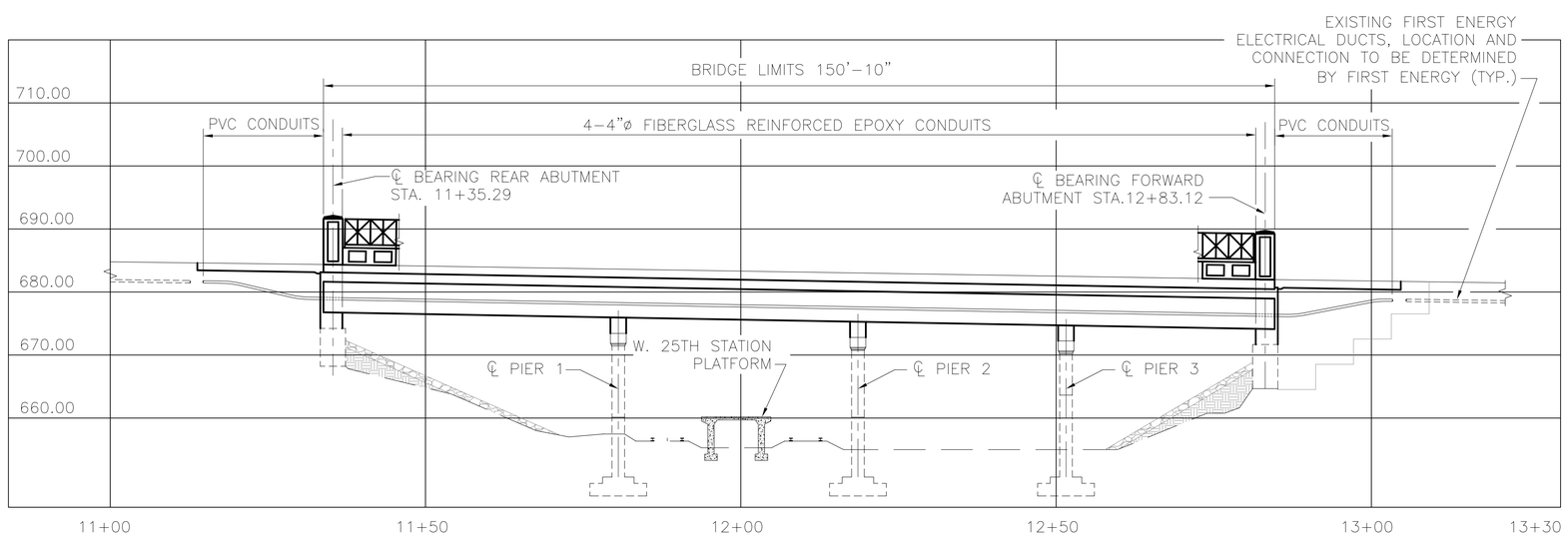
(FORWARD ABUTMENT SHOWN; REAR ABUTMENT SIMILAR)



SECTION B–B



CONDUIT DUCT BANK BLOCKOUT TYPICAL PIER DIAPHRAGM DETAIL



FIRST ENERGY ELECTRIC UTILITY PROFILE

LEGEND:

L.F. LINEAR FEET

NOTES:

1) CONTRACTOR SHALL COORDINATE WITH FIRST ENERGY FOR LOCATION OF ABUTMENT STEEL CONDUITS.
2) FOR SUPPORT LOCATIONS, SEE SHEET U–1.
3) FOR UTILITY SUPPORT DETAILS, SEE SHEET U–2.

REVISIONS:

DRAWN: CMM
CHECKED: JFM
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

RTA
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

FIRST ENERGY UTILITY DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–3

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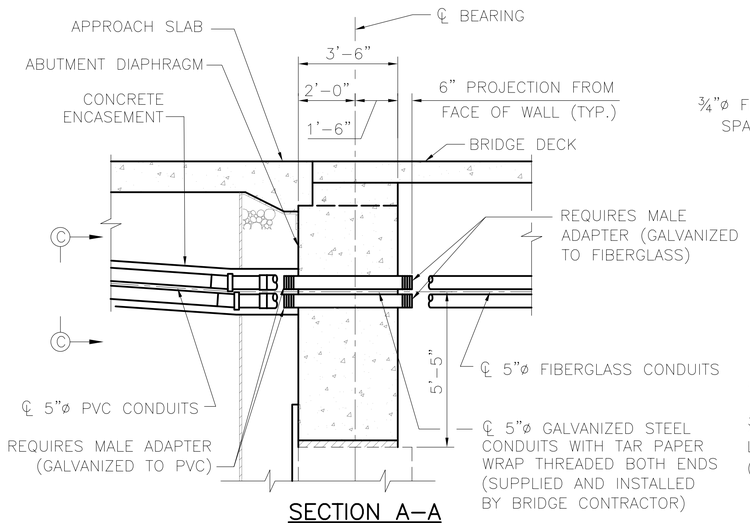
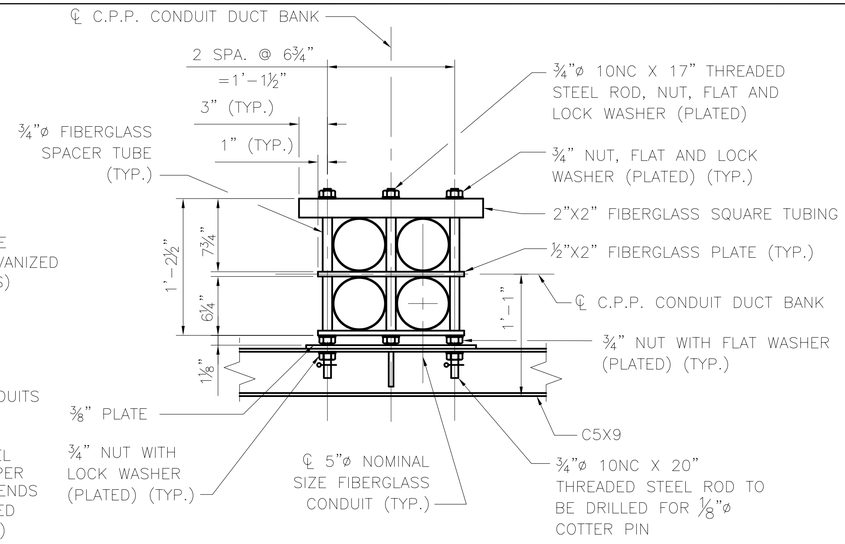
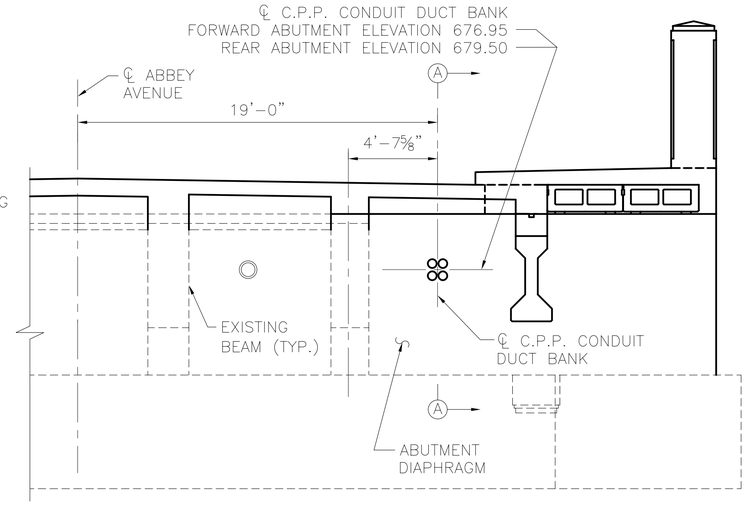


SECTION A–A

(FORWARD ABUTMENT SHOWN; REAR ABUTMENT SIMILAR)

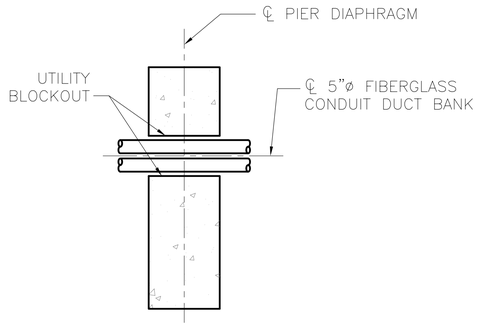


C.P.P. CONDUIT DUCT BANK SUPPORT DETAIL

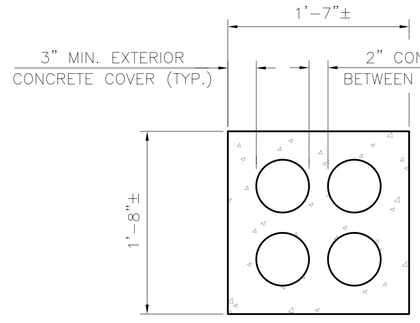


CONDUIT DUCT BANK – ABUTMENT DETAIL

(FORWARD ABUTMENT SHOWN; REAR ABUTMENT SIMILAR)

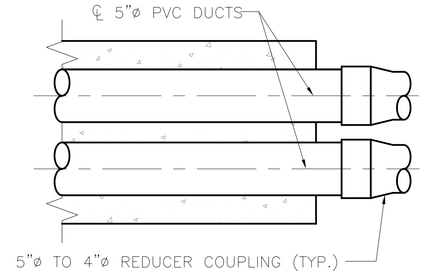


SECTION B–B



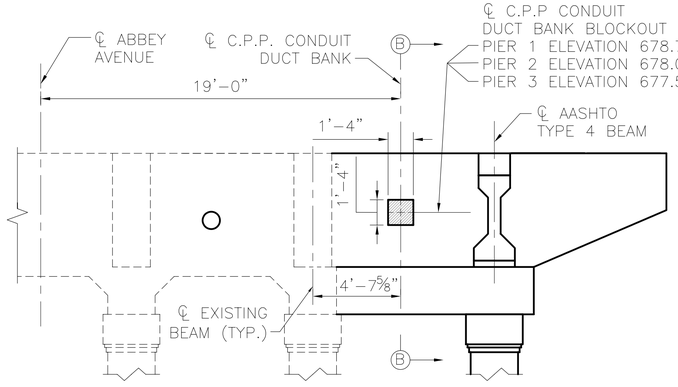
VIEW C–C

(SEE NOTES 1 AND 2)

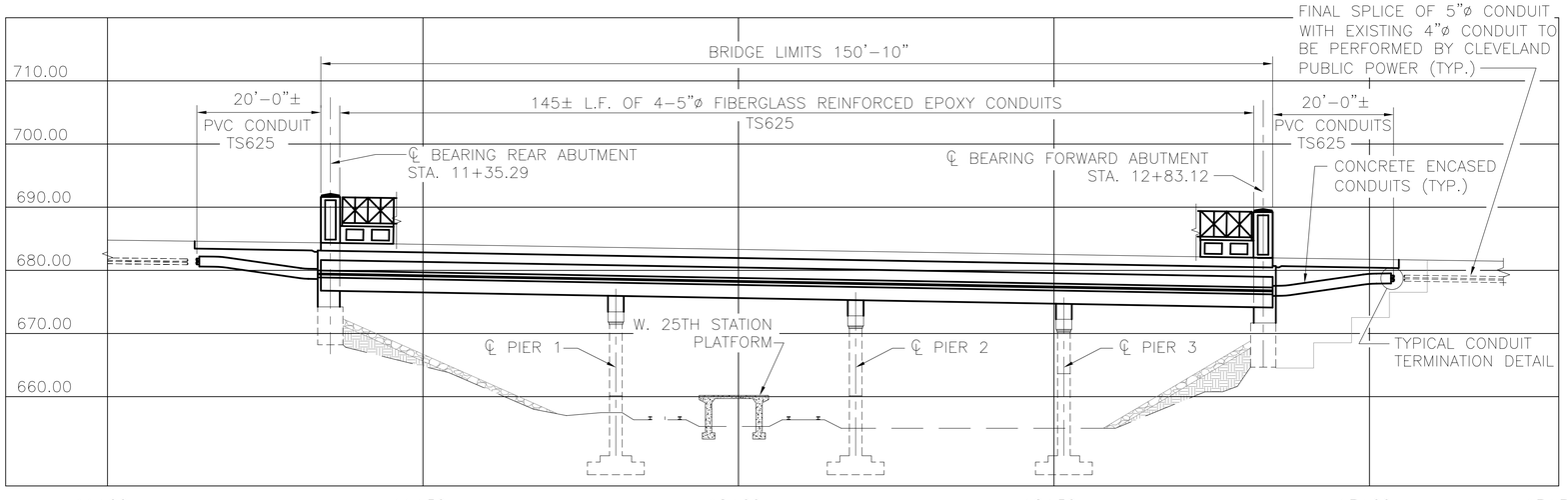


TYPICAL CONDUIT TERMINATION DETAIL

(FORWARD ABUT. SHOWN; REAR ABUT. SIMILAR)



CONDUIT DUCT BANK BLOCKOUT TYPICAL PIER DIAPHRAGM DETAIL



C.P.P. ELECTRIC UTILITY PROFILE

LEGEND:

C.P.P. = CLEVELAND PUBLIC POWER

MIN. = MINIMUM

NOTES:

1) DUCT SPACING ACHIEVED WITH STANDARD BASE AND INTERMEDIATE SPACERS.

2) CONCRETE ENCASEMENT SHALL BE CLASS C. PAYMENT SHALL BE INCLUDED WITH PVC CONDUIT.

3) FOR SUPPORT LOCATIONS SEE SHEET U–1.

4) FOR UTILITY SUPPORT DETAILS, SEE SHEET U–2.

REVISIONS:

DRAWN: CMM
CHECKED: JFM
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CLEVELAND PUBLIC POWER UTILITY DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–4

6/6/2007 12:51 PM

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GENERAL

SPECIFICATIONS

ALL WORK IN THIS CONTRACT SHALL CONFORM TO THE LATEST STATE OF OHIO DEPARTMENT OF TRANSPORTATION (ODOT) CONSTRUCTION AND MATERIALS SPECIFICATIONS, GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY (RTA). NATIONAL ELECTRIC SAFETY CODE AND OSHA REQUIREMENTS, EXCEPT WHERE LOCAL REGULATIONS ARE MORE STRINGENT, IN WHICH CASE LOCAL REGULATIONS SHALL GOVERN.

SCOPE OF WORK

A. THE CONTRACTOR SHALL RELOCATE AND REMOVE ALL CLEVELAND PUBLIC POWER (CPP) FACILITIES AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THIS WORK SHALL BE PROPERLY COMPLETED, INCLUDING INCIDENTALS, AS SHOWN ON THE DRAWINGS AND HEREINAFTER SPECIFIED.

B. THE MAJOR ITEMS OF WORK TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR SHALL BE AS FOLLOWS:

1. PERMANENT UNDERGROUND 5" CONCRETE ENCASED PVC DUCTS AT BOTH APPROACH ENDS FROM ABUTMENT APPROXIMATELY 20 FT TO EXISTING CPP 4" DUCTS.

2. PERMANENT DUCT SYSTEM ON THE ROADWAY BRIDGE.

C. CONSTRUCTION SEQUENCE NECESSARY TO ACCOMPLISH THE REQUIRED SCOPE OF WORK IS:

1. PRIOR TO THE BRIDGE CLOSING, CPP WILL DEACTIVATE THE EXISTING LINE AND TEMPORARILY RELOCATE IT OFF THE BRIDGE. RTA CONTRACTOR IS TO REMOVE THE EXISTING FASCIA GIRDER WITH CPP ENCASED DUCTS. RTA CONTRACTOR SHALL THEN INSTALL THE NEW FASCIA GIRDER AND CAST GALVANIZED CONDUITS THROUGH THE PROPOSED ABUTMENTS. DURING CONSTRUCTION INSTALL CONDUITS, SUPPORTS, RACKS, ETC. ON THE BRIDGE.

2. INSTALL FOUR – 5"ø PVC CONDUITS WITH ENCASEMENT EAST AND WEST FROM FORWARD AND REAR ABUTMENTS RESPECTFULLY, WITH 5" TO 4" REDUCER AT ENDS. COORDINATE LOCATION AND ELEVATION WITH CITY INSPECTOR AND COOPERATE AND COORDINATE WITH DOMINION EAST OHIO GAS.

3. C.P.P. WILL MAKE THE FINAL SPLICE CONNECTION OF THE NEW PVC CONDUIT TO THE EXISTING 4" FIBER DUCT. C.P.P. WILL THEN RUN THE NEW CABLE AND REENERGIZE THE LINE.

4. THE CUT–OVER OF CABLES WILL BE PERFORMED ONE AT A TIME AND WILL REQUIRE COORDINATION BETWEEN CONTRACTOR AND C.P.P.

SUBMITTALS

A. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS ON THE FOLLOWING ITEMS OF EQUIPMENT:

DUCT HANGERS
PVC AND FRE CONDUITS

DEFINITIONS

WHENEVER IN THESE SPECIFICATIONS OR IN ANY DOCUMENTS OR INSTRUCTIONS ON CONSTRUCTION WHERE THESE SPECIFICATIONS GOVERN, THE FOLLOWING TERMS (OR PRONOUNS IN PLACE OF THEM) ARE USED, THE INTENT AND MEANING SHALL BE INTERPRETED AS FOLLOWS:

THE CITY, OR "THE CITY OF CLEVELAND", IS THE DIRECTOR OF THE CITY OF CLEVELAND DEPARTMENT OF PUBLIC UTILITIES.

STATUS OF CITY INSPECTOR

INSPECTORS AS DESIGNATED BY THE CITY OF CLEVELAND SHALL BE AUTHORIZED TO INSPECT ALL WORK DONE AND MATERIALS FURNISHED. SUCH INSPECTING MAY EXTEND TO ALL OR ANY PART OF THE WORK, AND TO THE PREPARATION OR MANUFACTURE OF THE MATERIALS TO BE USED IN THE WORK. THE CITY INSPECTOR AS DESIGNATED BY THE DIRECTOR OF PUBLIC UTILITIES SHALL GIVE WORK INSTRUCTIONS THROUGH THE PROJECT ENGINEER.

ITEM TS 625 – CONDUIT, MISC.: NON–REINFORCED CONCRETE ENCASED CONDUIT BANKS

A. WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL MATERIALS FOR, AND SHALL PROPERLY CONSTRUCT AND CONNECT TO GALVANIZED PIPE SLEEVES THROUGH ABUTMENT AS SHOWN ON THE PLANS OR AS DIRECTED, ALL NON–REINFORCED CONCRETE–ENCASED PVC (EB) CONDUIT BANKS AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT. ALL APPLICABLE SECTIONS OF ODOT CMS ITEM 625 SHALL BE UNDERSTOOD AS PART OF THIS SECTION.

B. CONDUIT AND FITTINGS

POLYVINYL CHLORIDE (PVC) EB20 CONDUIT SHALL CONFORM TO UL 651 STANDARDS, 5–INCH INSIDE DIAMETER WITH CONCRETE ENCASEMENT AS DETAILED ON PLANS. COUPLINGS SHALL BE SOCKET TYPE. 5" ANGLE COUPLINGS, STANDARD COUPLINGS, VARIOUS DEGREE SWEEPS, 11¼" TO 90 DEGREE INCLUDING FIELD BENDS, AND PLUGS OR CAPS TO CLOSE UNUSED CONDUITS, SHALL BE MADE OF THE SAME MATERIAL AS THE CONDUIT. CONDUIT SPACERS MAY BE MADE OF PLASTIC, STYRENE, POLYVINYL CHLORIDE OR POLYETHYLENE. CONCRETE BLOCK SPACERS WILL NOT BE ACCEPTED.

C. CONCRETE

CONCRETE USED FOR ENCASEMENT OF CONDUITS SHALL CONFORM TO ODOT SPECIFICATION 499, CLASS C, USING NO. 8 SIZE AGGREGATE.

D. INSTALLATION

CONDUIT SHALL BE INSTALLED BY THE BUILT–UP METHOD WITH JOINTS IN ADJACENT DUCTS STAGGERED. NECESSARY SPACERS SHALL BE PLACED AT NO GREATER THAN 5–FEET INTERVALS TO HOLD DUCTS IN THE DESIRED CONFIGURATION, WITH THE DUCTBANK BRACED SECURELY TO KEEP IT FROM SHIFTING AND FLOATING WHILE CONCRETE IS POURED. SEALER COMPOUND FURNISHED BY THE CONDUIT MANUFACTURER SHALL BE APPLIED TO EACH SECTION OF CONDUIT AND EACH SECTION SHALL BE TAPPED SECURELY INTO PLACE IN THE PREVIOUS COUPLING TO OBTAIN JOINTS THAT ARE TIGHT AND LEAKPROOF.

1. CONCRETE SHALL BE WORKED INTO THE SPACES BETWEEN DUCTS SO THAT THE CONDUIT BANK IS EFFECTIVELY ENCASED IN CONCRETE WITHOUT VOIDS OR EMPTY SPACES.

2. CONDUIT WHICH IS CUT TO FIT SHORT SECTIONS SHALL BE DEBURRED ON THE DUCT END AND THE END OF THE BELL SHALL BE REAMED IN THE INSIDE DIAMETER FOR EACH ENTRY OF THE DUCT INTO THE COUPLING TO PRODUCE THE SAME JOINTING CONDITIONS AS PROVIDED BY FACTORY–MADE CONDUIT SECTIONS.

3. ALL END BELLS SHALL BE GROUTED IN PLACE.

E. MEASUREMENT

THE NUMBER OF LINEAR FEET OF CONDUIT BANK TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF LINEAR FEET FURNISHED AND PLACED AND ACCEPTED IN ACCORDANCE WITH THESE SPECIFICATIONS, AS MEASURED ALONG THE AXIS OF THE CONDUIT LINE, INCLUDING FITTINGS.

F. PAYMENT

THE FOOTAGE MEASURED AS PROVIDED ABOVE SHALL BE PAID FOR AT THE CONTRACT PRICE BID PER LINEAR FOOT UNDER ITEM TS 625 AS DESCRIBED BELOW, CLASSIFIED AS TO SIZE AND TYPE, WHICH PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR EXCAVATING AND FOR FURNISHING, HAULING, PLACING THE CONDUIT, FITTINGS, CAPPING, SPACERS, CONCRETE, SHEETING AND BRACING, INCIDENTAL CONCRETE AND DUCT CLEANING, REMOVAL OF ALL SURPLUS EXCAVATION AND DISCARDED MATERIAL AND ALL LABOR, EQUIPMENT, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK AS SPECIFIED.

ITEMS AS MEASURED AND PROVIDED ABOVE SHALL BE PAID FOR UNDER:

ITEM	UNIT	DESCRIPTION
TS 625	L.F.	CONDUIT MISC.; NON–REINFORCED, CONCRETE ENCASED, FOUR–5 INCH PVC CONDUIT BANK

ITEM TS 625 – CONDUIT, MISC.: NON–ENCASED, STRUCTURE–SUPPORTED 5–INCH FIBERGLASS REINFORCED EPOXY CONDUIT BANK

A. WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL MATERIALS FOR, AND SHALL PROPERLY INSTALL AND CONNECT TO EXPANSION COUPLINGS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER, ALL NON–ENCASED, STRUCTURE–SUPPORTED FIBERGLASS REINFORCED EPOXY CONDUIT AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT. ALL APPLICABLE SECTIONS OF ITEM 625 SHALL BE UNDERSTOOD AS PART OF THIS SECTION.

B. FIBERGLASS REINFORCED EPOXY (FRE) CONDUIT AND FITTINGS

FIBERGLASS REINFORCED EPOXY CONDUIT SHALL BE COMPOSED OF GLASS FILAMENTS ENCAPSULATED IN AN EPOXY MATRIX. THE CONDUIT AND FITTINGS SHALL BE FILAMENT WOUND. THE GLASS FIBER CONTENT SHALL NOT BE LESS THAN 60% BY WEIGHT OF THE REINFORCED WALL THICKNESS. CONDUIT AND FITTINGS SHALL BE "UL" LISTED. EACH CONDUIT LENGTH SHALL HAVE AN INTEGRAL WOUND–IN EXPANDED COUPLING INCORPORATING AN INTEGRAL URETHANE GASKET FOR SEALING. NO THREADS OR ADHESIVES SHALL BE REQUIRED TO ASSURE WATERTIGHT JOINTS. ALL CONDUIT AND FITTINGS WILL BE PIGMENTED WITH CARBON BLACK DISPERSED HOMOGENEOUSLY THROUGH THE EPOXY GLASS MATRIX FOR ULTRAVIOLET PROTECTION.

FRE DUCT SHALL HAVE THE FOLLOWING PHYSICAL PROPERTIES MEETING APPLICABLE ASTM TEST SPECIFICATIONS:

INSIDE DIAMETER	5 INCHES
WALL THICKNESS	0.096 INCHES
WEIGHT	1.2 LB./FT.
5% DEFLECTION LOAD	205 LB./FT.
THERMAL EXPANSION	0.015 IN./100 FT./DEGREE F
TENSILE STRENGTH	11,000 PSI (AXIAL)

C. DUCTBANK SUPPORT COMPONENTS

ALL STEEL COMPONENTS SHALL BE EITHER HOT–DIP GALVANIZED OR PER ASTM A583. ELEMENTS IN CONTACT WITH FRE DUCT SHALL BE PVC COATED OR FIBERGLASS.

D. MEASUREMENT

THE NUMBER OF LINEAR FEET OF CONDUIT BANK TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF LINEAR FEET FURNISHED AND PLACED IN ACCORDANCE WITH THESE SPECIFICATIONS AS MEASURED ALONG THE AXIS OF THE CONDUIT LINE, INCLUDING FITTINGS.

E. PAYMENT

THE FOOTAGE MEASURED AS PROVIDED ABOVE SHALL BE PAID FOR AT THE CONTRACT PRICE BID PER LINEAR FOOT FOR ITEM TS 625 AS DESCRIBED BELOW, CLASSIFIED AS TO SIZE AND TYPE, WHICH PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING, HAULING AND PLACING THE CONDUIT, FITTINGS, SPACERS, AND FOR ALL LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM. SUPPORT BRACKETS AND CROSSFRAMES ARE PAID FOR SEPARATELY UNDER ITEM TS 513. THE ITEMS AS MEASURED AND PROVIDED ABOVE SHALL BE PAID FOR UNDER:

ITEM	UNIT	DESCRIPTION
TS 625	L.F.	CONDUIT MISC.; NON–ENCASED, STRUCTURE– SUPPORTED FOUR 5 INCH FRE CONDUIT BANK

REVISIONS:

DRAWN: CMM
CHECKED: JFM
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

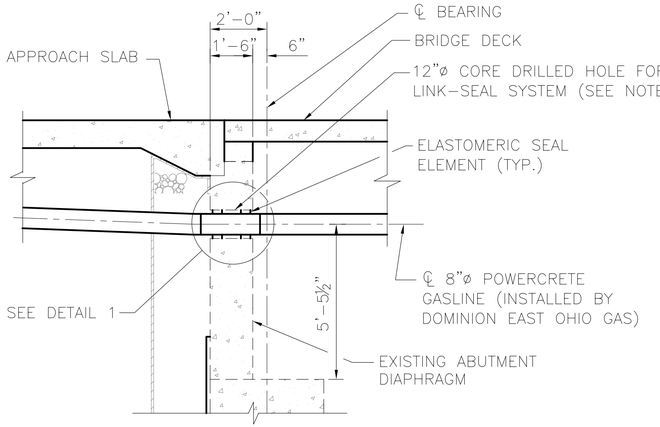
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

POWER NOTES
CLEVELAND PUBLIC POWER

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

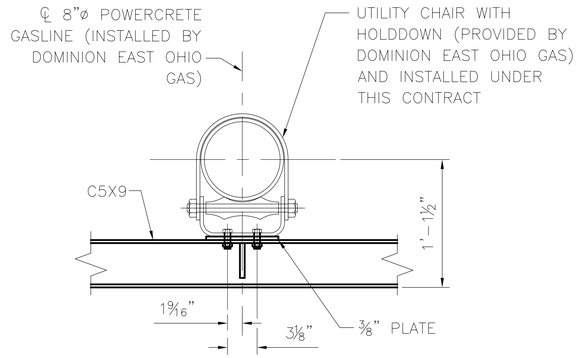
RTA PROJ 29D
BID PAC

SHEET U–5

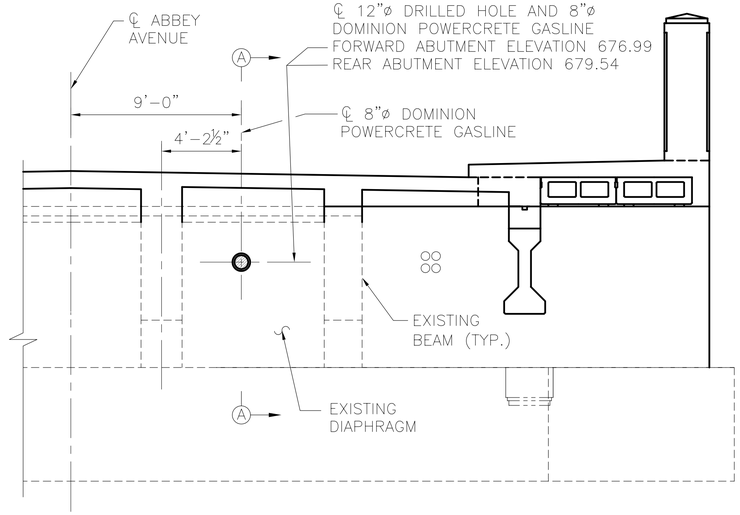


SECTION A–A

(FORWARD ABUTMENT SHOWN; REAR ABUTMENT SIMILAR)

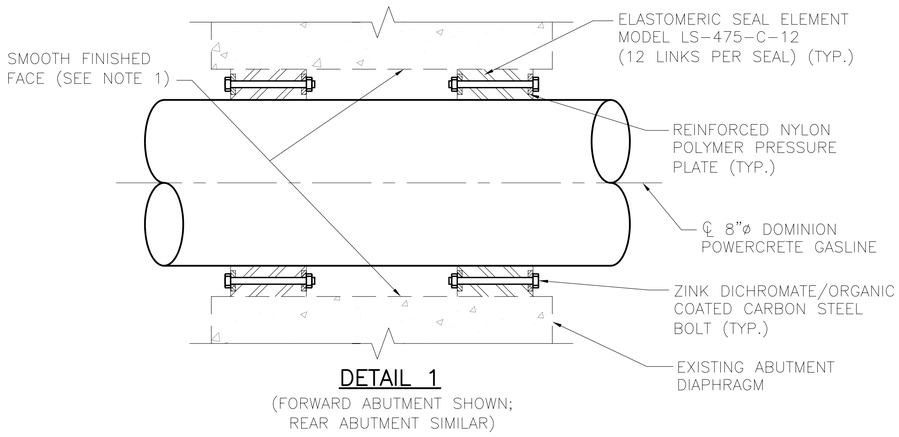


DOMINION EAST OHIO GAS SUPPORT DETAIL



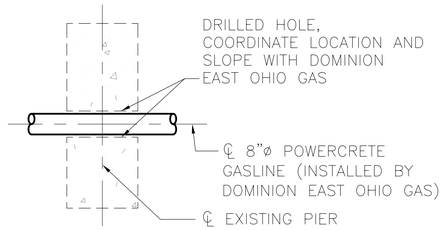
CORE DRILLED HOLE – ABUTMENT DETAIL

(FORWARD ABUTMENT SHOWN; REAR ABUTMENT SIMILAR)

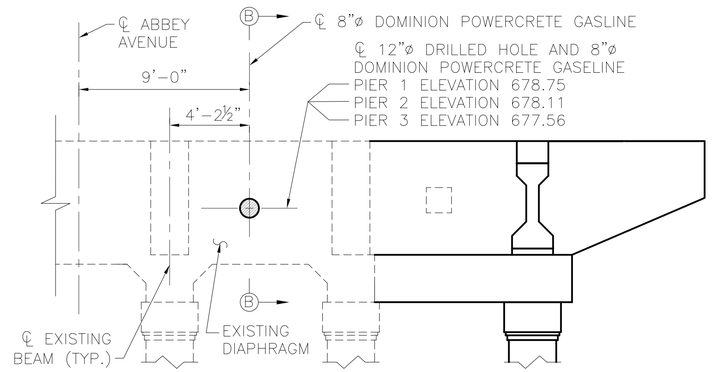


DETAIL 1

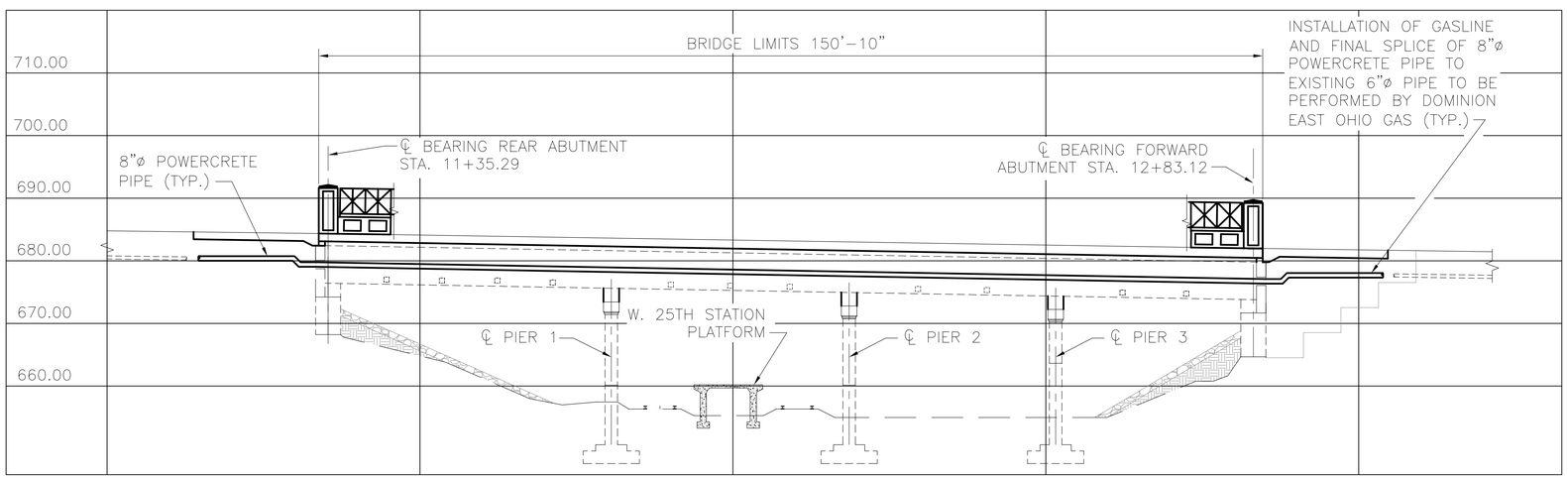
(FORWARD ABUTMENT SHOWN; REAR ABUTMENT SIMILAR)



SECTION B–B



CORE DRILLED HOLE TYPICAL PIER DIAPHRAGM DETAIL



DOMINION EAST OHIO GAS UTILITY PROFILE

LEGEND:

L.F. = LINEAR FEET

NOTES:

1) CONTRACTOR TO CORE DRILL HOLE THROUGH ABUTMENT OBTAINING A ROUND, SMOOTH FACE WHEN COMPLETE.
2) FOR SUPPORT LOCATIONS, SEE SHEET U–1.
3) FOR UTILITY SUPPORT DETAILS, SEE SHEET U–2.

REVISIONS:

DRAWN: CMM
CHECKED: JFM
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

DOMINION EAST OHIO GAS UTILITY DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–6

6/6/2007 12:53 PM

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WATERWORK NOTES

GENERAL

SCOPE OF WORK

THE WORK CONTEMPLATED 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 SHEETS U-7 TO U-26 AND DESCRIBED BELOW:

WATERMAIN CONSTRUCTION SEQUENCE

(SEE ROADWAY PLAN SHEET FOR EXISTING VALVE AND HYDRANT LOCATIONS)

1. CLOSE EXISTING VALVES AT STA. 10+33 AND STA. 13+64.
2. COVER OUT-OF-SERVICE HYDRANT AT STA. 10+39.
3. CONSTRUCT NEW WATERMAIN, BENDS, AND VALVES. CONNECT TO EXISTING MAIN.
4. WITH NEW VALVES IN CLOSED POSITION PRESSURE TEST NEW WATERMAIN UTILIZING NEW AIR RELIEF VALVE TO FILL MAIN.
5. CHLORINATE NEW MAIN.
6. OPEN HYDRANT AT STA. 10+39. OPEN NEW VALVES AT STA. 11+16 AND STA. 13+03 AND OPEN EXISTING VALVE AT STA. 10+33 TO ALLOW FLUSHING AND SAMPLING OF MAIN.
7. FLUSH AND SAMPLE MAIN.
8. OPEN EXISTING VALVE AT STA. 13+64.

GENERAL NOTES

THE EXACT LOCATION OF EXISTING WATER LINES AND UNDERGROUND STRUCTURES IS NOT KNOWN. INFORMATION SHOWN ON THE PLANS WAS OBTAINED FROM CLEVELAND WATER DEPARTMENT DRAWINGS.

THE FIELD TESTING HEAD SHALL BE 75 PSI PLUS THAT DUE TO THE STATIC HEAD, BUT IN NO CASE LESS THAN 150 PSI.

THE CONTRACTOR SHALL NOTIFY MR. RICHARD KMETZ, SUPERVISOR OF THE CLEVELAND WATER DEPARTMENT INSPECTION AND ENFORCEMENT UNIT THREE (3) WEEKS PRIOR TO STARTING ANY WATER WORKS CONSTRUCTION. CALL 216-664-2342.

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

DEFINITIONS

WHEREVER IN THESE SPECIFICATIONS OR IN OTHER CONTRACT DOCUMENTS THE FOLLOWING TERMS OR PRONOUNS IN PLACE OF THEM ARE USED, THE INTENT AND MEANING SHALL BE INTERPRETED AS FOLLOWS:

ENGINEER

THE ENGINEER IS THE DULY DESIGNATED THE PROJECT REPRESENTATIVE OF GCRTA.

THE CITY

THE CITY IS THE DIRECTOR, DEPARTMENT OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND OR THEIR DULY DESIGNATED DEPUTIES, AGENTS OR REPRESENTATIVES.

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 PROJECT ENGINEER. ARRANGEMENTS FOR CITY INSPECTORS ARE TO BE MADE BY NOTIFYING INSPECTION AND ENFORCEMENT DIVISION OF WATER AND HEAT (216-664-2342), 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 DIRECTOR OF PUBLIC UTILITIES, 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 DIRECTOR MAY BE PRESENT TO INSPECT THE MANUFACTURE. THE CONTRACTOR SHALL PROVIDE, WITHOUT CHARGE OR EXPENSE TO GCRTA AND CITY, ALL NECESSARY ASSISTANCE TO THE ENGINEER AND CITY WHEN REQUIRED FOR INSPECTION OR VERIFICATION OF WORK DONE.

DIMENSIONS, DETAILED DRAWINGS AND ELEVATIONS

FIGURED DIMENSIONS ON DRAWINGS SHALL TAKE PRECEDENT 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

(A) ATTENTION IS CALLED TO THE FACT THAT THE WORK OF THIS CONTRACT INCLUDED CERTAIN PERFORMANCE AS INCIDENTAL TO THE ITEMIZED REQUIREMENTS HEREOF, THOUGH NOT EXCLUSIVE AS FOLLOWS: TO PERFORM ALL EXCAVATION, BACKFILLING, SHEETING, SHORING, AND TO TEST AND CHLORINATE THE INSTALLATION. GCRTA 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 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.

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 DIRECTOR 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 DIRECTOR OF PUBLIC UTILITIES OR HIS 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.

(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.

WATER MAIN DISINFECTION

(A.) WATER MAIN DISINFECTION SHALL CONSIST OF: FLUSHING WATER MAINS AFTER THE HYDROSTATIC TEST AND PRIOR TO THE CHLORINATION PROCEDURE; THE CHLORINATION PROCEDURE, THE FINAL FLUSHING AND SAMPLING.

1. TAPS, TAPPING SADDLES, SERVICE PIPES, COMBINATION BLOWOFFS, AND EXISTING WATER MAINS WITH READILY ACCESSIBLE CONTROL VALVES, AND ALL PIPES, APPLIANCES, LABOR AND OTHER APPURTENANCES SHALL BE FURNISHED OR PROVIDED BY THE CONTRACTOR. THEY SHALL BE USED FOR INTRODUCING DISINFECTING AGENT AND WATER FOR FLUSHING INTO THE NEW OR EXTENDED WATER MAINS. TAPS OR SERVICE PIPES SHALL BE A MINIMUM ONE INCH (1") SIZE OF COPPER TO IRON PIPE THREAD CONFIGURATION. ADDITIONAL TAPS SHALL BE PROVIDED IF NECESSARY. ALL ONE INCH (1") TAPS ON DUCTILE IRON WATER MAINS WITH THICKNESS LESS THAN CLASS 56 WILL REQUIRE BRONZE DOUBLE STRAP TAPPING SADDLES, OR APPROVED EQUAL, FURNISHED BY THE CONTRACTOR. COMBINATION BLOWOFFS AND SAMPLING TAPS SHALL BE: EITHER TAPPED OUTLET OR REGULAR BRANCH OUTLET TEES; AND/OR TAPPED PLUGS OR PIPE ENDS WHICH SHALL BE PLUGGED; OR HAVE ENDS CONNECTED TO WATER SYSTEM AFTER SATISFACTORY DISINFECTION AND FLUSHING. TAPPING OF WATER MAINS FOR CHLORINATION SHALL BE IN ACCORDANCE WITH THAT SPECIFIED IN PARAGRAPH "WORK TO BE DONE BY CITY".

2. ON EXISTING WATER MAINS AND ON NEW, RELOCATED OR EXTENDED WATER MAINS PLACED IN SERVICE ONLY THE CITY WILL OPERATE THE VALVES. THE CONTRACTOR WILL COOPERATE WITH CITY'S CHLORINATION CREW IN COORDINATING THE CHLORINATION AND FLUSHING IN DETERMINING THE AMOUNTS AND EXTENT OF CHLORINATION AND FLUSHING.

3. 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.

4. THE CONTRACTOR SHALL PREPARE AND PRESENT TO THE CITY FOR APPROVAL A PLAN FOR ALL DISINFECTION FROM THE HYDROSTATIC TESTING TO THE FINAL FLUSHING FOR THE NEW OR EXTENDED WATER MAIN, INCLUDING ANY BRANCHES. THE DISINFECTION PLAN SHALL SHOW COMPLETE LAYOUT, INCLUDING SIZES AND LOCATION OF: (A) FLUSHING WATER SOURCE; (B) WATER SOURCE FOR CHLORINATION UTILIZING CALCIUM HYPOCHLORITE SOLUTION FURNISHED IN MIXING DRUM; (C) BLENDING WATER SOURCE TO ASSURE PROPER AND UNIFORM CONCENTRATION OF CHLORINATION SOLUTION THROUGHOUT THE WATER MAIN TO BE DISINFECTED; (D) OUTLETS TO BE UTILIZED OR PROVIDED FOR THE DRAWING AND FINAL FLUSHING OF CHLORINE SOLUTION THROUGH AND FROM THE WATER MAIN BEING DISINFECTED; AND (E) TYPE, NUMBER, SEQUENCE AND SIZES OF OUTLETS INCLUDING FIRE HYDRANTS AND VALVES TO BE OPERATED.

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SHEET U-7

5. BEFORE HYDROSTATIC TESTING WILL BE PERMITTED, THE CONTRACTOR SHALL OBTAIN FROM THE CITY, DIVISION OF WATER & HEAT, PERMITS AND SALES, MISCELLANEOUS SERVICE RECEIPT (MR CARD). APPROVED WATER MAIN PLANS OF THE NEW WATER MAIN OR EXTENSION SHALL BE USED IN PREPARATION OF THE PLAN FOR DISINFECTION. UPON RECEIPT OF APPROVAL BY THE COMMISSIONER OF WATER AND HEAT OF THE PLAN FOR DISINFECTION, THE CONTRACTOR SHALL SUBMIT THE PLANS TO THE INSPECTION AND ENFORCEMENT RESIDENT INSPECTOR ALONG WITH THE MISCELLANEOUS SERVICE RECEIPT (MR CARD). ONLY UPON RECEIPT OF THE PLANS AND MR CARD WILL THE CHLORINATION PROCEDURE BE PERFORMED. THE CITY'S CHLORINATION CREW WILL INSPECT THE ENTIRE JOB AS TO BEING IN ACCORDANCE WITH APPROVED PLANS AND FOOTAGE LENGTH ON MAINS TO BE CHLORINATED.

6. CHLORINATION PROCEDURE FOR DISINFECTING NEW OR EXTENDED WATER MAINS SHALL BE BY THE CONTINUOUS FEED METHOD USING A SOLUTION FORMED BY MIXING WATER AND CALCIUM HYPOCHLORITE. NO OTHER FORM OF CHLORINE WILL BE USED. AMERICAN WATER WORKS ASSOCIATION AWWA STANDARD FOR DISINFECTING WATER MAINS – ANSI/AWWA C–651–86 SHALL BE FOLLOWED AS TO NEED, PROCEDURES, METHODS, HOLDING TIME, FREE CHLORINE RESIDUAL, APPLICATION AND CONFINEMENT TO WATER MAIN BEING DISINFECTED. WATER USED FOR CHLORINATION, BLENDING OF CHLORINATION SOLUTION TO DETERMINED CONCENTRATION, AND TO FEED DOSAGE INTO FULL LENGTH OF MAINS TO BE DISINFECTED SHALL BE OBTAINED AS FOR TESTING.

7. THE CITY WILL SUPPLY THE PUMP, SOLUTION MIXING PADDLE, 35 GALLON DRUM, GASOLINE POWERED ELECTRIC GENERATOR, AND SUPPLY OF POWDERED CALCIUM HYPOCHLORITE. THE CONTRACTOR SHALL SUPPLY ALL PIPES, HOSES, VALVES, FITTINGS, ETC., FOR USE EITHER TO CONVEY WATER, CHLORINE SOLUTION OR COMBINATION THEREOF AND TO DISPOSE OF HIGHLY CHLORINATED WATER FLUSHED TO WASTE.

8. THE CONTRACTOR SHALL COOPERATE WITH THE CITY'S CHLORINATION CREW OR RESIDENT 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.

9. THE WATER DEPARTMENT CHLORINATION CREW WILL DETERMINE THE LENGTH OF TIME THE CHLORINE SOLUTION IS TO BE HELD IN THE WATER MAIN BEING DISINFECTED.

(B.) FLUSHING

1. BEFORE DISINFECTION ALL DIRT AND FOREIGN MATTER SHALL BE REMOVED FROM THE NEW WATER MAIN OR EXTENSIONS TO EXISTING MAINS BY A THOROUGH FLUSHING THROUGH THE HYDRANTS OR BY OTHER APPROVED MEANS. EACH VALVE 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 DIRECTOR TO BE SUFFICIENT SHALL BE PERMITTED. IF IN THE OPINION OF THE DIRECTOR 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.

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

3. IN FLUSHING, THE CONTRACTOR SHALL PROPERLY DISPOSE OF THE CHLORINATION SOLUTION. ONLY POINTS OF DISCHARGE APPROVED BY 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 CITY SHALL NEUTRALIZE THE CHLORINE SOLUTION AS PROVIDED IN APPENDIX B OF AWWA C–651. THE CITY 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 RESIDENT INSPECTOR AND CHLORINATION CREW BEFORE ANY FLUSHING IS BEGUN.

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

(C.) 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. THE CITY WILL MIX THE CHLORINATION SOLUTION TO BE USED BY THE CONTRACTOR FOR DISINFECTING.

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 DIRECTOR.

CONNECTION OF NEW MAINS

THE CONTRACTOR SHALL FOLLOW STRICTLY THE SEQUENCE OF CONSTRUCTION SHOWN ON THE PLANS. WHEN THE NEW MAINS HAVE BEEN TESTED AND CHLORINATED AND ARE READY TO BE CONNECTED TO THE OLD 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 AND SLEEVES TO BE USED IN CONNECTION THOROUGHLY WITH A CHLORINE SOLUTION OF AT LEAST 100 P.P.M.

(D) MAKE UP AS MUCH OF THE 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 CAN 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 OF TIME.

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 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 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 GCRTA 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, 2005 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 COVERED WITH AN ASPHALT PAINT, 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 BY THE CONTRACTOR.

(D.) PROTECTION OF CONCRETE PIPE: IF, IN THE PROCESS OF MANUFACTURE, TRANSPORTATION, OR HANDLING, ANY CONCRETE PIPE 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 OR SPECIAL SHALL BE REJECTED AND REPLACED 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.

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CHANGES IN WATER MAINS

(A) WHEREVER IT BECOMES NECESSARY, IN THE OPINION OF THE ENGINEER OR CITY TO CHANGE THE LOCATION OR ELEVATION OF WATER MAINS AND HYDRANTS AND WHERE CONNECTIONS ARE TO BE MADE BETWEEN EXISTING DISTRIBUTION MAINS AND WATER MAINS UNDER THIS CONTRACT, THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING WATER LINE MATERIALS REQUIRED TO MAKE THE CONNECTION, AND SHALL FURNISH AND INSTALL COMPLETE ALL THE DUCTILE IRON PIPE, PRESTRESSED CONCRETE CYLINDER PIPE, FITTINGS, AND VALVES TO MAKE THE CONNECTIONS INDICATED, EXCEPT TAPPING SLEEVES AND VALVES WHICH SHALL BE FURNISHED BY THE CONTRACTOR AND INSTALLED BY THE CITY. PRESSURE TAPS FOR DISTRIBUTION MAINS SHALL BE MADE BY THE CITY OF CLEVELAND DIVISION OF WATER AND HEAT. 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 WILL BE INCLUDED IN PRICE BID UNDER APPROPRIATE ITEM FOR SIZE OF WATER MAIN OR CONNECTION TO BE INSTALLED. ALL PIPES, 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 OF CLEVELAND

(A) THE CITY WILL INSTALL ALL BRANCH SLEEVES AND VALVES FURNISHED BY THE CONTRACTOR. THE CONTRACTOR SHALL SUPPLY THE BRANCH SLEEVES AND VALVES AND DO ALL THE NECESSARY EXCAVATION, BACKFILLING AND REPAVING REQUIRED THEREFORE. THE CONTRACTOR SHALL FURNISH ALL AIR COMPRESSORS REQUIRED FOR THE WORK.

(B) 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. TO SPEED UP THIS OPERATION, IT IS CALLED TO THE CONTRACTOR'S ATTENTION THAT THE WATER DEPARTMENT HAS ON HAND AT HARVARD YARDS MOTOR OPERATED PIPE CUTTERS WHICH ARE AVAILABLE FOR CUTTING PIPE BY CITY FORCES. COST INCLUDES THAT FOR LABOR, USE OF PIPE CUTTING MACHINE, AND TRUCK. THE CITY WILL CHARGE FOR CUTTING PIPE BY CITY FORCES. THE COSTS CHARGED MUST BE OBTAINED FROM THE PERMITS-SALES SECTION OF THE DIVISION OF WATER AND HEAT, 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.

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; AND FOR PIPE TEN (10) INCHES OR LARGER, AT LEAST TWELVE (12) INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE FOR CONCRETE PIPE AND EIGHTEEN (18) INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE FOR IRON AND STEEL PIPE, EXCEPT BY CONSENT OF THE ENGINEER. THE MAXIMUM CLEAR WIDTH OF TRENCH SHALL BE NOT 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. THE PIPE SHALL 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 SIX (6) INCHES ON EACH SIDE OF ALL CONCRETE PIPE AND NINE (9) INCHES ON EACH SIDE OF ALL CAST IRON 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 OR 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.

(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."

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 THE EXCAVATED MATERIAL FROM THE STREET OR LOTS, THE CONTRACTOR SHALL BE REQUIRED TO DO SO.

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 MATERIAL 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.

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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.

PLUGGING DEAD ENDS

STANDARD RESTRAINED PLUGS WITH CLAMPS SHALL BE INSERTED INTO THE BELLS OF ALL DEAD ENDS OF PIPES, TEES, OR CROSSES, AND SPIGOT ENDS SHALL HAVE RESTRAINED CAPS AND CLAMPS INSTALLED BY THE CONTRACTOR, ON ALL MAINS CONSTRUCTED BY HIM AND ON EXISTING WATER MAINS WHERE INDICATED IN THE CONTRACT DRAWINGS. CONCRETE PIERS SHALL BE PLACED WHEN CALLED FOR ON THE CONTRACT DRAWINGS, OR ORDERED BY THE CITY. THE COST OF FURNISHING AND INSTALLING THE PLUGS IN NEW WATER MAINS SHALL BE INCLUDED IN THE PER LINEAR FOOT PRICE BID FOR THE VARIOUS SIZES OF NEW WATER MAINS. THE COST OF FURNISHING AND INSTALLING THE PLUG IN EXISTING WATER MAIN SHALL BE INCLUDED IN THE UNIT PRICE BID FOR EACH "ITEM SPECIAL–PLUGGING EXISTING WATER MAINS AND BRANCHES," CLASSIFIED AS TO SIZE AS SHOWN ELSEWHERE IN THESE PLANS. PAYMENT FOR TEMPORARY PLUGS OR CAPS FOR TESTING AND CHLORINATION SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAL FOOT OF WATER MAIN TO BE TESTED AND CHLORINATED.

BACKFILLING

(A) BACKFILL, UNLESS OTHERWISE SPECIFIED, MAY BE MADE WITH MATERIAL EXCAVATED FROM TRENCHES, PROVIDING IT MINIMALLY CONFORMS TO THE REQUIREMENTS OF ITEM 603 OF THE O.D.O.T. "CONSTRUCTION AND MATERIAL SPECIFICATIONS" AND IS SATISFACTORY TO THE CITY. IF, IN THE OPINION OF THE ENGINEER, THE MATERIAL EXCAVATED IS UNSATISFACTORY, THEN THE CONTRACTOR SHALL FURNISH AT HIS OWN EXPENSE OTHER MATERIAL SUITABLE FOR BACKFILL. ALL BACKFILL SHALL BE FREE FROM SLAG, CINDERS, RUBBISH AND OTHER OBJECTIONABLE MATERIAL.

(B) BEFORE LAYING THE PIPE, THE BOTTOM OF THE TRENCH SHALL BE BROUGHT TO THE GRADE OF THE BOTTOM OF THE PIPE, EXCEPT AT FIELD JOINTS. WHEREVER THE BOTTOM OF THE TRENCH HAS BEEN EXCAVATED BELOW THE BOTTOM OF THE PIPE, THE CONTRACTOR SHALL PLACE SAND, OR OTHER MATERIAL SATISFACTORY TO THE ENGINEER TO BRING THE BOTTOM OF THE TRENCH TO THE GRADE OF THE BOTTOM OF THE PIPE. THIS BED SHALL BE THOROUGHLY TAMPED BEFORE THE PIPE IS LAID.

(C) UNLESS OTHERWISE SPECIFIED, THE BACKFILL UNDER, AROUND AND TO A DEPTH OF ONE (1) FOOT ABOVE THE TOP OF ALL PIPE SHALL BE MADE WITH SAND IN ACCORDANCE WITH 703.02, WHICH MATERIAL SHALL BE FREE FROM OBJECTIONABLE MATERIAL NOTED ABOVE. THE CONTRACTOR MUST USE SPECIAL CARE IN PLACING THIS PORTION OF THE BACKFILL, SO AS TO AVOID INJURING, DISTORTING OR MOVING THE PIPE DURING COMPACTION. ABOVE THIS LEVEL THE BACKFILL SHALL BE MADE WITH MATERIAL SATISFACTORY TO THE ENGINEER, MINIMALLY CONFORMING TO ITEM 603 (TYPE "B" CONDUIT UNDER PAVEMENT OR TYPE "C" CONDUIT WHEN NOT UNDER PAVEMENT) AND PER PARAGRAPH (G) BELOW.

(D) BACKFILLING AS NOTED IN PARAGRAPH (C) SHALL BE TAMPED IN THIN 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.

(E) ONLY AFTER THE BACKFILL PREVIOUSLY MENTIONED HAS BEEN SATISFACTORILY COMPACTED, MAY WORK PROCEED IN PLACING THE REMAINING BACKFILL WHICH MUST BE CAREFULLY PLACED AND COMPACTED IN FOUR INCH LOOSE DEPTH LAYERS BY TAMPING, WITH MECHANICAL TAMPERS OR ROLLING. ALL PRECAUTIONS MUST BE TAKEN TO ELIMINATE FUTURE SETTLEMENT. THE NUMBER OF WORKERS TAMPING SHALL BE NOT LESS THAN THE NUMBER BACKFILLING, AND ADDITIONAL WORKERS SHALL BE KEPT IN THE TRENCH TO SPREAD THE MATERIAL.

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

(G) ALL BACKFILL FROM ONE (1) FOOT ABOVE THE PIPE TO THE TOP OF BACKFILL SHALL BE MADE WITH CRUSHED STONE PER SECTION 603.02 OF THE O.D.O.T. SPECIFICATIONS WHERE PERMANENT PAVEMENTS, CURBS, DRIVEWAYS, OR SIDEWALKS ARE CONSTRUCTED OVER OR HAVE BEEN OPENED FOR OR UNDERCUT BY THE EXCAVATION; OR WHERE ORDERED BY THE ENGINEER.

(H) SPECIAL TREATMENT OF THE TRENCH WILL BE REQUIRED WHERE CINDER OR ACTIVE SULPHUR BEARING SHALE OR CLAY EXCAVATION EXCEEDING ONE FOOT MEASURED FROM THE TOP SURFACE IS ENCOUNTERED. BEFORE LAYING THE PIPE, THE BOTTOM OF THE TRENCH SHALL BE DUG BELOW 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 THREE (3) INCHES OF SAND. THE CRUSHED LIMESTONE SHALL BE WELL GRADED FROM THE FINE TO COURSE AND BE 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 STONE, HYDRATED LIME SHALL BE SUPPLIED IN THE AMOUNT OF 3/8 OF A POUND PER SQUARE FOOT OF TRENCH. THIS BED OF CRUSHED LIMESTONE SHALL BE THOROUGHLY TAMPED BEFORE THE 3" LAYER OF SAND IS PLACED. THE BACKFILL AROUND AND TO THE DEPTH OF 3" ABOVE THE TOP OF PIPE SHALL BE MADE WITH SAND. THE CONTRACTOR MUST USE SPECIAL CARE IN PLACING THIS PORTION OF THE BACKFILL SO AS TO AVOID INJURING OR MOVING THE PIPE WHEN COMPACTING SAME. ON TOP OF THE SAND THE CONTRACTOR SHALL PLACE ANOTHER LAYER OF CRUSHED LIMESTONE FIVE (5) INCHES THICK ON THE ENTIRE WIDTH OF THE TRENCH. ON TOP OF THE COMPACTED LAYER OF LIMESTONE HYDRATED LIME SHALL THEN BE APPLIED IN THE AMOUNT OF 3/4 OF A POUND PER SQUARE FOOT OF TRENCH. THE REMAINING BACKFILL SHALL BE MADE WITH GRANULAR MATERIAL, AS SPECIFIED IN PARAGRAPH (G) ABOVE, CAREFULLY PLACED AND COMPACT 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. NO EXTRA PAYMENT WILL BE MADE FOR THIS WORK BUT THE ENTIRE COST OF THE SAME SHALL BE INCLUDED IN THE WORK TO BE DONE IN THIS CONTRACT.

DRAWINGS

(A) THE CONTRACTOR SHALL SUBMIT TO GCRTA AND THE CITY FOR APPROVAL, DUPLICATE PRINTS OF ALL SHOP DRAWINGS AS DEVELOPED BY THE FABRICATOR, FOR CONCRETE PIPE, FITTINGS AND SPECIALS, AND MISCELLANEOUS DETAILS, SUCH AS VALVES, DRAIN FORGOINGS, PRECAST VALVES, CASTINGS, ETC. DRAWINGS SHALL INCLUDE DETAILS, LAYOUTS AND LAYING SCHEDULE FOR ALL PIECES FURNISHED REQUIRING DRAWING SUBMITTAL.

(B) ONE PRINT OF EACH OF THE DRAWINGS SUBMITTED WILL BE RETURNED WITH THE CRITICISMS OR APPROVAL OF GCRTA AND THE CITY. IN CASE THE DRAWINGS ARE NOT APPROVED, THE CONTRACTOR SHALL AGAIN SEND FOR APPROVAL DUPLICATE 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 DIRECTOR THREE (3) REPRODUCTABLE TRACINGS ON CLOTH OR MYLAR, OF EACH DRAWING. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED. DRAWINGS SHALL BE ON A COMPOSITE SHEETS 24" X 36". NO SMALLER SHEETS WILL BE ACCEPTED. MYLAR FILM THICKNESS SHALL BE 5 MILS.

(C) THE APPROVAL OF THE DRAWINGS BY THE DIRECTOR SHALL NOT RELIEVE THE CONTRACTOR OF ANY OF HIS OBLIGATIONS IN CONNECTION WITH THIS CONTRACT.

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 GCRTA AND CITY MAY ORDER.

ROAD SURFACES, SIDEWALKS, DRIVEWAYS, AND CURBING

A) THE CONTRACTOR SHALL REMOVE ALL PAVEMENTS AND ROAD SURFACES WITHIN THE LINES OF EXCAVATION. ALL APPURTENANT WORK CONSTRUCTED AND BACKFILL COMPLETED, HE SHALL FURNISH, PLACE AND MAINTAIN, WHEREVER THE PAVEMENT OR ROAD SURFACE HAS BEEN REMOVED OR DAMAGED BY HIM, A TEMPORARY PAVEMENT IN THE PAVED PORTION OF STREETS, OR A TEMPORARY ROAD SURFACE IN THE UNPAVED PORTION OF STREETS, SO AS TO PROVIDE A SAFE AND PASSABLE ROADWAY UNTIL SUCH TIME AS THE FINAL PAVEMENT OR ROAD SURFACE IS COMPLETED.

B) WHEN ONLY A PORTION OF THE STREET IS PAVED AND THE LINES OF EXCAVATION ARE IN THE UNPAVED PORTION, THE CONTRACTOR SHALL USE THE UTMOST CARE IN PREVENTING INJURY TO THE PAVEMENT. IF, IN MAKING THE EXCAVATION OR FOR ANY OTHER CAUSE, THE PAVEMENT IS REMOVED OR INJURED BY THE CONTRACTOR, HE SHALL FURNISH, PLACE AND MAINTAIN A TEMPORARY PAVEMENT WHEREVER THE PAVEMENT HAS BEEN REMOVED OR DAMAGED, SO AS TO PROVIDE A SAFE AND PASSABLE ROADWAY UNTIL SUCH TIME AS THE FINAL PAVEMENT IS COMPLETED.

C) ALL FINAL PAVING OF ROAD SURFACES, IF SO NOTED ON CONTRACT DRAWINGS, SHALL BE DONE BY THE CONTRACTOR TO THE SATIFACTION OF THE ENGINEER AND IN CONFORMITY TO THE LATEST REVISION OF THE CITY OF CLEVELAND SPECIFICATIONS AND STANDARDS. THE CONTRACTOR SHALL BEAR THE ENTIRE COST OF THE WORK. THE BASE OF PAVEMENT OF CONCRETE SHALL BE INSTALLED ON A CAREFULLY PREPARED BED (LEVEL WITH THE BOTTOM OF THE ABUTTING BASE) OVER DISTURBED AREAS AND SHALL BE OF THE THICKNESS SPECIFIED, BUT IN NO CASE LESS THAN 7–IN. THICK. WHERE PAVEMENT OR BASE OF PAVEMENT HAS BEEN DAMAGED BY CAVE–IN, OR BY TRENCH CUT LEAVING A PORTION OR PORTIONS OF PAVEMENT 18–IN. OR LESS IN WIDTH (BETWEEN SUCH CUT OR DAMAGE) TO CURB OR OTHER SUBSTRUCTURE, THAT REMAINING PORTION OF PAVEMENT SHALL BE REMOVED AND RESTORED MONOLITHIC WITH THE TYPE AND KIND OF PAVEMENT SPECIFIED FOR THE ADJACENT TRENCH AREA. THE WEARING COURSE OVER TRENCH OR OTHER DISTURBED AREAS SHALL BE RESTORED TO MATCH EXISTING PAVEMENT UNLESS OTHERWISE SPECIFIED. ASPHALTIC CONCRETE WEARING SURFACE OVER SUCH AREAS SHALL BE NEATLY AND SQUARELY CUT BEFORE THE THE INSTALLATION OF A CAREFULLY TOOTHED–IN–TO ADJACENT PAVEMENT, UNLESS OTHERWISE SPECIFIED. EXPANSION JOINTS SHALL BE INSTALLED BETWEEN BRICK WEARING COURSE (IF GROUTED) AND CURB OR OTHER SUBSTRUCTURE, WHERE SUCH RESTORATION IS REQUIRED BY THESE SPECIFICATIONS.

D) ALL DAMAGED OR DISPLACED CURB SHALL BE RENEWED OR RESET TO THE SATISFACTION OF THE ENGINEER. NO FAULTY CURB OR CURB LESS THAN 30–IN. LONG WILL BE PERMITTED FOR REUSE.

E) AT LOCATIONS NOT SPECIFICALLY MENTIONED THE CONTRACTOR SHALL RESTORE THE SAME TYPE OF PAVEMENT AS ENCOUNTERED.

F) IF PRIOR TO THE EXPIRATION OF THIS CONTRACT ANY OF THE PAVEMENTS OR ROAD SURFACES WITHIN THE LINES OF EXCAVATION OR ADJACENT THERETO, SHALL HAVE BEEN DAMAGED OR INJURED, DUE TO UNDERMINING, OR FOR ANY OTHER CAUSE WHICH MAY BE ATTRIBUTED TO THE WORK WHICH IS BEING DONE BY THE CONTRACTOR, THEN THE CONTRACTOR SHALL REMOVE SUCH DAMAGED OR INJURED PAVEMENTS OR ROAD SURFACES, FOUNDATIONS OF SAME AND ALL LOOSE EARTH. HE SHALL THEN BACKFILL WITH SAND PROPERLY RAMMED AND REPLACE THE FINAL PAVEMENT OR ROAD SURFACE.

G) IF ANY SIDEWALKS, DRIVEWAYS OR CURBS ARE REMOVED OR INJURED BY THE CONTRACTOR IN THE COURSE OF MAKING EXCAVATION OR HANDLING MATERIALS, OR FOR ANY OTHER REASON WHICH MAY BE ATTRIBUTED TO WORK WHICH HAS BEEN DONE BY THE CONTRACTOR, THEN HE SHALL RELAY SAME AFTER ALL WORK, INCLUDING BACKFILLING HAS BEEN COMPLETED. IF ANY STONE SIDEWALKS, DRIVEWAYS, OR CURBS WHICH HAVE BEEN REMOVED OR INJURED, ARE UNFIT TO BE RELAID, THEN THE CONTRACTOR SHALL FURNISH AND RELAY NEW MATERIAL. ALL CONCRETE OR CEMENT SIDEWALKS, DRIVEWAYS OR CURBS, WHICH ARE REMOVED OR INJURED BY THE CONTRACTOR SHALL BE BROKEN UP BY HIM AND HE SHALL FURNISH ALL LABOR AND MATERIALS AND CONSTRUCT NEW SIDEWALKS, DRIVEWAYS OR CURBS, TO REPLACE THOSE REMOVED OR DAMAGED. AT INTERSECTING WALKS, DRIVES, ETC., ADDITIONAL CONCRETE SLABS BEYOND THE EXCAVATION LIMITS SHALL BE REMOVED AND REPLACED WITH NEW MATERIAL, IN ORDER TO AVOID HAVING MORE JOINTS THAN IN THE ORIGINAL WORK. ALL SLABS REPLACED SHALL BE FULL WIDTH. THE CONTRACTOR SHALL FURNISH, PLACE AND MAINTAIN, WHEREVER THE SIDEWALK HAS BEEN DAMAGED BY HIM, A TEMPORARY SIDEWALK SO AS TO PROVIDE A SAFE AND PASSABLE SIDEWALK UNTIL SUCH TIME AS THE FINAL SIDEWALK IS COMPLETED.

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ENGINEERING & PROJECT MANAGEMENT DIVISON

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REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–10

H) ALL PAVEMENTS, ROAD SURFACES, SIDEWALKS, DRIVEWAYS, OR CURBS, WHICH THE CONTRACTOR IS REQUIRED TO REPLACE OR TO HAVE REPLACED, SHALL, AT THE EXPIRATION OF THE PERIOD OF MAINTENANCE, BE IN AT LEAST AS GOOD CONDITION AS AT THE TIME OF AWARDING THE CONTRACT.

I) ALL WORK THAT THE CONTRACTOR MAY DO IN CONNECTION WITH THE OPENING UP OR REPLACING OF PAVEMENTS, ROAD SURFACES, SIDEWALKS, DRIVEWAYS, OR CURBS, AS WELL AS THE FINAL REPAVING, SHALL BE DONE AT HIS EXPENSE, IN ACCORDANCE WITH THE RULES AND REQUIREMENTS OF THE STREET OR SIDEWALK DEPARTMENTS OF THE CITY OF CLEVELAND AND IN ACCORDANCE WITH THE ADDITIONAL REQUIREMENTS OF THESE SPECIFICATIONS. THE CONTRACTOR SHALL FURNISH EVIDENCE TO THE ENGINEER THAT THE WORK HAS BEEN COMPLETED TO THEIR SATISFACTION.

J) THE CONTRACTOR SHALL MAKE ALL PAVEMENT CUTS BY CHANNELING MACHINE, HAND-OPERATED PNEUMATIC TOOLS OR BY SUCH OTHER METHODS AS WILL FURNISH A CLEAN CUT IN THE PAVEMENT AND PAVEMENT BASE WITHOUT UNDUE SHATTERING. THE USE OF BALL OR WEIGHT TO BREAK THE PAVEMENT WILL NOT BE PERMITTED.

K) NO SPECIFIC OR SEPARATE PAYMENT WILL BE MADE FOR ALL OF THIS WORK, BUT THE COST THEREOF SHALL BE INCLUDED IN THE PRICES BID FOR THE VARIOUS ITEMS OF WORK TO BE DONE UNDER THIS CONTRACT. RESTORATION AS NOTED ABOVE WILL ONLY BE REQUIRED IN AREAS WHERE THE PLANS DO NOT OTHERWISE PROPOSE NEW CONSTRUCTION OF PAVEMENT, SIDEWALKS AND CURBS, EXCEPT THAT TEMPORARY RESTORATION IN SUCH AREAS MAY BE REQUIRED BY THE ENGINEER IN ORDER TO MAINTAIN TRAFFIC OR LOCAL ACCESS AS PER 104.04 AND 107.10, OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS DATED JANUARY 1, 2005.

REMOVED ITEMS

A) ALL MATERIALS CONSISTING OF PIPE AND FITTINGS, VALVES, VALVE BOXES, AND COVERS WHICH ARE INDICATED FOR REMOVAL BY THE CONTRACTOR SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE REMOVED AND DISPOSED OF BY HIM.

WORK PERMITS

THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND PAY ALL APPLICABLE FEES TO THE CITY OF CLEVELAND. THE COST OF SAID FEES SHALL BE INCLUDED IN THE APPLICABLE UNIT PRICES BID BY THE CONTRACTOR.

SEEDING AND SODDING

A) ALL DAMAGED GRASS AREAS DUE TO WATERWORK CONSTRUCTION SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER. THE REPAIR SHALL BE AS PER ODOT ITEM 659 AND AS NOTED HEREIN. PAYMENT SHALL BE INCLUDED WITH THE PERTINENT WATERWORK FACILITY.

B) IN PREPARATION FOR SEEDING OR SODDING, THE SURFACES SHALL BE HARROWED TO A DEPTH OF THREE (3) INCHES. ALL GRASS, WEEDS, ROOTS, STICKS, STONES, ETC., ARE TO BE REMOVED AND THE SOIL CAREFULLY BROUGHT TO THE EXACT FINISHED GRADE OR SUBBASE BY RAKING. AN APPLICATION OF NOT LESS THAN ONE POUND PER ONE HUNDRED (100) SQUARE FEET OF A HIGH NITROGEN CONTENT COMMERCIAL FERTILIZER HAVING AN ANALYSIS OF 10:6:4 SHALL THEN BE UNIFORMLY DISTRIBUTED AND RAKED IN.

C) IMMEDIATELY AFTER THE PREPARATION AND FERTILIZING OF THE SEED BED, THE PREPARED SURFACE SHALL BE SEEDED WITH NOT LESS THAN THREE HUNDRED (300) POUNDS OF GRASS SEED PER ACRE. THE SEED SHALL BE CAREFULLY AND UNIFORMLY SOWN BY EXPERIENCED AND SKILLED WORKMEN. FOLLOWING THE SEEDING, THE SURFACE SHALL BE LIGHTLY RAKED AND ROLLED WITH A LIGHT ROLLER. THE GRASS SEED TO BE USED SHALL BE APPROVED BY THE ENGINEER.

D) ALL SEEDED AND SODDED SURFACES SHALL BE CAREFULLY LOOKED AFTER AND TENDED BY THE CONTRACTOR, SHALL BE WATERED AND THE GRASS CUT WHEN NECESSARY. SETTLED AREAS SHALL BE REFILLED, LEVELED, AND TAMPED TO THE PROPER GRADE. ALL SEEDED AND SODDED SURFACE SHALL BE LEFT IN GOOD CONDITION ON THE COMPLETION OF THE WORK.

E) AS SEEDING AND SODDING CAN ONLY BE SUCCESSFULLY DONE AT CERTAIN SEASONS OF THE YEAR, THE PREPARATION OF THE SOD OR SEED BED, AND THE WORK OF SODDING AND SEEDING, SHALL ONLY BE DONE AT SUCH TIMES AS MAY BE APPROVED BY THE ENGINEER.

ITEM TS 638 – DUCTILE IRON PIPE AND FITTINGS

WORK INCLUDED

(A) THE CONTRACTOR SHALL UNDER THIS ITEM, 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, AND BACKFILLING.

ALL AS REQUIRED FOR THE COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT. IN GENERAL THIS WORK SHALL INCLUDE THE FURNISHING, LAYING, CONNECTING, PAINTING AND TESTING OF PIPE AND FITTINGS, THE EXCAVATION, SHEETING AND SHORING, AND BACKFILLING. 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 MAKE THE PRESSURE TAP IN ACCORDANCE WITH "WORK TO BE DONE BY THE CITY". IF THE INSTALLATION OF BRANCH SLEEVES AND VALVES CANNOT BE ACCOMPLISHED, THE CONTRACTOR WILL BE REQUIRED TO USE TEES AND SLEEVES 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 THE PLANS).

DUCTILE-IRON PIPE AND FITTINGS

(A) ALL PIPE AND FITTINGS SHALL BE MANUFACTURED IN ALL RESPECTS IN ACCORDANCE WITH, AND SHALL MEET THE REQUIREMENTS OF THE LATEST "AMERICAN NATIONAL STANDARD" SPECIFICATIONS FOR DUCTILE-IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SANDLINED MOLDS, AND DUCTILE IRON FITTINGS FOR WATER AND OTHER LIQUIDS, ADOPTED BY THE AMERICAN WATER WORKS ASSOCIATION; WHICH STANDARDS EXCEPT AS HEREIN MODIFIED ARE MADE A PART OF THESE SPECIFICATIONS. PIPE UP TO AND INCLUDING 20 INCHES SHALL HAVE RETAINED MECHANICAL JOINT PIPE AND FITTINGS. BOLTLESS RESTRAINED PIPE AND FITTINGS SHALL BE USED WHERE CALLED FOR ON THE CONTRACT DRAWINGS. PIPE 24-INCH AND LARGER SHALL HAVE BOLTLESS RESTRAINED SLIP-ON JOINTS WITHIN "RESTRAINED DISTANCE" SHOWN ON THE CONTRACT DRAWINGS.

(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. ALL FITTINGS ON PIPE SIZES UP TO AND INCLUDING 12-INCHES SHALL BE OF THE SHORT BODIED TYPE.

(C) 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 FOOT NOMINAL LAYING LENGTHS. THE CENTRIFUGALLY CAST DUCTILE SHALL CONFORM TO THE AMERICAN NATIONAL STANDARD ANSI A21.51-1976/AWWA C151-76 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 A21.11-80/AWWA C111-80 RUBBER-GASKET JOINTS FOR DUCTILE-IRON PRESSURE PIPE AND FITTINGS. ALL PIPE SHALL BE CEMENT LINED. 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 PARAGRAPH E, "RETAINED MECHANICAL JOINTS" OF THE "JOINTS" SUBSECTION.

(D) THE CONTRACTOR SHALL FURNISH DUCTILE-IRON CEMENT LINED FITTINGS. ALL DUCTILE-IRON FITTINGS ON PIPE SIZES 16" AND LARGER SHALL BE MANUFACTURED IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD ANSI A21.10-82/AWWA C110-82 AND ALL SUBSEQUENT AMENDMENTS THERETO. METAL FOR FITTINGS SHALL CONFORM TO AMERICAN NATIONAL STANDARD ANSI A21.10-82. ALL FITTINGS SHALL BE OF THE SHORT BODIED TYPE IN ACCORDANCE WITH ANSI/AWWA C153/A21.53-84 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

WORKING: SIZE	PRES-SURE	CLASSES 52	53	54	56	FIT-TINGS CLASS	WORKING: SIZE	PRES-SURE	CLASSES 52	53	54	56	FIT-TINGS CLASS
IN.	PSI					PSI	IN.	PSI					PSI
4"	350	.29	.32	.35	.41	350	20"	350	.42	.45	.48	.54	350
6"	350	.31	.34	.37	.43	350	24"	350	.44	.47	.50	.56	350
8"	350	.33	.36	.39	.45	350	30"	350	.47	.51	.55	.63	250
10"	350	.35	.38	.41	.47	350	36"	350	.53	.58	.63	.73	250
12"	350	.37	.40	.43	.49	350	42"	350	.59	.65	.71	.83	250
16"	350	.40	.43	.46	.52	350	48"	350	.65	.72	.79	.93	250

(F) ALL FITTINGS, UNLESS OTHERWISE NOTED IN 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 A21.11-80/AWWA C111-80 RUBBER-GASKET JOINTS FOR DUCTILE IRON AND GRAY-IRON PRESSURE PIPE AND FITTINGS. ALL FITTINGS SHALL BE CEMENT LINED. ALL MECHANICAL JOINTS SHALL BE RETAINED AS SPECIFIED IN PARAGRAPH E: "RETAINED MECHANICAL JOINTS" OF THE JOINTS SUBSECTION. PIPE AND FITTINGS WITHIN "RESTRAINED DISTANCE" ON PIPE SIZES 24-INCH AND LARGER SHALL BE FURNISHED WITH BOLTLESS RESTRAINED SLIP-ON JOINTS.

(G) WHERE "RESTRAINED DISTANCES" ARE SHOWN ON THE PLANS OR DIRECTLY SPECIFIED, PIPE AND FITTINGS HAVING APPROVED SLIP-ON SINGLE RUBBER-GASKET BOLTLESS RESTRAINED TYPE JOINTS SHALL BE FURNISHED.

(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 A21.11-80/AWWA C111-80 RUBBER GASKET JOINTS FOR DUCTILE-IRON AND GRAY-IRON PRESSURE PIPE AND FITTINGS.

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 LINES 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 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. ON MAINS 24" AND LARGER AN APPROVED TYPE RESTRAINED CAP/PLUG SHALL BE FURNISHED AND 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 PARAGRAPH E, "RETAINED MECHANICAL JOINTS", OF THE "JOINTS" SUBSECTION.

(M) TESTS, INSPECTION, REPORTS AND ANALYSES OF TESTS OF SAMPLES FOR ALL MATERIALS SHALL BE FURNISHED IN ACCORDANCE WITH THESE SPECIFICATIONS.

(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 AND FITTINGS SHALL BE GIVEN A CEMENT MORTAR LINING AT THE POINT OF MANUFACTURE. THE LINING SHALL CONFORM TO THE AMERICAN NATIONAL STANDARD A21.4-1980 (AWWA C104-80) 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 COATED WITH WHITE LEAD 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.

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WATERWORKS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
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SHEET U-11

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. OPEN ENDS OF PIPES SHALL BE KEPT PLUGGED WITH A BULKHEAD 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 C600-77, 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.

JOINTS

(A) FLANGED JOINTS

(1) FLANGED JOINTS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS. 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 BOLTS AND NUTS USED IN THE FINISHED WORK FOR FLANGES SHALL BE MADE OF SILICON BRONZE (ASTM B98-74A, ALLOY A) OR STAINLESS STEEL (ASTM A276-75, TYPE 302). 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.

(3) ALL FLANGES SHALL BE ACCURATELY FACED AT RIGHT ANGLES TO THE AXIS OF THE PIPE. ALL FLANGES SHALL BE COATED WITH A SEALANT IMMEDIATELY AFTER THEY HAVE BEEN FACED AND DRILLED AND TAPPED FOR STUD BOLTS.

(B) SLIP-ON JOINTS

ALL PIPE UNLESS OTHERWISE REQUIRED, SHOWN ON CONTRACT DRAWING, 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 AND HEAT. SLIP-ON COMPRESSION JOINTS SHALL CONFORM TO THE REGULAR AND SPECIAL REQUIREMENT FOR PUSH-ON JOINTS IN AMERICAN NATIONAL STANDARD ANSI/AWWA C111/A21.11-80 FOR RUBBER GASKET JOINTS FOR DUCTILE-IRON AND GRAY-IRON PRESSURE PIPE AND FITTINGS.

(C) MECHANICAL JOINTS

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, WHERE REQUIRED OR CALLED FOR ON THE CONTRACT DRAWINGS, BE OF THE SPECIFIED RETAINED TYPE. BOLTS AND NUTS FOR MECHANICAL JOINTS SHALL BE CORROSION RESISTANT, HIGH STRENGTH, LOW ALLOY STEEL.
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- 80 FOR RUBBER-GASKET JOINTS FOR DUCTILE-IRON AND GRAY-IRON PRESSURE PIPE AND FITTINGS. WHERE REQUIRED OR CALLED FOR ON THE CONTRACT DRAWINGS, MECHANICAL JOINTS SHALL BE RETAINED AS SPECIFIED IN PARAGRAPH E, "RETAINED MECHANICAL JOINTS". ALL MECHANICAL JOINTS SHALL BE POLYETHYLENE ENCASED AS SPECIFIED IN PARAGRAPH G, "POLYETHYLENE ENCASEMENT."

(D) VICTAULIC TYPE COUPLINGS

(1) WHERE SHOWN ON THE DRAWINGS OR WHERE REQUIRED, THE CONTRACTOR SHALL FURNISH AND INSTALL VICTAULIC TYPE COUPLINGS FOR CONNECTION OF DUCTILE IRON REDUCERS TO VALVES, CONCRETE PIPE OR STEEL PIPE. STEEL PIPE ENDS SHALL BE FABRICATED AND GROOVED AS INDICATED ON THE DRAWINGS. THE COUPLINGS SHALL BE ADAPTED FOR INSTALLATION ON SHOULDERED END CAST IRON SPACERS, REDUCERS AND FITTINGS AND 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 BE EQUAL IN ALL RESPECTS TO THOSE MANUFACTURED BY THE VICTAULIC COMPANY OF AMERICA. MALLEABLE HOUSINGS SHALL CONFORM TO THE "STANDARD SPECIFICATIONS FOR MALLEABLE IRON CASTINGS ASTM DESIGNATION A 47-68". BOLTS SHALL BE MANUFACTURED BY THE COUPLING MANUFACTURER AND SHALL BE HEAT TREATED STEEL BOLTS HAVING 100,000 PSI. TENSILE STRENGTH. ALL BOLTS AND NUTS SHALL BE ZINC COATED BY THE "HOT-DIP" METHOD ACCORDING TO ASTM DESIGNATION A123.

(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 "COATING".

(E) RETAINED MECHANICAL JOINTS

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 20-INCH SIZE WHERE SHOWN ON THE DRAWINGS OR WHERE REQUIRED BY "RESTRAINED DISTANCE", THE CONTRACTOR SHALL FURNISH AND INSTALL RETAINED TYPE MECHANICAL JOINTS. 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/A21.11-80 FOR RUBBER-GASKET JOINTS FOR DUCTILE-IRON AND GRAY-IRON PRESSURE PIPE AND FITTINGS AND/OR CONFORMING WITH ASTM A 536-80 WITH THE ADDITIONAL REQUIREMENT THAT ALL SUCH GLANDS SHALL BE OF THE DUCTILE-IRON GRADE 60-42-10 MINIMUM REQUIREMENTS OF CENTRIFUGALLY CAST DUCTILE-IRON PIPE. RETAINED MECHANICAL JOINTS SHALL BE EQUIPPED WITH CUPPED END SQUARE HEAD CORROSION RESISTANT ALLOY STEEL OR COPPER-BEARING DUCTILE IRON SET SCREWS THREADED THROUGH TAPPED AND THREADED HOLES IN THE GLAND LIP. GLAND FLANGE SHALL BE THICKENED AND GLAND LIP SHALL BE EXTENDED TO PROVIDE FOR GLAND STRENGTH AND SET SCREW SIZE. NO SPLIT RETAINER GLANDS SHALL BE USED. LONGER BOLTS FOR JOINT ASSEMBLY SHALL BE FURNISHED WITH RETAINER GLANDS. SET SCREWS SHALL BE MINIMUM FIVE-EIGHTHS INCH (5/8") SIZE. NUMBER OF PERPENDICULAR SET SCREWS PER RETAINED JOINT SHALL BE: 4 FOR 4" PIPE, 6 FOR 6" PIPE, MINIMUM OF 8 FOR 8" PIPE, MINIMUM OF 12 FOR 10" PIPE, 16 FOR 12" PIPE, 24 FOR 16" PIPE, AND 28 FOR 20" PIPE. WEDGE ACTION TYPE RETAINED MECHANICAL JOINTS HAVING TWIST-OFF NUTS MAY BE USED IF APPROVED BY THE COMMISSIONER OF WATER AND HEAT AS TO SIZE, NUMBER AND BOLT SIZE. WHERE JOINT DEFLECTION IS NECESSARY FOR ALIGNMENT SUCH DEFLECTION SHALL BE LIMITED TO 3 DEGREES. SET SCREWS SHALL BE TIGHTENED AFTER JOINT IS MADE TO 75 FOOT-POUNDS TORQUE. SET-SCREW TIGHTENING SHALL BE DONE AFTER THE JOINT BOLTS HAVE BEEN TIGHTENED. SET SCREWS SHALL ALL BE MADE FINGER-TIGHT AND TIGHTENED TO MAXIMUM TORQUE BY ALTERNATING TO OPPOSITE SIDES. ALL RETAINED MECHANICAL JOINT RETAINER GLANDS SHALL BE OF A DESIGN APPROVED BY THE COMMISSIONER OF WATER AND HEAT. ALL RETAINED JOINTS SHALL BE RATED FOR 250 PSI PRESSURE. ALL RETAINED JOINTS SHALL BE POLYETHYLENE ENCASED AS SPECIFIED IN PARAGRAPH G.

(F) BOLTLESS RESTRAINED SLIP-ON JOINTS

WHERE DUCTILE-IRON PIPE SIZE IS GREATER THAN 20-INCHES ON PIPE AND FITTINGS WHERE "TIED DISTANCE" IS REQUIRED OR SHOWN ALL RESTRAINT SHALL BE OF THE BOLTLESS RESTRAINED SLIP-ON JOINT TYPE AND SHALL EXTEND FOR A MINIMUM DISTANCE

OF ONE (1) EIGHTEEN FOOT (18') LENGTH OF PIPE OUT OF BOTH ENDS OF FITTINGS. VALVES WITHIN "RESTRAINED DISTANCES" SHALL BE OF THE TYPE INDICATED ON THE CONTRACT DRAWINGS. BOLTLESS RESTRAINED SLIP-ON JOINTS SHALL BE OF A DESIGN APPROVED BY THE COMMISSIONER OF WATER AND HEAT.

(G) POLYETHYLENE ENCASEMENT

ALL MECHANICAL JOINTS, ALL RETAINED MECHANICAL JOINTS AND ALL PIPE AND FITTING WHERE SHOWN ON THE DRAWING OR WHERE REQUIRED SHALL BE POLYETHYLENE ENCASED. POLYETHYLENE ENCASEMENT FOR MECHANICAL JOINTS, RETAINED MECHANICAL JOINTS OR ANY JOINT REQUIRING BOLTS SHALL BE GENERALLY IN ACCORDANCE WITH AMERICAN NATIONAL STANDARD ANSI/AWWA C105/A21.582 FOR POLYETHYLENE ENCASEMENT FOR DUCTILE-IRON PIPING FOR WATER AND OTHER LIQUIDS. 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.

(H) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS AND RETAINED MECHANICAL JOINTS SHALL HAVE FIELD APPLIED THREE (3) COATS OF BITUMASTIC COATING PRIOR TO POLYETHYLENE ENCASEMENT.

PAINTING

AFTER ERECTION 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 GCRTA AND THE CITY FOR APPROVAL DUPLICATE 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 CATALOG 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 GCRTA AND THE CITY SHALL NOT RELIEVE THE CONTRACTOR OF ANY OF HIS OBLIGATIONS IN CONNECTION WITH THIS CONTRACT.

MEASUREMENT

THE NUMBER OF FEET OF DUCTILE IRON PIPE AND CONNECTIONS TO BE PAID FOR SHALL BE ACTUAL NUMBER OF FEET FURNISHED AND PLACED IN ACCORDANCE WITH THESE SPECIFICATIONS AS MEASURED ALONG THE AXIS OF THE PIPING. FOR CONNECTIONS BETWEEN NEW AND EXISTING MAIN, MEASUREMENT SHALL BE THE DISTANCE FROM CENTERLINE TO CENTERLINE OF MAINS AND THE ACTUAL LENGTH OF EXISTING MAIN ORDERED TO BE REMOVED TO MAKE THE CONNECTION.

PAYMENT

THE FOOTAGE MEASURED AS PROVIDED ABOVE SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER FOOT FOR "ITEM TS 638-WATER MAIN, DUCTILE IRON PIPE, CLASSIFIED AS TO TYPE, SIZE AND CLASS WHICH PAYMENT SHALL BE FULL COMPENSATION FOR A COMPLETED WATER MAIN INSTALLATION IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS INCLUDING ALL LABOR, MATERIAL, EQUIPMENT, TOOLS, ETC.
NECESSARY AND INCLUDING BUT NOT LIMITED TO EXCAVATION, BEDDING, BACKFILL, SURFACE RESTORATION, AND FURNISHING, LAYING, CONNECTING, TESTING, PAINTING, POLYETHYLENE ENCASING PIPE FITTINGS, AND JOINTS. THE PAY ITEM DESCRIPTIONS AND UNIT FOR THIS PROJECT ARE:

ITEM TS 638 -"WATER MAIN, DUCTILE IRON PIPE WITH BOLTLESS RESTRAINED JOINTS AND FITTINGS, ANSI CLASS 56 (FT)"

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WATERWORKS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

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SHEET U-12

ITEM TS 638 – EXTRA STRONG WELDED GALVANIZED STEEL PIPE
ASTM A–53, GRADE B

(A) GALVANIZED STEEL PIPE SHALL BE 12.75" O.D. X 0.50" WALL ASTM A 53 GRADE B, HAVING A MINIMUM WORKING PRESSURE OF 350 PSI.

GALVANIZED STEEL PIPE SHALL BE 16" O.D. X 0.50" WALL ASTM A 53 GRADE B, HAVING A MINIMUM WORKING PRESSURE OF 350 PSI.

GALVANIZED STEEL PIPE SHALL BE 24" O.D. X 0.50" WALL ASTM A 53 GRADE B, HAVING A MINIMUM WORKING PRESSURE OF 350 PSI.

(B) THE INTERIOR OF ALL STEEL PIPE SHALL BE TOTALLY PRIMED AND COATED WITH WATER RESISTANT WHITEWASH FOR A DISTANCE OF THREE (3) FEET FROM EACH END.

DRAWINGS – EXTRA STRONG WELDED GALVANIZED STEEL PIPE ASTM A–53, GRADE B AND APPURTENANCES

(A) THE CONTRACTOR SHALL SUBMIT TO THE CITY THROUGH THE ENGINEER FOR APPROVAL A MINIMUM OF SIX (6) SETS OF PRINTS OF ALL SHOP DRAWINGS GENERATED BY THE PIPE OR STRUCTURAL FABRICATOR OF ALL PIPE, FITTINGS AND MISCELLANEOUS OR SPECIAL DETAILS OF PIPE AND FITTING JOINTS INCLUDING LINE AND ASSEMBLY LAYOUT, FLANGE DETAILS, VICTAULIC GROOVING, VICTAULIC COUPLINGS, EXPANSION JOINTS, WELDING DETAILS, FACTORY APPLIED INSULATION, FIELD APPLIED INSULATION, JACKET, SLEEVE PACKING DETAILS, PIPE SUPPORT DETAILS INCLUDING CLAMP, SHIMS AND "LUBRITE" PLATE, AND ANY OTHER PIPE APPURTENANCES. THE LINE AND ASSEMBLY LAYOUT SHALL INCLUDE ALL PIPE AND FITTING DIMENSIONS, LOCATION OF ALL PIPE JOINT AND TYPE, ALL PIPE SUPPORTS, ELEVATIONS OF PIPE AT SUPPORTS, EXPANSION JOINTS AND LOCATION OF ANY OTHER PIPE APPURTENANCES. 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.

JOINTS

(A) FLANGED JOINTS:

FLANGED JOINTS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS. FLANGES SHALL STRADDLE VERTICAL AND HORIZONTAL CENTERLINES. FLANGES FOR 12" AND 16" STEEL PIPE SHALL BE CLASS "D" OR WELDED NECK CLASS "D" FLANGES. FLANGES FOR 24" STEEL PIPE SHALL BE CLASS "E" OR WELDED NECK CLASS "E" FLANGES. FLANGES SHALL BE OF EITHER CAST STEEL, FORGED OR ROLLED STEEL, OR PROPERLY WELDED AND MACHINED FABRICATED STEEL PLATES, WELDED TO PIPE WITH TWO (2) 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 "AMERICAN 1928 STANDARD" DRILLING 150 POUND TEMPLATE. BLIND FLANGES, WHERE REQUIRED, SHALL BE RIBBED STEEL OR SHALL BE DISHED CAST IRON HAVING BOSSES TAPPED AT TOP AND BOTTOM FOR TWO (2) INCH STANDARD PIPE AND FURNISHED WITH MALLEABLE IRON PLUGS. ALL BOLTS AND NUTS FOR FLANGES AND OTHER TYPES OF BOLTING SHALL BE MADE OF STAINLESS STEEL: ASTM A 276 89a, "SPECIFICATION FOR STAINLESS AND HEAT–RESISTING STEEL BARS AND SHAPES," TYPE 304, AND ASTM A 193/A 193m–89, "SPECIFICATION FOR ALLOY–STEEL AND STAINLESS STEEL BOLTING MATERIALS FOR HIGH TEMPERATURE SERVICE", HEAVY HEX.

(B) EXPANSION JOINT ASSEMBLY:

THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO THE CITY THROUGH THE ENGINEER FOR APPROVAL OF THE EXPANSION JOINT ASSEMBLY.

THE EXPANSION JOINT ASSEMBLY SHALL BE, "DRESSER STYLE 63, TYPE 1" SLIP TYPE, OR APPROVED EQUAL, WITH MINIMUM 1/2" THICK BODY AND SLIP, WITH AN 8–IN, TRAVERSE. THE EXPANSION JOINT ASSEMBLY SHALL INCLUDE ALL MATERIALS, BOLTS, NUTS AND WASHERS, WELDED NECK FLANGES A.S.A. 150# AND GASKETS. ALL BOLTS AND NUTS SHALL BE MADE OF STAINLESS STEEL: ASTM A 276–89A, TYPE 304, "SPECIFICATION FOR STAINLESS AND HEAT–RESISTING SHEET BARS AND SHAPES." NO FIELD WELDING OF GALVANIZED STEEL PIPE WILL BE PERMITTED. THE EXPANSION JOINT SHALL BE GALVANIZED EXCEPT SLIP PIPE. THE EXPANSION JOINT SHALL HAVE FIELD APPLIED INSULATION AS PER DETAILS ON THE CONTRACT DRAWINGS.

(C) VICTAULIC TYPE COUPLINGS:

THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO THE CITY THROUGH THE ENGINEER FOR APPROVAL OF THE VICTAULIC COUPLING.

(1) WHERE SHOWN ON THE DRAWINGS, OR WHERE REQUIRED, THE CONTRACTOR SHALL FURNISH AND INSTALL VICTAULIC TYPE JOINTS, INCLUDING COUPLINGS, FOR CONNECTION OF PIPE ENDS. STEEL PIPE ENDS SHALL BE FABRICATED AND GROOVED, AS SHOWN ON THE DRAWINGS, ADAPTED FOR INSTALLATION OF A STYLE 77 JOINT AND COUPLING.

VICTAULIC COUPLINGS SHALL BE STYLE 77 AND SHALL BE COMPOSED OF MALLEABLE IRON HOUSINGS HELD TOGETHER WITH STEEL BOLTS HEAT TREATED AND "HOT–DIP" GALVANIZED ACCORDING TO ASTM A 123–89A, "SPECIFICATION FOR ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS," 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 BE EQUAL IN ALL RESPECTS TO THOSE MANUFACTURED BY THE "VICTAULIC COMPANY OF AMERICA." MALLEABLE HOUSINGS SHALL CONFORM TO ASTM A 47 89, "SPECIFICATION FOR FERRITIC MALLEABLE IRON CASTINGS," OR TO THE REQUIREMENTS OF ASTM A 536 84, "SPECIFICATION FOR DUCTILE–IRON CASTINGS."

BOLTS AND NUTS SHALL BE MANUFACTURED BY THE COUPLING MANUFACTURER AND SHALL COMPLY IN MATERIAL WITH THE REQUIREMENTS ASTM A 183–83, "SPECIFICATION FOR CARBON STEEL TRACK BOLTS AND NUTS."

(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 "COATINGS."

PIPE SUPPORT ASSEMBLIES

PIPE SUPPORT ASSEMBLIES SHALL BE FABRICATED AS DETAILED ON THE PLANS AND SHALL BE COMPLETE IN ALL RESPECTS INCLUDING ALL MATERIALS, CADMIUM PLATED SHOULDER AND CLAMP BOLTS, FASTENERS AND NUTS. THE SUPPORT ASSEMBLY CLAMP, SEAT PLATE ("LUBRITE" PLATE) AND SHIMS SHALL ALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM A 123, LATEST REVISION THEREOF. NO FIELD WELDING OF GALVANIZED STEEL PIPE WILL BE PERMITTED. THERE SHALL BE A MINIMUM OF TWO (2) PIPE SUPPORTS FOR EACH PIPE LENGTH.

INSULATION AND OUTER PROTECTIVE JACKET

INSULATION SHALL BE MINIMUM THREE AND ONE–HALF (3–1/2") FOR 12.75" O.D. STEEL PIPE AND MINIMUM THREE INCHES (3") FOR 16" O.D. STEEL PIPE OF A MINIMUM DENSITY OF 2 POUNDS PER CUBIC FOOT OF POLYURETHANE FOAM FACTORY APPLIED TO COMPLETELY FILL THE SPACE BETWEEN THE PIPE AND THE OUTER WEATHERPROOF JACKET. THE OUTER JACKET SHALL BE GALVANIZED STEEL OF THE DIMENSIONS SHOWN ON THE PLANS. THE OUTER JACKET SHALL BE A MINIMUM 24 GAUGE GALVANIZED STEEL, SPIRAL LOCK SEAM CONSTRUCTION. TO ASSURE NO VOIDS IN THE FOAM INSULATION ARE PRESENT, AN INFRARED OR X–RAY INSPECTION OF EACH PREINSULATED UNIT AT THE FACTORY IS REQUIRED.

EXTERIOR PIPE COATING ON 24" O.D., OR LARGER, STEEL WATER MAINS SHALL BE APPLIED IN ACCORDANCE WITH ANSI/AWWA C203–91, "COAL–TAR PROTECTIVE COATINGS AND LININGS FOR STEEL WATER PIPELINES – ENAMEL AND TAPE – HOT APPLIED" CONSISTING OF THE FOLLOWING:

1) COAL TAR PRIMER – TYPE A;
2) COAL TAR ENAMEL – TYPE A, 1/32" THICK;
3) FIBROUS GLASS MAT;
4) 2ND COAT OF COAL TAR ENAMEL – TYPE A, 1/32" THICK;
5) 2ND LAYER OF FIBROUS GLASS MAT;
6) A COAT OF HEAVY BODIED COAL TAR EMULSION; AND
7) TWO (2) FINISH COATS OF ALUMINUM PAINT.

IN LIEU OF THE ABOVE, CONTRACTOR MAY FURNISH A FACTORY PREINSULATED SPRAY APPLIED POLYURETHANE FOAM INSULATION, THICKNESS AS INDICATED ABOVE, WITH A FIBERGLASS REINFORCED POLYESTER RESIN (FRP) JACKET APPLIED DIRECTLY OVER THE FOAM INSULATION. EXTERIOR PIPE COATING IS NOT REQUIRED. THE SYSTEM HEREIN SPECIFIED SHALL BE ONE WHICH IS DESIGNED TO BE SUPPORTED DIRECTLY ON THE FIBERGLASS JACKET AND PIPE SUPPORTS.

PIPE JOINTS, INCLUDING EXPANSION JOINTS AND SUPPORT AREAS, AND PIPE BETWEEN THE BACKWALLS OF THE BRIDGE ABUTMENTS SHALL BE FIELD INSULATED WITH FIBERGLASS OR PREFORMED POLYURETHANE FOAM (OR FRP IF APPLICABLE) AND JACKETED WITH GALVANIZED STEEL BANDED OVER ADJACENT JACKET. ALL FIELD APPLIED INSULATION SHALL BE INSTALLED TO FULLY FILL ANY VOIDS. FIELD PLACED INSULATION AND JACKET SHALL BE REMOVABLE IN ORDER TO PERFORM MAINTENANCE OR MAKE ADJUSTMENTS TO THE PACKING GLAND OF THE EXPANSION JOINT(S).

BURIED PIPE BEYOND THE BACKWALLS OF THE BRIDGE ABUTMENTS HAVING LESS THAN FOUR AND ONE–HALF (4–1/2') FEET OF COVER SHALL BE INSULATED WITH A MINIMUM OF A ONE (1) FOOT INSULATION ENVELOPE EQUAL TO "WITCOLITE" OR "GILSULATE 500XR."

THE VOID BETWEEN THE SLEEVE AND THE STEEL WATER MAIN THROUGH EACH BRIDGE ABUTMENT WALL SHALL BE FILLED WITH JUTE PACKING AND SEALED AT BOTH ENDS WITH THREE (3") INCHES OF NON–SHRINKING GROUT AS SHOWN IN THE "SLEEVE PACKING DETAIL" ON THE PLANS.

MEASUREMENT

THE NUMBER OF FEET OF STEEL PIPE TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF FEET FURNISHED AND PLACED IN ACCORDANCE WITH THESE SPECIFICATIONS AS MEASURED ALONG THE AXIS OF THE PIPING.

PAYMENT

(A) THE FOOTAGE MEASURED AS PROVIDED ABOVE SHALL BE PAID FOR AT THE CONTRACT PRICE BID PER FOOT FOR "ITEM TS 638 – WATER MAIN EXTRA STRONG WELDED GALVANIZED STEEL PIPE ASTM A–53, GRADE B " CLASSIFIED AS TO SIZE AND TYPE, WHICH PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING, HAULING, PLACING, CUTTING INTO AND CONNECTING THE PIPE, INCLUDING ALL EXPANSION JOINTS, COUPLINGS, PIPE INSULATION, INSTALLING SUPPORT ASSEMBLIES, AND OTHER PIPE APPURTENANCE, FURNISHING AND COMPLETING THE SLEEVE PACKING DETAIL, INCLUDING THE SEAL, AND FOR ALL LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM EXCEPT FOR THE ITEMS SPECIFICALLY LISTED AS SEPARATE PAY ITEMS.

(B) THE CONTRACTOR WILL BE ASSESSED A CWD LABOR CHARGE FOR THE CHLORINATION OR THE FLUSHING, TESTING AND SAMPLING OF THE NEWLY LAID WATER MAIN BY THE CITY OF CLEVELAND, DIVISION OF WATER. PAYMENT OF THE CWD LABOR CHARGE FOR CHLORINATION OR THE FLUSHING, TESTING AND SAMPLING SHALL BE MADE BY THE CONTRACTOR TO THE PERMITS AND SALES SECTION OF THE DIVISION OF WATER BEFORE ANY WATER WORK IS PERFORMED.

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ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

WATERWORKS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–13

ITEM TS 638 – 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 BY THE ENGINEER, ALL AIR RELIEF VALVES, DRAIN VALVES AND GATE VALVES OF THE VARIOUS SIZES AND TYPE SPECIFIED OR ORDERED, ALL AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

AIR RELIEF VALVES

ALL AIR RELIEF VALVES OR AIR VENT VALVES SHALL BE 2–INCH BRONZE ANGLE METER VALVES WITH A BRONZE WATER METER 2–INCH IRON PIPE THREAD COMPANION FLANGE, AND A 2–INCH EXTRA HEAVY BRASS "CLOSE" (2–INCH LONG) NIPPLE. 2–INCH AIR RELIEF VALVES SHALL BE EQUAL IN ALL RESPECTS TO THE 2–INCH ANGLE METER VALVE MANUFACTURED BY J. JONES CO. NO. J–1527–F, FORD METER BOX CO. NO. FV–7, OR MUELLER CO. NO. H–14286.

CHECK VALVES

(A) TYPE OF VALVES

ALL CHECK VALVES SHALL BE OF THE SWING GATE TYPE, WITH HINGED GATES SEATING IN A VERTICAL OR INCLINED POSITION. CHECK VALVES SHALL BE CONSTRUCTED TO BE USED IN A HORIZONTAL POSITION.

(B) MATERIAL

CHECK VALVES 2" AND UNDER SHALL BE OF ALL BRONZE CONSTRUCTION, AND CHECK VALVES 3" AND OVER IN SIZE SHALL HAVE IRON BODIES WITH BRONZE MOUNTINGS.

(C) BODIES AND COVERS

THE BODIES OF ALL CHECK VALVES SHALL BE PROVIDED WITH HANDHOLES OR MANHOLES OF SUFFICIENT SIZE TO PERMIT REMOVAL OF SWING GATES. CHECK VALVES 2" AND UNDER IN SIZE SHALL HAVE HANDHOLES FITTED WITH THREADED CAPS, CHECK VALVES 3" TO 12" INCLUSIVE IN SIZE SHALL BE PROVIDED WITH HANDHOLES HAVING FLANGED COVERS. ALL FLANGED COVERS SHALL BE SECURELY BOLTED IN PLACE. ARROWS SHALL BE CAST ON THE VALVE BODIES TO ASSURE PROPER INSTALLATION. THE ARROWS SHALL POINT IN THE DIRECTION OF FLOW IN THE LINE.

(D) GATES

CHECK VALVES 12" AND UNDER IN SIZE SHALL BE PROVIDED WITH ONE GATE AND SHALL BE EQUIPPED WITH AN OUTSIDE LEVER. THE GATES FOR CHECK VALVES 6" AND UNDER IN SIZE SHALL BE OF CAST BRONZE; THE GATES FOR CHECK VALVES 8" AND OVER IN SIZE SHALL BE OF CAST IRON WITH BRONZE GATE RINGS. THE GATES SHALL BE SO CONSTRUCTED TO PREVENT THEIR SWINGING HIGHER THAN HORIZONTAL WHEN WIDE OPEN AND FREE OF THE WATERWAY, ALSO TO PREVENT THEM FROM BECOMING STUCK IN THE OPEN POSITION. GATES FOR CHECK VALVES 2" AND UNDER IN SIZE SHALL BE ATTACHED TO THE HINGES BY MEANS OF A HUB OR STUD ON BACK OF GATE, ON WHICH THE GATE SHALL BE FREE TO ROTATE. GATES FOR CHECK VALVES 3" AND LARGER IN SIZE SHALL BE ATTACHED TO HINGES BY MEANS OF HUBS, STUDS OR HINGE PINS. WHERE HINGE PINS ARE USED FOR ATTACHING GATES TO HINGES THE MOVEMENT OF GATES SHALL BE CONFINED TO PREVENT EXCESSIVE TILTING ON HINGES.

(E) HINGES AND PINS

THE HINGES AND PINS FOR SUSPENDING GATES OF CHECK VALVES SHALL BE OF CAST BRONZE, ALL PINS USED FOR FASTENING GATES TO HINGES AND FOR SUSPENDING HINGES IN BODIES OR CHECK VALVES SHALL BE OF GRADE FOUR BRONZE. WHERE PINS ATTACHING HINGES TO BODIES ARE ACCESSIBLE FROM THE OUTSIDE OF BODIES, THEY SHALL BE RETAINED IN PLACE BY MEANS OF REMOVABLE BRONZE SIDE PLUGS. ALL PINS SHALL BE SECURELY FASTENED IN PLACE.

(F) SEAT AND GATE RINGS

ALL CHECK VALVES HAVING CAST IRON BODIES SHALL HAVE BODY SEAT RINGS OF BRONZE SCREWED IN PLACE. WHERE GATES ARE MADE OF MATERIAL OTHER THAN BRONZE, THEY SHALL BE FITTED WITH BRONZE SEAT RINGS SECURELY FASTENED IN PLACE. THE FACES OF GATE AND SEAT RINGS COMING INTO CONTACT SHALL BE MACHINED FLAT TO PROVIDE TIGHT JOINTS. THE DIMENSIONS OF BRONZE SEAT AND GATE RINGS FOR THE VARIOUS SIZE CHECK VALVES SHALL NOT BE LESS THAN THOSE GIVEN IN SECTION FOR BOTTOM WEDGE GATE VALVES OF THE SAME SIZE.

(G) FLANGE ENDS

THE END FLANGES OF FLANGED AND CHECK VALVES SHALL CONFORM IN DIMENSION AND DRILLING TO THE "AMERICAN 125 LB. CAST IRON FLANGE STANDARD" UNLESS OTHERWISE ORDERED.

(H) SCREW ENDS

ALL 2" CHECK VALVES AND UNDER SHALL BE MADE WITH SCREW ENDS. THE 3" CHECK VALVES SHALL BE FURNISHED WITH SCREW ENDS WHENEVER REQUIRED BY THE ENGINEER. THREADS TO BE INSIDE IRON PIPE THREADS.

(I) BOLTS AND NUTS

ALL BOLTS AND NUTS FOR FLANGED COVERS SHALL MEET REQUIREMENTS OF THESE SPECIFICATIONS.

GATE VALVES

(A) TYPE OF VALVES

THE GATE VALVES SHALL BE MANUFACTURED IN FULL COMPLIANCE WITH THE STANDARD SPECIFICATIONS FOR GATE VALVES FOR ORDINARY WATER WORKS SERVICE OF THE AMERICAN WATER WORKS ASSOCIATION AWWA C–500–80 OR LATEST REVISION THEREOF AND IN ADDITION SHALL COMPLY WITH THE FOLLOWING SUPPLEMENTARY REQUIREMENTS OR BE EQUAL TO VALVES PRESENTLY FURNISHED TO CITY UNDER REQUIREMENT CONTRACT.

1) ALL GATE VALVES SHALL BE OF THE NONREVOLVING DOUBLE DISC PARALLEL SEAT BOTTOM WEDGE OR SIDE WEDGE TYPE.

2) ALL GATE VALVES 20 INCHES AND OVER SHALL INCLUDE BYPASS VALVES ATTACHED THERETO.

3) IN OPENING OR CLOSING THE VALVE, THE GATES SHALL BE FORCED TO ASCEND OR DESCEND BY REASON OF THE THRUST EXERTED UPON THEM BY THE VALVE STEM NUT: THIS THRUST BEING GENERATED BY THE ROTATION OF THE VALVE STEM.

4) 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 TO THE ENGINEER.

5) 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 OR 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 DISC.

6) ALL GATE VALVES, 16 INCH AND UNDER, SHALL BE CONSTRUCTED TO WORK VERTICALLY. VALVES OVER 16 INCH SHALL BE CONSTRUCTED TO WORK HORIZONTALLY.

7) ALL VALVES TO HAVE MECHANICAL JOINTS WITH BELL END UNLESS OTHERWISE NOTED.

(B) VALVES WITH STATIONARY STEMS

ALL GATE VALVES, UNLESS OTHERWISE ORDERED, SHALL BE MADE WITH SINGLE NONRISING STEMS.

(C) 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 MALLEABLE IRON. WHEELS SHALL HAVE CAST ON THEM AN ARROW INDICATING THE DIRECTION OF TURNING FOR OPENING THE VALVE.

(D) HUB ENDS

THE DIMENSIONS OF THE BELLS ON VALVES UP TO AND INCLUDING 20 INCHES IN DIAMETER SHALL CONFORM TO THOSE FOR CLASS "D" PRESSURE FITTINGS AS REQUIRED BY AWWA C100 ON VALVES 24 INCHES AND LARGER IN SIZE. THE BELL DIMENSIONS SHALL BE FOR THE CLASSES ORDERED.

(E) VICTAULIC ENDS

VICTAULIC ENDS SHALL CONFORM TO THE DIMENSIONS GIVEN ON THE CONTRACT DRAWINGS.

(F) MECHANICAL JOINT ENDS

THE BELL DIMENSIONS SHALL CONFORM TO TABLE 11.1 OF ANSI A–21.11 (AWWA C111), "A MECHANICAL JOINT FOR CAST IRON PRESSURE PIPE AND FITTINGS". JOINTS TO BE OF RETAINED TYPE.

(G) FLANGE ENDS

THE END FLANGES OF FLANGED END GATE VALVES SHALL CONFORM IN DIMENSIONS AND DRILLING TO THE "AMERICAN 125 LB. CAST IRON FLANGE STANDARD", UNLESS OTHERWISE ORDERED.

(H) SCREW ENDS

ALL 2–INCH GATE VALVES AND UNDER SHALL BE MADE WITH SCREW ENDS, UNLESS OTHERWISE SPECIFIED. THE 3 INCH AND 4 INCH HANDWHEEL GATE VALVES SHALL BE FURNISHED WITH SCREW ENDS WHENEVER REQUIRED BY THE ENGINEER. THREADS TO BE INSIDE STANDARD IRON PIPE THREADS.

(I) SOLDER JOINT ENDS

THE END CONNECTION SOCKETS OF SOLDER–JOINT GATE VALVES SHALL BE MADE TO CLOSE TOLERANCES AND SNUGLY FIT TYPE K AND L COPPER TUBING TO PERMIT MAKING SWEAT JOINTS. DEPTH OF JOINTS ON 1–1/2 INCH VALVES SHALL NOT BE LESS THAN 1–3/16 INCH AND ON 2–INCH VALVES, NOT LESS THAN 1–3/8 INCH.

(J) SLIP–ON JOINT ENDS

ALL VALVES 4" UP TO AND INCLUDING 12" IN DIAMETER WHEN SPECIFICALLY ORDERED SHALL BE FURNISHED WITH SLIP–ON JOINT ENDS COMPLETE WITH GASKETS WHICH WILL FIT THE PLAIN–END OF ALL CAST IRON PIPE CLASSES 150, 200 OR 250 MANUFACTURED TO SPECIFICATIONS ANSI A21.8 OF LATEST REVISION INCLUDING THE PLAIN–END OF ALL MAKES OF CAST IRON PIPE OF SLIP CONNECTION TYPE.

(K) BYPASSES

BYPASSES WITH GATE VALVES SHALL BE PROVIDED ON VALVES 20 INCH AND LARGER. THE BYPASSES SHALL BE LOCATED ON OR BELOW THE HORIZONTAL CENTERLINE OF THE VALVES. BYPASS VALVES SHALL BE OF THE SAME SIZE AS THE BYPASS AND SHALL CONFORM TO THE REQUIREMENT OF THESE SPECIFICATIONS FOR THE SPECIFIC VALVE USED. THE SIZE REQUIREMENTS OF THE BYPASS SHALL BE AS FOLLOWS: 20 INCH VALVES SHALL BE PROVIDED WITH 3 INCH BYPASSES; VALVES 24 INCH TO 30 INCH INCLUSIVE SHALL BE PROVIDED WITH 4 INCH BYPASSES; VALVES 36 INCH TO 42 INCH INCLUSIVE SHALL BE PROVIDED WITH 6 INCH BYPASSES; 48 INCH VALVES SHALL BE PROVIDED WITH 8 INCH BYPASSES.

(L) DOWEL PINS

ALL GEAR VALVES SHALL HAVE TWO DOWEL PINS SET IN THE FLANGES CONNECTING THE DOME AND BODY. SIZE OF PINS TO BE SHOWN IN PLANS.

(M) BOSSES

OUTSIDE SCREW AND YOKE, GATE VALVES 6 INCHES 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 HAVING DIAMETERS NOT LESS THAN ONE SIXTH OF THE NOMINAL SIZE OF GATE VALVE.

(N) FLANGES

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. ALL BOLT HOLES SHALL BE OF THE SIZE SHOWN ON THE DRAWINGS TO BE SUBMITTED AND APPROVED; SHALL BE ACCURATELY DRILLED FROM TEMPLATES, SPACED EQUAL DISTANCES APART AND SHALL STRADDLE HORIZONTAL AND VERTICAL AXIS, ALL AS SHOWN ON THE DRAWINGS. THE DIMENSIONS AND DRILLING OF ALL END FLANGES SHALL CONFORM TO THE SPACING INDICATED ON THE DRAWINGS WHICH SHALL BE THE "AMERICAN 125 LB. CAST IRON FLANGE STANDARD". FLANGES SHALL BE PLAIN FACE WITH A SMOOTH FINISH.

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SHEET U–14

(O) MARKING

ALL GATE VALVES 3 INCHES AND OVER SHALL HAVE THE IDENTITY OF MAKER, SIZE AND THE YEAR WHEN MADE AND ALSO THE LETTERS "C.W.D." CAST UPON ITS BODY OR DOME IN RAISED LETTERS.

(P) STUFFING BOXES

THE STUFFING BOX ON EACH GATE VALVE 3 INCHES 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 ENGINEER, VALVES 16 INCHES AND SMALLER SHALL BE FURNISHED WITH "O" RING TYPE SEAL PLATE. THE SEAL PLATE 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" RINGS SHALL BE COMPOUNDED TO MEET ASTM D200, AND HAVE PHYSICAL PROPERTIES SUITABLE FOR THE APPLICATION.

(Q) SEAT AND GATE RINGS

DIMENSIONS OF THE BRONZE SEAT AND GATE RINGS SHALL BE PROPORTIONED TO FIT THE TEST PRESSURE REQUIRED, AND SHALL MEET THE APPROVAL OF THE ENGINEER. GATE RINGS SHALL BE ROLLED OR PRESSED INTO GROOVES MACHINED IN THE DISCS OR FASTENED BY SOME OTHER METHOD ACCEPTABLE TO THE CITY. DIMENSIONS OF THE BRONZE SEAT AND GATE RINGS FOR GATE VALVES SHALL BE + OR – 1/8 INCH OF THAT SPECIFIED IN THE FOLLOWING TABLES. BODY SEAT RINGS SHALL BE MADE OF GRADE ONE BRONZE. GATE SEAT RINGS SHALL BE MADE OF GRADE ONE BRONZE.

BODY AND GATE RINGS (DIMENSIONS IN INCHES)

BODY WEDGE

VALVE SIZE	A FACE	B DEPTHS	C THICK.	D THICK.	E FACE	F THICK.	G THICK.
3	7/16	9/16	3/16	3/16	1/2	5/32	1/4
4	1/2	9/16	3/16	3/16	9/16	1/8	5/16
6	1/2	9/16	3/16	5/16	9/16	1/8	5/16
8	5/8	5/8	3/16	7/32	11/16	5/32	5/16
10	3/4	5/8	3/16	7/32	11/16	5/32	11/32
12	3/4	5/8	7/32	7/32	13/16	5/32	11/32
16	1	3/4	1/4	9/32	1	3/16	1/2
20	1–3/8	1–1/8	5/16	3/8	1–3/8	3/8	5/8
24	1–3/8	1–1/8	5/16	3/8	1–3/8	3/8	5/8
30	1–1/2	1–1/4	3/8	7/16	1–1/2	7/16	3/4
36	1–1/2	1–1/4	3/8	7/16	1–1/2	7/16	3/4
42	1–3/4	1–1/2	1/2	1/2	1–3/4	1/2	7/8
48	2	1–3/4	1/2	5/8	2	5/8	1

SIDE WEDGE

VALVE SIZE	BODY RINGS A FACE	B DEPTHS	C THICK.	GATE RINGS D THICK.	E FACE	F THICK.	G THICK.
3	13/32	1/2	3/16	3/16	ALL	BRONZE	DISK
4	7/16	9/16	3/16	3/16	1/2	5/32	21/64
6	1/2	11/16	9/32	1/4	5/8	5/32	21/64
8	17/32	11/16	9/32	1/4	11/16	5/32	21/64
10	5/8	13/16	3/8	5/16	13/16	5/32	21/64
12	5/8	13/16	3/8	5/16	13/16	5/32	21/64
16	3/4	1	15/32	3/8	7/8	3/16	13/32
20	7/8	1–5/16	17/32	7/16	1	1/4	17/32
24	1–1/16	1–3/8	21/32	1/2	1–3/16	5/16	19/32
30	1–5/16	1–1/2	25/32	1/2	1–7/16	5/16	19/32
36	1–1/2	1–1/2	27/32	1/2	1–9/16	5/16	19/32
42	1–3/4	1–9/16	29/32	9/16	1–13/16	5/16	5/8
48	2	1–5/8	29/32	5/8	2–1/16	3/8	11/16

(R) VALVE STEM

ALL GATE VALVES SHALL BE OF SINGLE SCREW TYPE. ALL THE STEMS SHALL BE OF BRONZE AND MEET THE MINIMUM TENSILE STRENGTH, MAXIMUM NOMINAL YIELD AND MAXIMUM ELONGATION. THE THREADS OF STEMS AND STEM NUTS SHALL BE ACME, MODIFIED ACME OR ONE–HALF V TYPE. THE LENGTH OF THE FLAT ON THE VALVE STEM SHALL BE EQUAL TO THE HEIGHT OF THE OPERATING NUT. IF REQUESTED, A MANUFACTURER'S CERTIFICATE OF TEST SHALL BE FURNISHED WITH ALL BRONZE STEMS. THE DIAMETERS OF STEMS AT THE BASE OF THE THREAD SHALL BE NOT LESS THAN THOSE SHOWN BELOW, 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 GRADE ONE, BRONZE BUSHED WITH TWO "O" RING SEALS LOCATED ABOVE THE THRUST COLLAR OR HAVE AN "O" RING LOCATED ABOVE THE THRUST COLLAR AND ONE BELOW FORMING A LUBRICANT CHAMBER. THE NUMBER OF THREADS PER INCH SHALL BE GIVEN BELOW:

SIZE OF VALVE INCHES	MINIMUM TENSILE STRENGTH	DIA. OF STEM @ BASE OF THREAD–IN	MAXIMUM NOMINAL YIELD	NO. OF THREADS PER INCH	NO. ELONG.
1	60,000 PSI	0.469	35,000 PSI	4	15%
1–1/2	"	"	"	"	"
2	"	"	"	"	"
3	"	0.859	"	"	"
4	"	"	"	3	"
6	"	1.000	"	"	"
8	"	"	"	"	"
10	"	1.125	"	"	"
12	"	1.188	"	"	"
16	"	1.438	"	"	"
20	"	1.772	20,000 PSI	"	"
24	"	1.980	"	2	"
30	80,000 PSI	2.480	32,000 PSI	"	"
36	"	2.7301	"	"	"
42	"	3.230	"	"	"
48	"	3.750	"	"	"

THE MANUFACTURER SHALL SUPPLY DATA CONCERNING TORQUE AND END PULL OR PUSH AT THE REQUEST OF THE DIRECTOR.

(S) WRENCH CAPS

THE WRENCH CAPS 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 4 INCHES TO 20 INCHES INCLUSIVE, THEY SHALL BE 1–3/4 INCHES SQUARE ON TOP, 1–7/8 INCHES SQUARE AT BASE, AND 1–3/4 INCHES DEEP. ON 3 INCH VALVES AND UNDER THEY SHALL BE 1–1/4 INCHES SQUARE ON TOP, 1–3/8 INCHES SQUARE AT BASE AND 1–1/2 INCHES DEEP. MACHINED WRENCH CAPS FOR VALVES 3–INCHES TO 48–INCHES INCLUSIVE SHALL BE FITTED TO A MACHINED SQUARE STEM OR PINION SHAFT AND HELD IN PLACE BY A RETAINING NUT OF BRONZE, 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 CUTAWAY SKIRT TO PERMIT EASY ACCESS TO GLAND BOLTS.

(T) VALVES

VALVES ARE TO OPEN CLOCKWISE EXCEPT THOSE 2 INCHES AND UNDER. ALL GATE VALVES 3 INCHES AND OVER INCLUDING BYPASS VALVES, SHALL BE MADE TO OPEN BY TURNING IN A CLOCKWISE DIRECTION. ALL VALVES ARE TO BE SO MADE THAT THEY CAN BE EASILY OPERATED.

(U) FACING OF GATES

ALL DISCS OF GATES AND THREADS FOR SEAT RINGS IN THE BODY SHALL BE MACHINED TRUE AND A 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 ENGINEER, AND THE RINGS ARE TO BE FINISHED TO A TRUE SURFACE.

(V) ROLLERS AND SCRAPERS

IN ALL VALVES 20 INCH IN DIAMETER AND LARGER, DESIGNED TO LIE HORIZONTALLY, EACH GATE OR DISC SHALL BE PROVIDED WITH TWO BRONZE ROLLERS TRAVELLING ON BRONZE TRACKS AND PROVIDED WITH SUITABLE BRONZE SCRAPER; OR TWO STAINLESS STEEL ROLLERS TRAVELLING ON STAINLESS STEEL FACED TRACKS AND PROVIDED WITH SUITABLE STAINLESS STEEL SCRAPERS. THE THICKNESS OF THE FACING OF THE TRACKS SHALL BE NOT LESS THAN 1/4 INCHES. THE BRONZE SHALL BE CLASS 1 AND THE STAINLESS STEEL SHALL BE ASTM A276–75, TYPE 302.

(W) VALVE GUIDES

ALL VALVES 20 INCHES IN DIAMETER AND LARGER, SHALL BE PROVIDED WITH GUIDES OR TRACKS WHICH SHALL BE MADE STRAIGHT AND TRUE, AND ALL IRREGULARITIES MUST BE MACHINED OFF. THE GUIDES OR TRACKS OF HORIZONTAL VALVES SHALL BE SUBSTANTIALLY FACED WITH A MINIMUM OF 1/4 INCH OF GRADE ONE BRONZE, OR STAINLESS STEEL ASTM A276–75, TYPE 302, SATISFACTORY TO THE DIRECTOR, SECURELY FASTENED AND PLANED OFF SMOOTH AND TRUE.

(X) GEARING

ALL VALVES 20 INCHES IN DIAMETER AND LARGER SHALL BE EQUIPPED WITH ENCLOSED CUT TOOTH STEEL GEARS. GEARS, SHAFTS AND BEARINGS, SHALL BE SUCH AS TO PRODUCE EASY OPERATION WITHOUT BENDING OR TWISTING.

(Y) DOWEL PINS

ALL GEAR VALVES SHALL HAVE TWO DOWEL PINS SET IN THE FLANGES CONNECTING THE DOME AND BODY. SIZE OF THE PINS TO BE SHOWN IN PLANS.

(Z) INDICATORS

ALL VALVES 20 INCHES IN DIAMETER AND OVER, SHALL BE EQUIPPED WITH INDICATORS DENOTING THE POSITIONS OF THE GATE. THE MOVING PART AND BEARINGS TO BE OF BRONZE OR BRONZE–LINED.

(AA) GREASE CASES

ALL VALVES 20 INCHES IN DIAMETER AND LARGER, SHALL HAVE WATERTIGHT GREASE CASES INSTALLED. THE GREASE CASES SHALL BE OF THE EXTENDED TYPE AND SHALL BE MADE OF CAST IRON CONFORMING TO ASTM SPECIFICATION SERIAL DESIGNATION: A126, CLASS B OR ANY SUBSEQUENT AMENDMENT THERETO. BEARING SURFACES FOR VALVE STEM AND PINION SHAFT SHALL BE BRONZED BUSHED WITH GRADE ONE BRONZE. THE GREASE CASES SHALL BE SECURELY BOLTED TO THE VALVE BONNET THROUGH A HEAVY CAST IRON YOKE. THE YOKE SHALL BE OF SUFFICIENT LENGTH TO PROVIDE SPACE FOR REPACKING VALVE AND GREASE CASE STUFFING BOXES. ALL GREASE CASES SHALL BE PROVIDED WITH A REMOVABLE COVER SECURELY BOLTED IN PLACE TO ALLOW EASY ACCESS TO THE GEARS. THERE SHALL ALSO BE PROVIDED CONVENIENT FILLING AND DRAINING PLUGS AND SUFFICIENT OIL TO FULLY SUBMERGE THE PINION GEAR. THE VALVES SHALL BE DELIVERED WITH THE GREASE CASES FILLED WITH THE PROPER OIL AS RECOMMENDED BY THE MANUFACTURER.

(BB) BRONZE PARTS

THE STEMS, RETAINING NUTS, DISC AND SEAT RINGS SHALL BE OF SOLID BRONZE. OTHER PARTS SUCH AS WEDGES, GLANDS, THRUST BEARINGS, GEAR SPINDLES, ROLLERS, SCRAPERS TRACKS, STEM NUTS, AND ALL OTHER PARTS COMING TOGETHER IN OPERATION, SHALL BE OF BRONZE OR STAINLESS STEEL OF A THICKNESS NO LESS THAN 1/4 OF AN INCH AND AS SHOWN ON DRAWINGS SUBMITTED AND APPROVED. ALL 2 INCH VALVES AND UNDER SHALL BE MADE ENTIRELY OF BRONZE, EXCEPT HANDWHEELS WHICH SHALL BE MADE OF MALLEABLE IRON.

(CC) CAST IRON PARTS

THE BODIES, COVERS, DISCS, FRAMES, ETC., OF ALL GATE VALVES 3 INCHES AND OVER SHALL BE CAST IRON EXCEPT ITEMS SPECIFYING BRONZE BODIES.

(DD) WATERWAY OPENING

WITH THE 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.

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MATERIAL SPECIFICATIONS

(A) STRENGTH OF VALVES

THE GATE AND CHECK VALVES 3 INCHES TO 12 INCHES SHALL BE DESIGNED FOR 200 PSI WORKING PRESSURE AND 16 INCH AND ABOVE 150 PSI. SHALL WITHSTAND AN INTERNALLY APPLIED HYDROSTATIC PRESSURE AT ALL POINTS OF AT LEAST 300 POUNDS PER SQUARE INCH, EXCEPT AS SPECIFIED IN SECTION ON "HYDROSTATIC TESTS AT THE FACTORY". A FACTOR OF SAFETY OF NOT LESS THAN 10 SHALL BE USED ON THE DESIGN. SHOULD TESTS REVEAL ANY WEAKNESS THE VALVES FROM THAT DESIGN SHALL BE REJECTED, AND A NEW DESIGN MADE.

(B) REINFORCEMENT AT FLANGES

ALL VALVE FLANGES SHALL BE REINFORCED BY FILLETS IN ACCORDANCE WITH THE MANUFACTURER'S PRACTICE PROVEN SATISFACTORY IN ACTUAL SERVICE.

(C) JOINTS

ALL JOINTS OF THE VALVES SHALL BE FACED TRUE IN A LATHE OR PLANER, AND PUT TOGETHER WITH A GASKET OF SOME MATERIAL ACCEPTABLE TO THE ENGINEER.

(D) BOLT HOLES

ALL BOLT HOLES SHALL BE ACCURATELY DRILLED FROM TEMPLATES AND SPACED EQUAL DISTANCES APART.

(E) BOLTS AND NUTS

ALL BOLTS AND NUTS SHALL BE MADE OF SILICON BRONZE (ASTM B98–75 ALLOY A), STAINLESS STEEL (ASTM A276–55, TYPE 302), DUCTILE IRON (ASTM A536 SQUARE GRADE 65–45–12), KORETEN A OR AN ACCEPTABLE EQUIVALENT.

(F) PARTS TO BE INTERCHANGEABLE

ALL PARTS OF VALVES OF THE SAME SIZE AND MAKE MUST BE PERFECTLY INTERCHANGEABLE AND ALL WORK MUST BE DONE IN A THOROUGH AND WORKMANLIKE MANNER.

(G) CASTINGS

ALL CASTING, 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/OR OF UNIFORM THICKNESS. NO WELDING, PLUGGING OR FILLING OF HOLES OR OTHER DEFECTS WILL BE PERMITTED. FOR PARTS WHOSE THICKNESS IS LESS THAN ONE (1) INCH, CASTINGS BEING THINNER THAN THE SPECIFIED THICKNESS BY 0.06 INCH OR MORE SHALL BE REJECTED; AND FOR PARTS FOR WHOSE THICKNESS IS ONE (1) INCH OR MORE, CASTINGS BEING THINNER THAN SPECIFIED BY 0.08 INCH OR MORE SHALL BE REJECTED.

(H) BRONZE PARTS

1) BRONZE FOR PARTS, OTHER THAN THOSE LISTED BELOW, SHALL BE GRADE ONE OR APPROVED EQUIVALENT.

2) VALVE STEMS, PINION SHAFTS, STEM NUTS, WRENCH CAPS AND RETAINING NUTS SHALL BE MADE OF GRADE THREE BRONZE.

3) DISC RINGS SHALL BE MADE OF GRADE FIVE BRONZE.

(I) TESTS OF BRONZE

1) IF REQUESTED, A MANUFACTURER'S CERTIFICATE OF TEST SHALL BE FURNISHED WITH ALL BRONZE STEMS.

2) ALL STEMS OF 16 INCH GATE VALVES AND OVER SHALL HAVE A PROLONGATION ON ONE END OF EACH STEM, OF THE SAME DIMENSIONS AND CROSS SECTION AS THE STEM, AND OF SUFFICIENT LENGTH TO ENABLE THE CUTTING OF SPECIMENS PARALLEL WITH THE LONGITUDINAL AXIS OF THE STEM SPECIMENS SHALL BE CUT FROM PROLONGATIONS ONE–HALF WAY BETWEEN SURFACE AND CENTRAL AXIS. OTHER METHODS OF TEST WILL BE CONSIDERED BY THE ENGINEER, BUT MUST BE SUBMITTED IN DETAIL WITH THE BID.

3) FOR ALL STEMS OF GATE VALVES SMALLER THAN 16 INCHES, NOT LESS THAN TWO TEST PIECES SHALL BE CAST FROM THE MOLTEN METAL OF EACH HEAT FROM WHICH VALVE STEMS ARE BEING MADE.

4) ALL STEMS MADE FROM BRONZE SHOWING LESS STRENGTH ELONGATION AND OR DUCTILITY THAN ABOVE REQUIRED SHALL BE REJECTED.

5) TESTS OF VALVE STEMS, OR THE VARIOUS PARTS OF ANY VALVE, MAY BE MADE AT ANY TIME BEFORE OR AFTER DELIVERY, AND IF FOUND TO BE DEFICIENT IN STRENGTH OR UNSATISFACTORY TO THE ENGINEER, THE WHOLE LOT OR SHIPMENT MAY BE REJECTED.

(J) CAST IRON

1) QUALITY: CAST IRON SHALL CONFORM TO ASTM SPECIFICATION A126, CLASS B, OR LATEST REVISION THEREOF. ALL IRON CASTINGS SHALL BE TOUGH AND WITHOUT BRITTLENESS, SUCH AS MAY BE CUT, DRILLED 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.

2) TEST BARS FROM THE MOLTEN METAL FROM WHICH THE VALVES ARE BEING MADE SHALL BE TESTED AT SUCH TIME AND IN SUCH MANNER AS THE ENGINEER MAY REQUIRE. THE REQUIREMENTS OF ASTM SPECIFICATIONS A126 CHARACTERISTICS OF THE IRON CASTINGS. SHOULD THE RESULT OBTAINED FROM THE BAR TESTED FAIL TO SHOW THAT THE CAST IRON MEETS THE REQUIREMENTS HEREIN SPECIFIED, THE ENTIRE MELT WILL BE REJECTED. TEST BARS, HOWEVER, WHOSE FAILURE IS DUE TO INHERENT DEFECTS SHALL NOT BE CONSIDERED. ALL VALVES MADE FROM IRON SHOWING LESS STRENGTH THAN CALLED FOR IN THE ASTM SPECIFICATIONS SHALL BE REJECTED.

(K) QUALITY OF MATERIALS

GRADE ONE CAST BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B62.

GRADE TWO CAST BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B132, ALLOY A.

GRADE THREE CAST BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B132, ALLOY B.

GRADE FOUR ROLLED BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B21, ALLOY A (ONE–HALF HARD).

GRADE FIVE BRONZE SHALL BE SUFFICIENTLY MALLEABLE TO CONFORM TO DOVETAILED GROOVES WHEN PEENED OR ROLLED, AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH, WITHOUT DEFORMATION, OF 4,000 PSI, AND SHALL HAVE THE FOLLOWING CHEMICAL COMPOSITION:

COPPER, PERCENT	91.0
TIN, PERCENT	0.0
ZINC, PERCENT	5.0
LEAD, PERCENT	4.0

SILICON BRONZE SHALL CONFORM TO ASTM SPECIFICATION B98, ALLOY A.

STAINLESS STEEL SHALL CONFORM TO ASTM SPECIFICATION A276, TYPE 302.

CAST IRON SHALL CONFORM TO ASTM SPECIFICATIONS A126, CLASS B. WROUGHT IRON SHALL BE TOUGH FIBEROUS, AND UNIFORM IN CHARACTER, SPECIMENS CUT FROM BARS AND BROKEN IN A TESTING MACHINE SHALL SHOW A TENSILE STRENGTH OF NOT LESS THAN 4500 PSI WITH AN ELONGATION OF 18 PERCENT IN EIGHT DIAMETERS.

(L) 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 KINDS, AND SUBJECT TO INSPECTION, TESTS, AND APPROVAL BY THE ENGINEER.

(M) CHEMICAL ANALYSIS

CHEMICAL ANALYSIS OF THE MATERIAL USED SHALL BE FURNISHED BY THE CONTRACTOR WHENEVER REQUIRED BY THE ENGINEER.

(N) 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.

(O) 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" AND UNDER	300 PSI	– NO TIME REQUIREMENT
4" 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 MINUTES– 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 A MODIFICATION OF SECTION 29 OF THE "STANDARD SPECIFICATIONS AWWA DESIGNATION: C500–71". ALL LEAKS, FLAWS OR OTHER DEFECTS DEVELOPED IN MAKING THESE TESTS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER 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.

(P) PERFORMANCE TESTS

EACH VALVE SHALL BE OPERATED IN THE POSITION THAT IT WILL ASSURE IN SERVICE, AND FOR THE FULL LENGTH OF GATE TRAVEL IN BOTH DIRECTIONS 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 SET ACCURATELY AND CAREFULLY TO THE LINES AND GRADES GIVEN. ALL CONNECTIONS TO PIPE SHALL HAVE THE NECESSARY FLANGED, LEAD, SOLDERED JOINT, SCREWED OR VICTAULIC ENDS AS REQUIRED UNDER THE VARIOUS SECTIONS OF THESE SPECIFICATIONS AND AS SHOWN ON THE VALVE SCHEDULE.

(B) AFTER THE VALVES ARE SET IN PLACE AND READY TO OPERATE, THE CONTRACTOR SHALL TEST THEM UNDER WORKING PRESSURE AND CONDITIONS HEREIN SPECIFIED UNDER "GENERAL – TESTING MAINS". 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.

PAINTING

(A) IRON BODY VALVES SHALL EITHER BE DIPPED IN ASPHALT PAINT AND ALL BRONZE PARTS CLEANED, OR ALL IRON CASTINGS SHALL BE PAINTED INSIDE BEFORE ASSEMBLING WITH TWO (2) COATS OF APPROVED PAINT, AND AFTER PASSING THE HYDRAULIC TEST, SHALL BE GIVEN AT LEAST TWO (2) COATS OF APPROVED PAINT OUTSIDE.

(B) AFTER ERECTION, ALL EXPOSED METAL SURFACES OF VALVES EXCEPT BRASS OR BRONZE SHALL BE PAINTED WITH TWO (2) FIELD COATS OF COAL TAR PITCH PAINT USING INERTOL 66, OR KOPPERS BITUMASTIC 50 OR APPROVED EQUAL.

INSPECTION

THE ENGINEER OR HIS AUTHORIZED DESIGNATE WILL INSPECT THE MATERIAL AND WORK DONE, AS THE INTEREST OF THE CITY OR GCRTA MAY REQUIRE. HE 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 ENGINEER. 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.

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ENGINEERING & PROJECT MANAGEMENT DIVISON

RTA
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DATE OF PROPOSAL

PROPOSAL SHALL BE ACCOMPANIED BY DRAWINGS FURNISHED BY THE MANUFACTURER, FULLY AND DISTINCTLY ILLUSTRATING AND DESCRIBING AND GIVING THE WEIGHT OF THE VALVES PROPOSED TO FURNISHED.

DRAWINGS

(A) PRIOR TO THE MANUFACTURE OF ANY VALVES, THE CONTRACTOR SHALL SUBMIT FOR THE APPROVAL OF THE ENGINEER AND DIRECTOR OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND COMPLETE WORKING, DETAIL, AND DIMENSION DRAWINGS SHOWING THICKNESS AND KINDS OF MATERIAL, AND SIMILAR INFORMATION.

(B) ONE (1) PRINT EACH OF THE DRAWINGS SUBMITTED WILL BE RETURNED WITH THE CRITICISMS OR APPROVAL OF THE ENGINEER. IN CASE THE DRAWINGS ARE NOT APPROVED, THE CONTRACTOR SHALL AGAIN SEND FOR APPROVAL DUPLICATE 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 ENGINEER THREE (3) SETS OF MYLAR OR REPRODUCIBLE CLOTH, ONE OF WHICH SHALL BE FURNISHED TO THE DIRECTOR OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND, AND ONE (1) SET RETURNED TO THE CONTRACTOR. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED.

(C) IF THE VALVE FURNISHED IS ONE PREVIOUSLY APPROVED FOR WHICH DRAWINGS ARE PRESENTLY ON FILE WITH THE DEPARTMENT OF PUBLIC UTILITIES, THE DRAWING REQUIREMENT WILL BE WAIVED.

PAYMENT

THE UNIT PRICE STIPULATED FOR EACH "ITEM TS 638 – VALVES" CLASSIFIED AS TO SIZE AND TYPE, SHALL INCLUDE THE FURNISHING, PLACING, TESTING AND PAINTING OF THE AIR RELIEF LOCKS, DRAIN VALVES, GATE VALVES, CHECK VALVES, INCLUDING BYPASS VALVES, OPERATING NUTS, VALVE BOXES AND COVERS AND OTHER ACCESSORIES AND APPURTENANCES AND THE FURNISHING OF ALL MATERIALS, LABOR, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

ITEM TS 638 – CUTTING–IN VALVE WITH VALVE BOX, COMPLETE

WORK INCLUDED

THE DIVISION OF WATER WILL SET THE TIME OF INSTALLATION AND THE CONTRACTOR WILL DO ALL PIPE CUTTING AND INSTALLING UNDER THE SUPERVISION OF THE DIVISION OF WATER AND HEAT. THE CONTRACTOR SHALL FURNISH AND HAUL TO THE PROPER LOCATION THE HUB VALVE AND VALVE BOX COMPLETE, STANDARD NO. 38 DRESSER COUPLING OR APPROVED SMITH BLAIR COUPLING OR APPROVED EQUAL, CAST IRON PIPE AND LEAD FOR THE INSTALLATION. THE CONTRACTOR SHALL EXCAVATE, PROVIDE SHEETING AND BRACING AS NECESSARY, BACKFILL AND REPAVE AS NECESSARY.

QUALITY OF VALVES

THE VALVES SHALL BE A.P. SMITH MANUFACTURING CO. OR APPROVED EQUAL AND SHALL COMPLY WITH THE REQUIREMENTS OF THE "ITEM TS 638 – 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 TS 638 – CUTTING IN VALVE WITH VALVE BOX COMPLETE", CLASSIFIED AS TO SIZE. THE PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR PERFORMING ALL EXCAVATION, SHEETING, BRACING, BACKFILLING, REPAVING, FURNISHING AND INSTALLING THE CUTTING–IN VALVE AND THE FURNISHING OF ALL MATERIALS, LABOR, EQUIPMENT, TOOLS AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM OF WORK.

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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 DIVISON OF WATER, BEFORE ANY WORK IS PERFORMED.

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 INDICATED HEREIN. NO ADDITIONAL COMPENSATION WILL BE PROVIDED TO THE CONTRACTOR(S) BY GCRTA FOR DIVISION OF WATER LABOR FOR WORK REQUIRED TO BE PERFORMED BY THE DIVISON OF WATER BUT THE REQUIRED CWD LABOR, PERMIT, AND CITY INSPECTION 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. (SEE WORK TO BE DONE BY THE CITY)

THE CONTRACTOR SHALL PROVIDE COPIES OF ALL CORRESPONDENCE (I.E., INVOICES, RECEIPTS, CANCELLED CHECKS, ETC.) BETWEEN CWD AND THE CONTRACTOR TO THE PROJECT ENGINEER/SUPERVISOR TO DOCUMENT APPROPRIATE PAYMENTS.

DIVISION OF WATER CHARGES STIPULATED HEREIN ARE ON A FLAT RATE BASIS, UNLESS OTHERWISE SPECIFIED AS A "DEPOSIT – COST PLUS" BASIS.

ANY WORK PERFORMED ON CONCRETE WATER MAINS WILL BE PRICED 55% ABOVE THE CHARGES INDICATED BELOW.

PRICES ARE SUBJECT TO CHANGE AND CONTRACTOR MUST PAY MOST CURRENT FEES.

NEW CONNECTIONS: (INSTALLATION ONLY – GENERAL SERVICE AND FIRE LANES)

1"	$ 135.00	4"	$ 1,065.00
1" (SINGULAR)	$ 135.00	6"	$ 1,120.00
1–1/2"	$ 640.00	8"	$ 1,260.00
2"	$ 690.00	10"	$ 1,500.00
3"	$ 835.00	12"	$ 2,100.00

RETAP AND RECONNECTS: (INSTALLATION ONLY – GENERAL SERVICE AND FIRE LINES)

1"	$ 135.00	4"	$ 1,065.00
1" (SINGULAR)	$ 135.00	6"	$ 1,120.00
1–1/2"	$ 640.00	8"	$ 1,260.00
2"	$ 690.00	10"	$ 1,500.00
3"	$ 835.00	12"	$ 2,100.00

EXTEND: (INSTALLATION ONLY – GENERAL SERVICE AND FIRE LINES)

1"	$ 135.00	4"	$ 1,065.00
1" (SINGULAR)	$ 135.00	6"	$ 1,120.00
1–1/2"	$ 640.00	8"	$ 1,260.00
2"	$ 690.00	10"	$ 1,500.00
3"	$ 835.00	12"	$ 2,100.00

FIRE LINES – O.S. & Y. AND CHECK VALVES: (LABOR ONLY – ASSEMBLE AND INSTALL: OR REMOVE AND RESET)

4"	$ 100.00	10"	$ 175.00
6"	$ 125.00	12"	$ 200.00
8"	$ 150.00		

METERS – BYPASS AND CHECK VALVES: (LABOR ONLY – ASSEMBLE AND INSTALL: OR REMOVE AND RESET)

1–1/2"	$ 275.00	6"	$ 565.00
2"	$ 275.00	8"	$ 715.00
3"	$ 275.00	10"	$ 900.00
4"	$ 430.00	12"	$ 1,100.00

BACKFLOW PREVENTION DEVICE: (LABOR ONLY – REMOVE AND RESET)

1–1/2"	$ 190.00	6"	$ 375.00
2"	$ 190.00	8"	$ 475.00
3"	$ 190.00	10"	$ 600.00
4"	$ 285.00	12"	$ 725.00

TAPPING SLEEVES AND VALVES: (LABOR ONLY – INSTALL, TAP, AND TEST) SEE PARAGRAPH " WORK TO BE DONE BY THE CITY"

MAIN SIZE		MAIN SIZE	
6" OR LESS	$ 700.00	12"	$ 760.00
8"	$ 710.00	16"	$ 890.00
10"	$ 730.00	20"	$ 2,700.00 DEPOSIT (COST PLUS)

PIPE CUTTING: (PER CUT)

ANY SIZE	$ 500.00

PLUGGING SERVICE CONNECTIONS AND WATER MAINS

MAIN SIZE:	
LESS THAN 2"	$ 700.00
2" THROUGH 12"	$ 1200.00
16" AND LARGER	$ 1500.00 DEPOSIT (COST PLUS)

RESETTING OF SMALL METERS: (LABOR ONLY – COST OF METER NOT INCLUDED)

1" AND SMALLER	$ 60.00

CURB VALVES: (LABOR ONLY – ON INSTALLATION REQUIRING AN EASEMENT, INSIDE METER, OR FIRE LINE)

1–1/2" AND 2"	$ 90.00
3" THROUGH 8"	$ 200.00
10" AND 12"	$ 300.00

CHLORINATION: (LABOR ONLY)

MAIN SIZE	COST PER FOOT	MINIMUM CHARGE
6"	$ 0.35	$ 420.00
8"	$ 0.45	$ 485.00
10"	$ 0.45	$ 485.00
12"	$ 0.55	$ 550.00
16"	$ 0.60	$ 630.00
20" AND LARGER	ACTUAL COST	ACTUAL COST

FLUSH, TEST AND SAMPLE: (LABOR ONLY)

WHERE LENGTH OF NEW /RELOCATED/LOWERED PIPE IS 350 OR LESS – $ 250.00

REVISIONS:

DRAWN: EJK
CHECKED: MJW
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

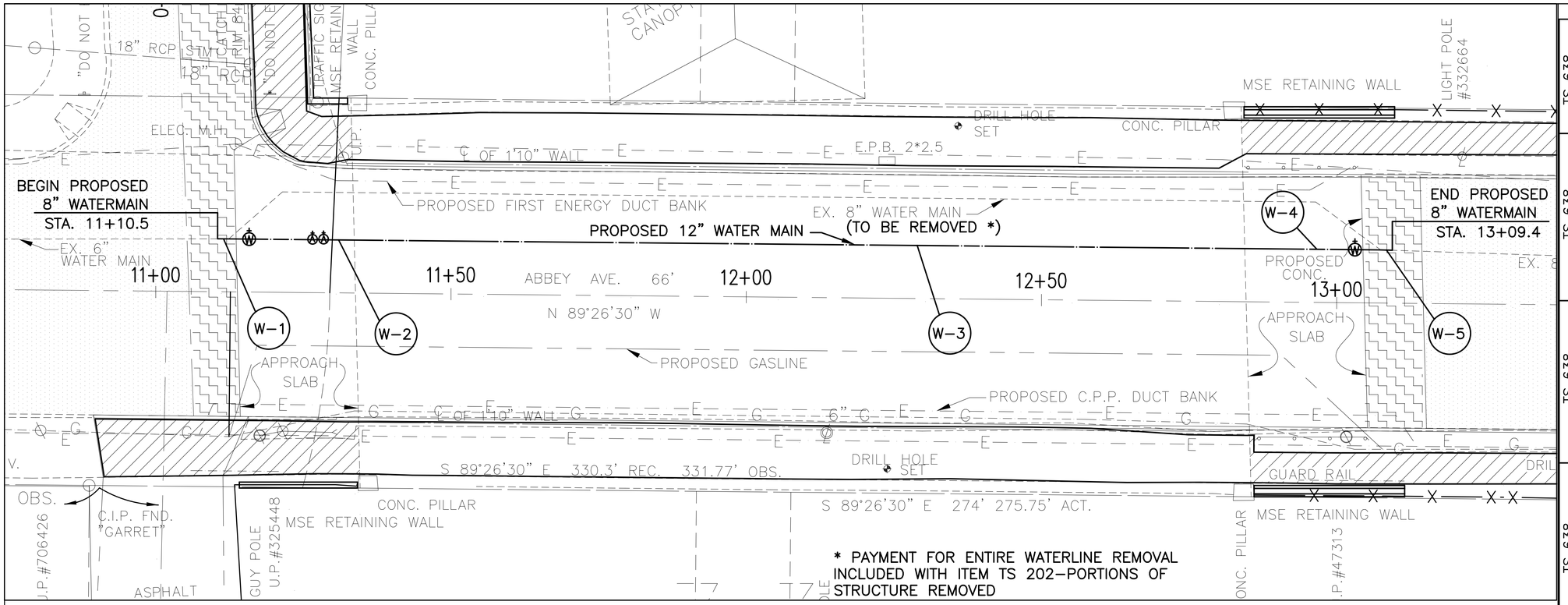
RTA
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

WATERWORKS

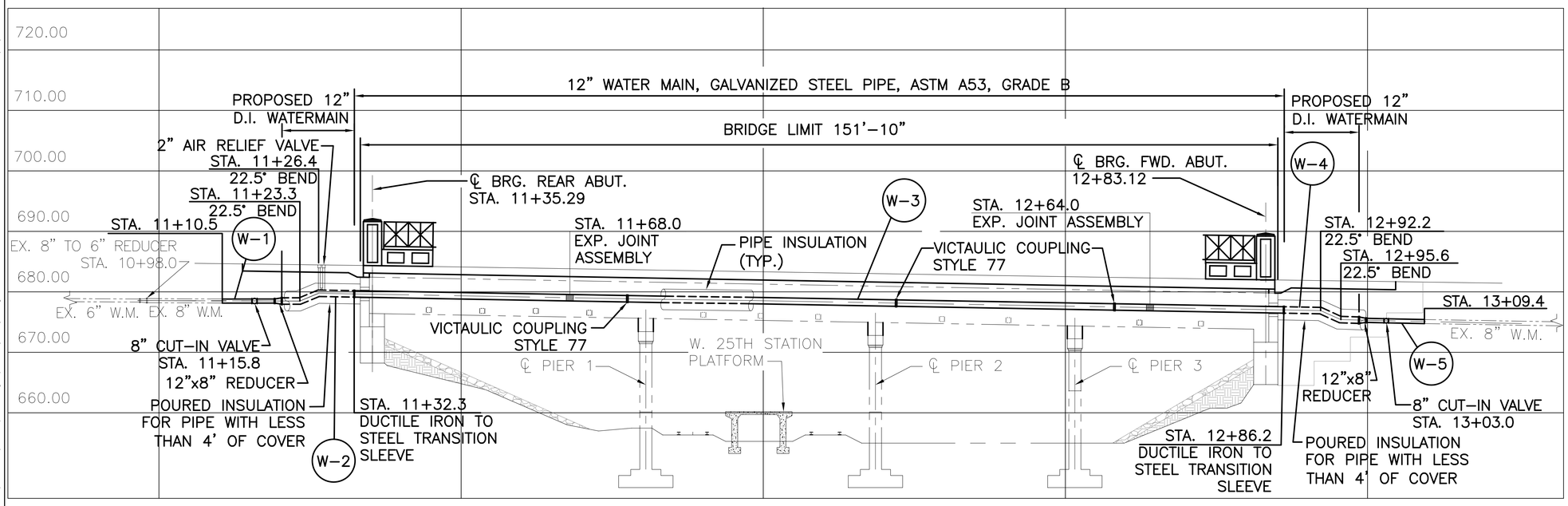
REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–18



* PAYMENT FOR ENTIRE WATERLINE REMOVAL INCLUDED WITH ITEM TS 202–PORTIONS OF STRUCTURE REMOVED



WATER UTILITY PROFILE

REF NO.	STATION FROM	STATION TO	SIDE	TS 638 8" WATER MAIN DUCTILE IRON PIPE WITH BOLTLESS RESTRAINED JOINTS & FITTINGS, ANSI CLASS 56 FT	TS 638 2" AIR RELIEF VALVE WITH VALVE BOX, COMPLETE EACH	TS 638 8" GATE VALVE WITH VALVE BOX COMPLETE EACH	TS 638 12" WATER MAIN GALVANIZED STEEL PIPE, ASTM A53, GRADE B FT	TS 638 12" WATER MAIN DUCTILE IRON PIPE WITH BOLTLESS RESTRAINED JOINTS & FITTINGS, ANSI CLASS 56 FT
W-1	11+10.5	11+20.0	LT	9	1	1		13
W-2	11+20.0	11+32.3	LT		1		154	
W-3	11+32.3	12+86.2	LT					14
W-4	12+86.2	13+00.0	LT			1		
W-5	13+00.0	13+09.4	LT	10	1	2	154	27
TOTALS CARRIED TO GENERAL SUMMARY				19	4	4	308	54

REVISIONS:

DRAWN: EJK
CHECKED: MJW
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

WATERWORKS PLAN
CITY OF CLEVELAND WATER

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–19

6/7/2007 8:57 AM
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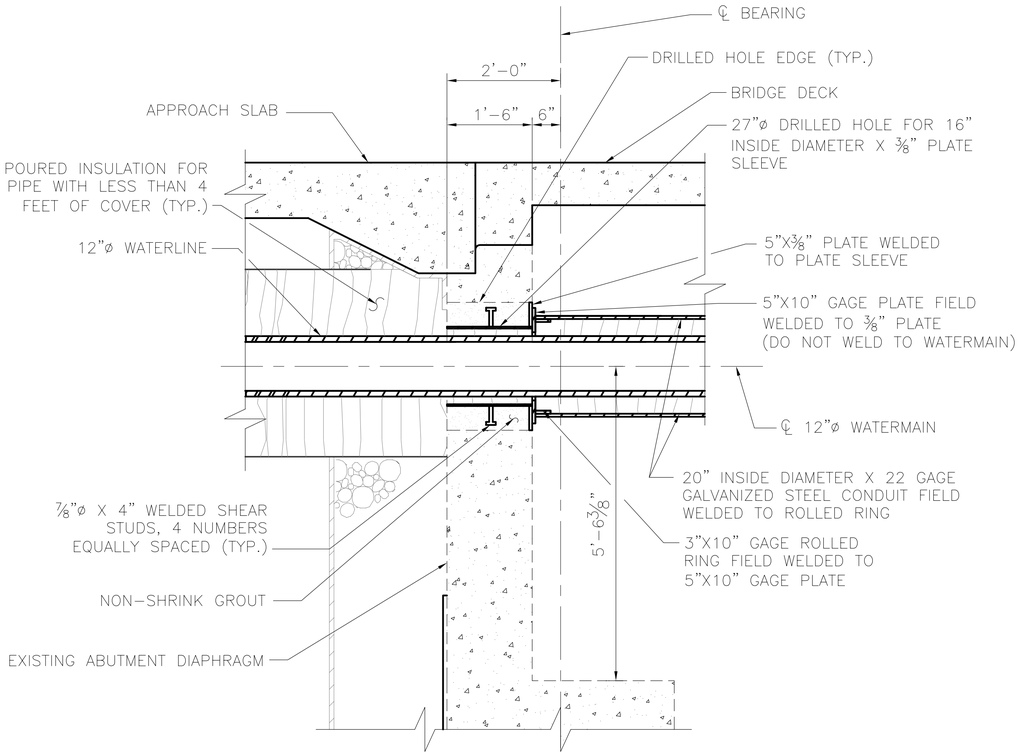
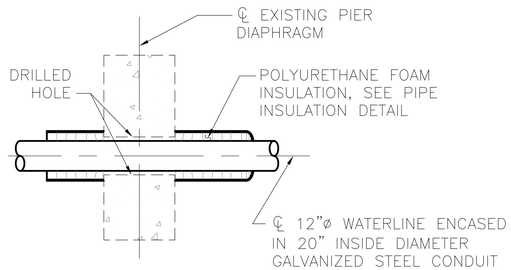
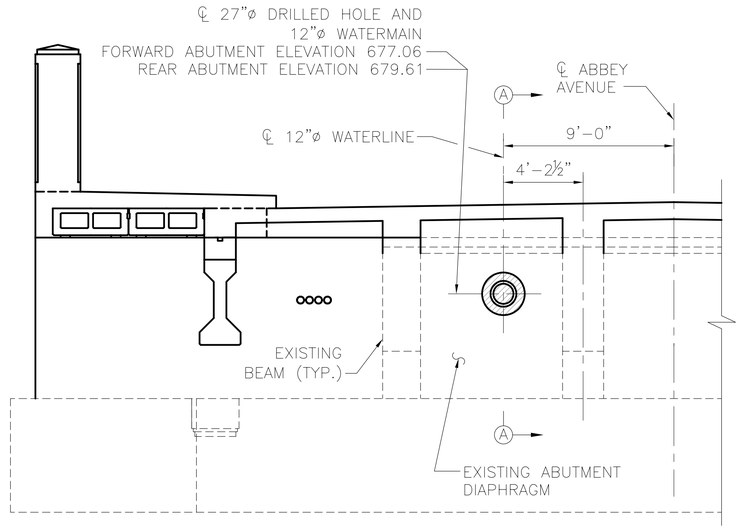


SECTION A-A

(FORWARD ABUTMENT SHOWN; REAR ABUTMENT SIMILAR)

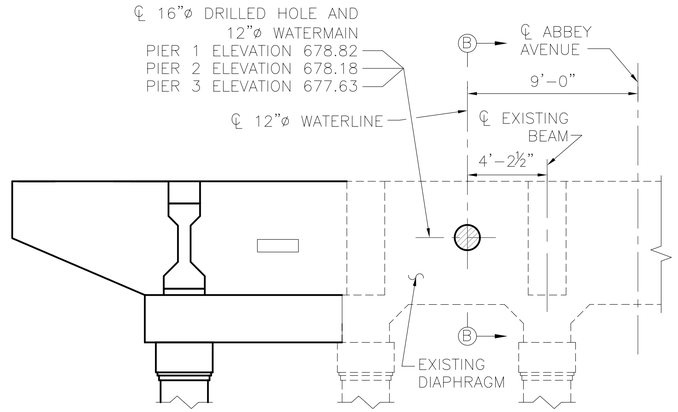


SECTION B-B



CORE DRILLED HOLE - ABUTMENT DETAIL

(FORWARD ABUTMENT SHOWN; REAR ABUTMENT SIMILAR)



CORE DRILLED HOLE
TYPICAL PIER DIAPHRAGM DETAIL

NOTES:

1) EXCEPT FOR BOLTS, LOCK WASHERS AND NUTS WHICH ARE CADMIUM PLATED, ENTIRE ASSEMBLY, INCLUDING SHIMS, IS TO BE HOT DIPPED GALVANIZED, ASTM A-123. SHIMS TO BE INSTALLED (OR DELETED) IN FIELD WHERE REQUIRED.

2) FOR SUPPORT LOCATIONS, SEE SHEET U-1.

3) FOR UTILITY SUPPORT DETAILS, SEE SHEET U-2.

4) FOR WATERMAIN SUPPORT DETAILS, SEE SHEET U-21.

REVISIONS:

DRAWN: CMM
CHECKED: JFM
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

RTA
GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CITY OF CLEVELAND WATER UTILITY DETAILS-1

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-20

6/6/2007 12:54 PM
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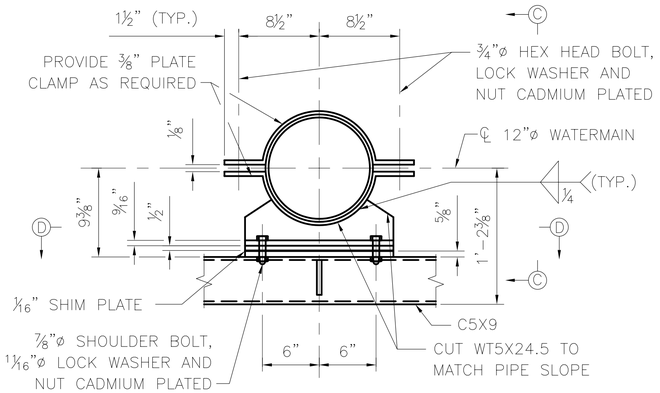
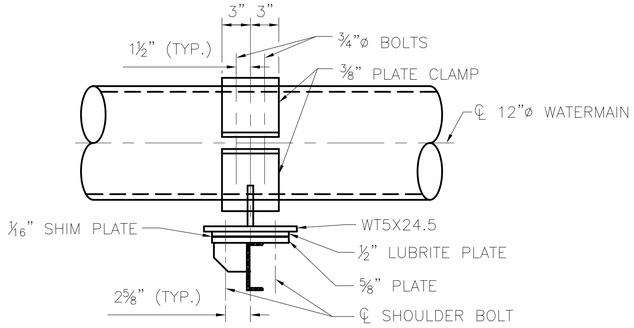
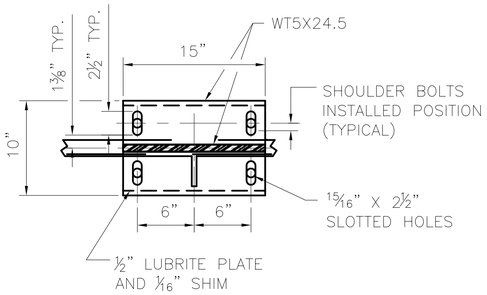


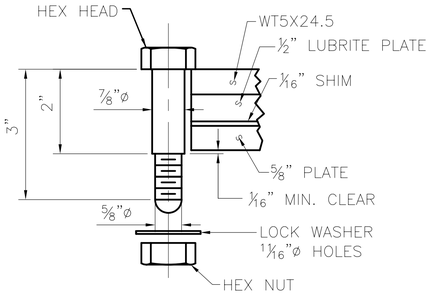
WATERMAIN SUPPORT DETAIL



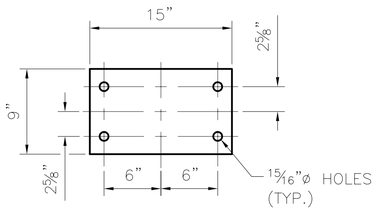
VIEW C–C



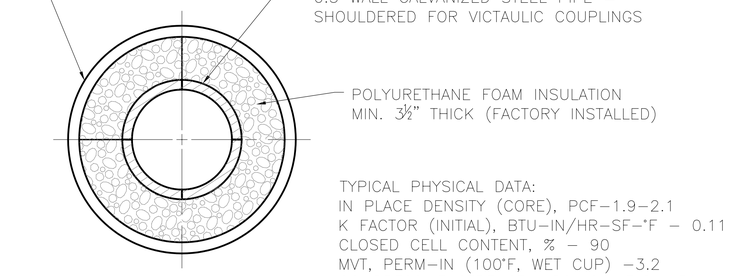
SECTION D–D



CADMIUM PLATED SHOULDER BOLT



½" LUBRITE PLATE AND 1/16" STEEL SHIM PLATE



PIPE INSULATION DETAIL

* IN LIEU OF A 20" X 22GA. GALVANIZED STEEL CONDUIT CONTRACTOR MAY FURNISH A FACTORY INSTALLED POLYURETHANE FOAM INSULATED PIPE WITH A FIBERGLASS REINFORCED POLYESTER OUTER JACKET.

NOTES:

1) EXCEPT FOR BOLTS, LOCK WASHERS AND NUTS WHICH ARE CADMIUM PLATED, ENTIRE ASSEMBLY, INCLUDING SHIMS, IS TO BE HOT DIPPED GALVANIZED, ASTM A–123. SHIMS TO BE INSTALLED (OR DELETED) IN FIELD WHERE REQUIRED.
2) FOR SUPPORT LOCATIONS, SEE SHEET U–1.
3) FOR UTILITY SUPPORT DETAILS, SEE SHEET U–2.
4) FOR WATERLINE DETAILS, SEE SHEET U–19.

REVISIONS:

DRAWN: CMM
CHECKED: JFM/MJW
APPROVED: RHW
DATE: 6–1–2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CITY OF CLEVELAND WATER UTILITY DETAILS–2

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–21

6/7/2007 7:44 AM

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*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.

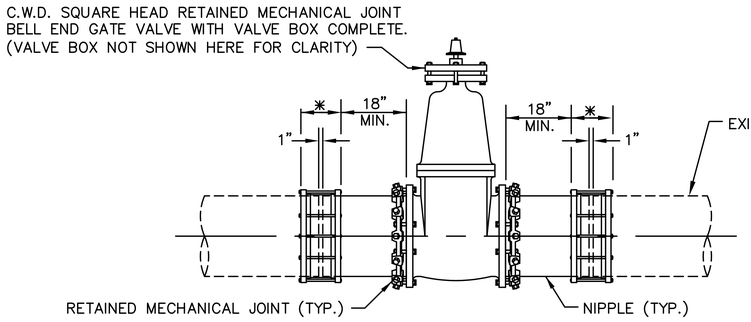
MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

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".

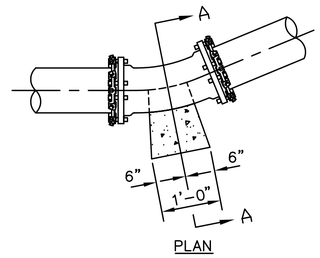
THE DIVISION OF WATER WILL DETERMINE THE FIELD LOCATION OF THE CUT-IN-VALVE ASSEMBLY. THE DIVISION OF WATER WILL ALSO SET THE TIME OF INSTALLATION OF THE CUT-IN-VALVE ASSEMBLY.

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.

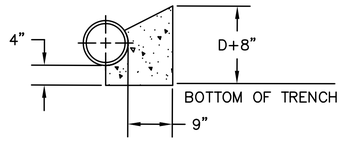


CUT-IN-VALVE DETAIL
- NOT TO SCALE -

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.

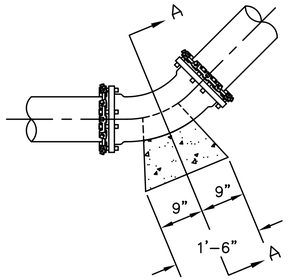


PLAN
(22-1/2 DEGREE) BEND

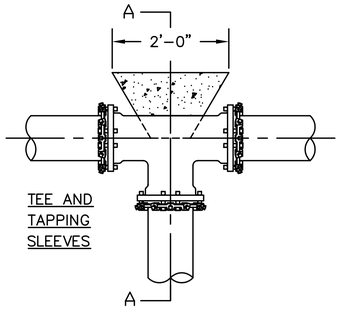


SECTION A-A

TYPICAL THRUST BLOCK DETAIL
FOR HORIZONTAL DEFLECTION
FOR PIPE UP TO 16" DIAMETER
- NOT TO SCALE -
D = PIPE DIAMETER



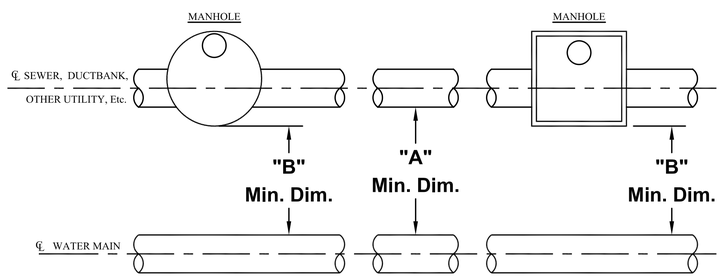
PLAN
(45 DEGREE) BEND



TEE AND TAPPING SLEEVES

PLAN

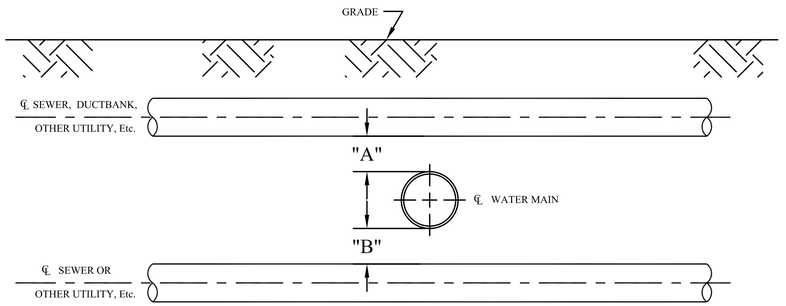
NOTES
1: ALL DIMENSIONS SHOWN HEREON ARE MINIMUM; THRUST BLOCK SHALL BE POURED TO UNDISTURBED EARTH.
2: ALL CONCRETE FOR THRUST BLOCKS SHALL BE CLASS "C" HAVING 4,000 PSI 28 DAY COMPRESSIVE STRENGTH.
3: DO NOT COVER BOLTS WITH CONCRETE ON MECHANICAL JOINTS.
4: USE FORMS WHEN POURING CONCRETE TO MAINTAIN SHAPE AND DIMENSIONS OF THRUST BLOCKS.



PLAN VIEW
- SEE STD-018 FOR PROFILE VIEW -

	HORIZONTAL CLEARANCE	STORM SEWER	SANITARY SEWER	GAS, DUCTBANK, OTHER UTILITY, Etc.
WHEN BOTTOM OF UTILITY PIPE IS AT OR ABOVE BOTTOM OF WATER MAIN	"A"	4'-0"	10-0" MIN.	3'-0"
	"B"	4'-0"	7'-0" MIN.	3'-0"
WHEN BOTTOM OF UTILITY PIPE IS BELOW BOTTOM OF WATER MAIN	"A"	5'-0"	10'-0" MIN.	5'-0"
	"B"	5'-0"	7'-0" MIN.	5'-0"

CLEARANCE FOR UTILITIES
NOT TO SCALE



PROFILE VIEW
- SEE STD-017 FOR PLAN VIEW -

VERTICAL CLEARANCE	SANITARY SEWER LESS THAN 24"	SANITARY SEWER 24" & LARGER	STORM SEWER, DUCTBANK, GAS, OTHER UTILITY LESS THAN 24"	STORM SEWER, DUCTBANK, GAS, OTHER UTILITY 24" & LARGER	REMARKS
"A"	18" Min.	*18" Min.	***12"	*12"	*WATER MAIN IN CASING: CLEARANCE TO TOP OF CASING
"B"	18" Min.	**18" Min.	12"	**12"	**CLEARANCE TO TOP OF UTILITY OR TOP OF CASING; WHEN UTILITY IS IN CASING

***INCREASE TO 18" WHEN WIDTH OR DIAMETER OF UTILITY IS GREATER THAN DIAMETER OF WATER MAIN

CLEARANCE FOR UTILITIES
NOT TO SCALE

REVISIONS:

DRAWN: EJK
CHECKED: MJW
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CITY OF CLEVELAND WATER
UTILITY DETAILS-3

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-22

6/7/2007 9:00 AM
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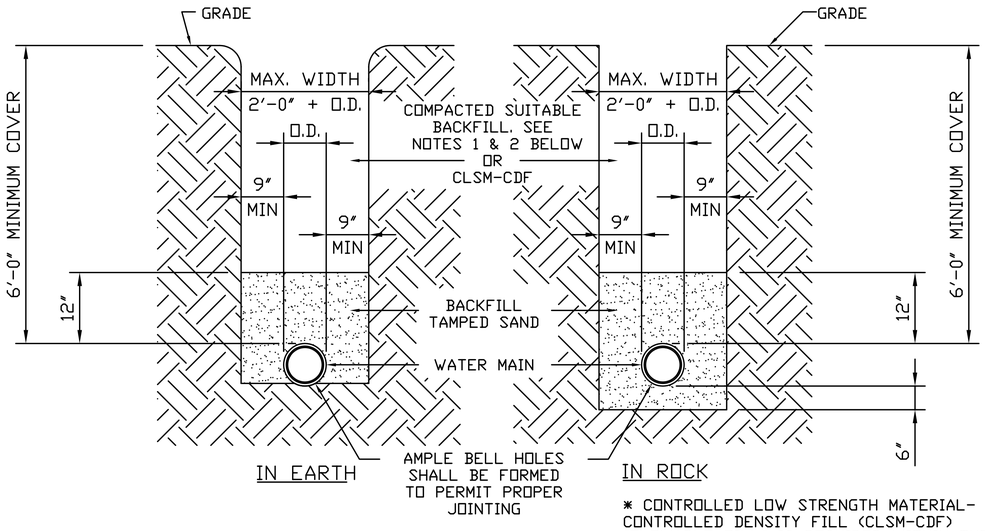


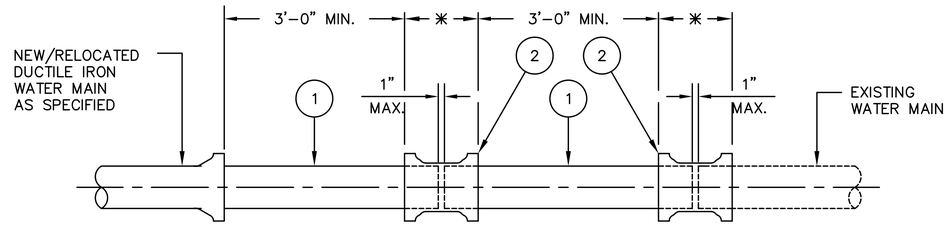
WATER MAIN TRENCH DETAILS

– 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.



SLEEVE-IN INSTALLATION DETAIL

– NOT TO SCALE –

1) PLAIN END x PLAIN END DUCTILE IRON PIPE AS SPECIFIED (CUT TO SUIT).

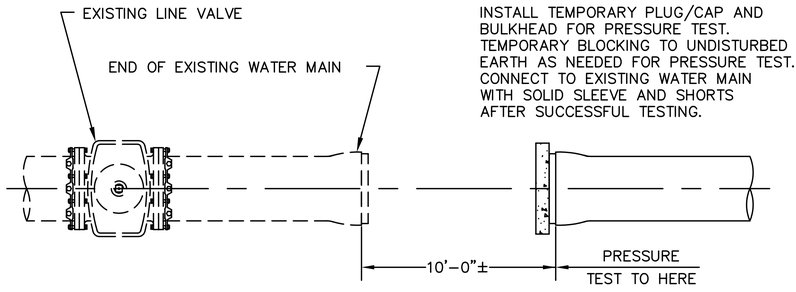
2) *CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.

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) ER-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".



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 –

REVISIONS:

DRAWN: EJK
CHECKED: MJW
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CITY OF CLEVELAND WATER UTILITY DETAILS-4

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-23

6/7/2007 9:00 AM

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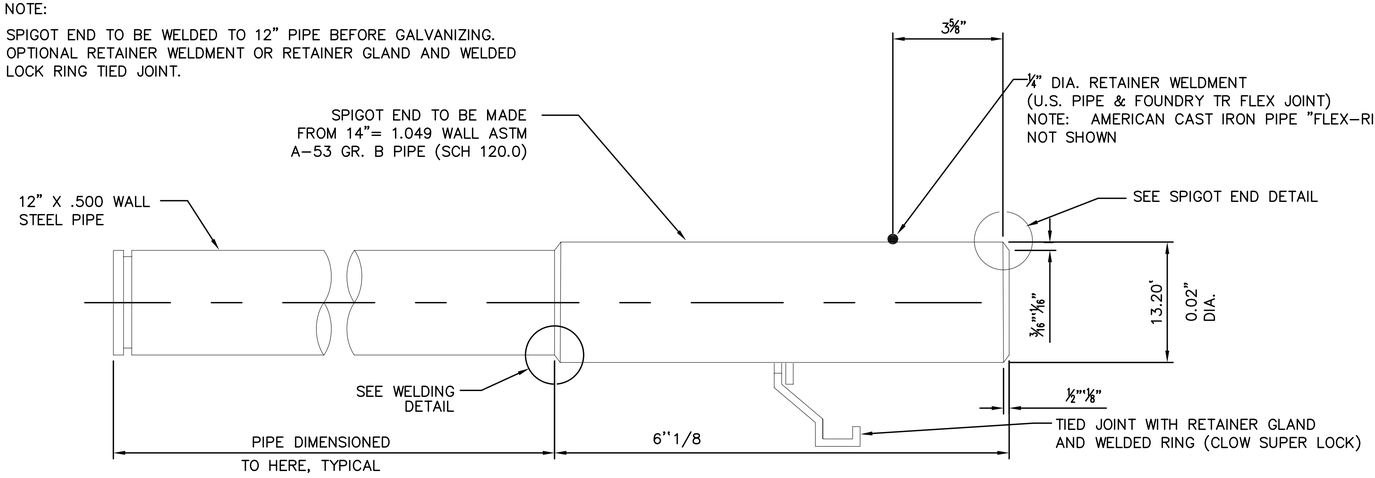
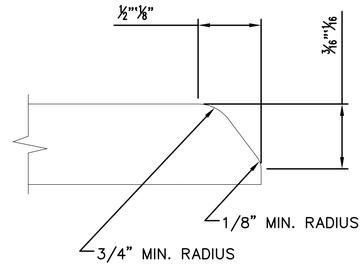
NOTE:

SPIGOT END TO BE WELDED TO 12" PIPE BEFORE GALVANIZING. OPTIONAL RETAINER WELDMENT OR RETAINER GLAND AND WELDED LOCK RING TIED JOINT.



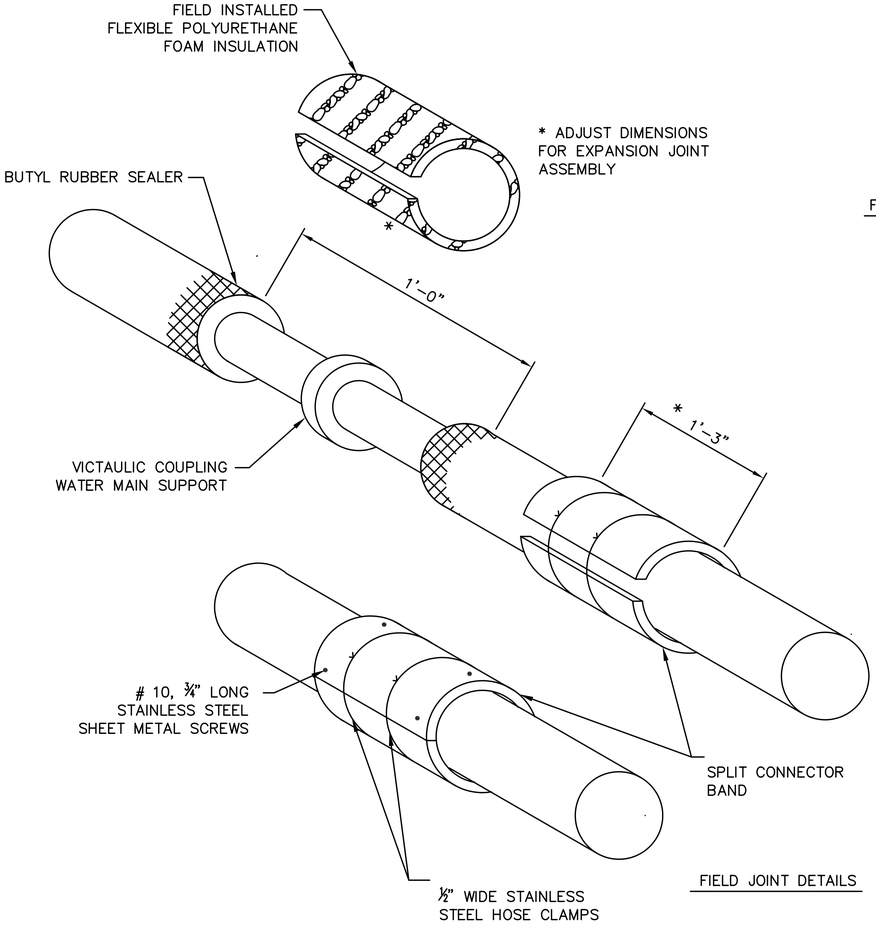
STEEL TO DUCTILE IRON PIPE
TRANSITION SLEEVE DETAIL

– NOT TO SCALE –



SPIGOT END DETAIL

– NOT TO SCALE –



FIELD JOINT DETAILS

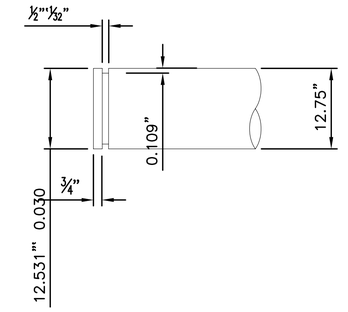
FIELD JOINT SEQUENCE

1. SLIDE SPLIT CONNECTOR BAND ON TO UNIT. MAKE JOINT AND TEST.

2. WRAP FLEXIBLE POLYURETHANE FOAM AROUND EXPOSED PIPE AND COUPLING AND TAPE INTO PLACE.

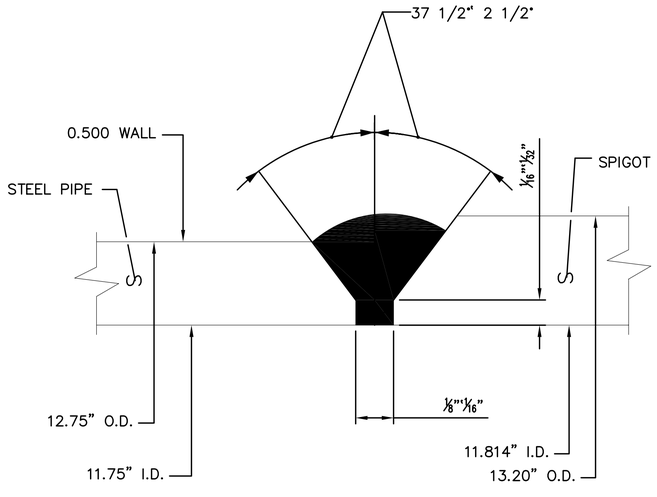
3. APPLY BUTYL RUBBER SEALER TO BOTH SIDES OF JOINT.

4. CENTER SPLIT CONNECTOR BAND OVER JOINT AND DRAW DOWN TIGHT WITH HOSE CLAMPS. SECURE SPLIT CONNECTOR BAND TO JACKET WITH SHEET METAL SCREWS (4 SCREWS PER END).



STYLE #77

VICTAULIC GROOVING DETAIL



WELDING DETAILS

– NOT TO SCALE –

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

DRAWN: EJK
CHECKED: MJW
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

REVISIONS:

RTA GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CITY OF CLEVELAND WATER UTILITY DETAILS-5

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-24

6/7/2007 9:00 AM

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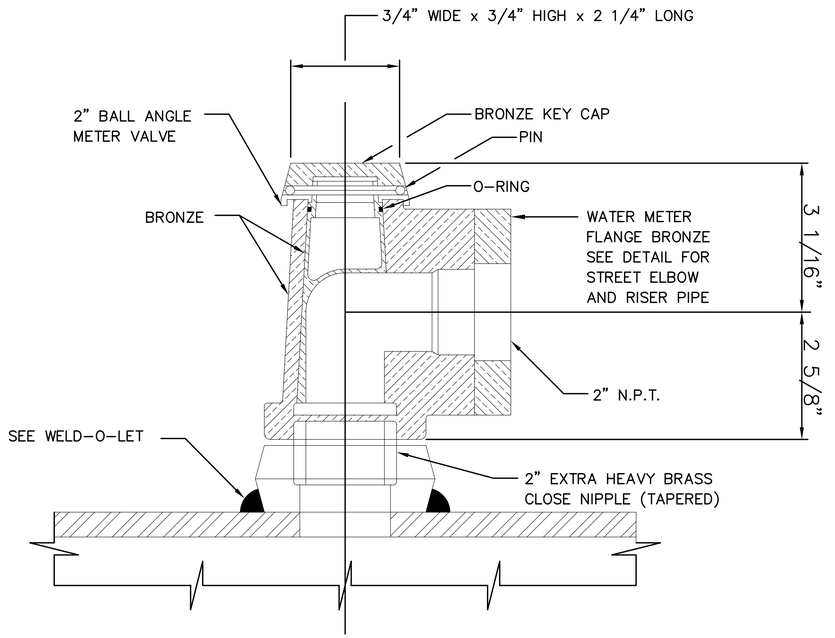
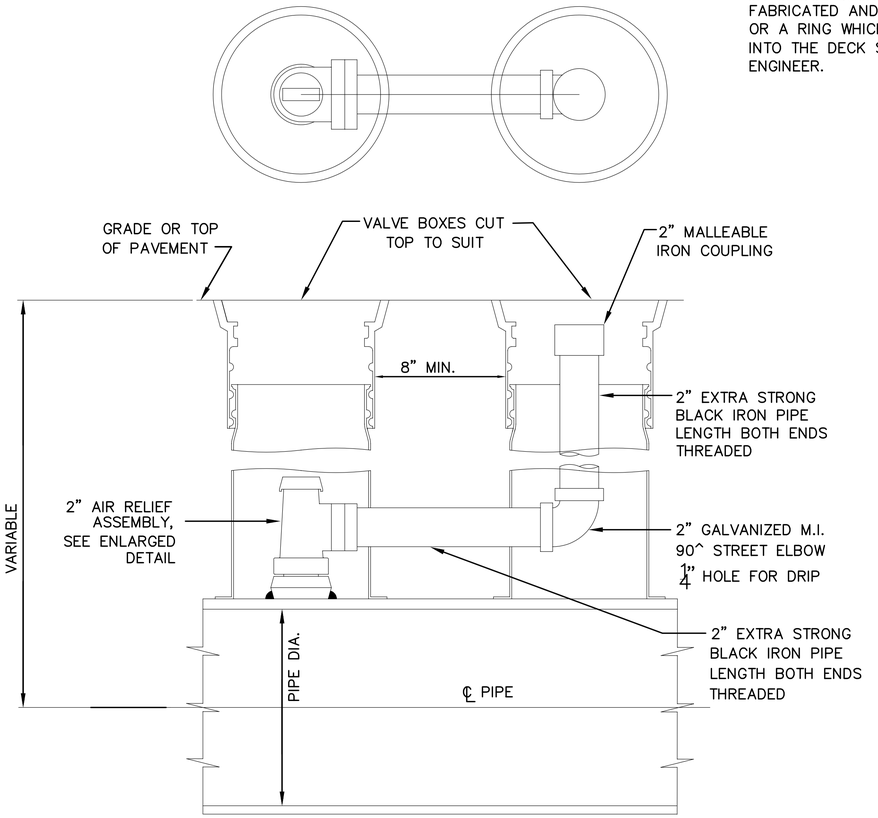
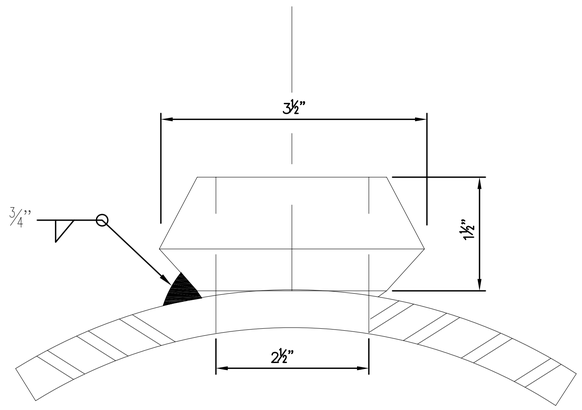


AIR RELIEF VALVE ASSEMBLY

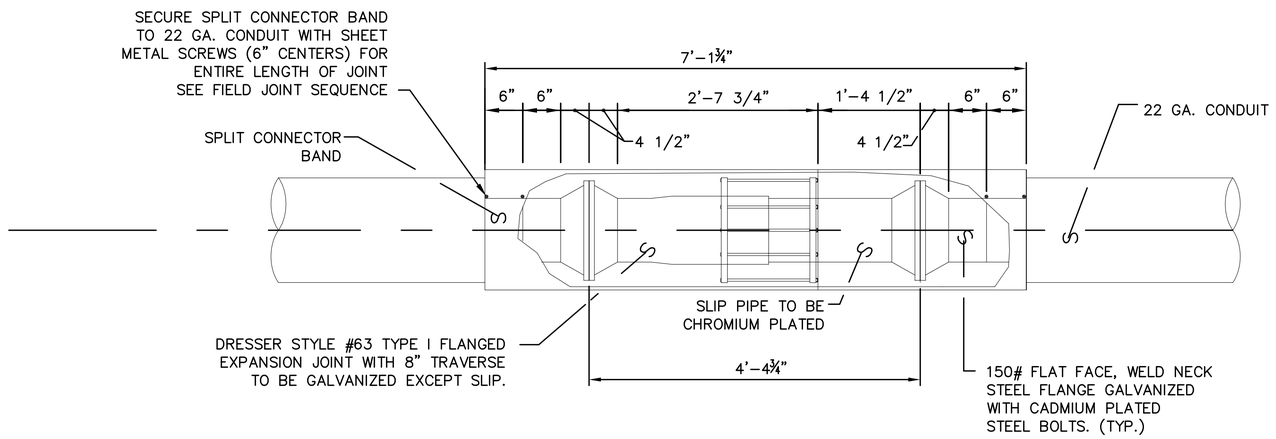
NOTE: AIR RELIEF VALVE BOX(ES) INSTALLED ON BRIDGE DECKS SHALL HAVE INTEGRAL, OR FABRICATED AND SECURELY FASTENED, LUGS OR A RING WHICH WILL ANCHOR THE BOX(ES) INTO THE DECK SLAB, AS APPROVED BY THE ENGINEER.



DOUBLE VALVE BOX ASSEMBLY



WELD-O-LET DETAIL



EXPANSION JOINT ASSEMBLY

NOTE: BODY AND SLIP PIPE TO BE MIN.½" THICK.

REVISIONS:

DRAWN: EJK
CHECKED: MJW
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CITY OF CLEVELAND WATER UTILITY DETAILS-6

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-25

6/6/2007 1:01 PM

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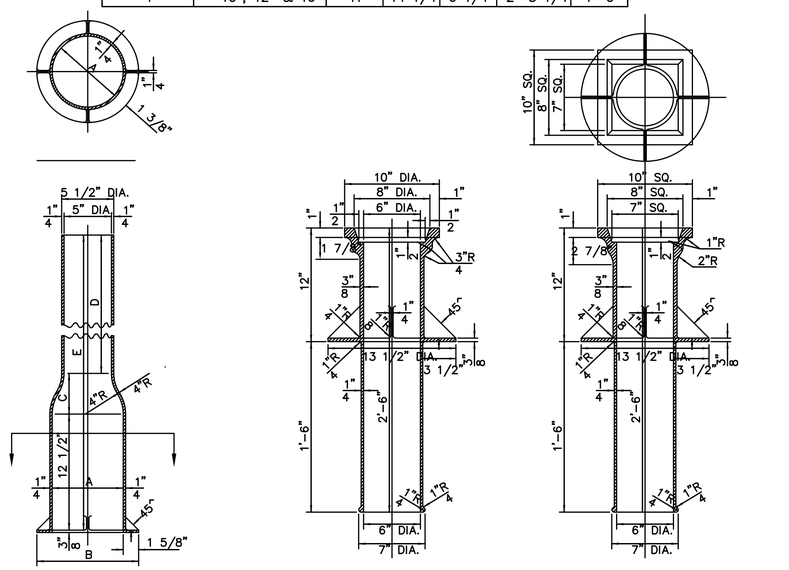
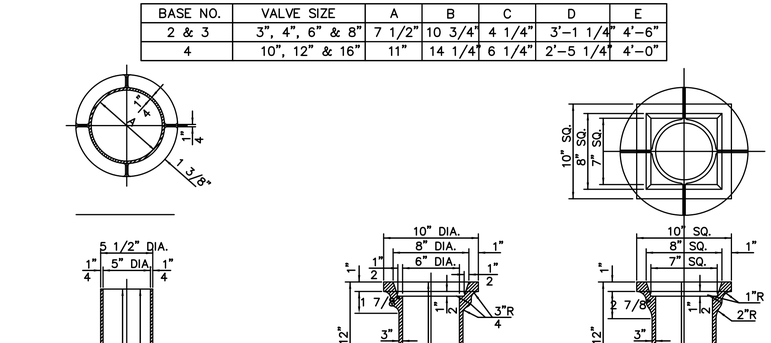
BASE NO.	VALVE SIZE	A	B	C	D	E
2 & 3	3", 4", 6" & 8"	7 1/2"	10 3/4"	4 1/4"	3'-1 1/4"	4'-6"
4	10", 12" & 16"	11"	14 1/4"	6 1/4"	2'-5 1/4"	4'-0"

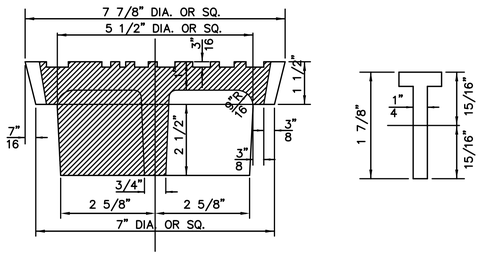


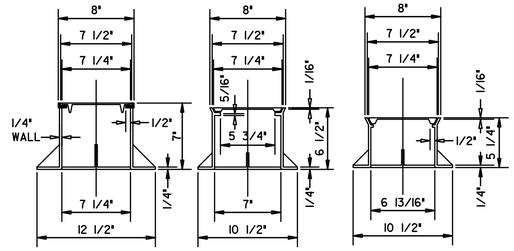
BASE NO. 2, 3 & 4
EST. WT. 71 POUNDS (NOS. 2 & 3)
EST. WT. 79 POUNDS (NOS. 4)

TOP NO. 1 & 2 (ROUND HEAD)
EST. WT. 73 POUNDS

TOP NO. 3 & 4 (SQUARE HEAD)
EST. WT. 73 POUNDS



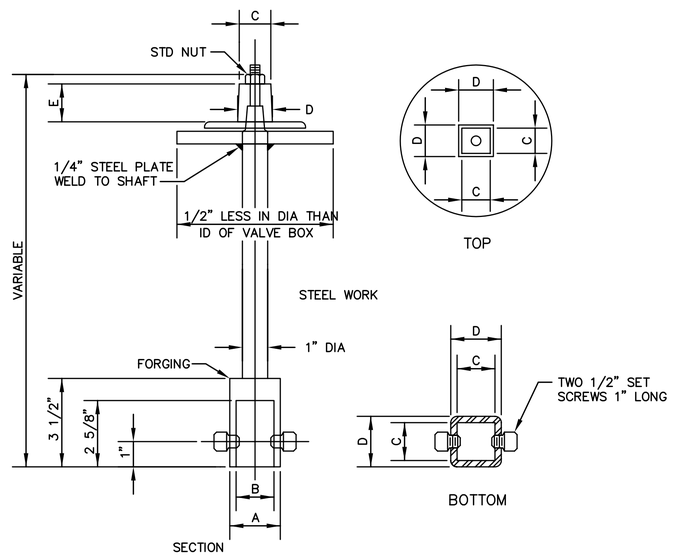




ALTERNATE SHORT TOP NO. 1
WT 36 LBS

ALTERNATE SHORT TOP NO. 2
WT 29 LBS

ALTERNATE SHORT TOP NO. 3
WT 21LBS

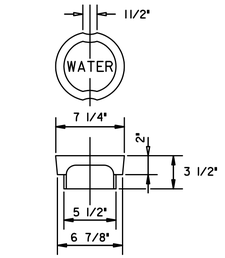


NOTE: VALVE NUTS TO BE CONTERSUNK
1/8" TO RECEIVE SET SCREWS

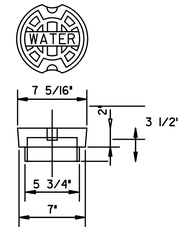
VALVE SIZE	A	B	C	D	E
3" AND SMALLER	2"	1 1/2"	1 1/4"	1 3/8"	1 1/2"
4" TO 20"	2 1/2"	2"	1 3/4"	1 7/8"	1 3/4"
24" AND LARGER	2 5/8"	2 1/8"	* 2"	* 2"	2"

*-NOT TAPERED

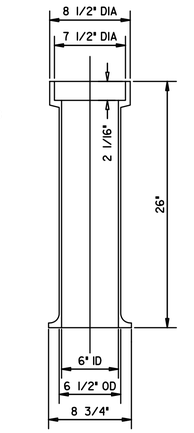
NOTE: EXTENSION STEM REQUIRED WHENEVER DEPTH TO TOP OF VALVE OPERATING NUT EXCEEDS 4'-0"



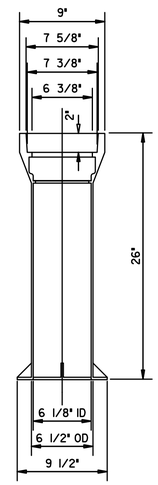
ALTERNATE COVER NO. 1



ALTERNATE COVER NO. 2
WEIGHT 13 POUNDS



ALTERNATE LONG TOP NO. 1
WEIGHT 55.5 POUNDS



ALTERNATE LONG TOP NO. 2
WEIGHT 65 POUNDS

REVISIONS:

DRAWN: EJK
CHECKED: MJW
APPROVED: RHW
DATE: 6-1-2007
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

CITY OF CLEVELAND WATER UTILITY DETAILS-7

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-26

6/6/2007 1:02 PM
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LIGHTING GENERAL NOTES

PROPOSED WORK

IT IS THE INTENT OF THESE PLANS TO PROVIDE LIGHTING ALONG THE LIMITS OF THE PROJECT AS SHOWN ON THE DRAWINGS. THIS WORK WILL INCLUDE SPECIFIC COMPONENTS FOR A PROPOSED LIGHTING SYSTEM.

CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MOUNTING ALL CONDUIT, PULL BOXES, AND FOUNDATIONS AS SHOWN ON THE PLANS. CONTRACTOR SHALL VERIFY THAT POLE AND BRACKET CONDUCTORS ARE FURNISHED AND SUPPLIED BY CPP WHEN INSTALLING THE LUMINAIRE TO THE MOUNTING BRACKET AND POLE FOR FUTURE CONNECTION BY CPP.

CLEVELAND PUBLIC POWER SHALL BE RESPONSIBLE FOR SUPPLYING, PULLING, AND CONNECTING ALL WIRE CONDUCTORS FROM THE SERVICE TO EACH OF THE LIGHT FIXTURES.

ITEM TS625 – POWER SERVICE

IN ADDITION TO THE REQUIREMENTS OF THE SPECIFICATIONS, THE FOLLOWING IS ADDED.

THE POWER SUPPLYING AGENCY FOR THIS PROJECT IS:

POWER COMPANY: CLEVELAND PUBLIC POWER
PHONE NUMBER: (216) 664–3922
CONTACT NAME: DALE TURKOVICH

ITEM TS625 – LIGHT POLE FOUNDATION

LIGHT POLE FOUNDATIONS SHALL BE CONSTRUCTED ACCORDING TO THE OHIO DEPARTMENT OF TRANSPORTATION STANDARD CONSTRUCTION DRAWING DETAIL HL–20.11.

CONTRACTOR SHALL COORDINATE WITH THE OWNER OF THE ANCHOR BOLT PATTERNS BEING USED. ANCHOR BOLTS SHALL BE PROVIDED BY THE CITY OF CLEVELAND.

PAYMENT WILL BE MADE AT THE UNIT BID PRICE FOR EACH.

ITEM TS625, "LIGHT POLE FOUNDATION" WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM IN A SATISFACTORY AND WORKMANLIKE MANNER.

ITEM TS625 – LIGHT POLE, DECORATIVE, INSTALLATION ONLY

ALL LIGHT POLES SHALL BE PROVIDED BY THE STREET LIGHTING BUREAU OF THE CITY OF CLEVELAND . CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE LIGHT POLES FROM THE CITY OF CLEVELAND AND PROVIDE THE COMPLETE INSTALLATION OF THE LIGHT POLES SHOWN IN THE PROJECT.

PAYMENT WILL BE MADE FOR THE INSTALLATION PRICE FOR EACH CMS ITEM TS625, "LIGHT POLE, DECORATIVE, INSTALLATION ONLY" WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM IN A SATISFACTORY AND WORKMANLIKE MANNER.

ITEM TS625 – LUMINAIRE, CONVENTIONAL, INSTALLATION ONLY

IN ADDITION TO THE REQUIREMENTS OF ODOT'S CONSTRUCTION AND MATERIAL SPECIFICATIONS, LUMINAIRES FOR CONVENTIONAL LIGHTING UNITS SHALL BE AS FOLLOWS:

ALL LUMINAIRES SHALL BE PROVIDED BY THE STREET LIGHTING BUREAU OF THE CITY OF CLEVELAND. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE REQUIRED LUMINAIRES ASSOCIATED WITH THE PROJECT FROM THE CITY OF CLEVELAND AND PROVIDE THE COMPLETE INSTALLATION OF THE LUMINAIRE(S) TO THE BRACKET ARM AND POLE.

LUMINAIRES FOR CONVENTIONAL LIGHTING UNITS WITH AN IES II–M–SC DISTRIBUTION AND 250 WATT HIGH PRESSURE SODIUM LAMPS SHALL BE AMERICAN ELECTRIC "SERIES 126" WITH PHOTOMETRIC DISTRIBUTION AE3849I, COOPER "OVD" WITH PHOTOMETRIC DISTRIBUTION OVD2S2F, GENERAL ELECTRIC "M–400" WITH PHOTOMETRIC DISTRIBUTION 1014, OR EQUAL AS APPROVED BY THE ENGINEER. EACH LUMINAIRE SHALL BE PROVIDED WITH A SELF–CONTAINED PHOTOCELL.

PAYMENT WILL BE MADE AT THE UNIT BID PRICE FOR EACH ITEM TS625, "LUMINAIRE, CONVENTIONAL, INSTALLATION ONLY" FOR EACH LUMINAIRE WHICH SHALL BE FULL COMPENSATION FOR ALL INSTALLATION, LABOR, AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM IN A SATISFACTORY AND WORKMANLIKE MANNER.

ITEM TS625 – LIGHT POLE ANCHOR BOLTS, MISC.: SET FOR PILASTER MOUNTED LIGHT POLE

ALL ANCHOR BOLTS SHALL BE PROVIDED BY THE STREET LIGHTING BUREAU OF THE CITY OF CLEVELAND. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE REQUIRED ANCHOR BOLTS ASSOCIATED FOR PARAPET MOUNTED OR CAST–IN–PLACE DRILLED SHAFT FOUNDATIONS FROM THE CITY OF CLEVELAND AND PROVIDE THE COMPLETE INSTALLATION OF THE ANCHOR BOLTS ASSOCIATED WITH THE APPROPRIATE FOUNDATION BEING USED.

WHEN A LIGHT POLE IS MOUNTED ON A PILASTER OR BLISTER LOCATED ON A BRIDGE PARAPET OR ON A RETAINING WALL, THE REQUIRED ANCHOR BOLTS MAY DIFFER IN LENGTH AND/OR SHAPE FROM THOSE REQUIRED WHEN THE POLE IS MOUNTED ON A CAST–IN–PLACE DRILLED SHAFT FOUNDATION.

IN ADDITION, THERE IS NO FOUNDATION CONSTRUCTION ITEM IN WHICH TO INCLUDE THE SETTING OF THE ANCHOR BOLTS. THUS, THE SETTING OF THE ANCHOR BOLTS INTO THE PILASTER, BLISTER OR DRILLED SHAFT FOUNDATION IS ALSO PART OF THIS WORK.

PAYMENT WILL BE MADE AT EACH SUCH POLE LOCATION AT THE UNIT PRICE BID FOR EACH ITEM TS625, "LIGHT POLE ANCHOR BOLTS, MISC.: SET FOR PILASTER MOUNTED LIGHT POLE" AND SHALL BE FULL COMPENSATION FOR THE INSTALLATION COSTS ASSOCIATED WITH THE SET OF ANCHOR BOLTS REQUIRED.

ITEM TS625 – PULL BOXES

REFERENCE IS MADE TO THE STANDARD DRAWING HL–30.11 FOR DETAILS OF DRAINING PULL BOXES. UNDERDRAINS FOR PULL BOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND CONNECT TO THE MSE WALL DRAINAGE SYSTEM USING 4" TYPE E CONDUIT PER SPECIFICATION ITEM 603. THE COSTS INVOLVED WITH THE UNDERDRAINS SHALL BE INCIDENTAL AND INCLUDED AS A PART OF THE COST OF THE PULL BOX.

ITEM TS625 – CONDUIT EXPANSION AND DEFLECTION

EXPANSION FITTINGS SHALL BE OZ TYPE AX, CROUSE HINDS TYPE XJG, APPLETON TYPE AX OR EQUAL APPROVED BY THE ENGINEER. EACH EXPANSION FITTING SHALL PROVIDE EITHER 4" OR 8" TOTAL MOVEMENT AS SPECIFIED BY THE PLAN DETAILS AND SHALL HAVE AN EXTERNAL COPPER BONDING JUMPER, UNLESS SPECIFIED OTHERWISE BY THE PLAN DETAILS.

DEFLECTION COUPLINGS SHALL BE OZ TYPE DX, CROUSE HINDS TYPE XD, APPLETON TYPE DF OR EQUAL APPROVED BY THE ENGINEER. EACH DEFLECTION COUPLING SHALL HAVE AN EXTERNAL COPPER BONDING JUMPER, UNLESS SPECIFIED OTHERWISE BY THE PLAN DETAILS.

ITEM TS625 – BRACKET ARM, 8', INSTALLATION ONLY

ALL LIGHT POLE BRACKET ARMS SHALL BE PROVIDED BY THE STREET LIGHTING BUREAU OF THE CITY OF CLEVELAND. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE LIGHT POLE BRACKET ARMS FROM THE CITY OF CLEVELAND FOR COMPLETE INSTALLATION OF THE BRACKET ARMS AS SHOWN IN THE PROJECT.

PAYMENT WILL BE MADE FOR THE INSTALLATION PRICE FOR EACH ITEM TS625, "BRACKET ARM, 8', INSTALLATION ONLY" WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM IN A SATISFACTORY AND WORKMANLIKE MANNER.

Use general.ctb and generalHalf.ctb to plot this drawing

ABBEY–PLAN.dwg

REVISIONS:

DRAWN: JRH
CHECKED: RLS
APPROVED: JGS
DATE: 6/01/07
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114–1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

LIGHTING GENERAL NOTES

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U–27

				TS625	TS625	TS625	TS625	TS625	TS625	TS625	TS625	TS625	TS625	TS625
				LIGHT POLE, DECORATIVE, INSTALLATION ONLY	LIGHT POLE ANCHOR BOLTS, MISC:SET FOR PILASTER MOUNTED LIGHT POLE	LIGHT POLE FOUNDATION	CONDUIT, 2", 725.05 SCH 80, PVC	WEATHERPROOF SERVICE HEAD, 2"	TRENCH 24" DEEP	PULL BOX, 725.08, 24"	JUNCTION BOX, STRUCTURE 18"x12"x8"	GROUND ROD, 8'	LUMINAIRE, CONVENTIONAL, INSTALLATION ONLY	BRACKET ARM, 8', INSTALLATION ONLY
				EACH	EACH	EACH	FT	EACH	FT	EACH	EACH	EACH	EACH	EACH
REF.	FROM STATION	REF	TO STATION											
POLE #44286	13+78, 115.5' LT	PB1	13+14, 35.5' RT				225	1	185					
PB1	13+14, 35.5' LT	1A01	13+12, 34.0' LT				10		5	1		1		
1A01	13+12, 34.0' LT			1		1							1	1
PB1	13+14, 35.5' LT	JB1	12+31.8, 33.0' LT				90							
1A02	12+31.8, 34.0' LT	JB1	12+31.8, 33.0' LT	1	1		5						1	1
JB1	12+31.8, 33.0' LT	JB2	11+50.2, 33.0' LT				90				1			
JB2	11+50.2, 33.0' LT	1A03	11+50.2, 34.0' LT				5				1			
1A03	11+50.2, 34.0' LT			1	1								1	1
TOTALS CARRIED TO GENERAL SUMMARY				3	2	1	425	1	190	1	2	1	3	3

REVISIONS:

DRAWN: JRH
CHECKED: RLS
APPROVED: JGS
DATE: 6/01/07
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

LIGHTING SUBSUMMARY

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-28

Use general.ctb and generalHalf.ctb to plot this drawing

ABBEY-PLAN.dwg

SHEET NUMBER											ITEM	GRAND TOTAL	UNIT	DESCRIPTION
U-28														
3											TS625	3	EACH	LIGHT POLE, DECORATIVE, INSTALLATION ONLY
2											TS625	2	EACH	LIGHT POLE ANCHOR BOLTS, MISC: SET FOR PILASTER MOUNTED LIGHT POLE
1											TS625	1	EACH	LIGHT POLE FOUNDATION
425											TS625	425	FT	CONDUIT, 2", 725.05, SCH 80 PVC
1											TS625	1	EACH	WEATHERPROOF SERVICE HEAD, 2"
190											TS625	190	FT	TRENCH 24" DEEP
1											TS625	1	EACH	PULL BOX, 725.08, 24"
2											TS625	2	EACH	JUNCTION BOX, STRUCTURE 18"x12"x8"
1											TS625	1	EACH	GROUND ROD, 8'
3											TS625	3	EACH	LUMINAIRE, CONVENTIONAL, INSTALLATION ONLY
3											TS625	3	EACH	BRACKET ARM, 8', INSTALLATION ONLY

REVISIONS:

DRAWN: JRH
CHECKED: RLS
APPROVED: JGS
DATE: 6/01/07
JOB NO.:

DESIGN AGENCY
HNTB
1100 SUPERIOR AVE., SUITE 1330
CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

LIGHTING GENERAL SUMMARY

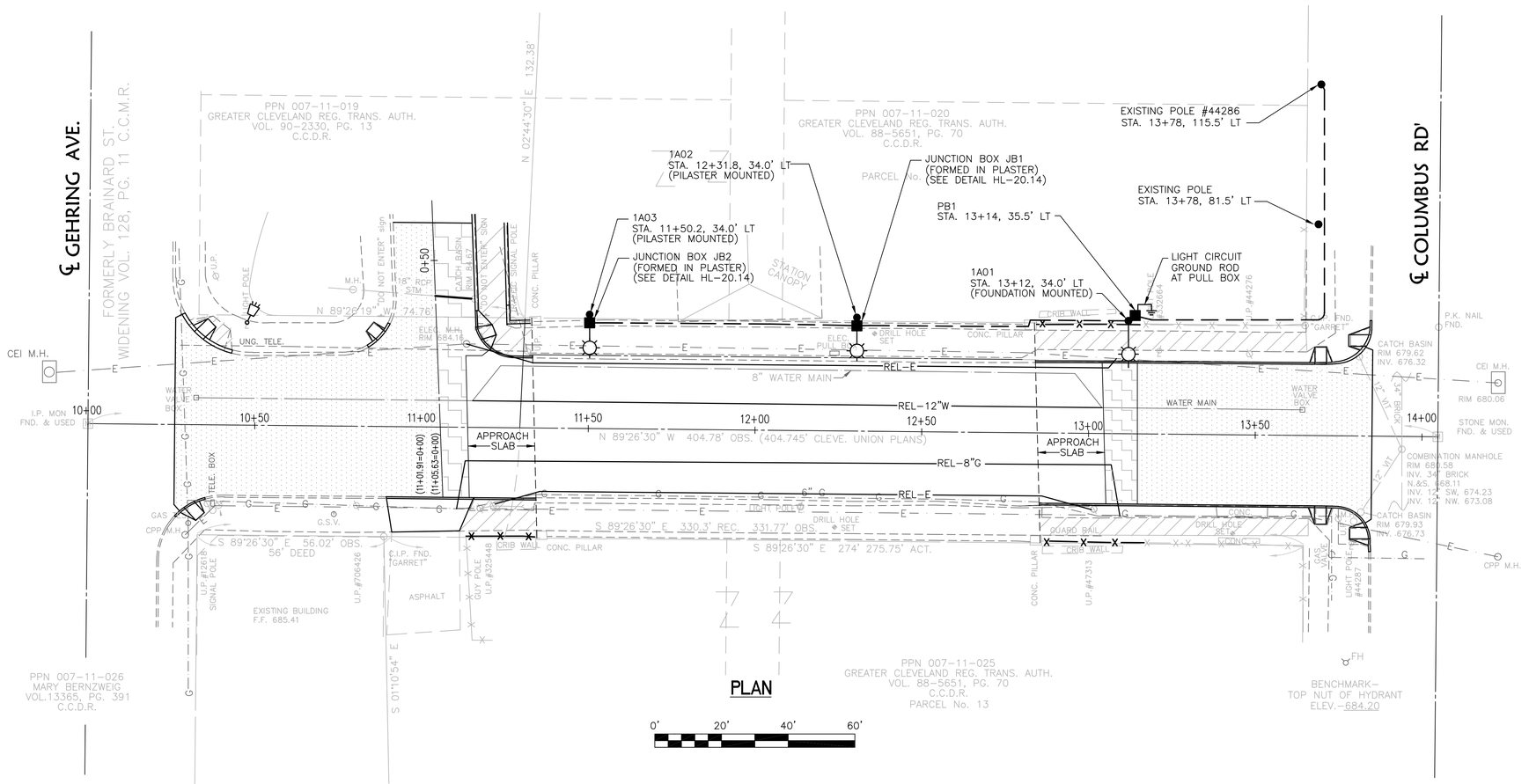
REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-29

Use general.ctb and generalHalf.ctb to plot this drawing

ABBEY-PLAN.dwg



LEGEND

- 250 WATT HPS LUMINAIRE ON 30' ROADWAY POLE
- EXISTING FLOOD LIGHT
- PULL BOX OR JUNCTION BOX
- 2" SCH 80 PVC CONDUIT

N

REVISIONS:

DRAWN:	CHECKED:	APPROVED:	DATE:	JOB NO.:
JRH	RLS	JGS	6/01/07	

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HNTB 1100 SUPERIOR AVE., SUITE 1330 CLEVELAND, OHIO 44114-1816

ENGINEERING & PROJECT MANAGEMENT DIVISON

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY

ROADWAY PLAN & PROFILE

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

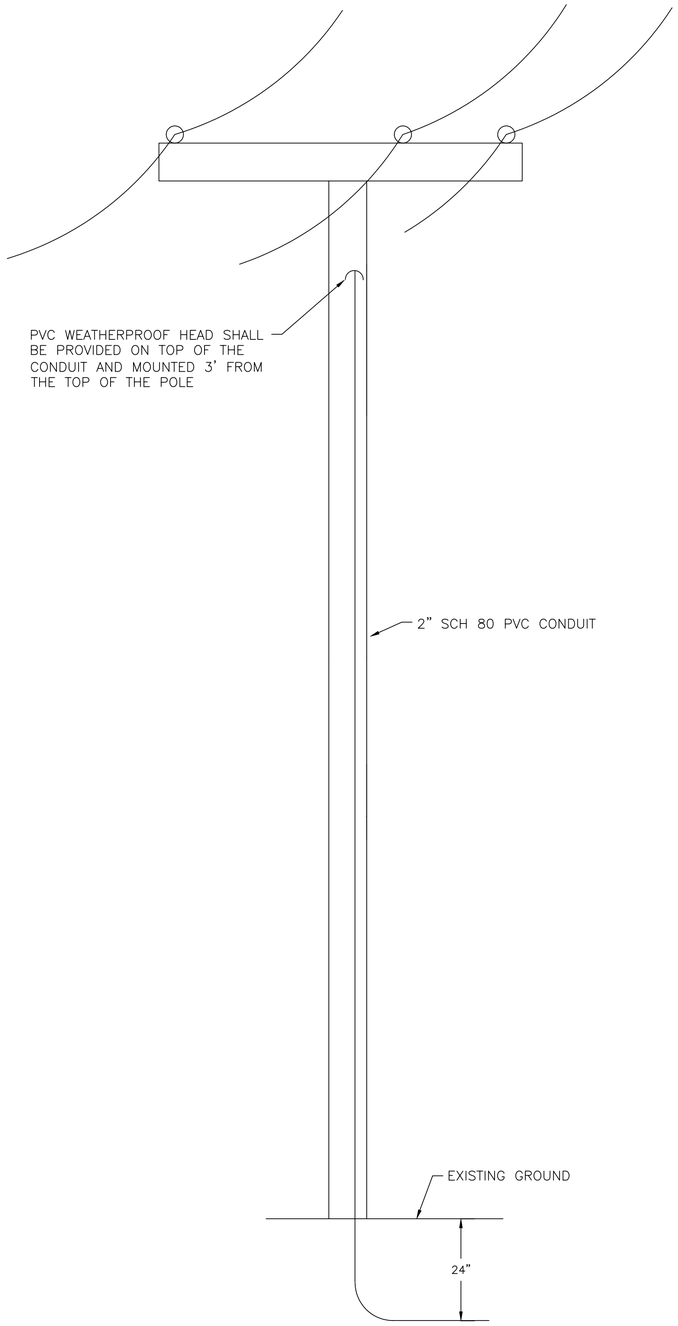
RTA PROJ 29D

BID PAC

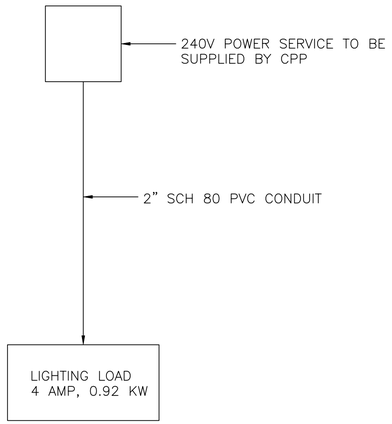
SHEET U-30

Use general.ctb and generalHalf.ctb to plot this drawing

ABBEY-PLAN.dwg



POLE #44286 INSTALLATION DETAIL
NOT TO SCALE



POWER DIAGRAM

NOTES:

1. CONDUIT SHALL BE SECURED TO POLE IN 6' INCREMENTS PER CPP REQUIREMENTS.

REVISIONS:

DRAWN: JRH
CHECKED: RLS
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LIGHTING DETAILS

REHABILITATION OF ABBEY AVE. BRIDGE OVER GCRTA TRACKS

RTA PROJ 29D
BID PAC

SHEET U-31

Use general.ctb and generalHalf.ctb to plot this drawing

ABBEY-PLAN.dwg