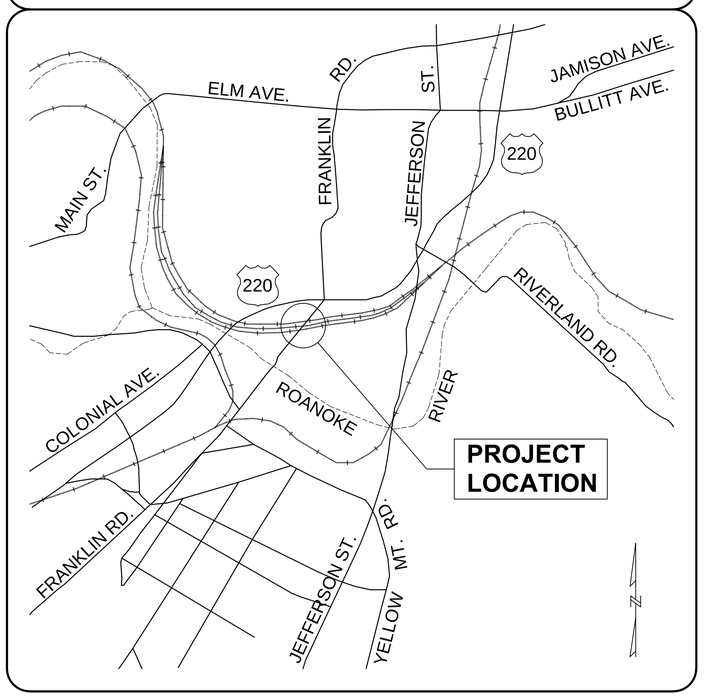
PROJECT LOCATION MAP



ROANOKE

OFFICE OF THE CITY ENGINEER

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CONSTRUCTION PROCEDURE REQUIREMENTS

1. RIGHT-OF-WAY EXCAVATION PERMIT - PRIOR TO COMMENCEMENT OF ANY DIGGING, ALTERATION OR CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY (STREETS, ALLEYS, PUBLIC EASEMENTS), A RIGHT-OF-WAY EXCAVATION PERMIT SHALL BE APPLIED FOR AND OBTAINED BY THE CONTRACTOR FROM THE CITY OF ROANOKE.
2. LAND DISTURBANCE PERMIT - AN APPROVED EROSION AND SEDIMENT CONTROL PLAN FOR ANY BORROW/FILL SITES ASSOCIATED WITH THE PROJECT MUST BE SUBMITTED PRIOR TO THE ISSUANCE OF A LAND DISTURBANCE PERMIT.
3. PLANS AND PERMITS - A COPY OF THE PLANS AS APPROVED BY THE CITY (SIGNED BY THE PROPER CITY OFFICIALS) AND ALL PERMITS ISSUED BY THE CITY SHALL BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES OF ONGOING CONSTRUCTION.
4. LOCATION OF UTILITIES - THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
5. CONSTRUCTION ENTRANCE - THE CONTRACTOR SHALL INSTALL AN ADEQUATE CONSTRUCTION ENTRANCE FOR ALL CONSTRUCTION RELATED EGRESS FROM THE SITE. SIZE AND COMPOSITION OF CONSTRUCTION ENTRANCE SHALL BE AS SHOWN ON THE PLANS.
6. STREETS TO REMAIN CLEAN - IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE THAT THE PUBLIC STREET ADJACENT TO THE CONSTRUCTION ENTRANCE REMAINS FREE OF MUD, DIRT, DUST, AND/OR ANY TYPE OF CONSTRUCTION MATERIALS OR LITTER AT ALL TIMES.
7. BARRICADES/ DITCHES - THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF ALL EXCAVATED DITCHES AND SHALL FURNISH AND ENSURE THAT ALL BARRICADES PROPER AND NECESSARY FOR THE SAFETY OF THE PUBLIC ARE IN PLACE.
8. SEWER AND PAVEMENT REPLACEMENT - CONSTRUCTION OF SANITARY SEWERS AND THE REPLACEMENT OF PAVEMENT SHALL BE IN ACCORDANCE WITH APPROVED STANDARDS AND SPECIFICATIONS OF THE CITY OF ROANOKE AND THE WESTERN VIRGINIA WATER AUTHORITY.
9. APPROVED PLANS/ CONSTRUCTION CHANGES - ANY CHANGE OR VARIATION FROM THE CONSTRUCTION DESIGN AS SHOWN ON THE OFFICIALLY APPROVED PLANS SHALL BE APPROVED BY THE EROSION AND SEDIMENT CONTROL AGENT PRIOR TO SAID CHANGES OR VARIATION IN CONSTRUCTION BEING MADE.
10. FINAL ACCEPTANCE/ CITY - THE OWNER OR DEVELOPER SHALL FURNISH THE CITY OF ROANOKE'S PLANNING BUILDING AND DEVELOPMENT DEPARTMENT WITH A FIELD SURVEY FINAL CORRECT SET OF AS-BUILT PLANS OF THE NEWLY CONSTRUCTED STORM DRAIN AND/OR STORM WATER MANAGEMENT FACILITIES PRIOR TO FINAL ACCEPTANCE AND ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE CITY. AS-BUILT PLANS SHALL BE PROVIDED IN THE STATE PLANE VIRGINIA SOUTH COORDINATE SYSTEM, NAD 1983, FIPS 4502 FEET, US SURVEY FEET, DATUM NAD 83, IN THE FORM OF 1 PAPER COPY AND 1 DIGITAL AUTOCAD FILE.

CONSULTING ENGINEERS

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COMMONWEALTH OF VIRGINIA
5/17/16
DANIEL R DEAN
Lic. No.33530
PROFESSIONAL ENGINEER

AECOM PROJECT NO.: 60290893

PROJECT NAME

REPLACEMENT OF FRANKLIN ROAD BRIDGE

OVER NORFOLK SOUTHERN RAILWAY

STRUCTURE 1817

CITY OF ROANOKE, VIRGINIA

CITY PROJECT NUMBER: 6787

VDOT PROJECT NUMBER: 0220-128-R34 / UPC 104248

NSC FILE: 117-19156 (BR0002281) R.R.M.P. V-243.55 (VIRGINIA)

CP NUMBER: CP150045

TAX NUMBER: TM 9999998

APPROVED FOR CONSTRUCTION

ROANOKE CITY ENGINEER	8-25-2016 DATE
DIRECTOR OF PUBLIC WORKS	08/24/16 DATE
ASSISTANT CITY MANAGER FOR OPERATIONS	8/24/16 DATE

SHEET NUMBER: G-001

PLAN SHEET SIZE: 22" X 34"

FRANKLIN ROAD BRIDGE REPLACEMENT

ANSI D 22" x 34"

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REV #	DATE	DESCRIPTION

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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8/17/16
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ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

S□EET TITLE

INDEX OF SHEETS AND TABLE OF REVISIONS

S□EET NUMBER

G-002

ANSI D 22" x 34"

ESTIMATED QUANTITIES - BRIDGE SUBSTRUCTURE AND RETAINING WALLS

	CONCRETE CLASS A3	CONCRETE CLASS C1	REINF. STEEL	CRR REINF. STEEL, CL. I	STRUCTURE EXCAV. ⊙	ROCK EXCAV.	SELECT MAT. TY I	DRILLED SHAFT STD. EXCAV. 48" DIA.	DRILLED SHAFT ROCK SOCKET 42" DIA.	PERMANENT STEEL CASING	CROSS HOLE SONIC LOG TESTING	STEEL PILES HP12x53	STEEL PILES HP14x73	ARCH. TREATMENT	CONCRETE RAILING ⊙
	CY	CY	LBS	LBS	CY	CY	TON	LF	LF	LF	EA	LF	LF	SY	LF
ABUTMENT A	660	—	22,100	21,600	1,000	—	3,400	—	—	—	—	—	1370	—	49
PIER 1	345	—	32,500	—	120	—		153	36	60	3	—	—	—	—
PIER 2	366	—	33,900	—	120	—		224	36	60	3	—	—	—	—
PIER 3	339	—	32,300	—	50	—		236	36	60	3	—	—	—	—
PIER 4	287	—	28,700	—	200	—		47	36	60	3	—	—	—	—
ABUTMENT B	510	42	17,700	14,400	1,400	18	2,100	—	—	—	—	230	770	27	110
RETAINING WALL AE *	753	—	30,600	25,900	2,300	—	2,800	—	—	—	—	2170	—	458	140
RETAINING WALL AW	132	—	6,900	3,400	400	—	270	—	—	—	—	830	—	58	83
TOTAL	3,392	42	204,700	65,300	5,590	18	8,570	660	144	240	12	3,230	2,140	543	382

* INCLUDES PLAZA WALL

⊙ INDICATES ITEM TO BE PAID BASED ON PLAN QUANTITY

QUANTITY FOR STRUCTURE EXCAVATION INCLUDES LIMITS OF SELECT BACKFILL AS INDICATED IN THE PLANS.

NOTES

DISMANTLE AND REMOVE EXISTING STRUCTURE WILL BE PAID AT THE CONTRACT LUMP SUM PRICE. THIS PRICE SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND EQUIPMENT NEEDED FOR DEMOLITION, REMOVAL, AND DISPOSAL OF THE EXISTING BRIDGE, AS WELL AS PREPARATION, SUBMISSION, AND APPROVAL OF THE DEMOLITION PLAN, PROTECTION OF RAILWAY FACILITIES, SITE ACCESS, AND ASSOCIATED MAINTENANCE OF TRAFFIC. DEMOLITION INCLUDES THE FOLLOWING ITEMS.

1. EXISTING BRIDGE DECK, RAILILNG, SIDEWALKS, LIGHTS
2. EXISTING BRIDGE STEEL SUPERSTRUCTURE
3. EXISTING ABUTMENTS, INCLUDING WINGWALLS AND SPREAD FOOTING FOUNDATIONS
4. EXISTING PIERS TO THE LIMITS INDICATED IN THESE PLANS

CONTRACTOR SHALL COORDINATE WITH AEP TO HAVE ELECTRICAL SERVICE DISCONNECTED PRIOR TO REMOVAL OF EXISTING STRUCTURE LIGHTS.

STRUCTURAL STEEL WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE. ESTIMATED WEIGHT OF STRUCTURAL STEEL IS SHOWN FOR INFORMATION ONLY. THE PRICE BID SHALL INCLUDE STEEL GIRDERS AND CROSS FRAMES, SHEAR CONNECTORS, HLMR BEARINGS, ANCHORAGES, BOLTS, AND OTHER METALS OR MATERIALS NOT PAID FOR AS A SEPARATE PAY ITEMS. PRICES FOR STRUCTURAL STEEL SHALL INCLUDE THE COST FOR FURNISHING, FABRICATING, TRANSPORTING, ERECTING STEEL MEMEBERS, ASSOCIATED MAINTENANCE OF TRAFFIC, SITE ACCESS, PROTECTION OF CONCRETE SUBSTRUCTURE, PREPARATION AND APPROVAL OF WORK PLANS, AND PROTECTION OF RAILROAD FACILITIES.

COST OF BRIDGE BEARINGS SHALL BE INCLUDED WITH THE PRICE BID FOR STRUCTURAL STEEL.

ESTIMATED QUANTITIES - BRIDGE SUPERSTRUCTURE

ITEM	UNIT	QUANTITY
CONCRETE, CLASS A4	CY	1134
CRR REINF STEEL, CL. I	LBS	211,900
CONCRETE RAILING ⊙	LF	1097
STRUCTURAL STEEL, A709 GR. 50W	LBS*	1,230,500
DECK EXPANSION JOINT ⊙	LF	152
BRIDGE DECK GROOVING	SY	2618

* INDICATES ITEM WILL BE MEASURED AND PAID ON A LUMP SUM BASIS

⊙ INDICATES ITEM TO BE MEASURED AND PAID BASED ON PLAN QUANTITY

LUMP SUM BID ITEMS

MOBILIZATION	LS
CONSTRUCTION SURVEYING	LS
EROSION AND SEDIMENT CONTROL	LS
MAINTENANCE OF TRAFFIC	LS
DISMANTLE AND REMOVE EXISTING STRUCTURE	LS
MATERIAL DISPOSAL	LS
ENVIRONMENTAL AND WORKER PROTECTION	LS
BRIDGE PYLONS	LS
CONCRETE SURFACE COLOR COATING	LS
ELECTRICAL FACILITIES	LS
TRAFFIC SIGNALIZATION	LS
LANDSCAPING	LS
EARTHWORK	LS

ESTIMATED QUANTITIES - ROADWAY

ITEM	UNIT	QUANTITY
FLOWABLE BACKFILL	CY	17
15" CONCRETE PIPE	LF	52
18" CONCRETE PIPE	LF	8
24" CONCRETE PIPE	LF	333
30" CONCRETE PIPE	LF	8
DROP INLET DI-3B, L=10'	EA	1
DROP INLET DI-3B, L=12'	EA	2
DROP INLET DI-3BB, L=8'	EA	1
MANHOLE MH-1 or 2	LF	31
END WALLS	EA	1
FRAME & COVER MH-1	EA	4
RECONSTRUCT EXISTING MANHOLE	EA	1
EROSION CONTROL STONE CL. 2, EC-1	TON	30
AGGR. BASE MAT'L TYPE I NO. 21B	TON	1,973
ASPHALT CONCRETE TYPE SM-12.5D	TON	508
ASPHALT CONCRETE TYPE BM-25.0A	TON	606
STD. CURB CG-2	LF	110
RADIAL CURB CG-2	LF	54
COMB. CURB & GUTTER CG-6	LF	753
RADIAL COMB. CURB & GUTTER CG-6	LF	148
CG-12 DETECTABLE WARNING SURFACE	SY	32
CONCRETE SIDEWALK 4"	SY	1,058
BRICK BANDING	LF	580
METAL RAILING	LF	70
FLEXIBLE PAVEMENT PLANING 2"-4"	SY	2,849
DEMOLITION OF PAVEMENT (FLEXIBLE)	SY	1,994
SAW CUT PAVEMENT (FULL DEPTH)	LF	993
TY. A PAVE. MARK ELONG. ARROW (SINGLE)	EA	3
TY. A PAVE. MARK ELONG. ARROW (DOUBLE)	EA	7
PAVEMENT LINE MARKING (Type A, CL. 1, 4")	LF	5,239
PAVEMENT LINE MARKING (Type A, CL. 1, 6")	LF	294
PAVEMENT LINE MARKING (Type A, CL. 1, 24")	LF	80
PAVEMENT MESSAGE MARK BICYCLE LANE SYMBOL	EA	6

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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5/17/16
DANIEL R DEAN
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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

ESTIMATED QUANTITIES

SHEET NUMBER

G-003

ANSI D 22" x 34"

BRIDGE GENERAL NOTES

SPECIFICATIONS:

CONSTRUCTION: VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS, 2007 AND ROAD AND BRIDGE STANDARDS, 2008.

DESIGN: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION, 2012; AND VDOT MODIFICATIONS.

DESIGN CAPACITY: AASHTO HL-93 LOADING.

BRIDGE NUMBER OF EXISTING BRIDGE 128-1817.

THESE PLANS ARE INCOMPLETE UNLESS ACCOMPANIED BY THE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS INCLUDED IN THE CONTRACT DOCUMENTS.

THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION WORK AREA PROTECTION MANUAL REVISION 1, JUNE 2011 AND LATEST REVISIONS.

DESIGN LOADING INCLUDES 20 PSF ALLOWANCE FOR CONSTRUCTION TOLERANCES AND CONSTRUCTION METHODS.

ALL STRUCTURAL STEEL, INCLUDING BEARINGS, SHALL BE ASTM A709 GRADE 50W AND SHALL BE UNPAINTED.

THE SPACING AND HEIGHT OF STUD SHEAR CONNECTORS SHALL BE SHOWN ON THE SHOP PLANS.

CONCRETE IN SUPERSTRUCTURE, INCLUDING SIDEWALKS AND RAILING, SHALL BE CLASS A4 ; CONCRETE IN SUBSTRUCTURE AND RETAINING WALLS SHALL BE CLASS A3. ALL CONCRETE SHALL BE LOW PERMEABILITY. PERMEABILITY TESTING IS NOT REQUIRED FOR THIS PROJECT.

ALL REINFORCING STEEL SHALL BE DEFORMED AND SHALL CONFORM TO ASTM A615, GRADE 60, EXCEPT FOR REINFORCING DESIGNATED AS CORROSION RESISTANT REINFORCING (CRR). CRR CLASS I SHALL CONFORM TO THE REQUIREMENTS OF ASTM A1035. CRR SHALL BE UTILIZED IN ACCORDANCE WITH VDOT IIM-S&B-81.5. ALL REINFORCING BAR DIMENSIONS ON THE DETAILED DRAWINGS ARE TO CENTERS OF BARS EXCEPT WHERE OTHERWISE NOTED AND ARE SUBJECT TO FABRICATION AND CONSTRUCTION TOLERANCES.

THE EXISTING BRIDGE STEEL PAINT SYSTEM IS ASSUMED TO CONTAIN LEAD. ACTIVITIES INVOLVING REMOVAL OF THE PAINT SYSTEM WILL INCLUDE CONTAINMENT AND ENVIRONMENTAL PROTECTIONS IN ACCORDANCE WITH APPLICABLE REGULATIONS.

TO PREVENT STAINING OF THE CONCRETE SUBSTRUCTURE, ALL CONCRETE SURFACES OF PIERS AND ABUTMENTS BELOW THE BEAM SEAT SHALL BE DRAPED, WRAPPED, OR OTHERWISE SHELTERED WITH A HEAVY-GAUGE WATER-PROOF COVERING, SUCH AS POLYETHYLENE SHEETING, CAPABLE OF RESISTING TEARING BY WIND GUSTS AND CONSTRUCTION OPERATIONS. THIS PROTECTION SHALL REMAIN IN PLACE UNTIL CONSTRUCTION OF THE BRIDGE DECK IS COMPLETED. COST OF PROTECTIVE SYSTEM SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.

MATERIAL IN THE SELECT BACKFILL ZONE SHALL BE SELECT MATERIAL TYPE I, MINIMUM CBR 30, AND SHALL BE COMPACTED IN ACCORDANCE WITH SECTIONS 303 AND 305 OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS. ALTERNATIVELY, 21A OR 21B MAY BE SUBSTITUTED FOR SELECT MATERIAL TYPE 1, MINIMUM CBR 30, AT NO ADDITIONAL COST TO THE CITY. PLACEMENT OF SELECT BACKFILL BEYOND THE LIMITS SHOWN WILL BE PAID FOR ONLY IF AUTHORIZED BY THE CITY. IN AREAS OF CUT, EXISTING MATERIALS MAY BE LEFT IN PLACE IF SHOWN TO HAVE STRENGTH CHARACTERISTICS GREATER THAN THE SELECT BACKFILL BY A PROGRAM OF LABORATORY TESTING APPROVED BY THE CITY.

REINFORCING BAR LAP LENGTHS, WHERE NOT INDICATED IN THE PLANS, SHALL CONFORM TO THE VALUES SHOWN IN THE REINFORCING LAP LENGTHS TABLE ON THIS SHEET.

SHEAR KEYS IN CAST-IN-PLACE CONCRETE JOINTS SHALL BE A MINIMUM SIZE OF 5" X 2", UNLESS NOTED OTHERWISE.

FOR ABUTMENTS AND RETAINING WALLS, USE 12" POROUS BACKFILL @ 100 LBS./CU. FT. COVER WEEP HOLE WITH 12" X 12" PLASTIC HARDWARE CLOTH 1/4" MESH OR GALVANIZED STEEL WIRE. MINIMUM WIRE DIAMETER 0.03", NUMBER 4 MESH HARDWARE CLOTH ANCHORED FIRMLY TO OUTSIDE OF STRUCTURE. COST SHALL BE INCLUDED IN THE PRICE BID FOR CONCRETE.

ALL STEEL PILES SHALL CONFORM TO ASTM A709 GRADE 50. THE REQUIRED NOMINAL PILE AXIAL RESISTANCE SHALL BE BASED ON A RESISTANCE FACTOR OF 0.50. SUITABILITY OF THE PROPOSED PILE DRIVING EQUIPMENT SHALL BE CONFIRMED BY WAVE EQUATION ANALYSIS IN ACCORDANCE WITH THE SPECIFICATIONS, WHICH SHALL BE SUBMITTED TO THE CITY FOR APPROVAL. ALL PILES SHALL BE DRIVEN TO PRACTICAL REFUSAL BASED ON THE RESULTS OF THE DRIVABILITY ANALYSIS. ALL PILES SHALL BE DRIVEN WITH CAST STEEL POINTS CONFORMING TO ASTM A148 (GRADE 90-60). THE COST OF DRIVING POINTS SHALL BE INCLUDED IN THE PRICE BID FOR STEEL PILES.

THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO ENSURE THAT THE PILES ARE IN PROPER ALIGNMENT, INCLUDING THE USE OF INSTALLATION FRAMES, FIXED LEADS OR OTHER MEANS AS ARE NECESSARY.

CONCRETE SURFACE COLOR COATING, SELECTED FROM THE VDOT CURRENT LIST OF APPROVED CONCRETE SURFACE COLOR COATINGS, SHALL BE APPLIED TO THE FOLLOWING SURFACES:

A. ALL SURFACES OF CONCRETE RAILING, THE EDGE OF DECK SLAB AND THE UNDERSIDE OF THE BRIDGE DECK OVERHANGS FROM THE DECK EDGE TO THE STEEL GIRDER.
B. PIER WALLS FROM 6 INCHES BELOW FINISHED GRADE TO THE UPPER LIMITS OF THE PIER CAPS BUT EXCLUDING THE TOP OF CAP. PIER COATING SHALL NOT BE APPLIED UNTIL AFTER CONSTRUCTION OF THE BRIDGE DECK.
C. EXPOSED SURFACES OF ABUTMENT WALLS FROM 6 INCHES BELOW FINISHED GRADE TO AND INCLUDING THE TOP OF THE WINGWALL, EXCLUDING BRIDGES SEATS AND PORTION OF BACK WALL BETWEEN LIMITS OF EXTERIOR STRUCTURAL MEMBERS. COATING BELOW ABUTMENT BEAM SEATS SHALL NOT BE APPLIED UNTIL AFTER CONSTRUCTION OF THE BRIDGE DECK.
D. EXPOSED SURFACES OF RETAINING WALLS WITHOUT ARCHITECTURAL TEXTURE.

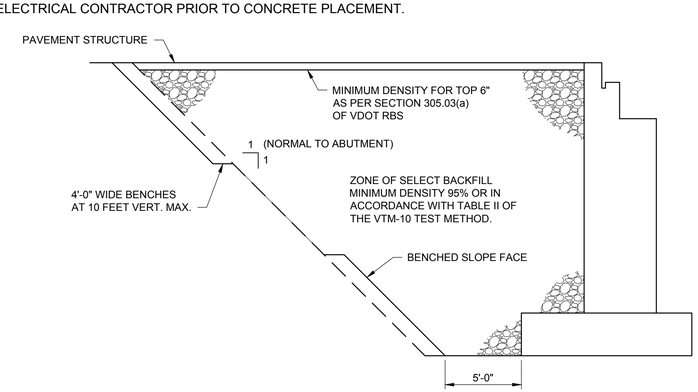
THE CONCRETE SURFACE SHALL BE CLEANED AND PREPARED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

THE LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED IN THE FIELD PRIOR TO BEGINNING ANY ADJACENT CONSTRUCTION ACTIVITIES.

SOME WATER AND SEWER UTILITIES IN THE VICINITY OF ABUTMENT A AND THE ADJOINING RETAINING WALLS ARE NOTED TO BE ABANDONED BY OTHERS. THESE UTILITIES WILL BE ABANDONED BY THE WESTERN VIRGINIA WATER AUTHORITY (WVWA). CONSTRUCTION OF ABUTMENT A AND THE ADJACENT RETAINING STRUCTURES SHALL NOT COMMENCE UNTIL THE CONTRACTOR IS NOTIFIED THAT THE UTILITY ABANDONMENT IS COMPLETE. THE CONTRACTOR SHALL PROVIDE ACCESS TO THE SITE FOR WVWA CREWS AND CONTRACTORS TO COMPLETE THE UTILITY WORK.

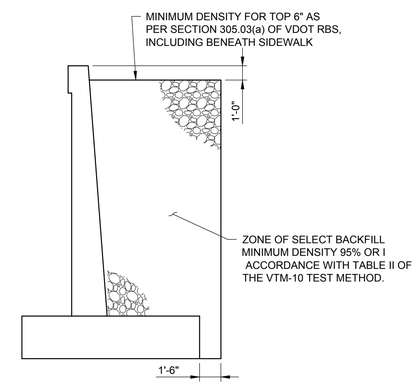
WHERE ELECTRICAL CONDUIT IS TO BE EMBEDDED IN CAST-IN-PLACE CONCRETE, THE CONDUIT SHALL BE CONFIRMED BY THE ELECTRICAL CONTRACTOR PRIOR TO CONCRETE PLACEMENT.

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH (INCHES)
3	1'-9"
4	1'-9"
5	2'-2"
6	2'-9"
7	3'-9"
8	4'-11"
9	6'-2"
10	7'-10"
11	9'-7"



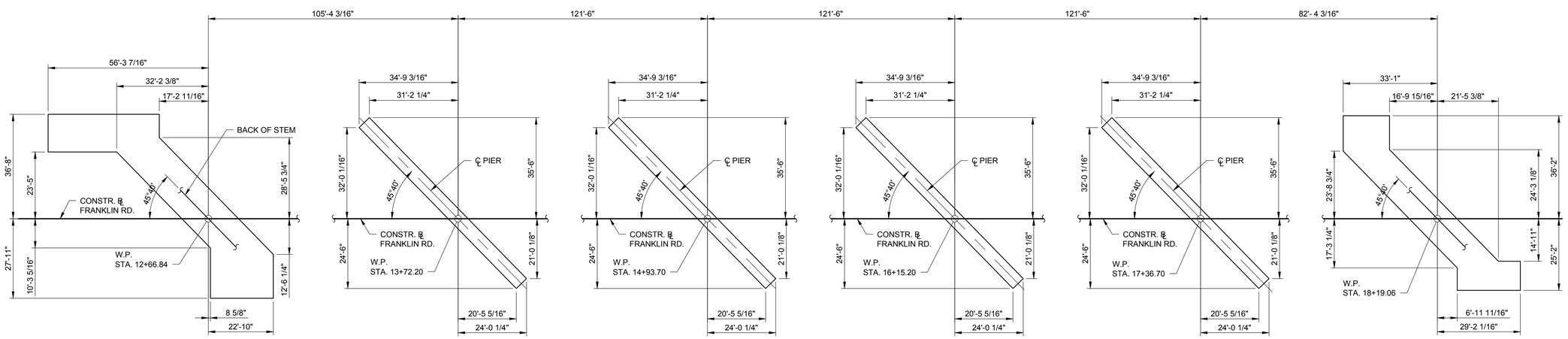
LIMITS OF SELECT BACKFILL MATERIAL TYPICAL AT ABUTMENTS

NOT TO SCALE



LIMITS OF SELECT BACKFILL MATERIAL TYPICAL AT RETAINING WALLS

NOT TO SCALE



ABUTMENT A **PIER** **PIER** **PIER** **PIER** **ABUTMENT B**

SUBSTRUCTURE LAYOUT

SCALE: 1" = 20'

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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COMMONWEALTH OF VIRGINIA
5/17/16
DANIEL R DEAN
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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

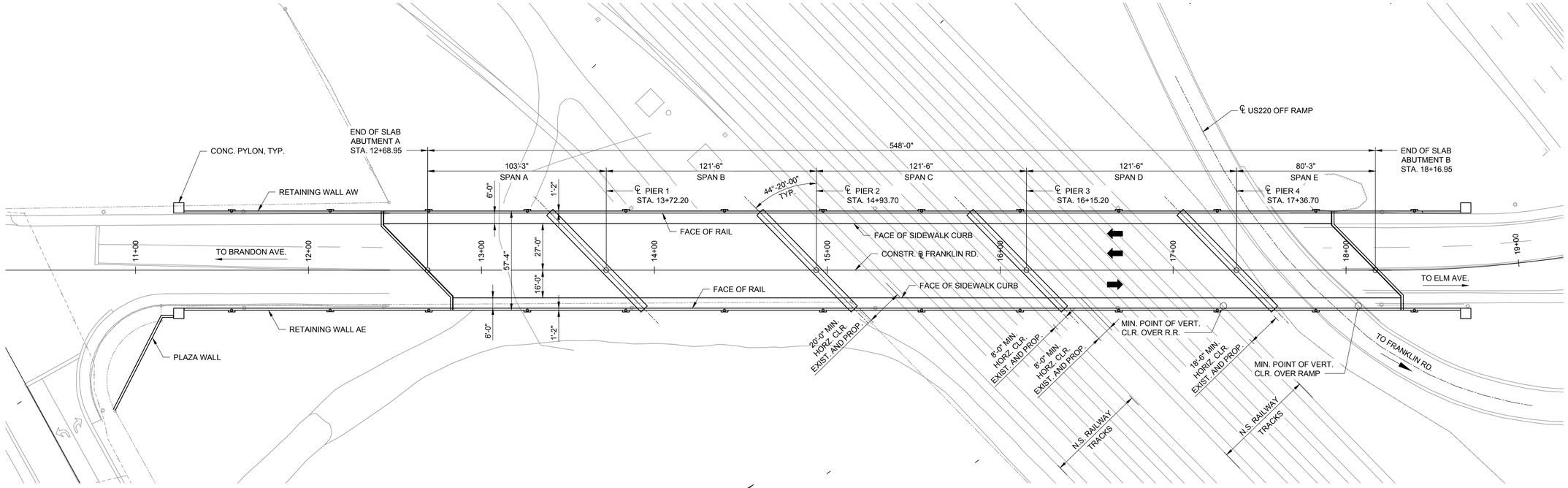
SHEET TITLE

STRUCTURAL GENERAL NOTES AND SUBSTRUCTURE LAYOUT

SHEET NUMBER

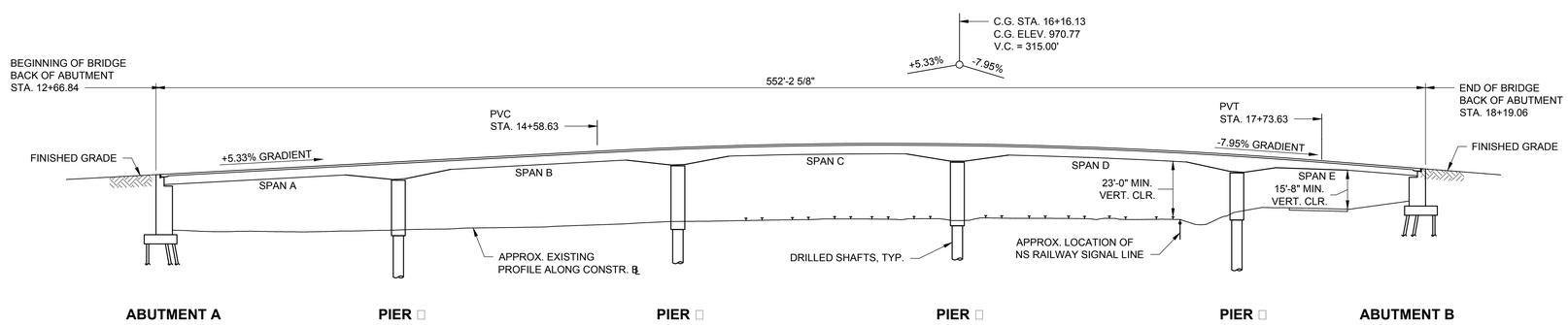
CB-001

ANSI D 22" X 34"



PLAN

SCALE: 1/32" = 1'-0"



DEVELOPED SECTION ALONG CONSTR. ℄

SCALE: 1/32" = 1'-0"

1/32"=1'-0" 32' 16' 0 32' 64'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

BRIDGE PLAN AND ELEVATION

SHEET NUMBER

CB-002

ANSI D 22" X 34"

GENERAL NOTES

THE CONTRACTOR SHALL CONTACT THE RAILROAD'S REPRESENTATIVE TWO DAYS IN ADVANCE OF WORK AT THOSE PLACES WHERE EXCAVATION OR HEAVY LOADS MAY DAMAGE THE RAILROAD'S UNDERGROUND FACILITIES. UPON REQUEST FROM THE CONTRACTOR, RAILROAD FORCES WILL LOCATE AND PAINT MARK OR FLAG THE RAILROAD'S UNDERGROUND FACILITIES.

A TEMPORARY AT-GRADE TRACK CROSSING IS INDICATED IN THE PLANS, FOR THE PURPOSE OF FACILITATING DEMOLITION AND CONSTRUCTION ACTIVITIES. THIS CROSSING WILL BE CONSTRUCTED BY THE RAILROAD. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE A SCHEDULE WITH THE RAILROAD FOR CONSTRUCTION OF THIS AT-GRADE CROSSING, OR ANY OTHER STAGED WORK BY THE RAILROAD. IN ARRANGING HIS SCHEDULE HE SHALL ASCERTAIN, FROM THE RAILROAD, THE LEAD TIME REQUIRED FOR ASSEMBLING CREWS AND MATERIALS AND SHALL MAKE DUE ALLOWANCE THEREFORE. USE OF THE AT-GRADE CROSSING WILL ONLY BE AS AUTHORIZED BY THE RAILROAD.

A TEMPORARY WALL IS INDICATED IN THE PLANS FOR THE PURPOSE OF FACILITATING CONSTRUCTION OF A WORKING PAD FOR EQUIPMENT AND OPERATION. THE CONTRACTOR SHALL DETERMINE THE NEED FOR AND EXTENTS OF THE WALL AND PAD. DETAILS OF THE WALL AND PAD SHALL BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED FOR APPROVAL. THIS SUBMITTAL SHALL INCLUDE DETAILS FOR MAINTAINING AND PROTECTING EXISTING DRAINAGE STRUCTURES.

THE COST OF RAILROAD COORDINATION, INCLUDING SUBMITTALS AND TEMPORARY WORKS, SHALL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS.

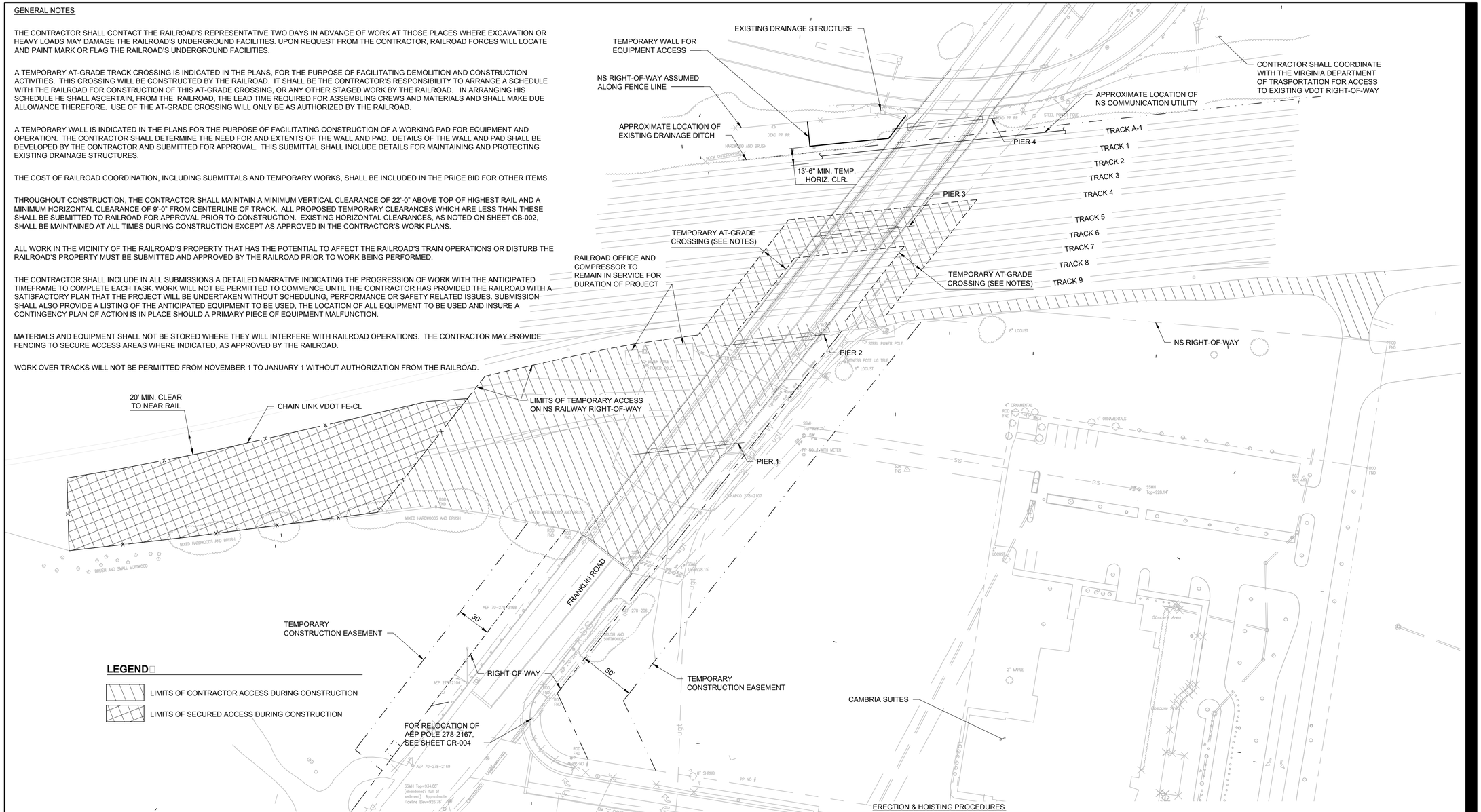
THROUGHOUT CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A MINIMUM VERTICAL CLEARANCE OF 22'-0" ABOVE TOP OF HIGHEST RAIL AND A MINIMUM HORIZONTAL CLEARANCE OF 9'-0" FROM CENTERLINE OF TRACK. ALL PROPOSED TEMPORARY CLEARANCES WHICH ARE LESS THAN THESE SHALL BE SUBMITTED TO RAILROAD FOR APPROVAL PRIOR TO CONSTRUCTION. EXISTING HORIZONTAL CLEARANCES, AS NOTED ON SHEET CB-002, SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION EXCEPT AS APPROVED IN THE CONTRACTOR'S WORK PLANS.

ALL WORK IN THE VICINITY OF THE RAILROAD'S PROPERTY THAT HAS THE POTENTIAL TO AFFECT THE RAILROAD'S TRAIN OPERATIONS OR DISTURB THE RAILROAD'S PROPERTY MUST BE SUBMITTED AND APPROVED BY THE RAILROAD PRIOR TO WORK BEING PERFORMED.

THE CONTRACTOR SHALL INCLUDE IN ALL SUBMISSIONS A DETAILED NARRATIVE INDICATING THE PROGRESSION OF WORK WITH THE ANTICIPATED TIMEFRAME TO COMPLETE EACH TASK. WORK WILL NOT BE PERMITTED TO COMMENCE UNTIL THE CONTRACTOR HAS PROVIDED THE RAILROAD WITH A SATISFACTORY PLAN THAT THE PROJECT WILL BE UNDERTAKEN WITHOUT SCHEDULING, PERFORMANCE OR SAFETY RELATED ISSUES. SUBMISSION SHALL ALSO PROVIDE A LISTING OF THE ANTICIPATED EQUIPMENT TO BE USED, THE LOCATION OF ALL EQUIPMENT TO BE USED AND INSURE A CONTINGENCY PLAN OF ACTION IS IN PLACE SHOULD A PRIMARY PIECE OF EQUIPMENT MALFUNCTION.

MATERIALS AND EQUIPMENT SHALL NOT BE STORED WHERE THEY WILL INTERFERE WITH RAILROAD OPERATIONS. THE CONTRACTOR MAY PROVIDE FENCING TO SECURE ACCESS AREAS WHERE INDICATED, AS APPROVED BY THE RAILROAD.

WORK OVER TRACKS WILL NOT BE PERMITTED FROM NOVEMBER 1 TO JANUARY 1 WITHOUT AUTHORIZATION FROM THE RAILROAD.



PLAN

NOT TO SCALE

EXCAVATION FOR STRUCTURES AND SHORING PROTECTION

THE CONTRACTOR WILL BE REQUIRED TO TAKE SPECIAL PRECAUTION AND CARE IN CONNECTION WITH EXCAVATING AND SHORING PITS, AND IN DRIVING PILES OR SHEETING FOR FOOTINGS ADJACENT TO TRACKS TO PROVIDE ADEQUATE LATERAL SUPPORT FOR THE TRACKS AND THE LOADS WHICH THEY CARRY, WITHOUT DISTURBANCE OF TRACK ALIGNMENT AND SURFACE, AND TO AVOID OBSTRUCTING TRACK CLEARANCES WITH WORKING EQUIPMENT, TOOLS OR OTHER MATERIAL.

THE CONTRACTOR SHALL PROVIDE A DETAILED INSTALLATION AND REMOVAL PLAN OF THE SHORING COMPONENTS. ANY COMPONENT THAT WILL BE INSTALLED VIA THE USE OF A CRANE OR ANY OTHER LIFTING DEVICE SHALL BE SUBJECT TO THE GUIDELINES OUTLINED IN THE SPECIAL PROVISION FOR PROTECTION OF RAILWAY INTEREST.

DEMOLITION PROCEDURES

A DEMOLITION PLAN IS REQUIRED FOR ALL SPANS AND PIERS OF THE EXISTING BRIDGE AND IN ALL SITUATIONS WHERE CRANES WILL BE SITUATED ON, OVER, OR ADJACENT TO RAILROAD RIGHT-OF-WAY AND WITHIN A DISTANCE OF THE BOOM LENGTH PLUS 15'-0" FROM THE CENTERLINE OF TRACK. THE DEMOLITION PLAN SHALL BE PREPARED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR PROTECTION OF RAILWAY INTERESTS.

THE DEMOLITION DEBRIS SHIELD SHALL BE INSTALLED PRIOR TO THE DEMOLITION OF THE BRIDGE DECK OR OTHER RELEVANT PORTIONS OF THE SUPERSTRUCTURE OVER THE TRACK AREA TO CATCH ALL FALLING DEBRIS. A VERTICAL DEMOLITION DEBRIS SHIELD MAY BE REQUIRED FOR SUBSTRUCTURE REMOVALS IN CLOSE PROXIMITY TO THE RAILROAD TRACK AND OTHER FACILITIES, AS DETERMINED BY THE RAILROAD ENGINEER.

A PRE-DEMOLITION MEETING SHALL BE CONDUCTED WITH THE CITY, THE RAILROAD REPRESENTATIVE, AND THE KEY CONTRACTOR PERSONNEL PRIOR TO THE START OF THE DEMOLITION PROCEDURE.

ERECTION & HOISTING PROCEDURES

AN ERECTION PLAN IS REQUIRED FOR ALL SPANS AND PIERS OF THE EXISTING BRIDGE AND IN ALL SITUATIONS WHERE CRANES WILL BE SITUATED ON, OVER, OR ADJACENT TO RAILROAD RIGHT-OF-WAY AND WITHIN A DISTANCE OF THE BOOM LENGTH PLUS 15'-0" FROM THE CENTERLINE OF TRACK. THE ERECTION PLAN SHALL BE PREPARED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR PROTECTION OF RAILWAY INTERESTS.

A PRE-ERECTION MEETING SHALL BE CONDUCTED WITH THE CITY, THE RAILROAD REPRESENTATIVE, AND THE KEY CONTRACTOR PERSONNEL PRIOR TO THE START OF THE ERECTION PROCEDURE.

FOR FIELD SPLICES LOCATED OVER RAILROAD PROPERTY, A MINIMUM OF 50% OF THE HOLES FOR EACH CONNECTION SHALL BE FILLED WITH BOLTS OR PINS PRIOR TO RELEASING THE CRANE. ALL BOLTS MUST BE APPROPRIATELY TIGHTENED.

NO LOADS MAY BE HOISTED DIRECTLY OVER RAIL CARS.

ALL AS-BUILT BRIDGE SEATS AND TOP OF RAIL ELEVATIONS SHALL BE FURNISHED TO THE RAILROAD FOR REVIEW AND VERIFICATION AT LEAST 30 DAYS IN ADVANCE OF THE ERECTION, TO ENSURE THAT MINIMUM VERTICAL CLEARANCES AS APPROVED IN THE PLANS WILL BE ACHIEVED.

MAINTENANCE OF RAILROAD FACILITIES

THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN ALL DITCHES AND DRAINAGE STRUCTURES FREE OF SILT OR OTHER OBSTRUCTIONS WHICH MAY RESULT FROM HIS OPERATIONS AND PROVIDE AND MAINTAIN ANY EROSION CONTROL MEASURES AS REQUIRED. IF IT BECOMES NECESSARY TO BLOCK A DITCH, PIPE OR OTHER DRAINAGE FACILITY, TEMPORARY PIPES, DITCHES OR OTHER DRAINAGE FACILITIES SHALL BE INSTALLED TO MAINTAIN ADEQUATE DRAINAGE, AS APPROVED BY THE RAILROAD. UPON COMPLETION OF THE WORK, THE TEMPORARY FACILITIES SHALL BE REMOVED AND THE PERMANENT FACILITIES RESTORED.

PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL SURVEY THE EXISTING RAIL ELEVATIONS AT TRACKS 4 AND 5 IN THE VICINITY OF THE BRIDGE AND SUBMIT THIS INFORMATION TO THE RAILROAD AS A BASELINE FOR EVALUATING SETTLEMENT OF THE TRACKS DURING CONSTRUCTION.

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ISSUE REVISION

I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

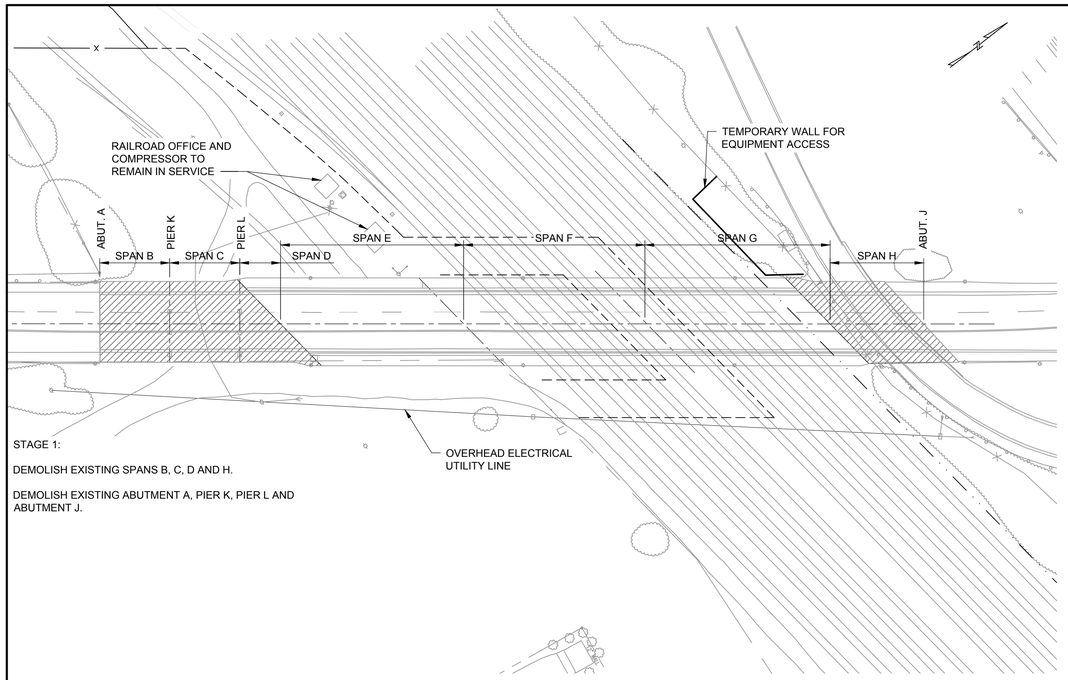
SHEET TITLE

SITE ACCESS AND RAILROAD COORDINATION

SHEET NUMBER

CB-003

ANSI D 22" x 34"



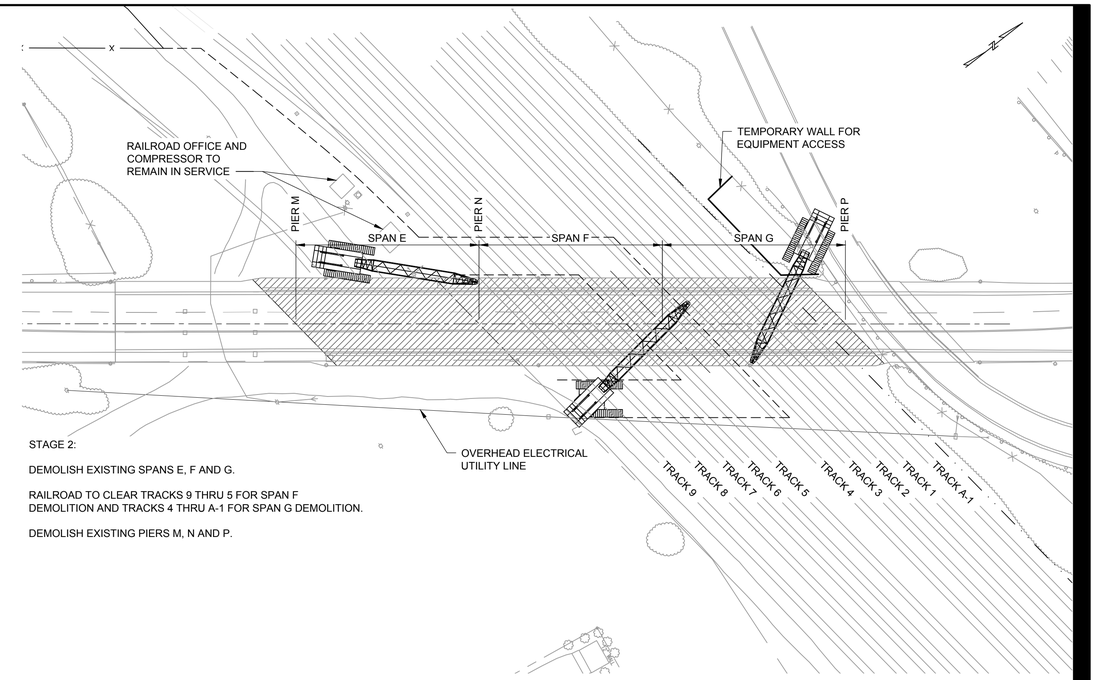
STAGE 1:

DEMOLISH EXISTING SPANS B, C, D AND H.

DEMOLISH EXISTING ABUTMENT A, PIER K, PIER L AND ABUTMENT J.

STAGE 1

NOT TO SCALE



STAGE 2:

DEMOLISH EXISTING SPANS E, F AND G.

RAILROAD TO CLEAR TRACKS 9 THRU 5 FOR SPAN F DEMOLITION AND TRACKS 4 THRU A-1 FOR SPAN G DEMOLITION.

DEMOLISH EXISTING PIERS M, N AND P.

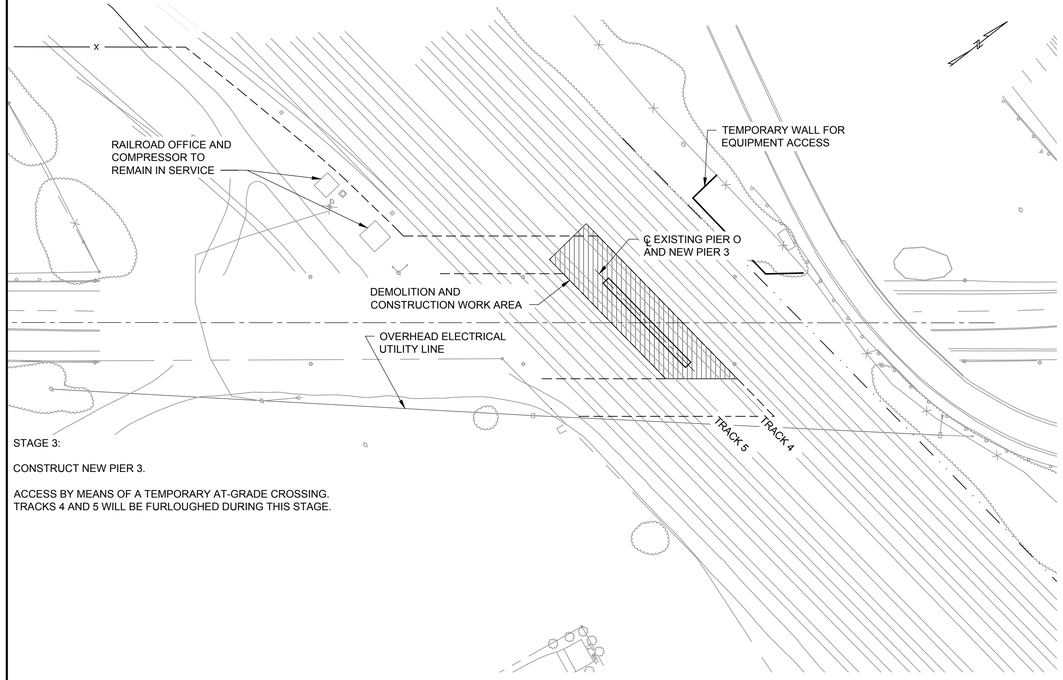
STAGE 2

NOT TO SCALE

NOTES:

SEE SHEET CB-003 FOR NOTES.

THE SUGGESTED SEQUENCE OF CONSTRUCTION AND CRANE PLACEMENT DEPICTED IN THESE PLANS IS IN CONCEPT ONLY. THE CONTRACTOR SHALL DEVELOP A SPECIFIC PLAN OF OPERATIONS FOR APPROVAL. SEE CB-003 FOR ADDITIONAL NOTES.



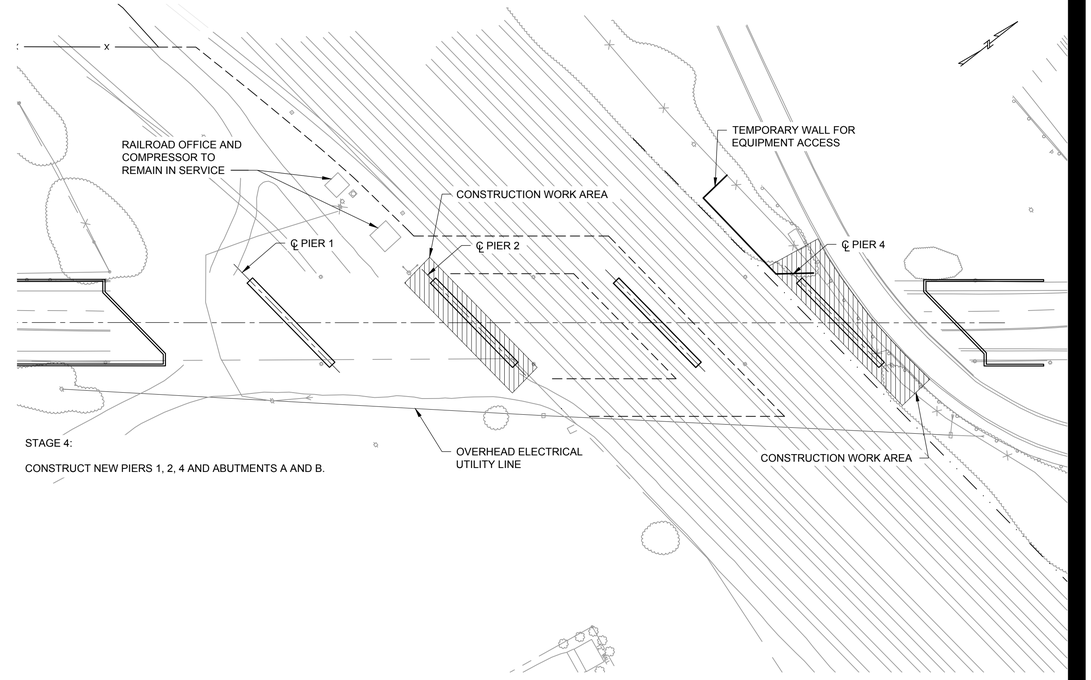
STAGE 3:

CONSTRUCT NEW PIER 3.

ACCESS BY MEANS OF A TEMPORARY AT-GRADE CROSSING. TRACKS 4 AND 5 WILL BE FURLOUGHED DURING THIS STAGE.

STAGE 3

NOT TO SCALE



STAGE 4:

CONSTRUCT NEW PIERS 1, 2, 4 AND ABUTMENTS A AND B.

STAGE 4

NOT TO SCALE

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

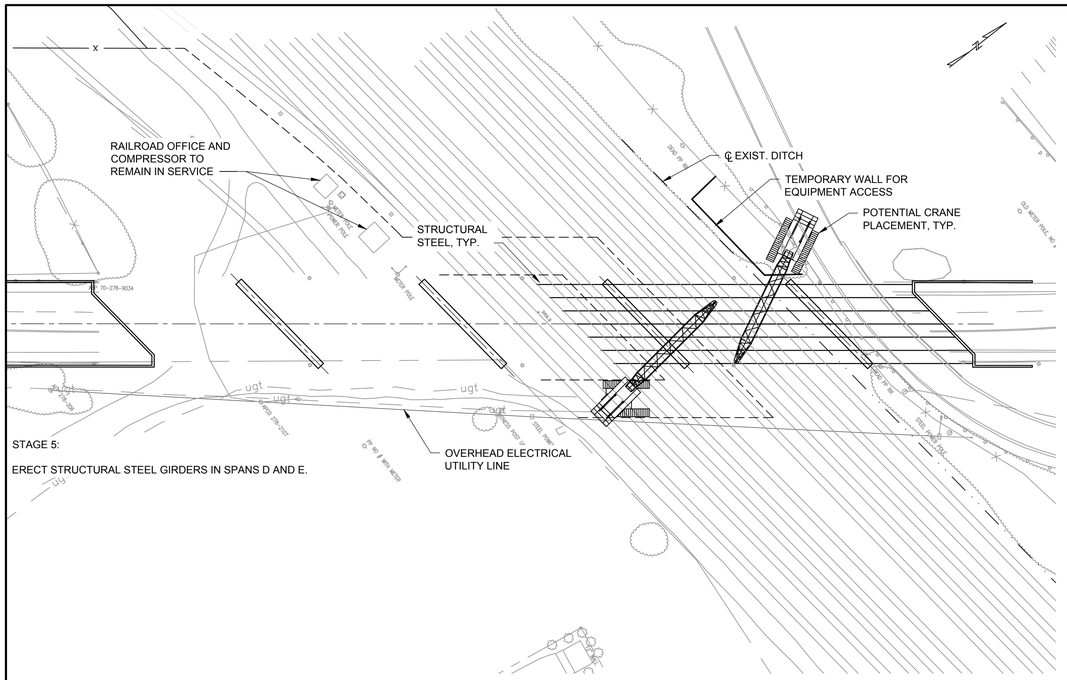
SHEET TITLE

SUGGESTED SEQUENCE OF CONSTRUCTION 1 OF 2

SHEET NUMBER

CB-004

ANSI D 22" X 34"

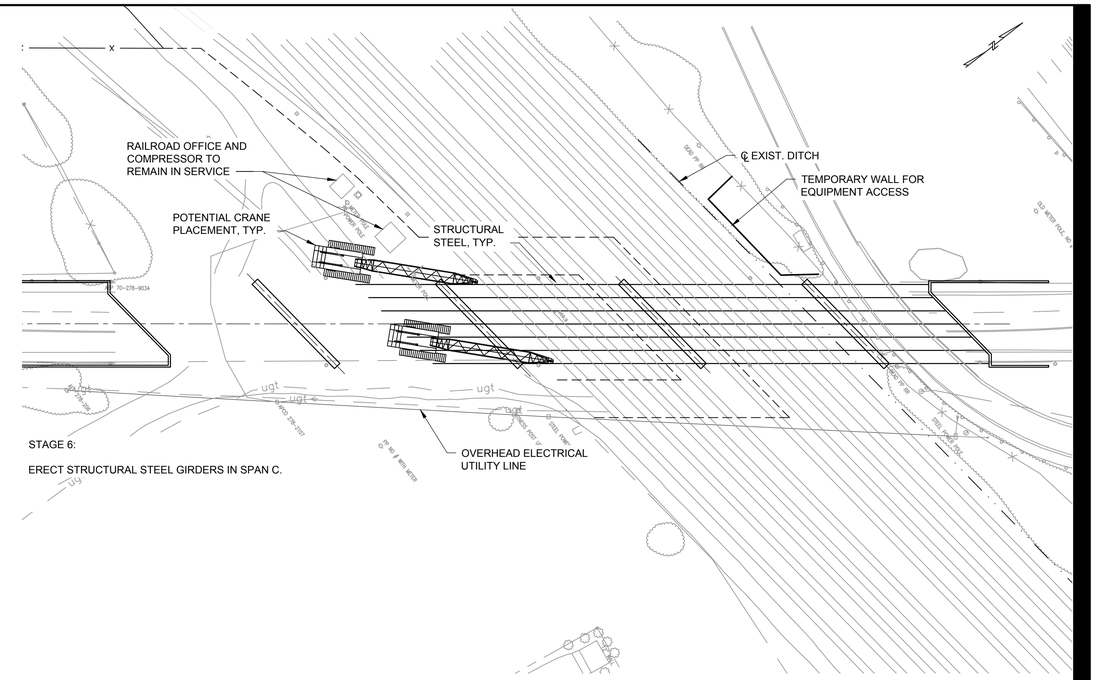


STAGE 5:

ERECT STRUCTURAL STEEL GIRDERS IN SPANS D AND E.

STAGE 5

NOT TO SCALE



STAGE 6:

ERECT STRUCTURAL STEEL GIRDERS IN SPAN C.

STAGE 6

NOT TO SCALE

NOTES:

SEE SHEET CB-003 FOR NOTES.

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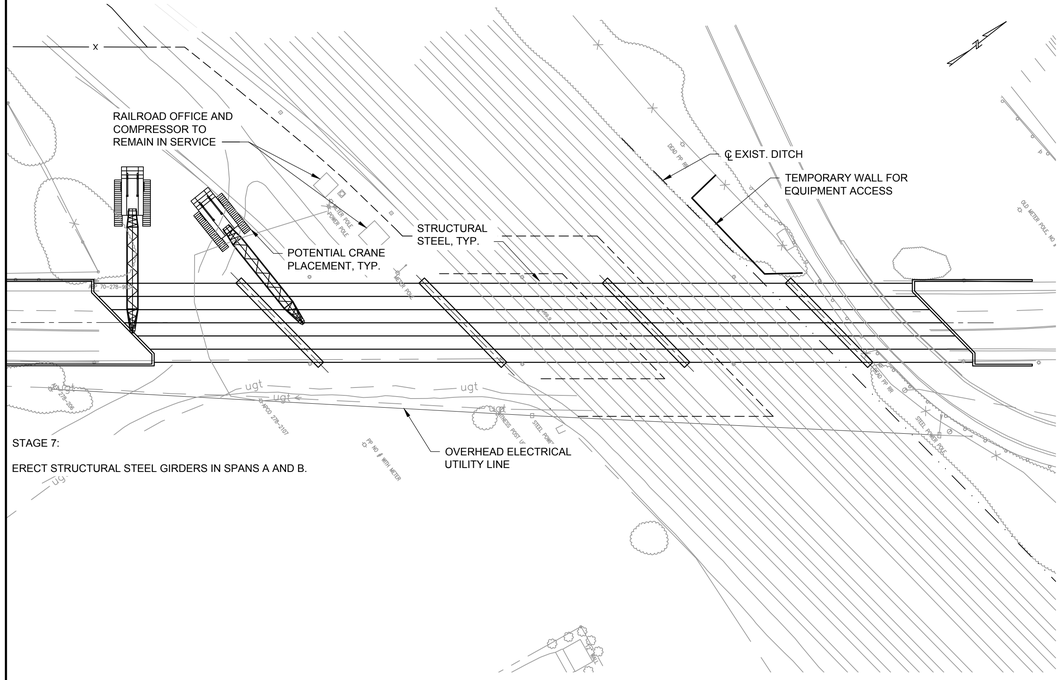
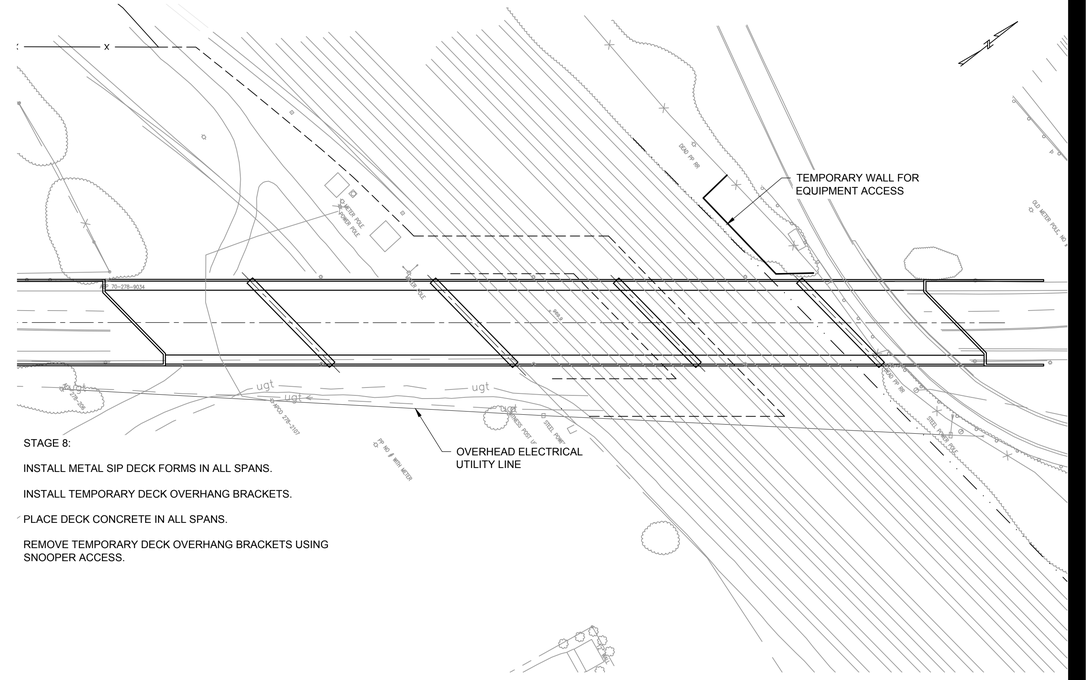


STAGE 7:

ERECT STRUCTURAL STEEL GIRDERS IN SPANS A AND B.

STAGE 7

NOT TO SCALE



STAGE 8:

INSTALL METAL SIP DECK FORMS IN ALL SPANS.

INSTALL TEMPORARY DECK OVERHANG BRACKETS.

PLACE DECK CONCRETE IN ALL SPANS.

REMOVE TEMPORARY DECK OVERHANG BRACKETS USING SNOOPER ACCESS.

STAGE 8

NOT TO SCALE

GRAPHIC SCALES

AECOM

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

SUGGESTED SEQUENCE OF CONSTRUCTION 2 OF 2

SHEET NUMBER

CB-005

ANSI D 22" X 34"

NOTES:

TOP OF JOINT WALL AND SIDEWALK SHALL BE FINISHED PARALLEL TO GRADE.

TOP OF BACKWALL SHALL BE FINISHED LEVEL PARALLEL TO CONSTRUCTION BASELINE.

FOR GENERAL NOTES AND SELECT BACKFILL DETAIL, SEE SHEET CB-001.

FOR FOOTING DETAILS, SEE SHEET CB-007.

FOR WINGWALL DETAILS, SEE SHEET CB-008.

FOR SECTIONS AND DETAILS, SEE SHEET CB-009.

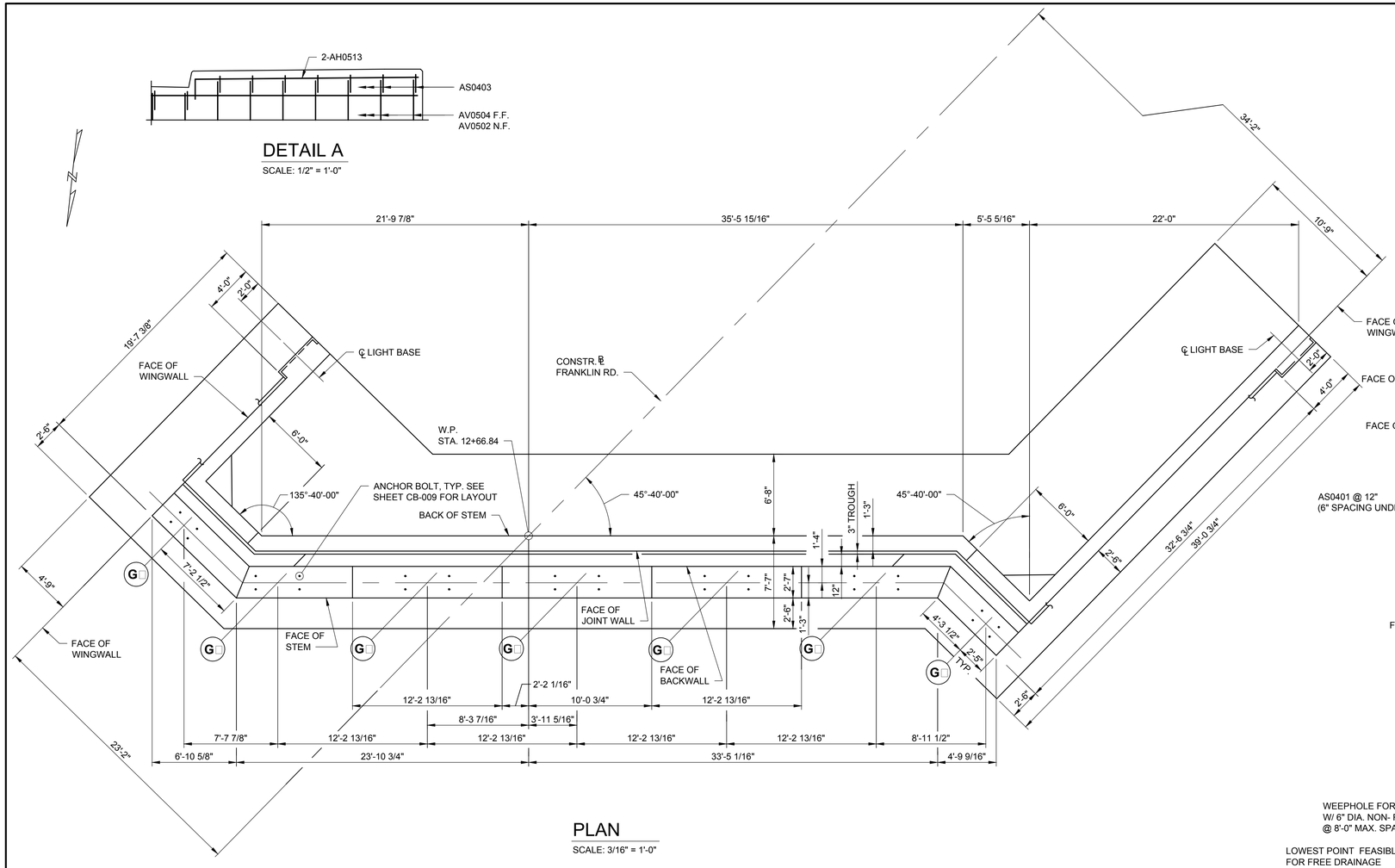
FOR WATERPROOFING OF TROUGH, SEE DETAIL ON SHEET CB-009

FOR DECK EXPANSION JOINT DETAILS, SEE SHEET CB-052.

SEE SPECIAL PROVISION FOR CONCRETE SURFACE COLOR COATING.

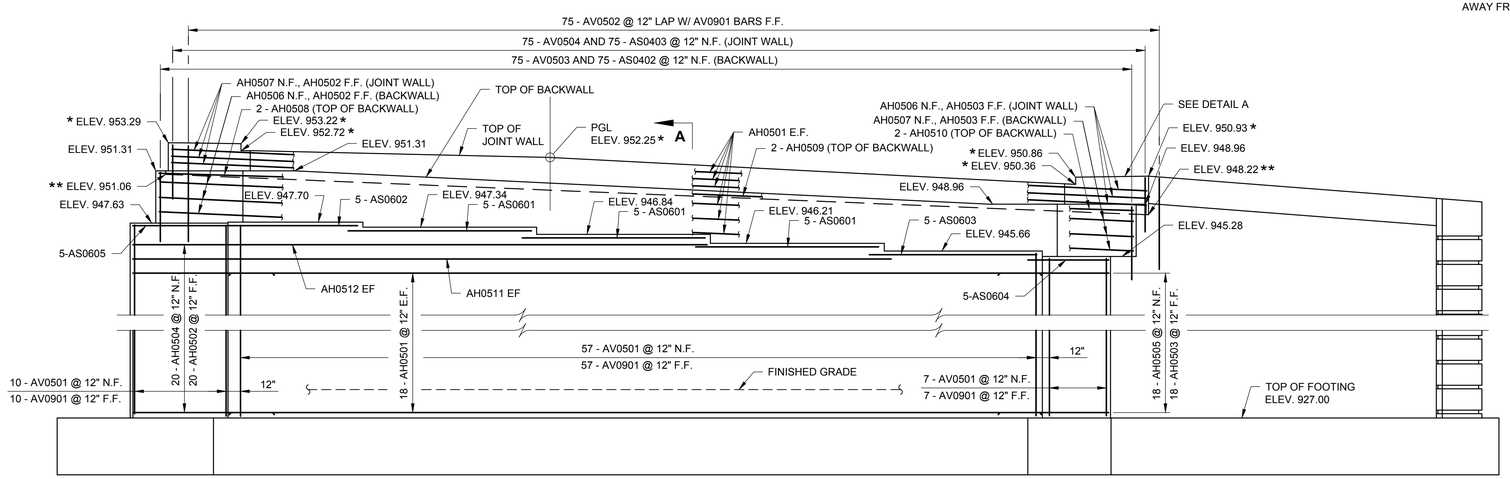
DETAIL A

SCALE: 1/2" = 1'-0"



PLAN

SCALE: 3/16" = 1'-0"

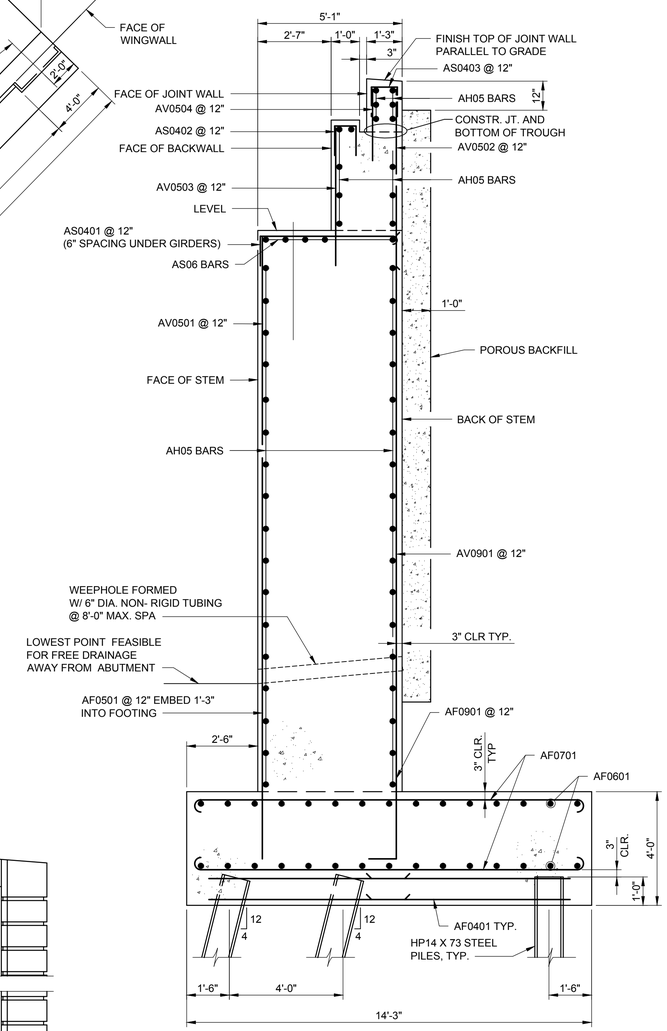


* = ELEVATION AT FACE OF JOINT WALL
** = ELEVATION AT BOTTOM OF TROUGH
PILES NOT SHOWN FOR CLARITY

A

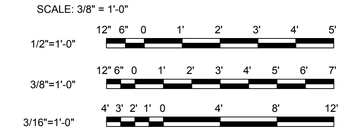
ELEVATION

SCALE: 3/16" = 1'-0"



SECTION A-A

SCALE: 3/8" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

ABUTMENT A PLAN AND ELEVATION

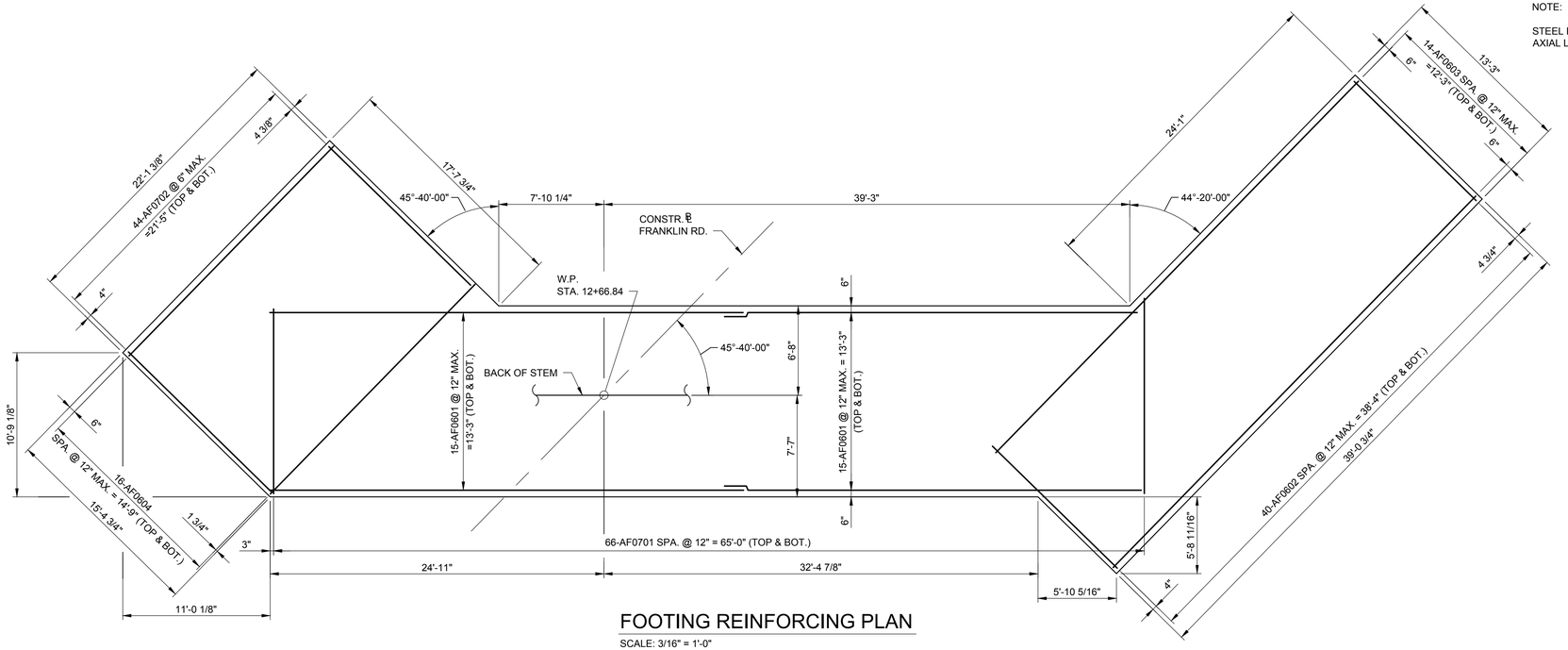
SHEET NUMBER

CB-006

ANSI D 22" x 34"

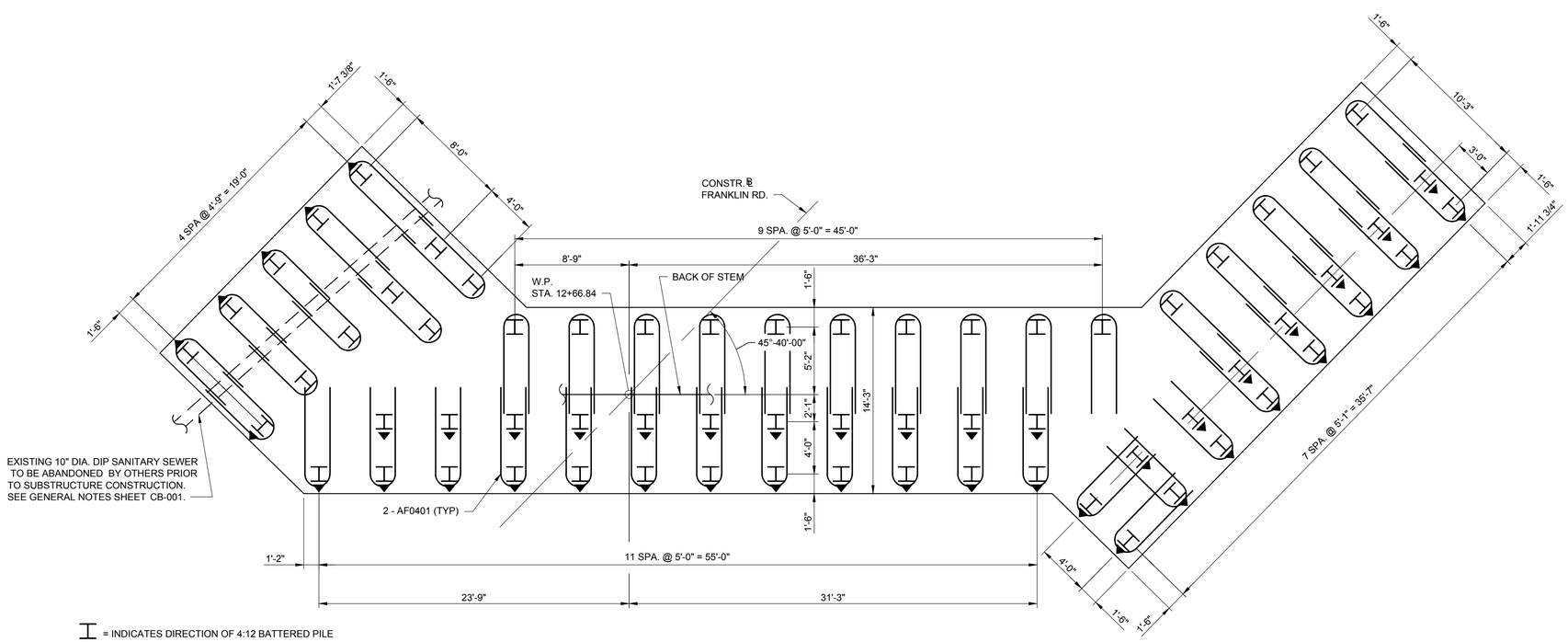
NOTE:

STEEL PILES FOR ABUTMENT A HAVE BEEN DESIGNED FOR A MAXIMUM FACTORED AXIAL LOAD OF 270 KIPS.



FOOTING REINFORCING PLAN

SCALE: 3/16" = 1'-0"



= INDICATES DIRECTION OF 4:12 BATTERED PILE

PILE PLAN

SCALE: 3/16" = 1'-0"

3/16"=1'-0"

4' 3' 2' 1' 0 4' 8' 12'

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

ABUTMENT A FOOTING PLAN AND DETAILS

SHEET NUMBER

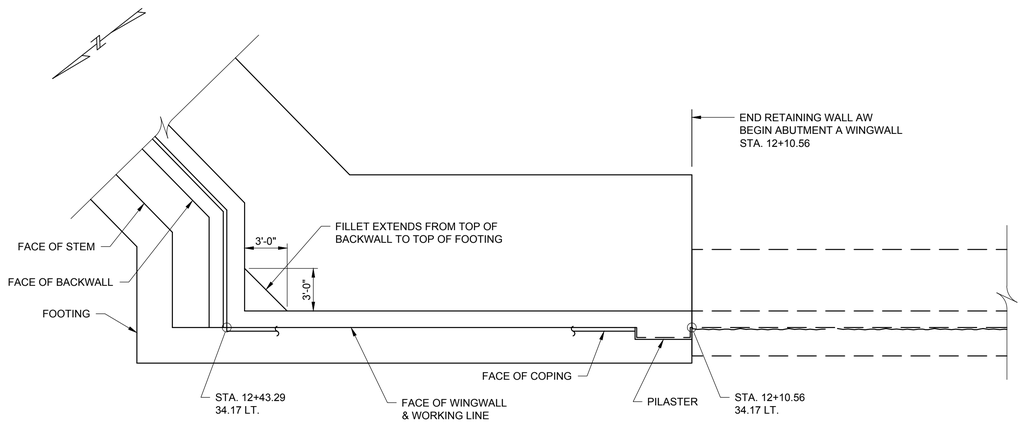
CB-007

ANSI D 22" X 34"

NOTES:

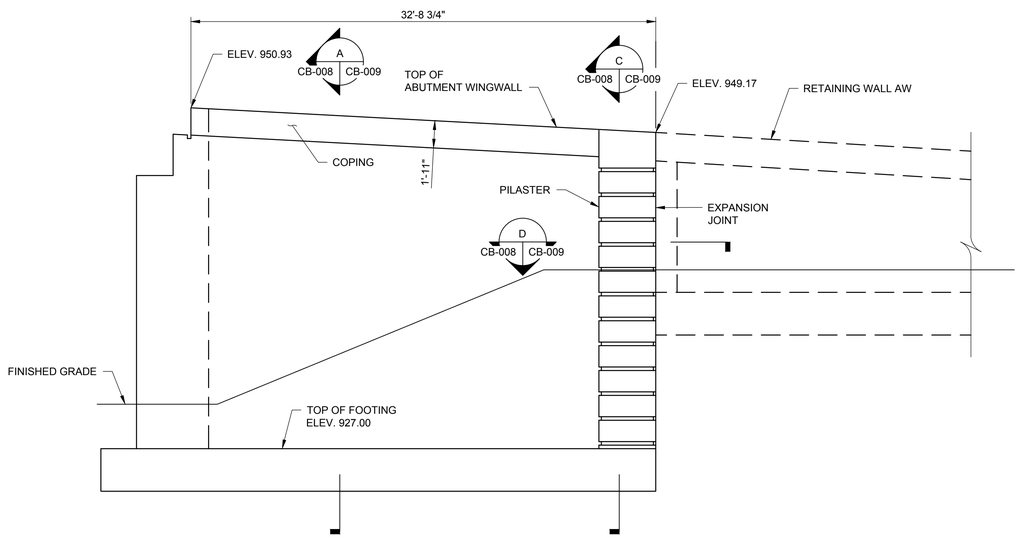
RAILING NOT SHOWN FOR CLARITY, SEE SHEETS CB-053 THRU CB-055 FOR DETAILS.

FOR EXPANSION JOINT DETAIL, SEE SHEET CB-023.



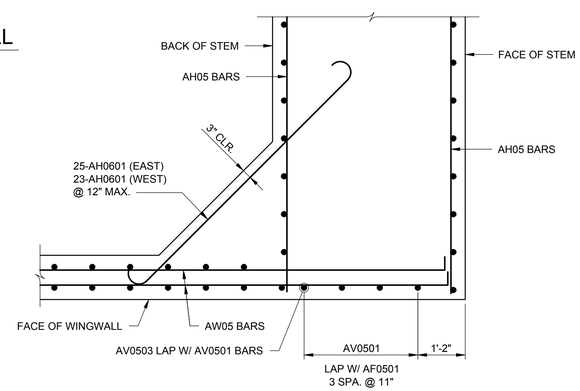
PLAN - WEST WINGWALL

SCALE: 3/16" = 1'-0"



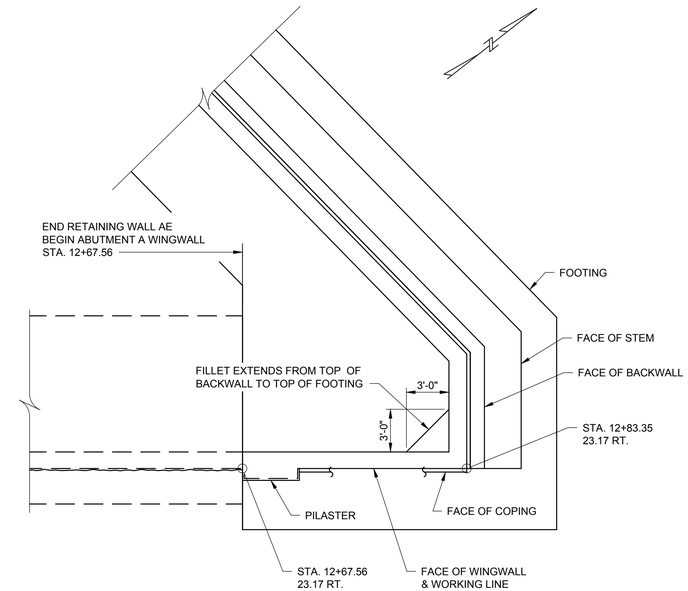
ELEVATION - WEST WINGWALL

SCALE: 3/16" = 1'-0"



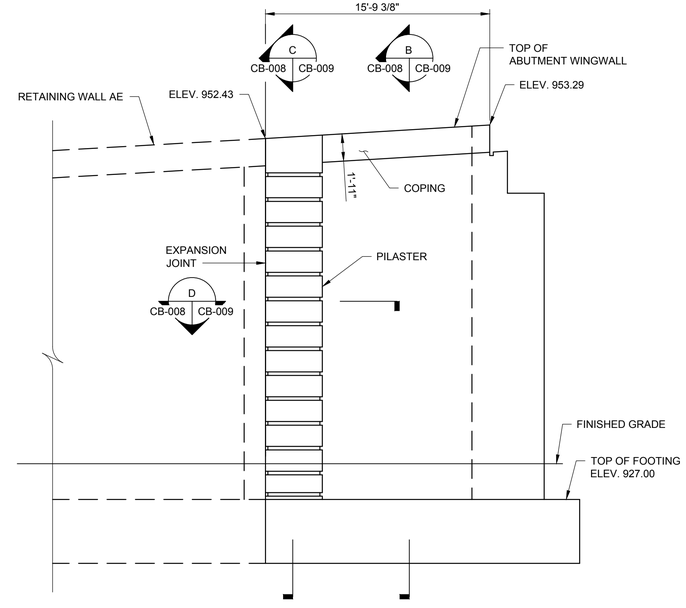
CORNER FILLET DETAIL

SCALE: 1/2" = 1'-0"



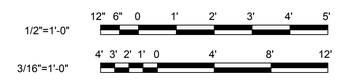
PLAN - EAST WINGWALL

SCALE: 3/16" = 1'-0"



ELEVATION - EAST WINGWALL

SCALE: 3/16" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
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REGISTRATION

COMMONWEALTH OF VIRGINIA
5/17/16
BENJAMIN L. SHEALY
Lic. No. 052810
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

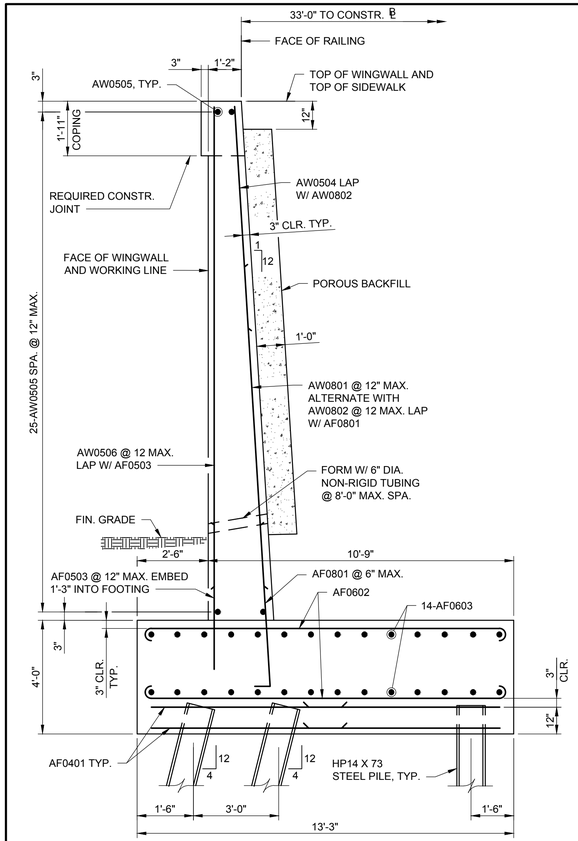
SHEET TITLE

ABUTMENT A WINGWALL
PLAN AND ELEVATION

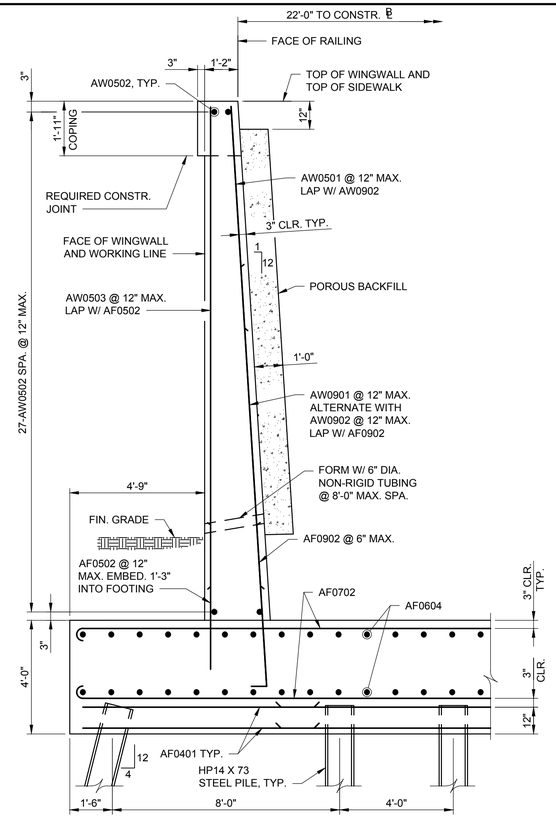
SHEET NUMBER

CB-008

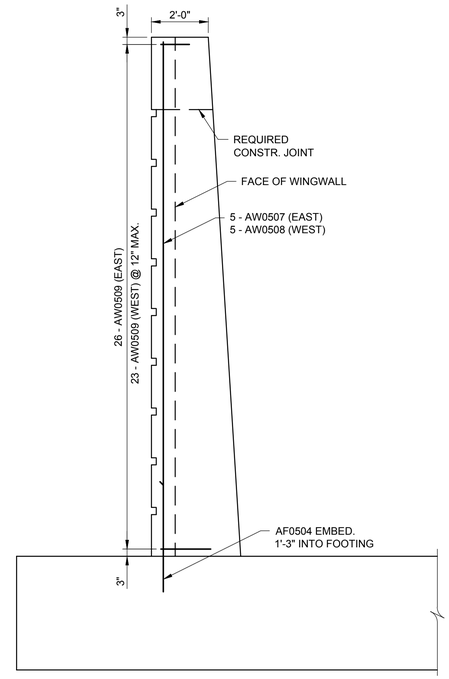
ANSI D 22" X 34"



SECTION A
SCALE: 3/8" = 1'-0"
CB-008 | CB-009



SECTION B
SCALE: 3/8" = 1'-0"
CB-008 | CB-009

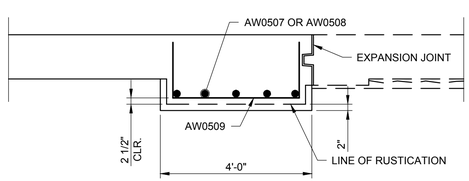


SECTION C
SCALE: 3/8" = 1'-0"
CB-008 | CB-009

NOTES:

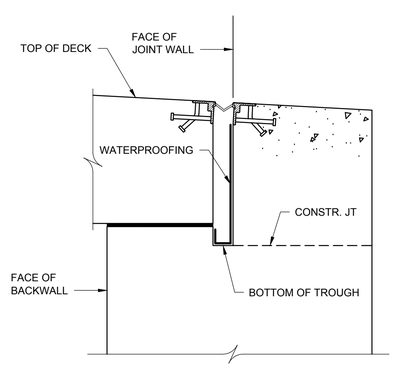
RAILING NOT SHOWN FOR CLARITY, SEE SHEETS CB-053 THRU CB-055 FOR DETAILS.

PRIOR TO CONSTRUCTION OF WALL COPING, WALL BACKFILL SHALL BE PLACED AND COMPACTED WITHIN 12" OF THE BOTTOM OF COPING. WHERE WALL DEFLECTION RESULTS FROM BACKFILL PLACEMENT, THE WALL COPING SHALL BE CONSTRUCTED TO ALIGN WITH THE PROPOSED FACE OF RAILING, AS INDICATED ON THESE PLANS.



SECTION D
SCALE: 1/2" = 1'-0"
CB-008 | CB-009

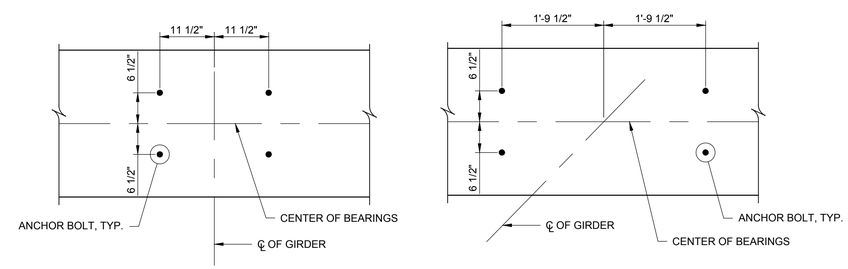
WEST WINGWALL SHOWN, EAST WINGWALL OPPOSITE HAND



TROUGH WATERPROOFING DETAIL

NOT TO SCALE

WATERPROOFING SHALL CONSIST OF ONE COAT OF EPOXY TYPE EP-3B AND ONE COAT OF EPOXY EP-3T CONFORMING TO VDOT RBS SECTION 243 AND INSTALLED IN ACCORDANCE WITH VDOT RBS SECTION 416. BROADCAST SAND IS NOT REQUIRED. THE COST OF WATERPROOFING SHALL BE INCLUDED WITH THE PRICE BID FOR CONCRETE CLASS A3.

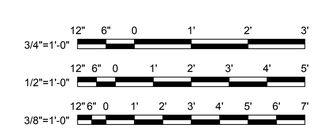


EXTERIOR GIRDERS

INTERIOR GIRDERS

ANCHOR BOLT LAYOUT

SCALE: 3/4" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

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I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

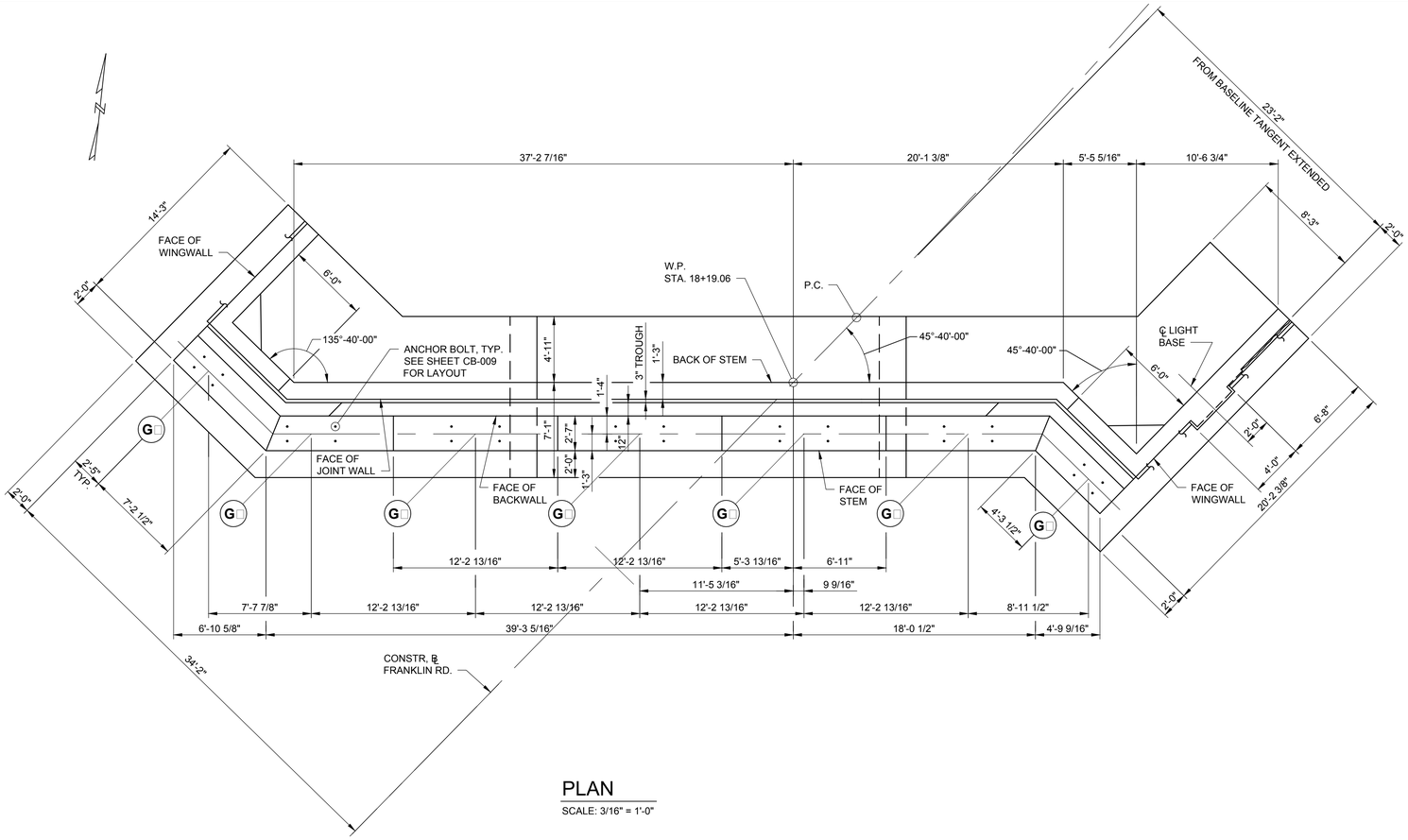
SHEET TITLE

ABUTMENT A SECTIONS AND DETAILS

SHEET NUMBER

CB-009

ANSI D 22" x 34"



PLAN

SCALE: 3/16" = 1'-0"

NOTES:

TOP OF JOINT WALL AND SIDEWALK SHALL BE FINISHED PARALLEL TO GRADE.

TOP OF BACKWALL SHALL BE FINISHED LEVEL PARALLEL TO CONSTRUCTION BASELINE.

FOR GENERAL NOTES AND SELECT BACKFILL DETAILS, SEE SHEET CB-001.

FOR FOOTING DETAILS, SEE SHEET CB-011.

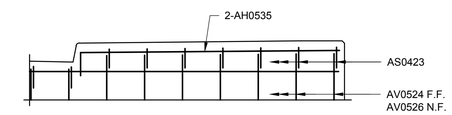
FOR WINGWALL DETAILS, SEE SHEETS CB-012 AND CB-013.

FOR SECTIONS AND DETAILS, SEE SHEET CB-014.

FOR WATERPROOFING OF TROUGH, SEE DETAIL ON SHEET CB-009.

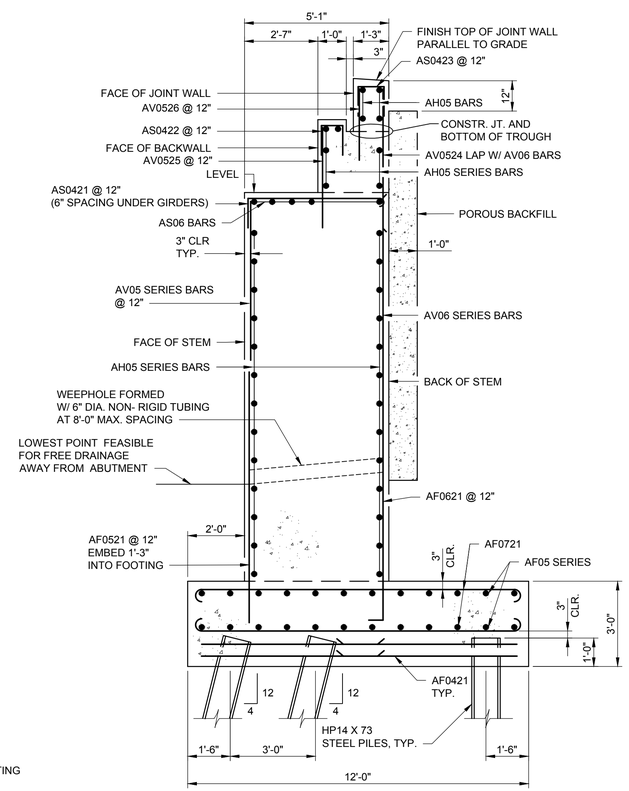
FOR DECK EXPANSION JOINT DETAILS, SEE SHEET CB-052.

SEE SPECIAL PROVISION FOR CONCRETE SURFACE COLOR COATING.



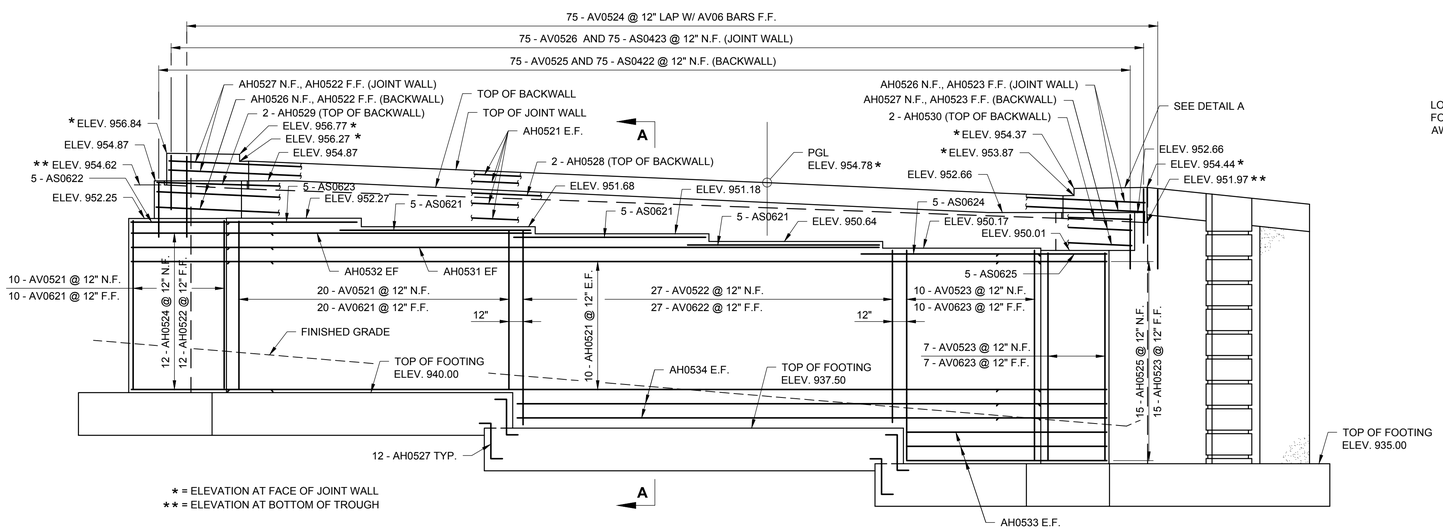
DETAIL A

SCALE: 1/2" = 1'-0"



SECTION A-A

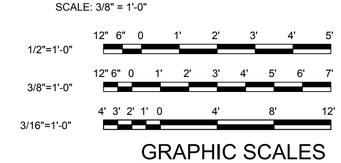
SCALE: 3/8" = 1'-0"



* = ELEVATION AT FACE OF JOINT WALL
** = ELEVATION AT BOTTOM OF TROUGH

ELEVATION

SCALE: 3/16" = 1'-0"
PILES NOT SHOWN FOR CLARITY



GRAPHIC SCALES

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KEY PLAN

PROJECT NUMBER

60290893

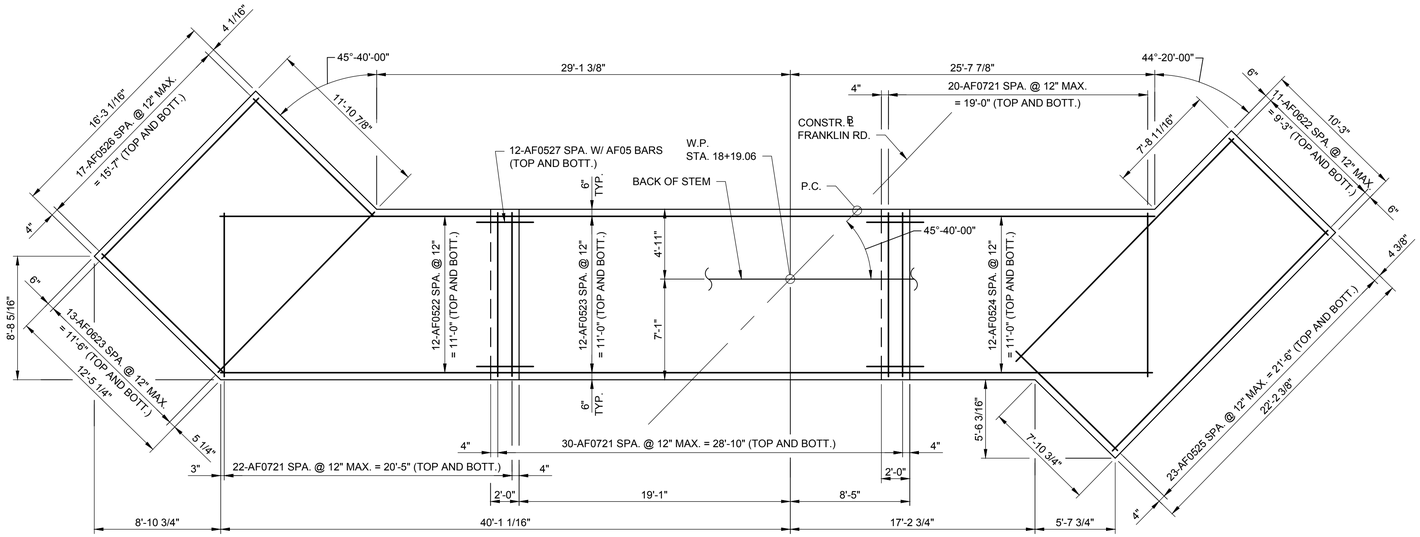
SHEET TITLE

ABUTMENT B PLAN AND ELEVATION

SHEET NUMBER

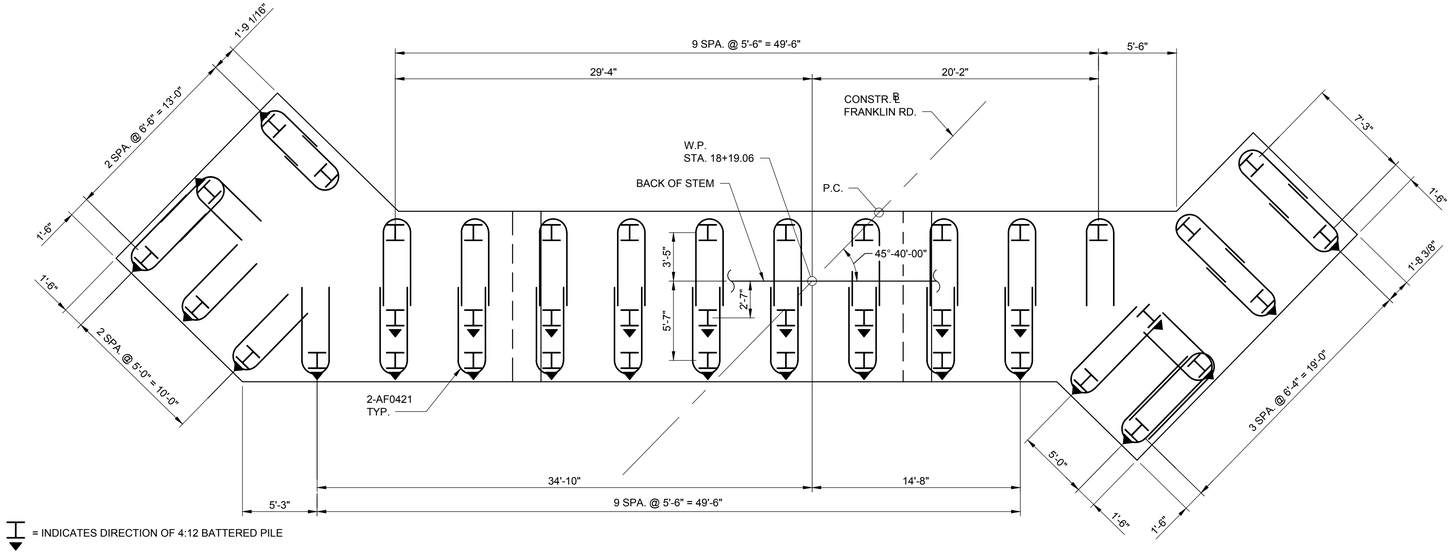
CB-010

ANSI D 22" x 34"



FOOTING REINFORCING PLAN

SCALE: 3/16" = 1'-0"



= INDICATES DIRECTION OF 4:12 BATTERED PILE

PILE PLAN

SCALE: 3/16" = 1'-0"

NOTES:

STEEL PILES FOR ABUTMENT B HAVE BEEN DESIGNED FOR A MAXIMUM FACTORED AXIAL LOAD OF 205 KIPS.

THE CONTRACTOR SHALL CONDUCT EXPLORATORY BORINGS IN THE VICINITY OF THE PROPOSED ABUTMENT B FOOTING, TO CONFIRM THE SUBSURFACE CONDITIONS PRIOR TO CONSTRUCTION OF THE FOUNDATION. THE DEPTH OF THE TEST BORINGS SHALL EXTEND TO ROCK, AND THE ROCK SHALL BE CONTINUOUSLY CORED FOR AT LEAST FIVE FEET. THE BOREHOLE LOG FOR THESE BORINGS SHALL BE SUBMITTED WITH ANY PROPOSED DEVIATIONS FROM PLAN DETAILS. THE COST OF EXPLORATORY BORINGS SHALL BE INCLUDED WITH THE PRICE BID FOR MOBILIZATION.

THE REINFORCING PROJECTING UP FROM THE FOOTING OF ABUTMENT B HAS BEEN DETAILED TO PERMIT LOWERING OF THE FOOTING BY UP TO THREE (3) FEET. WHERE SHALLOW BEDROCK IS ENCOUNTERED, THE CONTRACTOR MAY PROPOSE TO LOWER THE ABUTMENT B FOOTING.

WHERE SHALLOW BEDROCK IS ENCOUNTERED, THE CONTRACTOR MAY PROPOSE TO OMIT PILES AND CONSTRUCT A SUBFOOTING ON ROCK BENEATH THE PROPOSED FOOTING.

ROCK EXCAVATION REQUIRED FOR FOOTING CONSTRUCTION WILL BE PAID AT THE CONTRACT UNIT PRICE PER CUBIC YARD.

THE LIMITS OF SUBFOOTING SHALL EXTEND BEYOND THE LIMITS OF PROPOSED FOOTING BY A MINIMUM DIMENSION EQUAL TO THE SUBFOOTING THICKNESS. MINIMUM SUBFOOTING THICKNESS SHALL BE 1'-0". THE TOP OF CONCRETE SUBFOOTING IN CONTACT WITH THE FOOTING SHALL HAVE A ROUGHENED SURFACE.

SUBFOOTINGS FOR ABUTMENT B SHALL BE CONSTRUCTED USING CLASS C1 CONCRETE. THE PRICE BID FOR CLASS C1 CONCRETE SHALL INCLUDE ALL COST RELATED TO SUBFOOTING CONSTRUCTION.

PRIOR TO PLACING CONCRETE, THE BEDROCK SURFACE SHALL BE COMPLETELY CLEANED OF LOOSE BEDROCK AND DEBRIS. THE FINAL BEDROCK SURFACE SHALL BE NO STEEPER THAN 5H:1V AND SHALL BE FREE OF SHARP PROTRUSIONS. STEEPER SLOPES SHALL BE STEPPED IN LEVEL INCREMENTS WITH A MINIMUM HORIZONTAL STEP LENGTH OF 2 FEET.

3/16"=1'-0" 4' 3' 2' 1' 0 4' 8' 12'

GRAPHIC SCALES

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

ABUTMENT B FOOTING PLAN AND DETAILS

SHEET NUMBER

CB-011

ANSI D 22" X 34"

NOTES:

RAILING NOT SHOWN FOR CLARITY, SEE SHEETS CB-053 THRU CB-055 FOR DETAILS.

SEE THE SPECIAL PROVISION FOR ARCHITECTURAL TREATMENT.

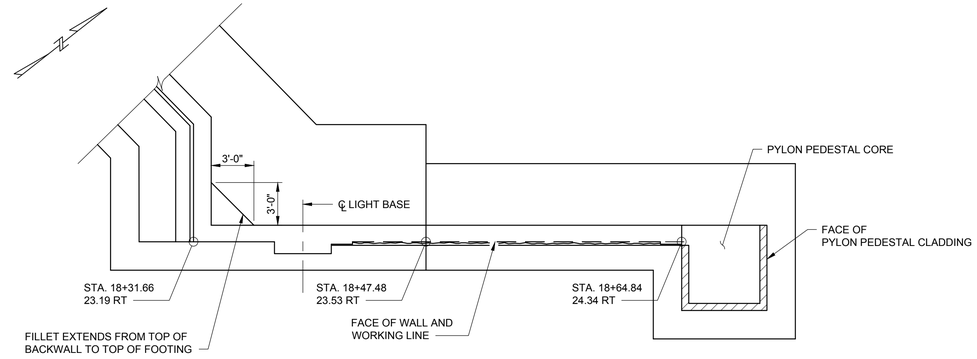
SEE THE SPECIAL PROVISION FOR PRECAST ARCHITECTURAL CONCRETE FOR REQUIREMENTS ON THE PYLON PEDESTAL CLADDING.

FOR CONSTRUCTION AND EXPANSION JOINT DETAILS, SEE SHEET CB-023.

STEEL PILES FOR ABUTMENT B EAST WINGWALL HAVE BEEN DESIGNED FOR A MAXIMUM FACTORED AXIAL LOAD OF 140 KIPS.

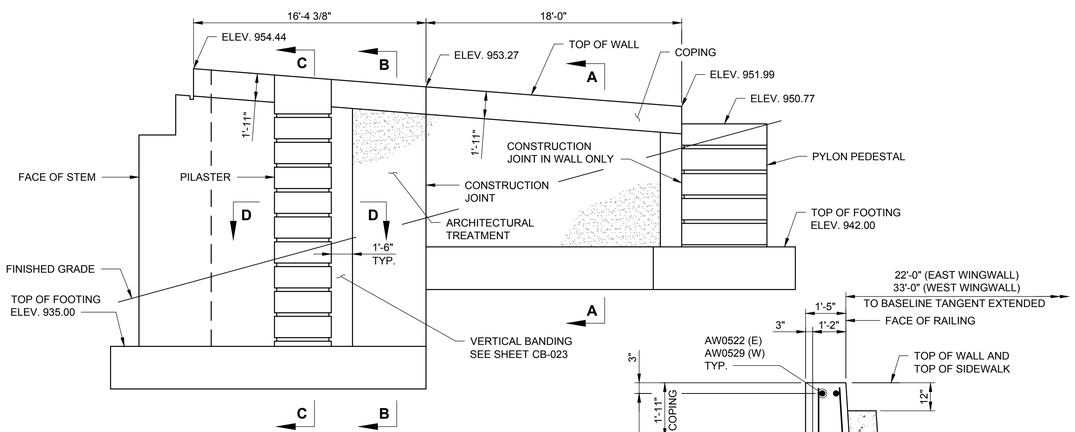
LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD. PILE LAYOUT MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

SEE SHEET CB-009 FOR BACKFILL REQUIREMENTS.



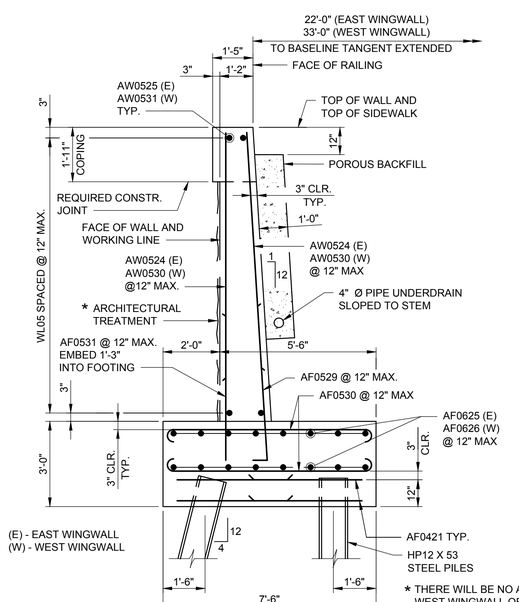
PLAN - EAST WINGWALL

SCALE: 3/16" = 1'-0"



ELEVATION - EAST WINGWALL

SCALE: 3/16" = 1'-0"



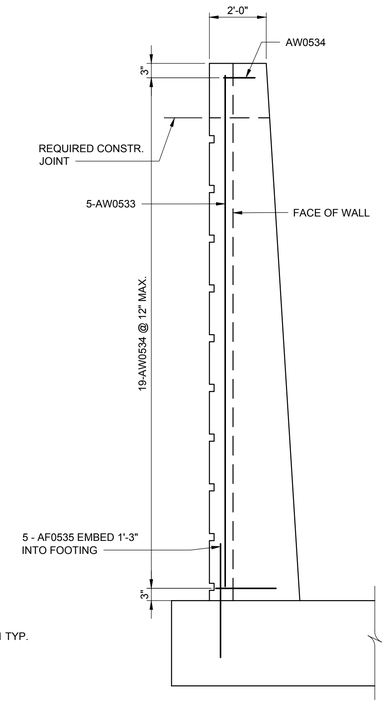
* THERE WILL BE NO ARCHITECTURAL TREATMENT ON THE WEST WINGWALL OR THE PORTION OF THE EAST WINGWALL FROM THE FACE OF STEM TO THE EDGE OF THE PILASTER.

SECTION A-A

SCALE: 3/8" = 1'-0"

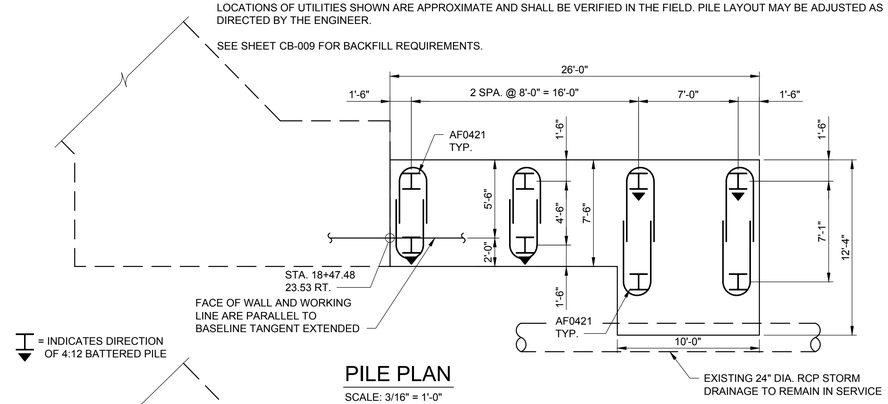
SECTION B-B

SCALE: 3/8" = 1'-0"



SECTION C-C

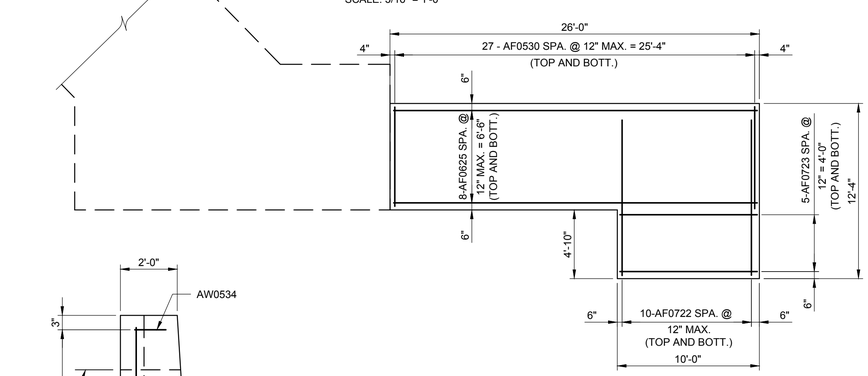
SCALE: 3/8" = 1'-0"



= INDICATES DIRECTION OF 4:12 BATTERED PILE

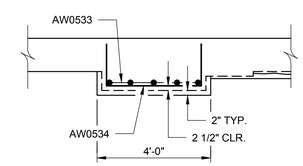
PILE PLAN

SCALE: 3/16" = 1'-0"



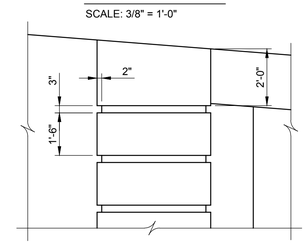
FOOTING REINFORCING PLAN

SCALE: 3/16" = 1'-0"



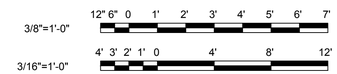
SECTION D-D

SCALE: 3/8" = 1'-0"



PILASTER DETAIL

SCALE: 3/8" = 1'-0"



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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

ABUTMENT B EAST WINGWALL PLAN AND DETAILS

SHEET NUMBER

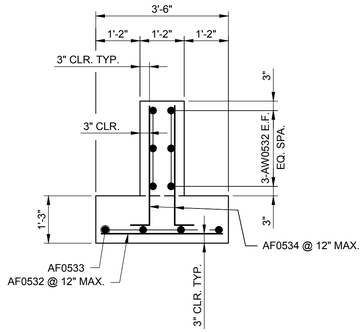
CB-012

ANSI D 22" X 34"

NOTES:

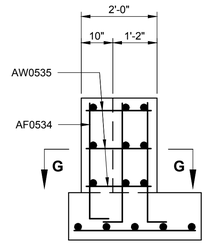
RAILING NOT SHOWN FOR CLARITY, SEE SHEETS CB-053 THRU CB-055 FOR DETAILS.

STEEL PILES FOR ABUTMENT B WEST WINGWALL HAVE BEEN DESIGNED FOR A MAXIMUM FACTORED AXIAL LOAD OF 95 KIPS.



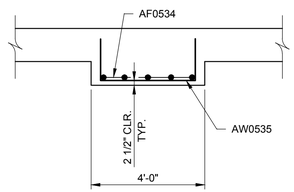
SECTION E-E

SCALE: 1/2" = 1'-0"



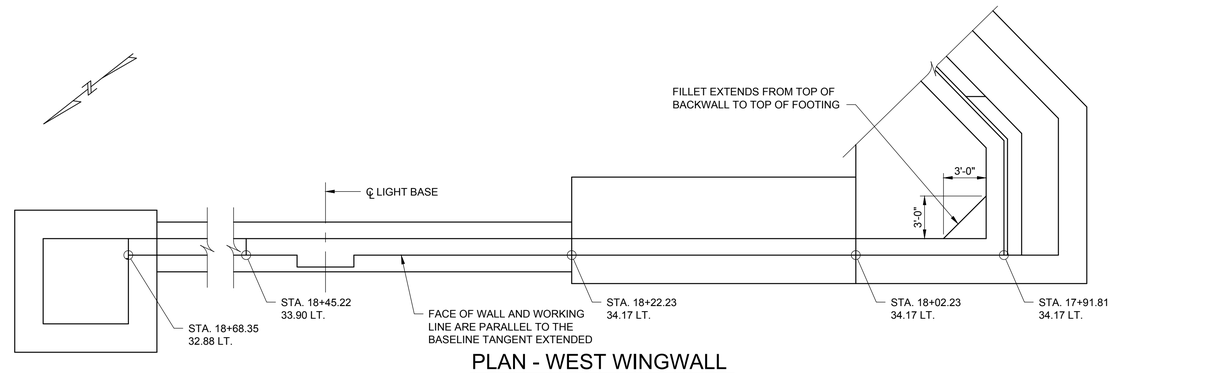
SECTION F-F

SCALE: 1/2" = 1'-0"



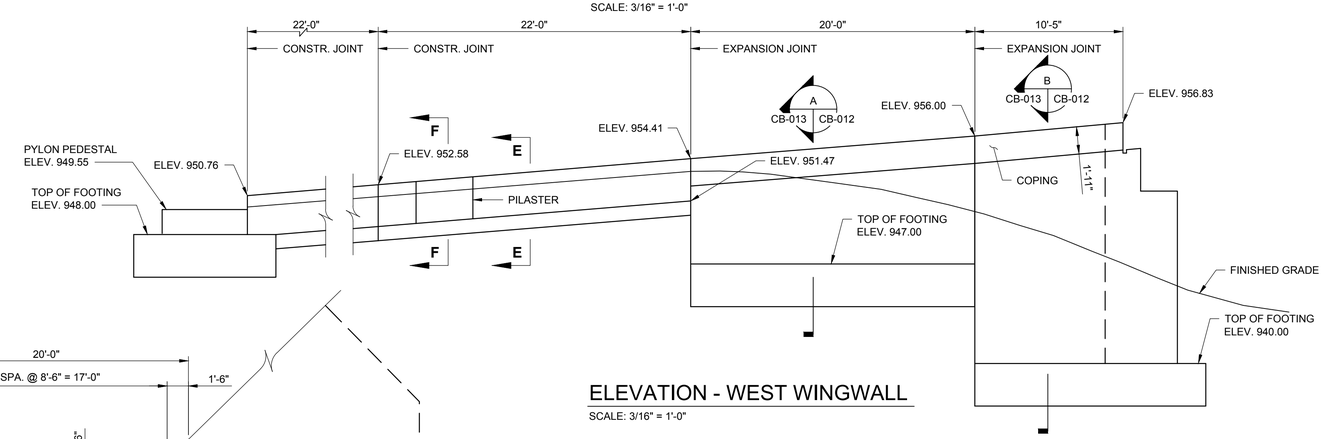
SECTION G-G

SCALE: 3/8" = 1'-0"



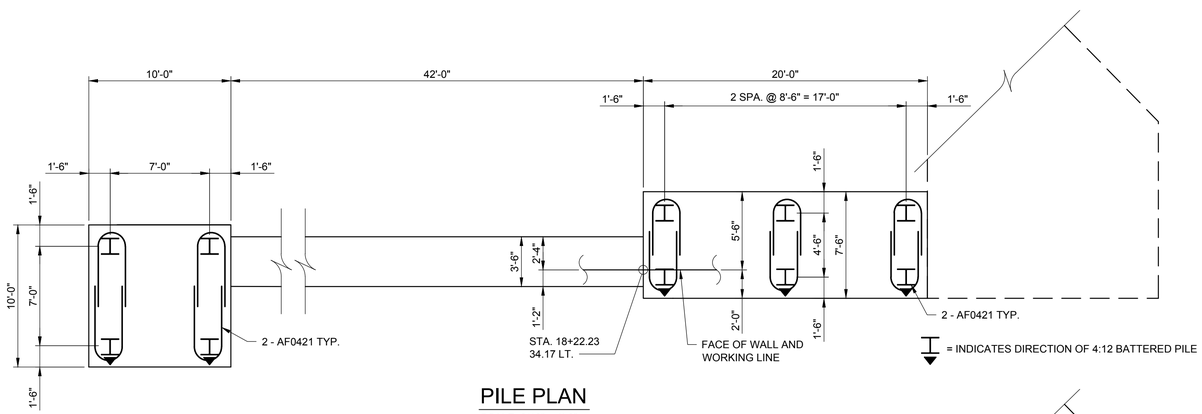
PLAN - WEST WINGWALL

SCALE: 3/16" = 1'-0"



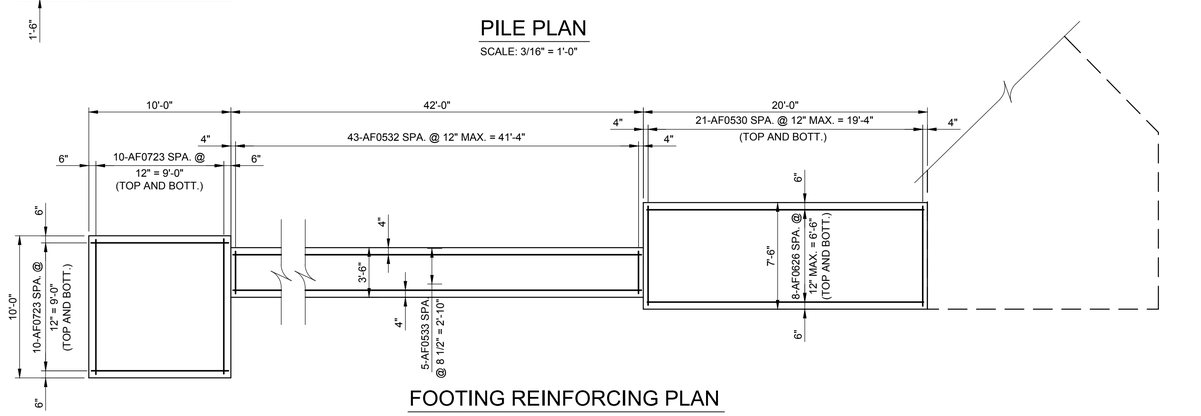
ELEVATION - WEST WINGWALL

SCALE: 3/16" = 1'-0"



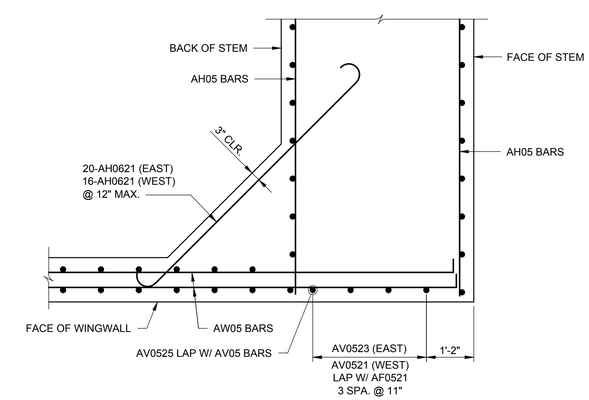
PILE PLAN

SCALE: 3/16" = 1'-0"



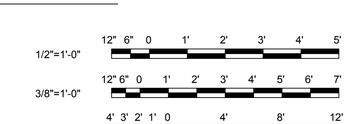
FOOTING REINFORCING PLAN

SCALE: 3/16" = 1'-0"



CORNER FILLET DETAIL

SCALE: 1/2" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
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REGISTRATION

COMMONWEALTH OF VIRGINIA
5/27/16
BENJAMIN L. SHEALY
Lic. No. 052810
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

ABUTMENT B WEST WINGWALL PLAN AND DETAILS

SHEET NUMBER

CB-013

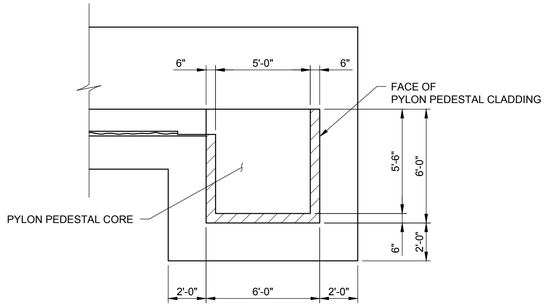
ANSI D 22" X 34"

NOTES:

DIMENSIONS FOR PYLON PEDESTAL CLADDING AND PYLON PEDESTAL CORE SHALL BE COORDINATED WITH THE PROPOSED PRECAST CLADDING AND PYLON DETAILS. SEE SHEET CB-027.

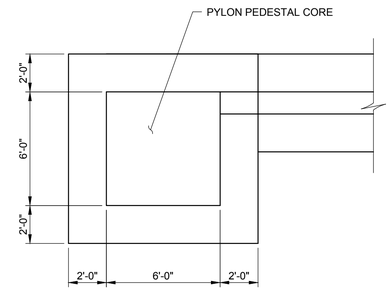
SEE THE SPECIAL PROVISION FOR PRECAST ARCHITECTURAL CONCRETE FOR REQUIREMENTS ON PYLON PEDESTAL CLADDING.

DECORATIVE PYLON CAST-IN-PLACE CONCRETE CORE NOT SHOWN FOR CLARITY. SEE SHEET CB-027 FOR DETAILS.



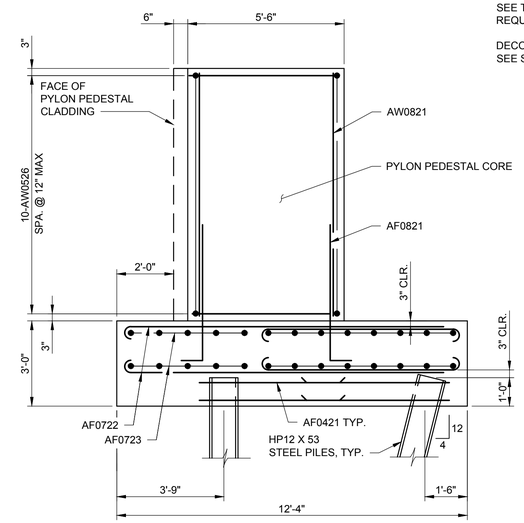
EAST PYLON PEDESTAL PLAN

SCALE: 1/4" = 1'-0"



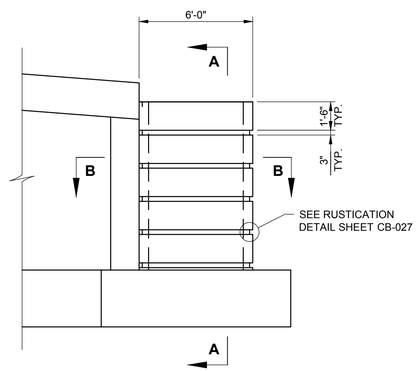
WEST PYLON PEDESTAL PLAN

SCALE: 1/4" = 1'-0"



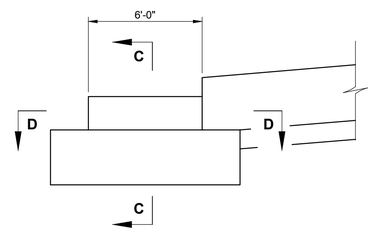
SECTION A-A

SCALE: 3/8" = 1'-0"



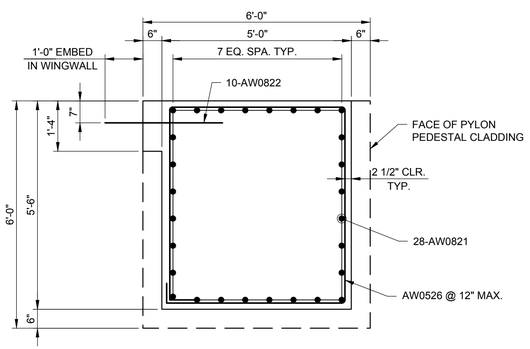
EAST PYLON PEDESTAL ELEVATION

SCALE: 1/4" = 1'-0"



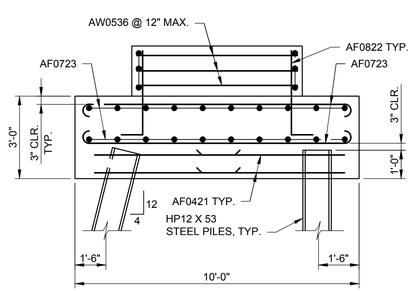
WEST PYLON PEDESTAL ELEVATION

SCALE: 1/4" = 1'-0"



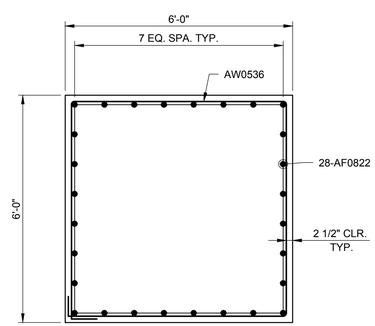
SECTION B-B

SCALE: 1/2" = 1'-0"



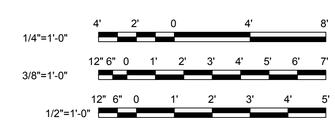
SECTION C-C

SCALE: 3/8" = 1'-0"



SECTION D-D

SCALE: 1/2" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

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5/17/16
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KEY PLAN

PROJECT NUMBER

60290893

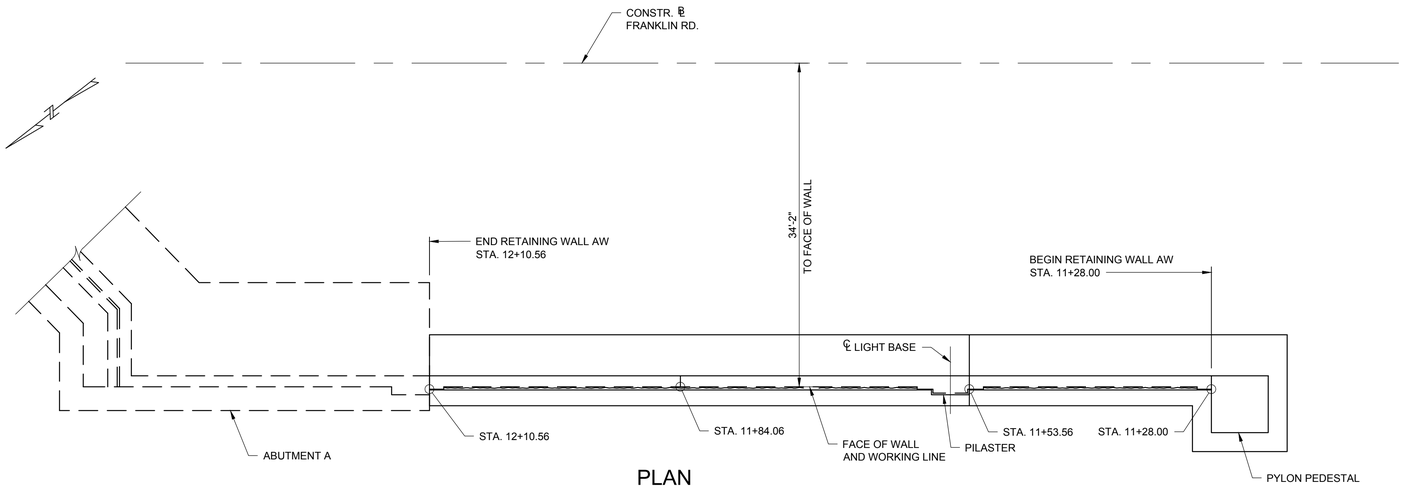
SHEET TITLE

ABUTMENT B SECTIONS AND DETAILS

SHEET NUMBER

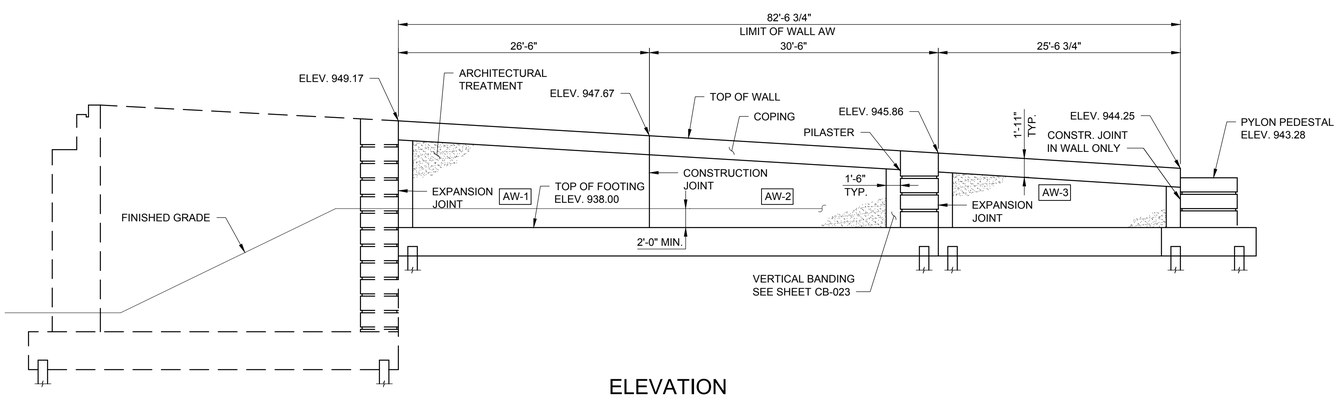
CB-014

ANSI D 22" X 34"



PLAN

SCALE: 1/8" = 1'-0"



ELEVATION

SCALE: 1/8" = 1'-0"

NOTES:

FOR GENERAL NOTES AND SELECT BACKFILL DETAIL, SEE SHEET CB-001.

FOR TYPICAL SECTIONS, SEE SHEET CB-016.

FOR FOOTING DETAILS, SEE SHEET CB-017.

FOR ADDITIONAL DETAILS, SEE SHEET CB-018.

RAILING NOT SHOWN FOR CLARITY. SEE SHEETS CB-053 THRU CB-055 FOR DETAILS.

DECORATIVE PYLON CAST-IN-PLACE CORE NOT SHOWN FOR CLARITY. SEE SHEET CB-027 FOR DETAILS.

FOR CONSTRUCTION AND EXPANSION JOINT DETAILS, SEE SHEET CB-023.

SEE SPECIAL PROVISION FOR ARCHITECTURAL TREATMENT.

SEE SPECIAL PROVISION FOR CONCRETE SURFACE COLOR COATING.

1/8"=1'-0" 8' 4' 0 8' 16'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

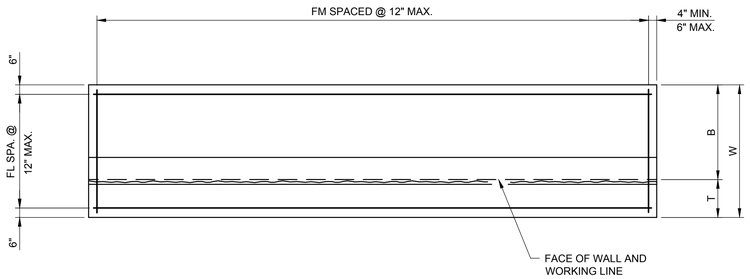
SHEET TITLE

RETAINING WALL AW
PLAN AND ELEVATION

SHEET NUMBER

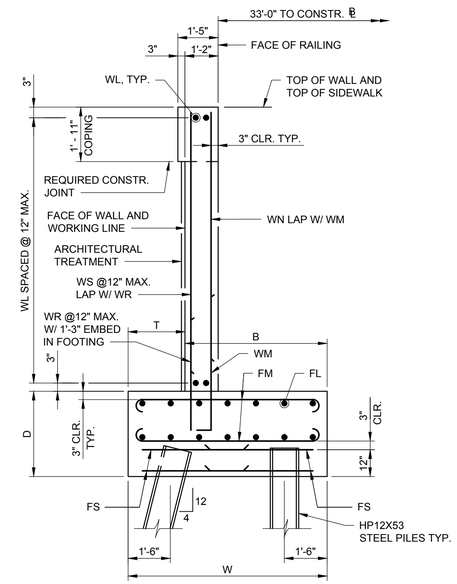
CB-015

ANSI D 22" x 34"



PLAN

NOT TO SCALE



SECTION A-A

NOT TO SCALE

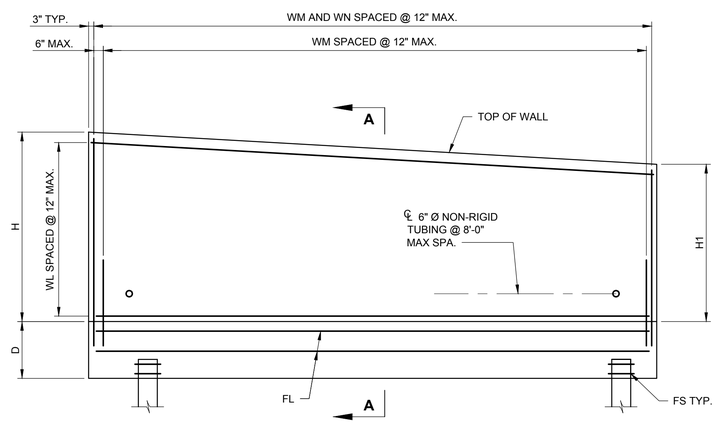
NOTES:

IN THE EXPANSION AND CONSTRUCTION JOINTS, WATERSTOPS SHALL EXTEND FROM THE TOP OF FOOTING TO 12" BELOW THE TOP OF WALL.

EXPANSION JOINTS SHALL HAVE COLD APPLIED JOINT SEALER ON THE FRONT FACE AND TOP OF WALL.

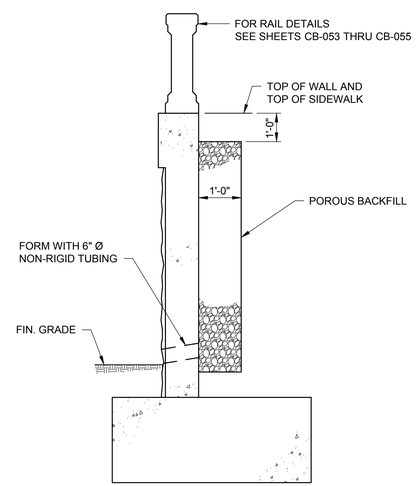
SEE THE SPECIAL PROVISION FOR ARCHITECTURAL TREATMENT.

PRIOR TO CONSTRUCTION OF WALL COPING, WALL BACKFILL SHALL BE PLACED AND COMPACTED WITHIN 12" OF THE BOTTOM OF COPING. WHERE WALL DEFLECTION RESULTS FROM BACKFILL PLACEMENT, THE WALL COPING SHALL BE CONSTRUCTED TO ALIGN WITH THE PROPOSED FACE OF RAILING, AS INDICATED ON THESE PLANS.



ELEVATION

NOT TO SCALE



POROUS BACKFILL DETAIL

NOT TO SCALE

WALL DIMENSIONS							REINFORCING STEEL DESIGNATIONS							
WALL SECTION	H	H1	D	W	T	B	WL	WM	WN	WR	WS	FL	FM	FS
AW-1	11'-2"	9'-8"	3'-0"	7'-6"	2'-0"	5'-6"	WL0501	WM0501	WN0501	WR0501	WS0501	FL0601	FM0501	FS0401
AW-2	9'-8"	7'-10 1/4"	3'-0"	7'-6"	2'-0"	5'-6"	WL0502	WM0502	WN0502	WR0502	WS0502	FL0602	FM0502	FS0402
AW-3	7'-10 1/4"	6'-3"	3'-0"	7'-6"	2'-0"	5'-6"	WL0503	WM0503	WN0503	WR0503	WS0503	FL0603	FM0503	FS0403

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

RETAINING WALL AW
TYPICAL SECTION AND
REINFORCING

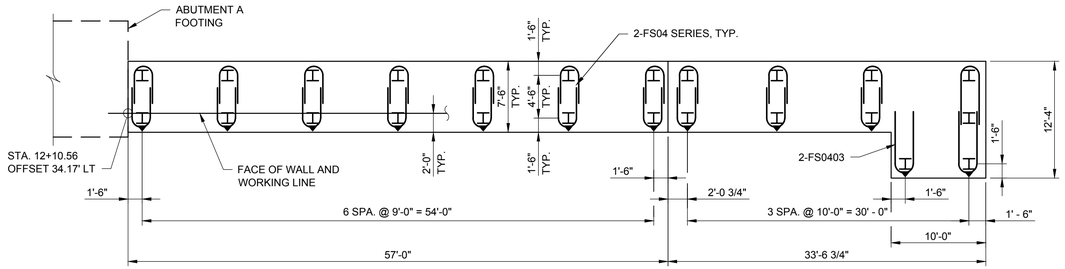
SHEET NUMBER

CB-016

ANSI D 22" X 34"

NOTE:

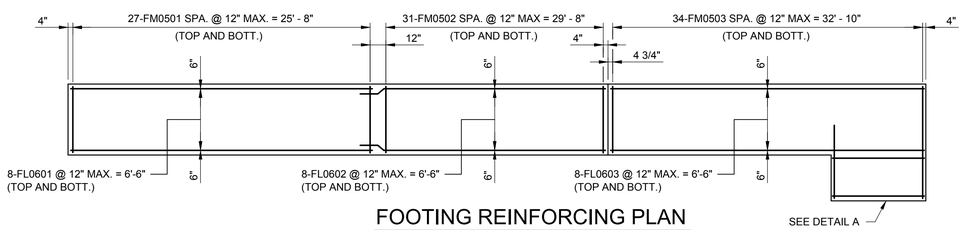
STEEL PILES FOR RETAINING WALL AW HAVE BEEN DESIGNED FOR A MAXIMUM FACTORED AXIAL LOAD OF 160 KIPS.



= INDICATES DIRECTION OF 4:12 BATTERED PILES

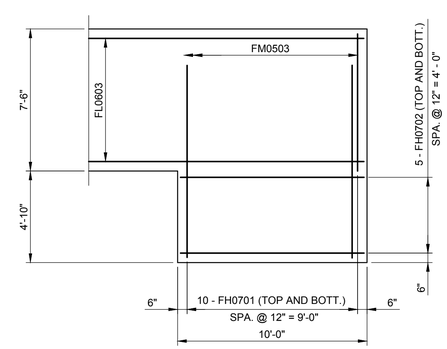
FOOTING PLAN

SCALE: 1/8" = 1'-0"



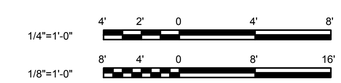
FOOTING REINFORCING PLAN

SCALE: 1/8" = 1'-0"



DETAIL A

SCALE: 1/4" = 1'-0"



GRAPHIC SCALES

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PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

RETAINING WALL AW
FOOTING PLAN

SHEET NUMBER

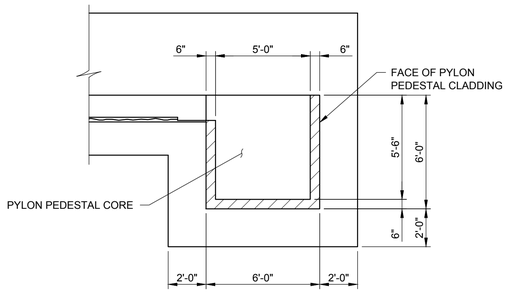
CB-017

ANSI D 22" X 34"

NOTES:

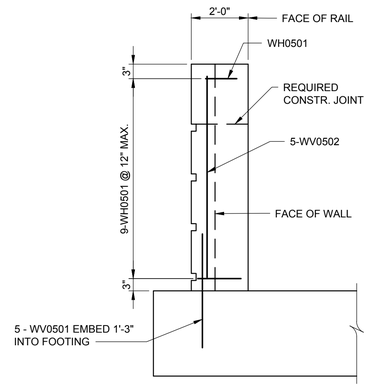
SEE SPECIAL PROVISION FOR PRECAST ARCHITECTURAL CONCRETE FOR REQUIREMENTS ON PYLON PEDESTAL CLADDING.

DIMENSIONS FOR PYLON PEDESTAL CLADDING AND PYLON PEDESTAL CORE SHALL BE COORDINATED WITH THE PROPOSED PRECAST CLADDING AND PYLON DETAILS. SEE SHEET CB-027.



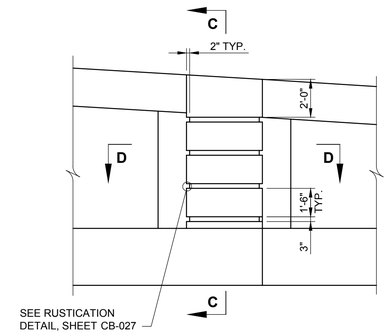
PYLON PEDESTAL PLAN

SCALE: 1/4" = 1'-0"



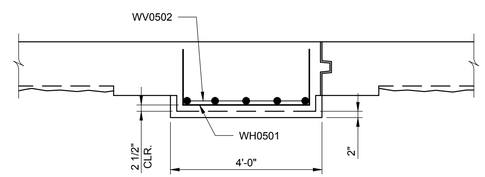
SECTION C-C

SCALE: 3/8" = 1'-0"



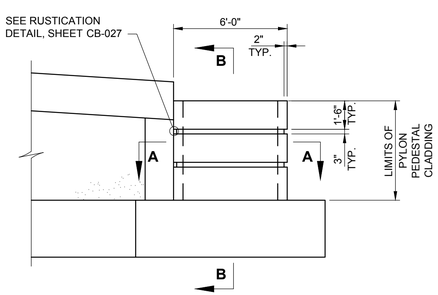
PILASTER ELEVATION

SCALE: 1/4" = 1'-0"



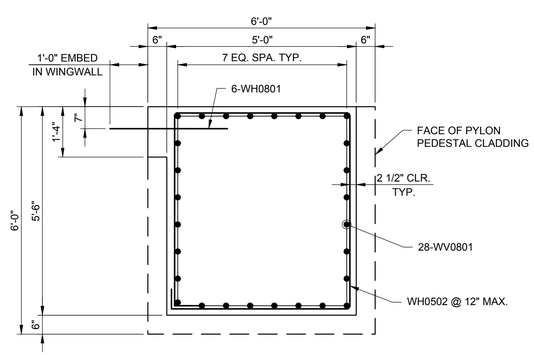
SECTION D-D

SCALE: 1/2" = 1'-0"



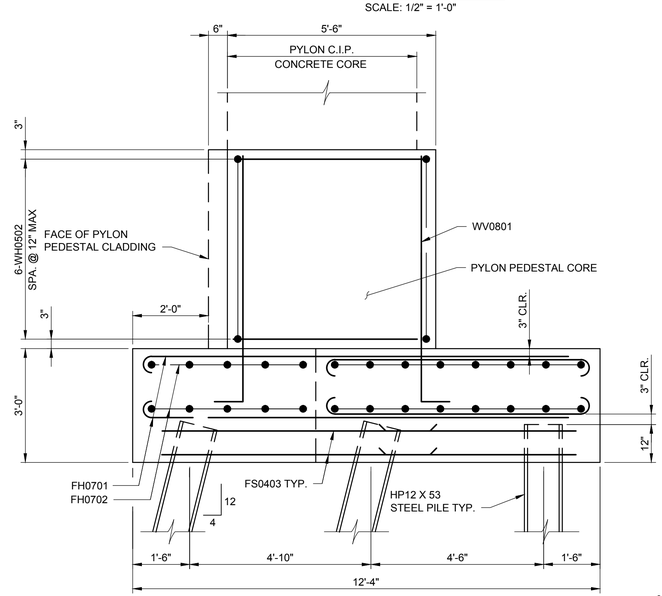
PYLON PEDESTAL ELEVATION

SCALE: 1/4" = 1'-0"



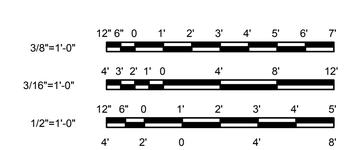
SECTION A-A

SCALE: 1/2" = 1'-0"



SECTION B-B

SCALE: 1/2" = 1'-0"



GRAPHIC SCALES

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PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

RETAINING WALL AW SECTIONS AND DETAILS

SHEET NUMBER

CB-018

ANSI D 22" X 34"

NOTES:

FOR GENERAL NOTES AND SELECT BACKFILL DETAIL, SEE SHEET CB-001.

FOR TYPICAL SECTIONS, SEE SHEET CB-020.

FOR FOOTING DETAILS, SEE SHEET CB-021.

FOR ADDITIONAL DETAILS, SEE SHEET CB-022.

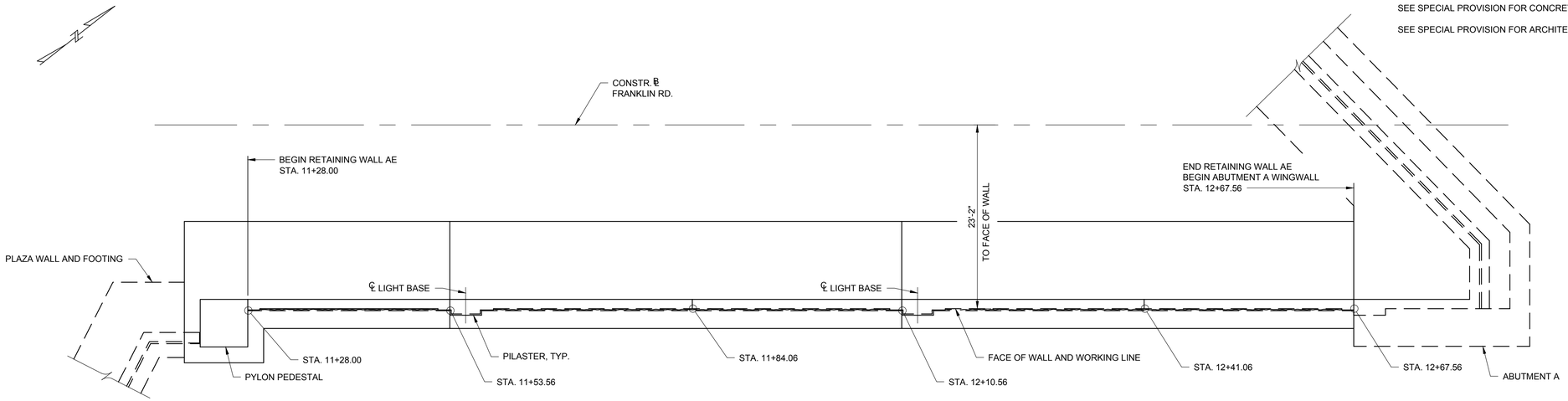
RAILING NOT SHOWN FOR CLARITY. SEE SHEETS CB-053 THRU CB-055 FOR DETAILS.

DECORATIVE PYLON CAST-IN-PLACE CORE NOT SHOWN FOR CLARITY. SEE SHEET CB-027 FOR DETAILS.

FOR CONSTRUCTION AND EXPANSION JOINT DETAILS, SEE SHEET CB-023.

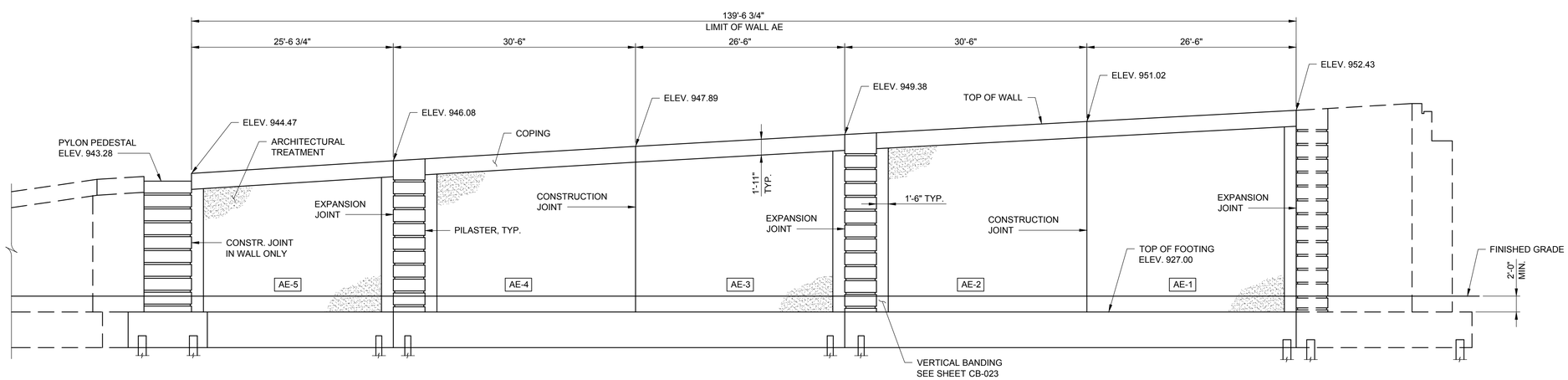
SEE SPECIAL PROVISION FOR CONCRETE SURFACE COLOR COATING.

SEE SPECIAL PROVISION FOR ARCHITECTURAL TREATMENT.



PLAN

SCALE: 1/8" = 1'-0"



ELEVATION

SCALE: 1/8" = 1'-0"

1/8"=1'-0" 8' 4' 0 8' 16'

GRAPHIC SCALES

AECOM

PROJECT

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PROJECT NUMBER

60290893

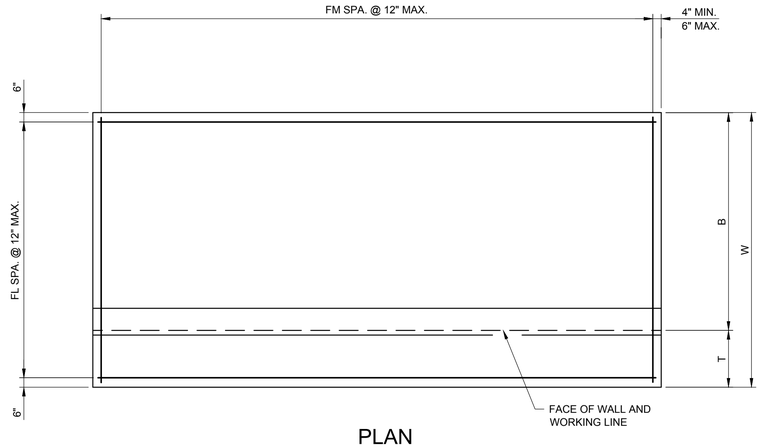
SHEET TITLE

RETAINING WALL AE
PLAN AND ELEVATION

SHEET NUMBER

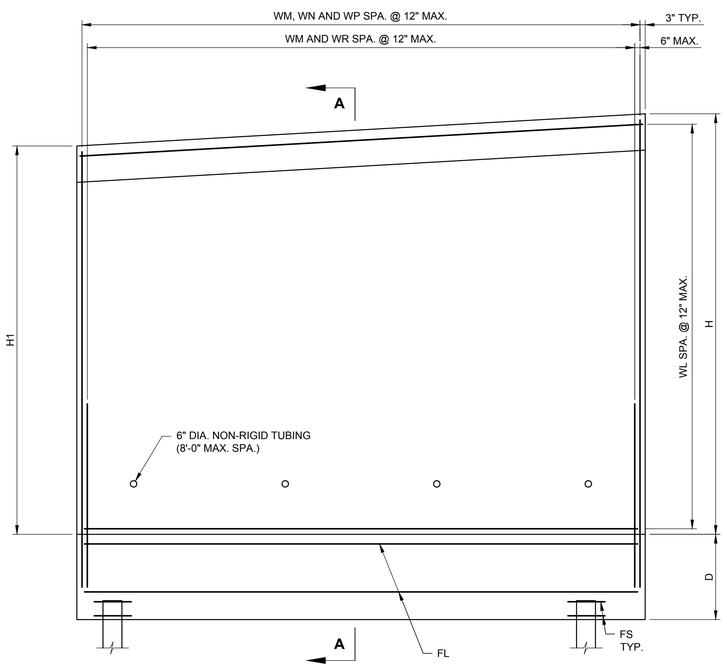
CB-019

ANSI D 22" X 34"



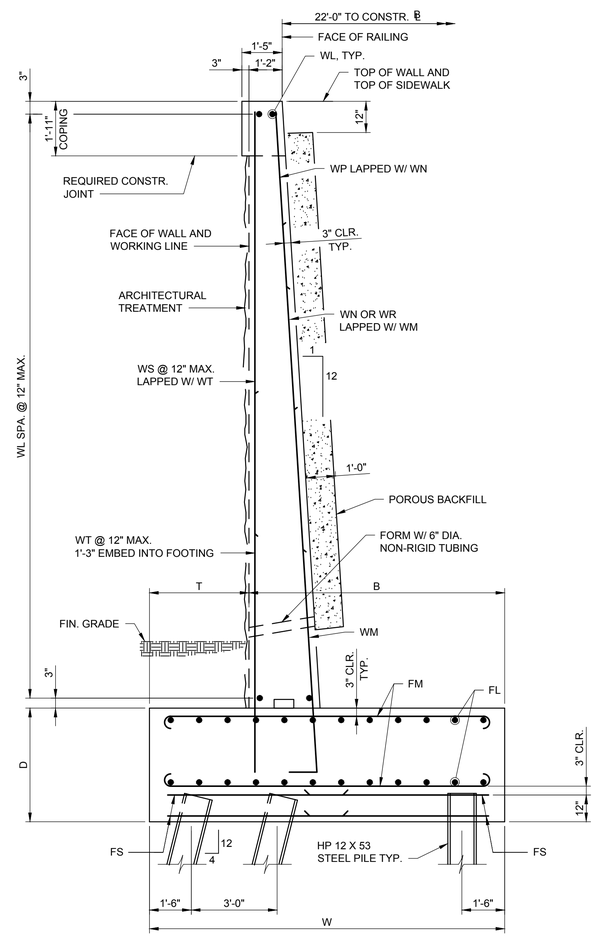
PLAN

NOT TO SCALE



ELEVATION

NOT TO SCALE



SECTION A-A

NOT TO SCALE

NOTES:

IN THE EXPANSION AND CONSTRUCTION JOINTS, WATERSTOPS SHALL EXTEND FROM THE TOP OF FOOTING TO 12" BELOW THE TOP OF WALL.

EXPANSION JOINTS SHALL HAVE COLD APPLIED JOINT SEALER ON THE FRONT FACE AND TOP OF WALL.

RAILING NOT SHOWN. FOR DETAILS SEE SHEETS CB-053 THRU CB-055.

SEE THE SPECIAL PROVISION FOR ARCHITECTURAL TREATMENT.

PRIOR TO CONSTRUCTION OF WALL COPING, WALL BACKFILL SHALL BE PLACED AND COMPACTED WITHIN 12" OF THE BOTTOM OF COPING. WHERE WALL DEFLECTION RESULTS FROM BACKFILL PLACEMENT, THE WALL COPING SHALL BE CONSTRUCTED TO ALIGN WITH THE PROPOSED FACE OF RAILING, AS INDICATED ON THESE PLANS.

WALL DIMENSIONS							REINFORCING STEEL DESIGNATIONS									
WALL SECTION	H	H1	D	W	T	B	WL	WM	WN	WP	WR	WS	WT	FL	FM	FS
AE-1	25'-5 1/4"	24'-0 1/4"	4'-0"	13'-6"	2'-6"	11'-0"	WL0504	WM0801	WN0801	WP0501	WR0801	WS0504	WT0504	FL0604	FM0801	FS0404
AE-2	24'-0 1/4"	22'-4 5/8"	4'-0"	13'-6"	2'-6"	11'-0"	WL0505	WM0802	WN0802	WP0502	WR0802	WS0505	WT0505	FL0605	FM0802	FS0405
AE-3	22'-4 5/8"	20'-10 3/4"	4'-0"	13'-6"	2'-6"	11'-0"	WL0506	WM0701	WN0701	WP0503	WR0701	WS0506	WT0506	FL0701	FM0601	FS0406
AE-4	20'-10 3/4"	19'-0 7/8"	4'-0"	13'-6"	2'-6"	11'-0"	WL0507	WM0702	WN0702	WP0504	WR0702	WS0507	WT0507	FL0702	FM0602	FS0407
AE-5	19'-0 7/8"	17'-5 5/8"	4'-0"	13'-6"	2'-6"	11'-0"	WL0508	WM0601	WN0601	WP0505	WR0601	WS0508	WT0508	FL0703	FM0603	FS0408

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
215 Church Avenue, SW
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REGISTRATION

COMMONWEALTH OF VIRGINIA
5/17/16
BENJAMIN L. SHEALY
Lic. No. 052810
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

RETAINING WALL AE
TYPICAL SECTION AND
REINFORCING

SHEET NUMBER

CB-020

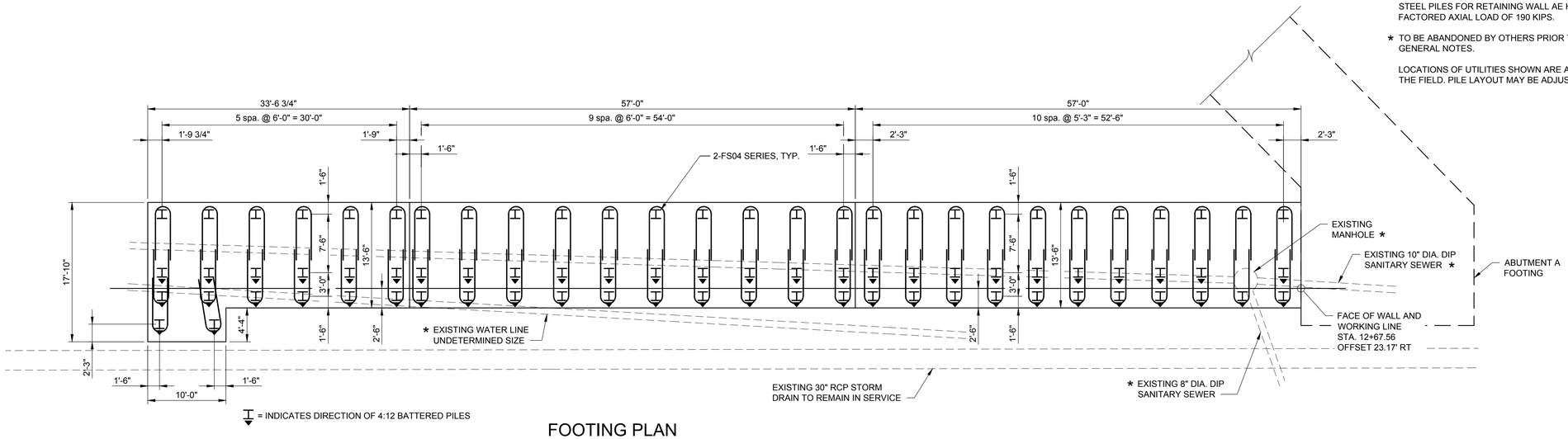
ANSI D 22" X 34"

NOTES:

STEEL PILES FOR RETAINING WALL AE HAVE BEEN DESIGNED FOR A MAXIMUM FACTORED AXIAL LOAD OF 190 KIPS.

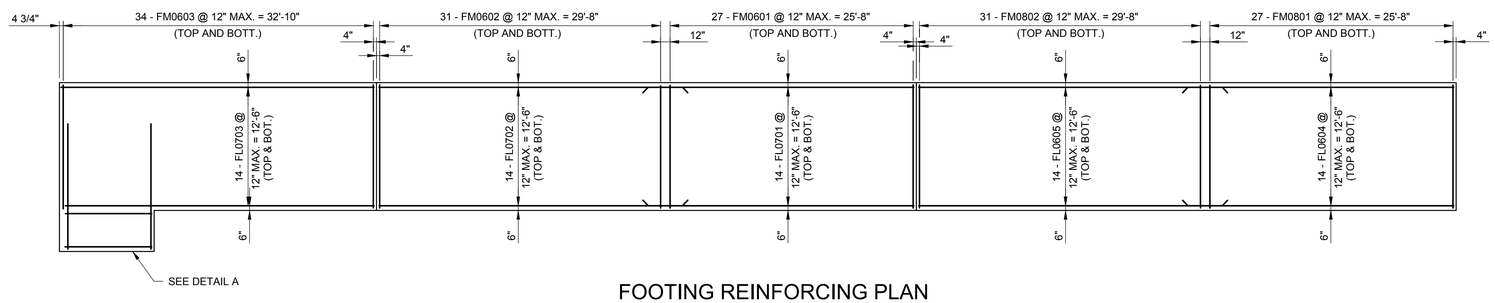
* TO BE ABANDONED BY OTHERS PRIOR TO SUBSTRUCTURE CONSTRUCTION. SEE GENERAL NOTES.

LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD. PILE LAYOUT MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.



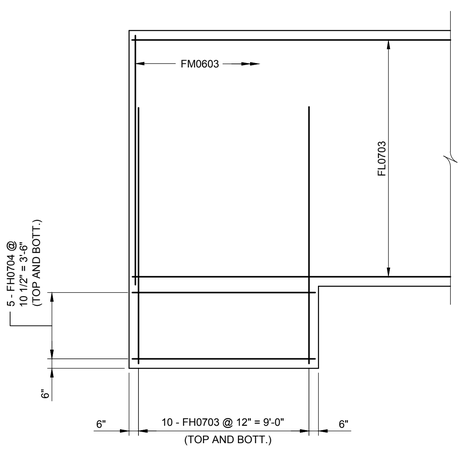
FOOTING PLAN

SCALE: 1/8" = 1'-0"



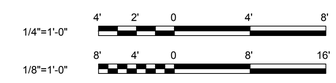
FOOTING REINFORCING PLAN

SCALE: 1/8" = 1'-0"



DETAIL A

SCALE: 1/4" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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5/17/16
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ISSUE REVISION

I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

RETAINING WALL AE
FOOTING PLAN

SHEET NUMBER

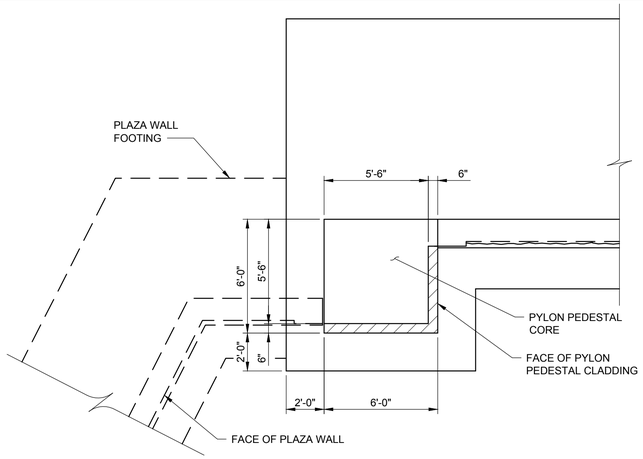
CB-021

ANSI D 22" X 34"

NOTES:

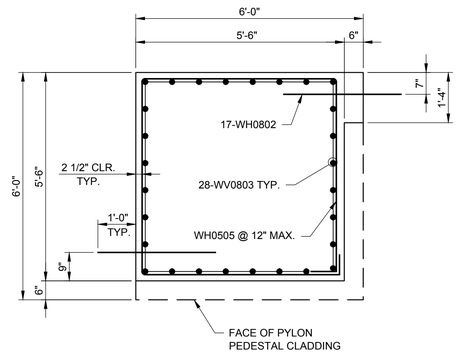
SEE SPECIAL PROVISION FOR PRECAST ARCHITECTURAL CONCRETE FOR REQUIREMENTS ON PYLON PEDESTAL CLADDING.

DIMENSIONS FOR PYLON PEDESTAL CLADDING AND PYLON PEDESTAL CORE SHALL BE COORDINATED WITH THE PROPOSED PRECAST CLADDING AND PYLON DETAILS. SEE SHEET CB-027.



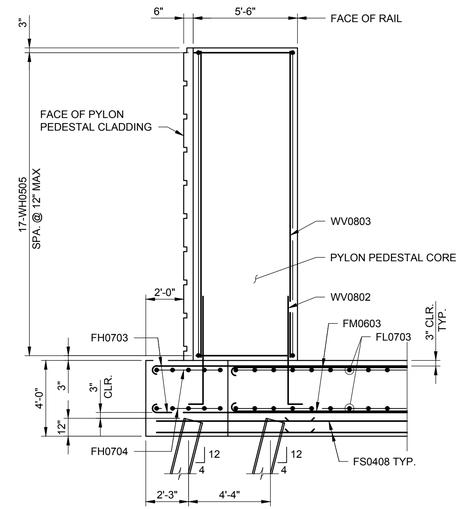
PYLON PEDESTAL PLAN

SCALE: 1/4" = 1'-0"



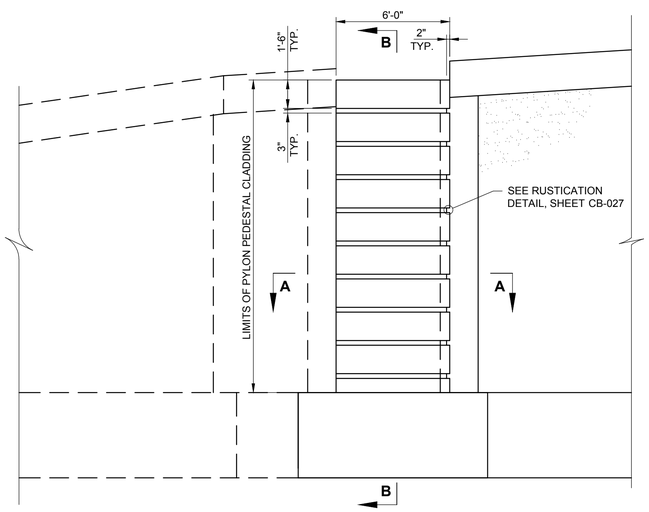
SECTION A-A

SCALE: 1/2" = 1'-0"



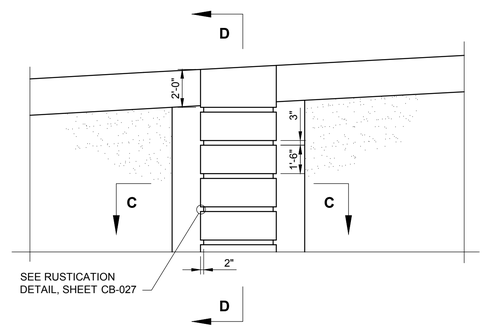
SECTION B-B

1/4" = 1'-0"



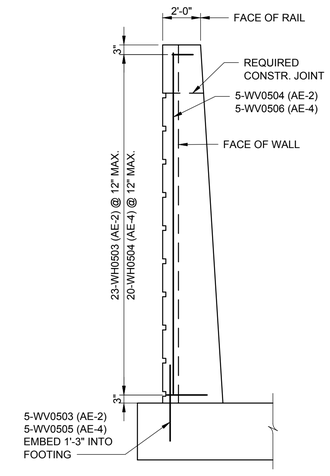
PYLON PEDESTAL ELEVATION

SCALE: 1/4" = 1'-0"



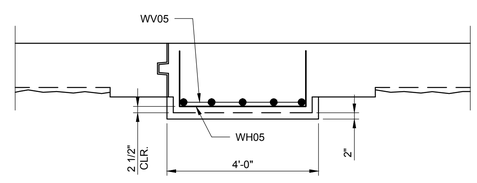
PILASTER ELEVATION

SCALE: 1/4" = 1'-0"



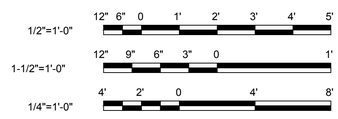
SECTION D-D

SCALE: 1/4" = 1'-0"



SECTION C-C

SCALE: 1/2" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE

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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

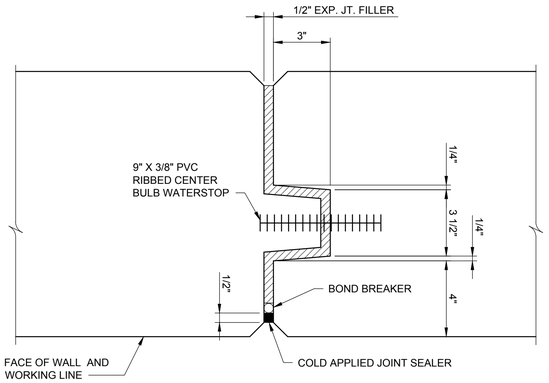
SHEET TITLE

RETAINING WALL AE SECTIONS AND DETAILS

SHEET NUMBER

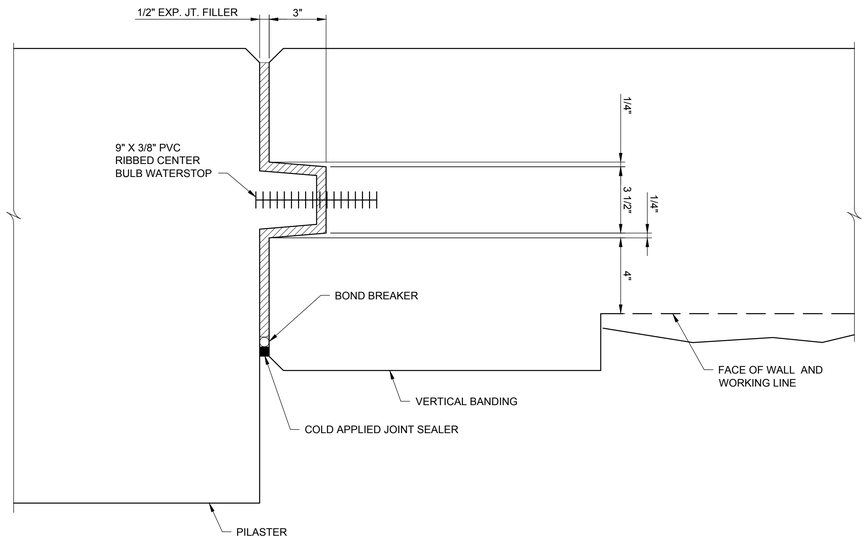
CB-022

ANSI D 22" X 34"



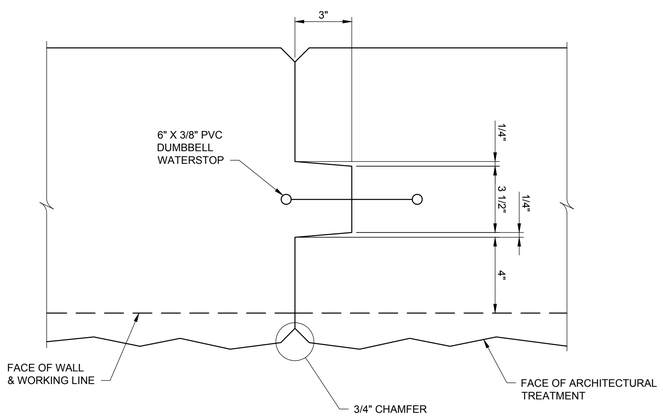
EXPANSION JOINT

SCALE: 3" = 1'-0"



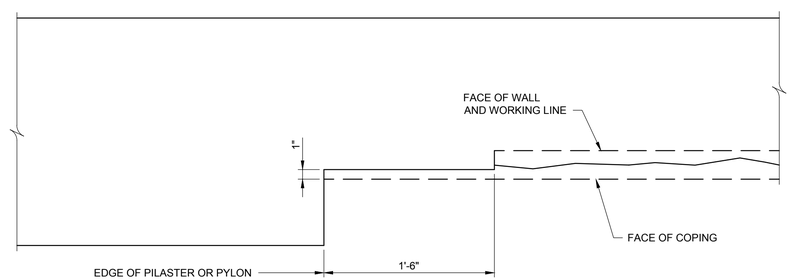
EXPANSION JOINT AT PILASTER

SCALE: 3" = 1'-0"



CONSTRUCTION JOINT

SCALE: 3" = 1'-0"

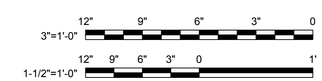


VERTICAL BANDING DETAIL

SCALE: 1 1/2" = 1'-0"

NOTES:

COST OF JOINT FILLER SHALL BE INCLUDED IN THE PRICE BID FOR CONCRETE.



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

RETAINING WALL GENERAL DETAILS

SHEET NUMBER

CB-023

ANSI D 22" X 34"

NOTES:

FOR GENERAL NOTES AND SELECT BACKFILL DETAIL, SEE SHEET CB-001.

FOR TYPICAL SECTIONS, SEE SHEET CB-025.

METAL RAILING NOT SHOWN FOR CLARITY. SEE SHEET CB-026 FOR DETAILS.

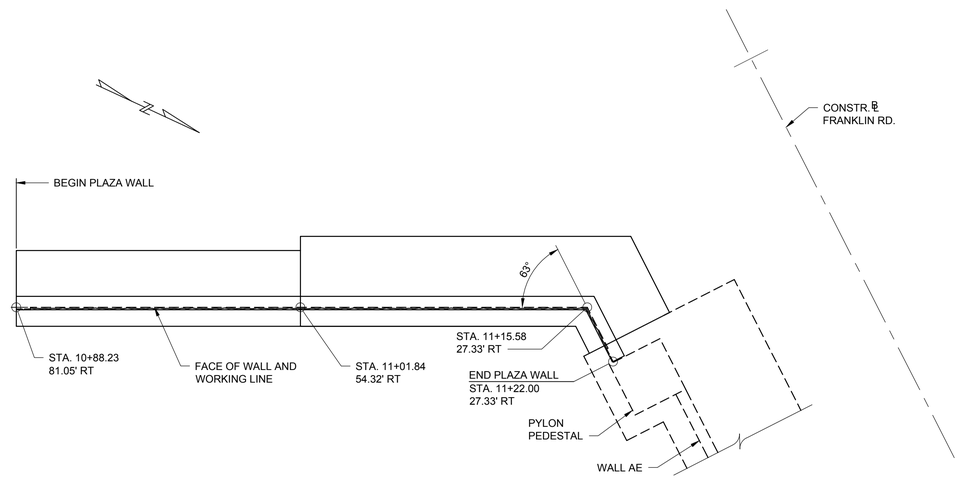
STEEL PILES FOR PLAZA WALL HAVE BEEN DESIGNED FOR A MAXIMUM FACTORED AXIAL LOAD OF 180 KIPS.

SEE SPECIAL PROVISION FOR CONCRETE SURFACE COLOR COATING.

SEE SPECIAL PROVISION FOR ARCHITECTURAL TREATMENT.

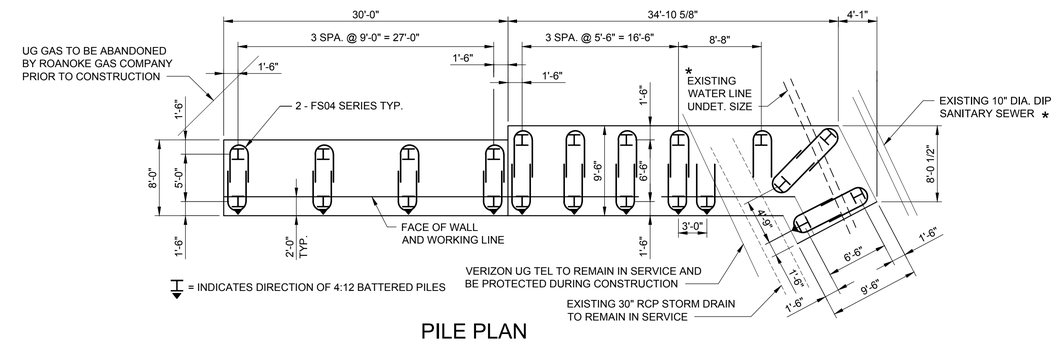
* TO BE ABANDONED BY OTHERS PRIOR TO SUBSTRUCTURE CONSTRUCTION. SEE GENERAL NOTES.

LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD. PILE LOCATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.



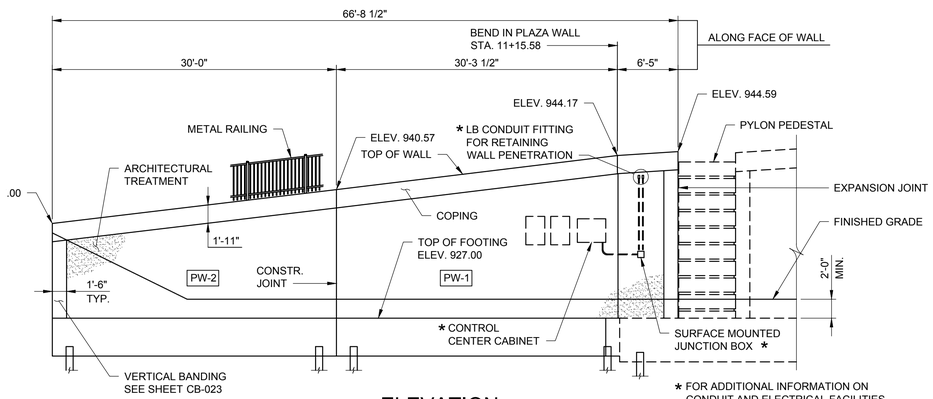
PLAN

SCALE: 1/8" = 1'-0"



PILE PLAN

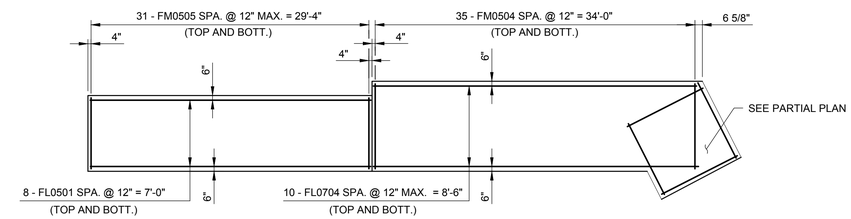
SCALE: 1/8" = 1'-0"



ELEVATION

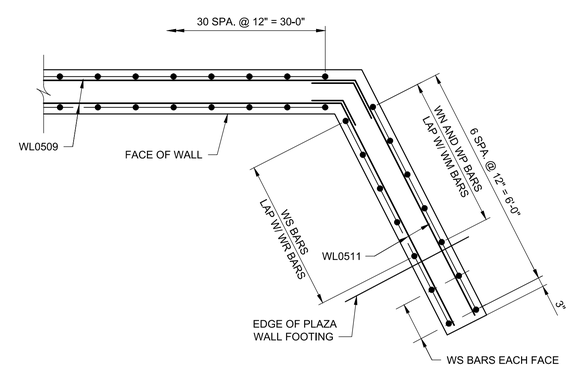
SCALE: 1/8" = 1'-0"

* FOR ADDITIONAL INFORMATION ON CONDUIT AND ELECTRICAL FACILITIES, SEE E SERIES SHEETS.



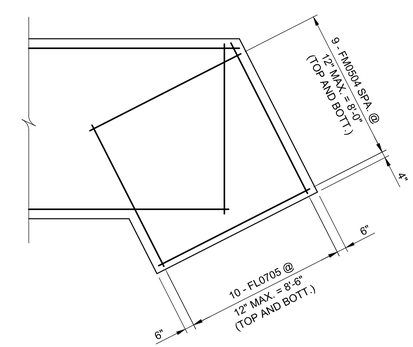
FOOTING REINFORCING PLAN

SCALE: 1/8" = 1'-0"



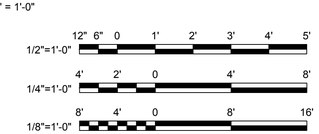
PARTIAL WALL REINFORCING PLAN

SCALE: 1/2" = 1'-0"



PARTIAL FOOTING REINFORCING PLAN

SCALE: 1/4" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

PLAZA WALL
PLAN AND ELEVATION

SHEET NUMBER

CB-024

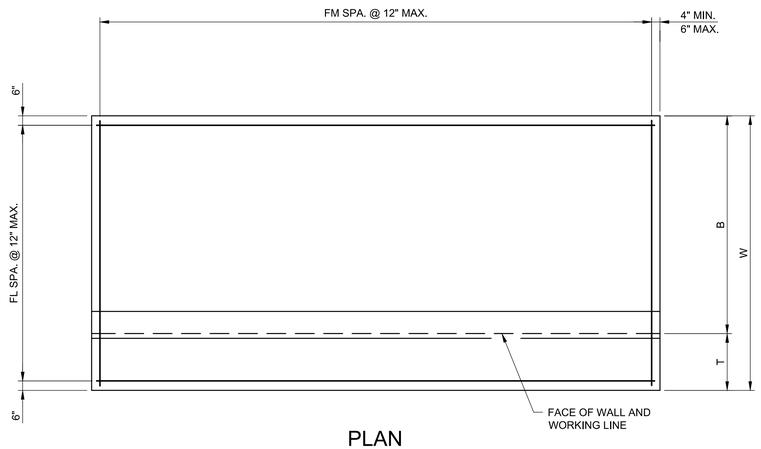
ANSI D 22" X 34"

NOTES:

IN THE EXPANSION AND CONSTRUCTION JOINTS, WATERSTOPS SHALL EXTEND FROM THE TOP OF FOOTING TO 12" BELOW THE TOP OF WALL.

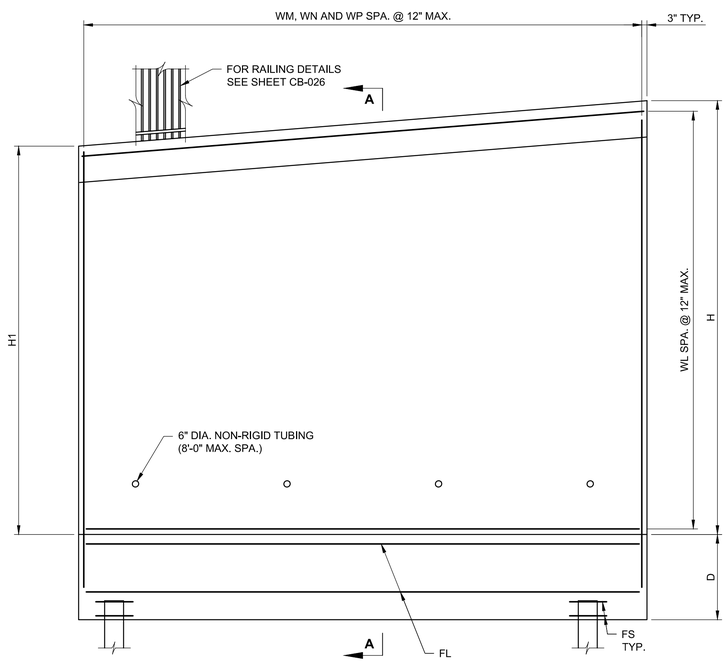
EXPANSION JOINTS SHALL HAVE COLD APPLIED JOINT SEALER ON THE FRONT FACE AND TOP OF WALL.

SEE THE SPECIAL PROVISION FOR ARCHITECTURAL TREATMENT.



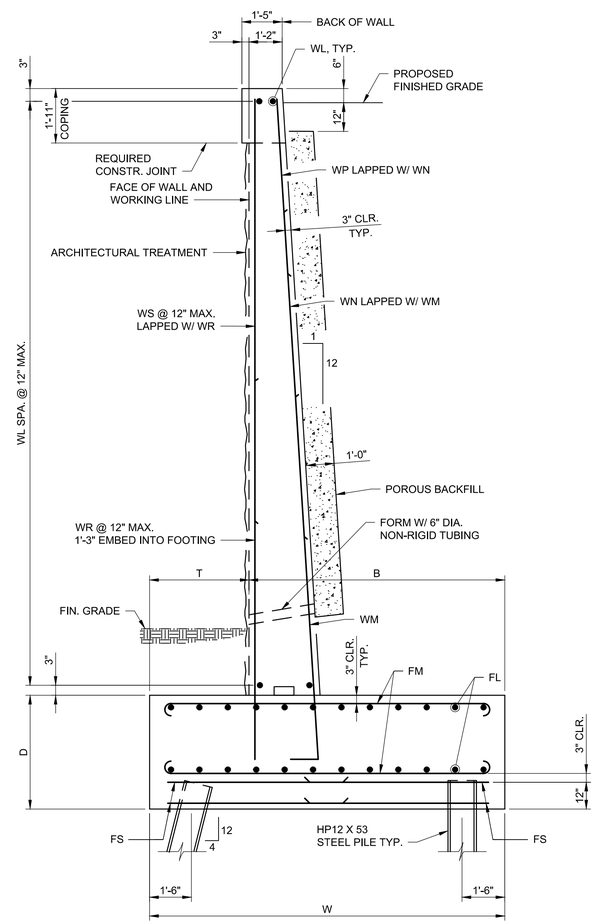
PLAN

NOT TO SCALE



ELEVATION

NOT TO SCALE



SECTION A-A

NOT TO SCALE

WALL DIMENSIONS							REINFORCING STEEL DESIGNATIONS								
WALL SECTION	H	H1	D	W	T	B	WL	WM	WN	WP	WR	WS	FL	FM	FS
PW-1	17'-7 1/8"	13'-6 7/8"	3'-6"	9'-6"	2'-0"	7'-6"	WL0509	WM0803	WN0803	WP0509	WR0509	WS0509	FL0704	FM0504	FS0409
PW-2	13'-6 7/8"	10'-0"	3'-6"	8'-0"	2'-0"	6'-0"	WL0510	WM0504	WN0504	—	WR0510	WS0510	FL0501	FM0505	FS0410

AECOM

PROJECT

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CLIENT

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KEY PLAN

PROJECT NUMBER

60290893

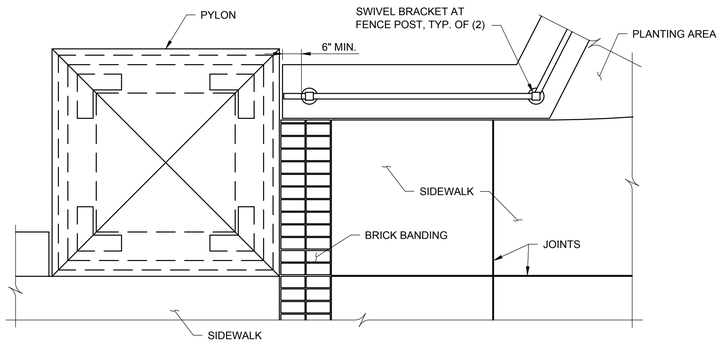
SHEET TITLE

PLAZA WALL DETAILS

SHEET NUMBER

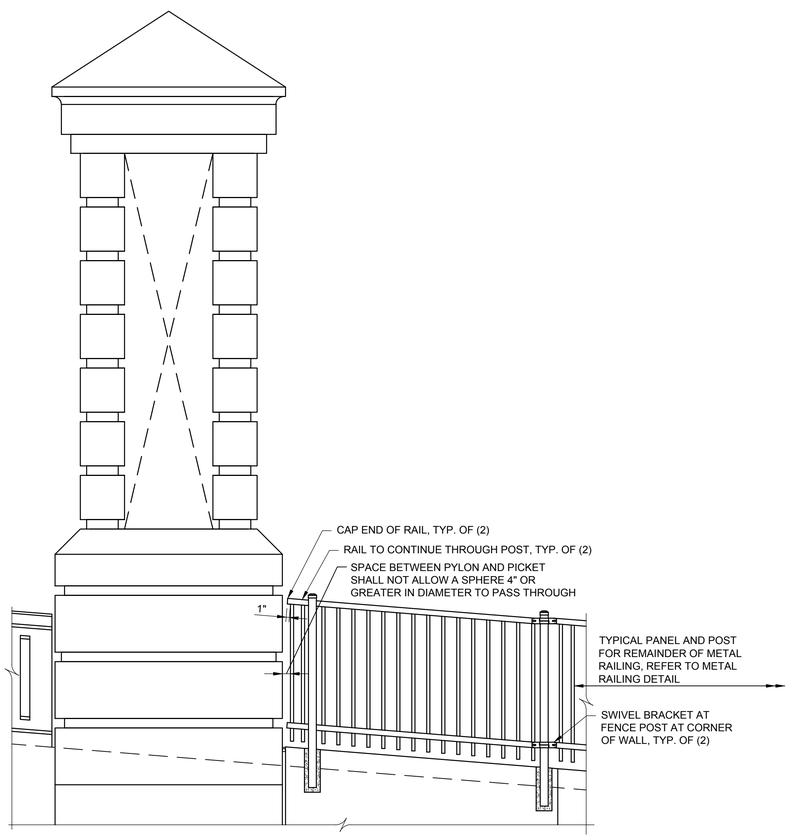
CB-025

ANSI D 22" X 34"



PLAN
METAL RAILING AT PYLON

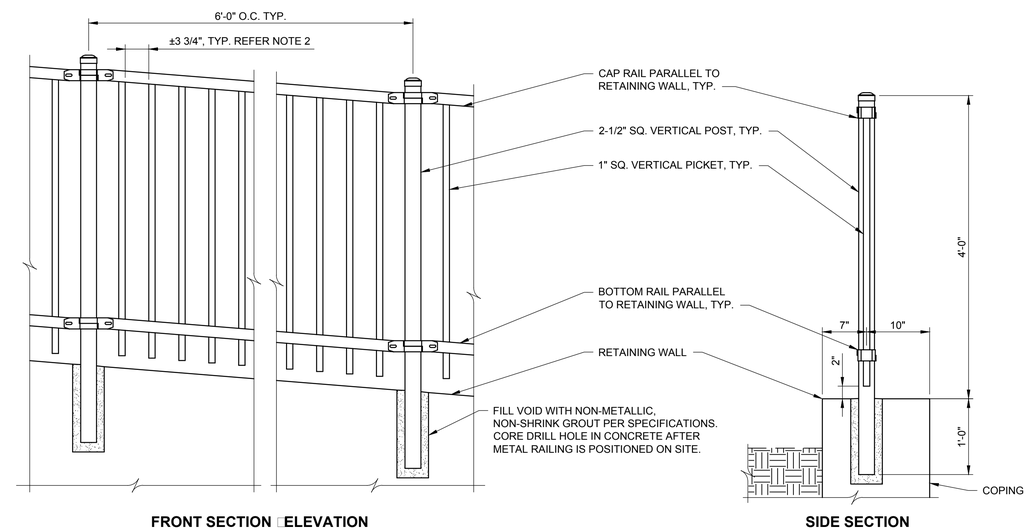
SCALE: 1/2" = 1'-0"



ELEVATION
METAL RAILING AT PYLON

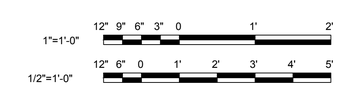
SCALE: 1/2" = 1'-0"

NOTES:
1. ALL METAL RAILING COMPONENTS TO HAVE BLACK POWDERCOAT FINISH.
2. METAL RAILING SHALL NOT ALLOW A 4" Ø SPHERE TO PASS THROUGH ANY OPENING OR BETWEEN POSTS AND ADJACENT VERTICAL SURFACES.
3. HORIZONTAL MEMBERS SHALL BE PARALLEL TO RETAINING WALL. VERTICAL MEMBERS TO BE VERTICAL.
4. BASIS-OF-DESIGN MANUFACTURER: AMERISTAR FENCE PRODUCTS, INC., ECHELON II MAJESTIC 2-RAIL INDUSTRIAL ALUMINUM FENCE, AMERISTARFENCE.COM (800) 321-8724.
5. WHEN USING SWIVEL BRACKETS AT ENDS OF PANEL INSTALLATION, ENSURE SPACING BETWEEN POST AND ADJOINING PICKETS MEETS APPLICABLE CODES.
6. REFER MANUFACTURER FOR INSTALLATION INSTRUCTIONS BEFORE DRILLING HOLES FOR POSTS IN RETAINING WALL.
7. CONTRACTOR SHALL PREPARE A SUBMITTAL TO THE CITY, SHOWING THE PROPOSED RAILING DETAILS, LAYOUT, AND MANUFACTURER INSTRUCTIONS FOR INSTALLATION.
8. PRICE BID FOR METAL RAILING SHALL INCLUDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO PROVIDE AND INSTALL RAILING AS SHOWN IN THESE DRAWINGS, INCLUDING SUBMITTALS, HOLE DRILLING AND GROUTING, ATTACHMENTS, FITTINGS, AND HARDWARE.



METAL RAILING DETAIL

SCALE: 1" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
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REGISTRATION

COMMONWEALTH OF VIRGINIA
8/17/16
DANIEL R DEAN
Lic. No.33539
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

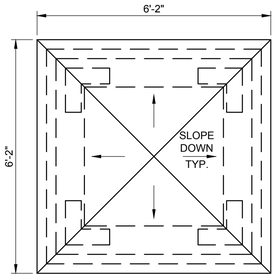
SHEET TITLE

PLAZA WALL METAL
RAILING DETAILS

SHEET NUMBER

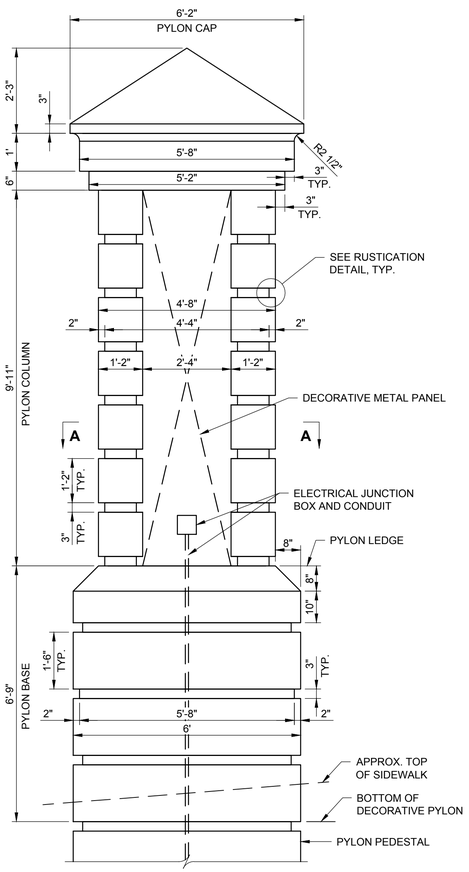
CB-026

ANSI D 22" X 34"



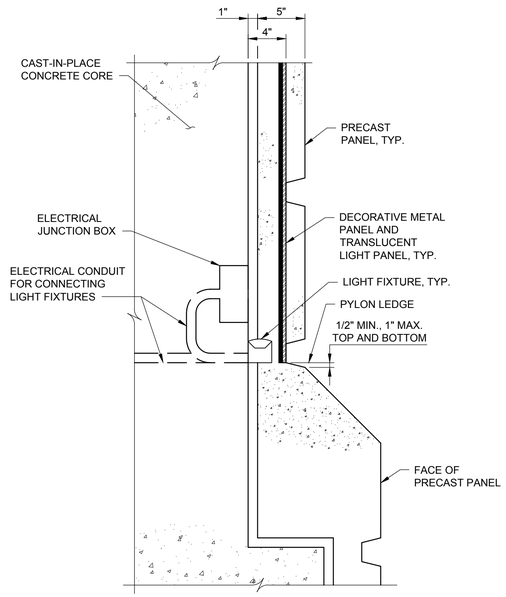
TOP PLAN

SCALE: 1/2" = 1'-0"



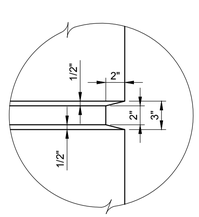
ELEVATION VIEW

SCALE: 1/2" = 1'-0"



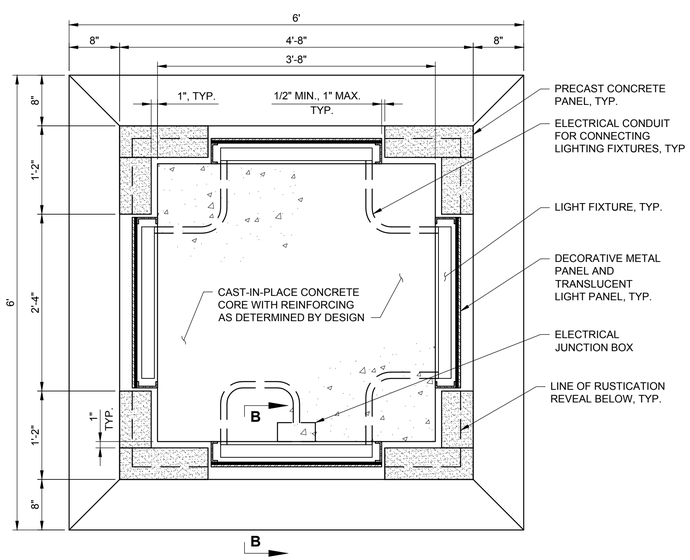
SECTION B-B

SCALE: 1 1/2" = 1'-0"



RUSTICATION DETAIL

SCALE: 1 1/2" = 1'-0"



SECTION A-A

SCALE: 1" = 1'-0"

RENDERING - DAY TIME

NOT TO SCALE

RENDERING - NIGHT TIME

NOT TO SCALE

NOTES:

PYLONS SHALL CONSIST OF A CAST-IN-PLACE CONCRETE STRUCTURAL CORE WITH ARCHITECTURAL PRECAST CONCRETE CLADDING AND DECORATIVE METAL PANELS WITH LIGHTING ON ALL FACES. THE RENDERINGS AND INFORMATION SHOWN ON THIS DRAWING EXPRESS THE INTENDED DESIGN CONCEPT. THE CONTRACTOR SHALL DEVELOP THE DETAILS NECESSARY TO FABRICATE AND INSTALL THE PYLONS IN ACCORDANCE WITH THESE PLANS AND THE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL SUBMIT SHOP PLAN DETAILS AND DESIGNS FOR REVIEW AND APPROVAL, INCLUDING SUCH DETAILS AS FABRICATION AND INSTALLATION OF ARCHITECTURAL PRECAST CONCRETE UNITS, FABRICATION AND INSTALLATION OF DECORATIVE METAL PANELS, CONNECTION AND ANCHORAGE DETAILS FOR METAL AND CONCRETE COMPONENTS, DIMENSION AND LIMITS OF CAST-IN-PLACE CONCRETE CORE, AND ELECTRICAL CONDUIT AND LIGHTING DETAILS. THE LIMITS OF CAST-IN-PLACE CONCRETE CORE SHOWN IS CONCEPTUAL AND MAY VARY BASED ON THE PROPOSED PRECAST CLADDING DETAILS.

FOR ADDITIONAL INFORMATION ON LIGHTING REQUIREMENTS, SEE ELECTRICAL DRAWINGS.

ARCHITECTURAL PRECAST CONCRETE CLADDING SHALL CONFORM TO THE SPECIAL PROVISION FOR PRECAST ARCHITECTURAL CONCRETE INCLUDED IN THE CONTRACT DOCUMENTS.

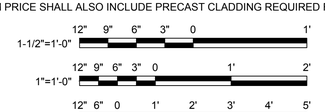
DECORATIVE METAL PANELS SHALL CONFORM TO THE SPECIAL PROVISION FOR DECORATIVE METAL PANELS. FINISH COLOR SHALL BE BLACK WITH LOW GLOSS FINISH.

CONCRETE MATERIALS SHALL CORRESPOND TO THE REQUIREMENTS OF THE SPECIAL PROVISIONS. EXPOSED FACES SHALL BE FREE OF JOINT MARKS, GRAIN, AND OTHER OBVIOUS DEFECTS. FINISH EXPOSED-FACE SURFACES OF ARCHITECTURAL PRECAST CONCRETE UNITS WITH AN ACID-ETCHED FINISH IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

STRUCTURAL STEEL USED FOR MOUNTING, SUPPORT, CONNECTIONS, OR FASTENERS SHALL BE STAINLESS STEEL.

THE CITY WILL REVIEW AND APPROVE SAMPLE PANELS FOR PRECAST CONCRETE AND PREFABRICATED METAL COMPONENTS PRIOR TO FABRICATION. CONTRACTOR SHALL COORDINATE CONNECTION AND FIT-UP DETAILS BETWEEN SUBCONTRACTED ENTITIES.

BRIDGE PYLONS WILL BE PAID AT THE CONTRACT LUMP SUM PRICE. THIS PRICE SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND EQUIPMENT NEEDED TO CONSTRUCT BRIDGE PYLONS. THIS WORK WILL INCLUDE, BUT MAY NOT BE LIMITED TO, DESIGN, PLANS, FABRICATION AND ERECTION OF CAST-IN-PLACE CONCRETE AND REINFORCING, CLADDING, DECORATIVE PANELS, AND LIGHTING. THE LUMP SUM PRICE SHALL ALSO INCLUDE PRECAST CLADDING REQUIRED FOR PYLON PEDESTALS.



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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5/17/16
DANIEL R DEAN
Lic. No.33533
Daniel R. Dean
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

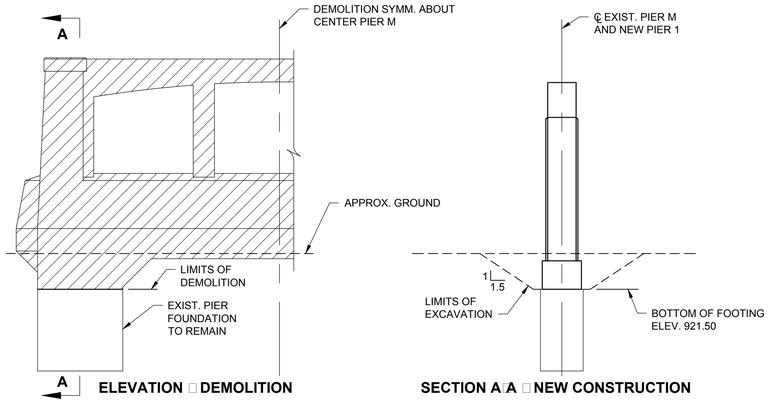
SHEET TITLE

PYLON DETAILS

SHEET NUMBER

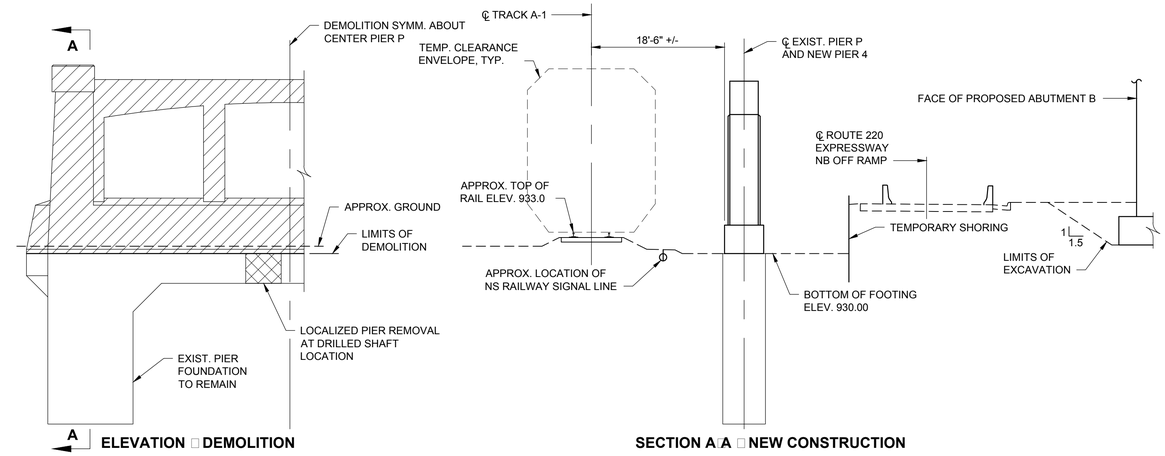
CB-027

ANSI D 22" x 34"



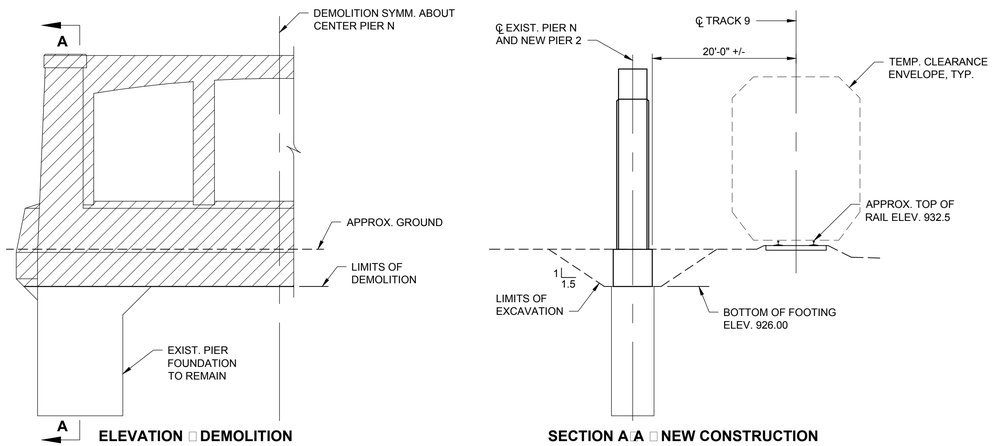
DEMOLITION EXISTING PIER M CONSTRUCTION PIER 1

SCALE: 3/32" = 1'-0"



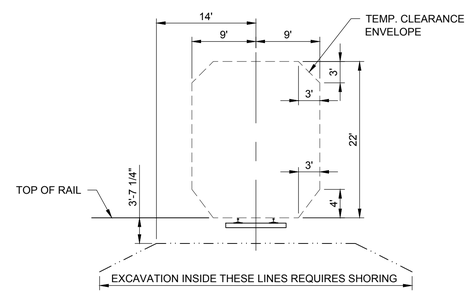
DEMOLITION EXISTING PIER P CONSTRUCTION PIER 4

SCALE: 3/32" = 1'-0"



DEMOLITION EXISTING PIER N CONSTRUCTION PIER 2

SCALE: 3/32" = 1'-0"



CLEARANCE AND SHORING DIAGRAM

SCALE: 3/32" = 1'-0"

NOTES:

SEE SHEET CB-003 FOR NOTES.

SEE SHEETS CB-029 TO CB-036 FOR PIER DETAILS.

SEE CB-004 AND CB-005 FOR SUGGESTED SEQUENCE OF CONSTRUCTION.

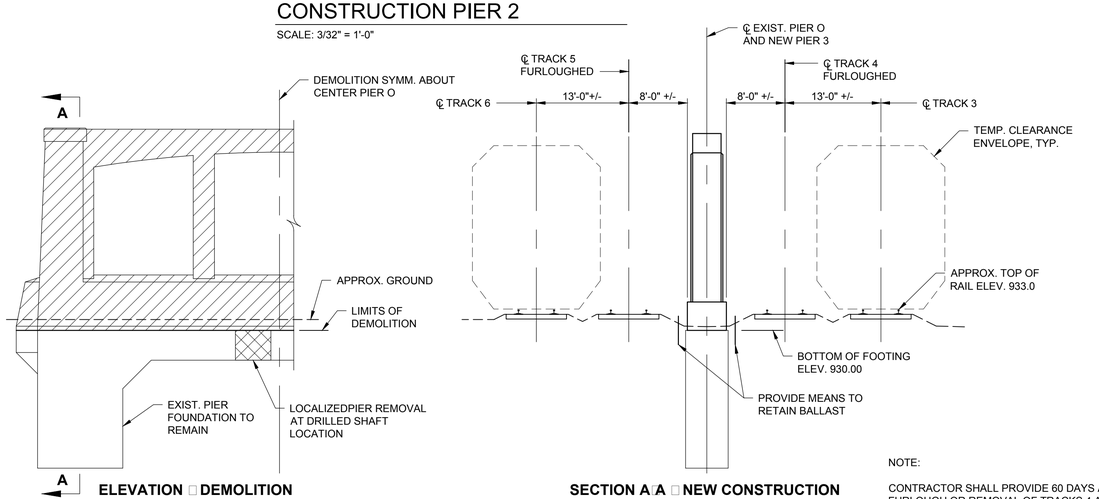
SEE SHEET CR-011 FOR IMPACTS TO ROUTE 220 NB OFF RAMP.

FOR TEMPORARY SHORING NOTES, SEE SHEET CB-003.

FOR DESIGNATION AND DETAILS OF EXISTING PIERS, SEE EXISTING BRIDGE PLANS.

NOTE:

DRIVEN TEMPORARY SHORING WITHIN 15 FEET FROM THE CENTERLINE OF TRACK MAY BE REQUIRED TO BE DEMOLISHED TWO FEET BELOW GRADE WITH THE REMAINDER LEFT IN PLACE PERMANENTLY.



DEMOLITION EXISTING PIER O CONSTRUCTION PIER 3

SCALE: 3/32" = 1'-0"

NOTE:

CONTRACTOR SHALL PROVIDE 60 DAYS ADVANCE NOTICE FOR FURLOUGH OR REMOVAL OF TRACKS 4 AND 5 BY NS RAILWAY FORCES.

LIMITS OF EXISTING PIER DEMOLITION

LIMITS OF LOCALIZED PIER REMOVAL

3/32"=1'-0" 8' 4' 0 12' 24'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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ISSUE/REVISION

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

PIER DEMOLITION LIMITS AND CONSTRUCTION CLEARANCES

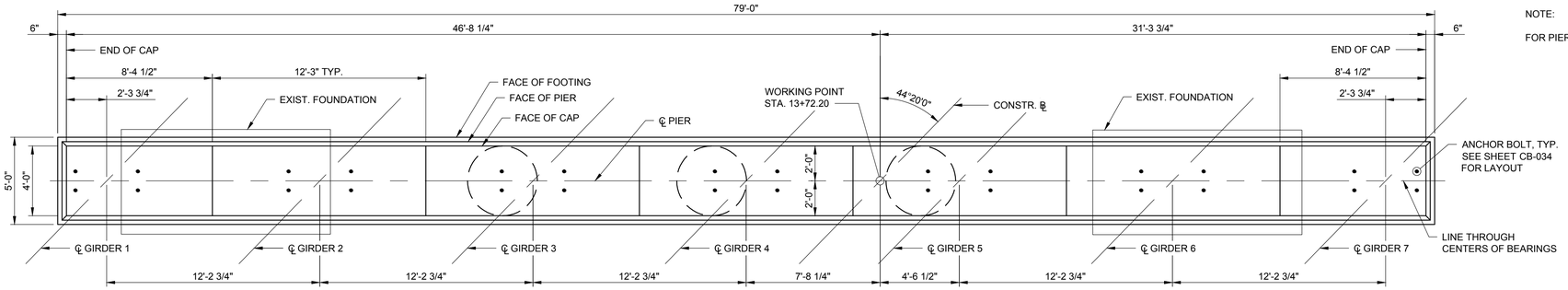
SHEET NUMBER

CB-028

ANSI D 22" x 34"

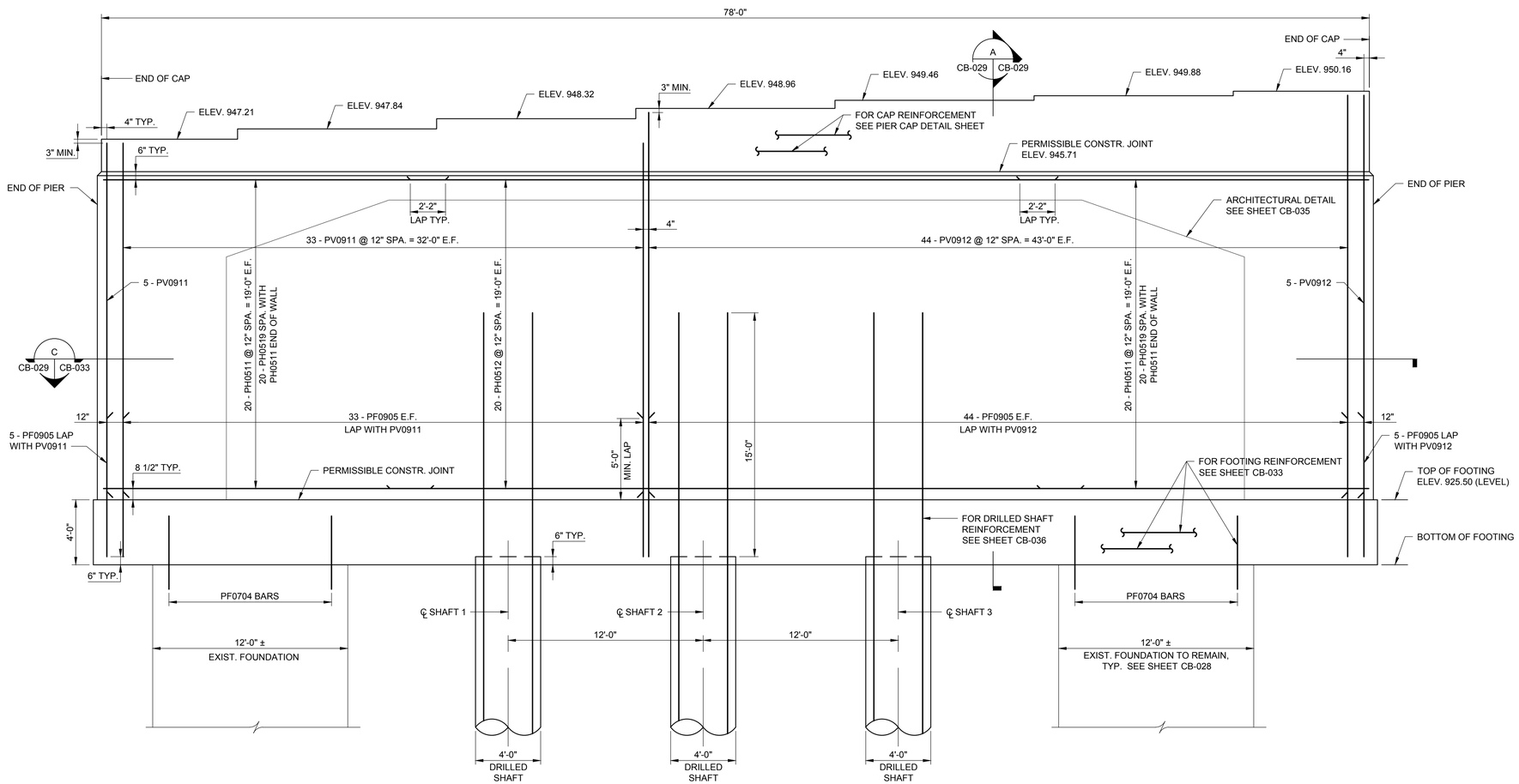
NOTE:

FOR PIER FOOTING AND SECTION DETAILS, SEE SHEET CB-033.



PLAN

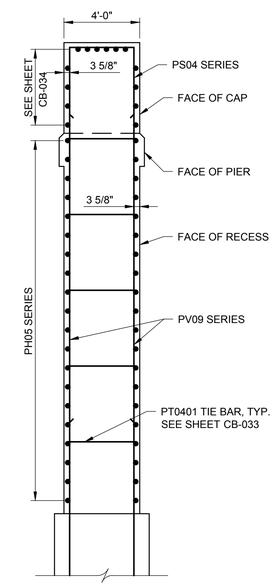
SCALE: 1/4" = 1'-0"



ELEVATION

SCALE: 1/4" = 1'-0"

NOTE: ARCHITECTURAL RUSTIFICATIONS DETAILS NOT SHOWN FOR CLARITY.



SECTION

SCALE: 1/4" = 1'-0"

A
CB-029 CB-029

CB-030, CB-031 & CB-032

1/4"=1'-0" 4' 2' 0 4' 8'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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ISSUE REVISION

I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

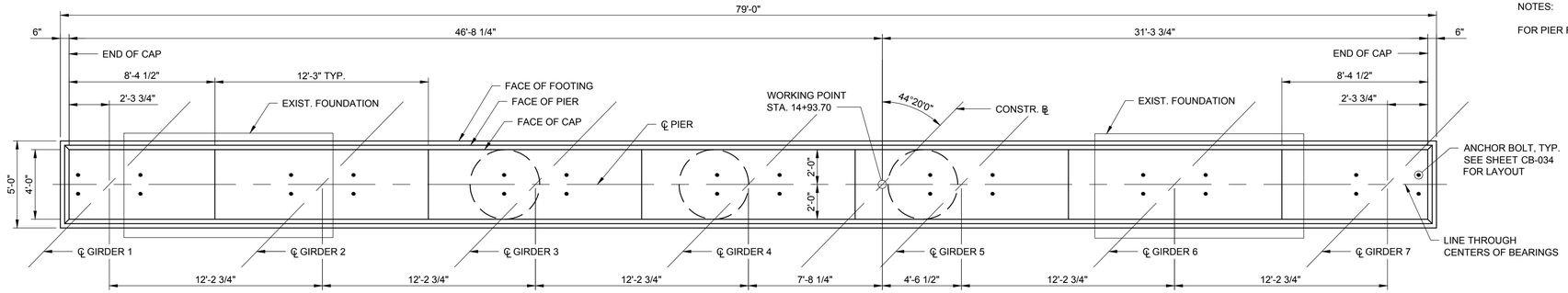
SHEET TITLE

PIER 1 PLAN AND ELEVATION

SHEET NUMBER

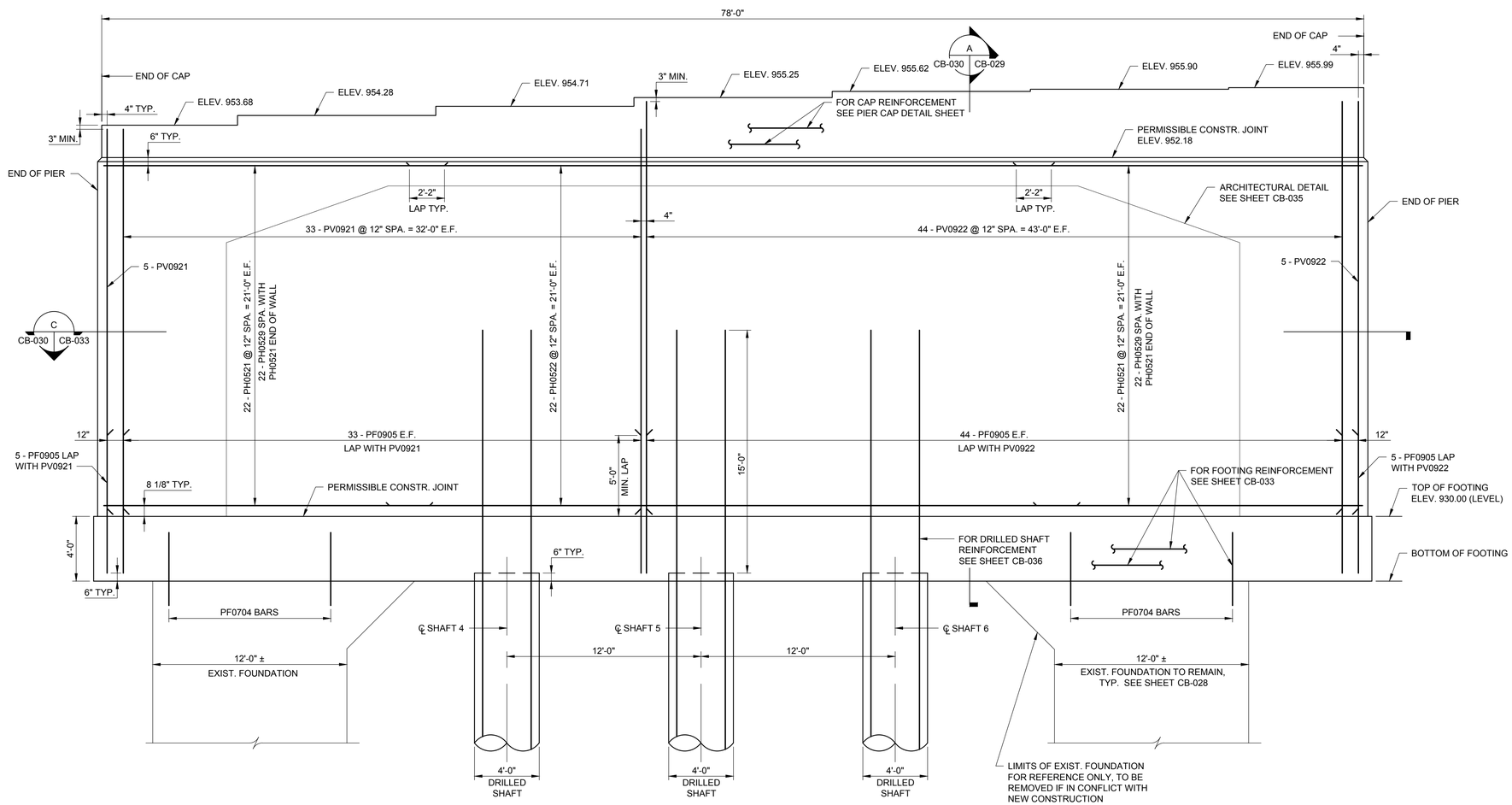
CB-029

ANSI D 22" x 34"



PLAN

SCALE: 1/4" = 1'-0"



ELEVATION

SCALE: 1/4" = 1'-0"

NOTE: ARCHITECTURAL RUSTIFICATIONS DETAILS NOT SHOWN FOR CLARITY.

NOTES:

FOR PIER FOOTING AND SECTION DETAILS, SEE SHEET CB-033.

1/4"=1'-0" 4' 2' 0 4' 8'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

PIER 2 PLAN AND ELEVATION

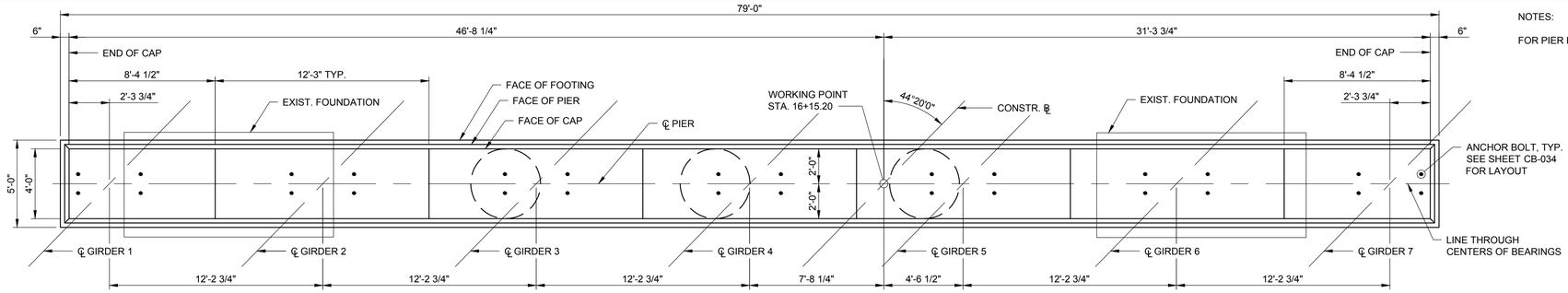
SHEET NUMBER

CB-030

ANSI D 22" x 34"

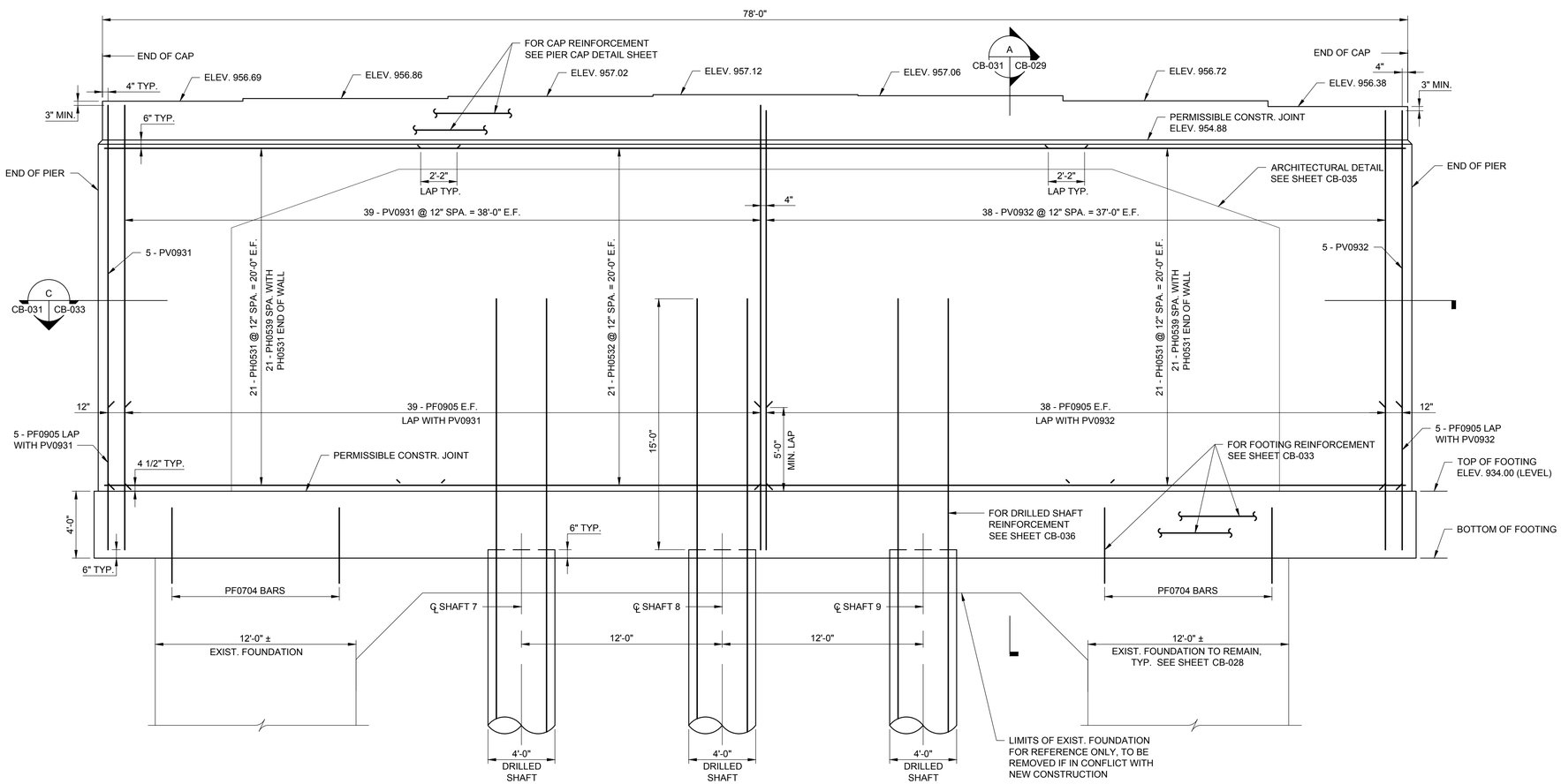
NOTES:

FOR PIER FOOTING AND SECTION DETAILS, SEE SHEET CB-033.



PLAN

SCALE: 1/4" = 1'-0"



ELEVATION

SCALE: 1/4" = 1'-0"

NOTE: ARCHITECTURAL RUSTIFICATIONS DETAILS NOT SHOWN FOR CLARITY.

1/4"=1'-0" 4' 2' 0 4' 8'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

PIER 3 PLAN AND ELEVATION

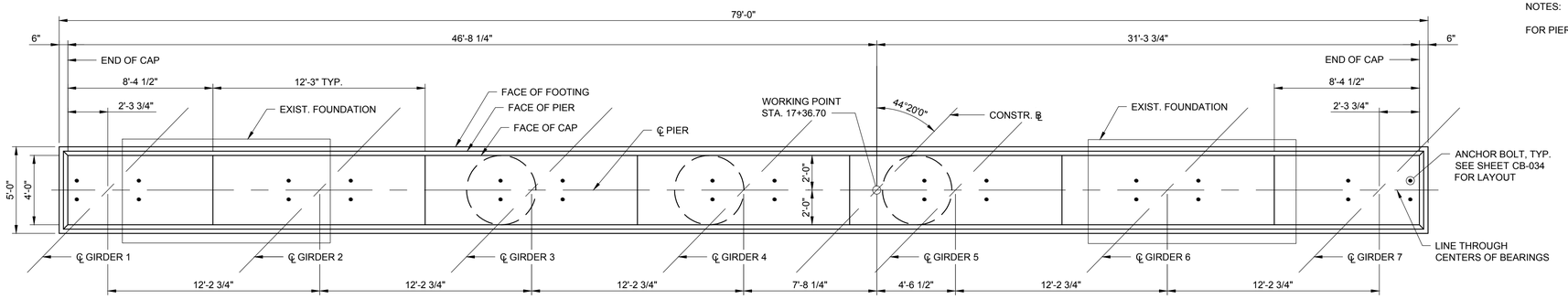
SHEET NUMBER

CB-031

ANSI D 22" x 34"

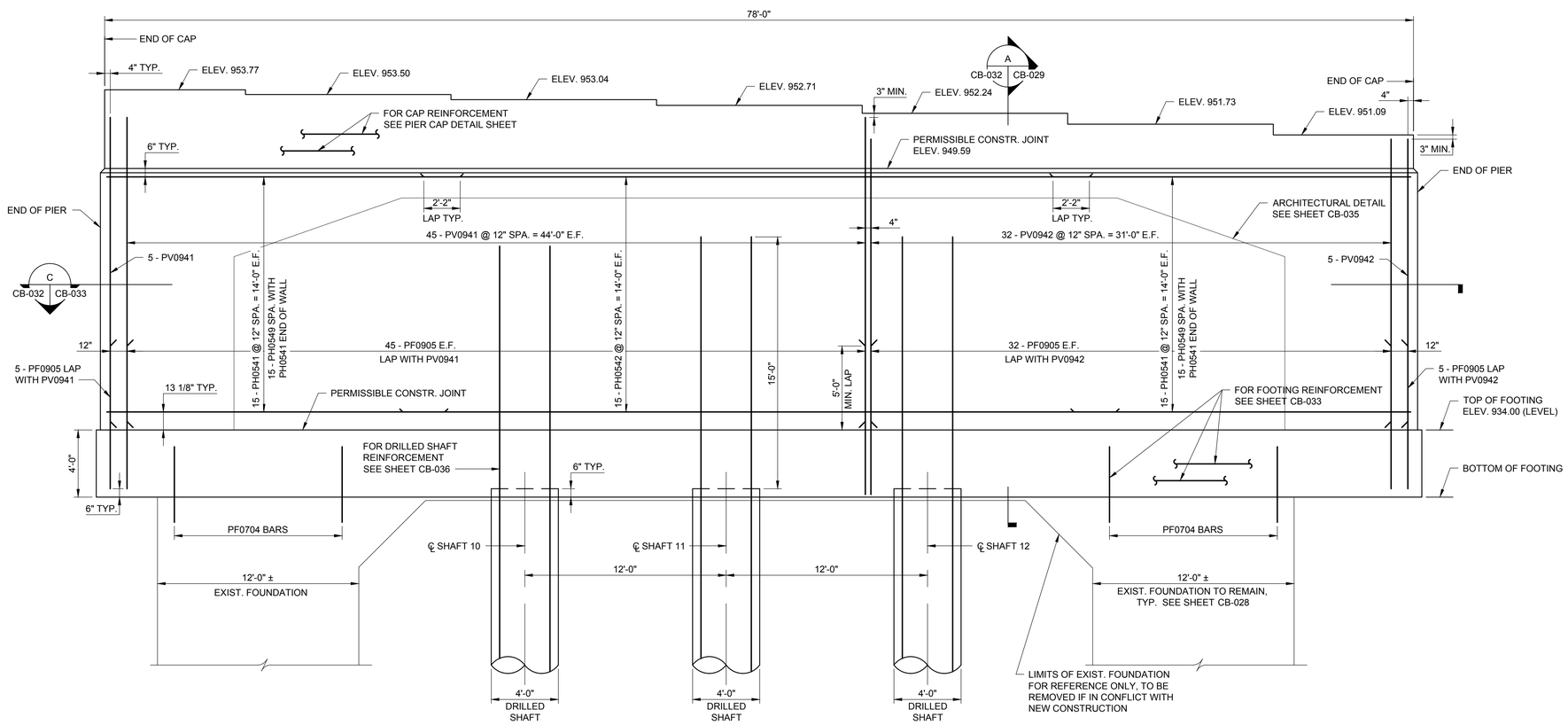
NOTES:

FOR PIER FOOTING AND SECTION DETAILS, SEE SHEET CB-033.



PLAN

SCALE: 1/4" = 1'-0"



ELEVATION

SCALE: 1/4" = 1'-0"

NOTE: ARCHITECTURAL RUSTIFICATIONS DETAILS NOT SHOWN FOR CLARITY.

1/4"=1'-0" 4' 2' 0 4' 8'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

PIER 4 PLAN AND ELEVATION

SHEET NUMBER

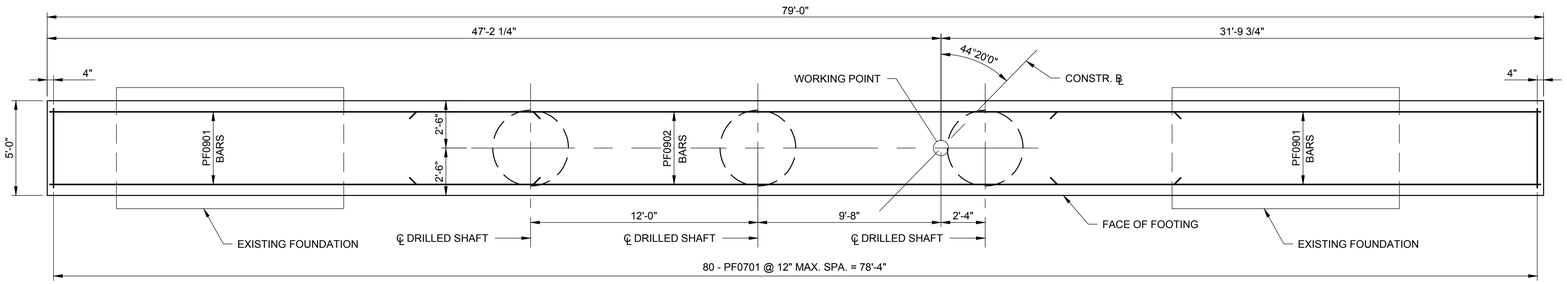
CB-032

ANSI D 22" x 34"

NOTES:

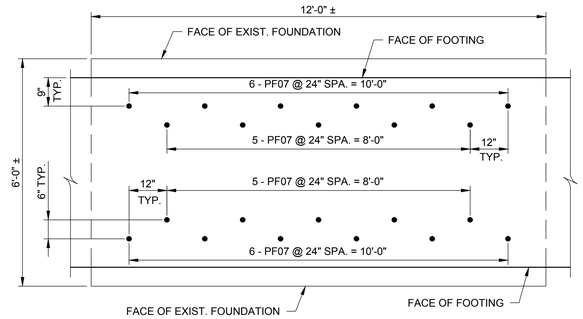
PF07 BARS SHALL BE DRILLED AND GROUTED TO DEVELOP FULL YIELD STRENGTH OF THE BARS AS VERIFIED BY FIELD TESTING IN ACCORDANCE WITH ASTM C900.

FOR DRILLED SHAFT REINFORCING AND DETAILS, SEE SHEET CB-036.



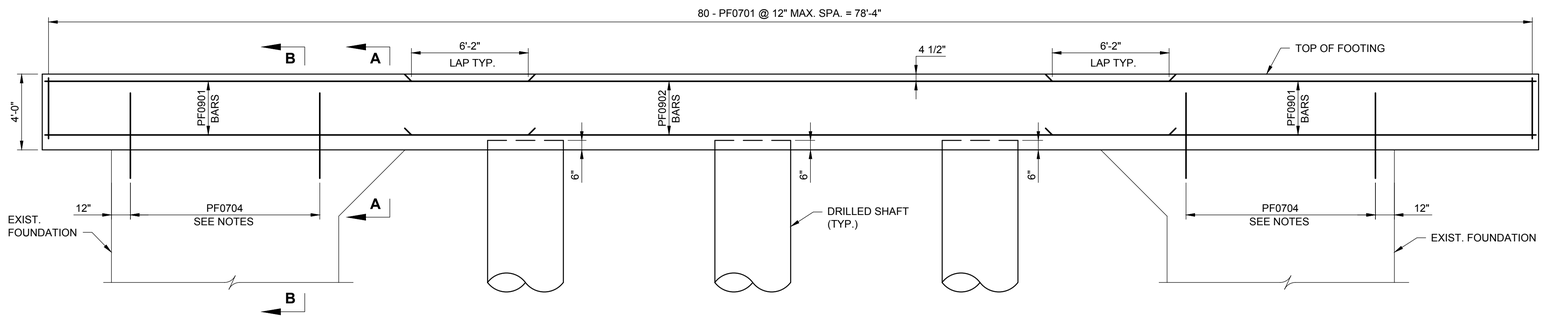
FOOTING PLAN

SCALE: 1/4" = 1'-0"



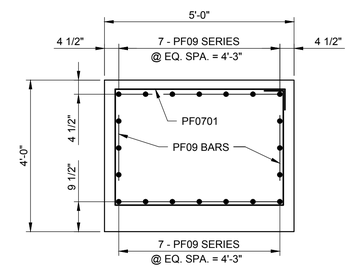
EXISTING FOUNDATION CONNECTION PLAN

SCALE: 1/2" = 1'-0"



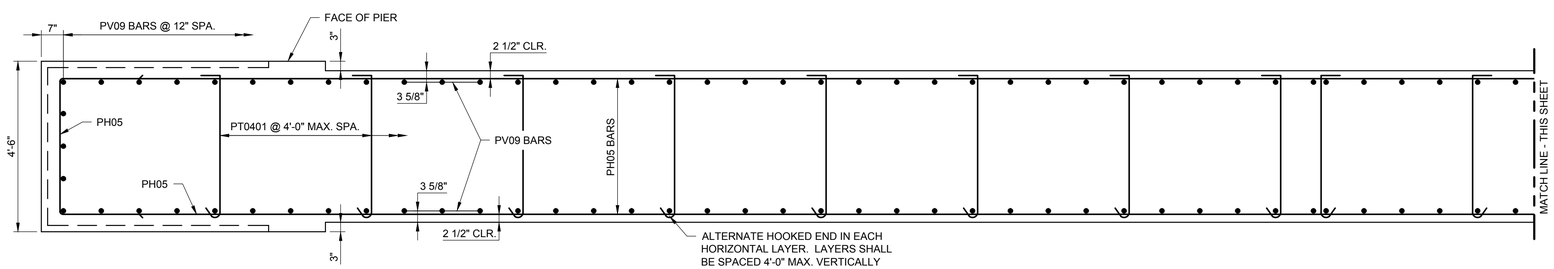
FOOTING ELEVATION

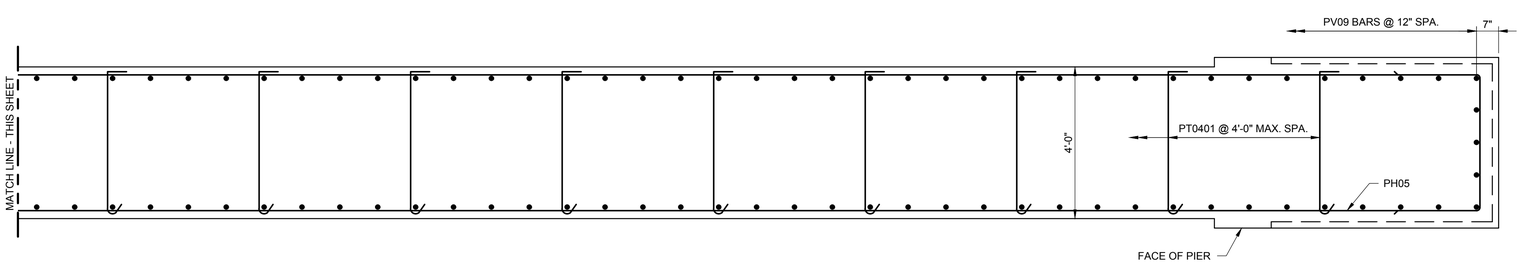
SCALE: 1/4" = 1'-0"



SECTION A-A

SCALE: 1/2" = 1'-0"





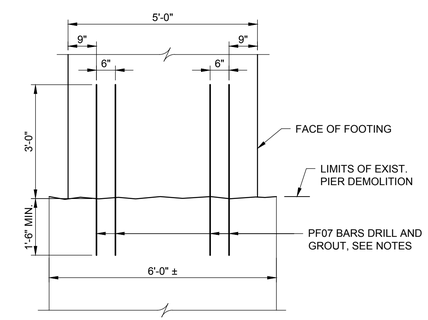
PIER WALL SECTION

SCALE: 1/2" = 1'-0"

C

CB-029, CB-030, CB-031, CB-032 | CB-033

PIER 1 SHOWN, OTHER PIERS SIMILIAR



SECTION B-B

SCALE: 1/2" = 1'-0"

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

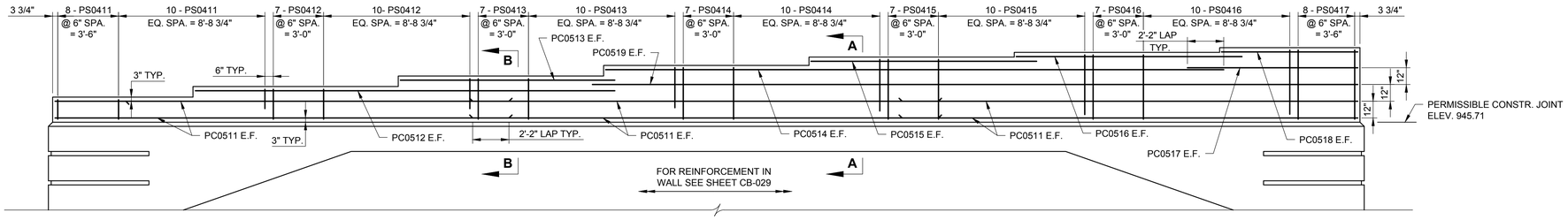
SHEET TITLE

PIER FOOTING DETAILS AND SECTIONS

SHEET NUMBER

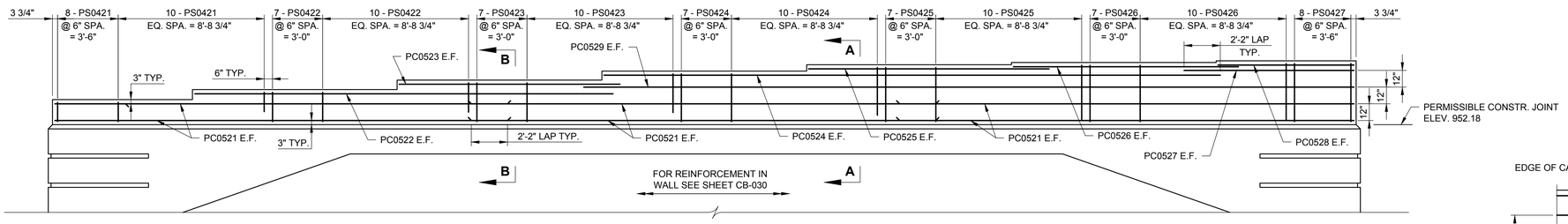
CB-033

ANSI D 22" X 34"



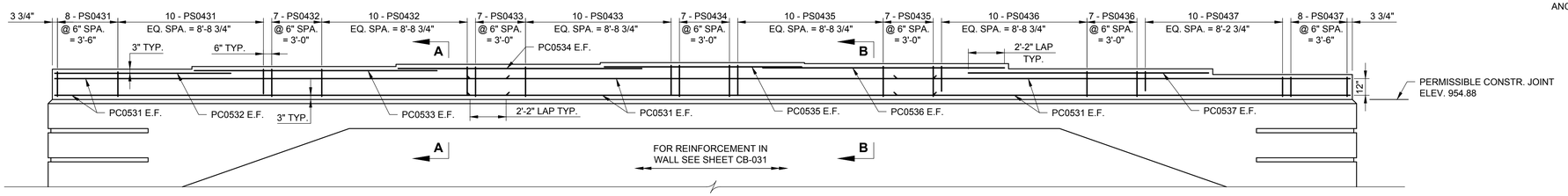
PIER 1 CAP ELEVATION

SCALE: 1/4" = 1'-0"



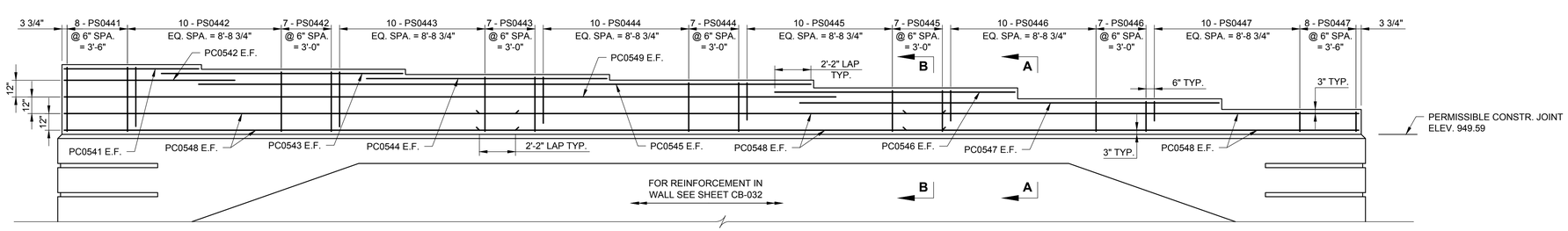
PIER 2 CAP ELEVATION

SCALE: 1/4" = 1'-0"



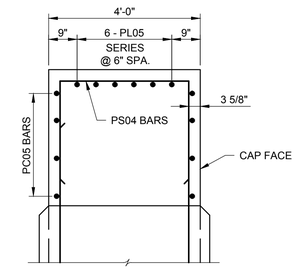
PIER 3 CAP ELEVATION

SCALE: 1/4" = 1'-0"



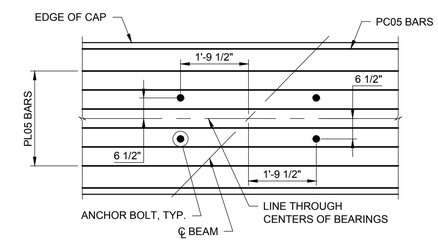
PIER 4 CAP ELEVATION

SCALE: 1/4" = 1'-0"



SECTION A-A

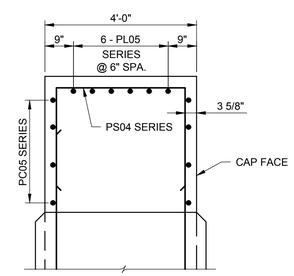
SCALE: 1/2" = 1'-0"



TYPICAL SEAT DETAIL

SCALE: 1/2" = 1'-0"

PS04 BARS NOT SHOWN FOR CLARITY.



SECTION B-B

SCALE: 1/2" = 1'-0"

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
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REGISTRATION

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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

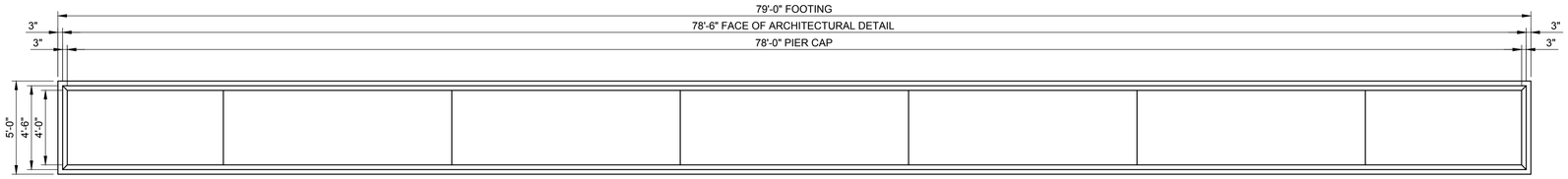
SHEET TITLE

PIER CAP DETAILS

SHEET NUMBER

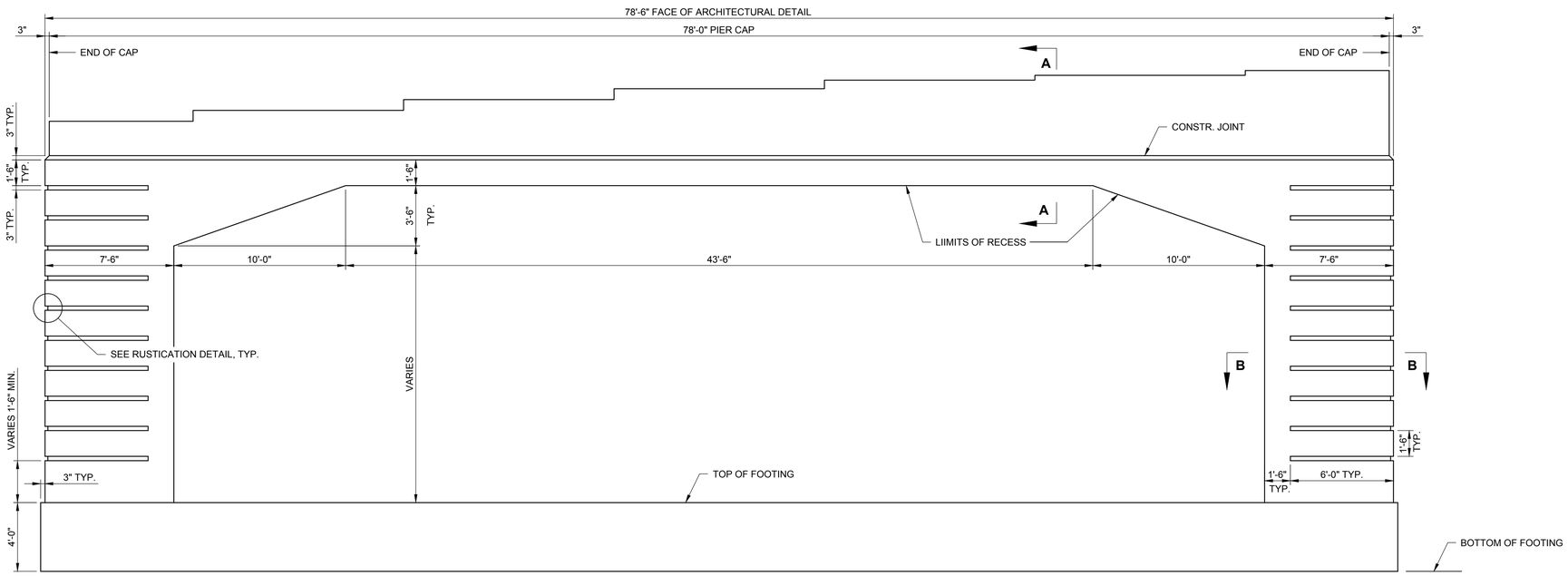
CB-034

ANSI D 22" X 34"



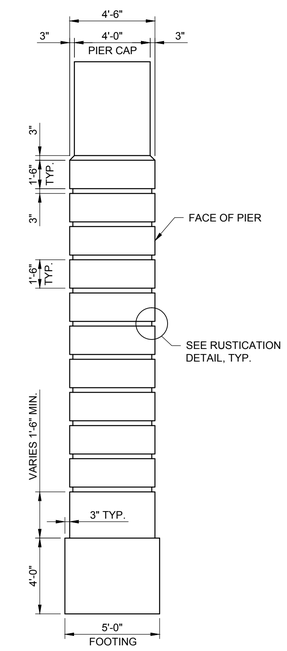
PLAN

SCALE: 1/4" = 1'-0"



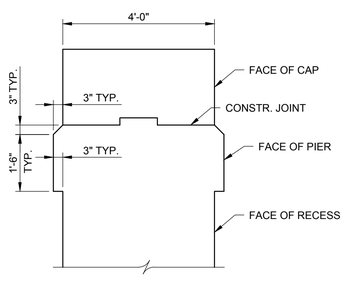
ELEVATION

SCALE: 1/4" = 1'-0"



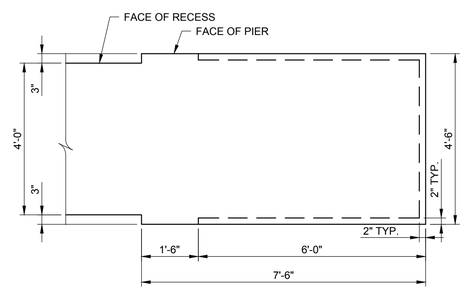
END VIEW

SCALE: 1/4" = 1'-0"



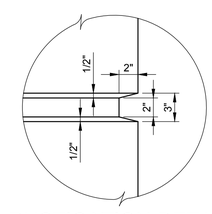
SECTION A-A

SCALE: 1/2" = 1'-0"



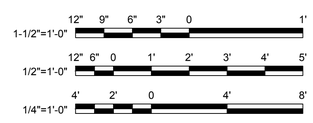
SECTION B-B

SCALE: 1/2" = 1'-0"



RUSTICATION DETAIL

SCALE: 1 1/2" = 1'-0"



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

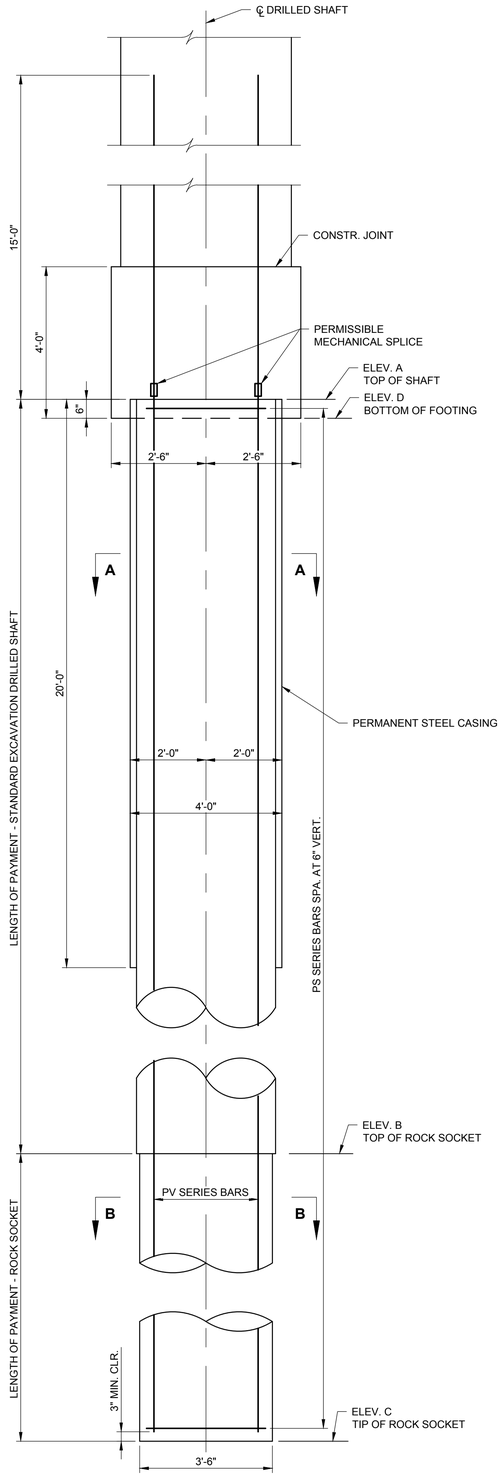
SHEET TITLE

PIER ARCHITECTURAL DETAILS

SHEET NUMBER

CB-035

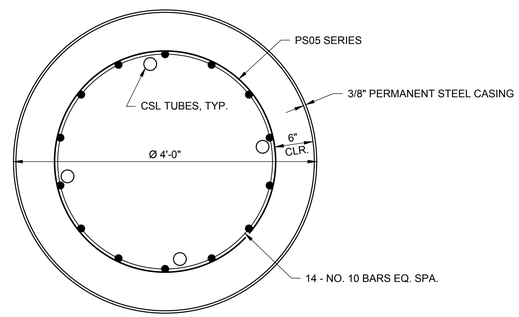
ANSI D 22" X 34"



SHAFT ELEVATION

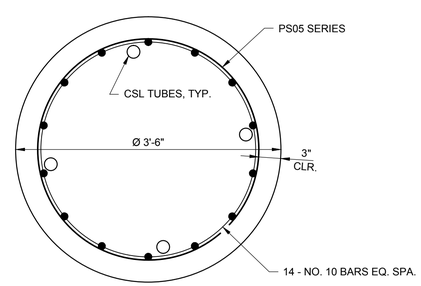
SCALE: 1/2" = 1'-0"

ESTIMATED DRILLED SHAFT ELEVATIONS				
	ELEV. A	ELEV. B	ELEV. C	ELEV. D
PIER 1	922.00	871.00	861.00	921.50
PIER 2	926.50	852.00	842.00	926.00
PIER 3	930.50	852.00	842.00	930.00
PIER 4	930.50	915.00	905.00	930.00



SECTION A-A

SCALE: 1" = 1'-0"



SECTION B-B

SCALE: 1" = 1'-0"

DRILLED SHAFT REINFORCEMENT					
	SHAFT NO.	MARK	LENGTH	NO.	WEIGTH
PIER 1	1	PV1001			
		PS0501			
	2	PV1002			
		PS0501			
	3	PV1003			
		PS0501			
PIER 2	4	PV1004			
		PS0501			
	5	PV1005			
		PS0501			
	6	PV1006			
		PS0501			
PIER 3	7	PV1007			
		PS0501			
	8	PV1008			
		PS0501			
	9	PV1009			
		PS0501			
PIER 4	10	PV1010			
		PS0501			
	11	PV1011			
		PS0501			
	12	PV1012			
		PS0501			

NOTES:

EACH DRILLED SHAFT SHALL BE INSTALLED WITH A MINIMUM EMBEDMENT OF 10 FEET INTO COMPETENT ROCK IN ACCORDANCE WITH THE SPECIAL PROVISION. DRILLED SHAFTS HAVE BEEN DESIGNED FOR A MAXIMUM FACTORED AXIAL LOAD OF 560 KIPS.

DRILLED SHAFT CONSTRUCTION METHODS AND TESTING SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR DRILLED SHAFTS USING SELF-CONSOLIDATING CONCRETE.

ELEVATIONS SHOWN IN THE TABLE ARE APPROXIMATE. ACTUAL DEPTHS AND ELEVATIONS OF THE TOP OF COMPETENT ROCK WILL BE DETERMINED IN THE FIELD AS EACH DRILLED SHAFT IS INSTALLED.

HYDRAULIC CEMENT CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF SECTION 217 OF THE VDOT RBS, AND THE SPECIAL PROVISION FOR DRILLED SHAFTS.

FOR LOW PERMEABILITY, CLASS F FLY ASH, GRANULATED IRON BLAST-FURNACE SLAG (SLAG CEMENT) AND SILICA FUME SHALL CONFORM TO THE REQUIREMENTS OF SECTION 215 OF THE VDOT RBS AND THE SPECIAL PROVISION FOR DRILLED SHAFTS.

CONCRETE SHALL BE SELF-CONSOLIDATING CONCRETE (SCC) AND SHALL MEET THE REQUIREMENTS OF REGULAR CONCRETE EXCEPT THAT THE SLUMP REQUIREMENT SHALL BE WAIVED. INSTEAD THE SLUMP FLOW (ASTM C 1611) SHALL BE MEASURED, WHICH IS THE DIAMETER OF THE CONCRETE SPREAD. THE SLUMP FLOW SHALL BE 23 +/- 3 IN. AND THERE SHALL BE NO VISIBLE SEGREGATION IN THE SPREAD. A VISUAL STABILITY INDEX (VSI) VALUE OF 0 OR 1 SHALL BE ACCEPTABLE; A VALUE OF 2 OR 3 SHALL BE REJECTED (ASTM C 1611). THE SLUMP FLOW SHALL BE COMPARED TO SLUMP FLOW WITH THE J-RING (ASTM C 1621) AND THE DIFFERENCE SHALL BE 2 INCHES OR LESS. COMBINED AGGREGATE GRADING, WORKABILITY RETAINING ADMIXTURE, AND VISCOSITY MODIFYING ADMIXTURE (VMA) CAN BE USED.

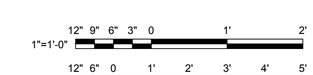
THE CONTRACTOR SHALL DEMONSTRATE BY DOCUMENTS INDICATING SUCCESSFUL EXPERIENCE OR BY TRIAL BATCHING THAT SATISFACTORY SCC CAN BE PRODUCED THAT MEETS THE SPECIFICATION REQUIREMENTS. A CONCRETE TECHNOLOGIST, EXPERIENCED IN THE PRODUCTION OF SCC AND REPRESENTING THE CONTRACTOR OR THE PRODUCER SHALL BE PRESENT DURING PLACEMENT. CONCRETE SHALL STAY PLASTIC AND WITHIN THE SLUMP FLOW SPECIFIED DURING THE PLACEMENT. CONCRETE PLACEMENT WILL BE CONDUCTED SO THAT AIR IS NOT ENCAPSULATED AND SEGREGATION DOES NOT OCCUR.

ENSURE THAT DRILLED SHAFT CONCRETE MAINTAINS THE REQUIRED SLUMP THROUGHOUT THE DRILLED SHAFT CONCRETE ELAPSED TIME. THE CONCRETE ELAPSED TIME IS THE SUM OF THE MIXING AND TRANSIT TIME, THE PLACEMENT TIME, AND THE TIME REQUIRED FOR REMOVAL OF ANY TEMPORARY CASING THAT COULD CAUSE THE CONCRETE TO FLOW INTO THE SPACE PREVIOUSLY OCCUPIED BY THE TEMPORARY CASING.

REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60. CONTRACTOR SHALL PROVIDE REINFORCING FOR DRILLED SHAFTS IN ACCORDANCE WITH THE DETAILS SHOWN ON THESE PLANS AND SHALL BE PREPARED TO ADJUST THE REINFORCING CAGE TO ACCOMMODATE CONDITIONS ENCOUNTERED IN THE FIELD. COST OF SHAFT REINFORCEMENT SHALL BE INCLUDED IN PRICE BID PER LINEAR FOOT OF DRILLED SHAFT AND ROCK SOCKET.

CASING PIPE SHALL CONFORM TO ASTM A 252, GRADE 2, FOR TEMPORARY AND PERMANENT APPLICATIONS. IF SHAFT CONSTRUCTION OPERATIONS REQUIRE LONGER PERMANENT CASING, ADDITIONAL QUANTITY AND PAYMENT MUST BE REQUESTED WITH INCREASE REASONING TO BE APPROVED BY THE CITY.

DRILLED SHAFTS SHALL BE EQUIPPED WITH ACCESS TUBES FOR CROSSHOLE SONIC LOGGING (CSL) TESTS AT THE LOCATIONS SHOWN IN THE PLANS. ACCESS TUBES FOR CSL TESTING SHALL BE 2 INCHES I.D. SCHEDULE 40 STEEL PIPE CONFORMING TO ASTM A 53, GRADE A OR B, TYPE E, F, OR S. PIPES SHALL HAVE A ROUND, REGULAR INTERNAL DIAMETER, BE FREE OF DEFECTS OR OBSTRUCTIONS; INCLUDING ANY DEFECT AT THE PIPE JOINTS, TO PERMIT THE FREE UNOBSTRUCTED PASSAGE OF SOURCE AND RECEIVER PROBES. CSL PROBES SHOULD BE 1.35 INCHES DIAMETER OR SMALLER AND 6 TO 10 INCHES LONG. EACH TUBE OR STEEL PIPE SHALL BE FITTED WITH A WATERTIGHT SHOE ONTO THE BOTTOM AND A REMOVABLE CAP AT THE TOP. BOTH, SHOE AND CAP SHALL BE WATERTIGHT AND FREE FROM CORROSION, AND THE INTERNAL AND EXTERNAL FACES OF THE TUBES CLEAN TO ENSURE PASSAGE OF THE PROBES AND GOOD BOND WITH THE CONCRETE.



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
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REGISTRATION

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5/17/16
DANIEL R DEAN
Lic. No.33535
Daniel R. Dean
PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

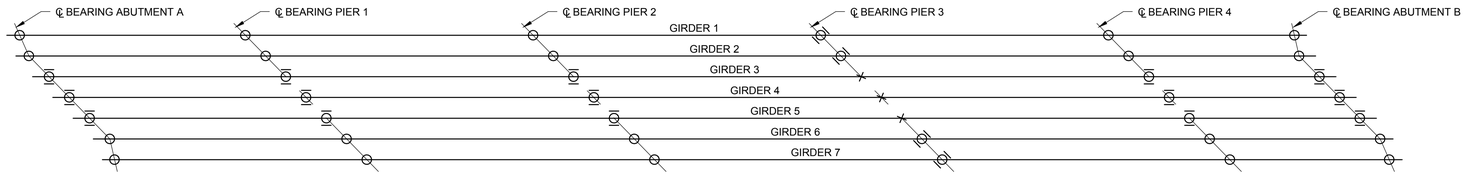
SHEET TITLE

DRILLED SHAFT DETAILS

SHEET NUMBER

CB-036

ANSI D 22" X 34"



LEGEND:

- ○ NON-GUIDED EXPANSION BEARING
- |O| GUIDED EXPANSION BEARING (LINES INDICATE GUIDE BAR ORIENTATION)
- × FIXED BEARING

BEARING LAYOUT PLAN

NOT TO SCALE

NOTES:

S.H.C.S. DESIGNATES SOCKET HEAD CAP SCREWS.

BEARINGS SHALL CONFORM TO SECTION 408.03(a). HIGH LOAD MULTI-ROTATIONAL BEARINGS, OF THE SPECIFICATIONS.

FILL HOLES IN MASONRY PLATE AROUND ANCHOR BOLTS WITH A NONHARDENING CAULKING COMPOUND OR ELASTIC JOINT SEALER.

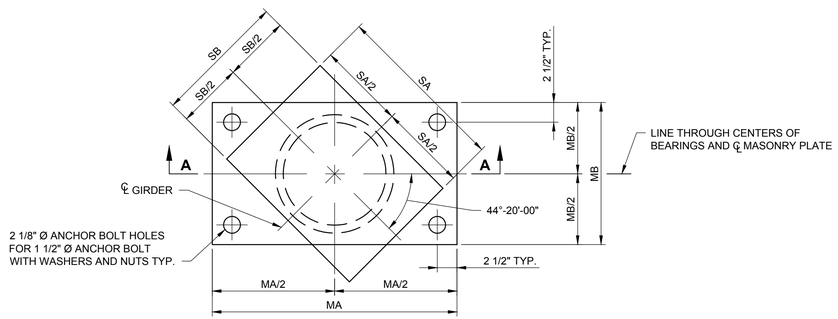
AT NO ADDITIONAL COST BEARINGS DIFFERING IN DETAIL FROM THOSE SHOWN MAY BE SUPPLIED PROVIDED THEY MEET THE REQUIREMENTS OF SECTION 408.03(a) OF THE VDOT RBS SPECIFICATIONS AND ARE APPROVED BY THE ENGINEER. BRIDGE SEAT ELEVATIONS ARE BASED ON TOTAL BEARING HEIGHT "H" IN TABLE AND SHALL BE ADJUSTED BY THE CONTRACTOR BASED ON HEIGHT OF BEARING FURNISHED.

IN LIEU OF WELDING, THE POT MAY BE RECESSED INTO THE MASONRY PLATE (MC) SHALL BE INCREASED BY THE DEPTH OF THE RECESS.

BEARING HEIGHTS ARE BASED ON THE USE OF POT BEARINGS WITH FLAT SEALING RINGS.

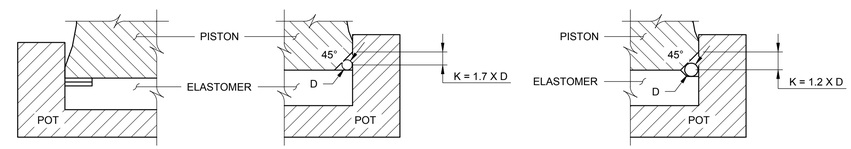
THE DESIGN ROTATION CAPACITY FOR THESE BEARINGS IS 0.03 RADIANS.

ANCHOR BOLTS SHALL CONFORM TO SECTION 226 OF THE SPECIFICATIONS AND SHALL BE HIGH-STRENGTH.



PLAN

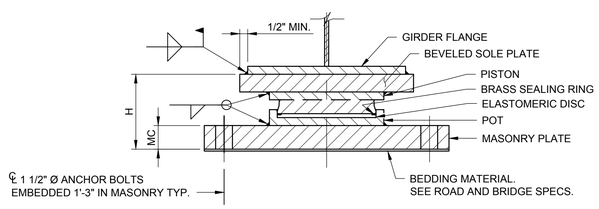
NOT TO SCALE



FLAT RING SEAL **ROUND RING IN C□AMFER** **ROUND RING RECESSED IN RUBBER**

SEALING RING DETAILS

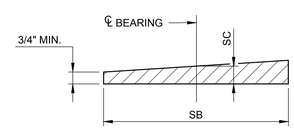
NOT TO SCALE



SECTION A□A

FIXED POT BEARING TYPE FF

NOT TO SCALE



BEVELED SOLE PLATE

NOT TO SCALE

BEARING SCHEDULE

LOCATION	GIRDER	TYPE	NO. REQ'D.	VERTICAL DESIGN SERVICE LOADS KIPS		HORIZONTAL DESIGN SERVICE LOADS KIPS	SOLE PLATE				MASONRY PLATE			TOTAL BEARING HEIGHT H INCHES
							INCHES			%	INCHES			
				MIN.	MAX.		SA	SB	SC	GRADE	MA	MB	MC	
PIER 3	3	FF	1	220	450	135	1'-6"	1'-5"	1 1/4"	-0.68	4'-0"	1'-6"	2"	8 5/8"
PIER 3	4	FF	1	220	450	135	1'-6"	1'-5"	1 1/4"	-1.04	4'-0"	1'-6"	2"	8 5/8"
PIER 3	5	FF	1	220	450	135	1'-6"	1'-5"	1 1/4"	-1.40	4'-0"	1'-6"	2"	8 5/8"

GRAPHIC SCALES

AECOM

PROJECT

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REGISTRATION

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ISSUE□REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

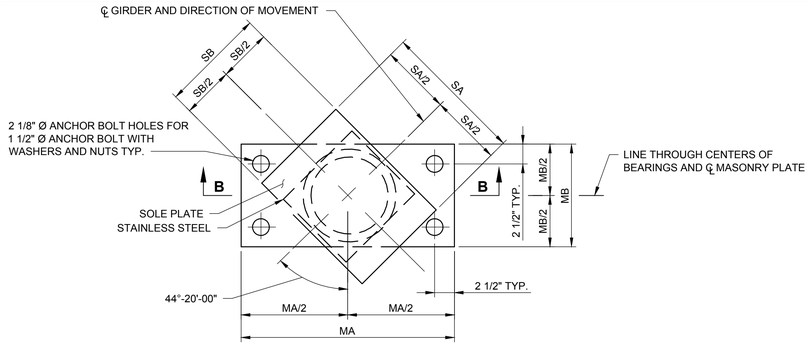
S□EET TITLE

HLMR FIXED BEARING DETAILS

S□EET NUMBER

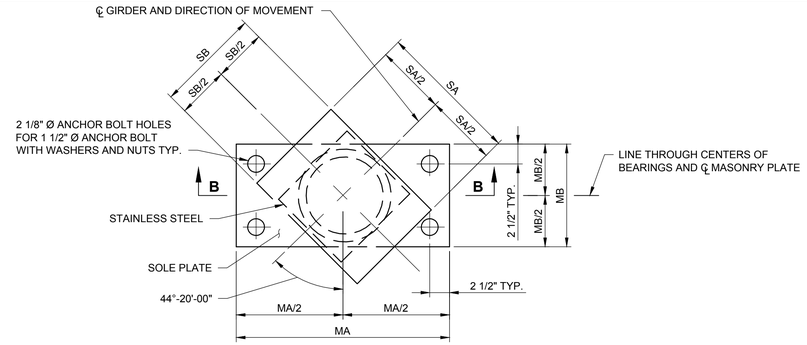
CB-037

ANSI D 22" x 34"



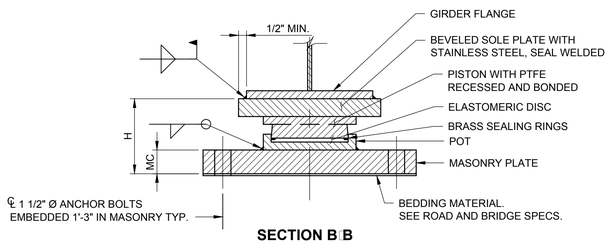
PLAN AT PIERS

NOT TO SCALE



PLAN AT ABUTMENTS - GIRDERS 2 AND 6

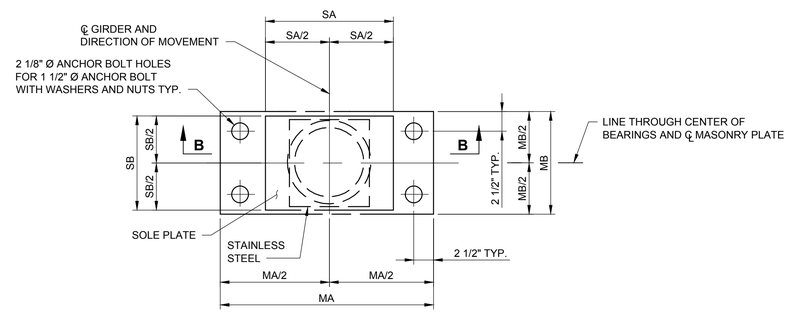
NOT TO SCALE



SECTION B B

NON-GUIDED POT EXPANSION BEARING TYPE EE

NOT TO SCALE



PLAN AT ABUTMENTS - GIRDERS 1 AND 7

NOT TO SCALE

NOTES:

FOR BEARING LAYOUT PLAN, SEE SHEET CB-037.

S.H.C.S. DESIGNATES SOCKET HEAD CAP SCREWS.

BEARINGS SHALL CONFORM TO SECTION 408.03(a). HIGH LOAD MULTI-ROTATIONAL BEARINGS, OF THE SPECIFICATIONS.

STAINLESS STEEL MATING SURFACES SHALL BE PROVIDED WITH A SURFACE FINISH OF 8 MICRO-INCHES RMS OR BETTER.

FILL HOLES IN MASONRY PLATE AROUND ANCHOR BOLTS WITH A NONHARDENING CAULKING COMPOUND OR ELASTIC JOINT SEALER.

AT NO ADDITIONAL COST BEARINGS DIFFERING IN DETAIL FROM THOSE SHOWN MAY BE SUPPLIED PROVIDED THEY MEET THE REQUIREMENTS OF SECTION 408.03(a) OF THE VDOT RBS SPECIFICATIONS AND ARE APPROVED BY THE ENGINEER. BRIDGE SEAT ELEVATIONS ARE BASED ON TOTAL BEARING HEIGHT "H" IN TABLE AND SHALL BE ADJUSTED BY THE CONTRACTOR BASED ON HEIGHT OF BEARING FURNISHED.

IN LIEU OF WELDING, THE POT MAY BE RECESSED INTO THE MASONRY PLATE (MC) SHALL BE INCREASED BY THE DEPTH OF THE RECESS.

BEARING HEIGHTS ARE BASED ON THE USE OF POT BEARINGS WITH FLAT SEALING RINGS.

THE DESIGN MOVEMENT IS THE MAXIMUM MOVEMENT TO ONE SIDE OF THE BEARING CENTERLINE. THE TOTAL MOVEMENT IS TWICE THE DESIGN MOVEMENT.

THE HORIZONTAL DESIGN LOAD FOR NON-GUIDED BEARINGS IS GIVEN SOLELY FOR THE DESIGN OF THE POTWALL THICKNESS AND PISTON EDGE WIDTHS.

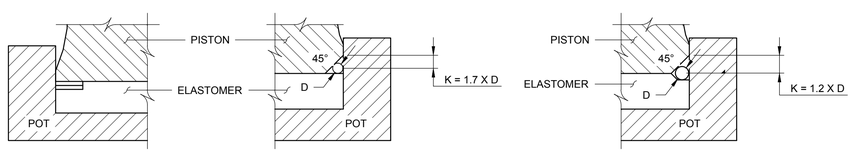
DIMENSION SA IS PERPENDICULAR TO THE CENTERLINE OF GIRDER AND DIMENSION SB IS PARALLEL TO IT.

THE COEFFICIENT OF FRICTION SHALL NOT EXCEED 0.06 AS DEMONSTRATED BY THE RESULTS OF FRICTION TESTING IN ACCORDANCE WITH THE SPECIFICATIONS.

BEARINGS SHALL BE LABELED IN THE FABRICATION SHOP TO INDICATE LOCATION AND ORIENTATION OF INSTALLATION. THE METHOD OF LABELING SHALL BE INDICATED IN THE SHOP PLANS.

THE DESIGN ROTATION CAPACITY FOR THESE BEARINGS IS 0.03 RADIANS.

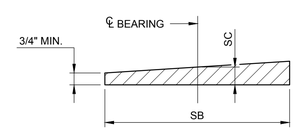
ANCHOR BOLTS SHALL CONFORM TO SECTION 226 OF THE SPECIFICATIONS AND SHALL BE HIGH-STRENGTH.



FLAT RING SEAL **ROUND RING IN C AMFER** **ROUND RING RECESSED IN RUBBER**

SEALING RING DETAILS

NOT TO SCALE



BEVELED SOLE PLATE

NOT TO SCALE

BEARING SCHEDULE

LOCATION	GIRDER	GRADE (%)
ABUTMENT A	1	5.33
	2	5.33
	6	5.33
	7	5.33
PIER 1	1	5.33
	2	5.33
	6	5.33
	7	5.33
PIER 2	1	5.16
	2	4.80
	6	3.36
	7	3.00
PIER 4	1	-5.09
	2	-5.45
	6	-6.89
	7	-7.25
ABUTMENT B	1	-7.95
	2	-7.95
	6	-7.95
	7	-7.95

BEARING SCHEDULE

LOCATION	GIRDER	TYPE	NO. REQ'D.	VERT. DESIGN SERVICE LOAD KIPS		HORIZ. DESIGN SERVICE LOAD KIPS	SOLE PLATE INCHES			MASONRY PLATE INCHES			TOTAL BEARING HEIGHT H INCHES	DESIGN MOVEMENT
				MIN.	MAX.		SA	SB	SC	MA	MB	MC		
ABUTMENT A	1 & 7	EE	2	50	160	16	1'-6"	1'-2"	1 1/2"	2'-4"	1'-6"	2"	6"	2"
ABUTMENT A	2 & 6	EE	2	50	160	16	1'-6"	1'-2"	1 1/2"	4'-0"	1'-6"	2"	6"	2"
PIER 1	1, 2, 6, 7	EE	4	230	450	45	1'-6"	1'-7"	1 1/2"	4'-0"	1'-6"	2"	7 1/4"	1 1/4"
PIER 2	1, 2, 6, 7	EE	4	200	440	44	1'-6"	1'-7"	1 1/2"	4'-0"	1'-6"	2"	7 1/4"	1"
PIER 4	1, 2, 6, 7	EE	4	190	410	41	1'-6"	1'-7"	1 1/2"	4'-0"	1'-6"	2"	7 1/4"	1"
ABUTMENT B	1 & 7	EE	2	20	130	13	1'-6"	1'-2"	1 1/2"	2'-4"	1'-6"	2"	6"	1 1/2"
ABUTMENT B	2 & 6	EE	2	20	130	13	1'-6"	1'-2"	1 1/2"	4'-0"	1'-6"	2"	6"	1 1/2"

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

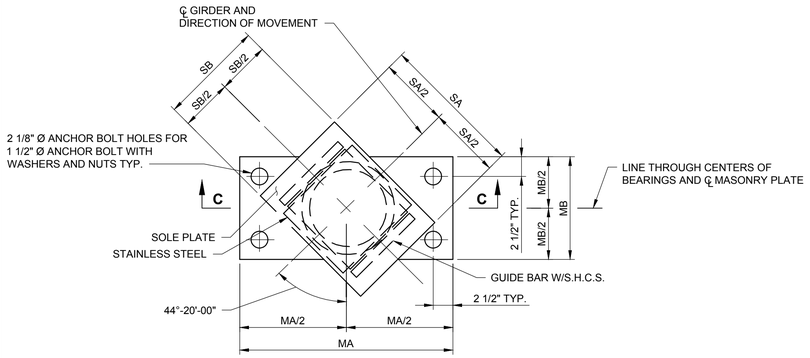
S EET TITLE

HLMR NON-GUIDED EXPANSION BEARING DETAILS

S EET NUMBER

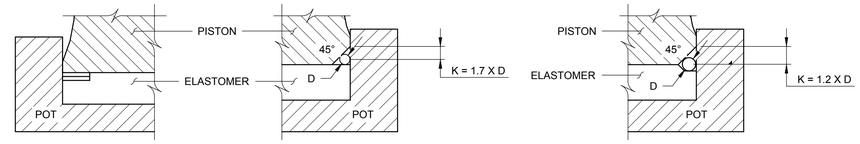
CB-038

ANSI D 22" X 34"



PLAN - ALL LOCATIONS U.N.O.

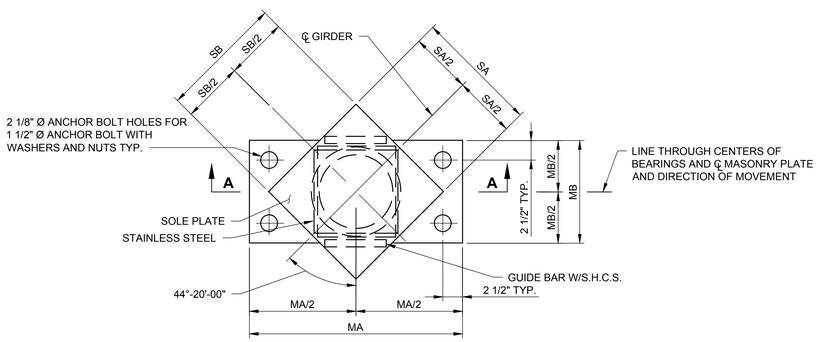
NOT TO SCALE



FLAT RING SEAL **ROUND RING IN C□AMFER** **ROUND RING RECESSED IN RUBBER**

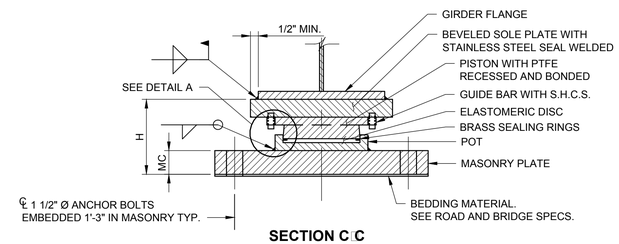
SEALING RING DETAILS

NOT TO SCALE



PLAN - PIER 3

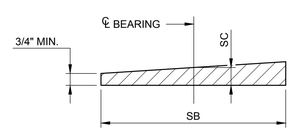
NOT TO SCALE



SECTION C C

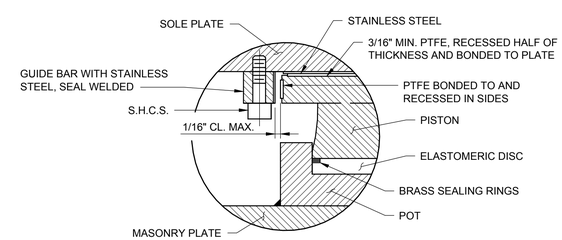
GUIDED POT EXPANSION BEARING TYPE EF

NOT TO SCALE



BEVELED SOLE PLATE

NOT TO SCALE



DETAIL A

NOT TO SCALE

NOTES:

FOR BEARING LAYOUT PLAN, SEE SHEET CB-037.

U.N.O. = UNLESS NOTED OTHERWISE.

S.H.C.S. DESIGNATES SOCKET HEAD CAP SCREWS.

BEARINGS SHALL CONFORM TO SECTION 408.03(a). HIGH LOAD MULTI-ROTATIONAL BEARINGS, OF THE SPECIFICATIONS.

STAINLESS STEEL MATING SURFACES SHALL BE PROVIDED WITH A SURFACE FINISH OF 8 MICRO-INCHES RMS OR BETTER.

TO RESTRICT TRANSVERSE MOVEMENT, EITHER A GUIDE BAR OR KEYWAY SYSTEM SHALL BE USED.

FILL HOLES IN MASONRY PLATE AROUND ANCHOR BOLTS WITH A NONHARDENING CAULKING COMPOUND OR ELASTIC JOINT SEALER.

AT NO ADDITIONAL COST BEARINGS DIFFERING IN DETAIL FROM THOSE SHOWN MAY BE SUPPLIED PROVIDED THEY MEET THE REQUIREMENTS OF SECTION 408.03(a) OF THE VDOT RBS SPECIFICATIONS AND ARE APPROVED BY THE ENGINEER. BRIDGE SEAT ELEVATIONS ARE BASED ON TOTAL BEARING HEIGHT "H" IN TABLE AND SHALL BE ADJUSTED BY THE CONTRACTOR BASED ON HEIGHT OF BEARING FURNISHED.

IN LIEU OF WELDING, THE POT MAY BE RECESSED INTO THE MASONRY PLATE (MC) SHALL BE INCREASED BY THE DEPTH OF THE RECESS.

BEARING HEIGHTS ARE BASED ON THE USE OF POT BEARINGS WITH FLAT SEALING RINGS.

THE DESIGN MOVEMENT IS THE MAXIMUM MOVEMENT TO ONE SIDE OF THE BEARING CENTERLINE. THE TOTAL MOVEMENT IS TWICE THE DESIGN MOVEMENT.

DIMENSION SA IS PERPENDICULAR TO THE CENTERLINE OF GIRDER AND DIMENSION SB IS PARALLEL TO IT.

THE COEFFICIENT OF FRICTION SHALL NOT EXCEED 0.06 AS DEMONSTRATED BY THE RESULTS OF FRICTION TESTING IN ACCORDANCE WITH THE SPECIFICATIONS.

BEARINGS SHALL BE LABELED IN THE FABRICATION SHOP TO INDICATE LOCATION AND ORIENTATION OF INSTALLATION. THE METHOD OF LABELING SHALL BE INDICATED IN THE SHOP PLANS.

THE DESIGN ROTATION CAPACITY FOR THESE BEARINGS IS 0.03 RADIANS.

ANCHOR BOLTS SHALL CONFORM TO SECTION 226 OF THE SPECIFICATIONS AND SHALL BE HIGH-STRENGTH.

BEARING SCHEDULE

LOCATION	GIRDER	GRADE (%)
ABUTMENT A	3	5.33
	4	5.33
	5	5.33
PIER 1	3	5.33
	4	5.33
	5	5.33
PIER 2	3	4.44
	4	4.08
	5	3.72
PIER 3	1	0.04
	2	-0.32
	6	-1.77
	7	-2.13
PIER 4	3	-5.81
	4	-6.17
	5	-6.53
ABUTMENT B	3	-7.95
	4	-7.95
	5	-7.95

BEARING SCHEDULE

LOCATION	GIRDER	TYPE	NO. REQ'D.	VERT. DESIGN SERVICE LOAD KIPS		HORIZ. DESIGN SERVICE LOAD KIPS	SOLE PLATE INCHES			MASONRY PLATE INCHES			TOTAL BEARING HEIGHT H INCHES	DESIGN MOVEMENT
				MIN.	MAX.		SA	SB	SC	MA	MB	MC		
ABUTMENT A	3, 4, 5	EF	3	50	160	48	1'-6"	1'-3"	1 1/2"	4'-0"	1'-6"	2"	7"	2"
PIER 1	3, 4, 5	EF	3	230	450	135	1'-11"	1'-8"	1 1/2"	4'-0"	1'-6"	2"	9"	1 1/4"
PIER 2	3, 4, 5	EF	3	200	440	132	1'-11"	1'-8"	1 1/2"	4'-0"	1'-6"	2"	9"	1"
PIER 3	1, 2, 6, 7	EF	4	220	450	135	2'-4"	2'-4"	1 1/2"	4'-0"	1'-6"	2"	9"	1/2"
PIER 4	3, 4, 5	EF	3	190	410	123	1'-11"	1'-8"	1 1/2"	4'-0"	1'-6"	2"	9"	1"
ABUTMENT B	3, 4, 5	EF	3	20	130	39	1'-6"	1'-3"	1 1/2"	4'-0"	1'-6"	2"	7"	1 1/2"

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

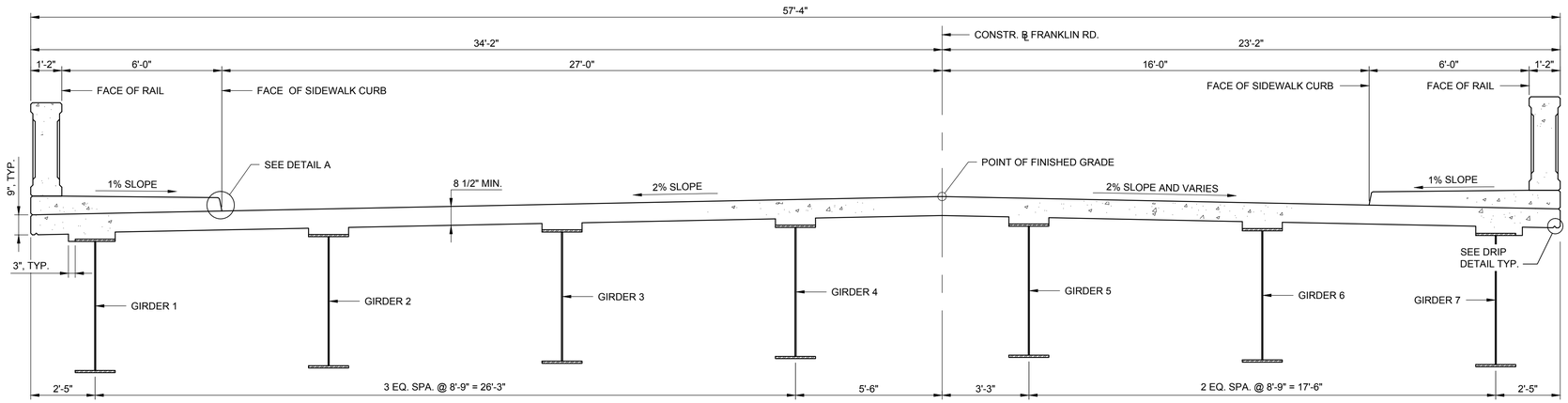
S□EET TITLE

HLMR GUIDED EXPANSION BEARINGS DETAILS

S□EET NUMBER

CB-039

ANSI D 22" X 34"



TRANSVERSE SECTION

SCALE: 3/8" = 1'-0"

NOTES:

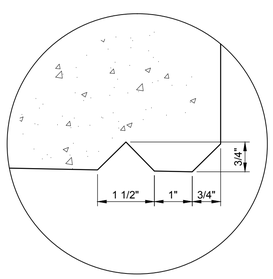
FOR ADDITIONAL REINFORCING STEEL IN TOP LAYER OF DECK SLAB AT PIERS AND OTHER REINFORCING STEEL NOT SHOWN, SEE DECK SLAB PLAN ON SHEET CB-049.

FOR DETAILS OF RAIL, SEE SHEETS CB-053 THRU CB-055.

THE NUMBERS SHOWN ON THE CONCRETE PLACEMENT SCHEDULE INDICATE THE ORDER OF CONCRETE PLACEMENT IN DECK SECTIONS. DECK SCREED SHALL BE ORIENTED PARALLEL TO SUBSTRUCTURE UNITS.

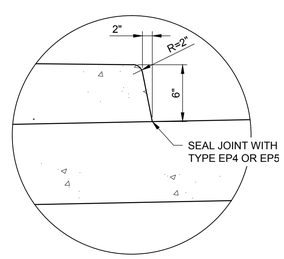
MODIFICATION OF DECK PLACEMENT SEQUENCE MAY REQUIRE ADJUSTMENT TO CAMBER AND DEAD LOAD DEFLECTION DIAGRAMS. THESE ADJUSTMENTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE AT NO ADDITIONAL COST. CONTRACTOR SHALL SUBMIT THE ANALYSIS AND DETAILS OF ANY SUCH MODIFICATIONS FOR REVIEW AND APPROVAL.

APPLY CONCRETE COLOR SURFACE COATING TO THE RAILING AND DECK OVERHANG TO THE LIMITS SHOWN, IN ACCORDANCE WITH THE SPECIAL PROVISIONS.



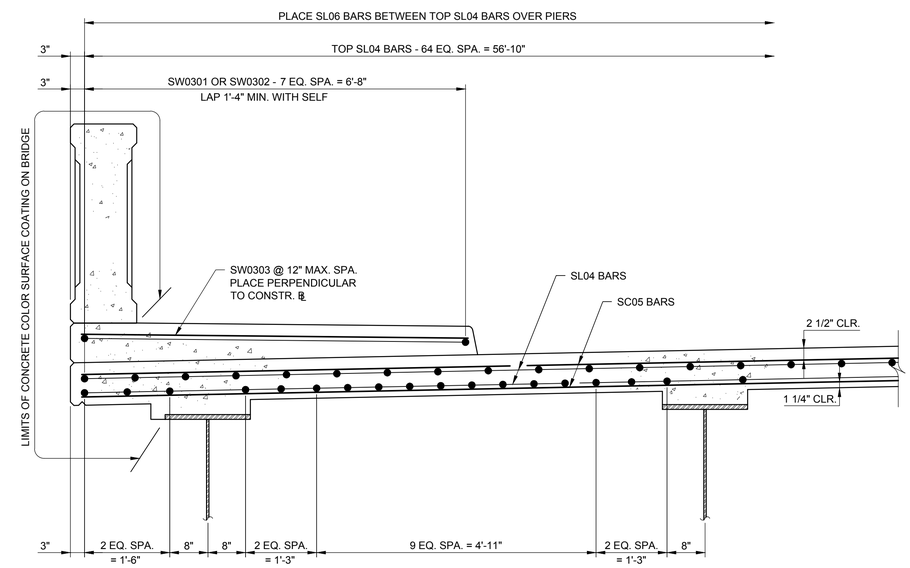
DRIP DETAIL

NOT TO SCALE



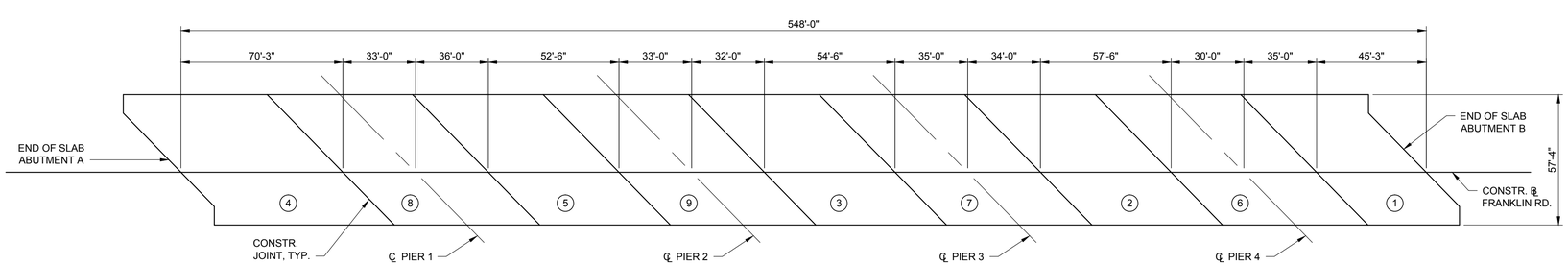
DETAIL A

NOT TO SCALE



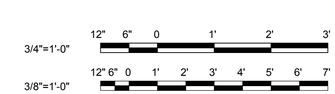
PART SECTION

SCALE: 3/4" = 1'-0"



DECK SLAB CONCRETE PLACEMENT SCHEDULE

NOT TO SCALE



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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05/17/2016
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

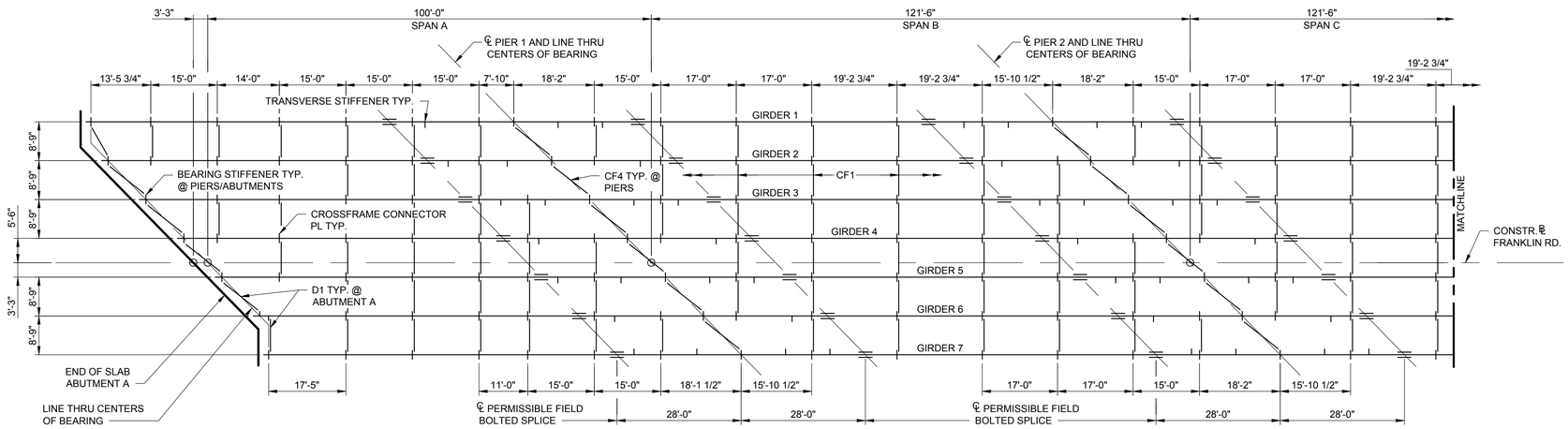
SHEET TITLE

TRANSVERSE SECTION AND POUR SEQUENCE

SHEET NUMBER

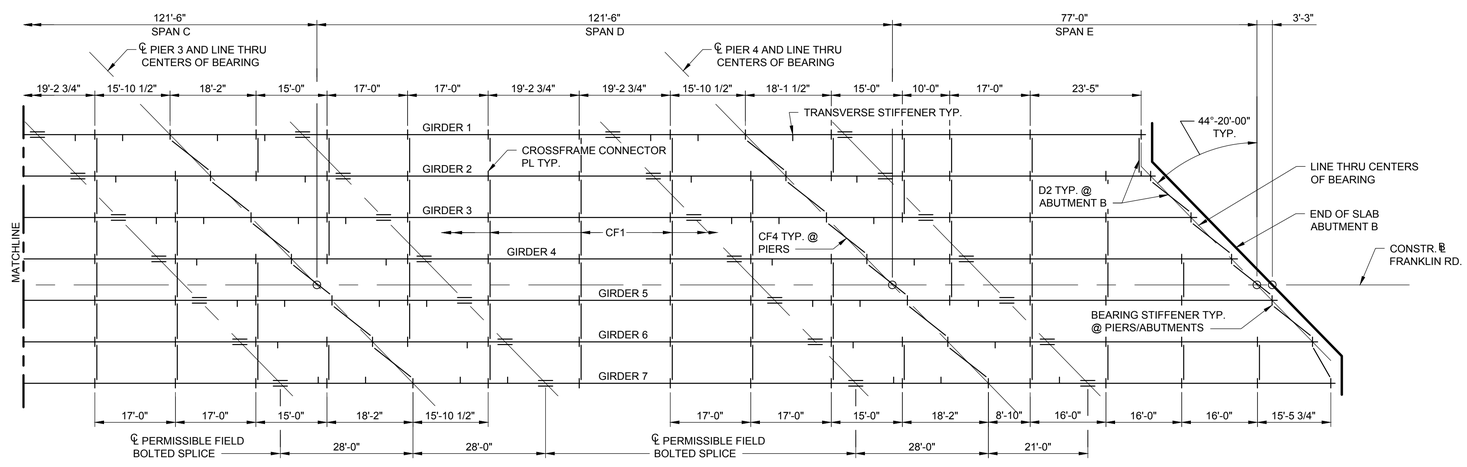
CB-040

ANSI D 22" X 34"



PARTIAL FRAMING PLAN

SCALE: 1/16" = 1'-0"
SPANS A, B AND C



PARTIAL FRAMING PLAN

SCALE: 1/16" = 1'-0"
SPANS C, D AND E

NOTES:

FOR BOLTED SPLICE DETAILS. SEE SHEET CB-045.

FOR GIRDER DETAILS, SEE SHEETS CB-043 AND CB-044.

EXCEPT AS OTHERWISE NOTED, DIMENSIONS SHOWN ON THESE PLANS ARE MEASURED IN THE RESPECTIVE HORIZONTAL OR VERTICAL PLANES AT LOCATIONS ALONG THE TOP OF WEB. DIMENSIONS THAT ARE AFFECTED BY GRADIENTS OR VERTICAL CURVATURE SHALL BE ADJUSTED AS NECESSARY BY THE CONTRACTOR AND SHALL BE SHOWN ON THE WORKING DRAWINGS.

THE CONTRACTOR SHALL SUBMIT A DETAILED ERECTION PLAN AND PROCEDURES FOR REVIEW BY THE CITY, PREPARED BY OR UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER REGISTERED IN VIRGINIA. THE DETAILED ERECTION PLAN AND PROCEDURES SHALL CONTAIN DRAWINGS AND CALCULATIONS AS NEEDED TO SUPPORT THE ERECTION PLAN AND PROCEDURES. THE PLAN AND PROCEDURES SHALL ADDRESS ALL REQUIREMENTS FOR ERECTION OF THE STRUCTURAL STEEL INTO THE FINAL DESIGNED CONFIGURATION AND SATISFY ALL WRITTEN REVIEW COMMENTS PRIOR TO THE START OF ERECTION, AND SHALL BE PREPARED BASED ON THE GUIDELINES OF NCHRP REPORT 725 - APPENDIX B: "RECOMMENDATIONS FOR CONSTRUCTION PLAN DETAILS AND LEVEL OF CONSTRUCTION ANALYSIS".

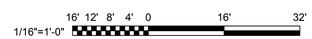
THE ERECTION PLAN SHALL CONTAIN A PLAN OF THE WORK AREA SHOWING THE BRIDGE, THE PIERS AND ABUTMENTS, RAILROAD TRACKS, OVERHEAD AND UNDERGROUND UTILITIES, STRUCTURES AND CONDITIONS THAT MAY LIMIT ACCESS, RIGHT-OF-WAY AND PROPERTY LINES, MATERIAL STORAGE AREAS, AND OTHER INFORMATION THAT MAY BE PERTINENT TO THE STEEL ERECTION. THE ERECTION PLAN SHALL CONTAIN THE ERECTION SEQUENCE FOR ALL MEMBERS NOTING THE USE OF TEMPORARY SUPPORT CONDITIONS, SUCH AS HOLDING CRANE POSITIONS, TEMPORARY SUPPORTS, FALSEWORK, ETC. THE ERECTION SEQUENCE SHALL BE SHOWN IN AN ILLUSTRATIVE PLAN VIEW OF THE BRIDGE FOR EACH ERECTION STAGE, HIGHLIGHTING THE STRUCTURAL COMPONENTS TO BE ERECTED, LIFTING CRANE LOCATIONS FOR PRIMARY MEMBER PICKS, AND ANY TEMPORARY SUPPORT CONDITIONS THAT ARE NECESSARY DURING THE PARTICULAR STAGE. THE ILLUSTRATIVE PLAN VIEW SHALL BE ACCOMPANIED WITH A WRITTEN NARRATIVE OF THE PROCEDURE TO BE FOLLOWED BY THE STEEL ERECTOR, WHICH SHALL CLEARLY STATE ITEMS SUCH AS STRUCTURAL COMPONENTS TO BE ERECTED, USE OF TEMPORARY SUPPORTS, USE OF TEMPORARY BRACING, HOLD CRANES, ETC. MEMBER REFERENCE MARKS, WHEN REFLECTED ON THE ERECTION PLAN, SHOULD BE THE SAME AS USED ON THE SHOP DETAIL DRAWINGS.

THE ERECTION PLAN SHALL SHOW THE LOCATION OF EACH CRANE TO BE USED FOR EACH PRIMARY MEMBER PICK, THE CRANE TYPE, THE CRANE PICK RADIUS, BOOM LENGTH, COUNTERWEIGHT REQUIREMENTS, THE CRANE SUPPORT METHODS (MATS, ETC.), AND THE MEANS OF ATTACHMENT TO THE GIRDERS BEING LIFTED OR SUPPORTED. THE ERECTION PLAN SHALL INCLUDE THE LIFTING WEIGHT OF THE PRIMARY MEMBER PICKS, INCLUDING ALL RIGGING AND PRE-ATTACHED ELEMENTS (SUCH AS CROSS-FRAMES OR SPLICE PLATES).

THE ERECTION PLAN SHALL INDICATE THE BOLTING REQUIREMENTS FOR FIELD SPLICES AND CROSS-FRAME CONNECTIONS. FOR BOLTED SPLICE CONNECTIONS OF PRIMARY MEMBERS, AND BOLTED CONNECTIONS OF CROSS FRAMES THAT BRACE I-GIRDERS, FILL AT LEAST 50 PERCENT OF HOLES IN THE CONNECTION PRIOR TO CRANE RELEASE WITH EITHER ERECTION BOLTS IN A SNUG TIGHT CONDITION, OR FULL-SIZE ERECTION PINS (A.K.A., "DRIFT PINS"), USING BOLTS FOR AT LEAST HALF OF THE FILLED HOLES (I.E., AT LEAST 25 PERCENT OF ALL HOLES). SUFFICIENT ERECTION PINS SHALL BE USED NEAR THE OUTSIDE CORNERS OF SPLICE PLATE AND AT MEMBER ENDS NEAR SPLICE PLATE EDGES TO ENSURE ALIGNMENT. THE FILLED HOLES SHALL BE UNIFORMLY DISTRIBUTED ACROSS THE CONNECTION.

TRANSVERSE STIFFENER SPACING FROM ℄ OF PIER

GIRDER	PIER 1, SPAN A	PIER 1, SPAN B	PIER 2, SPAN B	PIER 2, SPAN C	PIER 3, SPAN C	PIER 3, SPAN D	PIER 4, SPAN D	PIER 4, SPAN E
1	1 SPA. @ 20' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	1 SPA. @ 10' = 10'
2	2 SPA. @ 10' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 15' = 15'
3	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	1 SPA. @ 10' = 10'
4	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 10' = 10'
5	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	1 SPA. @ 15' = 15'
6	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 20' = 20'	1 SPA. @ 10' = 10'
7	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	2 SPA. @ 10' = 20'	1 SPA. @ 15' = 15'



GRAPHIC SCALES

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PROJECT

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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

FRAMING PLAN

SHEET NUMBER

CB-041

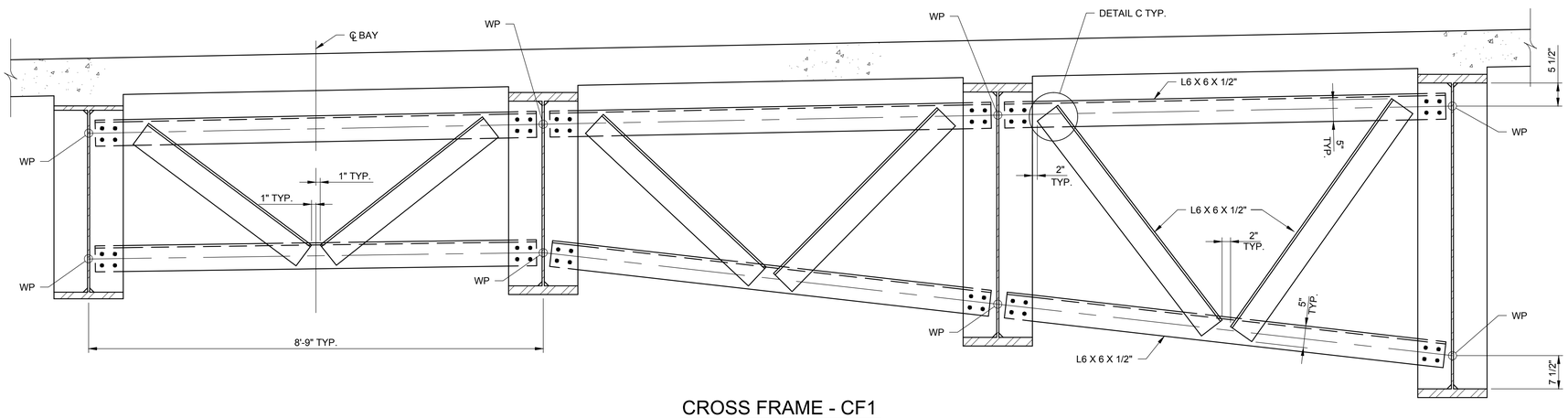
ANSI D 22" X 34"

NOTE:

ALL WELDING OF STRUCTURAL STEEL AND QUALITY CONTROL INSPECTION OF WELDS. INCLUDING FIELD WELDING AND QUALITY CONTROL INSPECTION OF THE FIELD WELDING, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR IN ACCORDANCE WITH SECTION 407.04(I) OF THE VDOT SPECIFICATIONS.

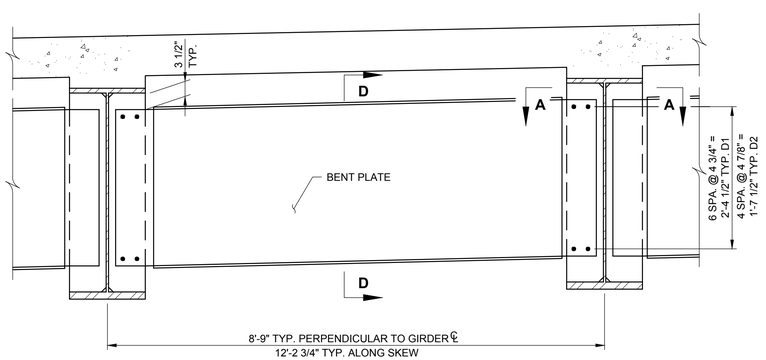
FOR INTERIOR GIRDERS, CROSS FRAME CONNECTOR PLATES SHALL BE PLACED IN PAIRS, EVEN WHEN THERE IS NO CORRESPONDING CROSS FRAME.

LINE THROUGH WORK POINTS, WP, IS LOCATED AT MID-DEPTH OF ANGLE LEG.



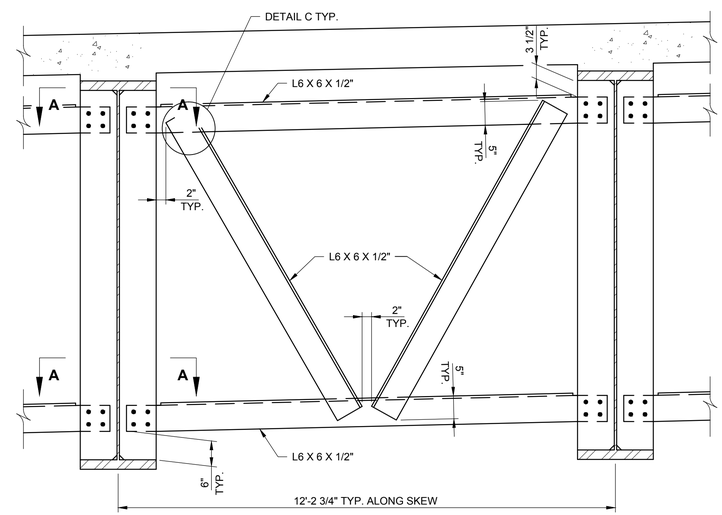
CROSS FRAME - CF1

NOT TO SCALE
INTERIOR CROSS FRAMES



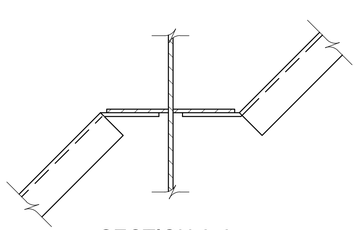
DIAPHRAGM - D1 AND D2

NOT TO SCALE
ABUTMENT DIAPHRAGMS



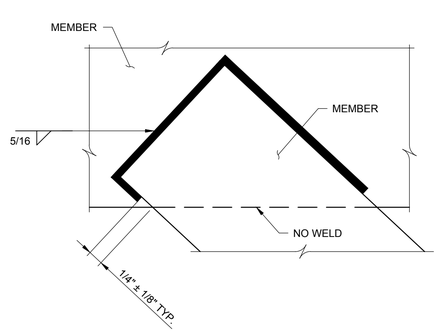
CROSS FRAME - CF4

NOT TO SCALE
PIER CROSS FRAMES



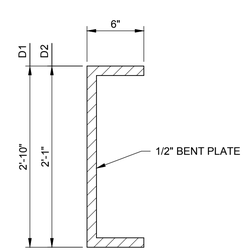
SECTION A-A

NOT TO SCALE



DETAIL C

NOT TO SCALE



SECTION D-D

NOT TO SCALE

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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ISSUE REVISION

I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

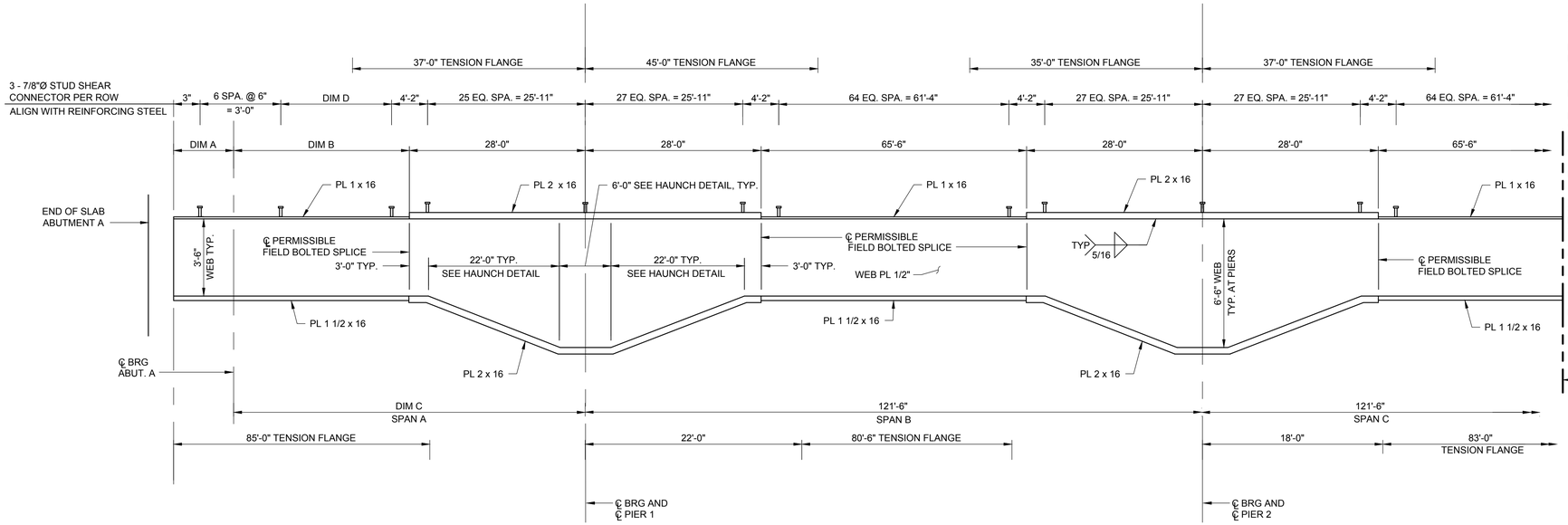
SHEET TITLE

CROSS FRAME DETAILS

SHEET NUMBER

CB-042

ANSI D 22" x 34"



GIRDER ELEVATION

NOT TO SCALE

NOTES:

FOR SPACING OF TRANSVERSE INTERMEDIATE STIFFENERS AND CROSS FRAME CONNECTOR PLATES, SEE FRAMING PLAN SHEET CB-041.

THE TOP AND BOTTOM FLANGES AS SHOWN IN GIRDER ELEVATION, WEB, AND ALL SPLICE PLATES ARE AREAS OF TENSILE STRESS FOR CHARPY V-NOTCH IMPACT REQUIREMENTS.

FOR STUD SHEAR CONNECTOR SPACING IN VICINITY OF PERMISSIBLE BOLTED FIELD SPLICE, SEE BOLTED SPLICE DETAILS, SHEET CB-045.

OMIT ONE STUD SHEAR CONNECTOR AT EACH END OF G2 TO G6 DUE TO FLANGE CLIP.

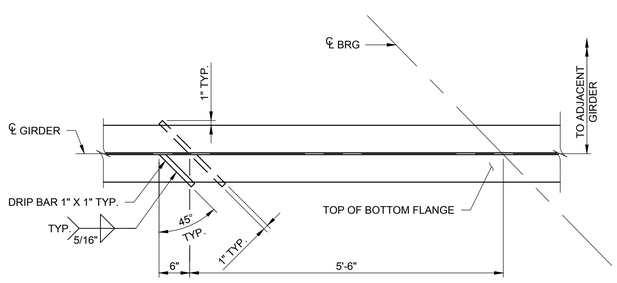
FABRICATE THE GIRDERS AND CROSS FRAMES SUCH THAT ALL GIRDER WEBS ARE PLUMB VERTICAL AFTER THE STEEL GIRDERS AND CROSS FRAMES HAVE BEEN FULLY ERECTED (PRIOR TO PLACING DECK CONCRETE).

EXCEPT AS OTHERWISE NOTED, DIMENSIONS SHOWN ON THESE PLANS ARE MEASURED IN THE RESPECTIVE HORIZONTAL OR VERTICAL PLANES AT LOCATIONS ALONG THE TOP OF WEB. BEAM ENDS AND BEARING STIFFENERS SHALL BE VERTICAL AFTER ERECTION. WEB DEPTH DIMENSIONS ARE INDICATED NORMAL TO THE TOP FLANGE. DIMENSIONS THAT ARE AFFECTED BY GRADIENTS OR VERTICAL CURVATURE SHALL BE ADJUSTED AS NECESSARY BY THE CONTRACTOR AND SHALL BE SHOWN ON THE WORKING DRAWINGS.

TOP OF WEB SHALL BE FABRICATED TO BE PARALLEL TO FINISHED GRADE AFTER FULL DEAD LOAD DEFLECTION.

FOR ADDITIONAL DETAILS SEE SHEET CB-044.

SYMBOL Ø = DIAMETER.



EXTERIOR GIDER DRIP BAR DETAIL

NOT TO SCALE

NOTES:

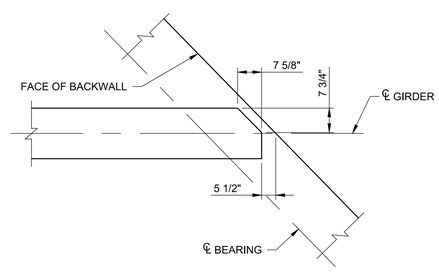
DRIP BARS SHALL BE PROVIDED ADJACENT TO EACH EXTERIOR GIRDER BEARING.

TOP DRIP BAR SHALL BE CLIPPED/MACHINED TO PROVIDE CLEARANCE FOR THE WELD BETWEEN THE GIRDER FLANGE AND WEB. REMAINING GAP TO BE FILLED WITH A NON-HARDENING CAULKING COMPOUND.

DRIP BARS SHALL BE ORIENTED TO PROVIDE POSITIVE DRAINAGE.

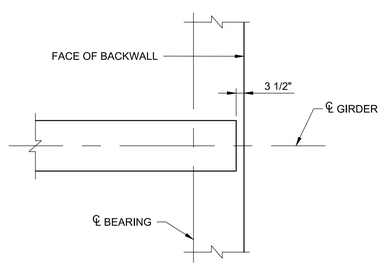
GIRDER DIMENSION TABLE

GIRDER	DIM A	DIM B	DIM C	DIM D
1	1'-0 1/2"	67'-3 3/4"	95'-3 3/4"	71 EQ. SPA. = 63'-0 1/4"
2-6	1'-4 7/8"	72'-0"	100'-0"	76 EQ. SPA. = 68'-0 7/8"
7	1'-0 1/2"	78'-6 1/2"	106'-6 1/2"	83 EQ. SPA. = 74'-3"



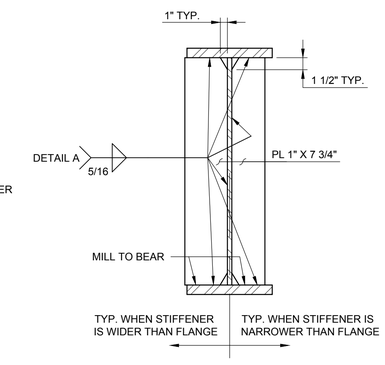
GIRDER END DETAIL

NOT TO SCALE
GIRDERS 2 THRU 6



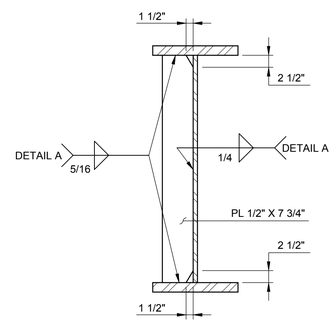
GIRDER END DETAIL

NOT TO SCALE
GIRDERS 1 AND 7



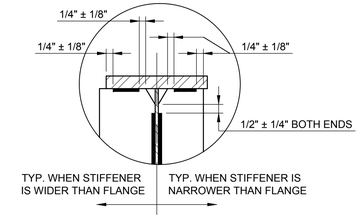
BEARING STIFFENERS

NOT TO SCALE



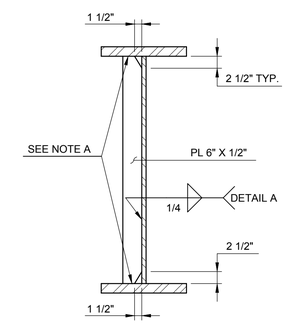
CROSS FRAME CONNECTOR PLATE

NOT TO SCALE



DETAIL A

NOT TO SCALE



TRANSVERSE INTERMEDIATE STIFFENER

NOT TO SCALE
NOTE A: 5/16" FILLET WELD (BOTH SIDES) TO COMPRESSION FLANGE(S). TIGHT FIT TO TENSION FLANGE(S).

GRAPHIC SCALES

AECOM

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ISSUE REVISION

I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

GIRDER ELEVATION 1 OF 2

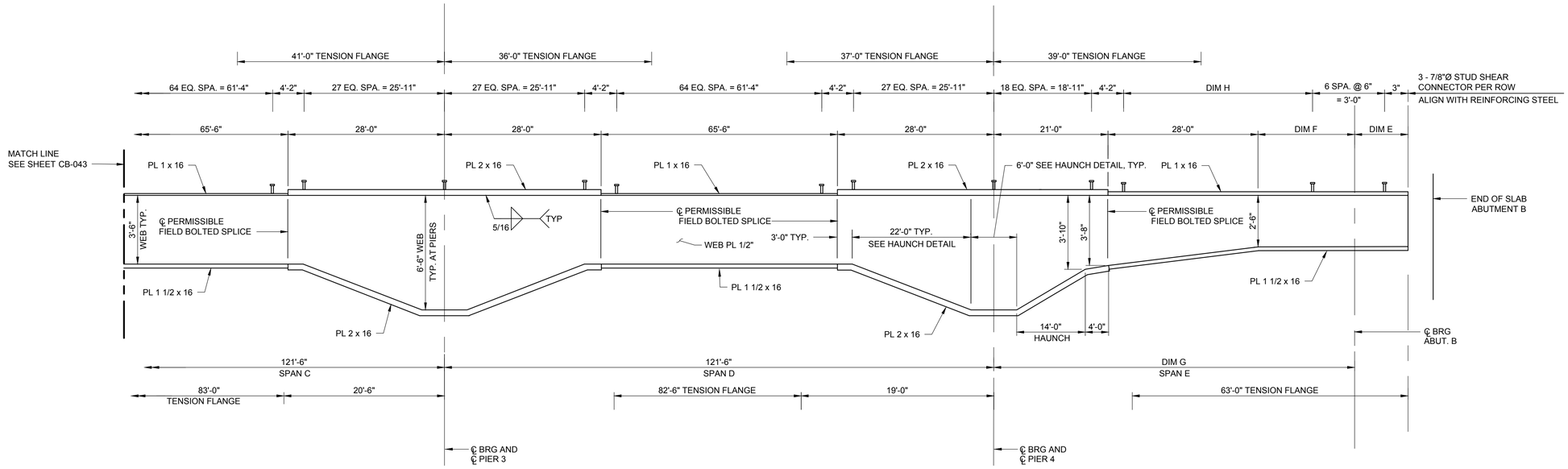
SHEET NUMBER

CB-043

ANSI D 22" x 34"

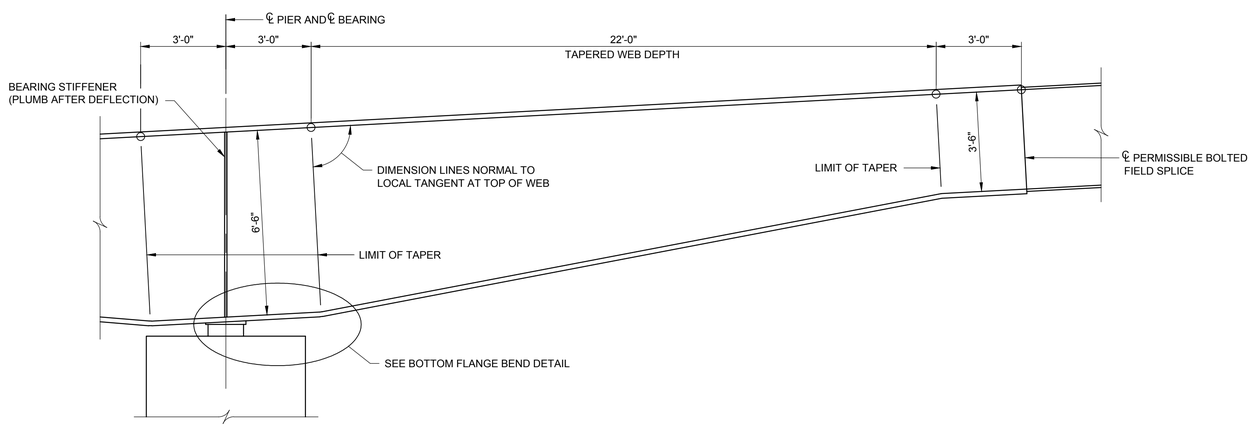
NOTES:

FOR NOTES AND ADDITIONAL DETAILS, SEE SHEET CB-043.



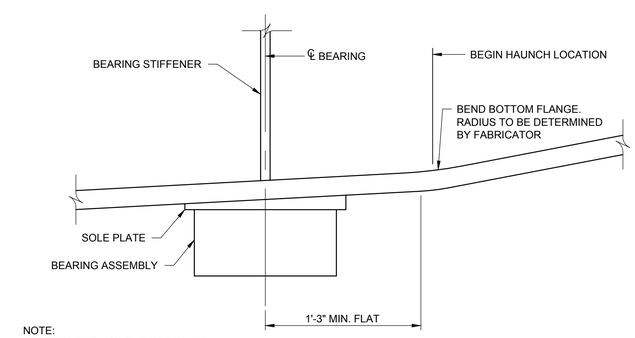
GIRDER ELEVATION

NOT TO SCALE



GIRDER HAUNCH DETAIL

NOT TO SCALE



NOTE:
CONTRACTOR HAS THE OPTION OF SHOP WELDING A SEPERATE FLANGE PLATE AT THE WORKING POINT IN LIEU OF BENDING THE FLANGE AS SHOWN.

BOTTOM FLANGE BEND DETAIL

NOT TO SCALE

GIRDER DIMENSION TABLE

GIRDER	DIM E	DIM F	DIM G	DIM H
1	1'-0 1/2"	34'-6 1/2"	83'-6 1/2"	73 EQ. SPA. = 58'-3"
2-6	1'-4 7/8"	28'-0"	77'-0"	65 EQ. SPA. = 52'-0 7/8"
7	1'-0 1/2"	23'-3 3/4"	72'-3 3/4"	59 EQ. SPA. = 47'-0 1/4"

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

GIRDER ELEVATION 2 OF 2

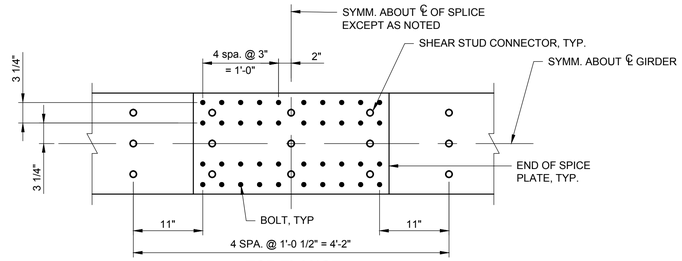
SHEET NUMBER

CB-044

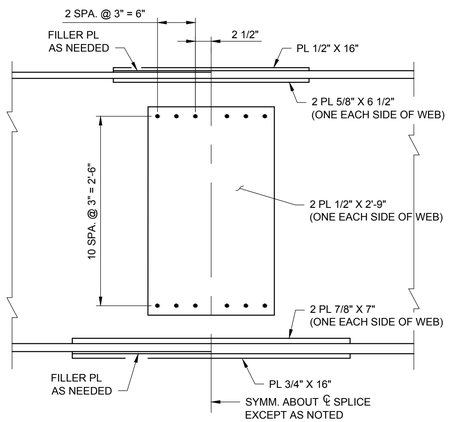
ANSI D 22" x 34"

NOTES:

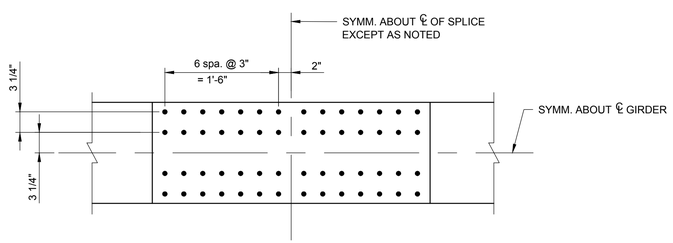
STUD SHEAR CONNECTORS ON TOP FLANGE BEYOND LIMITS OF BOLTED SPLICE NOT SHOWN. FOR SPACING, SEE GIRDER DETAILS, SHEET CB-043 AND CB-044.



TOP FLANGE



WEB



BOTTOM FLANGE

BOLTED SPLCE DETAILS

NOT TO SCALE

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

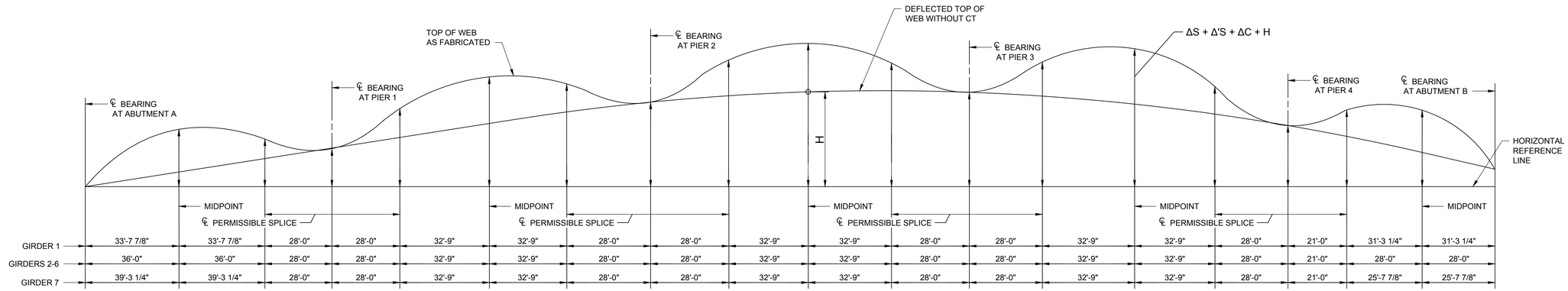
SHEET TITLE

BOLTED SPLICE DETAILS

SHEET NUMBER

CB-045

ANSI D 22" X 34"



GIRDER 1	Δs	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0	0	0.01	0.02	0.01	0	0	0.01	0
	Δ's	0	0.08	0.03	0	0.02	0.07	0.03	0	0.02	0.07	0.02	0	0.03	0.08	0.04	0	0	0.05	0
	Δc	0	0.03	0.01	0	0.01	0.03	0.01	0	0.02	0.03	0.01	0	0.02	0.03	0.02	0	0.01	0.02	0
	H	0	1.79	3.59	5.08	6.57	8.32	10.06	11.55	12.83	13.91	14.53	14.71	14.55	13.95	12.90	11.64	10.48	8.41	5.97
	TOTAL	0	1.92	3.64	5.08	6.60	8.43	10.11	11.55	12.88	14.02	14.56	14.71	14.61	14.08	12.97	11.64	10.49	8.49	5.97
GIRDER 2	Δs	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0	0	0.01	0.02	0.01	0	0	0	0
	Δ's	0	0.08	0.03	0	0.02	0.07	0.02	0	0.03	0.06	0.02	0	0.04	0.09	0.04	0	0.01	0.04	0
	Δc	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0.01	0	0.01	0.02	0.01	0	0	0	0
	H	0	1.92	3.84	5.33	6.82	8.57	10.31	11.77	12.95	13.91	14.42	14.49	14.24	13.52	12.35	10.99	9.75	7.81	5.61
	TOTAL	0	2.04	3.89	5.33	6.84	8.66	10.35	11.77	13.00	13.99	14.45	14.49	14.30	13.65	12.41	10.99	9.76	7.85	5.61
GIRDER 3	Δs	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0	0	0.01	0.02	0.01	0	0	0	0
	Δ's	0	0.08	0.03	0	0.02	0.07	0.02	0	0.03	0.06	0.02	0	0.04	0.09	0.04	0	0.01	0.04	0
	Δc	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0.01	0	0.01	0.02	0.01	0	0	0	0
	H	0	1.92	3.84	5.33	6.82	8.57	10.31	11.71	12.79	13.63	14.02	13.99	13.64	12.80	11.51	10.05	8.74	6.70	4.47
	TOTAL	0	2.04	3.89	5.33	6.84	8.66	10.35	11.71	12.84	13.71	14.05	13.99	13.70	12.93	11.57	10.05	8.75	6.74	4.47
GIRDER 4	Δs	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0	0	0.01	0.02	0.01	0	0	0	0
	Δ's	0	0.08	0.03	0	0.02	0.07	0.02	0	0.03	0.06	0.02	0	0.04	0.09	0.04	0	0.01	0.04	0
	Δc	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0.01	0	0.01	0.02	0.01	0	0	0	0
	H	0	1.92	3.84	5.33	6.82	8.57	10.31	11.62	12.60	13.32	13.59	13.46	13.01	12.05	10.64	9.08	7.69	5.56	3.34
	TOTAL	0	2.04	3.89	5.33	6.84	8.66	10.35	11.62	12.65	13.40	13.62	13.46	13.07	12.18	10.70	9.08	7.70	5.60	3.34
GIRDER 5	Δs	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0	0	0.01	0.02	0.01	0	0	0	0
	Δ's	0	0.08	0.03	0	0.02	0.07	0.02	0	0.03	0.06	0.02	0	0.04	0.09	0.04	0	0.01	0.04	0
	Δc	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0.01	0	0.01	0.02	0.01	0	0	0	0
	H	0	1.92	3.84	5.33	6.82	8.57	10.29	11.50	12.37	12.98	13.13	12.90	12.34	11.27	9.75	8.11	6.67	4.50	2.30
	TOTAL	0	2.04	3.89	5.33	6.84	8.66	10.33	11.50	12.42	13.06	13.16	12.90	12.40	11.40	9.81	8.11	6.68	4.54	2.30
GIRDER 6	Δs	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0	0	0.01	0.02	0.01	0	0	0	0
	Δ's	0	0.08	0.03	0	0.02	0.07	0.02	0	0.03	0.06	0.02	0	0.04	0.09	0.04	0	0.01	0.04	0
	Δc	0	0.02	0.01	0	0	0.01	0.01	0	0.01	0.01	0.01	0	0.01	0.02	0.01	0	0	0	0
	H	0	1.92	3.84	5.33	6.82	8.57	10.24	11.34	12.12	12.61	12.64	12.31	11.65	10.46	8.84	7.18	5.71	3.59	1.47
	TOTAL	0	2.04	3.89	5.33	6.84	8.66	10.28	11.34	12.17	12.69	12.67	12.31	11.71	10.59	8.90	7.18	5.72	3.63	1.47
GIRDER 7	Δs	0	0.03	0.01	0	0	0.01	0	0	0.01	0.01	0	0	0.01	0.02	0.01	0	0	0	0
	Δ's	0	0.1	0.03	0	0.02	0.06	0.02	0	0.03	0.06	0.01	0	0.04	0.09	0.04	0	0	0.03	0
	Δc	0	0.04	0.02	0	0.01	0.03	0.01	0	0.01	0.03	0.01	0	0.02	0.04	0.02	0	0	0.01	0
	H	0	2.09	4.19	5.68	7.17	8.92	10.50	11.51	12.18	12.55	12.47	12.04	11.28	9.97	8.30	6.61	5.13	3.25	1.37
	TOTAL	0	2.26	4.25	5.68	7.20	9.02	10.53	11.51	12.23	12.65	12.49	12.04	11.35	10.12	8.37	6.61	5.13	3.29	1.37

ALL VALUES IN CAMBER TABLE ARE IN DECIMAL FEET.

CAMBER

NOT TO SCALE

Δ S = DEFLECTION OF GIRDER FROM ITS OWN WEIGHT AFTER ERECTION INCLUDING DIAPHRAGMS, CONNECTORS, ETC.

Δ 'S = DEFLECTION OF GIRDER FROM DEAD LOAD OF CONCRETE DECK SLAB AND BOLSTERS.

Δ C = DEFLECTION OF GIRDER FROM DEAD LOAD (E.G. PARAPET AND SIDEWALK) ADDED AFTER DECK SLAB IS CAST.

H = DISTANCE BETWEEN HORIZONTAL REFERENCE LINE AND DEFLECTED TOP OF WEB AT ANY POINT BEING CONSIDERED.

CT = CAMBER TOLERANCE

AECOM

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KEY PLAN

PROJECT NUMBER

60290893

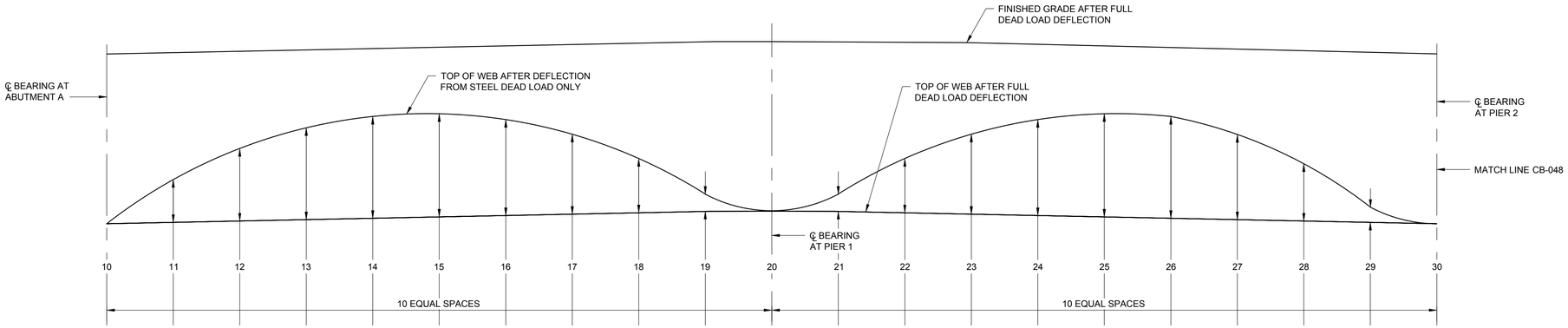
SHEET TITLE

CAMBER DIAGRAM

SHEET NUMBER

CB-046

ANSI D 22" X 34"



	POINT	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
GIRDER 1	Δ 'S	0	0.03	0.06	0.08	0.08	0.07	0.06	0.04	0.02	0.01	0	0	0.02	0.04	0.06	0.07	0.06	0.04	0.02	0.01	0
	Δ C	0	0.01	0.02	0.03	0.03	0.03	0.02	0.02	0.01	0	0	0	0.01	0.02	0.03	0.03	0.03	0.02	0.01	0	0
	Total	0	0.04	0.08	0.11	0.11	0.1	0.08	0.06	0.03	0.01	0	0	0.03	0.06	0.09	0.1	0.09	0.06	0.03	0.01	0
GIRDER 2	Δ 'S	0	0.03	0.06	0.08	0.08	0.07	0.06	0.04	0.02	0.01	0	0	0.02	0.04	0.06	0.07	0.06	0.04	0.02	0	0
	Δ C	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0
	Total	0	0.04	0.07	0.10	0.10	0.09	0.07	0.05	0.03	0.01	0	0	0.02	0.05	0.07	0.08	0.07	0.05	0.02	0	0
GIRDER 3	Δ 'S	0	0.03	0.06	0.08	0.08	0.07	0.06	0.04	0.02	0.01	0	0	0.02	0.04	0.06	0.07	0.06	0.04	0.02	0	0
	Δ C	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0
	Total	0	0.04	0.07	0.10	0.10	0.09	0.07	0.05	0.03	0.01	0	0	0.02	0.05	0.07	0.08	0.07	0.05	0.02	0	0
GIRDER 4	Δ 'S	0	0.03	0.06	0.08	0.08	0.07	0.06	0.04	0.02	0.01	0	0	0.02	0.04	0.06	0.07	0.06	0.04	0.02	0	0
	Δ C	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0
	Total	0	0.04	0.07	0.10	0.10	0.09	0.07	0.05	0.03	0.01	0	0	0.02	0.05	0.07	0.08	0.07	0.05	0.02	0	0
GIRDER 5	Δ 'S	0	0.03	0.06	0.08	0.08	0.07	0.06	0.04	0.02	0.01	0	0	0.02	0.04	0.06	0.07	0.06	0.04	0.02	0	0
	Δ C	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0
	Total	0	0.04	0.07	0.10	0.10	0.09	0.07	0.05	0.03	0.01	0	0	0.02	0.05	0.07	0.08	0.07	0.05	0.02	0	0
GIRDER 6	Δ 'S	0	0.03	0.06	0.08	0.08	0.07	0.06	0.04	0.02	0.01	0	0	0.02	0.04	0.06	0.07	0.06	0.04	0.02	0	0
	Δ C	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0
	Total	0	0.04	0.07	0.10	0.10	0.09	0.07	0.05	0.03	0.01	0	0	0.02	0.05	0.07	0.08	0.07	0.05	0.02	0	0
GIRDER 7	Δ 'S	0	0.04	0.07	0.09	0.1	0.09	0.07	0.04	0.02	0.01	0	0	0.02	0.04	0.06	0.06	0.05	0.03	0.01	0	0
	Δ C	0	0.02	0.03	0.04	0.04	0.04	0.03	0.02	0.01	0.01	0	0	0.01	0.02	0.03	0.03	0.03	0.02	0.01	0	0
	Total	0	0.06	0.10	0.13	0.14	0.13	0.10	0.06	0.03	0.02	0	0	0.03	0.06	0.09	0.09	0.08	0.05	0.02	0	0

ALL VALUES IN DEAD LOAD DEFLECTION TABLE ARE IN DECIMAL FEET.

Δ 'S = DEFLECTION OF GIRDER FROM DEAD LOAD OF CONCRETE DECK SLAB AND BOLSTERS.

Δ C = DEFLECTION OF GIRDER FROM DEAD LOAD (e.g. PARAPET) ADDED AFTER DECK SLAB IS CAST.

DEAD LOAD DEFLECTIONS

TOP OF SLAB ELEVATIONS ALONG ℄ GIRDER

POINT	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
GIRDER 1	950.40	950.91	951.42	951.92	952.43	952.94	953.45	953.96	954.46	954.97	955.48	956.13	956.78	957.42	958.07	958.72	959.37	960.01	960.66	961.31	961.95
GIRDER 2	950.78	951.31	951.85	952.38	952.91	953.45	953.98	954.51	955.04	955.58	956.11	956.76	957.41	958.05	958.70	959.35	960.00	960.64	961.29	961.94	962.55
GIRDER 3	951.41	951.94	952.48	953.01	953.54	954.08	954.61	955.14	955.68	956.21	956.74	957.39	958.04	958.68	959.33	959.98	960.63	961.27	961.92	962.55	963.12
GIRDER 4	952.04	952.58	953.11	953.64	954.17	954.71	955.24	955.77	956.31	956.84	957.37	958.02	958.67	959.32	959.96	960.61	961.26	961.91	962.55	963.14	963.66
GIRDER 5	952.54	953.08	953.61	954.14	954.67	955.21	955.74	956.27	956.81	957.34	957.87	958.52	959.17	959.82	960.46	961.11	961.76	962.41	963.01	963.56	964.04
GIRDER 6	952.82	953.36	953.89	954.42	954.96	955.49	956.02	956.55	957.09	957.62	958.15	958.80	959.45	960.10	960.74	961.39	962.04	962.66	963.23	963.73	964.17
GIRDER 7	952.76	953.32	953.89	954.46	955.03	955.59	956.16	956.73	957.30	957.87	958.43	959.08	959.73	960.38	961.02	961.67	962.31	962.89	963.41	963.87	964.26

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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REGISTRATION

COMMONWEALTH OF VIRGINIA
SARAH C. SARVER
Lic. No. 53554
05/17/2016
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

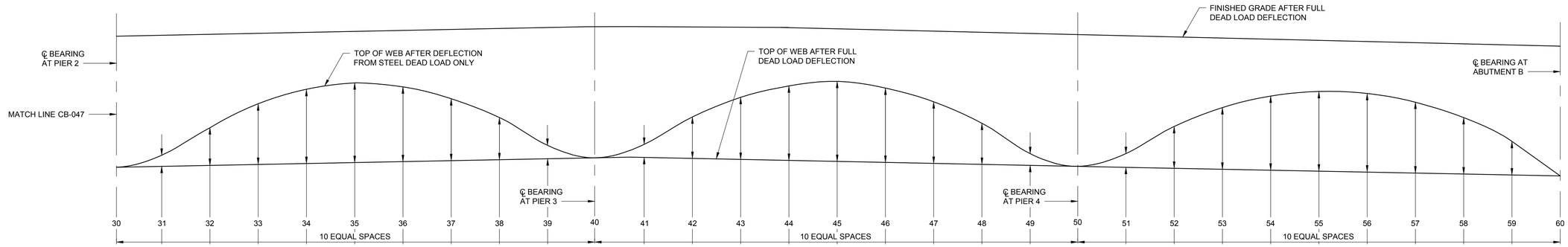
SHEET TITLE

DEAD LOAD DEFLECTIONS AND TOP OF SLAB ELEVATIONS
1 OF 2

SHEET NUMBER

CB-047

ANSI D 22" X 34"



	POINT	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
GIRDER 1	Δ 'S	0	0.01	0.02	0.04	0.06	0.07	0.06	0.04	0.02	0	0	0.01	0.02	0.05	0.07	0.08	0.08	0.06	0.03	0.01	0	0	0	0.01	0.02	0.04	0.05	0.05	0.04	0.02	0
	Δ C	0	0	0.01	0.02	0.03	0.03	0.03	0.02	0.01	0	0	0	0.01	0.02	0.03	0.03	0.03	0.02	0.01	0.01	0	0	0	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0
	Total	0	0.01	0.03	0.06	0.09	0.1	0.09	0.06	0.03	0	0	0.01	0.03	0.07	0.10	0.11	0.11	0.08	0.04	0.02	0	0	0	0.02	0.04	0.06	0.07	0.07	0.06	0.03	0
GIRDER 2	Δ 'S	0	0.01	0.02	0.04	0.06	0.06	0.05	0.03	0.01	0	0	0.01	0.03	0.06	0.08	0.09	0.08	0.06	0.03	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
	Δ C	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0.01	0.02	0.05	0.07	0.07	0.06	0.04	0.01	0	0	0.01	0.04	0.07	0.10	0.11	0.10	0.07	0.04	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
GIRDER 3	Δ 'S	0	0.01	0.02	0.04	0.06	0.06	0.05	0.03	0.01	0	0	0.01	0.03	0.06	0.08	0.09	0.08	0.06	0.03	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
	Δ C	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0.01	0.02	0.05	0.07	0.07	0.06	0.04	0.01	0	0	0.01	0.04	0.07	0.10	0.11	0.10	0.07	0.04	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
GIRDER 4	Δ 'S	0	0.01	0.02	0.04	0.06	0.06	0.05	0.03	0.01	0	0	0.01	0.03	0.06	0.08	0.09	0.08	0.06	0.03	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
	Δ C	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0.01	0.02	0.05	0.07	0.07	0.06	0.04	0.01	0	0	0.01	0.04	0.07	0.10	0.11	0.10	0.07	0.04	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
GIRDER 5	Δ 'S	0	0.01	0.02	0.04	0.06	0.06	0.05	0.03	0.01	0	0	0.01	0.03	0.06	0.08	0.09	0.08	0.06	0.03	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
	Δ C	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0.01	0.02	0.05	0.07	0.07	0.06	0.04	0.01	0	0	0.01	0.04	0.07	0.10	0.11	0.10	0.07	0.04	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
GIRDER 6	Δ 'S	0	0.01	0.02	0.04	0.06	0.06	0.05	0.03	0.01	0	0	0.01	0.03	0.06	0.08	0.09	0.08	0.06	0.03	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
	Δ C	0	0	0	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0.01	0.02	0.05	0.07	0.07	0.06	0.04	0.01	0	0	0.01	0.04	0.07	0.10	0.11	0.10	0.07	0.04	0.01	0	0	0	0.01	0.02	0.03	0.04	0.04	0.04	0.02	0
GIRDER 7	Δ 'S	0	0.01	0.02	0.04	0.06	0.06	0.04	0.02	0.01	0	0	0.01	0.03	0.06	0.08	0.09	0.08	0.06	0.03	0.01	0	0	0	0	0.01	0.02	0.03	0.03	0.03	0.02	0
	Δ C	0	0	0.01	0.02	0.03	0.03	0.02	0.02	0.01	0	0	0.01	0.01	0.03	0.03	0.04	0.03	0.03	0.02	0.01	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0.01	0
	Total	0	0.01	0.03	0.06	0.09	0.09	0.06	0.04	0.02	0	0	0.02	0.04	0.09	0.11	0.13	0.11	0.09	0.05	0.02	0	0	0	0	0.02	0.03	0.04	0.04	0.04	0.03	0

ALL VALUES IN DEAD LOAD DEFLECTION TABLE ARE IN DECIMAL FEET.

Δ 'S = DEFLECTION OF GIRDER FROM DEAD LOAD OF CONCRETE DECK SLAB AND BOLSTERS.

Δ C = DEFLECTION OF GIRDER FROM DEAD LOAD (e.g. PARAPET) ADDED AFTER DECK SLAB IS CAST.

DEAD LOAD DEFLECTIONS

TOP OF SLAB ELEVATIONS ALONG ℄ GIRDER

POINT	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
GIRDER 1	961.95	962.55	963.08	963.55	963.96	964.31	964.59	964.82	964.98	965.07	965.11	965.08	964.99	964.84	964.63	964.35	964.02	963.62	963.15	962.63	962.04	961.60	961.13	960.64	960.11	959.55	958.96	958.35	957.70	957.04	956.37
GIRDER 2	962.55	963.11	963.60	964.02	964.39	964.69	964.93	965.11	965.23	965.28	965.27	965.20	965.07	964.87	964.62	964.30	963.92	963.47	962.97	962.40	961.77	961.34	960.88	960.40	959.89	959.36	958.80	958.22	957.61	957.00	956.39
GIRDER 3	963.12	963.63	964.08	964.46	964.78	965.04	965.24	965.37	965.45	965.46	965.40	965.29	965.11	964.87	964.57	964.21	963.79	963.30	962.75	962.14	961.46	961.00	960.52	960.01	959.47	958.91	958.33	957.72	957.11	956.50	955.89
GIRDER 4	963.66	964.13	964.53	964.87	965.15	965.36	965.51	965.61	965.63	965.60	965.51	965.35	965.13	964.84	964.50	964.09	963.62	963.09	962.50	961.84	961.12	960.64	960.12	959.59	959.03	958.44	957.83	957.22	956.60	955.99	955.38
GIRDER 5	964.04	964.46	964.82	965.12	965.35	965.52	965.63	965.68	965.66	965.59	965.45	965.24	964.98	964.65	964.26	963.81	963.30	962.73	962.09	961.40	960.65	960.14	959.61	959.05	958.47	957.87	957.26	956.66	956.05	955.45	954.85
GIRDER6	964.17	964.54	964.86	965.11	965.30	965.43	965.49	965.50	965.44	965.32	965.13	964.89	964.58	964.21	963.78	963.28	962.73	962.11	961.46	960.76	960.00	959.49	958.95	958.38	957.80	957.21	956.63	956.04	955.46	954.87	954.29
GIRDER 7	964.26	964.60	964.87	965.08	965.22	965.31	965.33	965.29	965.19	965.02	964.79	964.50	964.15	963.74	963.26	962.72	962.12	961.50	960.85	960.14	959.36	958.87	958.36	957.83	957.30	956.77	956.24	955.71	955.18	954.65	954.12

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE

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215 Church Avenue, SW
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REGISTRATION

COMMONWEALTH OF VIRGINIA
SARAH C. SARVER
Lic. No. 53554
05/17/2016
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

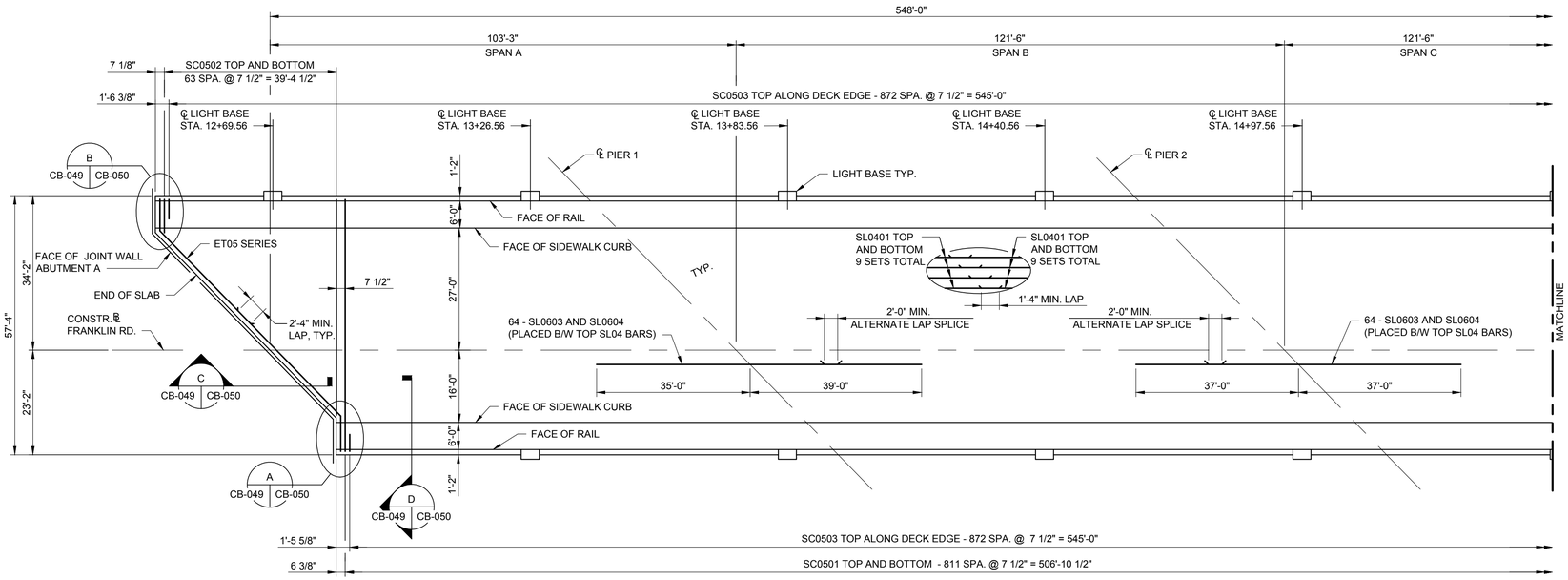
SHEET TITLE

DEAD LOAD DEFLECTIONS AND TOP OF SLAB ELEVATIONS
2 OF 2

SHEET NUMBER

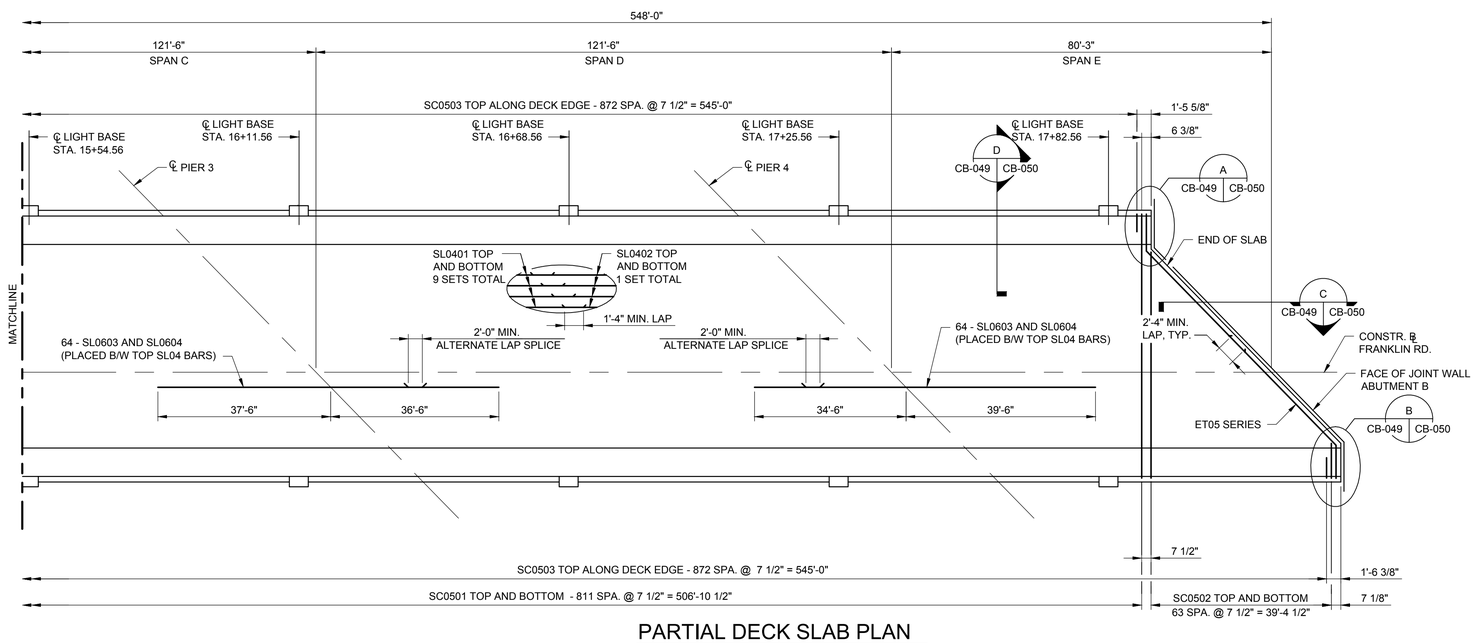
CB-048

ANSI D 22" x 34"



PARTIAL DECK SLAB PLAN

SCALE: 1/16" = 1'-0"
SPANS A, B AND C



PARTIAL DECK SLAB PLAN

SCALE: 1/16" = 1'-0"
SPANS C, D AND E

NOTES:

FOR SPACING OF SL04 BARS AND SL06 BARS, SEE SHEET CB-040.

FOR END OF SLAB AND DECK EXTENSION DETAILS, SEE SHEET CB-050.

FOR RAILING DETAILS, SEE SHEETS CB-053, CB-054 AND CB-055.

LIGHT BASE LOCATIONS ARE AT THE STATIONS INDICATED ON BOTH SIDES OF THE BRIDGE.

THE CONTRACTOR SHALL CONSTRUCT BRIDGE DECK FALSEWORK AND CONCRETE FORMS, INCLUDING TEMPORARY STRUTS AND/OR TIES, TO PREVENT OVERSTRESS OR DEFORMATION TO THE PERMANENT BRIDGE GIRDERS. DESIGN OF FORMING AND FALSEWORK INCLUDING DECK OVERHANG SHALL BE BY A PROFESSIONAL ENGINEER REGISTERED IN VIRGINIA, WHO SHALL ALSO VERIFY THAT THE DESIGN IS UTILIZED. THE CONTRACTOR SHALL SUBMIT FORMING PLANS AND SUPPORTING CALCULATIONS TO THE CITY FOR REVIEW PRIOR TO ERECTING THE FORMWORK.

FOR LIGHTING CONDUIT DETAILS, SEE SHEET CB-056.

16' 12' 8' 4' 0 16' 32'
1/16"=1'-0"

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
215 Church Avenue, SW
Room 350
Roanoke, VA 24011

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REGISTRATION

COMMONWEALTH OF VIRGINIA
SARAH C. SARVER
Lic. No. 53554
05/17/2016
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

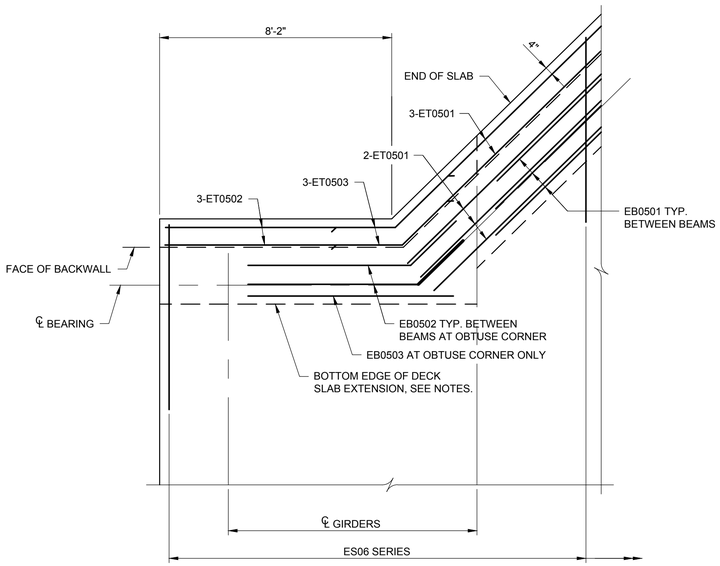
SHEET TITLE

DECK SLAB PLAN

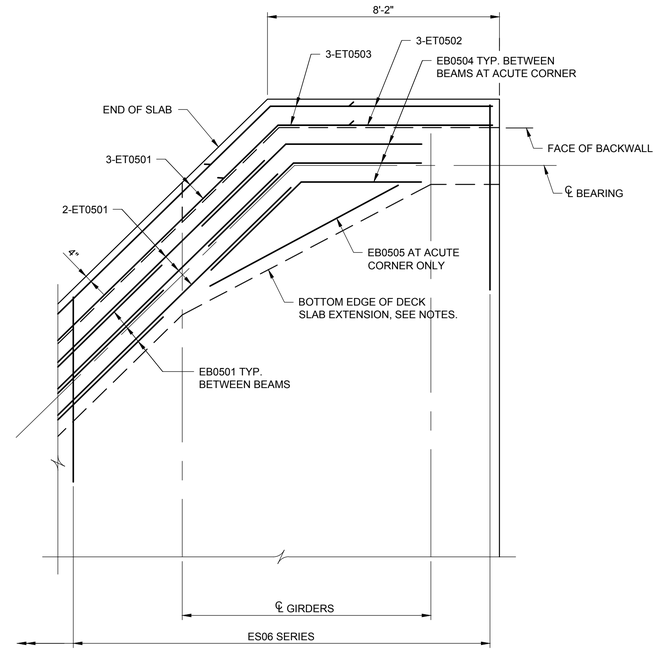
SHEET NUMBER

CB-049

ANSI D 22" X 34"



DETAIL A
SCALE: 3/8" = 1'-0"
CB-049 | CB-050



DETAIL B
SCALE: 3/8" = 1'-0"
CB-049 | CB-050

NOTES:

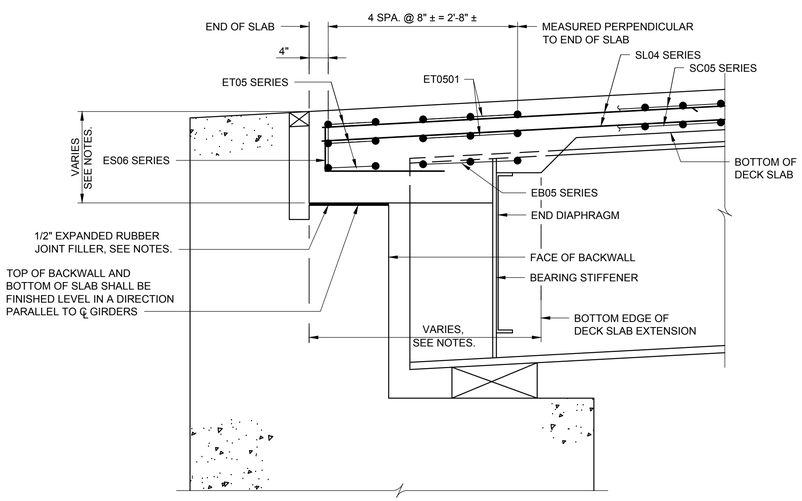
SECTION C-C IS PERPENDICULAR TO CENTERLINE OF GIRDER.

THICKNESS OF DECK SLAB EXTENSION VARIES FROM 1'-4" TO 1'-9 1/2" AT ABUTMENT A AND 1'-4" TO 1'-5 7/8" AT ABUTMENT B. SEE SHEETS CB-006 AND CB-010 FOR ELEVATIONS OF TOP OF BACKWALL AT ABUTMENT A AND ABUTMENT B.

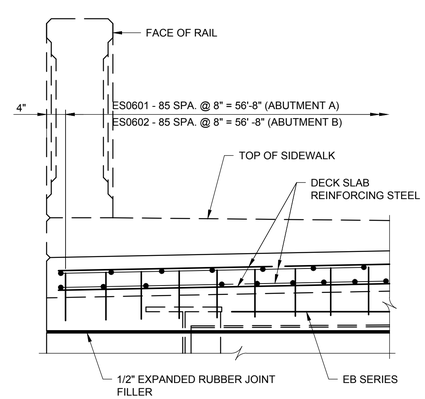
THE 1/2" EXPANDED RUBBER JOINT FILLER SHALL EXTEND THE FULL LENGTH OF THE DECK SLAB EXTENSION. COST OF JOINT FILLER SHALL BE INCLUDED IN THE PRICE BID FOR CONCRETE.

FOR SPACING OF SC05 AND SL04 SERIES IN DECK SLAB, SEE SHEET CB-040 AND CB-049.

BOTTOM EDGE OF DECK SLAB EXTENSION SHALL BEAR FULLY ON END DIAPHRAGM AND SHALL EXTEND A MINIMUM OF 3" BEYOND EDGE OF END DIAPHRAGM.



SECTION C
SCALE: 3/4" = 1'-0"
CB-049 | CB-050



SECTION D
SCALE: 3/4" = 1'-0"
CB-049 | CB-050

3/4"=1'-0" 12" 6" 0 1' 2' 3'
3/8"=1'-0" 12" 6" 0 1' 2' 3' 4' 5' 6' 7'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

DECK EXTENSION DETAILS

SHEET NUMBER

CB-050

ANSI D 22" X 34"

DECK SLAB ELEVATIONS

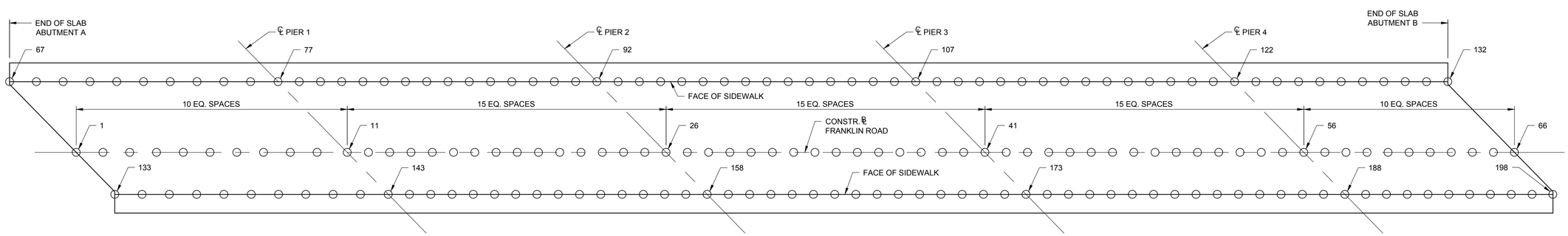
	Point	BASELINE	Point	FACE OF LEFT CURB	Point	FACE OF RIGHT CURB
END OF SLAB	1	952.26	67	950.37	133	952.73
	2	952.82	68	950.92	134	953.28
	3	953.37	69	951.46	135	953.84
	4	953.92	70	952.01	136	954.39
	5	954.47	71	952.55	137	954.95
	6	955.02	72	953.10	138	955.50
	7	955.57	73	953.64	139	956.06
	8	956.12	74	954.19	140	956.62
	9	956.67	75	954.73	141	957.17
	10	957.22	76	955.28	142	957.73
CL PIER 1	11	957.77	77	955.82	143	958.28
	12	958.20	78	956.25	144	958.71
	13	958.63	79	956.69	145	959.15
	14	959.06	80	957.12	146	959.58
	15	959.50	81	957.55	147	960.01
	16	959.93	82	957.98	148	960.44
	17	960.36	83	958.41	149	960.87
	18	960.79	84	958.84	150	961.30
	19	961.22	85	959.28	151	961.74
	20	961.65	86	959.71	152	962.17
	21	962.09	87	960.14	153	962.58
	22	962.52	88	960.57	154	962.96
	23	962.92	89	961.00	155	963.32
	24	963.31	90	961.44	156	963.64
	25	963.66	91	961.87	157	963.94
CL PIER 2	26	963.99	92	962.28	158	964.22
	27	964.28	93	962.67	159	964.46
	28	964.55	94	963.03	160	964.68
	29	964.80	95	963.36	161	964.87
	30	965.01	96	963.67	162	965.03
	31	965.20	97	963.95	163	965.16
	32	965.36	98	964.20	164	965.27
	33	965.49	99	964.42	165	965.35
	34	965.60	100	964.61	166	965.40
	35	965.67	101	964.78	167	965.42
	36	965.72	102	964.92	168	965.42
	37	965.74	103	965.03	169	965.39
	38	965.74	104	965.12	170	965.33
	39	965.70	105	965.17	171	965.24
	40	965.64	106	965.20	172	965.13

DECK SLAB ELEVATIONS

	Point	BASELINE	Point	FACE OF LEFT CURB	Point	FACE OF RIGHT CURB
CL PIER 3	41	965.55	107	965.20	173	964.98
	42	965.44	108	965.17	174	964.81
	43	965.29	109	965.12	175	964.61
	44	965.12	110	965.04	176	964.39
	45	964.92	111	964.93	177	964.14
	46	964.69	112	964.79	178	963.86
	47	964.44	113	964.63	179	963.55
	48	964.15	114	964.43	180	963.21
	49	963.84	115	964.21	181	962.85
	50	963.51	116	963.97	182	962.46
	51	963.14	117	963.69	183	962.04
	52	962.75	118	963.39	184	961.62
	53	962.33	119	963.06	185	961.18
	54	961.88	120	962.70	186	960.72
	55	961.40	121	962.31	187	960.23
CL PIER 4	56	960.90	122	961.90	188	959.71
	57	960.37	123	961.45	189	959.17
	58	959.82	124	960.98	190	958.61
	59	959.24	125	960.48	191	958.03
	60	958.63	126	959.96	192	957.43
	61	957.99	127	959.40	193	956.84
	62	957.36	128	958.82	194	956.25
	63	956.72	129	958.21	195	955.66
	64	956.08	130	957.57	196	955.06
	65	955.44	131	956.93	197	954.47
END OF SLAB	66	954.80	132	956.28	198	953.88

NOTES:

SLAB ELEVATIONS AS SHOWN IN TABLES ARE ON TOP OF FINISHED ROADWAY. THOSE SHOWN ON THE BASELINE ARE AT POINT OF FINISHED GRADE DENOTED ON TRANSVERSE SECTION. STRAIGHT LINE INTERPOLATIONS FOR INTERMEDIATE ELEVATIONS ON TOP OF FINISHED ROADWAY MAY BE MADE IN ANY DIRECTION BETWEEN ANY TWO ADJACENT POINTS.



DECK SLAB ELEVATIONS

NO SCALE

AECOM

PROJECT

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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

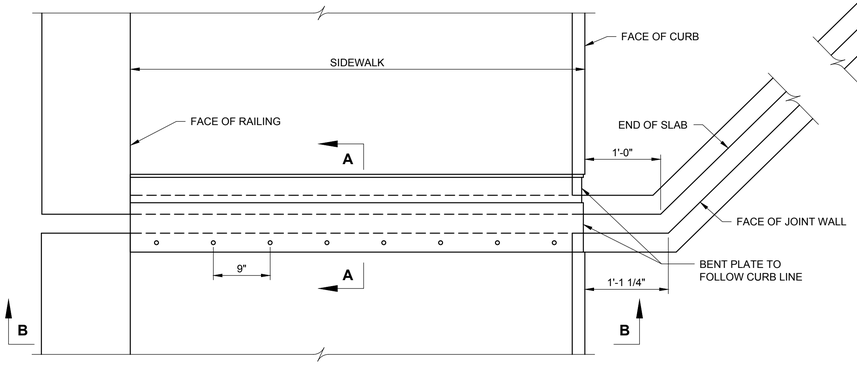
SHEET TITLE

DECK SLAB ELEVATIONS

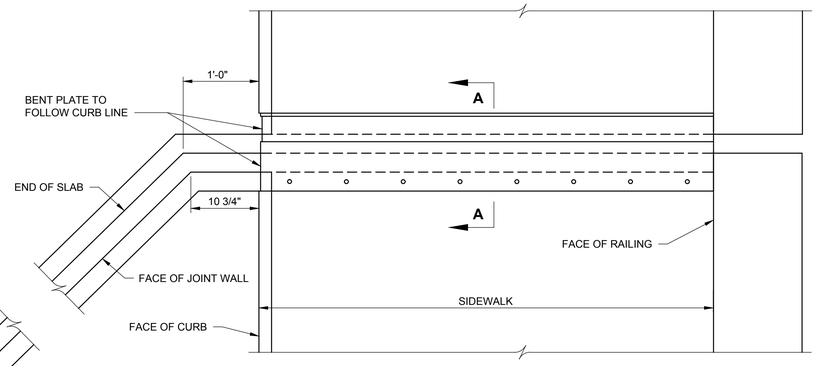
SHEET NUMBER

CB-051

ANSI D 22" X 34"



ABUTMENT A WEST
ABUTMENT B SIMILAR



ABUTMENT A EAST
ABUTMENT B SIMILAR

PLAN
NOT TO SCALE

NOTES:

SHOP DRAWINGS OF THE TYPE OF DAM SELECTED AND CORRESPONDING SLAB OPENING AND ANCHOR DETAILS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH THESE DETAILS AND SECTION 105.10 OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS.

TOP OF DAM SHALL BE SET BELOW TOP OF SLAB IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION OR 1/8", WHICHEVER IS GREATER.

CONCRETE SHALL BE PLACED BENEATH THE DAM IN SUCH A MANNER AS TO PREVENT THE FORMATION OF AIR POCKETS IN THE CONCRETE.

ALL BOLTS, NUTS, WASHERS AND CAP SCREWS SHALL BE ASTM A276, TYPE 304 STAINLESS STEEL.

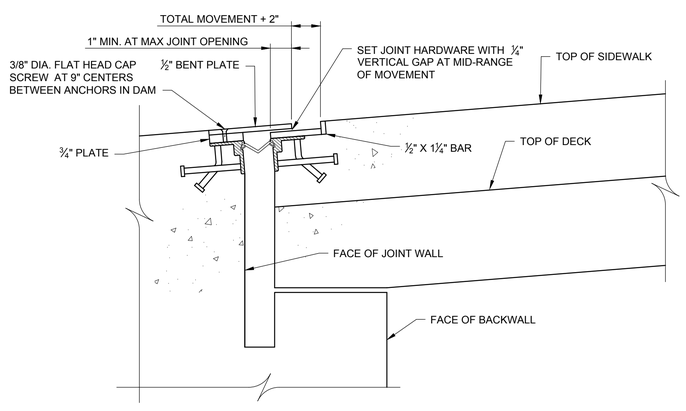
NON-STAINLESS FERROUS METAL SHALL BE ASTM A709, GRADE 36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 411 OF THE SPECIFICATIONS.

COMPLETELY WELDED CURB AND GUTTER SECTIONS SHALL BE FURNISHED.

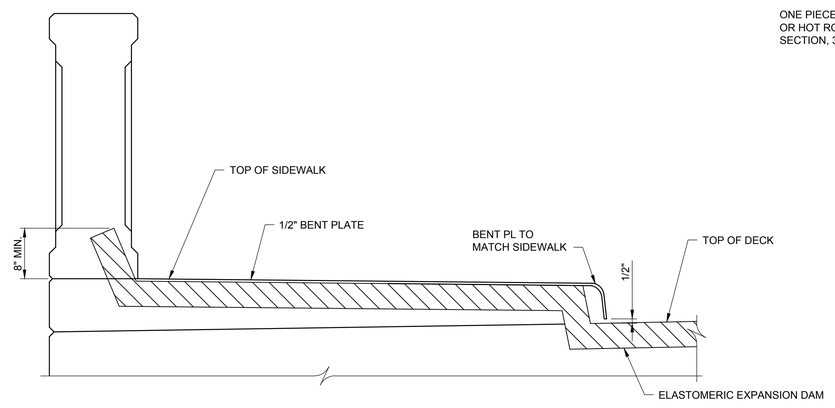
STEEL SECTIONS SHALL BE FURNISHED IN MINIMUM LENGTHS OF 18' AND SHALL BE FIELD WELDED INTO CONTINUOUS SECTIONS. WELDS SHALL BE GROUND SMOOTH IN AREAS WHERE THEY WILL BE IN CONTACT WITH THE ELASTOMER.

GLAND MATERIAL SHALL CONFORM TO SECTION 212.02 OF THE SPECIFICATIONS.

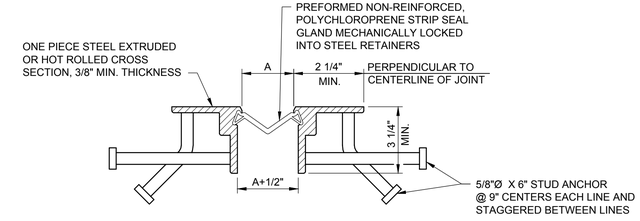
THE PRICE BID FOR DECK EXPANSION JOINT SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO INSTALL THE DECK EXPANSION JOINTS, INCLUDING FABRICATION, TRANSPORTATION, INSTALLATION OF EXPANSION DAMS AND SLIDING COVER PLATES. THIS PRICE SHALL ALSO INCLUDE THE COST OF SHOP DRAWING PREPARATION AND APPROVAL.



SECTION A-A
NOT TO SCALE



SECTION B-B
NOT TO SCALE



JOINT SECTION
NOT TO SCALE

LOCATION	A (AT 60° F)	T	TOTAL MOVEMENT
ABUTMENT A	2 1/2"	1/4"	4"
ABUTMENT B	2 1/2"	1/4"	4"

THE DIMENSION "A" SHALL BE INCREASED OR DECREASED FOR EVERY 10 DEG F TEMPERATURE DROP OR RISE RESPECTIVELY BY "T". THE DIMENSION "A" IS MEASURED PERPENDICULAR TO THE JOINT CENTERLINE.

TOTAL MOVEMENT IS THE MOVEMENT THE DAM MUST BE CAPABLE OF PROVIDING TO ALLOW FOR THE EFFECTS OF TEMPERATURE CHANGES, GIRDER END ROATATION UNDER LIVE LOAD, AND RACKING CAUSED BY THE SKEW ANGLE.

GRAPHIC SCALES

AECOM

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KEY PLAN

PROJECT NUMBER

60290893

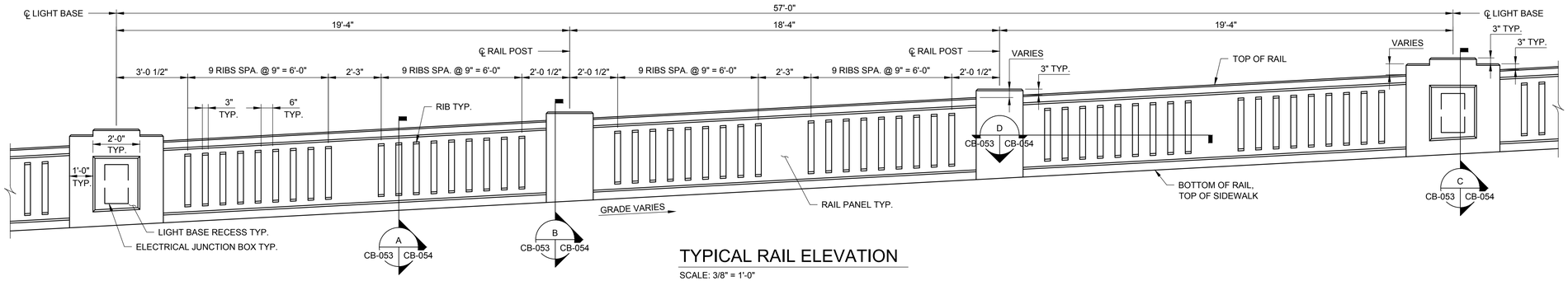
SHEET TITLE

DECK EXPANSION JOINT DETAILS

SHEET NUMBER

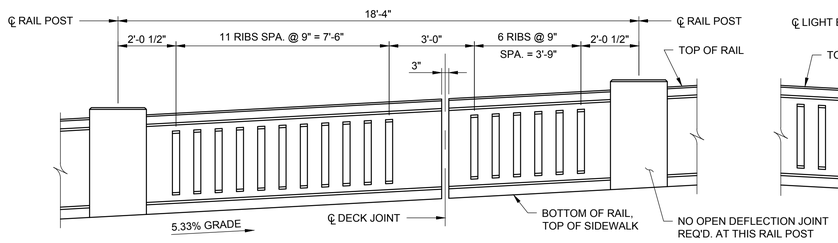
CB-052

ANSI D 22" X 34"



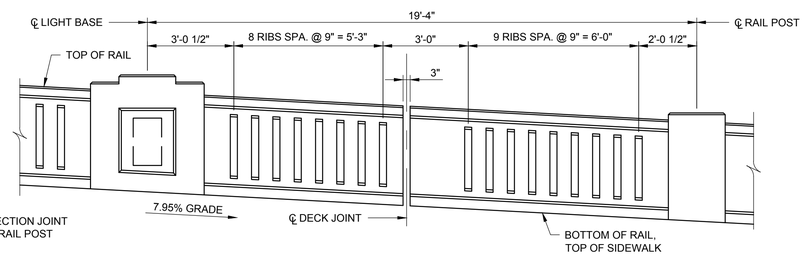
TYPICAL RAIL ELEVATION

SCALE: 3/8" = 1'-0"



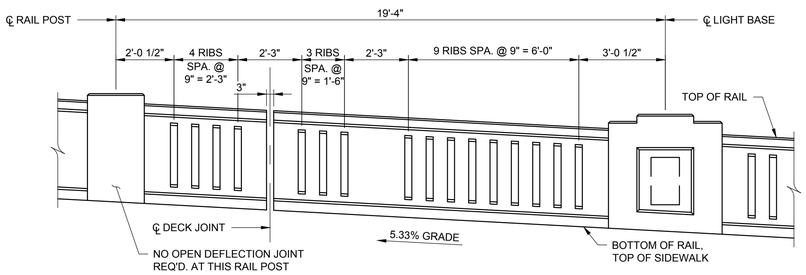
RAIL ELEVATION AT DECK JOINT ABUTMENT A - WEST RAILING

SCALE: 3/8" = 1'-0"



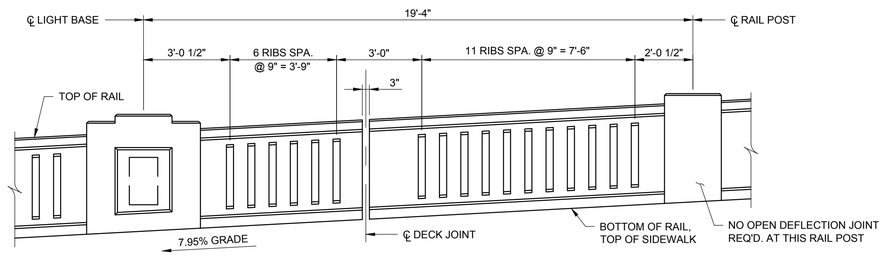
RAIL ELEVATION AT DECK JOINT ABUTMENT B - WEST RAILING

SCALE: 3/8" = 1'-0"



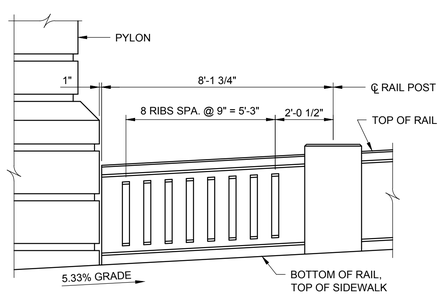
RAIL ELEVATION AT DECK JOINT ABUTMENT A - EAST RAILING

SCALE: 3/8" = 1'-0"



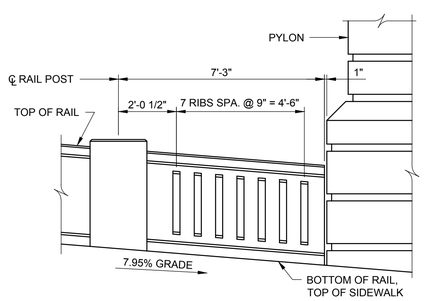
RAIL ELEVATION AT DECK JOINT ABUTMENT B - EAST RAILING

SCALE: 3/8" = 1'-0"



END OF RAILING AT PYLON SOUTH END OF BRIDGE

SCALE: 3/8" = 1'-0"



END OF RAILING AT PYLON NORTH END OF BRIDGE

SCALE: 3/8" = 1'-0"

NOTE:

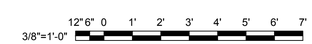
ALL RAIL ELEVATION VIEWS ARE SHOWN LOOKING TOWARD ROADSIDE FACE OF RAIL.

PROVIDE EXPANSION JOINTS IN RAILING AT LOCATIONS OF EXPANSION JOINTS IN RETAINING WALLS AND WINGWALLS. SEE RETAINING WALL AND WINGWALL DETAIL SHEETS FOR LOCATIONS.

SEE SHEET CB-054 FOR RAILING EXPANSION JOINT DETAIL.

SEE SHEET CB-055 FOR ADDITIONAL NOTES.

SEE SHEET CB-049 FOR LIGHT BASE LOCATIONS.



GRAPHIC SCALES

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KEY PLAN

PROJECT NUMBER

60290893

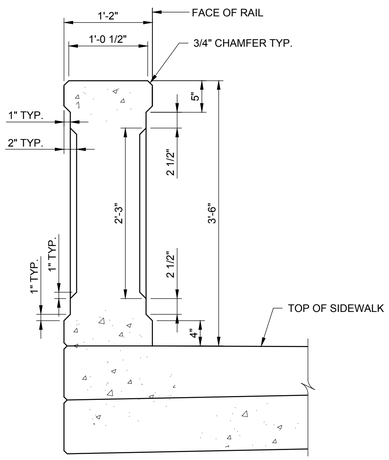
SHEET TITLE

RAILING ELEVATIONS

SHEET NUMBER

CB-053

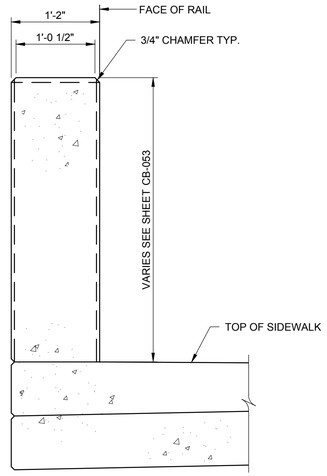
ANSI D 22" X 34"



RAIL SECTION

SCALE: 1" = 1'-0"

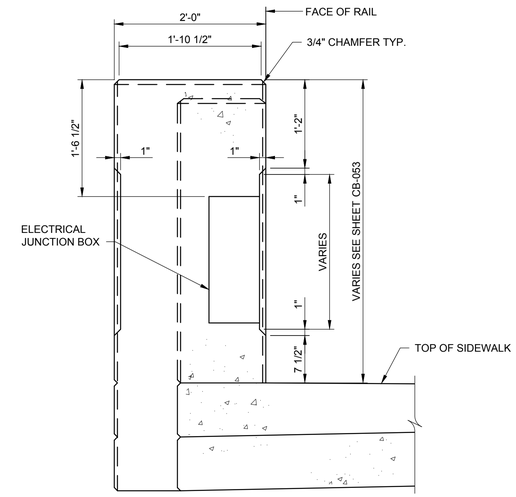
A
CB-053 | CB-054



RAIL POST SECTION

SCALE: 1" = 1'-0"

B
CB-053 | CB-054



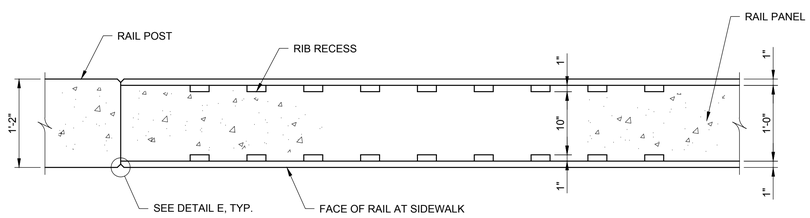
LIGHT BASE SECTION

SCALE: 1" = 1'-0"

C
CB-053 | CB-054

NOTE:

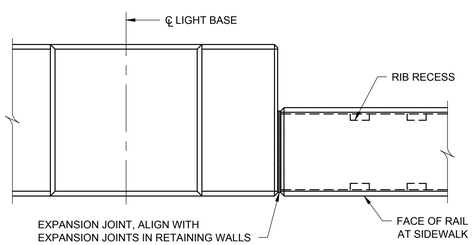
SEE SHEET CB-055 FOR ADDITIONAL NOTES.



RAIL SECTION

SCALE: 1" = 1'-0"

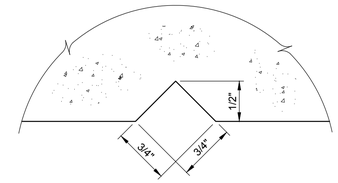
D
CB-053 | CB-054



RAILING EXPANSION JOINT DETAIL

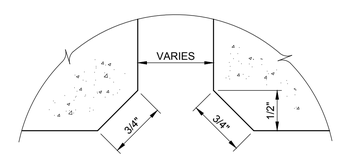
SCALE: 1" = 1"

NOTE:
DETAIL SHOWN FOR RAIL EXPANSION JOINTS LOCATED AT LIGHT BASE.
WHERE JOINTS OCCUR AT OTHER LOCATIONS, THE CONTRACTOR SHALL
ADJUST RIB SPACING SLIGHTLY TO AVOID LOCATING JOINTS WITHIN A RIB.



DETAIL E

SCALE: 1" = 1"



DETAIL F

SCALE: 1" = 1"

1"=1'-0" 12" 9" 6" 3" 0 1' 2'

GRAPHIC SCALES

AECOM

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KEY PLAN

PROJECT NUMBER

60290893

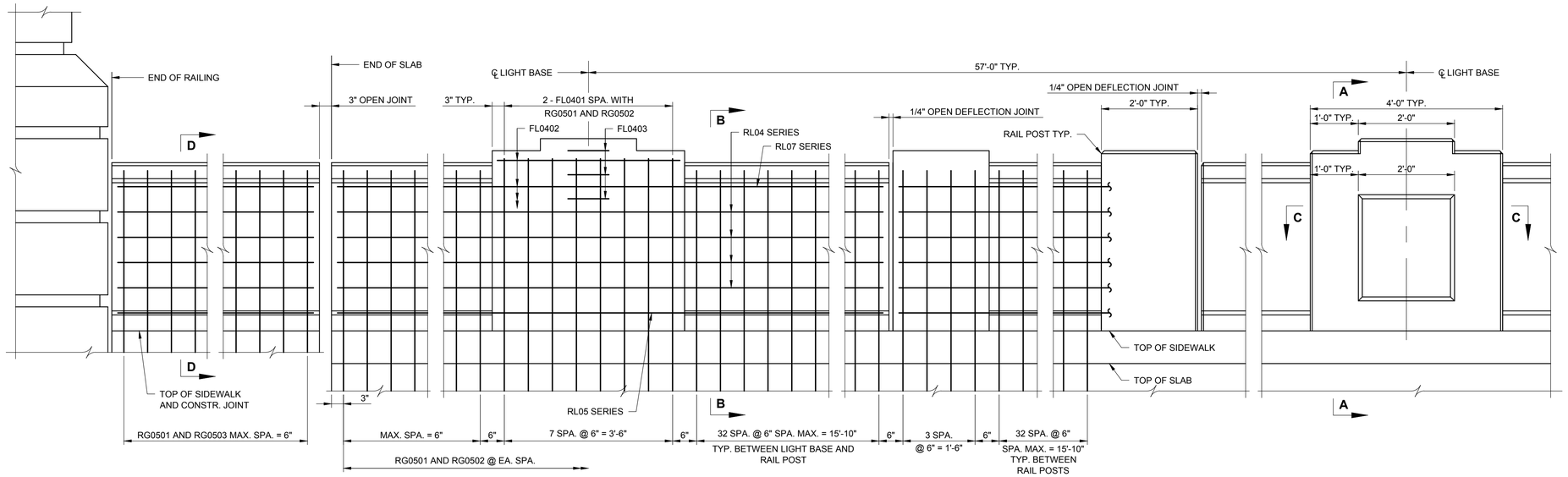
SHEET TITLE

RAILING SECTIONS AND DETAILS

SHEET NUMBER

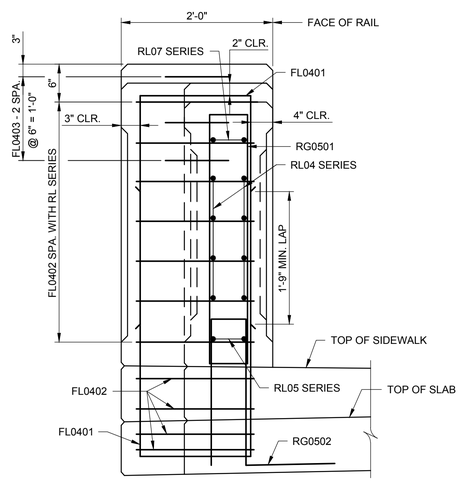
CB-054

ANSI D 22" X 34"



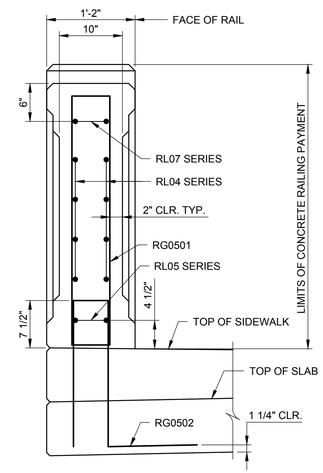
ELEVATION

SCALE: 3/4" = 1'-0"



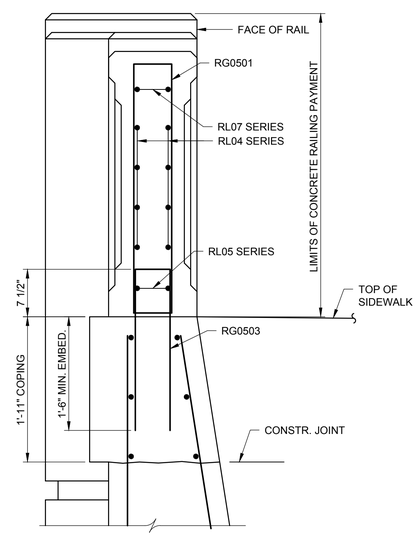
SECTION A-A

SCALE: 1" = 1'-0"



SECTION B-B

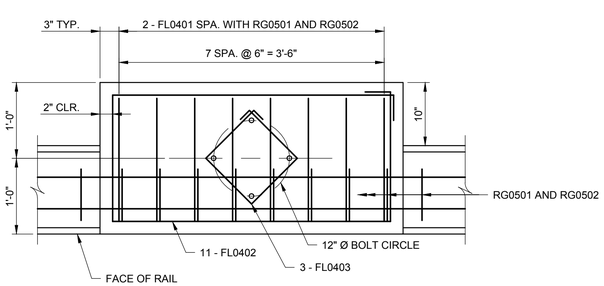
SCALE: 1" = 1'-0"



SECTION D-D

SCALE: 1" = 1'-0"

FOR WALL REINFORCING, SEE WINGWALL AND RETAINING WALL DETAILS.



SECTION C-C

SCALE: 1" = 1'-0"

NOTES:

PLAN DIMENSIONS SHOWN ARE MEASURED IN THE RESPECTIVE HORIZONTAL AND VERTICAL PLANES.

THE CONTRACTOR SHALL DETERMINE ALL DIMENSIONS AND DETAILS NECESSARY FOR INSTALLATION.

ALL CONCRETE SHALL BE CLASS A4.

THE REINFORCING STEEL SHOWN HAS BEEN DETAILED BASED ON A STANDARD 2% CROSS SLOPE. THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL AS REQUIRED FOR OTHER CROSS SLOPES.

ALL REINFORCING STEEL SHALL BE CORROSION RESISTANT REINFORCING STEEL, CLASS I.

FOR RAILING SUPPORTED ON THE BRIDGE DECK, PROVIDE OPEN DEFLECTION JOINTS AT EACH RAIL POST ON THE SIDE OF POST TOWARD THE NEAREST LIGHT BASE. FOR RAILING SUPPORTED ON WALLS, SEE SHEET CB-053 FOR JOINT REQUIREMENTS.

FOR CONDUIT SYSTEM DETAILS, SEE SHEET CB-056.

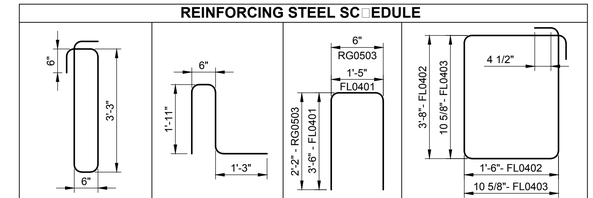
FOR LIGHT BASE LOCATIONS, SEE SHEET CB-049.

FOR CONCRETE COLOR COATING REQUIREMENTS, SEE SPECIAL PROVISIONS.

PRIOR TO BEGINNING CONSTRUCTION OF CONCRETE RAILING, CONTRACTOR SHALL PRODUCE A RAILING SAMPLE PANEL FOR REVIEW AND APPROVAL BY CITY AT LEAST ONE MONTH PRIOR TO BEGINNING CONSTRUCTION OF THE CONCRETE RAILING. THE RAILING SAMPLE PANEL SHALL BE A MINIMUM OF 15 FEET IN LENGTH AND SHALL INCLUDE ONE POST, ONE LIGHT BASE AND A MINIMUM OF 9 VERTICAL RIBS. THE RAILING SAMPLE PANEL SHALL INCORPORATE FULL-SCALE DETAILS OF ARCHITECTURAL FEATURES AND FINISH, INCLUDING COLOR COATING, AND SHALL BE CONSTRUCTED WITH A MINIMUM SLOPE OF 5%. CONSTRUCTION OF THE CONCRETE RAILING SHALL BE CONSISTENT WITH THE APPROVED RAILING SAMPLE PANEL.

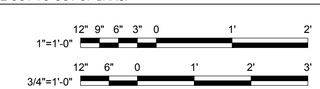
BID ITEM FOR CONCRETE RAILING SHALL INCLUDE CONCRETE AND REINFORCING STEEL NOTED IN THE PLANS, AS WELL AS CONSTRUCTION OF SAMPLE RAILING PANEL FOR APPROVAL.

REINFORCING STEEL SCHEDULE



MARK	NO.	SIZE	PIN Ø	LENGTH	LOCATION
FL0401		#4	3"	8'-3"	LIGHT BASE
FL0402		#4	2"	10'-8"	LIGHT BASE
FL0403		#4	2"	3'-11"	LIGHT BASE
RG0501		#5	3 3/4"	8'-0"	RAIL
RG0502		#5	3 3/4"	5'-3"	RAIL / SLAB
RG0503		#5	3 3/4"	4'-7"	RAIL / WINGWALL / RETAINING WALL
RL04		#4	——		RAIL
RL05		#5	——		RAIL
RL07		#7	——		RAIL

DIMENSIONS IN BENDING DIAGRAM ARE OUT-TO-OUT OF BARS.



GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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COMMONWEALTH OF VIRGINIA
5/17/16
BENJAMIN L. SHEALY
Lic. No. 052810
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

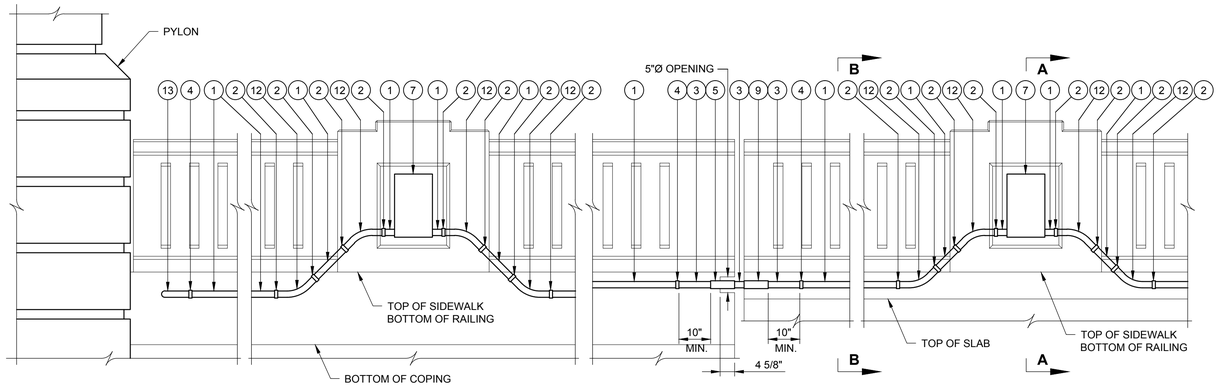
SHEET TITLE

RAILING REINFORCING DETAILS

SHEET NUMBER

CB-055

ANSI D 22" x 34"

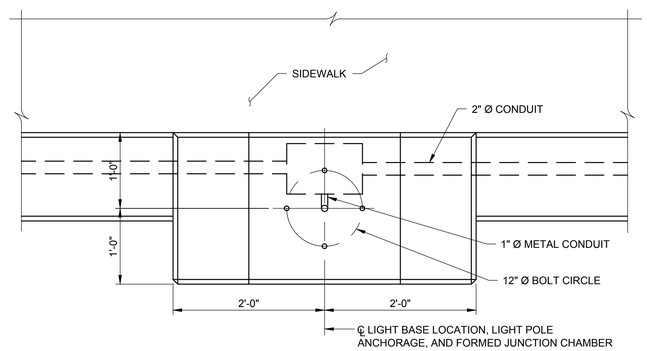


CONDUIT LAYOUT - RAILING ELEVATION

NOT TO SCALE

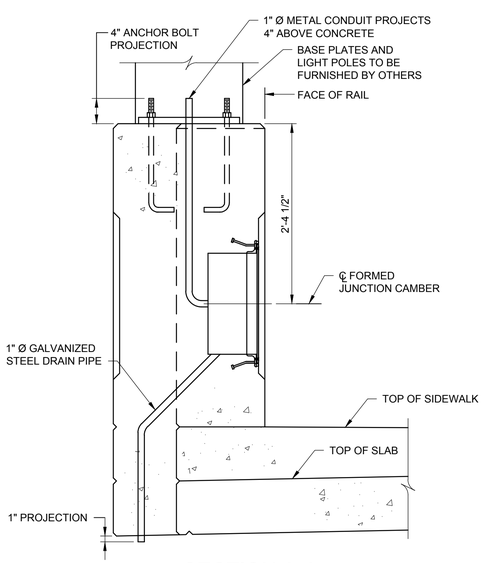
ABUTMENT	LONGITUDINAL MOVEMENT	t
A	4"	1/4"
B	4"	1/4"

1. 2" Ø NONMETALLIC CONDUIT
2. NONMETALLIC COUPLING
3. 2" Ø METAL CONDUIT
4. ADAPTOR TO CONNECT NONMETALLIC CONDUIT TO METAL CONDUIT
5. METAL EXPANSION AND DEFLECTION FITTING
6. 2" Ø PIPE CAP
7. 8" x 6" x 1'-4" JUNCTION BOX
8. 1" Ø METAL CONDUIT. FURNISH LOCKNUT AND BUSHING TO CONNECT CONDUIT TO JUNCTION BOX.
9. METAL EXPANSION FITTING
10. PIPE COUPLING
11. 2" Ø 45° 13" R STEEL ELBOW
12. 2" Ø 45° 9 1/2" R NONMETALLIC ELBOW
13. 2" Ø METAL CONDUIT FROM JUNCTION BOX, SEE ELECTRICAL SHEETS E-101 AND E-103



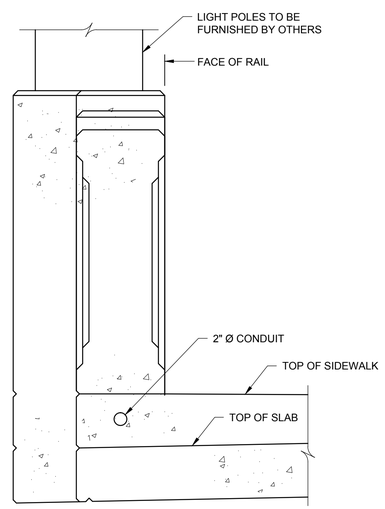
PLAN

SCALE: 1" = 1'-0"



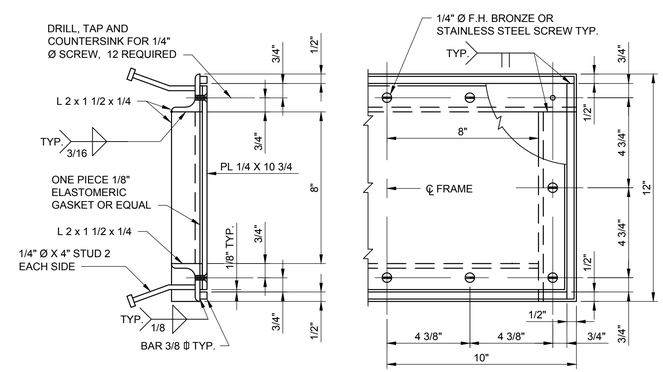
SECTION A-A

SCALE: 1" = 1'-0"



SECTION B-B

SCALE: 1" = 1'-0"



JUNCTION CHAMBER FRAME

NOT TO SCALE

NOTES:

FOR LIGHT BASE LOCATIONS, SEE SHEET CB-049.

CLOSE ADHERENCE TO THE MANUFACTURER'S REQUIREMENTS IN REGARD TO CLEARANCES FOR THE INSTALLATION OF DEFLECTION FITTINGS SHALL BE OBSERVED.

JUNCTION CHAMBER FRAME AND COVER TO BE GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. EXPOSED SURFACES OF JUNCTION FRAME AND COVER SHALL BE POWDER COATED IN ACCORDANCE WITH ASTM D6386 TO MATCH CONCRETE SURFACE COLOR COATING ON RAILING.

ANCHOR BOLT SPECIFICATIONS:

NUTS: ASTM F467 ALLOY 6262-T9 OR 6061-T6,

WASHERS: ASTM B209 ALLOY ALCLAD 2024-T3 OR T4, 2 1/4" Ø X 0.165".

RODS: 1" DIAMETER, ASTM A276, TYPE 430 OR 410 ANNEALED, HOT FINISHED. THREADS ON RODS MAY BE ROLLED OR CUT. 3 1/2" AT EACH END OF ROD SHALL BE THREADED. EACH ROD SHALL BE SUPPLIED WITH 1 WASHER AND 1 NUT.

LONGITUDINAL MOVEMENT IS THE MAXIMUM AMOUNT OF MOVEMENT OF THE EXPANSION AND DEFLECTION FITTING CALCULATED FOR PLACEMENT AT 60° F AND SHALL BE ADJUSTED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. THE AMOUNT OF MOVEMENT SHALL BE INCREASED OR DECREASED FOR EVERY 10° F TEMPERATURE DROP OR RISE RESPECTIVELY BY t.

THE CONTRACTOR SHALL DETERMINE ALL DIMENSIONS AND DETAILS NECESSARY FOR INSTALLATION.

CONDUIT SHALL BE GROUNDED IN CONFORMANCE WITH SECTION 700 WITH GROUNDING MATERIALS THAT CONFORM TO SECTION 238.

ANCHOR BOLTS AND HARDWARE WILL BE PROVIDED BY AEP.

THE COST OF PROVIDING AND INSTALLING THE STRUCTURE LIGHTING CONDUIT SYSTEM SHALL BE INCLUDED IN THE PRICE BID FOR ELECTRICAL FACILITIES. SEE SHEET G-003 FOR ADDITIONAL NOTES.

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

STRUCTURE LIGHTING CONDUIT SYSTEM

SHEET NUMBER

CB-056

ANSI D 22" x 34"

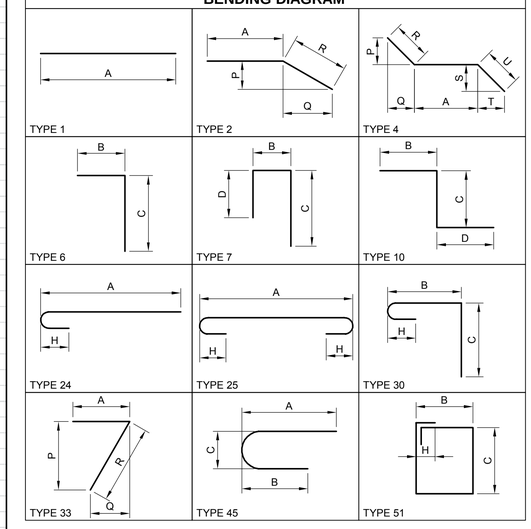
Reinforcing Steel Schedule / Dimension Table

Mark	No.	Bar Size	Pin Dia. FT	Pin Dia. IN	Length FT	Length IN	Length To FT	Length To IN	Weight (LBS)	Location	Type	A FT	A IN	B FT	B IN	C FT	C IN	D FT	D IN	E - P FT	E - P IN	F - Q FT	F - Q IN	G - R FT	G - R IN	H FT	H IN	I - S FT	I - S IN	J - T FT	J - T IN	K - U FT	K - U IN	L FT	L IN
		ABUTMENT A (PLAIN)																																	
AF0401	92	4			16	5			1009	Abutment Footing	45	7	9	7	9	1	8																		
AF0501	82	5			6	0			513	Abutment Footing	1	6	0																						
AF0502	15	5			4	6			70	East Wingwall Footing	1	4	6																						
AF0503	32	5			5	5			181	West Wingwall Footing	1	5	5																						
AF0504	10	5			3	10			40	East/West Wingwall Footing	1	3	10																						
AF0601	60	6			34	3			3087	Abutment Footing	1	34	3																						
AF0602	80	6	4	4/8	14	1			1692	West Wingwall Footing	25	12	9													6									
AF0603	28	6			38	6			1619	West Wingwall Footing	1	38	6																						
AF0604	32	6			21	7			1037	East Wingwall Footing	1	21	7																						
AF0701	132	7	5	2/8	15	4			4137	Abutment Footing	25	13	9													7									
AF0702	88	7	5	2/8	16	7			2983	East Wingwall Footing	25	15	0													7									
AF0801	63	8	6		8	10			1486	West Footing	33	7	8							1	3 7/8		1	1	4										
AF0901	75	9	9	4/8	12	7			3209	Abutment Footing	6			11	3	1	7 2/8																		
AF0902	29	9	9	4/8	10	3			1011	East Wingwall Footing	33	8	11							1	7 2/8		1 2/8	1	7 2/8										
			TOTAL WEIGHT IN PRECEDING GROUP OF BARS:						22074																										
		ABUTMENT A - NEAT (CRR CLASS I)																																	
AH0501	48	5			57	3			2866	Stem & Backwall	1	57	3																						
AH0502	26	5	3	6/8	10	6			285	Stem & Backwall	2	7	6							2	1 1/8	2	1 6/8	3	0										
AH0503	24	5	3	6/8	11	4			284	Stem & Backwall	2	8	4							2	1 1/8	2	1 6/8	3	0										
AH0504	20	5	3	6/8	12	2			254	Stem	2	9	2							2	1 1/8	2	1 6/8	3	0										
AH0505	18	5	3	6/8	9	7			180	Stem	2	6	7							2	1 1/8	2	1 6/8	3	0										
AH0506	6	5	3	6/8	11	1			69	Backwall & Joint Wall	2	8	1							2	1 1/8	2	1 6/8	3	0										
AH0507	6	5	3	6/8	10	8			67	Backwall & Joint Wall	2	7	8							2	1 1/8	2	1 6/8	3	0										
AH0508	2	5	3	6/8	11	9			25	Backwall	2	8	0							2	7 4/8	2	8 2/8	3	9										
AH0509	2	5	3	6/8	54	0			113	Backwall	4	49	0								1 4/8	2	5 7/8	2	6			1 4/8		2	5 7/8	2	6		
AH0510	2	5	3	6/8	12	1			25	Backwall	2	7	8							3	1 1/8	3	1 7/8	4	5										
AH0511	2	5			47	6			99	Stem	1	47	6																						
AH0512	2	5			33	6			70	Stem	1	33	6																						
AH0513	4	5	3	6/8	8	0			33	Joint Wall	6			6	8	1	6																		
AH0601	48	6	4	4/8	8	10			637	Stem & Backwall	25	7	6													6									
AS0401	98	4	2		6	11			453	Beam Seat	30			4	7	2	0									4	4/8								
AS0402	75	4	2		3	4			167	Backwall	7				6	1	6	1	6																
AS0403	75	4	2		3	7			180	Joint Wall	7				9	1	6	1	6																
AS0601	15	6			13	0			293	Beam Seat	1	13	0																						
AS0602	5	6			8	10			66	Beam Seat	1	8	10																						
AS0603	5	6			12	9			96	Beam Seat	1	12	9																						
AS0604	5	6			8	3			62	Beam Seat	1	8	3																						
AS0605	5	6			9	0			68	Beam Seat	1	9	0																						
AV0501	82	5			18	0			1539	Stem	1	18	0																						
AV0502	75	5			8	0			626	Backwall	1	8	0																						
AV0503	77	5			4	9			381	Backwall	1	4	9																						
AV0504	75	5			3	9			293	Stem	1	3	9																						
AV0901	75	9			18	0			4590	Joint Wall	1	18	0																						
AW0501	15	5			9	9			153	East Wingwall	1	9	9																						
AW0502	54	5	3	6/8	19	7			1103	East Wingwall	6			18	11		10																		
AW0503	15	5			25	1			392	East Wingwall	1	25	1																						
AW0504	32	5			10	9			359	West Wingwall	1	10	9																						
AW0505	50	5	3	6/8	36	6			1903	West Wingwall	6			35	10		10																		
AW0506	32	5			21	11			731	West Wingwall	1	21	11																						
AW0507	5	5			25	2			131	East Pilaster	1	25	2																						
AW0508	5	5			21	11			114	West Pilaster	1	21	11																						
AW0509	49	5	2	4/8	6	0			307	Pilaster	7			3	3	1	6	1	6																
AW0801	31	8			9	0			745	West Wingwall	1	9	0																						
AW0802	32	8			15	3			1303	West Wingwall	1	15	3																						
AW0901	14	9			10	0			476	East Wingwall	1	10	0																						
AW0902	15	9			18	6			944	East Wingwall	1	18	6																						
			TOTAL WEIGHT IN PRECEDING GROUP OF BARS:						21538																										

Dimension Variation Table

Mark	# Ea. Len.	Dim.	From FT	From IN	To FT	To IN	Vary By FT	Vary By IN

BENDING DIAGRAM



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I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

REINFORCING STEEL SCHEDULE
1 OF 7

SHEET NUMBER

CB-057

ANSI D 22" x 34"

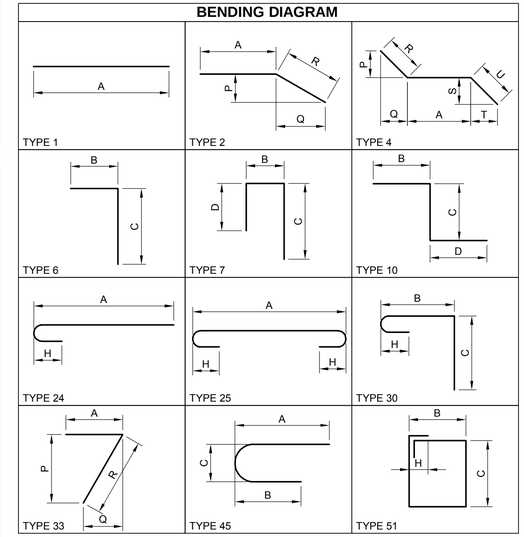
Reinforcing Steel Schedule / Dimension Table

Mark	No.	Bar Size	Pin Dia. FT	Pin Dia. IN	Length FT	Length IN	Length To	Length FT	Length IN	Weight (LBS)	Location	Type	A FT	A IN	B FT	B IN	C FT	C IN	D FT	D IN	E - P FT	E - P IN	F - Q FT	F - Q IN	G - R FT	G - R IN	H FT	H IN	I - S FT	I - S IN	J - T FT	J - T IN	K - U FT	K - U IN	L FT	L IN
		ABUTMENT B (PLAIN)																																		
AF0421	106	4			13	5				950	Footings	45	6	3	6	3	1	8																		
AF0521	82	5			8	1				691	Abutment Footing	1	8	1																						
AF0522	24	5			20	9				519	Abutment Footing	1	20	9																						
AF0523	24	5			29	0				726	Abutment Footing	1	29	0																						
AF0524	24	5			19	0				476	Abutment Footing	1	19	0																						
AF0525	46	5	3	6/8	10	11				524	East Wingwall Footing	25	9	9													5									
AF0526	34	5	3	6/8	13	2				467	West Wingwall Footing	25	12	0													5									
AF0527	48	5	3	6/8	7	3				363	Abutment Footing	10			2	6	2	6	2	6																
AF0528	26	5			7	9				210	East & West Wingwall Footing	1	7	9																						
AF0529	40	5	3	6/8	6	4				264	East & West Wingwall Footing	33	5	7							9	7/8		5/8		10										
AF0530	96	5	3	6/8	8	2				818	East & West Wingwall Footing	25	7	0													5									
AF0531	40	5			5	3				219	East & West Wingwall Footing	1	5	3																						
AF0532	43	5			3	0				135	West Wingwall Footing	1	3	0																						
AF0533	5	5			41	6				216	West Wingwall Footing	1	41	6																						
AF0534	95	5	3	6/8	4	3				421	West Wingwall Footing	6			3	7		10																		
AF0535	5	5			6	9				35	East Wingwall Footing	1	6	9																						
AF0621	75	6	4	4/8	9	11				1117	Abutment Footing	6			9	1	1	0																		
AF0622	22	6			21	8				716	East Wingwall Footing	1	21	8																						
AF0623	26	6			15	9				615	West Wingwall Footing	1	15	9																						
AF0624	50	6	4	4/8	8	8				651	East & West Wingwall Footing	33	7	9							11	7/8		6/8	1	0										
AF0625	16	6			25	6				613	East Wingwall Footing	1	25	6																						
AF0626	16	6			19	6				469	West Wingwall Footing	1	19	6																						
AF0721	144	7	5	2/8	13	1				3851	Abutment Footing	25	11	6													7									
AF0722	20	7	5	2/8	12	7				514	East Wingwall Footing	24	11	9													7									
AF0723	50	7	5	2/8	11	1				1133	East & West Wingwall Footing	25	9	6													7									
AF0821	28	8	6		7	10				586	East Wingwall Footing	6			6	9	1	4																		
AF0822	28	8	6		4	2				312	West Wingwall Footing	6			3	1	1	4																		
			TOTAL WEIGHT IN PRECEDING GROUP OF BARS:							17611																										
		ABUTMENT B - NEAT (CRR CLASS I)																																		
AH0521	28	5			57	3				1672	Stem & Backwall	1	57	3																						
AH0522	16	5	3	6/8	10	6				175	Stem & Backwall	2	7	6							2	1 1/8	2	1 6/8	3	0										
AH0523	19	5	3	6/8	11	4				225	Stem & Backwall	2	8	4							2	1 1/8	2	1 6/8	3	0										
AH0524	12	5	3	6/8	12	2				152	Stem	2	9	2							2	1 1/8	2	1 6/8	3	0										
AH0525	15	5	3	6/8	9	7				150	Stem	2	6	7							2	1 1/8	2	1 6/8	3	0										
AH0526	8	5	3	6/8	11	1				92	Backwall & Joint Wall	2	8	1							2	1 1/8	2	1 6/8	3	0										
AH0527	8	5	3	6/8	10	8				89	Backwall & Joint Wall	2	7	8							2	1 1/8	2	1 6/8	3	0										
AH0528	2	5	3	6/8	54	0				113	Backwall	4	49	0								1 3/8	2	5 6/8	2	6			1 3/8	2	5 6/8	2	6		
AH0529	2	5	3	6/8	11	9				25	Backwall	2	8	0							2	7 4/8	2	8 2/8	3	9										
AH0530	2	5	3	6/8	12	1				25	Backwall	2	7	8							3	1 2/8	3	1 7/8	4	5										
AH0531	2	5			35	6				74	Stem	1	35	6																						
AH0532	2	5			11	0				23	Stem	1	11	0																						
AH0533	6	5			9	6				59	Stem	1	9	6																						
AH0534	4	5			37	0				154	Stem	1	37	0																						
AH0535	4	5	3	6/8	8	0				33	Joint Wall	6			6	8	1	6																		
AH0621	36	6	4	4/8	8	10				478	Stem & Backwall	25	7	6													6									
AS0421	98	4	2		6	11				453	Beam Seat	30			4	7	2	0									4	4/8								
AS0422	75	4	2		3	4				167	Backwall	7				6	1	6	1	6																
AS0423	75	4	2		3	7				180	Joint Wall	7				9	1	6	1	6																
AS0621	15	6			13	0				293	Beam Seat	1	13	0																						
AS0622	5	6			9	0				68	Beam Seat	1	9	0																						
AS0623	5	6			8	10				66	Beam Seat	1	8	10																						
AS0624	5	6			12	9				96	Beam Seat	1	12	9																						
AS0625	5	6			8	3				62	Beam Seat	1	8	3																						
AV0521	34	5			11	5				405	Beam Seat	1	11	5																						
AV0522	27	5			12	5				350	Stem	1	12	5																						
AV0523	21	5			14	9				323	Stem	1	14	9																						
AV0524	75	5			6	11				541	Backwall	1	6	11																						
AV0525	77	5			4	0				321	Backwall	1	4	0																						
AV0526	75	5			3	0				235	Joint Wall	1	3	0																						
AV0621	30	6			11	5				514	Stem	1	11	5																						
AV0622	27	6			12	5				504	Stem	1	12	5																						
AV0623	17	6			14	9				377	Stem	1	14	9																						
AW0521	16	5			18	0				300	East Wingwall	1	18	0																						
AW0522	40	5	3	6/8	20	2				841	East Wingwall	6			19	6		10																		
AW0523	16	5			11	6				192	East Wingwall	1	11	6																						
AW0524	38	5			9	7				380	East Wingwall	1	9	7																						
AW0525	24	5			17	6				438	East Wingwall	1	17	6																						
AW0526	10	5	2	4/8	20	6				214	East Pylon	51			4	7	5	1									10									
AW0527	10	5			15	9				164	West Wingwall	1	15	9																						
AW0528	10	5			8	11				93	West Wingwall	1	8	11																						
AW0529	36	5	3	6/8	14	3				535	West Wingwall	6			13	7		10																		
AW0530	42	5			7	2				314	West Wingwall	1	7	2																						
AW0531	20	5			19	6				407	West Wingwall	1	19	6																						
AW0532	6	5			43	6				272	West Wingwall	1	43	6																						
AW0533	5	5			18	5				96	East Pilaster	1	18	5																						
AW0534	19	5	2	4/8	6	0				119	East Pilaster	7			3	3	1	6	1	6																
AW0535	3	5	2	4/8	6	4				20	West Pilaster	7			3	7	1	6	1	6																
AW0536	3	5	2	4/8	23	6				74	West Pylon	51			5	7	5	7									10									
AW0621	24	6			7	3				261	East & West Wingwall	1	7	3																						
AW0622	26	6			10	0				391	East & West Wingwall	1	10	0																						
AW0821	28	8			8	8				648	East Pylon	1	8	8																						
AW0822	10	8			2	6				67	East Pylon	1	2	6																						
			TOTAL WEIGHT IN PRECEDING GROUP OF BARS:							14320																										

Dimension Variation Table

Mark	# Ea. Len.	Dim.	From FT	From IN	To FT	To IN	Vary By FT	Vary By IN

BENDING DIAGRAM



AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
215 Church Avenue, SW
Room 350
Roanoke, VA 24011

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REGISTRATION

COMMONWEALTH OF VIRGINIA
5/27/16
BENJAMIN L. SHEALY
Lic. No. 052810
PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

REINFORCING STEEL SCHEDULE
2 OF 7

SHEET NUMBER

CB-058

ANSI D 22" x 34"

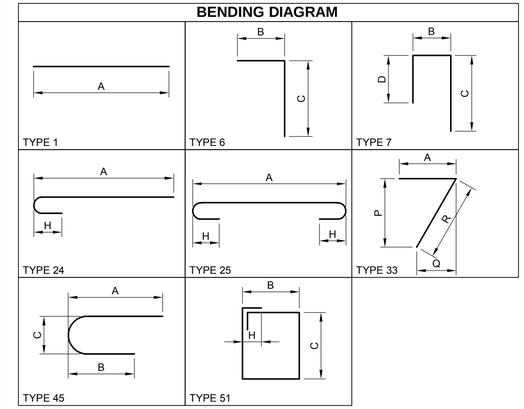
Reinforcing Steel Schedule / Dimension Table

Mark	No.	Bar Size	Pin Dia. FT	Pin Dia. IN	Length FT	Length IN	Length To FT	Length To IN	Weight (LBS)	Location	Type	A FT	A IN	B FT	B IN	C FT	C IN	D FT	D IN	E - P FT	E - P IN	F - Q FT	F - Q IN	G - R FT	G - R IN	H FT	H IN	I - S FT	I - S IN	J - T FT	J - T IN	K - U FT	K - U IN	L FT	L IN
RETAINING WALL AW (PLAIN)																																			
FH0701	20	7	5	2/8	11	10			484	Footing AW-3	24	11	0													7									
FH0702	10	7	5	2/8	11	1			227	Footing AW-3	25	9	6													7									
FL0601	16	6			27	9			667	Footing AW-1	1	27	9																						
FL0602	16	6			31	9			763	Footing AW-2	1	31	9																						
FL0603	16	6			33	0			793	Footing AW-3	1	33	0																						
FM0501	54	5	3	6/8	8	2			460	Footing AW-1	25	7	0													5									
FM0502	62	5	3	6/8	8	2			528	Footing AW-2	25	7	0													5									
FM0503	68	5	3	6/8	8	2			579	Footing AW-3	25	7	0													5									
FS0401	12	4			8	10			71	Footing AW-1	45	4	0	4	0	1	6																		
FS0402	16	4			8	10			94	Footing AW-2	45	4	0	4	0	1	6																		
FS0403	18	4			13	10			166	Footing AW-3	45	6	6	6	6	1	6																		
WM0501	53	5	3	6/8	6	11			382	Footing AW-1	6			6	3		10																		
WM0502	61	5	3	6/8	6	11			440	Footing AW-2	6			6	3		10																		
WM0503	26	5	3	6/8	6	3			169	Footing AW-3	6			5	7		10																		
WR0501	27	5			5	1			143	Footing AW-1	1	5	1																						
WR0502	31	5			5	5			175	Footing AW-2	1	5	5																						
WR0503	26	5			5	3			142	Footing AW-3	1	5	3																						
WV0501	5	5			4	0			21	Footing AW-2	1	4	0																						
WV0801	28	8	6		7	8			573	Footing AW-3	6			6	7	1	4																		
TOTAL WEIGHT IN PRECEDING GROUP OF BARS:									6877																										
RETAINING WALL AW - NEAT (CRR CLASS I)																																			
WH0501	9	5	2	4/8	6	0			56	Pilaster AW-2	7			3	3	1	6	1	6																
WH0502	6	5	2	4/8	20	6			128	Pylon AW-3	51			4	7	5	1									10									
WH0801	6	8			2	6			40	Pylon AW-3	1	2	6																						
WL0501	24	5			26	0			651	Wall AW-1	1	26	0																						
WL0502	22	5			30	0			688	Wall AW-2	1	30	0																						
WL0503	18	5			25	0			469	Wall AW-3	1	25	0																						
WN0501	27	5			8	9			246	Wall AW-1	1	8	9																						
WN0502	31	5			7	3			234	Wall AW-2	1	7	3																						
WN0503	26	5			6	0			163	Wall AW-3	1	6	0																						
WS0501	27	5			9	5			265	Wall AW-1	1	9	5																						
WS0502	31	5			7	7			245	Wall AW-2	1	7	7																						
WS0503	26	5			6	0			163	Wall AW-3	1	6	0																						
WV0502	5	5			7	7			40	Pilaster AW-2	1	7	7																						
TOTAL WEIGHT IN PRECEDING GROUP OF BARS:									3388																										
RETAINING WALL AE (PLAIN)																																			
FH0703	20	7	5	2/8	16	10			688	Footing AE-5	24	16	0													7									
FH0704	10	7	5	2/8	11	1			227	Footing AE-5	25	9	6													7									
FL0604	28	6			27	9			1167	Footing AE-1	1	27	9																						
FL0605	28	6			31	9			1335	Footing AE-2	1	31	9																						
FL0701	28	7			28	3			1617	Footing AE-3	1	28	3																						
FL0702	28	7			32	3			1846	Footing AE-4	1	32	3																						
FL0703	28	7			33	0			1889	Footing AE-5	1	33	0																						
FM0601	54	6	4	4/8	14	4			1163	Footing AE-3	25	13	0													6									
FM0602	62	6	4	4/8	14	4			1335	Footing AE-4	25	13	0													6									
FM0603	68	6	4	4/8	14	4			1464	Footing AE-5	25	13	0													6									
FM0801	54	8	6		14	10			2139	Footing AE-1	25	13	0													8									
FM0802	62	8	6		14	10			2456	Footing AE-2	25	13	0													8									
FS0404	18	4			13	7			163	Footing AE-1	45	6	4	6	4	1	8																		
FS0405	24	4			13	7			218	Footing AE-2	45	6	4	6	4	1	8																		
FS0406	20	4			13	7			181	Footing AE-3	45	6	4	6	4	1	8																		
FS0407	20	4			13	7			181	Footing AE-4	45	6	4	6	4	1	8																		
FS0408	28	4			14	9			276	Footing AE-5	45	6	11	6	11	1	8																		
WM0601	51	6	4	4/8	6	6			498	Footing AE-5	33	5	7								11	7/8		6/8		1	0								
WM0701	53	7	5	2/8	7	7			822	Footing AE-3	33	6	7							1	1	7/8		7/8		1	2								
WM0702	61	7	5	2/8	7	7			946	Footing AE-4	33	6	7							1	1	7/8		7/8		1	2								
WM0801	53	8	6		8	11			1262	Footing AE-1	33	7	9							1	3	7/8		1		1	4								
WM0802	61	8	6		8	11			1452	Footing AE-2	33	7	9							1	3	7/8		1		1	4								
WT0504	27	5			5	0			141	Footing AE-1	1	5	0																						
WT0505	31	5			5	3			170	Footing AE-2	1	5	3																						
WT0506	27	5			5	1			143	Footing AE-3	1	5	1																						
WT0507	31	5			5	5			175	Footing AE-4	1	5	5																						
WT0508	26	5			5	2			140	Footing AE-5	1	5	2																						
WV0503	5	5			4	0			21	Footing AE-2	1	4	0																						
WV0505	5	5			4	0			21	Footing AE-4	1	4	0																						
WV0802	28	8	6		8	10			660	Footing AE-5	6			7	9	1	4																		
TOTAL WEIGHT IN PRECEDING GROUP OF BARS:									24796																										

Dimension Variation Table

Mark	# Ea. Len.	Dim.	From FT	From IN	To FT	To IN	Vary By FT	Vary By IN

BENDING DIAGRAM



AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
215 Church Avenue, SW
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REGISTRATION

COMMONWEALTH OF VIRGINIA
5/17/16
BENJAMIN L. SHEALY
Lic. No. 052810
PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

REINFORCING STEEL SCHEDULE
3 OF 7

SHEET NUMBER

CB-059

ANSI D 22" x 34"

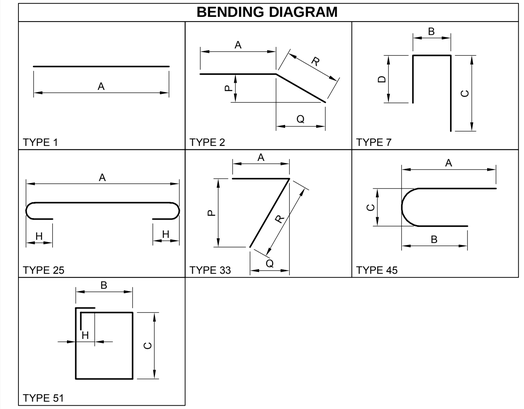
Reinforcing Steel Schedule / Dimension Table

Mark	No.	Bar Size	Pin Dia. FT	Pin Dia. IN	Length FT	Length IN	Length To	Length FT	Length IN	Weight (LBS)	Location	Type	A FT	A IN	B FT	B IN	C FT	C IN	D FT	D IN	E - P FT	E - P IN	F - Q FT	F - Q IN	G - R FT	G - R IN	H FT	H IN	I - S FT	I - S IN	J - T FT	J - T IN	K - U FT	K - U IN	L FT	L IN
		RETAINING WALL AE - NEAT (CRR CLASS I)																																		
WH0503	23	5	2	4/8	6	0				144	Pilaster AE-2	7			3	3	1	6	1	6																
WH0504	20	5	2	4/8	6	0				125	Pilaster AE-4	7			3	3	1	6	1	6																
WH0505	17	5	2	4/8	21	6				381	Pylon AE-5	51			5	1	5	1									10									
WH0802	34	8			2	6				227	Pylon AE-5	1	2	6																						
WL0504	52	5			26	0				1410	Wall AE-1	1	26	0																						
WL0505	50	5			30	0				1564	Wall AE-2	1	30	0																						
WL0506	46	5			26	0				1247	Wall AE-3	1	26	0																						
WL0507	44	5			30	0				1377	Wall AE-4	1	30	0																						
WL0508	40	5			25	0				1043	Wall AE-5	1	25	0																						
WN0601	26	6			10	0				391	Wall AE-5	1	10	0																						
WN0701	27	7			13	3				731	Wall AE-3	1	13	3																						
WN0702	31	7			13	3				840	Wall AE-4	1	13	3																						
WN0801	27	8			17	0				1226	Wall AE-1	1	17	0																						
WN0802	31	8			17	0				1407	Wall AE-2	1	17	0																						
WP0501	27	5			10	6				296	Wall AE-1	1	10	6																						
WP0502	31	5			9	2				296	Wall AE-2	1	9	2																						
WP0503	27	5			11	3				317	Wall AE-3	1	11	3																						
WP0504	31	5			9	9				315	Wall AE-4	1	9	9																						
WP0505	26	5			11	2				303	Wall AE-5	1	11	2																						
WR0601	25	6			7	3				272	Wall AE-5	1	7	3																						
WR0701	26	7			9	0				478	Wall AE-3	1	9	0																						
WR0702	30	7			9	0				552	Wall AE-4	1	9	0																						
WR0801	26	8			10	6				729	Wall AE-1	1	10	6																						
WR0802	30	8			10	6				841	Wall AE-2	1	10	6																						
WS0504	27	5			23	9				669	Wall AE-1	1	23	9																						
WS0505	31	5			22	1				714	Wall AE-2	1	22	1																						
WS0506	27	5			20	7				580	Wall AE-3	1	20	7																						
WS0507	31	5			18	10				609	Wall AE-4	1	18	10																						
WS0508	26	5			17	2				466	Wall AE-5	1	17	2																						
WV0504	5	5			22	1				115	Pilaster AE-2	1	22	1																						
WV0506	5	5			18	9				98	Pilaster AE-4	1	18	9																						
WV0803	28	8			16	2				1209	Pylon AE-5	1	16	2																						
			TOTAL WEIGHT IN PRECEDING GROUP OF BARS:							20972																											
		PLAZA WALL (PLAIN)																																		
FL0501	16	5			29	6				492	Footing PW-2	1	29	6																						
FL0704	20	7			34	6				1410	Footing PW-1	1	34	6																						
FL0705	20	7			8	8				354	Footing PW-1	1	8	8																						
FM0504	88	5	3	6/8	10	2				933	Footing PW-1	25	9	0													5									
FM0505	62	5	3	6/8	8	8				560	Footing PW-2	25	7	6													5									
FS0409	26	4			10	8				185	Footing PW-1	45	4	11	4	11	1	6																		
FS0410	16	4			9	2				98	Footing PW-2	45	4	2	4	2	1	6																		
WM0504	31	5	3	6/8	9	3				299	Footing PW-2	33	8	6								9 7/8		5/8		10										
WM0803	38	8	6		8	5				854	Footing PW-1	33	7	3							1	3 7/8		1	1	4										
WR0509	38	5			7	8				304	Footing PW-1	1	7	8																						
WR0510	31	5			7	2				232	Footing PW-2	1	7	2																						
			TOTAL WEIGHT IN PRECEDING GROUP OF BARS:							5721																											
		PLAZA WALL - NEAT (CRR CLASS I)																																		
WL0509	36	5			30	6				1145	Wall PW-1	1	30	6																						
WL0510	28	5			29	6				862	Wall PW-2	1	29	6																						
WL0511	36	5	3	6/8	8	10				332	Wall PW-1	2	6	5							2	2 6/8	1	1 5/8	2	6										
WN0504	31	5			9	9				315	Wall PW-2	1	9	9																						
WN0803	38	8			9	0				913	Wall PW-1	1	9	0																						
WP0509	38	5			10	8				423	Wall PW-1	1	10	8																						
WS0509	38	5			13	3				525	Wall PW-1	1	13	3																						
WS0510	31	5			9	9				315	Wall PW-2	1	9	9																						
			TOTAL WEIGHT IN PRECEDING GROUP OF BARS:							4830																											

Dimension Variation Table

Mark	# Ea. Len.	Dim.	From FT	From IN	To FT	To IN	Vary By FT	Vary By IN

BENDING DIAGRAM



AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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Office of City Engineer
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REGISTRATION

COMMONWEALTH OF VIRGINIA
5/17/16
BENJAMIN L. SHEALY
Lic. No. 052810
PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

REINFORCING STEEL SCHEDULE
4 OF 7

SHEET NUMBER

CB-060

ANSI D 22" x 34"

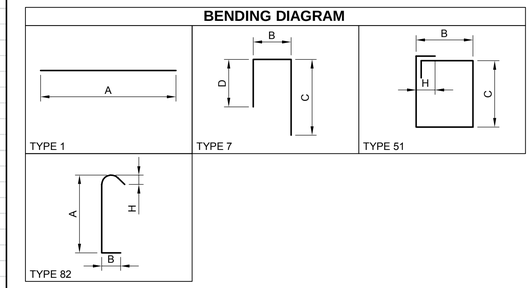
Reinforcing Steel Schedule / Dimension Table

Mark	No.	Bar Size	Pin Dia. FT	Pin Dia. IN	Length FT	Length IN	Length To	To FT	To IN	Weight (LBS)	Location	Type	A FT	A IN	B FT	B IN	C FT	C IN	D FT	D IN	E - P FT	E - P IN	F - Q FT	F - Q IN	G - R FT	G - R IN	H FT	H IN	I - S FT	I - S IN	J - T FT	J - T IN	K - U FT	K - U IN	L FT	L IN
		PIER 1 CAP (PLAIN)																																		
PS0411	18	4	2		5	7				67	Stirrup		7		3	5 4/8	1	2	1	2																
PS0412	17	4	2		6	9				77	Stirrup		7		3	5 4/8	1	9	1	9																
PS0413	17	4	2		7	9				88	Stirrup		7		3	5 4/8	2	3	2	3																
PS0414	17	4	2		9	1				103	Stirrup		7		3	5 4/8	2	11	2	11																
PS0415	17	4	2		10	1				115	Stirrup		7		3	5 4/8	3	5	3	5																
PS0416	17	4	2		10	11				124	Stirrup		7		3	5 4/8	3	10	3	10																
PS0417	8	4	2		11	5				61	Stirrup		7		3	5 4/8	4	1	4	1																
PC0511	12	5			27	4				342	Face Horizontal		1	27	4																					
PC0512	2	5			25	3				53	Face Horizontal		1	25	3																					
PC0513	2	5			19	1				40	Face Horizontal		1	19	1																					
PC0514	2	5			36	6				76	Face Horizontal		1	36	6																					
PC0515	2	5			13	4				28	Face Horizontal		1	13	4																					
PC0516	2	5			13	4				28	Face Horizontal		1	13	4																					
PC0517	2	5			10	4				22	Face Horizontal		1	10	4																					
PC0518	2	5			7	10				16	Face Horizontal		1	7	10																					
PC0519	2	5			40	0				83	Face Horizontal		1	40	0																					
PL0511	36	5			13	4				501	Bearing Seat		1	13	4																					
PL0512	6	5			7	10				49	Bearing Seat		1	7	10																					
		PIER 1 WALL (PLAIN)																																		
PH0511	80	5			21	2				1766	Face Horizontal		1	21	2																					
PH0512	40	5			40	0				1669	Face Horizontal		1	40	0																					
PT0401	95	4	2		4	3				270	Thru Thickness Ties		82	3	7		0	5									0	3								
PV0911	71	9			21	5				5170	Vertical		1	21	5																					
PV0912	93	9			23	2				7325	Vertical		1	23	2																					
PH0519	40	5	2 4/8		7	8				320	End Section		7			3	7	2	2	2	2																
		PIER 1 FOOTING (PLAIN)																																		
PF0701	80	7	5 2/8		16	9				2739	Stirrup		51			4	6	3	2								1	2								
PF0901	40	9			25	5				3457	Face Horizontal		1	25	5																					
PF0902	20	9			40	0				2720	Face Horizontal		1	40	0																					
PF0704	44	7			4	6				405	Dowels		1	4	6																					
PF0905	164	9			8	6				4740	Lap Bars to Wall		1	8	6																					
		TOTAL WEIGHT OF PIER 1 BARS								32454																										
		PIER 2 CAP (PLAIN)																																		
PS0421	18	4	2		5	7				67	Stirrup		7		3	5 4/8	1	2	1	2																
PS0422	17	4	2		6	9				77	Stirrup		7		3	5 4/8	1	9	1	9																
PS0423	17	4	2		7	7				86	Stirrup		7		3	5 4/8	2	2	2	2																
PS0424	17	4	2		8	7				97	Stirrup		7		3	5 4/8	2	8	2	8																
PS0425	17	4	2		9	5				107	Stirrup		7		3	5 4/8	3	1	3	1																
PS0426	17	4	2		9	11				113	Stirrup		7		3	5 4/8	3	4	3	4																
PS0427	8	4	2		10	1				54	Stirrup		7		3	5 4/8	3	5	3	5																
PC0521	12	5			27	4				342	Face Horizontal		1	27	4																					
PC0522	2	5			25	3				53	Face Horizontal		1	25	3																					
PC0523	2	5			19	1				40	Face Horizontal		1	19	1																					
PC0524	2	5			36	6				76	Face Horizontal		1	36	6																					
PC0525	2	5			13	4				28	Face Horizontal		1	13	4																					
PC0526	2	5			13	4				28	Face Horizontal		1	13	4																					
PC0527	2	5			10	4				22	Face Horizontal		1	10	4																					
PC0528	2	5			7	10				16	Face Horizontal		1	7	10																					
PC0529	2	5			40	0				83	Face Horizontal		1	40	0																					
PL0521	36	5			13	4				501	Bearing Seat		1	13	4																					
PL0522	6	5			7	10				49	Bearing Seat		1	7	10																					
		PIER 2 WALL (PLAIN)																																		
PH0521	88	5			21	2				1943	Face Horizontal		1	21	2																					
PH0522	44	5			40	0				1836	Face Horizontal		1	40	0																					
PH0529	44	5	2 4/8		7	8				352	End Section		7			3	7	2	2	2	2																
PT0401	95	4	2		4	3				270	Thru Thickness Ties		82	3	7		0	5									0	3								
PV0921	71	9			23	5				5653	Vertical		1	23	5																					
PV0922	93	9			25	0				7905	Vertical		1	25	0																					
		PIER 2 FOOTING (PLAIN)																																		
PF0701	80	7	5 2/8		16	9				2739	Stirrup		51			4	6	3	2								1	2								
PF0901	40	9			25	5				3457	Face Horizontal		1	25	5																					
PF0902	20	9			40	0				2720	Face Horizontal		1	40	0																					
PF0704	44	7			4	6				405	Dowels		1	4	6																					
PF0905	164	9			8	6				4740	Lap Bars to Wall		1	8	6																					
		TOTAL WEIGHT OF PIER 2 BARS								33859																										

Dimension Variation Table

Mark	# Ea. Len.	Dim.	From FT	From IN	To FT	To IN	Vary By FT	Vary By IN

BENDING DIAGRAM



NOTE:

FOR DRILLED SHAFT REINFORCING, SEE SHEET CB-036.

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
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REGISTRATION

COMMONWEALTH OF VIRGINIA
5/17/16
BENJAMIN L. SHEALY
Lic. No. 052810
PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

REINFORCING STEEL SCHEDULE
5 OF 7

SHEET NUMBER

CB-061

ANSI D 22" x 34"

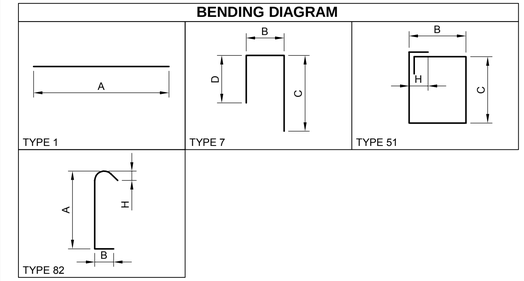
Reinforcing Steel Schedule / Dimension Table

Mark	No.	Bar Size	Pin Dia. FT	Pin Dia. IN	Length FT	Length IN	Length To	Length FT	Length IN	Weight (LBS)	Location	Type	A FT	A IN	B FT	B IN	C FT	C IN	D FT	D IN	E - P FT	E - P IN	F - Q FT	F - Q IN	G - R FT	G - R IN	H FT	H IN	I - S FT	I - S IN	J - T FT	J - T IN	K - U FT	K - U IN	L FT	L IN
		PIER 3 CAP (PLAIN)																																		
PS0431	18	4	2		6	1				73	Stirrup		7		3	5 4/8	1	5	1	5																
PS0432	17	4	2		6	5				73	Stirrup		7		3	5 4/8	1	7	1	7																
PS0433	17	4	2		6	9				77	Stirrup		7		3	5 4/8	1	9	1	9																
PS0434	7	4	2		7	1				33	Stirrup		7		3	5 4/8	1	11	1	11																
PS0435	17	4	2		6	11				79	Stirrup		7		3	5 4/8	1	10	1	10																
PS0436	17	4	2		6	3				71	Stirrup		7		3	5 4/8	1	6	1	6																
PS0437	18	4	2		5	7				67	Stirrup		7		3	5 4/8	1	2	1	2																
PC0531	12	5			27	4				342	Face Horizontal		1	27 4																						
PC0532	2	5			9	2				19	Face Horizontal		1	9 2																						
PC0533	2	5			13	4				28	Face Horizontal		1	13 4																						
PC0534	2	5			13	4				28	Face Horizontal		1	13 4																						
PC0535	2	5			11	9				25	Face Horizontal		1	11 9																						
PC0536	2	5			13	4				28	Face Horizontal		1	13 4																						
PC0537	2	5			14	2				30	Face Horizontal		1	14 2																						
PL0531	36	5			13	4				501	Bearing Seat		1	13 4																						
PL0532	6	5			11	9				74	Bearing Seat		1	11 9																						
		PIER 3 WALL (PLAIN)																																		
PH0531	84	5			21	2				1854	Face Horizontal		1	21 2																						
PH0532	42	5			40	0				1752	Face Horizontal		1	40 0																						
PH0539	42	5	2 4/8		7	8				336	End Section		7		3	7	2	2	2	2																
PT0401	95	4	2		4	3				270	Thru Thickness Ties		82	3 7	0	5											0	3								
PV0931	83	9			22	5				6326	Vertical		1	22 5																						
PV0932	81	9			22	1				6082	Vertical		1	22 1																						
		PIER 3 FOOTING (PLAIN)																																		
PF0701	80	7	5 2/8		16	9				2739	Stirrup		51		4	6	3	2									1	2								
PF0901	40	9	0		25	5				3457	Face Horizontal		1	25 5																						
PF0902	20	9	0		40	0				2720	Face Horizontal		1	40 0																						
PF0704	44	7	0		4	6				405	Dowels		1	4 6																						
PF0905	164	9	0		8	6				4740	Lap Bars to Wall		1	8 6																						
		TOTAL WEIGHT OF PIER 3 BARS								32229																										
		PIER 4 CAP (PLAIN)																																		
PS0441	8	4	2		10	11				58	Stirrup		7		3	5 4/8	3	10	3	10																
PS0442	17	4	2		10	5				118	Stirrup		7		3	5 4/8	3	7	3	7																
PS0443	17	4	2		9	5				107	Stirrup		7		3	5 4/8	3	1	3	1																
PS0444	17	4	2		8	9				99	Stirrup		7		3	5 4/8	2	9	2	9																
PS0445	17	4	2		7	9				88	Stirrup		7		3	5 4/8	2	3	2	3																
PS0446	17	4	2		6	9				77	Stirrup		7		3	5 4/8	1	9	1	9																
PS0447	18	4	2		5	7				67	Stirrup		7		3	5 4/8	1	2	1	2																
PC0541	2	5			7	10				16	Face Horizontal		1	7 10																						
PC0542	2	5			10	7				22	Face Horizontal		1	10 7																						
PC0543	2	5			13	4				28	Face Horizontal		1	13 4																						
PC0544	2	5			13	4				28	Face Horizontal		1	13 4																						
PC0545	2	5			36	3				76	Face Horizontal		1	36 3																						
PC0546	2	5			13	4				28	Face Horizontal		1	13 4																						
PC0547	2	5			31	4				65	Face Horizontal		1	31 4																						
PC0548	12	5			27	4				342	Face Horizontal		1	27 4																						
PC0549	2	5			40	0				83	Face Horizontal		1	40 0																						
PL0541	36	5			13	4				501	Bearing Seat		1	13 4																						
PL0542	6	5			7	10				49	Bearing Seat		1	7 10																						
		PIER 4 WALL (PLAIN)																																		
PH0541	60	5			21	2				1325	Face Horizontal		1	21 2																						
PH0542	30	5			40	0				1252	Face Horizontal		1	40 0																						
PH0549	30	5	2 4/8		7	8				240	End Section		7		3	7	2	2	2	2																
PT0401	57	4	2		4	3				162	Thru Thickness Ties		82	3 7	0	5											0	3								
PV0941	95	9			18	0				5814	Vertical		1	18 0																						
PV0942	69	9			16	10				3949	Vertical		1	16 10																						
		PIER 4 FOOTING (PLAIN)																																		
PF0701	80	7	5 2/8		16	9				2739	Stirrup		51		4	6	3	2									1	2								
PF0901	40	9			25	5				3457	Face Horizontal		1	25 5																						
PF0902	20	9			40	0				2720	Face Horizontal		1	40 0																						
PF0704	44	7			4	6				405	Dowels		1	4 6																						
PF0905	164	9			8	6				4740	Lap Bars to Wall		1	8 6																						
		TOTAL WEIGHT OF PIER 4 BARS								28655																										

Dimension Variation Table

Mark	# Ea. Len.	Dim.	From FT	From IN	To FT	To IN	Vary By FT	Vary By IN

BENDING DIAGRAM



NOTE:

FOR DRILLED SHAFT REINFORCING, SEE SHEET CB-036.

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
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REGISTRATION

COMMONWEALTH OF VIRGINIA
5/17/16
BENJAMIN L. SHEALY
Lic. No. 052810
PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

REINFORCING STEEL SCHEDULE
6 OF 7

SHEET NUMBER

CB-062

ANSI D 22" x 34"

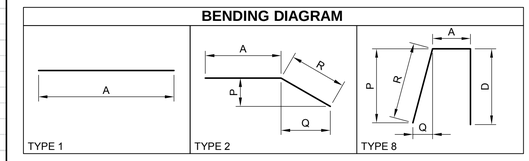
Reinforcing Steel Schedule / Dimension Table

Mark	No.	Bar Size	Pin Dia. FT	Pin Dia. IN	Length FT	Length IN	Length To	Length FT	Length IN	Weight (LBS)	Location	Type	A FT	A IN	B FT	B IN	C FT	C IN	D FT	D IN	E - P FT	E - P IN	F - Q FT	F - Q IN	G - R FT	G - R IN	H FT	H IN	I - S FT	I - S IN	J - T FT	J - T IN	K - U FT	K - U IN	L FT	L IN
		SUPERSTRUCTURE (CRR CLASS 1)																																		
EB0501	24	5			10	1				252	Deck extension		1	10	1																					
EB0502	4	5	3	6/8	7	9				32	Deck extension		2	5	11						1	3 3/8	1	3 6/8	1	10										
EB0503	2	5			7	3				15	Deck extension		1	7	3																					
EB0504	6	5	3	6/8	7	10				49	Deck extension		2	4	1						2	7 4/8	2	8 2/8	3	9										
EB0505	2	5			8	2				17	Deck extension		1	8	2																					
ES0601	86	6	4	4/8	9	2				1184	Deck extension - Abut A		8	0	10				2	1	6	6	0	4 1/8	6	6 1/8										
ES0602	86	6	4	4/8	9	2				1184	Deck extension - Abut B		8	0	10				2	1	6	6	0	6 2/8	6	6 2/8										
ET0501	48	5			29	10				1494	Deck extension		1	29	10																					
ET0502	24	5			7	10				196	Deck extension		1	7	10																					
ET0503	24	5	3	6/8	5	2				129	Deck extension		2	2	7						1	9 5/8	1	10 1/8	2	7										
SC0501	1624	5			56	11				96407	Deck slab		1	56	11																					
SC0502	256	5			8	3	TO	48	3 3/8	7547	Deck slab		1	vary																						
SC0503	1746	5			5	6				10016	Deck slab		1	5	6																					
SL0401	1395	4			60	0				55912	Deck slab		1	60	0																					
SL0402	155	4			19	6				2019	Deck slab		1	19	6																					
SL0603	256	6			60	0				23071	Deck slab		1	60	0																					
SL0604	256	6			16	0				6152	Deck slab		1	16	0																					
SW0301	144	3			60	0				3249	Sidewalk		1	60	0																					
SW0302	16	3			19	6				117	Sidewalk		1	19	6																					
SW0303	1098	3			6	9				2787	Sidewalk		1	6	9																					
		TOTAL WEIGHT IN PRECEDING GROUP OF BARS								211829																										

Dimension Variation Table

Mark	# Ea. Len.	Dim.	From FT	From IN	To FT	To IN	Vary By FT	Vary By IN

BENDING DIAGRAM



AECOM

PROJECT

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5/17/16
BENJAMIN L. SHEALY
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PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

REINFORCING STEEL SCHEDULE
7 OF 7

SHEET NUMBER

CB-063

ANSI D 22" X 34"

GENERAL NOTES

DRAINAGE

D The horizontal location of all drainage structures shown on these plans is approximate only, with the exception of structures showing specific stations, special design bridges and storm sewer systems.

D The horizontal location and invert elevations shown for proposed culverts and storm sewer outfall pipes are based on existing survey data and required design criteria. If during construction, it is found that the horizontal location or invert elevations shown on the plans differ significantly from the horizontal location or elevations of the stream or swale in which the culvert or storm sewer outfall pipe is to be placed, the Contractor shall confer with and get approval from, the City before installing the culvert or storm sewer outfall pipe.

D The "H" dimensions shown on plans for drop inlets and junction boxes and the "L.F." dimensions shown for manholes are for estimating purposes and are based on the proposed invert elevations shown for the structure and the anticipated top (rim) elevation based on existing or proposed finished grade. The actual "H" or "L.F." dimensions are to be determined by the contractor from field conditions.

D All pipe on this project shall be concrete. For strength, sheet thickness, or class designation; available sizes; height of cover limitations; and other restrictions for a particular pipe type or height cover, see the applicable sections of the VDOT Road and Bridge Standards PC-1.

D The proposed riprap may be omitted by the Engineer if the slope designated for placement of riprap is found to be comprised of solid rock or closely consolidated boulders with soundness, size and weight equal to, or exceeding, the specifications for the proposed riprap.

D All existing drainage facilities labeled "To Be Abandoned" shall be left in place, backfilled and plugged in accordance with the VDOT Road and Bridge Standard PP-1. Basis of Payment will be C.Y. of Flowable Backfill.

D Existing drainage facilities being utilized as a part of the drainage system, and designated on the plans "To Be Cleaned Out" shall be cleaned as directed by the City. The cost incidental to this shall be included in the contract price for other items.

D Proposed drop inlets with a height (H) less than the standard minimum shown in the VDOT Road and Bridge Standards shall be considered and paid for as Standard Drop Inlets for the type specified. Pipes with less than standard minimum finished height of cover shall be noted as such in the drainage description for the pipe. Specific pipe bedding and cover requirements are provided in the applicable PB-1 and PC-1 standard drawings of the VDOT Road and Bridge Standards.

D When CG-6 or modified CG-6 is specified on a radius (such as at a street intersection), the City may approve a decrease in the cross slope of the gutter to facilitate proper drainage.

D St'd. SL-1 Safety Slab locations are based on the assumed use of precast structures. If cast-in-place structures are utilized, and the interior chamber dimensions (length and width, or diameter) are less than 4 feet, the safety slabs shall not be installed.

GRADING

G The grade line denotes top of finished pavement unless shown otherwise on typical sections or plans.

G Earthwork quantities on this project are based on anticipated settlement and may require adjusting during construction. Payment will be made only for quantities actually moved.

G The cost of removal of all existing concrete items located in the area to be graded, including, but not limited to the following, shall be included in the price bid for Earthwork: curbs, curb & gutter, sidewalk, light pole foundations, and retaining walls.

G The borrow material for this project shall be a minimum CBR 10 or as approved by the City.

G The contractor shall stake storm drain locations within the floodway limits prior to construction.

PAVEMENT

P If any settlement occurs in pavement adjacent to bridges prior to acceptance of the project by the City, the contractor shall restore the pavement to the original grade by replacing the pavement. In the event the pavement cracks or becomes damaged, it shall be replaced, if directed by the Engineer.

P The pavement materials on this project will be paid for on a tonnage basis. The weight will vary in accordance with the specific gravity of the aggregates and the asphaltic content of the mix actually used to secure the design depth. The weight of the asphalt concrete is based on 95% of the theoretical maximum density.

MAINTENANCE OF TRAFFIC

Maintenance of traffic will be paid for as a lump sum item and shall include, but not be limited to; providing a person to meet the basic work zone traffic control and intermediate work zone traffic control requirements of Section105.14 of the Specifications; furnishing, placing, maintaining, replacing, relocating, adjusting, aligning, removing, warning lights, changeable message signs, channelizing devices, traffic barrier service, traffic barrier service guardrail terminals, impact attenuator service, construction pavement markings, construction pavement message markings, temporary pavement markers, eradication of existing pavement markings, temporary detours, aggregate material, Type III barricades, construction signs, and all labor, material and equipment incidental to completing this work in accordance with the Virginia Work Area Protection Manual and City traffic engineering guidelines.

CONCRETE WAS OUT

The contractor shall install a raised concrete washout facility in a location approved by the City Engineer.

INCIDENTALS

I Where Standard slope roundoffs would damage trees, bushes or other desirable vegetation, they shall be omitted when so ordered by the City.

I All pavement markings and traffic flow arrows shown on the roadway construction plans are schematic only. The actual location and application of pavement markings shall be in accordance with Section 704 of the applicable VDOT Road and Bridge Specifications, MUTCD, sequence of construction/traffic control plans, pavement marking plan sheets CR-201 thru CR-204 and as directed by the Engineer.

I Existing signs shall be reinstalled at the end of the project, as directed by the City. The cost of this shall be included in the price bid for other items.

I The following outside sources, under contract with the City of Roanoke, have provided information on this project.

Hydraulic Design	-	AECOM
Roadway Design	-	AECOM
Utility Design	-	AECOM
Utility Location	-	Anderson & Associates
Survey	-	Anderson & Associates
Bridge Design	-	AECOM
Traffic Design	-	AECOM
Landscape Design	-	AECOM

If questions or problems arise during construction, please contact the City Engineer. DO NOT CONTACT THE OUTSIDE SOURCES.

I The Official Electronic PDF Version of the plans will override the paper copies or prints of specific layers.

Portions of this plan assembly have been CADD generated. To assist in the preparation of the bid and construction of the project, AutoCAD format (.dwg) files will be made available to the prime contractor after award of the contract.

I The AutoCAD format (.dwg) files are furnished only as information for the contractor. These plans are developed in layers (layers) to aid in readability. The AutoCAD files will only match the scanned files if all required levels are turned on. An AutoCAD Software license is required to be able to read these files.

SIDEWALKS

All sidewalks shall be constructed on a bedding consisting of 6 inches of compacted No. 21B aggregate.

ROADSIDE DEVELOPMENT

The cost for all seeding (temporary and permanent) and mowing shall be included in the price bid for erosion and sediment control.

PB-1

GENERAL

1. METHOD "A" PIPE BEDDING SHALL BE USED FOR ALL TYPES OF PIPE CULVERTS WITHIN THE APPLICABLE HEIGHT OF COVER RANGE NOTED IN THE STANDARD PC-1 TABLES UNLESS OTHERWISE NOTED ON THE PLANS.
2. H = HEIGHT OF COVER MEASURED FROM TOP OF CULVERT TO FINISHED GRADE.
3. b = EXCAVATION DEPTH AS SHOWN ON PLANS OR TO FIRM BEARING SOIL.

CIRCULAR PIPE

1. D = OUTSIDE DIAMETER OF PIPE.
2. d = INSIDE DIAMETER OF PIPE.
3. X = WIDTH OF CLASS I BACKFILL MATERIAL BEYOND THE EXTREMITY OF THE PIPE.
   X = 12" WHERE d IS LESS THAN 36".
   X = 18" WHERE d IS 36" AND GREATER.
4. WHERE DIRECTED BY THE ENGINEER, BEDDING MATERIAL MAY BE ELIMINATED FOR NORMAL EARTH FOUNDATIONS UNDER ROUTINE ENTRANCE PIPE (EXCEPT PLASTIC PIPE) 30" AND LESS IN DIAMETER WITH HEIGHT OF COVER 15' OR LESS.
5. REGULAR BACKFILL MATERIAL MAY BE USED IN LIEU OF CLASS I BACKFILL MATERIAL FOR ALL FOUNDATION TYPES FOR ROUTINE ENTRANCE PIPE (EXCEPT PLASTIC PIPE) 30" AND LESS IN DIAMETER WITH HEIGHT OF COVER 15' OR LESS.
6. BEDDING MATERIAL AND CLASS I BACKFILL MATERIAL MAY BE ELIMINATED FOR SHOULDER SLOT INLET (DI-13) OUTLET PIPES INSTALLATIONS.

ELLIPTICAL PIPE

1. S_1 = OUTSIDE SPAN DIMENSION OF PIPE.
2. S_2 = INSIDE SPAN DIMENSION OF PIPE.
3. R = OUTSIDE RISE DIMENSION OF PIPE.
4. X = WIDTH OF CLASS I BACKFILL MATERIAL BEYOND THE EXTREMITY OF THE PIPE.
   X = 12" WHERE S_2 IS LESS THAN 36".
   X = 18" WHERE S_2 IS 36" AND GREATER
5. WHERE DIRECTED BY THE ENGINEER, BEDDING MATERIAL MAY BE ELIMINATED FOR NORMAL EARTH FOUNDATIONS UNDER ROUTINE ENTRANCE PIPE WHERE S_2 IS 36" OR LESS AND HEIGHT OF COVER 15' OR LESS.
6. REGULAR BACKFILL MATERIAL MAY BE USED IN LIEU OF CLASS I BACKFILL MATERIAL FOR ALL FOUNDATION TYPES FOR ROUTINE ENTRANCE PIPE WHERE S_2 IS 36" OR LESS AND HEIGHT OF COVER 15' OR LESS.

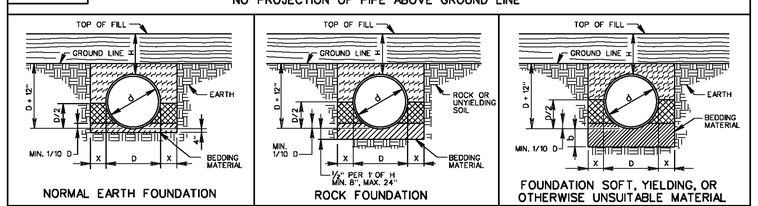
PIPE ARCH

1. S = SPAN DIMENSION OF PIPE.
2. R = RISE DIMENSION OF PIPE.
3. B = SEE PC-1 TABLE FOR APPLICABLE PIPE MATERIAL
4. x = WIDTH OF CLASS I BACKFILL MATERIAL BEYOND THE EXTREMITY OF THE PIPE.
   x = 12" WHERE S_2 IS LESS THAN 36".
   x = 18" WHERE S_2 IS 36" AND GREATER
5. WHERE DIRECTED BY THE ENGINEER, BEDDING MATERIAL MAY BE ELIMINATED FOR NORMAL EARTH FOUNDATIONS UNDER ROUTINE ENTRANCE PIPE WHERE S_2 IS 36" OR LESS AND HEIGHT OF COVER 15' OR LESS.
6. REGULAR BACKFILL MATERIAL MAY BE USED IN LIEU OF CLASS I BACKFILL MATERIAL FOR ALL FOUNDATION TYPES FOR ROUTINE ENTRANCE PIPE WHERE S IS 36" OR LESS AND HEIGHT OF COVER 15' OR LESS.

SPECIFICATION REFERENCE	INSTALLATION OF PIPE CULVERTS & STORM SEWERS GENERAL NOTES	VDOT ROAD AND BRIDGE STANDARDS	
302 303	VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE	SHEET 1 OF 1
			107.00

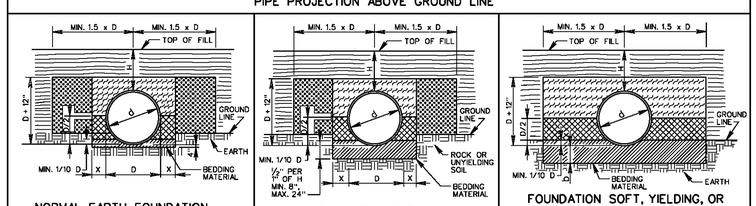
PB-1

NO PROJECTION OF PIPE ABOVE GROUND LINE



NORMAL EARTH FOUNDATION | ROCK FOUNDATION | FOUNDATION SOFT, YIELDING, OR OTHERWISE UNSUITABLE MATERIAL

PIPE PROJECTION ABOVE GROUND LINE



NORMAL EARTH FOUNDATION | ROCK FOUNDATION | FOUNDATION SOFT, YIELDING, OR OTHERWISE UNSUITABLE MATERIAL

BEDDING MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

CLASS I BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

FOR PLASTIC PIPE CLASS I BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

FOR ALL OTHER PIPE REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

EMBANKMENT

REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

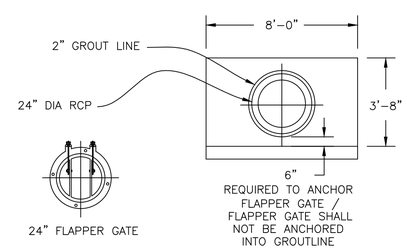
NOTES:

FOR GENERAL NOTES ON PIPE BEDDING, SEE INSTALLATION OF PIPE CULVERTS AND STORM SEWERS GENERAL NOTES ON SHEET 107.00.

CRUSHED GLASS CONFORMING TO THE SIZE REQUIREMENTS FOR CRUSHER RUN AGGREGATE SIZE 25 AND 26 MAY BE USED IN PLACE OF CLASS I BACKFILL.

VDOT ROAD AND BRIDGE STANDARDS		INSTALL. OF PIPE CULVERTS AND STORM SEWERS CIRC. PIPE BEDDING AND BACKFILL - METHOD "A"	SPECIFICATION REFERENCE
SHEET 1 OF 4	REVISION DATE	VIRGINIA DEPARTMENT OF TRANSPORTATION	302 303
107.01	07/12		

MODIFIED EW WIT " FLAPPER GATE DETAIL



ENDWALL MANUFACTURER:
FLAPPER GATE CONNECTION IS CRITICAL. THEREFORE, THE MANUFACTURER SHALL CONSTRUCT PIPE OPENING FOR PIPE DIAMETER, PIPE THICKNESS, AND 2" GROUT LINE.

AECOM

PROJECT

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CLIENT

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CONSULTANT

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REGISTRATION

COMMONWEALTH OF VIRGINIA
JACK SCOTT HODGE
Lic. No.15755
5/17/2016
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

S EET TITLE

CIVIL GENERAL NOTES

S EET NUMBER

CR-001

ANSI D 22" x 34"

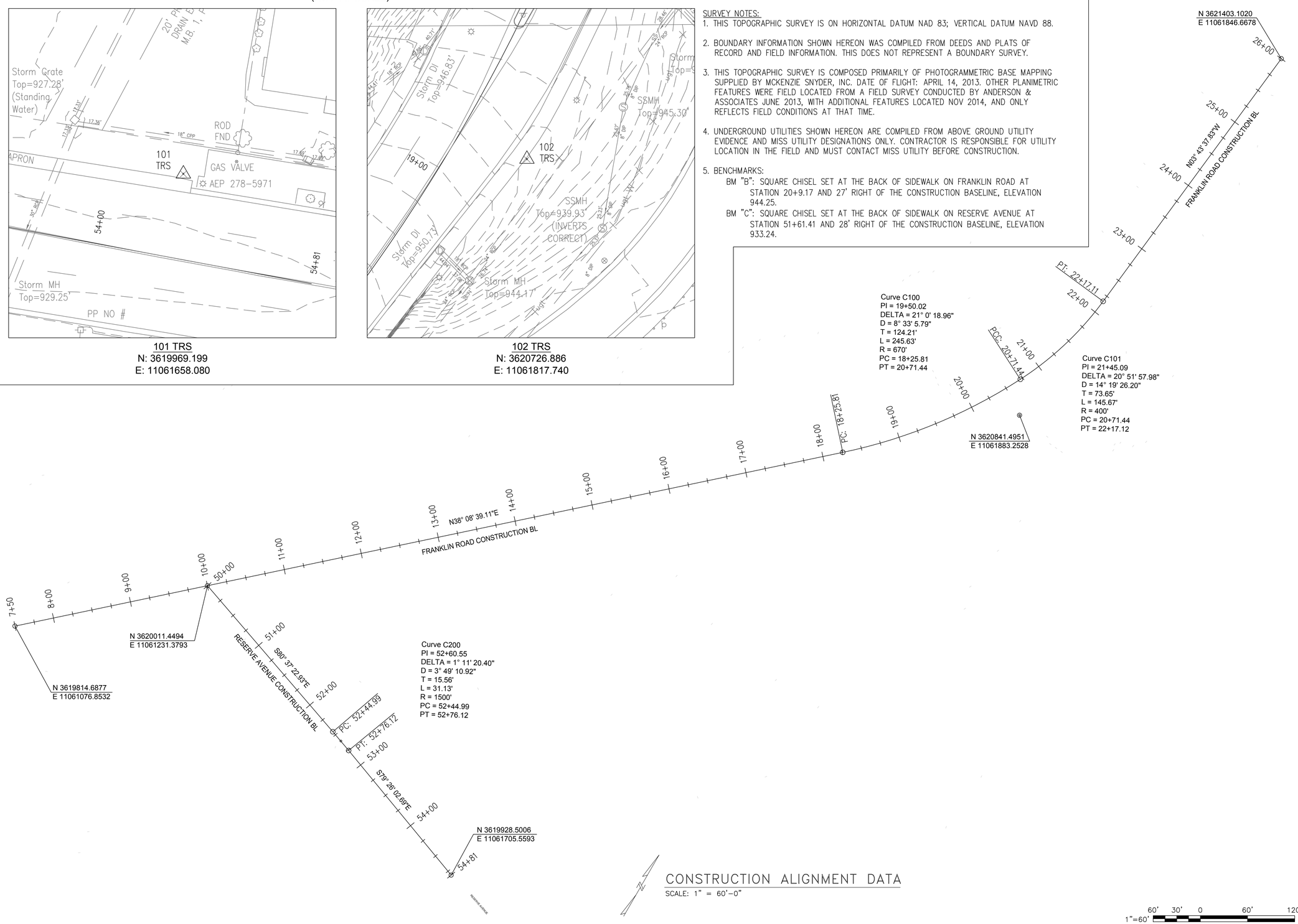
HORIZONTAL CONTROL POINT REFERENCE DIAGRAMS
(NOT TO SCALE)

101 TRS
N: 3619969.199
E: 11061658.080

102 TRS
N: 3620726.886
E: 11061817.740

SURVEY NOTES:

1. THIS TOPOGRAPHIC SURVEY IS ON HORIZONTAL DATUM NAD 83; VERTICAL DATUM NAVD 88.
2. BOUNDARY INFORMATION SHOWN HEREON WAS COMPILED FROM DEEDS AND PLATS OF RECORD AND FIELD INFORMATION. THIS DOES NOT REPRESENT A BOUNDARY SURVEY.
3. THIS TOPOGRAPHIC SURVEY IS COMPOSED PRIMARILY OF PHOTOGRAMMETRIC BASE MAPPING SUPPLIED BY MCKENZIE SNYDER, INC. DATE OF FLIGHT: APRIL 14, 2013. OTHER PLANIMETRIC FEATURES WERE FIELD LOCATED FROM A FIELD SURVEY CONDUCTED BY ANDERSON & ASSOCIATES JUNE 2013, WITH ADDITIONAL FEATURES LOCATED NOV 2014, AND ONLY REFLECTS FIELD CONDITIONS AT THAT TIME.
4. UNDERGROUND UTILITIES SHOWN HEREON ARE COMPILED FROM ABOVE GROUND UTILITY EVIDENCE AND MISS UTILITY DESIGNATIONS ONLY. CONTRACTOR IS RESPONSIBLE FOR UTILITY LOCATION IN THE FIELD AND MUST CONTACT MISS UTILITY BEFORE CONSTRUCTION.
5. BENCHMARKS:
   BM "B": SQUARE CHISEL SET AT THE BACK OF SIDEWALK ON FRANKLIN ROAD AT STATION 20+9.17 AND 27' RIGHT OF THE CONSTRUCTION BASELINE, ELEVATION 944.25.
   BM "C": SQUARE CHISEL SET AT THE BACK OF SIDEWALK ON RESERVE AVENUE AT STATION 51+61.41 AND 28' RIGHT OF THE CONSTRUCTION BASELINE, ELEVATION 933.24.



CONSTRUCTION ALIGNMENT DATA
SCALE: 1" = 60'-0"

60' 30' 0 60' 120'
1"=60'
GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

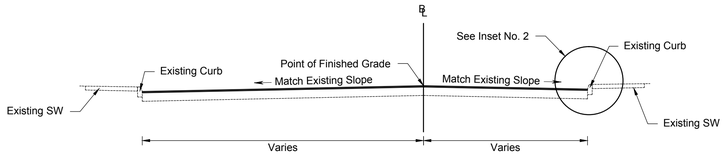
CONSTRUCTION ALIGNMENT DATA

SHEET NUMBER

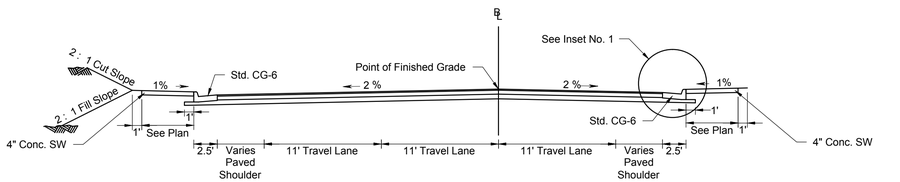
CR-002

ANSI D 22" x 34"

TYPICAL SECTIONS

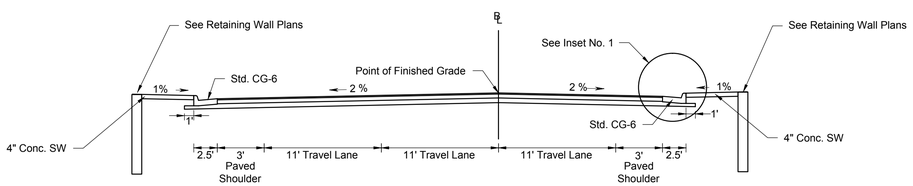


Station 8+6.46 to Station 10+31.00 Location Franklin Road



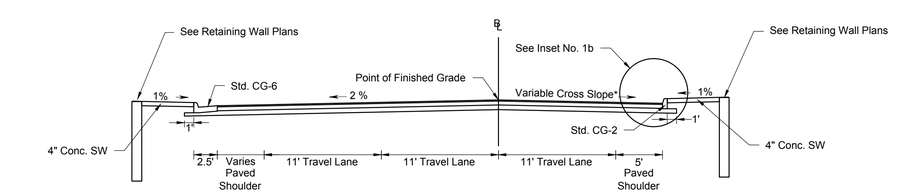
Station 10+31.00 to Station 11+28.00 Location Franklin Road

*See Contours for Cross Slopes



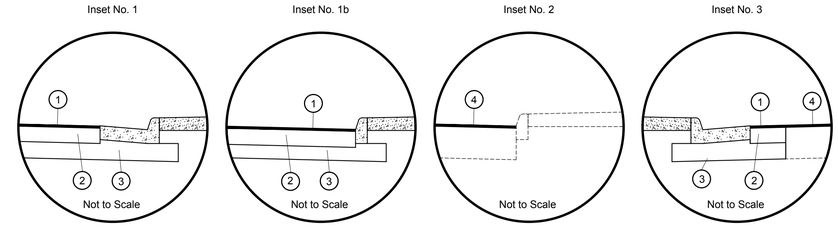
Station 11+28.00 to Station 12+66.84 Location Franklin Road

*See Contours for Cross Slopes

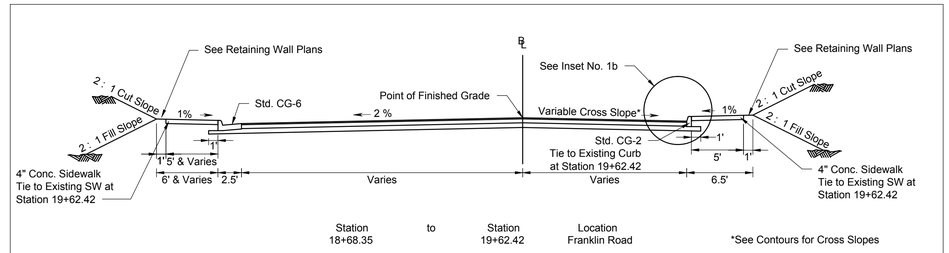


Station 18+19.06 to Station 18+68.35 Location Franklin Road

*See Contours for Cross Slopes

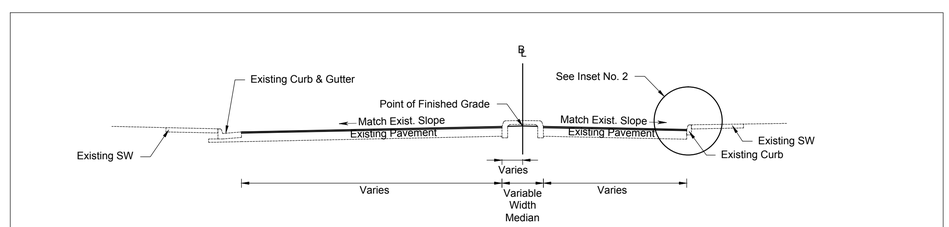


1. 2" Asphalt Concrete Surface Course Type SM-12.5D @ 220 lbs/sy
2. 6" Asphalt Concrete Base Course Type BM-25.0D @ 684 lbs/sy
3. 12" Aggregate Base Material Type 1 No. 21B (For Subbase)
4. Mill Existing Pavement 2" and Overlay with Asphalt Concrete Surface Course Type SM-12.5D @ 220 lbs/sy

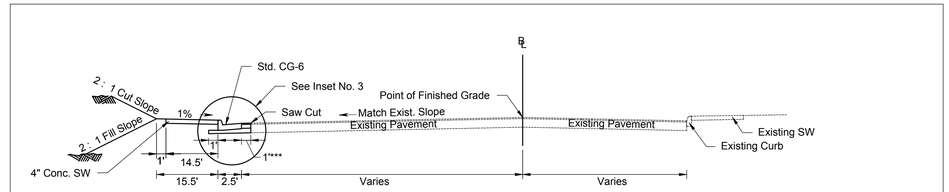


Station 18+68.35 to Station 19+62.42 Location Franklin Road

*See Contours for Cross Slopes



Station 19+62.42 to Station 21+05.00 Location Franklin Road



Station 50+00.00 to Station 53+24.00 Location Reserve Avenue

AECOM

PROJECT

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ISSUE REVISION

I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

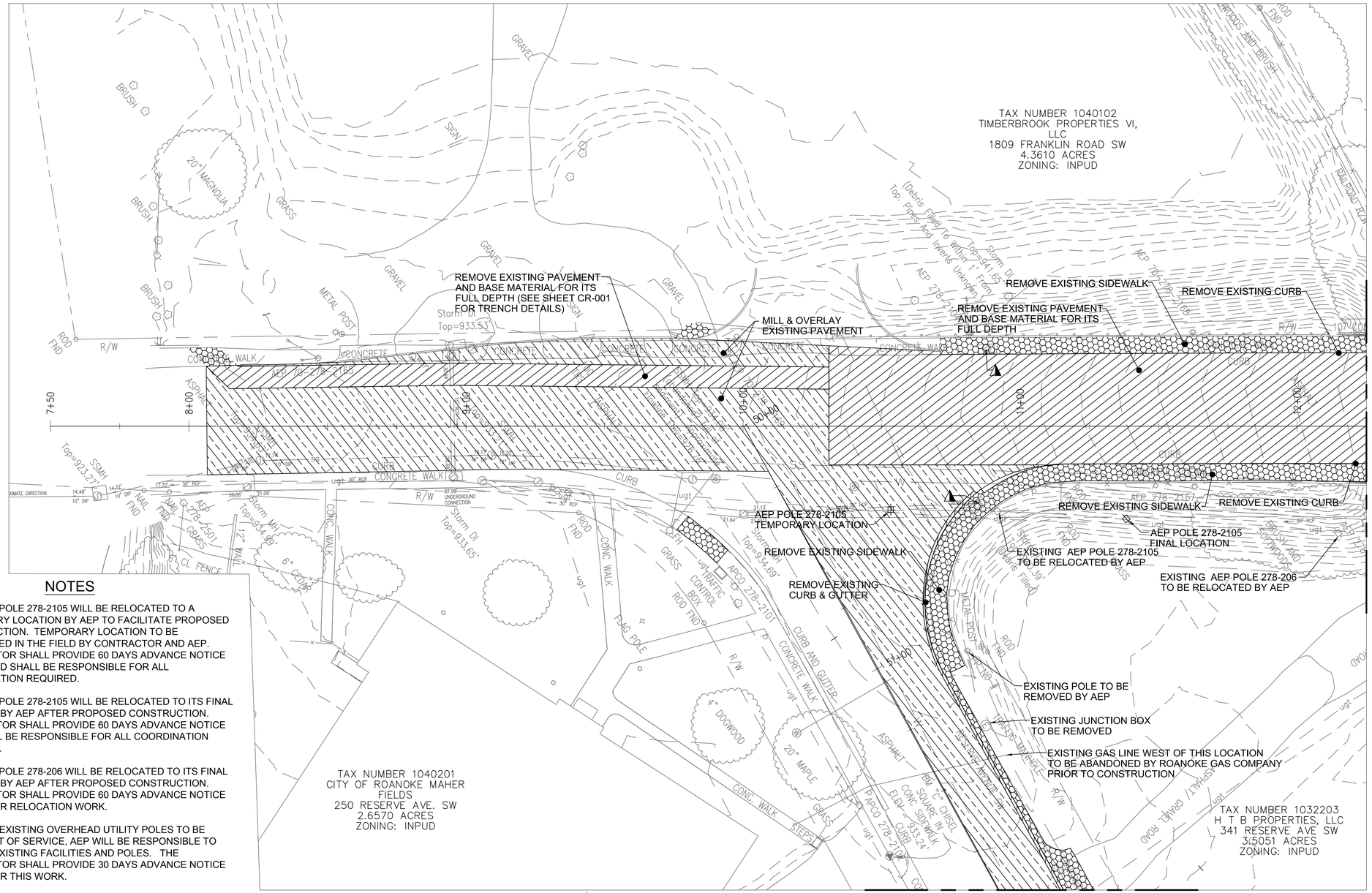
SHEET TITLE

TYPICAL SECTIONS

SHEET NUMBER

CR-003

ANSI D 22" X 34"



NOTES

1. AEP POLE 278-2105 WILL BE RELOCATED TO A TEMPORARY LOCATION BY AEP TO FACILITATE PROPOSED CONSTRUCTION. TEMPORARY LOCATION TO BE DETERMINED IN THE FIELD BY CONTRACTOR AND AEP. CONTRACTOR SHALL PROVIDE 60 DAYS ADVANCE NOTICE TO AEP AND SHALL BE RESPONSIBLE FOR ALL COORDINATION REQUIRED.

2. AEP POLE 278-2105 WILL BE RELOCATED TO ITS FINAL LOCATION BY AEP AFTER PROPOSED CONSTRUCTION. CONTRACTOR SHALL PROVIDE 60 DAYS ADVANCE NOTICE AND SHALL BE RESPONSIBLE FOR ALL COORDINATION REQUIRED.

3. AEP POLE 278-206 WILL BE RELOCATED TO ITS FINAL LOCATION BY AEP AFTER PROPOSED CONSTRUCTION. CONTRACTOR SHALL PROVIDE 60 DAYS ADVANCE NOTICE TO AEP FOR RELOCATION WORK.

4. FOR EXISTING OVERHEAD UTILITY POLES TO BE TAKEN OUT OF SERVICE, AEP WILL BE RESPONSIBLE TO REMOVE EXISTING FACILITIES AND POLES. THE CONTRACTOR SHALL PROVIDE 30 DAYS ADVANCE NOTICE TO AEP FOR THIS WORK.

LEGEND

- DENOTES DEMOLITION OF PAVEMENT
- DENOTES DEMOLITION OF CONCRETE SIDEWALK
- DENOTES MILL & OVERLAY OF PAVEMENT
- DENOTES DEMOLITION OF BRIDGE STRUCTURE
- TO BE REMOVED

EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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KEY PLAN

PROJECT NUMBER

60290893

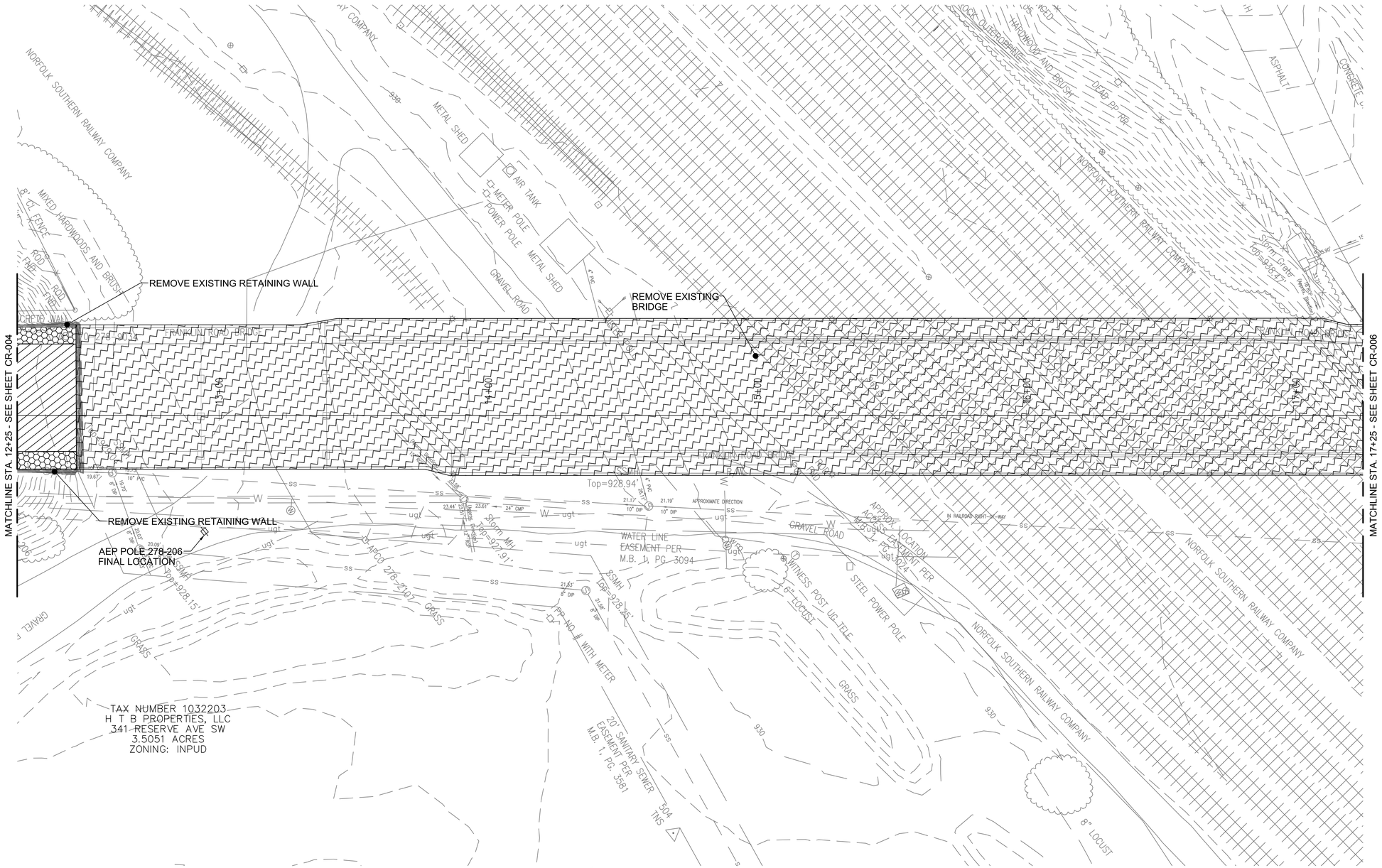
SHEET TITLE

EXISTING CONDITIONS AND DEMOLITION PLAN

SHEET NUMBER

CR-004

ANSI D 22" X 34"



LEGEND

- DENOTES DEMOLITION OF PAVEMENT
- DENOTES DEMOLITION OF CONCRETE SIDEWALK
- DENOTES MILL & OVERLAY OF PAVEMENT
- DENOTES DEMOLITION OF BRIDGE STRUCTURE
- TO BE REMOVED

EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

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KEY PLAN

PROJECT NUMBER

60290893

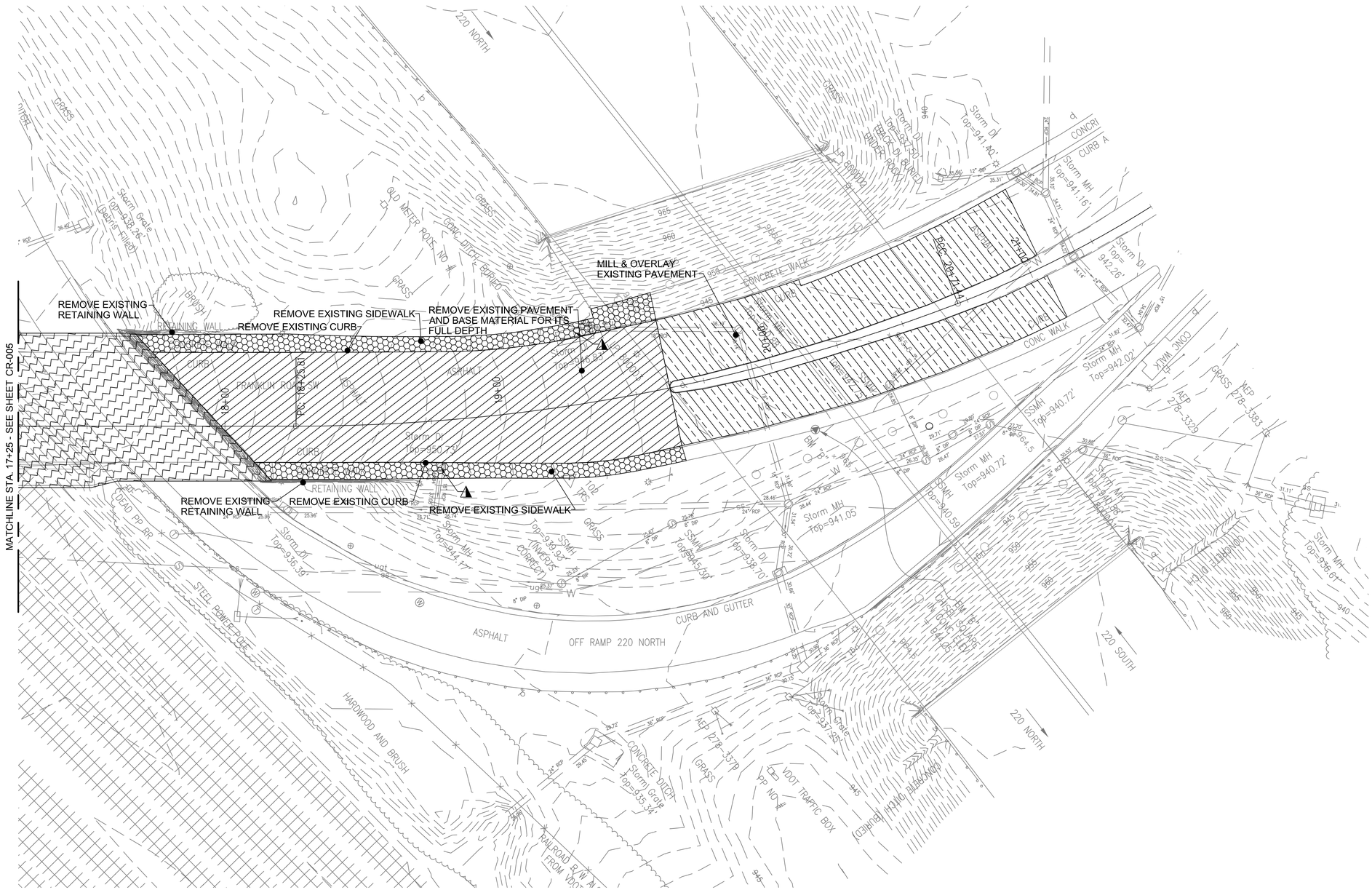
SHEET TITLE

EXISTING CONDITIONS AND DEMOLITION PLAN

SHEET NUMBER

CR-005

ANSI D 22" X 34"



LEGEND

- DENOTES DEMOLITION OF PAVEMENT
- DENOTES DEMOLITION OF CONCRETE SIDEWALK
- DENOTES MILL & OVERLAY OF PAVEMENT
- DENOTES DEMOLITION OF BRIDGE STRUCTURE
- TO BE REMOVED

EXISITNG CONDITIONS AND DEMOLITION PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

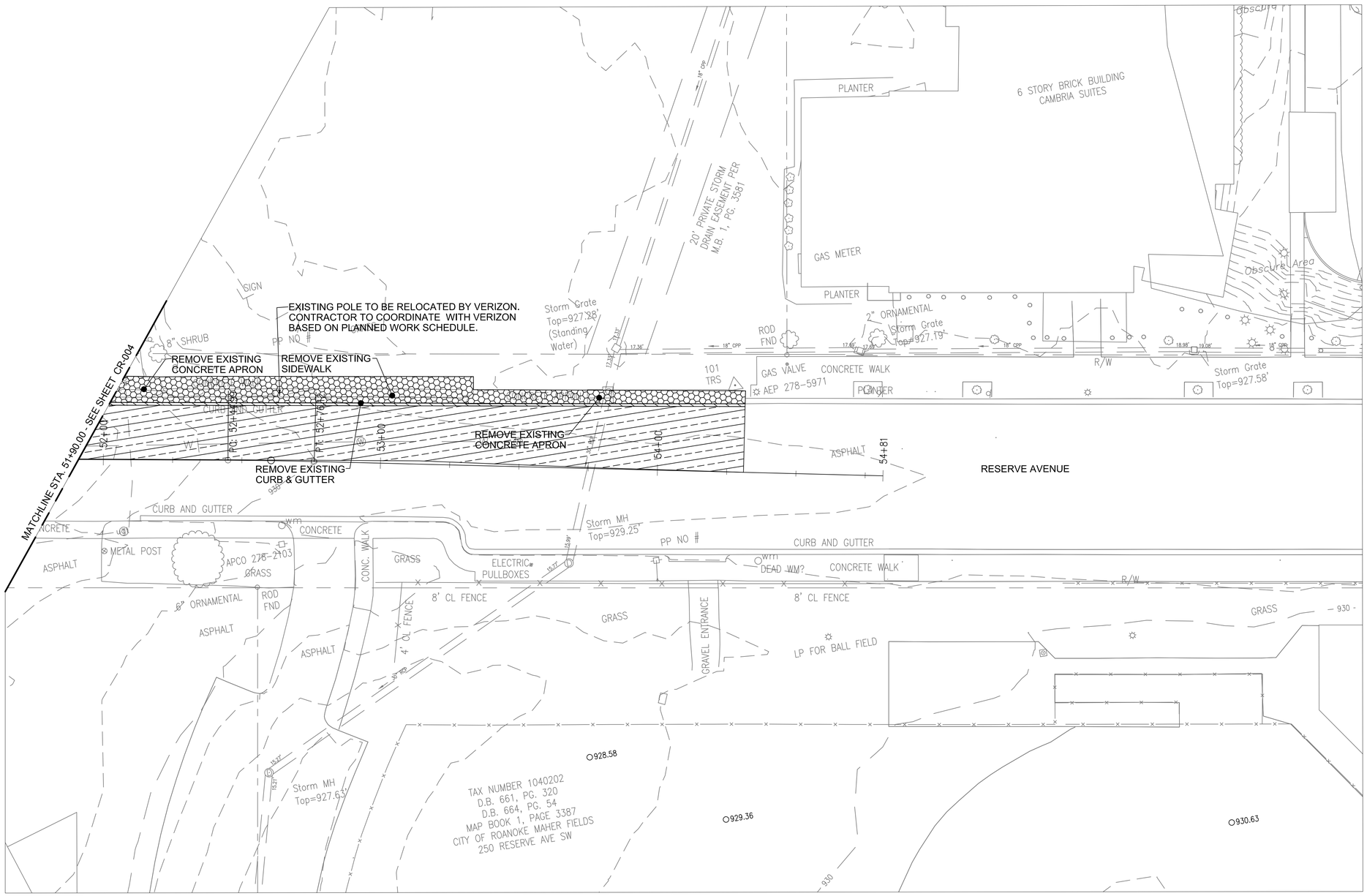
SHEET TITLE

EXISTING CONDITIONS AND DEMOLITION PLAN

SHEET NUMBER

CR-006

ANSI D 22" X 34"



LEGEND

- DENOTES DEMOLITION OF PAVEMENT
- DENOTES DEMOLITION OF CONCRETE SIDEWALK
- DENOTES MILL & OVERLAY OF PAVEMENT
- DENOTES DEMOLITION OF BRIDGE STRUCTURE
- TO BE REMOVED

EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

EXISTING CONDITIONS AND DEMOLITION PLAN

SHEET NUMBER

CR-007

ANSI D 22" X 34"

EROSION & SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION
THIS PROJECT CONSISTS OF THE REPLACEMENT OF THE BRIDGE STRUCTURE ON FRANKLIN ROAD AND ASSOCIATED ROADWAY INFRASTRUCTURE. APPROXIMATELY 0.97 ACRES WILL BE DISTURBED DURING CONSTRUCTION OF THIS SITE.

EXISTING CONDITIONS
THIS PROJECT IS LOCATED WITHIN THE CITY OF ROANOKE AT THE INTERSECTION OF FRANKLIN ROAD AND RESERVE AVENUE. THE BRIDGE TO BE REPLACED CROSSES OVER 10 TRACKS OF THE NORFOLK SOUTHERN RAILWAY AND THE 220 EXPRESSWAY NORTHBOUND RAMP.

ADJACENT PROPERTIES
TO THE EAST AND WEST OF THE INTERSECTION OF FRANKLIN AND RESERVE ARE VACANT LOTS. AT THE NORTH END OF THE PROJECT, ROUTE 220 CROSSES OVER THE PROPOSED CONSTRUCTION AREA.

OFFSITE AREAS
NO OFFSITE FILL OR BORROW AREAS ARE COVERED BY THIS PLAN. ANY SUCH AREA WILL REQUIRE A SEPARATE EROSION & SEDIMENT CONTROL PLAN.

CRITICAL AREAS
THE CONTRACTOR SHALL TAKE SPECIAL CARE TO ENSURE THAT SEDIMENT IS NOT ALLOWED TO FLOW INTO EITHER NEW STORM DRAINS OR THE EXISTING DOWNSTREAM RECEIVING CHANNELS. ENSURE THAT ALL EROSION AND SEDIMENT CONTROL MEASURES ARE STABILIZED AND FUNCTIONING TO MINIMIZE THE POTENTIAL FOR ANY SEDIMENT LEAVING THE SITE.

EROSION AND SEDIMENT CONTROL MEASURES
SILT FENCE (3.05) - SILT FENCE WILL BE INSTALLED AT THE LOWER ENDS OF THE PROJECT SITE TO INTERCEPT SEDIMENT LADEN RUN-OFF PRIOR TO EXITING THE SITE.

INLET PROTECTION (3.07) - INLET PROTECTION WILL BE INSTALLED AT EACH STORM DRAIN INLET TO MINIMIZE THE AMOUNT OF SEDIMENT LADEN RUN-OFF FROM ENTERING THE STORM DRAIN SYSTEM.

TEMPORARY SEEDING (3.31) - TEMPORARY SEEDING SHALL BE APPLIED TO ALL AREAS TO BE ROUGH GRADED, BUT NOT FINISHED GRADED DURING THE INITIAL PHASE OF CONSTRUCTION.

PERMANENT SEEDING (3.32) - PERMANENT SEEDING SHALL BE INSTALLED ON ALL DISTURBED AREAS OF THE SITE NOT OTHERWISE STABILIZED.

PERMANENT STABILIZATION
ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT SEEDING WITHIN 7 DAYS OF REACHING FINAL GRADES. SEEDING SHALL BE DONE IN ACCORDANCE WITH DEQ SPECIFICATION 3.32 (PERMANENT SEEDING), OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND WITH THE DETAILS SHOWN ON THIS PLAN. MULCH (STRAW OR FIBER) SHALL BE USED ON ALL SEEDED AREAS. IN ALL SEEDING OPERATIONS, SEED, FERTILIZER, AND LIME SHALL BE APPLIED PRIOR TO MULCHING.

MAINTENANCE
ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED ONCE EVERY FOUR (4) BUSINESS DAYS OR AT LEAST ONCE EVERY FIVE (5) BUSINESS DAYS AND NO LATER THAN 48 HOURS AFTER A MEASURABLE STORM EVENT. A LOG OF DATES AND INSPECTIONS SHALL BE KEPT. ANY DEFICIENCIES THAT ARE FOUND SHALL BE CORRECTED IMMEDIATELY. ACCUMULATED SEDIMENT AT TRAPPING MEASURES SHALL BE ROUTINELY REMOVED.

ALL DITCHES, SWALES, AND NATURAL WATERCOURSES DOWNSTREAM OF THIS PROJECT SHALL BE FIELD INSPECTED DURING AND AFTER CONSTRUCTION TO ENSURE COMPLIANCE WITH DEQ'S MS-19. IF EROSION OR SCOUR IS OCCURING, THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL CORRECTIVE MEASURES.

EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL AFTER ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED AND THEN TEMPORARY MEASURES PROPERLY REMOVED ON THE CITY OF ROANOKE HAS GRANTED APPROVAL.

GENERAL EROSION & SEDIMENT CONTROL NOTES
ROANOKE CITY, VIRGINIA

ES-1: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS VR 625-02-00 EROSION AND SEDIMENT CONTROL REGULATIONS.

ES-2: THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.

ES-3: ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.

ES-4: A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND NARRATIVE, AS WELL AS A COPY OF THE LAND DISTURBING PERMIT AND SWPPP SHALL BE MAINTAINED ON THE SITE AT ALL TIMES. THE EROSION AND SEDIMENT CONTROL ADMINISTRATOR WILL DELIVER THESE MATERIALS AT THE PRECONSTRUCTION CONFERENCE.

ES-5: PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.

ES-6: THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENT AS DETERMINED BY THE PLAN APPROVING AUTHORITY.

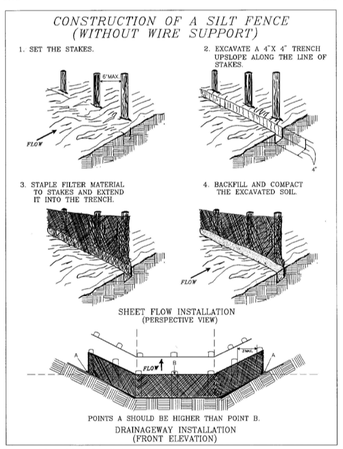
ES-7: ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING THE LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.

ES-8: DURING DEWATERING OPERATION, WATER WILL BE PUMPED INTO APPROVED FILTERING DEVICE.

ES-9: THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUN-OFF PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

ES-10:
EROSION AND SEDIMENT CONTROL WILL BE PAID AT THE CONTRACT LUMP SUM PRICE. THIS PRICE SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIAL, AND EQUIPMENT TO INSTALL, MAINTAIN, AND REMOVE THE E&S MEASURES AS REQUIRED FOR COMPLIANCE WITH THESE PLANS AND ALL APPLICABLE REGULATIONS.

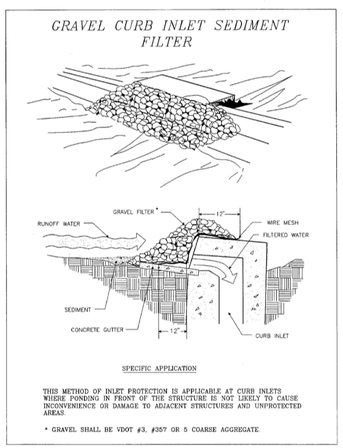
1992 3.05



Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 3.05-2

1992 3.07



Source: Va. DSWC

Plate 3.07-6

VIRGINIA EROSION AND SEDIMENT CONTROL PLAN MINIMUM STANDARDS (MS-19)

MS1: PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR. ***APPLY SEEDING MIXTURES IN ACCORDANCE WITH SPECIFICATIONS 3.31 AND 3.32 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH) TO ALL AREAS THAT DO NOT HAVE A NON-ERODABLE SURFACE AS SHOWN ON THE PLANS.***

MS2: DURING CONSTRUCTION OF THE PROJECT, SOIL STOCK PILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS BORROW AREAS AND SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE. ***ANY ON-SITE SOIL STOCKPILE SHALL HAVE SILT FENCE ALONG THE DOWNHILL PERIMETER. ALSO, A TEMPORARY SEED MIX IS TO BE APPLIED OVER THE SOIL STOCKPILE IF TO REMAIN AS-IS FOR LONGER THAN 30 DAYS. NO ON-SITE STOCKPILE IS CURRENTLY PLANNED FOR THIS PROJECT.***

MS3: A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION. ***APPLY SEEDING MIXTURES IN ACCORDANCE WITH SPECIFICATIONS 3.31 AND 3.32 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH) TO ALL AREAS THAT DO NOT HAVE A NON-ERODABLE SURFACE AS SHOWN ON THE PLANS.***

MS4: SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE. ***INSTALL EROSION CONTROL MEASURES AS OUTLINED IN THE CONSTRUCTION SEQUENCE.***

MS5: STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION. ***NOT APPLICABLE. NO EARTHEN STRUCTURES ARE PROPOSED WITH THIS PROJECT.***

MS6: SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND CONSTRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN.

a. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES.

b. SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A 25-YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.

NOT APPLICABLE. NO SEDIMENT TRAPS OR BASINS ARE PROPOSED WITH THIS PROJECT.

MS7: CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED. ***RESEED ANY AREAS THAT DO NOT HAVE AN ESTABLISHMENT OF GOOD STAND OF GRASS AFTER INITIAL APPLICATION OF PERMANENT SEEDING. ADDITIONAL SLOPE STABILIZATION MEASURES ARE TO BE CONSIDERED AS CONDITIONS DICTATE.***

MS8: CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE. ***NO CONCENTRATED RUNOFF SHALL FLOW DOWN CUT OR FILL SLOPES AND SHALL BE DIVERTED AS NECESSARY.***

MS9: WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED. ***THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY UP THE DISCOVERY OF ANY WATER SEEPS.***

MS10: ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT. ***INLET PROTECTION SHALL BE INSTALLED AS STORM DRAIN SYSTEM IS INSTALLED.***

MS11: BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL. ***OUTLET PROTECTION SHALL BE INSTALLED PRIOR TO OUTFALL PIPE BEING MADE OPERATIONAL.***

MS12: WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS. ***NOT APPLICABLE. NO LIVE WATERCOURSES EXIST WITHIN THIS PROJECT.***

MS13: WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NONERODIBLE MATERIAL SHALL BE PROVIDED. ***NOT APPLICABLE. NO LIVE WATERCOURSES EXIST WITHIN THIS PROJECT.***

MS14: ALL APPLICABLE FEDERAL, STATE AND LOCAL CHAPTERS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET. ***NOT APPLICABLE. NO LIVE WATERCOURSES EXIST WITHIN THIS PROJECT.***

MS15: THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED. ***NOT APPLICABLE. NO LIVE WATERCOURSES EXIST WITHIN THIS PROJECT.***

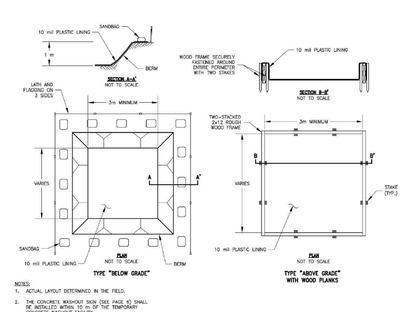
MS16: UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:

a. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
b. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
c. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.
d. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
e. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THIS CHAPTER.
f. APPLICABLE SAFETY CHAPTERS SHALL BE COMPLIED WITH.

UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS ABOVE.

MS17: WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND DISTURBING ACTIVITIES. ***ADEQUATE MEANS SHALL BE PROVIDED FOR THE CLEANING OF MUD AND SEDIMENT FROM CONSTRUCTION VEHICLES PRIOR TO ENTERING PUBLIC STREETS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND MUD AND SEDIMENT TRANSPORTED FROM THIS SITE ONTO THE PUBLIC STREETS.***

MS18: ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE VESCP AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION. ***EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BE REMOVED WITHOUT ROANOKE CITY PERMISSION AND SHALL BE IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.***



VIRGINIA EROSION AND SEDIMENT CONTROL PLAN MINIMUM STANDARDS (MS-19) CONT.

MS19: PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA. STREAM RESTORATION AND RELOCATION PROJECTS THAT INCORPORATE NATURAL CHANNEL DESIGN CONCEPTS ARE NOT MAN-MADE CHANNELS AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS:

a. CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITE SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN-MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEM. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR PIPE SYSTEM, DOWNSTREAM STABILITY ANALYSES AT THE OUTFALL OF THE PIPE OR PIPE SYSTEM SHALL BE PERFORMED.

b. ADEQUACY OF ALL CHANNELS AND PIPES SHALL BE VERIFIED IN THE FOLLOWING MANNER:

1) THE APPLICANT SHALL DEMONSTRATE THAT THE TOTAL DRAINAGE AREA TO THE POINT OF ANALYSIS WITHIN THE CHANNEL IS ONE HUNDRED TIMES GREATER THAN THE CONTRIBUTING DRAINAGE AREA OF THE PROJECT IN QUESTION; OR

2) (a) NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS.

(b) ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A TWO-YEAR STORM TO DEMONSTRATE THAT STORMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND

(c) PIPES AND STORM SEWER SYSTEMS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.

c. IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:

1) IMPROVE THE CHANNELS TO A CONDITION WHERE A TEN-YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO-YEAR STORM WILL NOT CAUSE EROSION TO CHANNEL THE BED OR BANKS; OR

2) IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE TEN-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES;

3) DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TWO YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A NATURAL CHANNEL OR WILL NOT CAUSE THE PREDEVELOPMENT PEAK RUNOFF RATE FROM A TEN-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A MANMADE CHANNEL; OR

4) PROVIDE A COMBINATION OF CHANNEL IMPROVEMENT, STORMWATER DETENTION OR OTHER MEASURES WHICH IS SATISFACTORY TO THE VESCP AUTHORITY TO PREVENT DOWNSTREAM EROSION.

d. THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.

e. ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT CONDITION OF THE SUBJECT PROJECT.

f. IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION, HE SHALL OBTAIN APPROVAL FROM THE VESCP OF A PLAN FOR MAINTENANCE OF THE DETENTION FACILITIES. THE PLAN SHALL SET FORTH THE MAINTENANCE REQUIREMENTS OF THE FACILITY AND THE PERSON RESPONSIBLE FOR PERFORMING THE MAINTENANCE.

g. OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATORS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.

h. ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.

i. INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.

j. IN APPLYING THESE STORMWATER MANAGEMENT CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE, SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITION SHALL BE USED IN ALL ENGINEERING CALCULATIONS.

k. ALL MEASURES USED TO PROTECT PROPERTIES AND WATERWAYS SHALL BE EMPLOYED IN A MANNER WHICH MINIMIZES IMPACTS ON THE PHYSICAL, CHEMICAL AND BIOLOGICAL INTEGRITY OF RIVERS, STREAMS AND OTHER WATERS OF THE STATE.

l. AN PLAN APPROVED PRIOR TO JULY 1, 2014, THAT PROVIDES FOR STORMWATER MANAGEMENT THAT ADDRESSES ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS SHALL SATISFY THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS IF THE PRACTICES ARE DESIGNED TO

i. DETAIN THE WATER QUALITY VOLUME AND TO RELEASE IT OVER 48 HOURS;

ii. DETAIN AND RELEASE OVER A 24-HOUR PERIOD THE EXPECTED RAINFALL RESULTING FROM THE ONE YEAR, 24- HOUR STORM; AND

iii. REDUCE THE ALLOWABLE PEAK FLOW RATE RESULTING FROM THE 1.5, 2, AND 10-YEAR, 24-HOUR STORMS TO A LEVEL THAT IS LESS THAN OR EQUAL TO THE PEAK FLOW RATE FROM THE SITE ASSUMING IT WAS IN A GOOD FORESTED CONDITION, ACHIEVED THROUGH MULTIPLICATION OF THE FORESTED PEAK FLOW RATE BY A REDUCTION FACTOR THAT IS EQUAL TO THE RUNOFF VOLUME FROM THE SITE WHEN IT WAS IN A GOOD FORESTED CONDITION DIVIDED BY THE RUNOFF VOLUME FROM THE SITE IN ITS PROPOSED CONDITION, AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS AS DEFINED IN ANY REGULATIONS PROMULGATED PURSUANT TO § 10.1-562 OR 10.1-570 OF THE ACT.

m. FOR PLANS APPROVED ON AND AFTER JULY 1, 2014, THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF § 10.1-561 A OF THE ACT AND THIS SUBSECTION SHALL BE SATISFIED BY COMPLIANCE WITH WATER QUANTITY REQUIREMENTS IN THE STORMWATER MANAGEMENT ACT (§ 10.1-603.2 ET SEQ. OF THE CODE OF VIRGINIA) AND ATTENDANT REGULATIONS, UNLESS SUCH LAND DISTURBING ACTIVITIES ARE IN ACCORDANCE WITH 4VAC50-60-48 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) PERMIT REGULATIONS.

n. COMPLIANCE WITH THE WATER QUANTITY MINIMUM STANDARDS SET OUT IN 4VAC50-60-66 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) PERMIT REGULATIONS SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF MINIMUM STANDARD 19.

THIS LINEAR DEVELOPMENT PROJECT IS EXEMPT FOR THE CITY'S STORMWATER MANAGEMENT ORDINANCE SINCE THE AMOUNT OF TOTAL DISTURBANCE IS LESS THAN 1.0 ACRES.

EROSION AND SEDIMENT CONTROL PLAN LEGEND

TSF	DENOTES TEMPORARY SILT FENCE, ST'D. EC-5
IP-B	DENOTES INLET PROTECTION, TYPE B
TS	DENOTES TEMPORARY SEEDING
PS	DENOTES PERMANENT SEEDING

Sheet Number	Rock Check Dams St'd EC-4		Temporary Silt Barriers St'd EC-5		Inlet Protection St'd EC-6		Dewatering Basin (St'd. EC-8)	St'd PG-3, Riprap Class I	Stabilized Construction Entrance (St'd. EC-11)*	Siltation Control Excavation
	Check Dam, Rock Ty. I	Check Dam, Rock Ty. II	Temp. Filter Barrier	Temp. Silt Fence	Inlet Protection, Type A	Inlet Protection, Type B				
	EA	EA	LF	LF	EA	EA	EA	TON	EA	CY
101				382		4				6
102				720			1			12
103				728	1	6	1			12
104				450	1					8
Project Total	0	0	0	2280	2	10	2	0	0	39

THESE QUANTITITES ARE APPROXIMATE AND ARE PROVIDED FOR ESTIMATING PURPOSES ONLY. ACTUAL QUANTITIES MAY VARY BASED ON CONDITIONS.

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
215 Church Avenue, SW
Room 350
Roanoke, VA 24011

CONSULTANT

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REGISTRATION

COMMONWEALTH OF VIRGINIA
JACK SCOTT HODGE
Lic. No.15755
5/17/2016
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

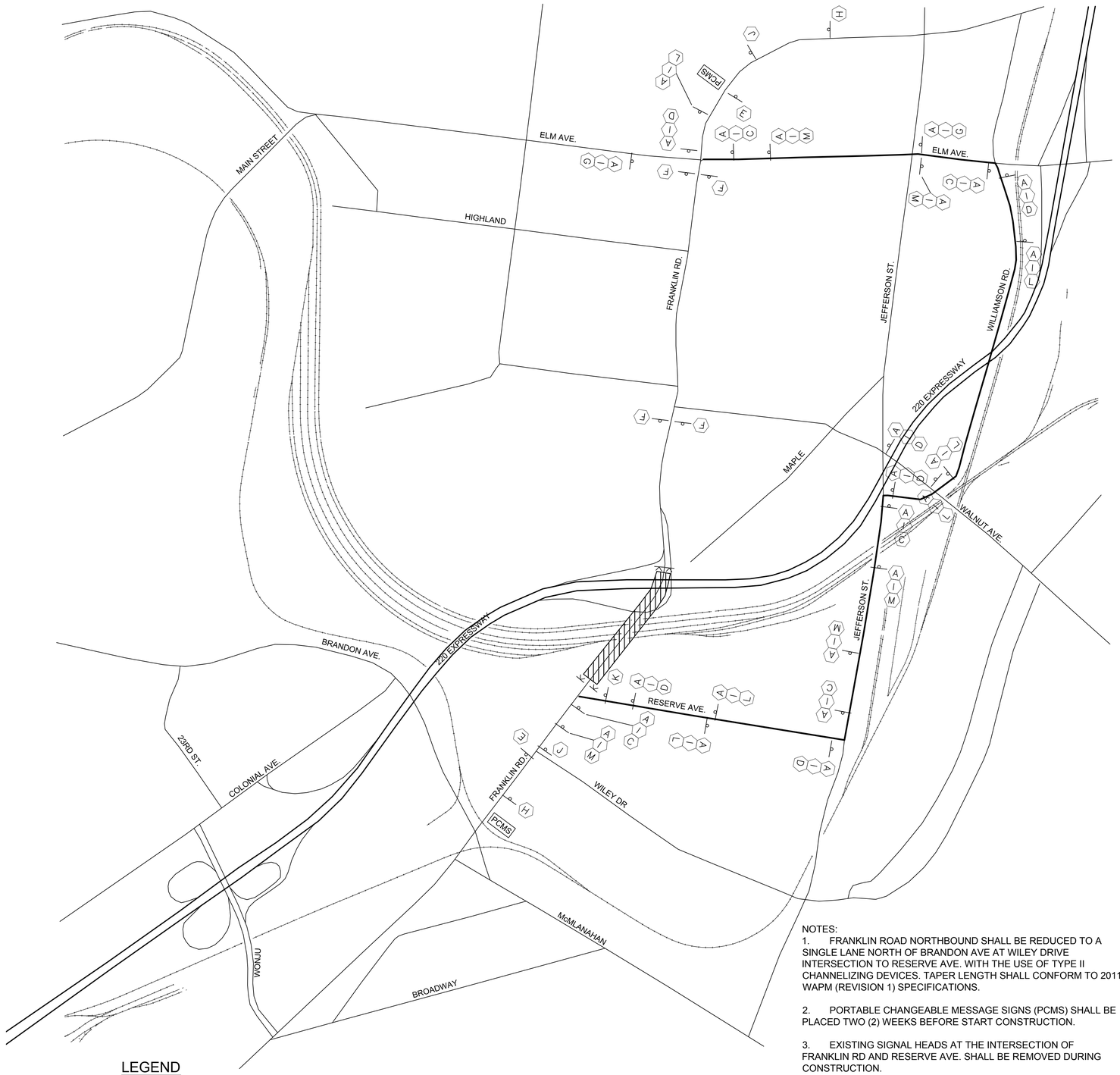
SHEET TITLE

EROSION & SEDIMENT CONTROL NARRATIVE

SHEET NUMBER

CR-008

ANSI D 22" x 34"



SIGN SCHEDULE

DESIGNATION	SIGN	NUMBER	SIZE
A	DETOUR	M4-8 B/O	24"x12"
B	ROAD CLOSED	R11-2	48"x30"
C	→	M6-1R	21"x15"
D	←	M6-1L	21"x15"
E	END DETOUR	M4-8a	24"x18"
F	ROAD CLOSED TO THRU TRAFFIC	R11-4	60"x30"
G	↑	M6-3	21"x15"
H	ROAD CLOSED AHEAD	W20-3	48"x48"
I	116	M1-5 B/W	30"x24"
J	DETOUR A□EAD	W20-2 B/O	48"x48"
K	↱	R3-1	24"x24"
L	↰	M5-1L	24"x18"
M	↱	M5-1R	24"x18"

NOTES:

1. FRANKLIN ROAD NORTHBOUND SHALL BE REDUCED TO A SINGLE LANE NORTH OF BRANDON AVE AT WILEY DRIVE INTERSECTION TO RESERVE AVE. WITH THE USE OF TYPE II CHANNELIZING DEVICES. TAPER LENGTH SHALL CONFORM TO 2011 WAPM (REVISION 1) SPECIFICATIONS.

2. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE PLACED TWO (2) WEEKS BEFORE START CONSTRUCTION.

3. EXISTING SIGNAL HEADS AT THE INTERSECTION OF FRANKLIN RD AND RESERVE AVE. SHALL BE REMOVED DURING CONSTRUCTION.

LEGEND

TYPE III BARRICADE (8') WITH SIGN (B)

APPROX. SIGN LOCATION W/ SIGN DESIGNATION (A)

N

0 5000' 10000'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
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5/17/2016
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

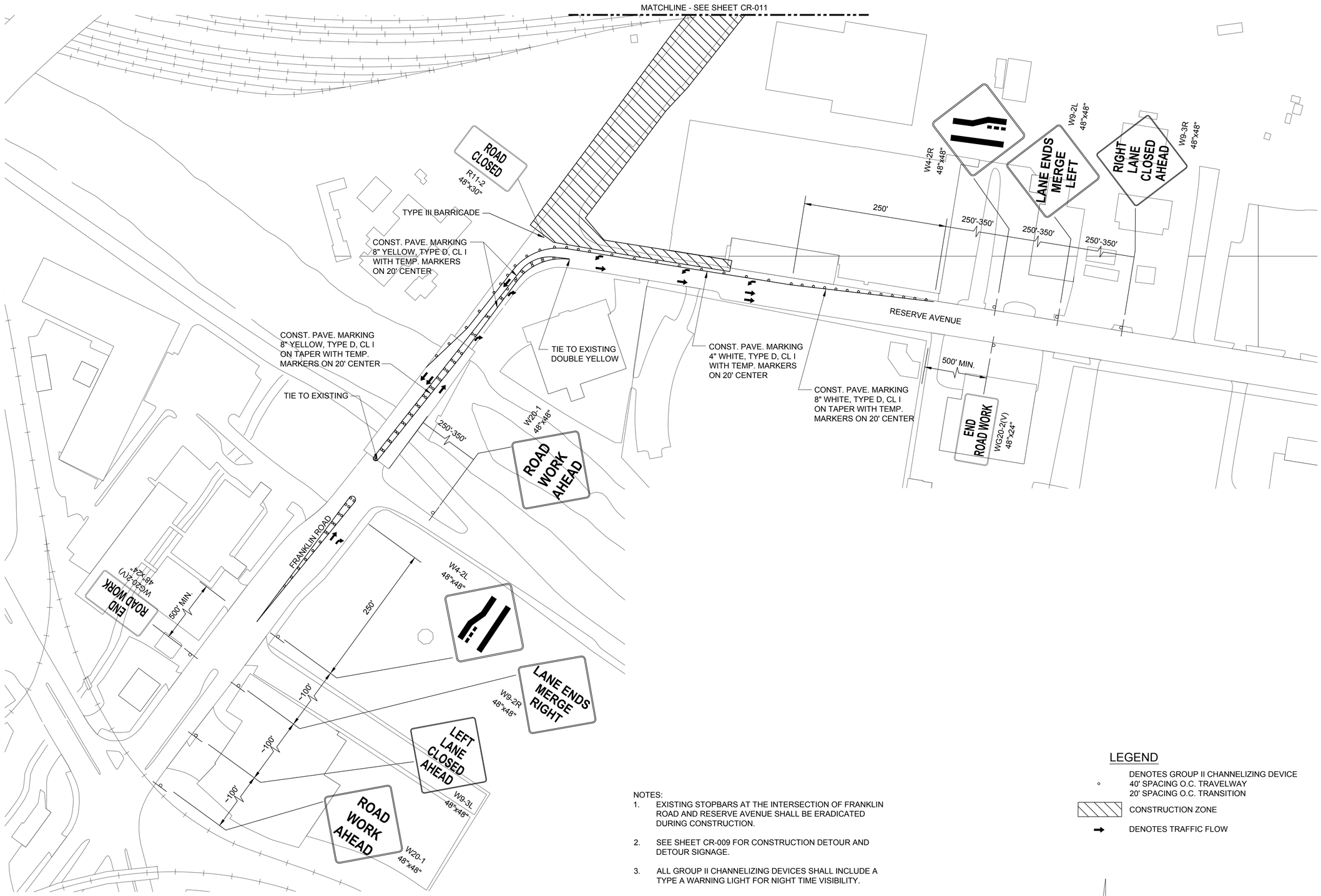
S□EET TITLE

DETOUR SHEET

S□EET NUMBER

CR-009

ANSI D 22" x 34"



NOTES:

1. EXISTING STOPBARS AT THE INTERSECTION OF FRANKLIN ROAD AND RESERVE AVENUE SHALL BE ERADICATED DURING CONSTRUCTION.
2. SEE SHEET CR-009 FOR CONSTRUCTION DETOUR AND DETOUR SIGNAGE.
3. ALL GROUP II CHANNELIZING DEVICES SHALL INCLUDE A TYPE A WARNING LIGHT FOR NIGHT TIME VISIBILITY.

LEGEND

- ◦ DENOTES GROUP II CHANNELIZING DEVICE
  40' SPACING O.C. TRAVELWAY
  20' SPACING O.C. TRANSITION
- CONSTRUCTION ZONE
- ➡ DENOTES TRAFFIC FLOW

N

0 1000' 2000'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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REGISTRATION

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Lic. No.15755
5/17/2016
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

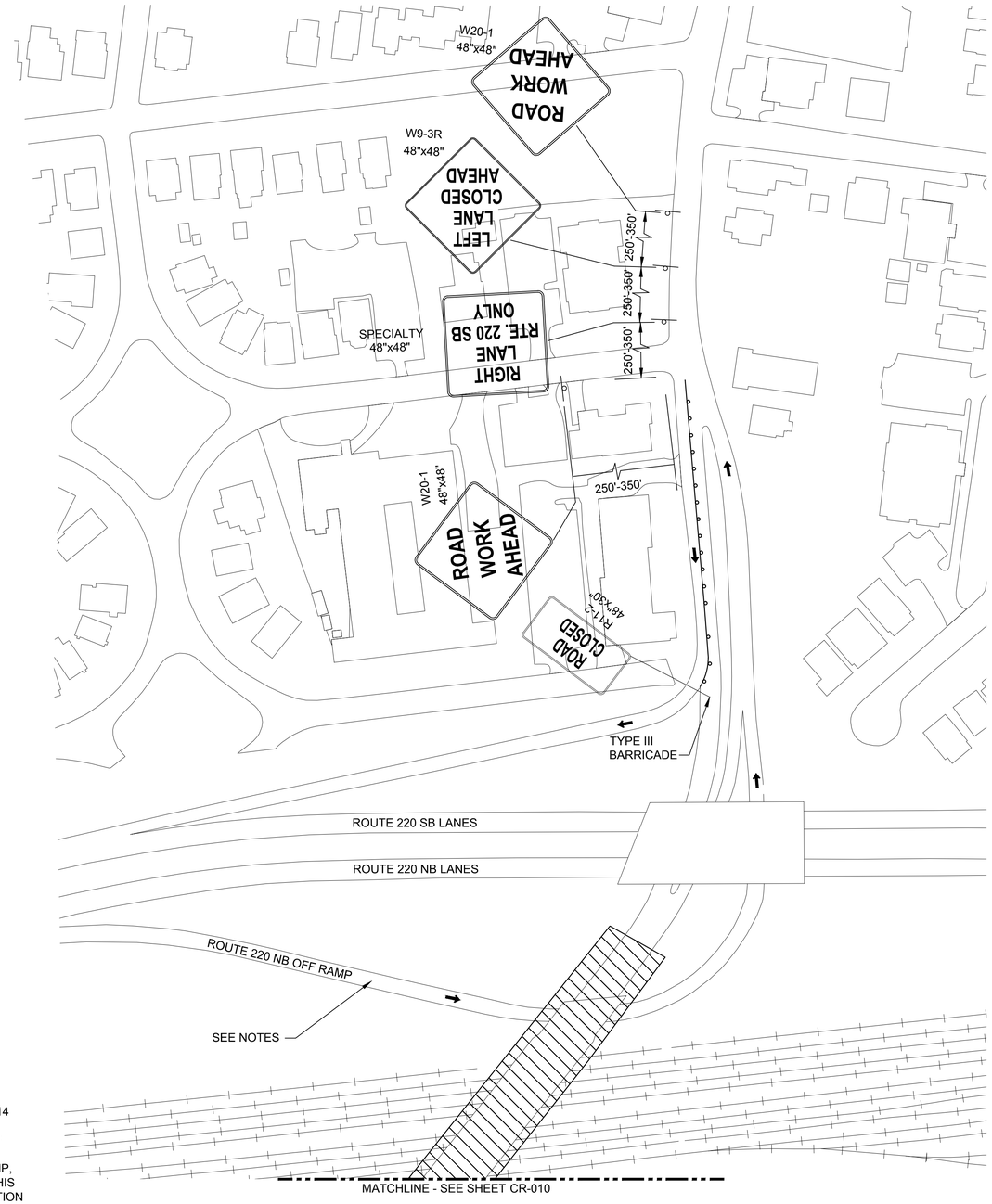
SHEET TITLE

DETOUR SHEET

SHEET NUMBER

CR-010

ANSI D 22" x 34"



NOTES:

1. SEE SHEET CR-009 FOR CONSTRUCTION DETOUR AND DETOUR SIGNAGE.
2. THE CONTRACTOR SHALL ENDEAVOR TO MAINTAIN A MINIMUM TRAVEL WAY WIDTH OF 14 FEET ON THE ROUTE 220 NB OFF-RAMP WHILE THE RAMP IS OPEN TO TRAFFIC. ANY REDUCTION OF THE EXISTING TRAVEL WIDTH SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE VIRGINIA WORK AREA PROTECTION MANUAL.
3. PRIOR TO ANY TEMPORARY CLOSURE OR RESTRICTION OF THE ROUTE 220 NB OFF RAMP, THE CONTRACTOR SHALL PREPARE AND SUBMIT A MAINTENANCE OF TRAFFIC PLAN. THIS PLAN SHALL BE DEVELOPED IN ACCORDANCE WITH THE VIRGINIA WORK AREA PROTECTION MANUAL AND SHALL INCORPORATE PORTABLE CHANGEABLE MESSAGE SIGNS ON ROUTE 220 NB. THE PLAN SHALL INCLUDE DETAILS OF PROPOSED SIGNAGE AND SCHEDULE OF OPERATIONS, AND SHALL BE SUBMITTED SIX WEEKS PRIOR TO THE PLANNED IMPLEMENTATION.
4. ALL GROUP II CHANNELIZING DEVICES SHALL INCLUDE A TYPE A WARNING LIGHT FOR NIGHT TIME VISIBILITY.

LEGEND

- ∘ DENOTES GROUP II CHANNELIZING DEVICE
  40' SPACING O.C. TRAVELWAY
  20' SPACING O.C. TRANSITION
- CONSTRUCTION ZONE
- → DENOTES TRAFFIC FLOW

N

0 1000' 2000'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
215 Church Avenue, SW
Room 350
Roanoke, VA 24011

CONSULTANT

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10 South Jefferson Street
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Roanoke, Virginia 24011
540.857.3100 tel
www.aecom.com

REGISTRATION

COMMONWEALTH OF VIRGINIA
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KEY PLAN

PROJECT NUMBER

60290893

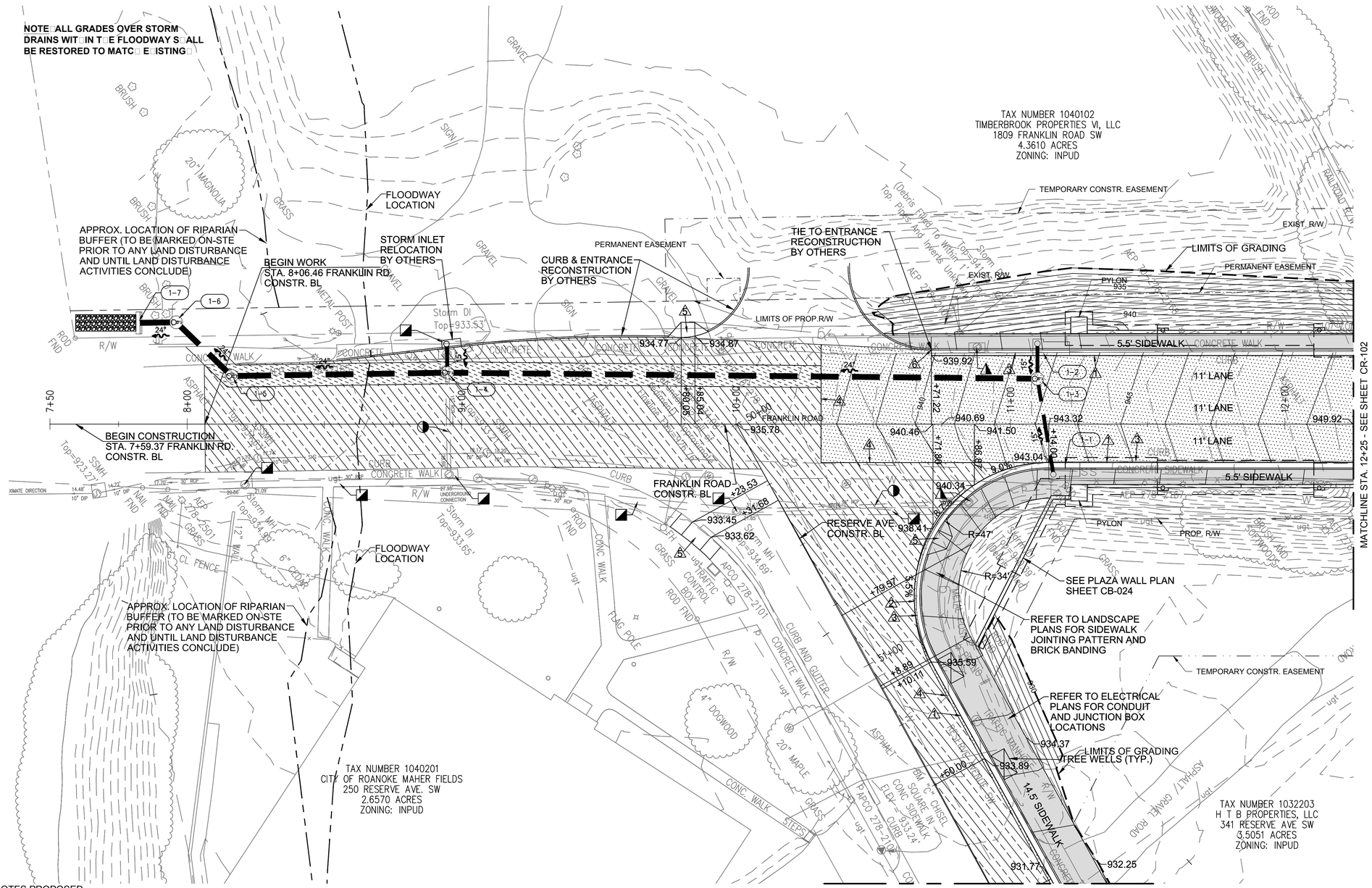
SHEET TITLE

DETOUR SHEET

SHEET NUMBER

CR-011

ANSI D 22" x 34"



DENOTES PROPOSED CONCRETE SIDEWALK

DENOTES PROPOSED PAVEMENT

DENOTES MILL & OVERLAY OF PAVEMENT

DENOTES FULL DEPTH PAVEMENT TO RE-ESTABLISH EXISTING GRADE & MILL & OVERLAY TO FINISHED GRADE

LEGEND

1. DENOTES ST'D COMB. CURB & GUTTER CG-6
2. DENOTES RADIAL COMB. CURB & GUTTER CG-6
3. DENOTES REMOVAL OF COMB. CURB & GUTTER
4. DENOTES SAWCUT REQ'D
5. DENOTES CG-12
6. DENOTES TIE TO EXIST. CURB & GUTTER
7. DENOTES ST'D CG-2
8. DENOTES TIE TO EXIST. CURB

ROADWAY PLAN

SCALE: 1" = 20'-0"

REFERENCES	
ROADWAY PROFILE	CR-101A
DRAINAGE PROFILES	CR-301
	CR-302
LANDSCAPE PLAN	L-101
LIGHTING PLAN	E-101

Drainage Legend

- To Be Removed
- To Remain
- To Remain & Be Cleaned Out
- To Be Abandoned

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

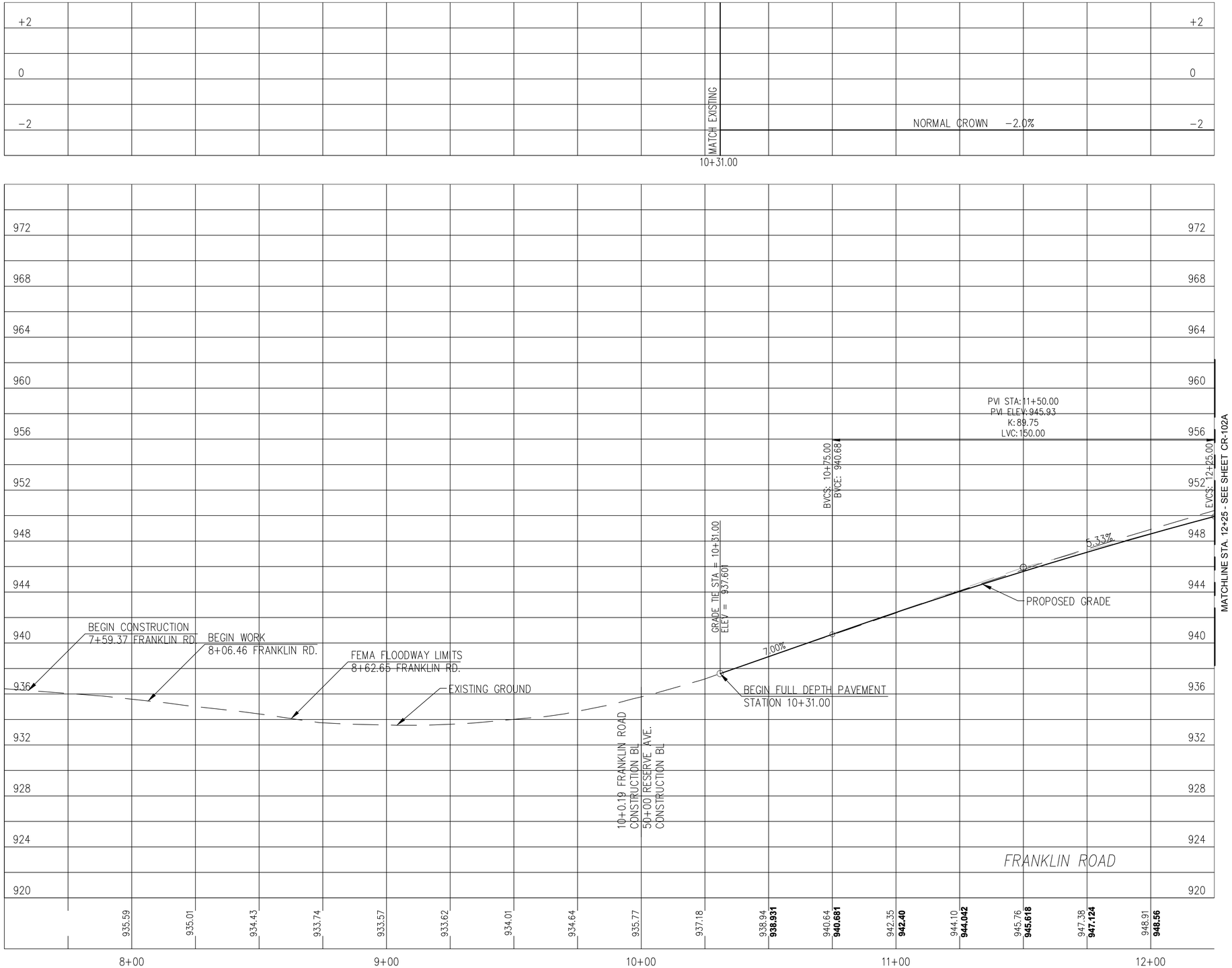
SHEET TITLE

ROADWAY PLAN

SHEET NUMBER

CR-101

ANSI D 22" x 34"



ROADWAY PROFILE

VERTICAL: 1"=4' 4' 2' 0 4' 8'

HORIZONTAL: 1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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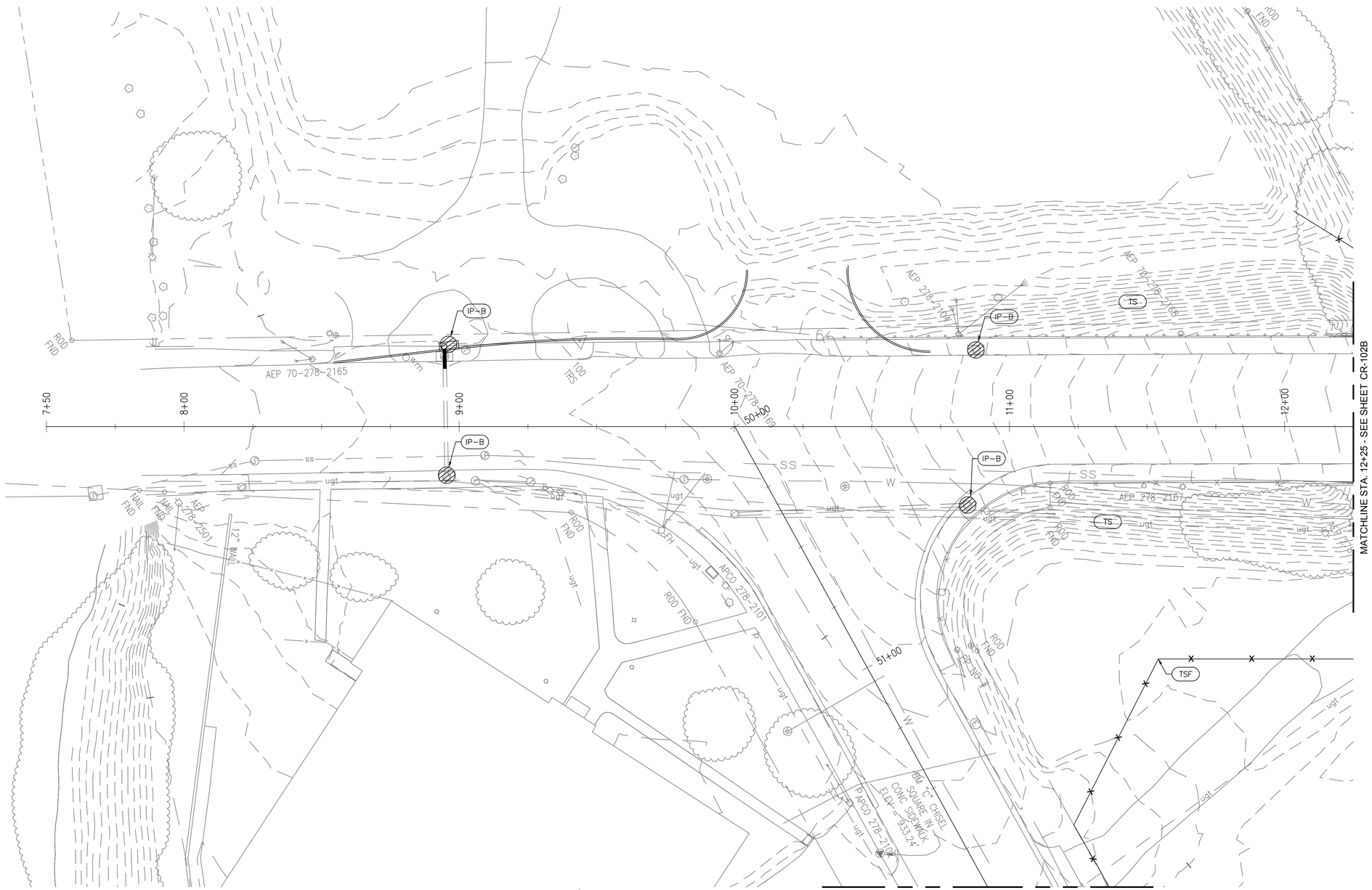
SHEET TITLE

ROADWAY PROFILE

SHEET NUMBER

CR-101A

ANSI D 22" X 34"



NOTES:

1. ALL TEMPORARY SILT FENCE THAT DOES NOT CONFLICT WITH EXISTING PAVEMENT IS TO BE INSTALLED AT THE BEGINNING OF EACH STAGE OF CONSTRUCTION.

2. TEMPORARY SILT FENCE TO BE LEFT IN PLACE UNTIL GROUND DRAINING TOWARDS SILT FENCE IS STABILIZED.

3. IMMEDIATELY BEGIN GRADING OPERATIONS AFTER REMOVING GRASS AND TOPSOIL.

4. INSTALL INLET PROTECTION IMMEDIATELY FOLLOWING THE INSTALLATION OF DROP INLETS.

5. TEMPORARY SEEDING TO BE APPLIED WHEN FINAL ELEVATIONS CAN NOT BE REACHED IN A GIVEN PHASE OF CONSTRUCTION.

6. UPON COMPLETION OF GRADING TO FINAL ELEVATIONS, PERMANENT SEEDING SHOULD BE INSTALLED.

EROSION & SEDIMENT CONTROL PHASE I PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

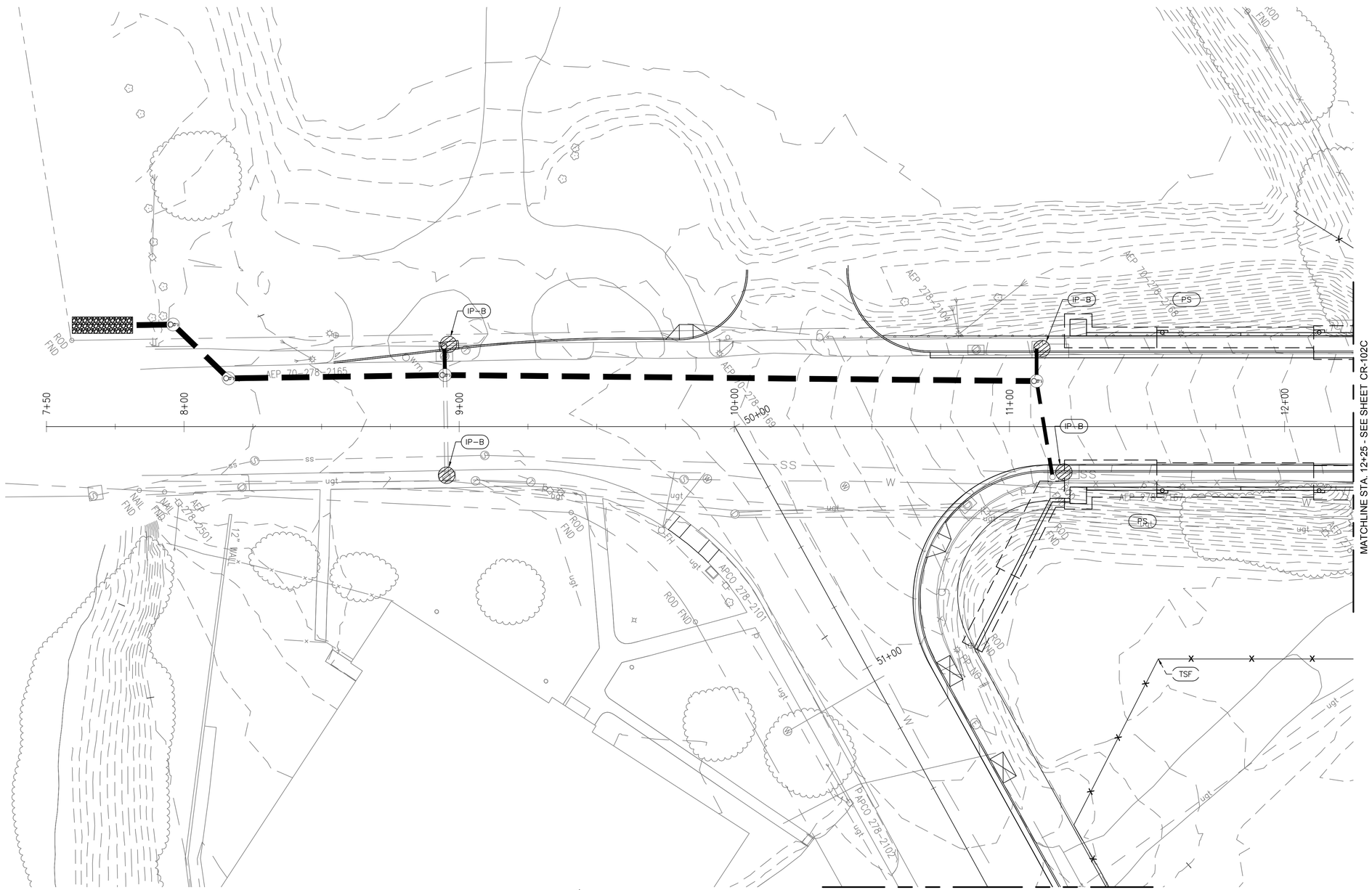
SHEET TITLE

EROSION & SEDIMENT CONTROL PHASE 1

SHEET NUMBER

CR-101B

ANSI D 22" X 34"



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EROSION & SEDIMENT CONTROL PHASE II PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

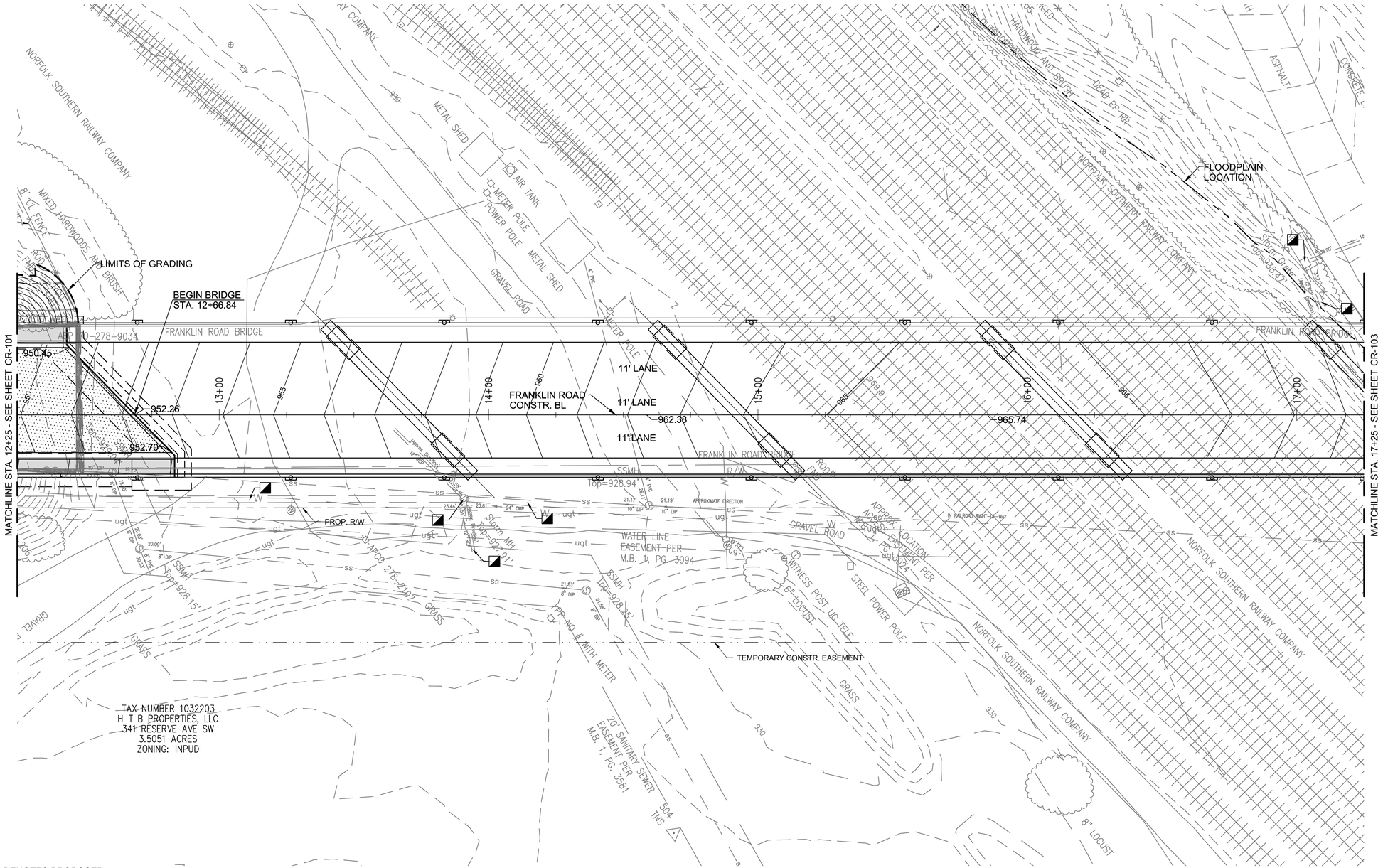
SHEET TITLE

EROSION & SEDIMENT CONTROL PHASE 2

SHEET NUMBER

CR-101C

ANSI D 22" X 34"



DENOTES PROPOSED CONCRETE SIDEWALK

DENOTES PROPOSED PAVEMENT

DENOTES MILL & OVERLAY OF PAVEMENT

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LEGEND

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3. DENOTES REMOVAL OF COMB. CURB & GUTTER
4. DENOTES SAWCUT REQ'D
5. DENOTES CG-12
6. DENOTES TIE TO EXIST. CURB & GUTTER
7. DENOTES ST'D CG-2
8. DENOTES TIE TO EXIST. CURB

ROADWAY PLAN

SCALE: 1" = 20'-0"

REFERENCES	
ROADWAY PROFILE	CR-102A
BRIDGE PLAN	CB-002

Drainage Legend

- To Be Removed
- To Remain
- To Remain & Be Cleaned Out
- To Be Abandoned

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

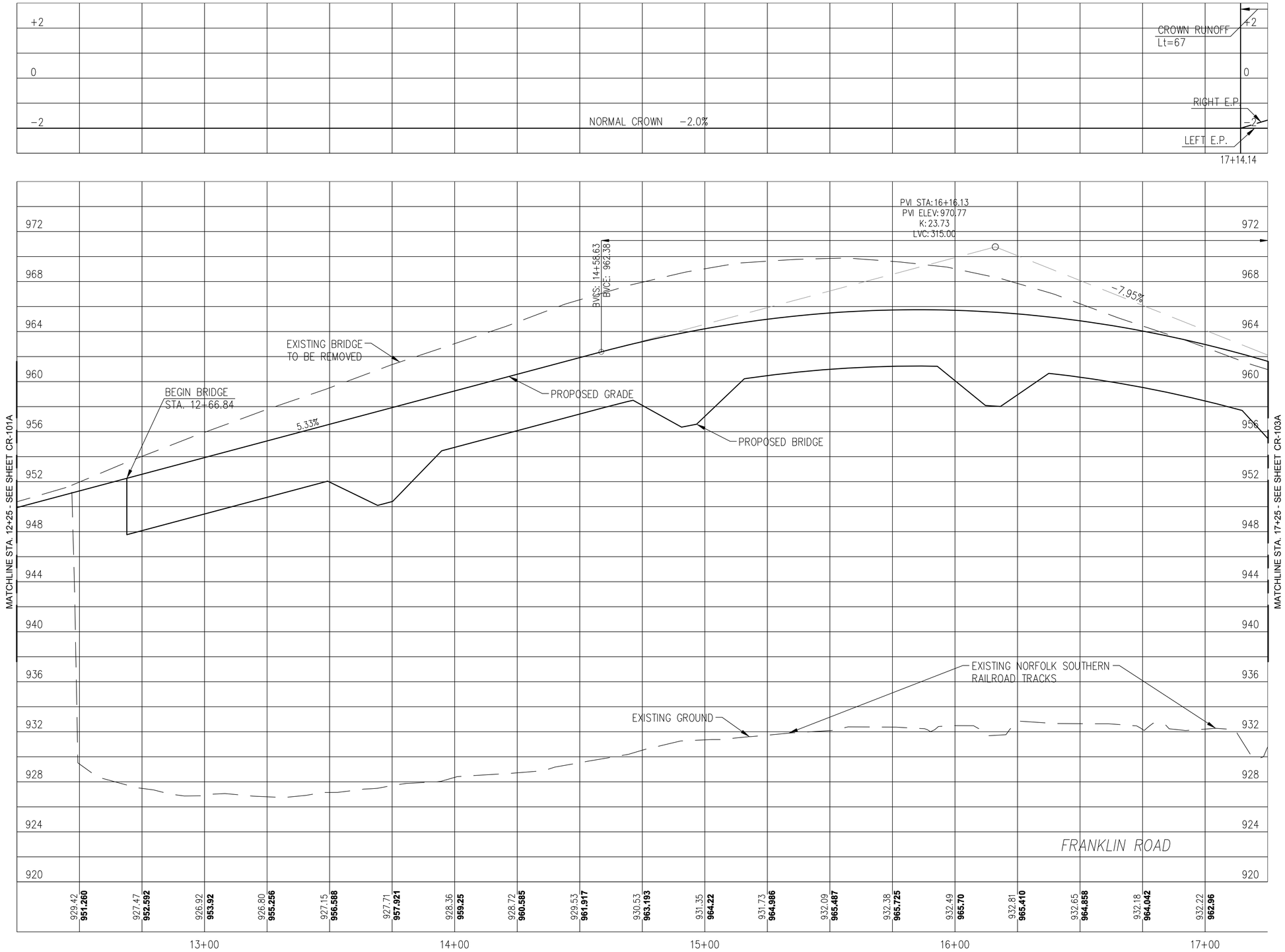
SHEET TITLE

ROADWAY PLAN

SHEET NUMBER

CR-102

ANSI D 22" X 34"



ROADWAY PROFILE

VERTICAL: 1"=4' 4' 2' 0 4' 8'

HORIZONTAL: 1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

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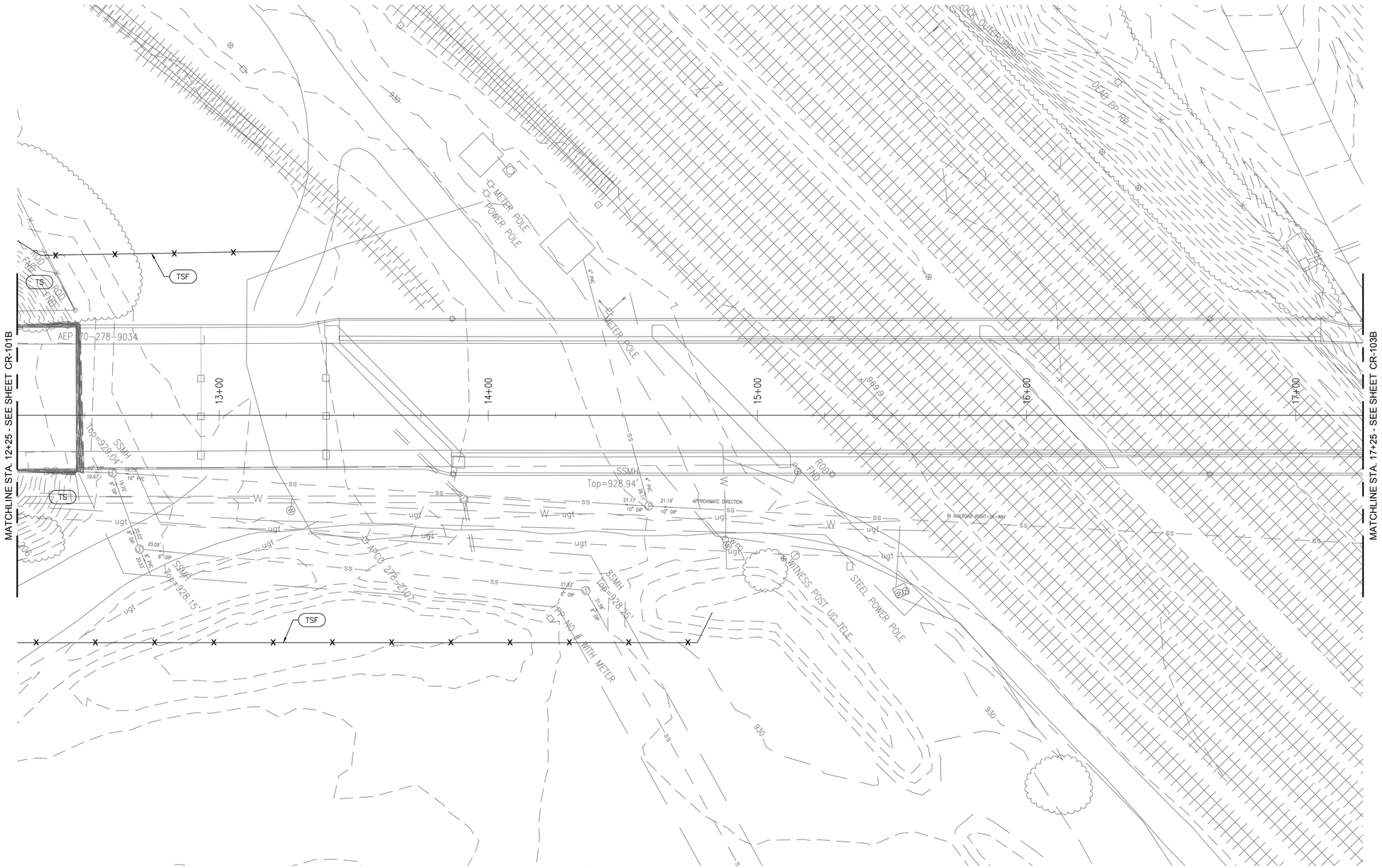
SHEET TITLE

ROADWAY PROFILE

SHEET NUMBER

CR-102A

ANSI D 22" x 34"



NOTES:

1. ALL TEMPORARY SILT FENCE THAT DOES NOT CONFLICT WITH EXISTING PAVEMENT IS TO BE INSTALLED AT THE BEGINNING OF EACH STAGE OF CONSTRUCTION.

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EROSION & SEDIMENT CONTROL PHASE I PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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CLIENT

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KEY PLAN

PROJECT NUMBER

60290893

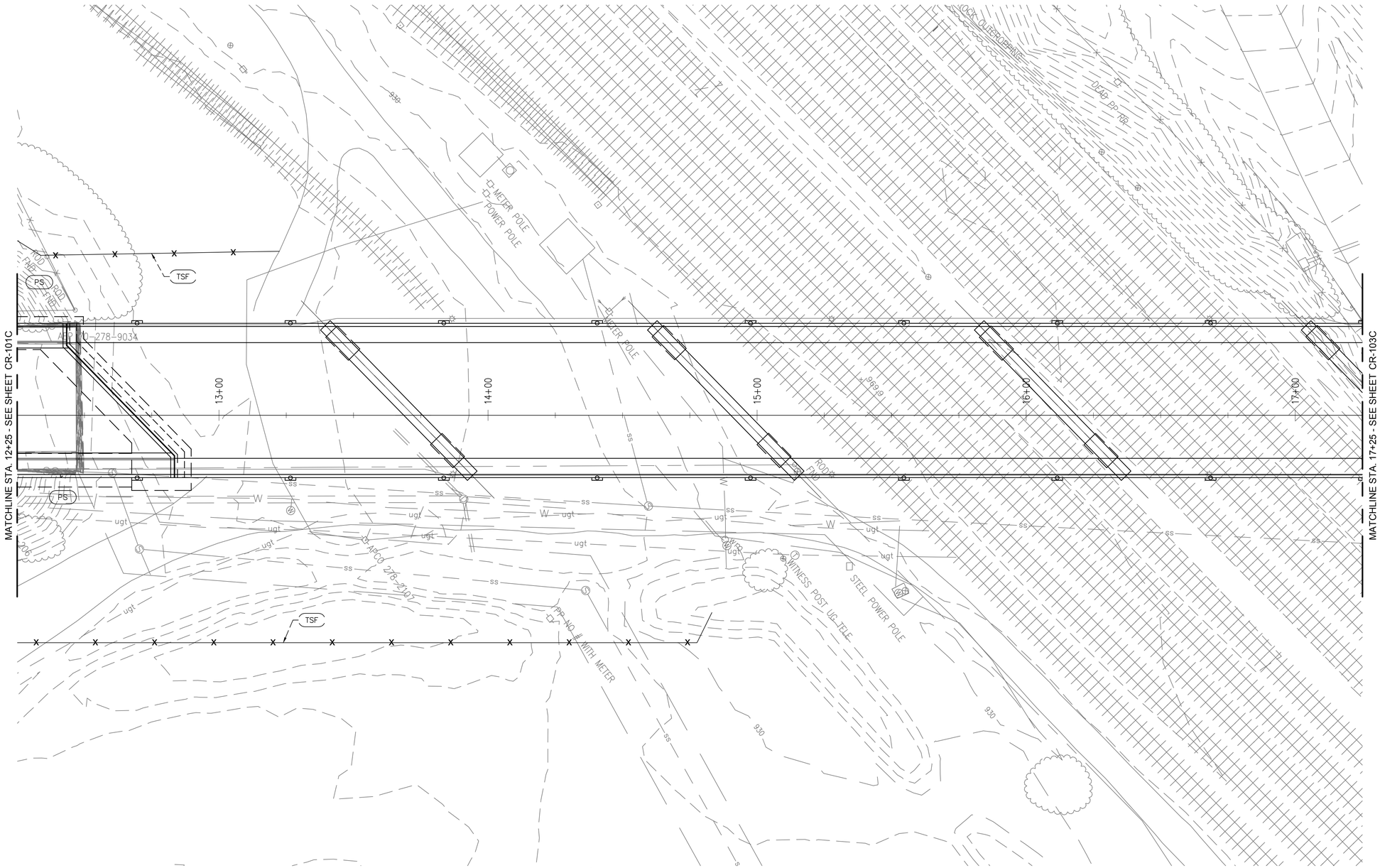
SHEET TITLE

EROSION & SEDIMENT CONTROL PHASE 1

SHEET NUMBER

CR-102B

ANSI D 22" X 34"



NOTES:

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EROSION & SEDIMENT CONTROL PHASE II PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

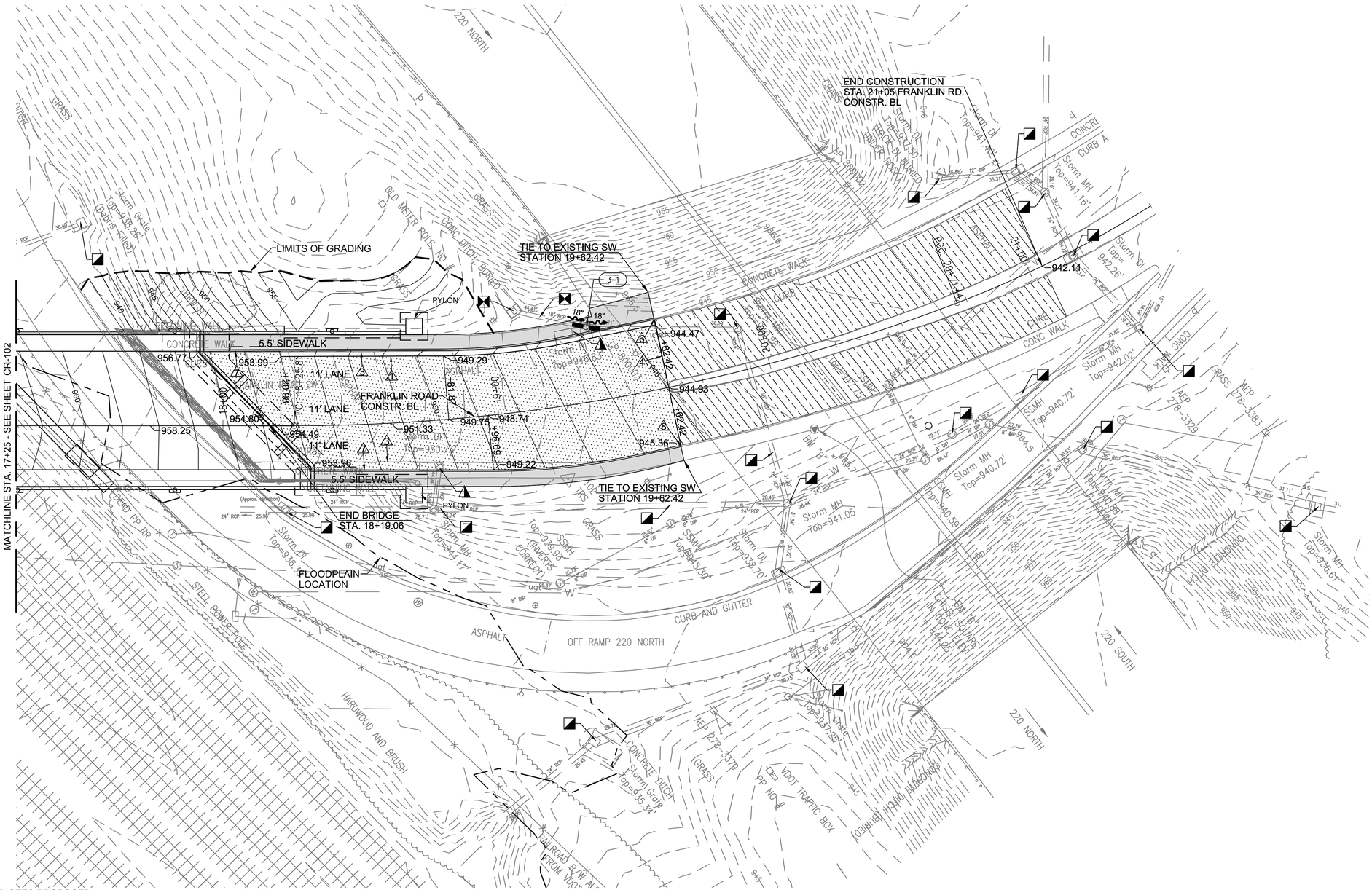
SHEET TITLE

EROSION & SEDIMENT CONTROL PHASE 2

SHEET NUMBER

CR-102C

ANSI D 22" x 34"



DENOTES PROPOSED CONCRETE SIDEWALK

DENOTES PROPOSED PAVEMENT

DENOTES MILL & OVERLAY OF PAVEMENT

DENOTES FULL DEPTH PAVEMENT TO RE-ESTABLISH EXISTING GRADE & MILL & OVERLAY TO FINISHED GRADE

LEGEND

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2. DENOTES RADIAL COMB. CURB & GUTTER CG-6
3. DENOTES REMOVAL OF COMB. CURB & GUTTER
4. DENOTES SAWCUT REQ'D
5. DENOTES CG-12
6. DENOTES TIE TO EXIST. CURB & GUTTER
7. DENOTES ST'D CG-2
8. DENOTES TIE TO EXIST. CURB

ROADWAY PLAN

SCALE: 1" = 20'-0"

REFERENCES	
ROADWAY PROFILE	CR-103A
DRAINAGE PROFILES	CR-303
BRIDGE PLAN	CB-002
LIGHTING PLAN	E-103

Drainage Legend

- To Be Removed
- To Remain
- To Remain & Be Cleaned Out
- To Be Abandoned

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

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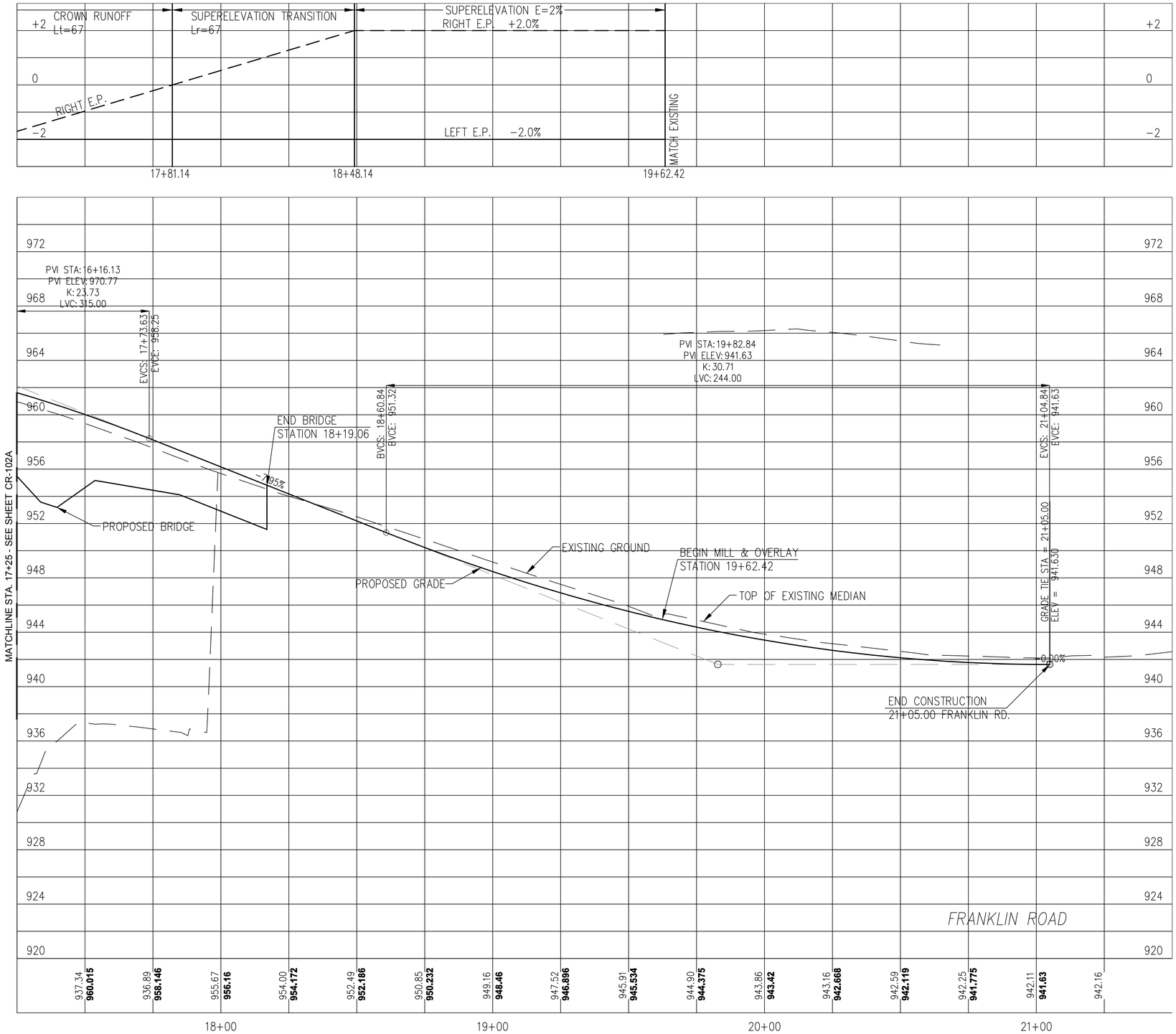
SHEET TITLE

ROADWAY PLAN

SHEET NUMBER

CR-103

ANSI D 22" x 34"



ROADWAY PROFILE

VERTICAL: 1"=4' 4' 2' 0 4' 8'

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GRAPHIC SCALES

AECOM

PROJECT

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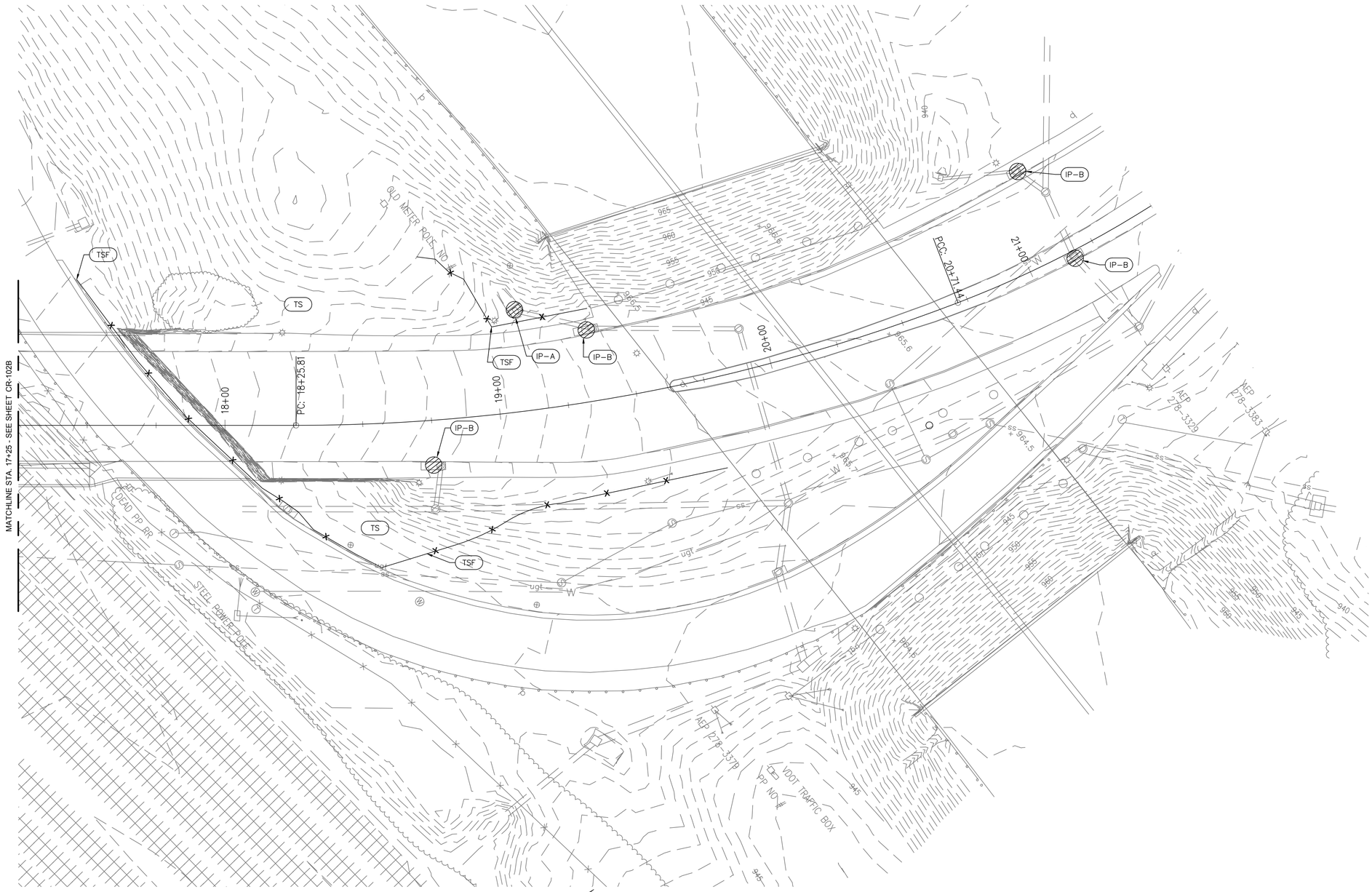
ROADWAY PROFILE

SHEET NUMBER

CR-103A

ANSI D 22" X 34"



NOTES:

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2. TEMPORARY SILT FENCE TO BE LEFT IN PLACE UNTIL GROUND DRAINING TOWARDS SILT FENCE IS STABILIZED.

3. IMMEDIATELY BEGIN GRADING OPERATIONS AFTER REMOVING GRASS AND TOPSOIL.

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EROSION & SEDIMENT CONTROL PHASE I PLAN

SCALE: 1" = 20'–0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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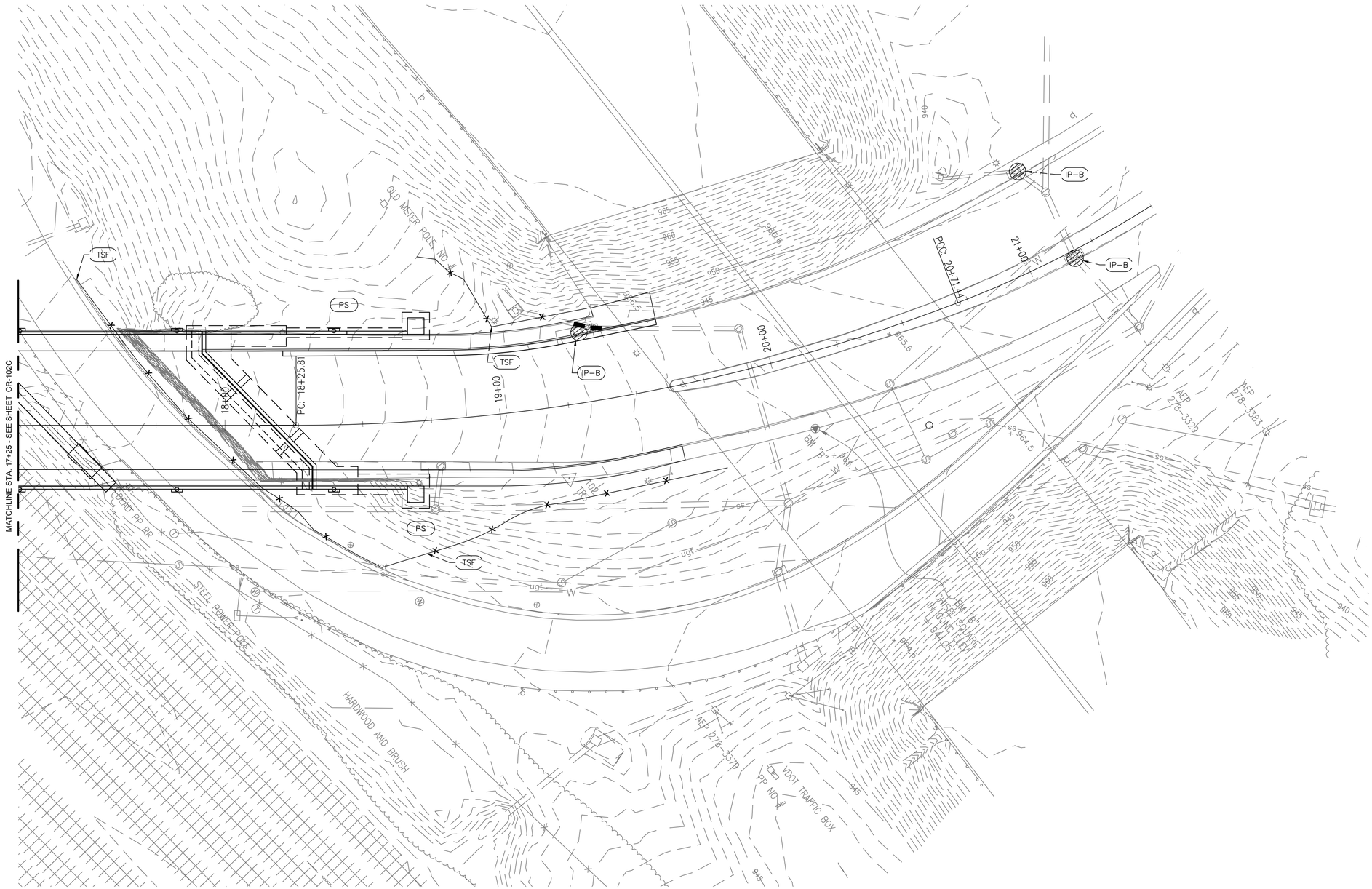
SHEET TITLE

EROSION & SEDIMENT CONTROL PHASE 1

SHEET NUMBER

CR-103B

ANSI D 22" X 34"



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EROSION & SEDIMENT CONTROL PHASE II PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
215 Church Avenue, SW
Room 350
Roanoke, VA 24011

CONSULTANT

AECOM
10 South Jefferson Street
Suite 1600
Roanoke, Virginia 24011
540.857.3100 tel
www.aecom.com

REGISTRATION

COMMONWEALTH OF VIRGINIA
JACK SCOTT HODGE
Lic. No.15755
5/17/2016
PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

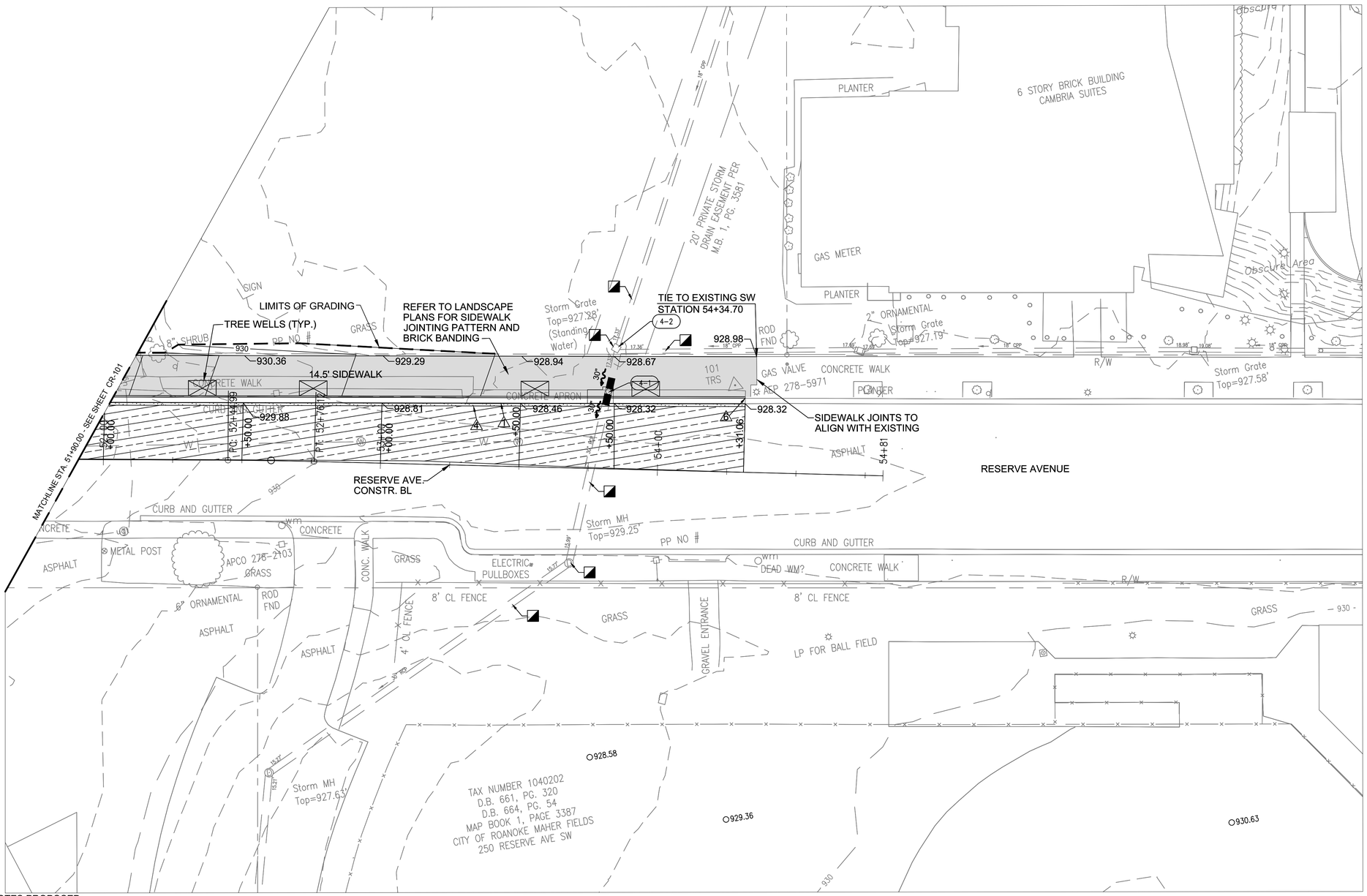
SHEET TITLE

EROSION & SEDIMENT CONTROL PHASE 2

SHEET NUMBER

CR-103C

ANSI D 22" X 34"



DENOTES PROPOSED CONCRETE SIDEWALK

DENOTES PROPOSED PAVEMENT

DENOTES MILL & OVERLAY OF PAVEMENT

DENOTES FULL DEPTH PAVEMENT TO RE-ESTABLISH EXISTING GRADE & MILL & OVERLAY TO FINISHED GRADE

LEGEND

1. DENOTES ST'D COMB. CURB & GUTTER CG-6
2. DENOTES RADIAL COMB. CURB & GUTTER CG-6
3. DENOTES REMOVAL OF COMB. CURB & GUTTER
4. DENOTES SAWCUT REQ'D
5. DENOTES CG-12
6. DENOTES TIE TO EXIST. CURB & GUTTER
7. DENOTES ST'D CG-2
8. DENOTES TIE TO EXIST. CURB

ROADWAY PLAN

SCALE: 1" = 20'-0"

REFERENCES	
ROADWAY PROFILE	CR-104A
DRAINAGE PROFILES	CR-303
LANDSCAPE PLAN	L-102
LIGHTING PLAN	E-102

Drainage Legend

- To Be Removed
- To Remain
- To Remain & Be Cleaned Out
- To Be Abandoned

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

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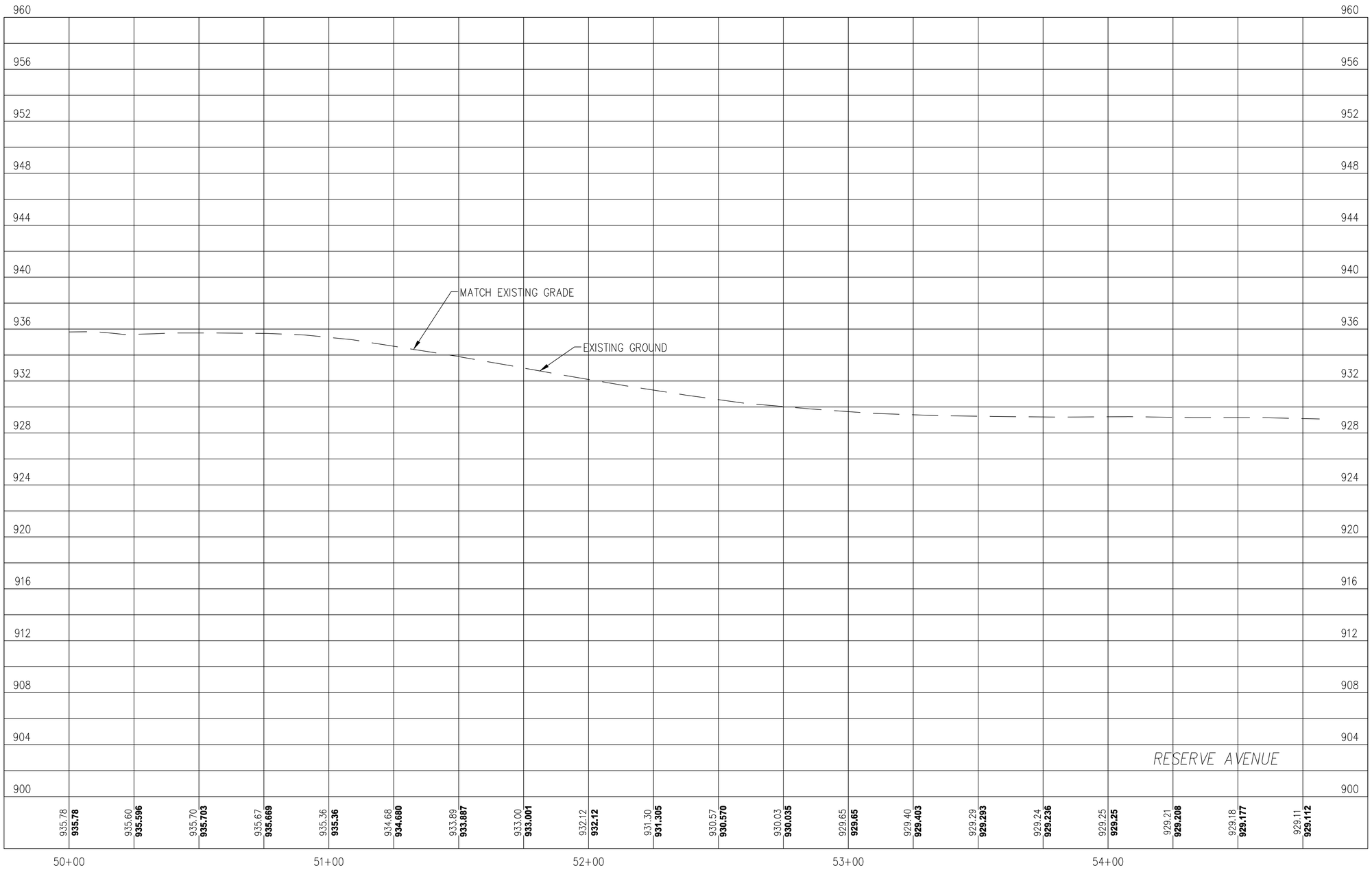
SHEET TITLE

ROADWAY PLAN

SHEET NUMBER

CR-104

ANSI D 22" X 34"



ROADWAY PROFILE

VERTICAL: 1"=4' 4' 2' 0 4' 8'

HORIZONTAL: 1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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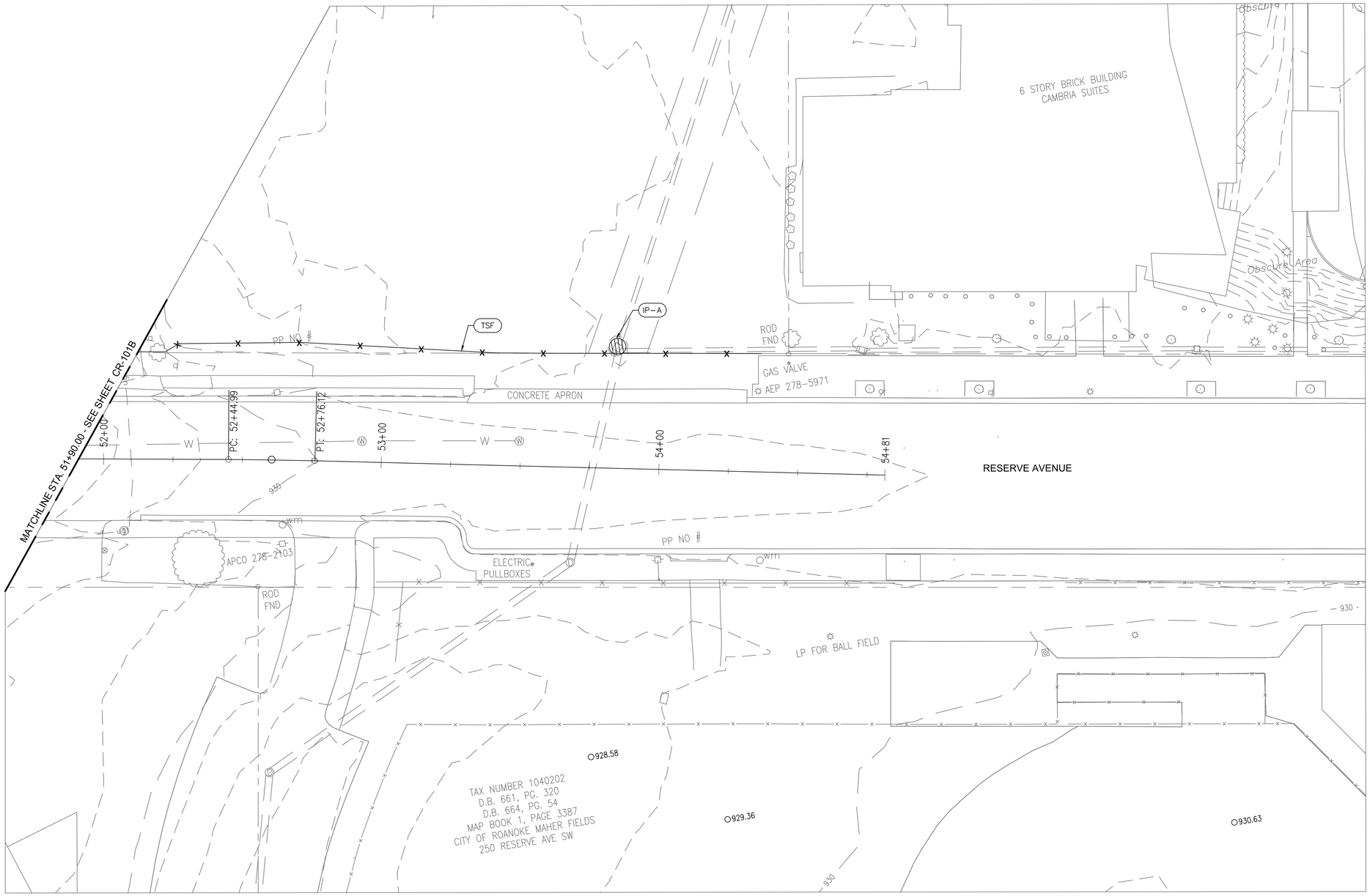
SHEET TITLE

ROADWAY PROFILE

SHEET NUMBER

CR-104A

ANSI D 22" X 34"



NOTES:

1. ALL TEMPORARY SILT FENCE THAT DOES NOT CONFLICT WITH EXISTING PAVEMENT IS TO BE INSTALLED AT THE BEGINNING OF EACH STAGE OF CONSTRUCTION.

2. TEMPORARY SILT FENCE TO BE LEFT IN PLACE UNTIL GROUND DRAINING TOWARDS SILT FENCE IS STABILIZED.

3. IMMEDIATELY BEGIN GRADING OPERATIONS AFTER REMOVING GRASS AND TOPSOIL.

4. INSTALL INLET PROTECTION IMMEDIATELY FOLLOWING THE INSTALLATION OF DROP INLETS.

5. TEMPORARY SEEDING TO BE APPLIED WHEN FINAL ELEVATIONS CAN NOT BE REACHED IN A GIVEN PHASE OF CONSTRUCTION.

6. UPON COMPLETION OF GRADING TO FINAL ELEVATIONS, PERMANENT SEEDING SHOULD BE INSTALLED.

EROSION & SEDIMENT CONTROL PHASE I PLAN

SCALE: 1" = 20'-0"

20' 10' 0 20' 40'
1"=20'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

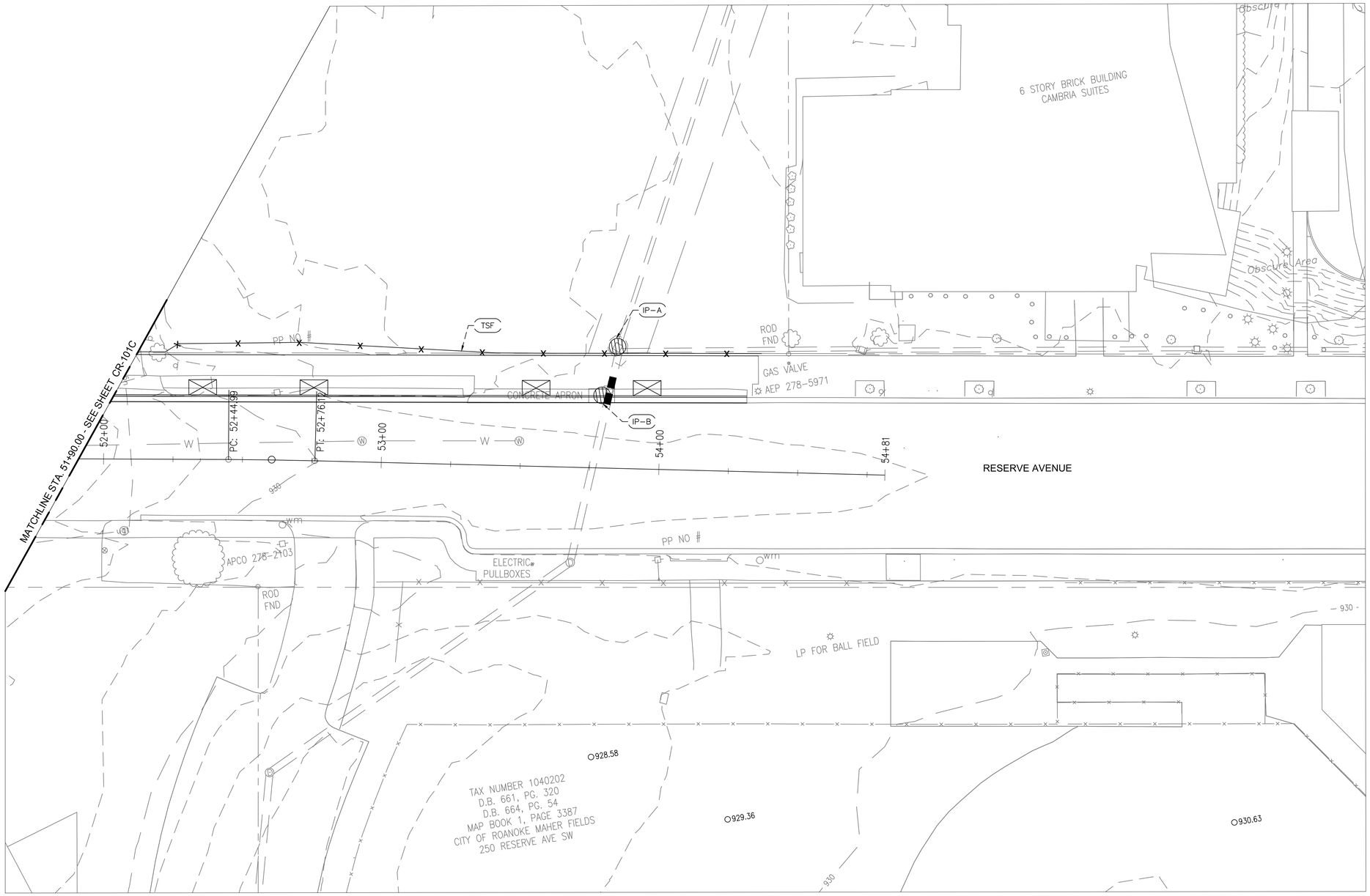
SHEET TITLE

EROSION & SEDIMENT CONTROL PHASE 1

SHEET NUMBER

CR-104B

ANSI D 22" X 34"



NOTES:

1. ALL TEMPORARY SILT FENCE THAT DOES NOT CONFLICT WITH EXISTING PAVEMENT IS TO BE INSTALLED AT THE BEGINNING OF EACH STAGE OF CONSTRUCTION.

2. TEMPORARY SILT FENCE TO BE LEFT IN PLACE UNTIL GROUND DRAINING TOWARDS SILT FENCE IS STABILIZED.

3. IMMEDIATELY BEGIN GRADING OPERATIONS AFTER REMOVING GRASS AND TOPSOIL.

4. INSTALL INLET PROTECTION IMMEDIATELY FOLLOWING THE INSTALLATION OF DROP INLETS.

5. TEMPORARY SEEDING TO BE APPLIED WHEN FINAL ELEVATIONS CAN NOT BE REACHED IN A GIVEN PHASE OF CONSTRUCTION.

6. UPON COMPLETION OF GRADING TO FINAL ELEVATIONS, PERMANENT SEEDING SHOULD BE INSTALLED.

EROSION & SEDIMENT CONTROL PHASE II PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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KEY PLAN

PROJECT NUMBER

60290893

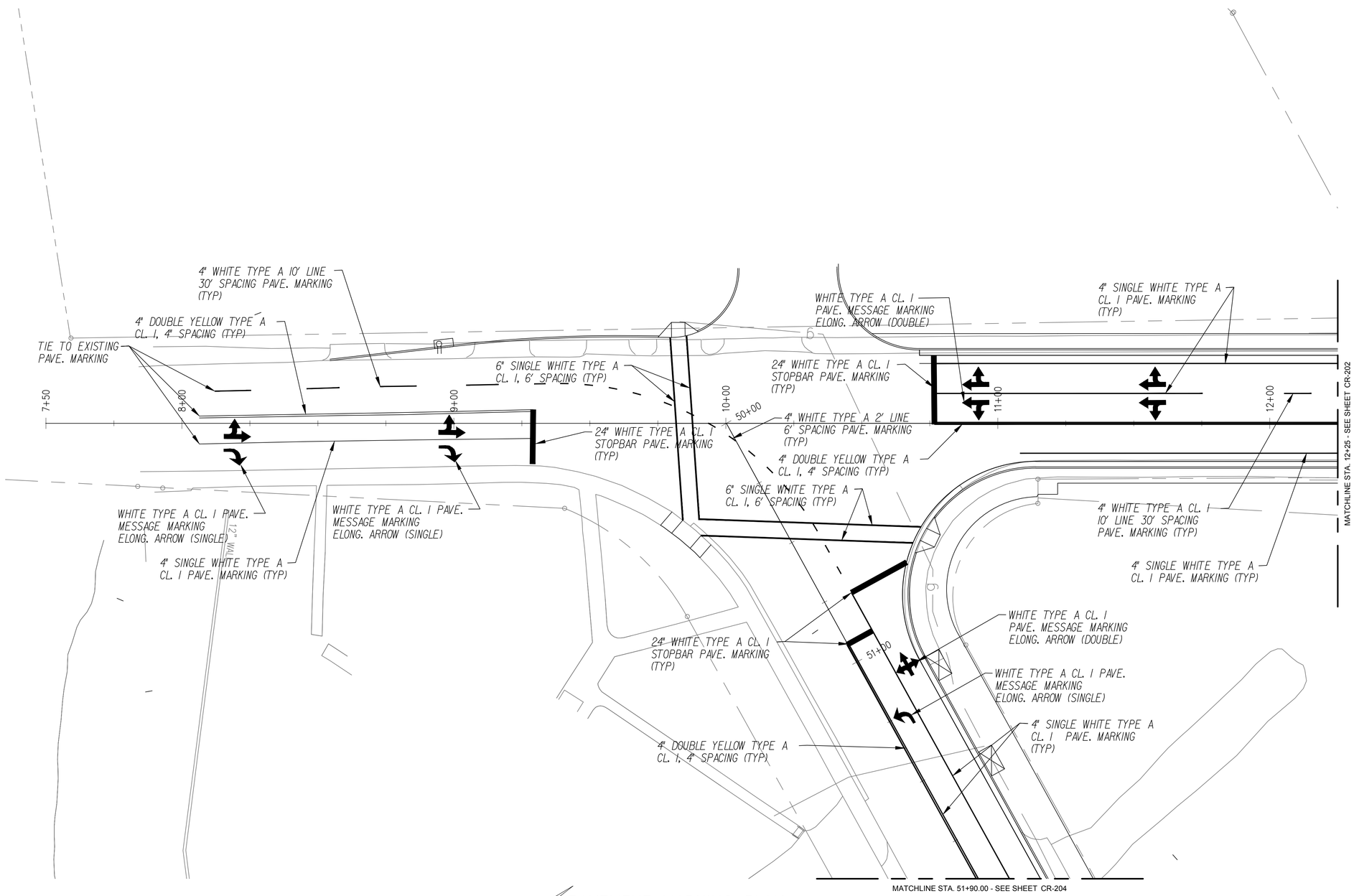
SHEET TITLE

EROSION & SEDIMENT CONTROL PHASE 2

SHEET NUMBER

CR-104C

ANSI D 22" X 34"



PAVEMENT MARKING PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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KEY PLAN

PROJECT NUMBER

60290893

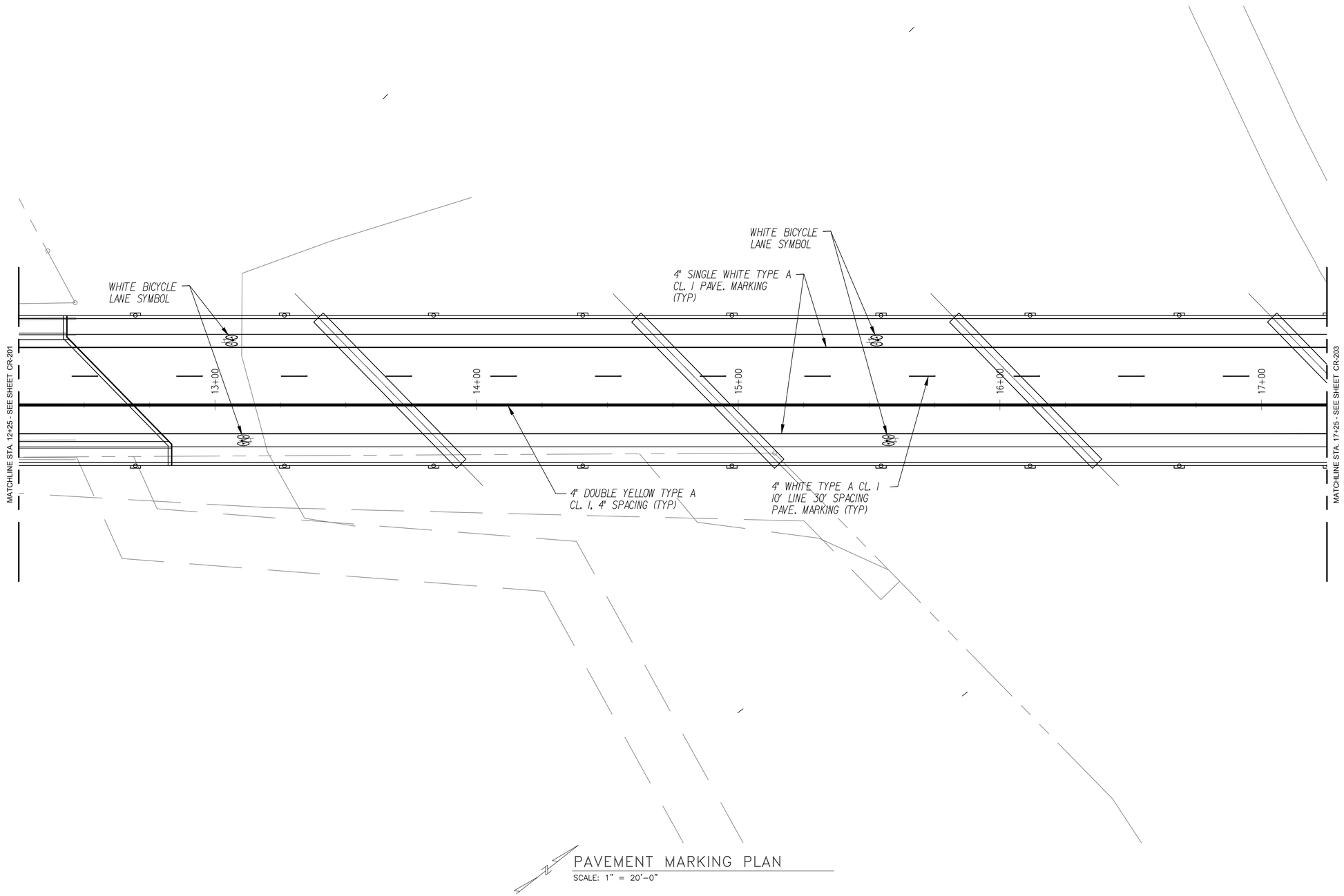
SHEET TITLE

PAVEMENT MARKING PLAN

SHEET NUMBER

CR-201

ANSI D 22" X 34"



PAVEMENT MARKING PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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KEY PLAN

PROJECT NUMBER

60290893

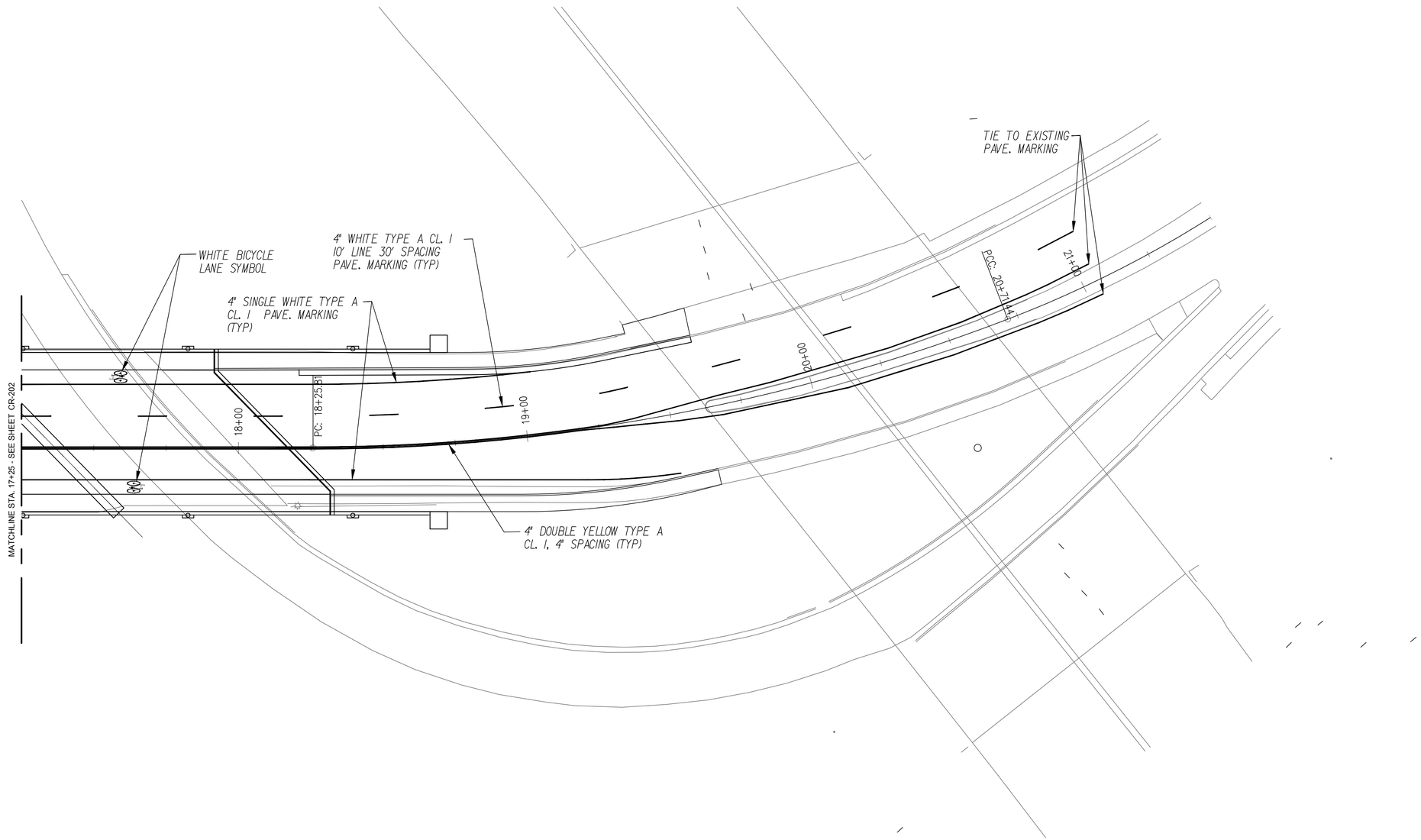
SHEET TITLE

PAVEMENT MARKING PLAN

SHEET NUMBER

CR-202

ANSI D 22" X 34"



PAVEMENT MARKING PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

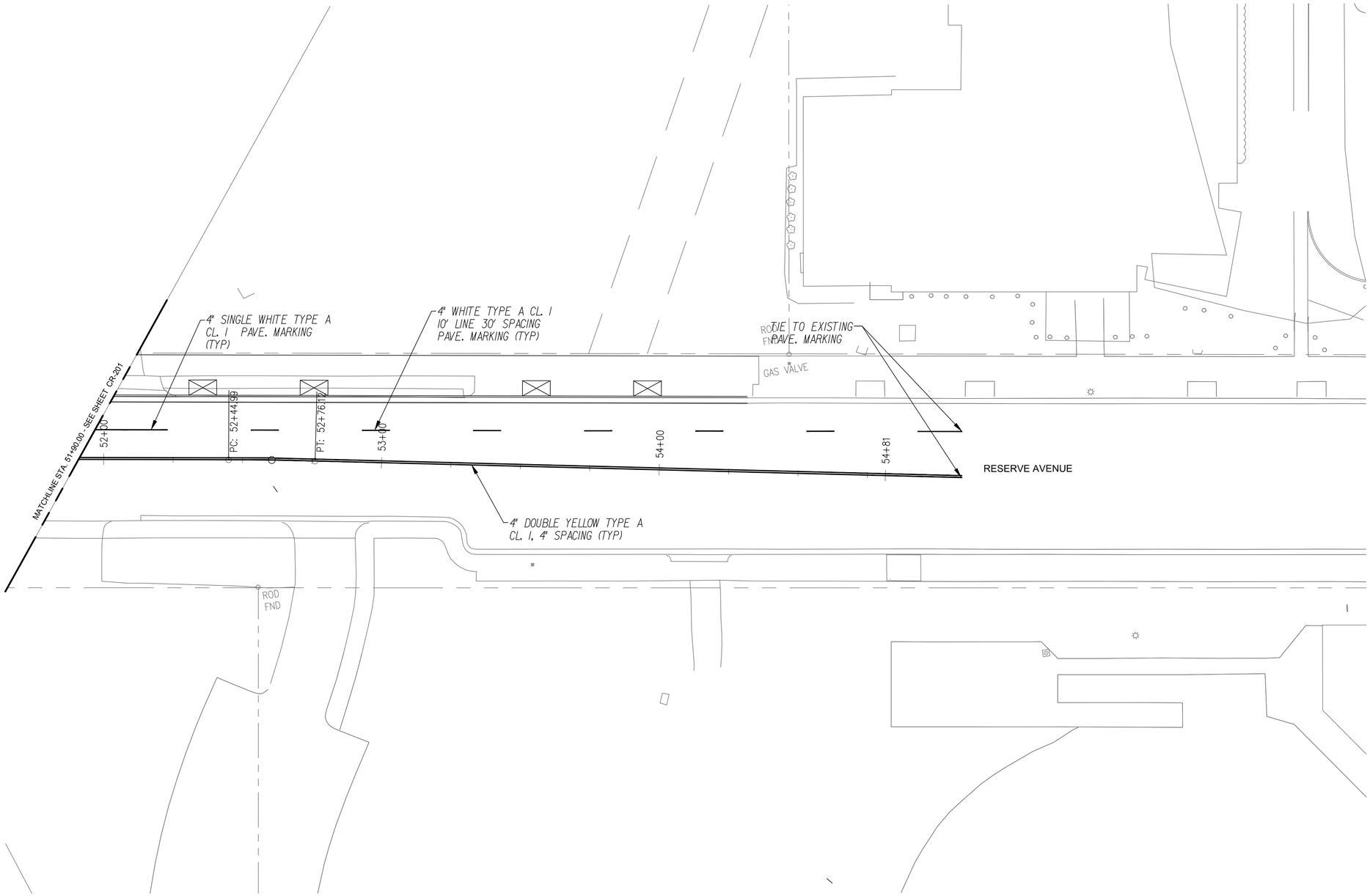
SHEET TITLE

PAVEMENT MARKING PLAN

SHEET NUMBER

CR-203

ANSI D 22" X 34"



PAVEMENT MARKING PLAN

SCALE: 1" = 20'-0"

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

PAVEMENT MARKING PLAN

SHEET NUMBER

CR-204

ANSI D 22" X 34"

GENERAL NOTES - TRAFFIC SIGNALS

1. All traffic signal equipment, mast arm poles and foundations shall conform to Virginia Department of Transportation (VDOT) Road and Bridge Standards Volume II (Latest Edition), Virginia Department of Transportation (VDOT) Road and Bridge Specifications (Latest Edition) and Section 703 (Signals).

2. See VDOT Special Provision "Signal Poles", August 1, 2012. Luminaire heads shall be cut-off style.

3. Mast arm pole foundations shall conform to VDOT PF-8. Final foundation depth to be furnished by the contractor and submitted to City of Roanoke for approval.

4. Conductor cable, conduit, trench excavation, saw cut, and signal junction boxes shall conform to Virginia Department of Transportation (VDOT) Road and Bridge Standards Volume II.

5. The location of all existing underground or overhead utilities should be considered approximate. The Contractor shall be responsible for the definite location of each utility involved within the area of excavation for work under this contract. The contractor shall call MISS UTILITY OF VIRGINIA (1-800-552-1007) before beginning work. Where conflicts occur, the Contractor shall contact the City of Roanoke Traffic Engineer prior to beginning work.

6. All signal heads shall be mounted in accordance with VDOT SM-3 with black metal backplates. All traffic signal heads shall be LED 12 inch and include full-visors on turn indications and cap-visors on through indications. Signal head assembly color shall be Black. The preferred source is McCain or approved equal.

7. It shall be the sole responsibility of the contractor to furnish and maintain, until the work has been accepted by City of Roanoke, any and all signs, lights, barricades, flagmen, etc., necessary for the safety of the general public, including both vehicular and pedestrian traffic. All costs for the maintenance of traffic shall be included in the lump sum bid item. Maintenance of traffic shall be done according to the Virginia Work Area Protection Manual (Latest Edition).

8. All damages to existing structures, facilities, pavement, grassed areas, etc., shall be restored to existing condition by the Contractor at his expense.

9. Signal heads shall have LED indications. The LED display characteristics of balls and arrows shall present the appearance of incandescent-type bulbs (uniform appearance) rather than discrete points of light. The preferred source is Dialight or approved equal.

10. The contractor shall contact City of Roanoke Traffic Engineer (540-853-2686) at least 72 hours prior to beginning work.

11. Pole location shall be installed within 24 inches of the point as shown on the plan. Contractor shall stake and field verify with MISS UTILITY OF VIRGINIA the pole location before ordering poles and arms. The City of Roanoke Traffic Engineer or his designee shall approve staked pole location prior to construction.

12. Emergency Preemption equipment shall be Global Traffic Technologies (GTT) Opticom system.

13. The pole supplier shall furnish to City of Roanoke shop drawings and calculations for all poles and foundations.

14. Shop drawings must be approved by City of Roanoke before Contractor orders poles/equipment.

15. The Contractor shall verify the elevations of all underground utilities to be crossed prior to directional boring of conduits. The Contractor shall hand-dig when crossing water lines, gas lines, sewer force mains and other underground utilities.

16. All underground conduit shall be installed in accordance with VDOT Standard ECI-1 and ECI-2.

17. All U-bolts, nuts, and washers shall be stainless steel. All plate material shall be galvanized.

18. Conduit entering junction boxes shall not extend over 3 inches maximum or 2 inches minimum and shall be fitted with bell ends or bushings.

19. The contractor will permanently mark each cabinet and pole foundation indicating the location of all conduits that are cast in the foundation. The markings will consist of an arrow four to six inches long with a letter designation as follows:
   (S) – spare conduits:
   (T) – conduits with signal, lighting or detection cables:
   (E) – conduits with electrical service conductors for the traffic signal:
   (G) – conduits for grounding conductors.

The contractor shall mark PF-8 and the foundation depth of the foundation. The markings shall be etched with a trowel one quarter inch deep into the concrete while the concrete is being finished.

20. System bond wire is required only if the conduit is non-metallic. Payment shall be incidental to conduit cost.

21. All conduits stubbed from junction boxes and foundations must extend a minimum of 6 inches beyond the box or foundation and must be capped.

22. Conduit and Junction Boxes as shown in the plan may be shifted in location to accommodate field conditions. All equipment shall be placed within the right-of-way.

23. Traffic Signal Controller and Cabinet shall be fully compatible with PEEK control equipment (PEEK ATC-1000 TS2 Type 1 Controller, PEEK TS2 Type 1 Cabinet, and CF-1 Controller Foundation).

24. All existing pavement markings to remain shall be refreshed from stop bar to 150 feet back from stop bar. Eradication of pavement markings must be done by grinding.

25. Video detection system shall be GridSmart 360 Camera System and will include two camera inputs and traffic volume count module. Video cable shall consist of CAT 5 Cable – no coax needed.

26. Uninterruptible Power Supply, this system shall be installed in its own cabinet directly adjacent to the controller cabinet, shall be CLARY SP Series UPS, or approved equal. All UPS equipment is to be installed in an auxiliary cabinet "piggy-backed" to the side of the main cabinet. The conduits for cabinet pad shall be configured to allow for a minimum floor space of 28 inches wide by 12 inches deep for the two UPS batteries. Cabinet door hinge shall be located on the left side of the pod and UPS shall be installed on the left side of the controller cabinet (facing cabinet).

27. Upon completion of the traffic signal installation, the Contractor shall place the as-built signal plan in the signal cabinet.

28. Contractor shall conform to VDOT's Traffic Engineering Design Manual.

29. Contractor shall ensure that signal pole foundation bearing splays do not intersect existing or proposed utilities.

30. Contractor shall locate detector height per the Manufacturer's mounting chart for horizontal setback and number of lanes to be detected.

31. Contractor shall align detector mounting angle per the Manufacturer's installation guide with respect of height, horizontal setback, and number of lanes detected.

32. Contractor shall attach detector to pole in NESC compliance relative to other utility attachments.

33. The electrical service shall be installed in accordance with Standard SE-5.

34. East bound approach signal heads are to be purchased and delivered to the City of Roanoke Signal Shop for future installation.

35. Contractor shall notify the City of Roanoke Traffic Engineer within three business days of completion of work. All signal equipment must be inspected and approved by the City of Roanoke Traffic Engineer prior to implementation. The City shall have thirty days to inspect the installation of the traffic signal equipment. If any malfunctions or errors on the signal operation or signal installation are found during this period, it will be the responsibility of the Contractor to correct it.

36. The City of Roanoke will provide signal timing.

37. The new traffic signal cabinet and controller shall be delivered directly to the City of Roanoke Signal Shop and shall be picked up by the contractor prior to installation.

38. Traffic signalization will be paid at the contract lump sum price. This price shall be full compensation for all work required to provide and install new working traffic signals, including all labor, materials and equipment needed to complete the work described in these plans. This work will include, but may not be limited to, controllers and equipment, concrete foundations, foundation investigation, foundation design and plan submission, electrical service connections, signal heads, mast arms and poles, luminaries, hanger assemblies, ups battery and hardware, video detection equipment, emergency preemption equipment, conductors, cables, bored and trenched conduits, excavation and backfill, radio transceivers, antenna equipment, junction boxes, electrical grounding, sign panels, pedestrian facilities, and other details shown in the plans.

STANDARD TRAFFIC SIGNAL LEGEND

PLAN ITEM		PLAN SYMBOL PROPOSED	PLAN SYMBOL EXISTING
Metal Signal Pole & Foundation and Mast Arm (As noted in Signal Pole Legend)			
Pedestal Pole and Foundation (St'd. PF-2)			
Pedestal Pole and Foundation (St'd. PA-3)			
Traffic Signal Head	w/ Backplate		
	w/o Backplate		
Pedestrian Signal Head			
Pedestrian Pushbutton & Sign		P.B.	P.B.
Traffic Signal Sign	Mast Arm or Span Wire Mt'd.		
	Pole Mounted		E
Emergency Vehicle Pre-emption (EVP) Sensor			
	w/ Conf. Light		
	w/o Conf. Light		
Video Detection Camera			
Junction Box (St'd. as noted on plans)		J	J
Signal Luminaire (250 W) and Arm			
Signal Luminaire (400 W) and Arm			
Loop Detector (Size as noted on plans)		6' x 20'	6' x 20'
Video Detection Zone (Size as noted on plans)		VDZ 6' x 20'	VDZ 6' x 20'
Conduit			

PLAN ITEM		PLAN SYMBOL PROPOSED	PLAN SYMBOL EXISTING
Electrical Service Meter		SM	SM
Electrical Service Safety Switch (Disconnect)		SD	SD
Controller Cabinet	Ground Mounted	CC	C
	Pole Mounted	CP	CP
Master Controller Cabinet	Ground Mounted	MC	MC
	Pole Mounted	MP	MP
Controller Cabinet & Foundation	Std. CF-1	CC 1	C 1
	Std. CF-3	CC 3	C 3
	Std. CF-4	CC 4	C 4
Master Controller Cabinet & Foundation	Std. CF-1	MC 1	MC 1
	Std. CF-3	MC 3	MC 3
	Std. CF-4	MC 4	MC 4

LABELS

Signal Pole or Controller	A	Proposed Signal Head	2	Signal Phasing	Ø2	Sign	S-1
Cable and Conduit	A	Existing Signal Head	2	Pedestrian Phasing	P2	Video Detection Camera	VDC-1
Junction Box	S3	Proposed Pedestrian Signal Head	P2			Emergency Preemption Detector	EVP-1
		Existing Pedestrian Signal Head	P2				

AECOM

PROJECT

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REGISTRATION

COMMONWEALTH OF VIRGINIA
5/17/16
STUART L. MARTIN
Lic. No.43891
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ISSUE REVISION

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

SIGNAL NOTES

SHEET NUMBER

CR-205

ANSI D 22" x 34"

Signal Pole & Controller Legend

(ALL DIMENSIONS ARE TO CENTER OF POLE)

(A) SIGNAL MAST ARM POLE (PF-8), TYPE IV
N 43440458.4158
E 132734280.1617
18' Luminaire Arm , 45° Angle to Franklin Rd.
AEL Autobahn ATB2 Roadway Luminaire 80BLEDE10 MVOLT R4 with LED Photocell and full cut-off, or approved equal meeting IES design criteria.
45' Arm, 90° Angle to Franklin Rd.
Signal Placements: 29', 39'
Sign Placement: 13', 43'
Emergency Preemption Detector/Confirmation Light: 33'
40' Arm, 0° Angle to Franklin Rd.
Signal Placements: 4',16', 30'
Sign Placement: 8', 12', 26'
Emergency Preemption Detector/Confirmation Light: 23'

(B) SIGNAL MAST ARM POLE (PF-8), TYPE IV
N 43439625.5246
E 132735063.0328
18' Luminaire Arm, 45° Angle to Franklin Rd.
AEL Autobahn ATB2 Roadway Luminaire 80BLEDE10 MVOLT R4 with LED Photocell and full cut-off, or approved equal meeting IES design criteria.
50' Arm, 90° Angle to Franklin Rd.
Signal Placements: 33', 43', 48'
Sign Placement: 17', 30'
Emergency Preemption Detector/Confirmation Light: 38'
58' Arm, 0° Angle to Franklin Rd.
Signal Placements: 30', 42'
Sign Placement: 16', 48'
Emergency Preemption Detector/Confirmation Light: 36'
2- SP-8 Pedestrian Signal Heads
2- Pedestrian Push Buttons
1- S-7
1- S-9

(E) PEDESTAL POLE (PF-2), 8'
N 43440606.5250
E 132735853.5914
PF-2 Concrete Foundation
SMB-1 One Way Hanger Assembly
1-SP-8 Pedestrian Signal Head
1-Pedestrian Push button
1-S-8

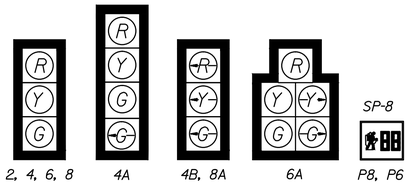
(F) PEDESTAL POLE (PF-2), 8'
N 43440277.8143
E 132734243.7245
PF-2 Concrete Foundation
SMB-1 One Way Hanger Assembly
1-SP-8 Pedestrian Signal Head
1-Pedestrian Push button
1-S-6

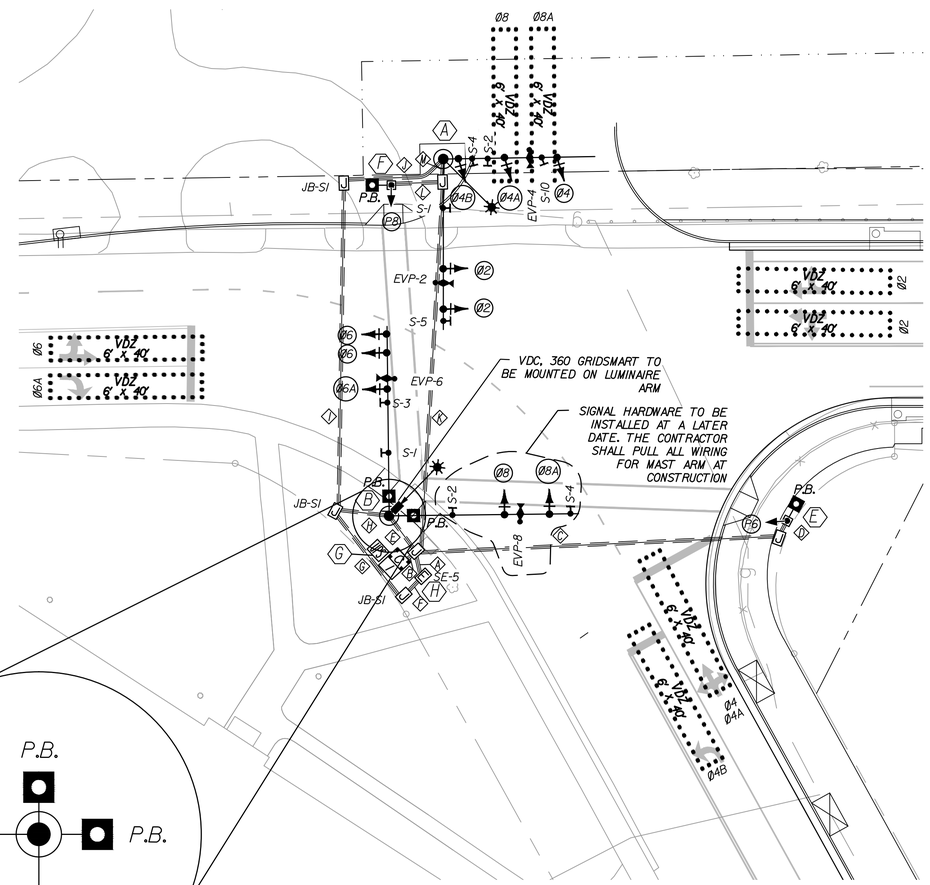
(G) CONTROLLER CABINET AND FOUNDATION (CF-1)
N 43439532.0591
E 132734963.9571
Cabinet door hinge located on right side of cabinet when facing cabinet door
UPS Cabinet piggy back on left side of controller cabinet
Door hinge on right side of UPS cabinet

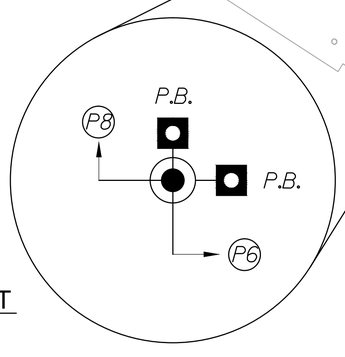
(H) SE-5 ELECTRICAL SERVICE
N 43439591.9317
E 132735280.1952
Meter and 40 Amp Circuit Breaker Disconnect Box
72" Mounting Height

NOTES:
1. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES IN THE VICINITY OF THE SIGNAL POLE FOUNDATIONS PRIOR TO DESIGN AND FABRICATION OF STRUCTURAL ELEMENTS.

Proposed Signals







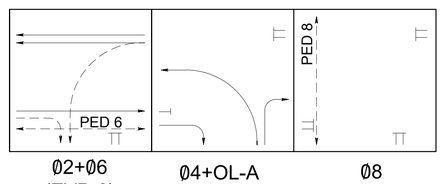
SIGNAL PLAN
SCALE: 1" = 20'-0"

COLOR SEQUENCE CHART

	SIGNAL	PHASES 2	4	6	8	COMB. 2-6	FLASH
SIGNALS	2	G				G	Y
	4		G				
	4A		G/G				
	4B		→G				
	6			G		G	Y
	6A		G←	G		G	Y
CLR. INT.	PED 8	DW	DW	DW	W	DW	DW
	PED 6	DW	DW	W	DW	W	DW

NOTES:
1. BLANK BOX INDICATES RED.
2. SIGNAL TIMINGS AND CLEARANCE INTERVALS TO BE PROVIDED BY THE CITY OF ROANOKE.

Phasing Diagram



Ø2+Ø6 (EVP-6) | Ø4+OL-A (EVP-4) (EVP-2) | Ø8 PED

JUNCTION BOX LEGEND

All Junction Boxes shall conform to St'd. JB-S3 unless otherwise noted on the plans.

Conduit & Cable Legend

(A)
1 - 3" Conduit
1 - 8/3c (Power)
1 - #8 EGC

(B)
1 - 4" Conduit
8 - 14/7c (SP-8 x4, PB x4)
8 - 14/7c (Heads 2, 4, 4A, 4B, 6, 6A, 8, 8A)
1 - #8 EGC

1 - 3" Conduit
4 - EPDC
4 - 14/2c (CL)
1 - Cat 5 Cable (VDC)
1 - #8 EGC

1 - 2" Conduit (Spare)
1 - #8 EGC

(C)
1 - 3" Bored Conduit
2 - 14/7c (Head SP-8, PB)
1 - #8 EGC

1 - 2" Bored Conduit (Spare)
1 - #8 EGC

(D)
1 - 2" Conduit
2 - 14/7c (Head SP-8, PB)
1 - #8 EGC

(E)
1 - 3" Conduit
4 - 14/7c (SP-8 x2, PB x2)
4 - 14/7c (Heads 6, 6A, 8, 8A)
1 - #8 EGC

1 - 3" Conduit
2 - EPDC
2 - 14/2c (CL)
1 - Cat 5 Cable (VDC)
1 - #8 EGC

1 - 2" Conduit (Spare)
1 - #8 EGC

(F)
1 - 2" Conduit
2 - 8/2c (LUM)
1 - #8 EGC

(G)
1 - 2" Conduit
2 - 8/2c (LUM)
1 - #8 EGC

(H)
1 - 2" Conduit
1 - 8/2c (LUM)
1 - #8 EGC

(I)
1 - 2" Bored Conduit
1 - 8/2c (LUM)
1 - #8 EGC

(J)
1 - 2" Conduit
1 - 8/2c (LUM)
1 - #8 EGC

(K)
1 - 3" Bored Conduit
2 - 14/7c (SP-8, PB)
4 - 14/7c (Heads 2, 4, 4A, 4B)
1 - #8 EGC

1 - 3" Bored Conduit
2 - EPDC
2 - 14/2c (CL)
1 - #8 EGC

1 - 2" Bored Conduit (Spare)
1 - #8 EGC

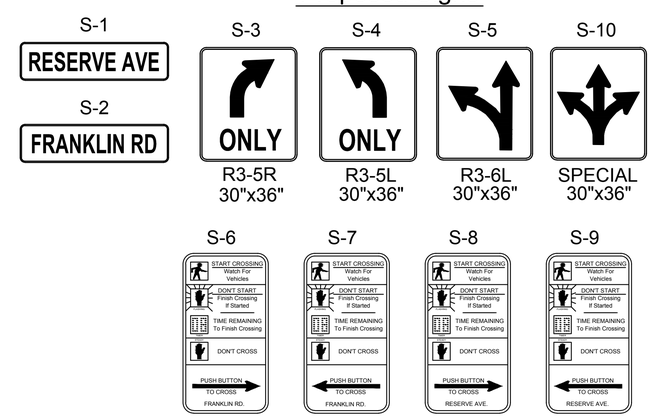
(L)
1 - 2" Conduit
2 - 14/7c (SP-8, PB)
1 - #8 EGC

(M)
1 - 3" Conduit
4 - 14/7c (Heads 2, 4, 4A, 4B)
1 - #8 EGC

1 - 3" Conduit
2 - EPDC
2 - 14/2c (CL)
1 - #8 EGC

1 - 2" Conduit (Spare)
1 - #8 EGC

Proposed Signs



NOTES:
1. Signs shall conform to TE-379 and the latest version of the Virginia Standard Highway Sign Book.
2. Signs S-6, S-7, S-8, S-9 shall be installed such that the arrows are parallel to the corresponding crosswalk.

1"=20' 20' 10' 0 20' 40'
GRAPHIC SCALES

AECOM

PROJECT
REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT
CITY OF ROANOKE
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215 Church Avenue, SW
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REGISTRATION
COMMONWEALTH OF VIRGINIA
5/17/16
STUART L. MARTIN
Lic. No.43891
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

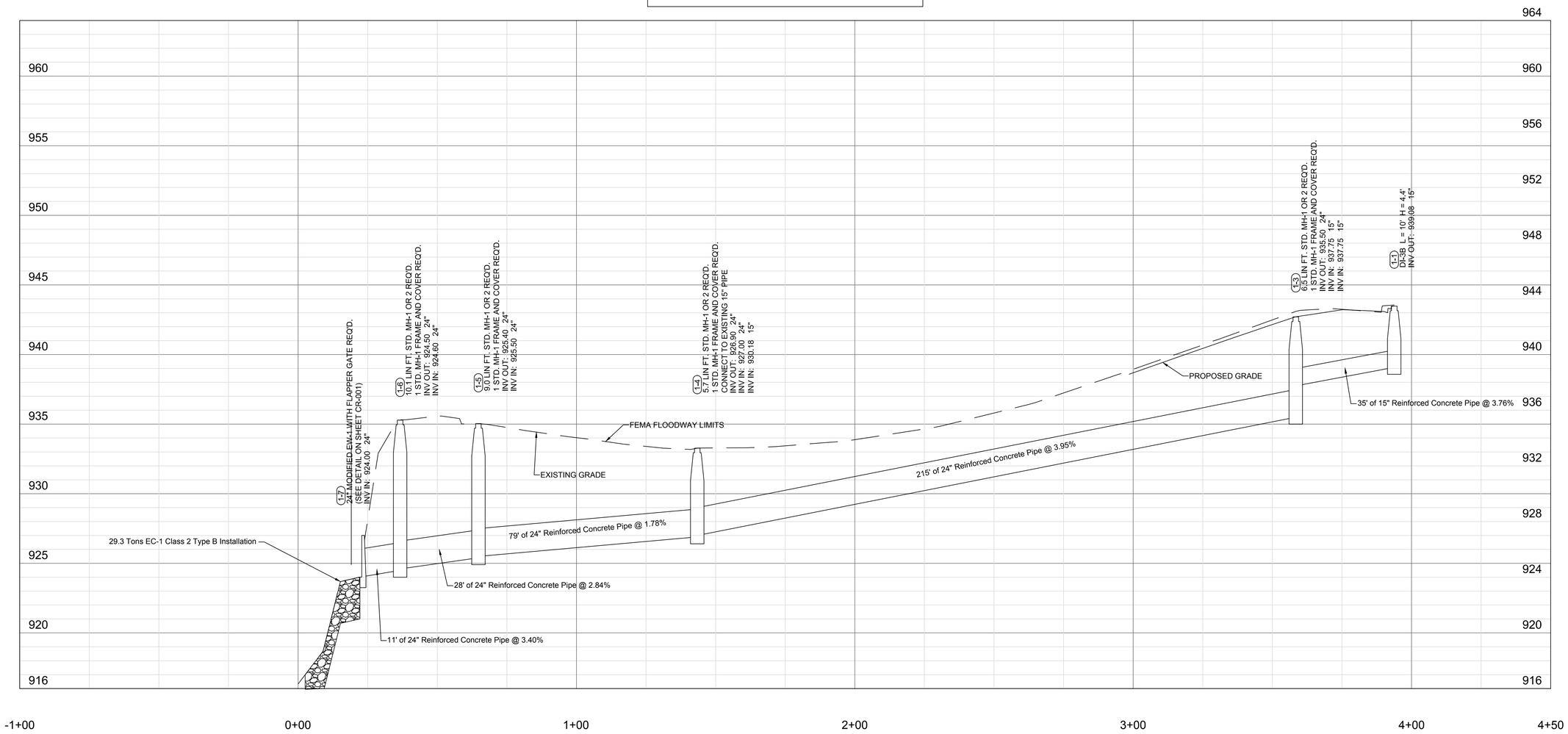
PROJECT NUMBER
60290893

SHEET TITLE
SIGNAL PLAN

SHEET NUMBER
CR-206

ANSI D 22" x 34"

Structure 1-7 to Structure 1-1



VERTICAL: 1"=4' 4' 2' 0 4' 8'

HORIZONTAL: 1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

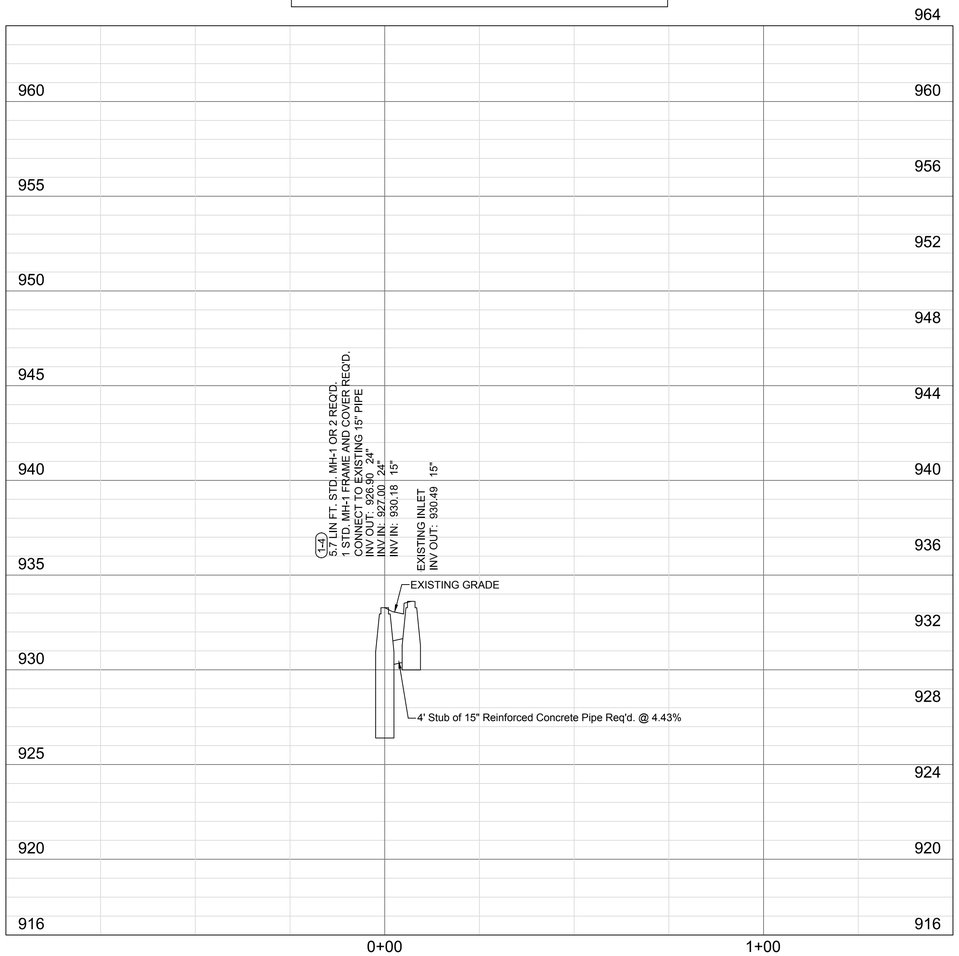
DRAINAGE PROFILES

SHEET NUMBER

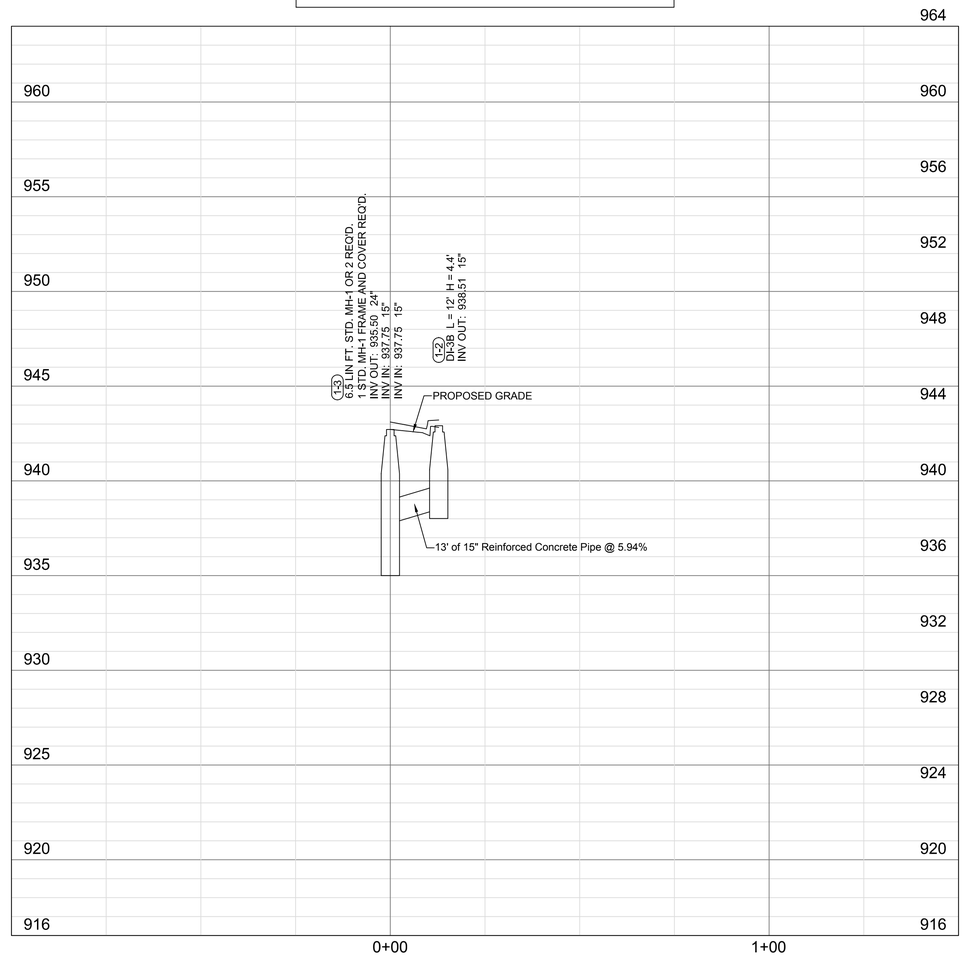
CR-301

ANSI D 22" x 34"

Structure 1-4 to Existing Inlet



Structure 1-3 to Structure 1-2



VERTICAL: 1"=4' 4' 2' 0 4' 8'

HORIZONTAL: 1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

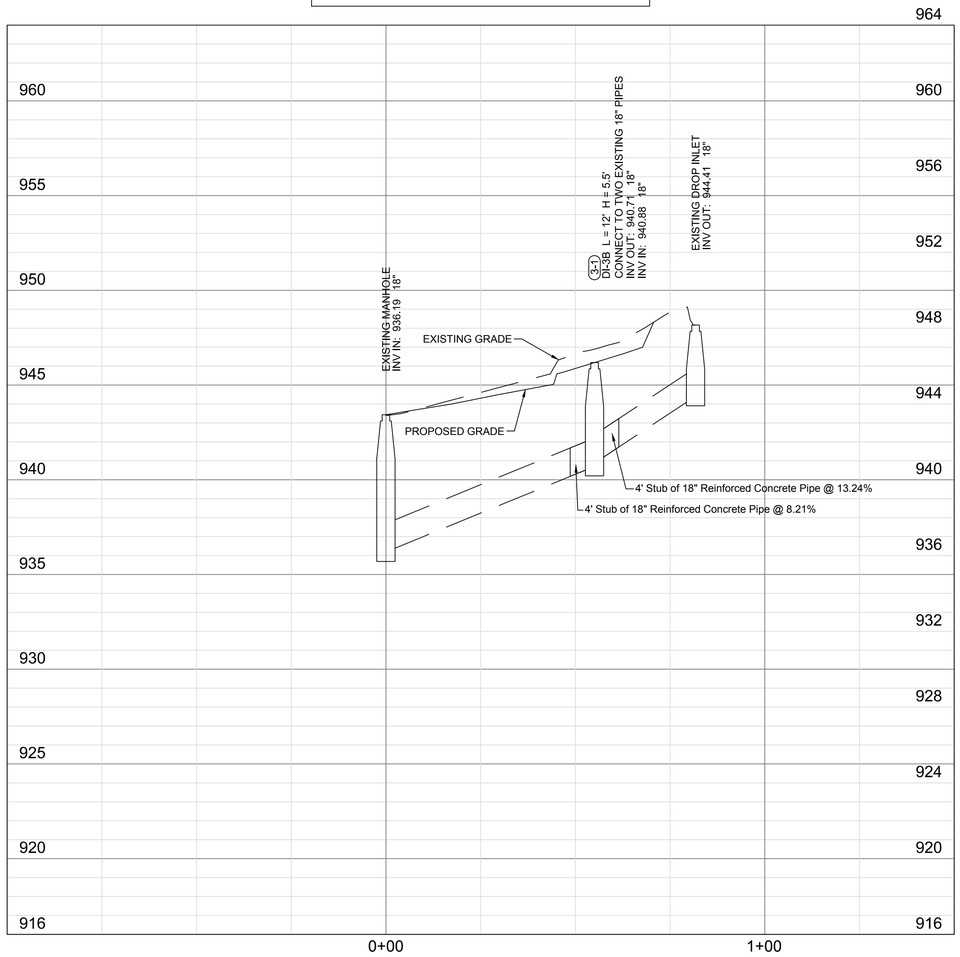
DRAINAGE PROFILES

SHEET NUMBER

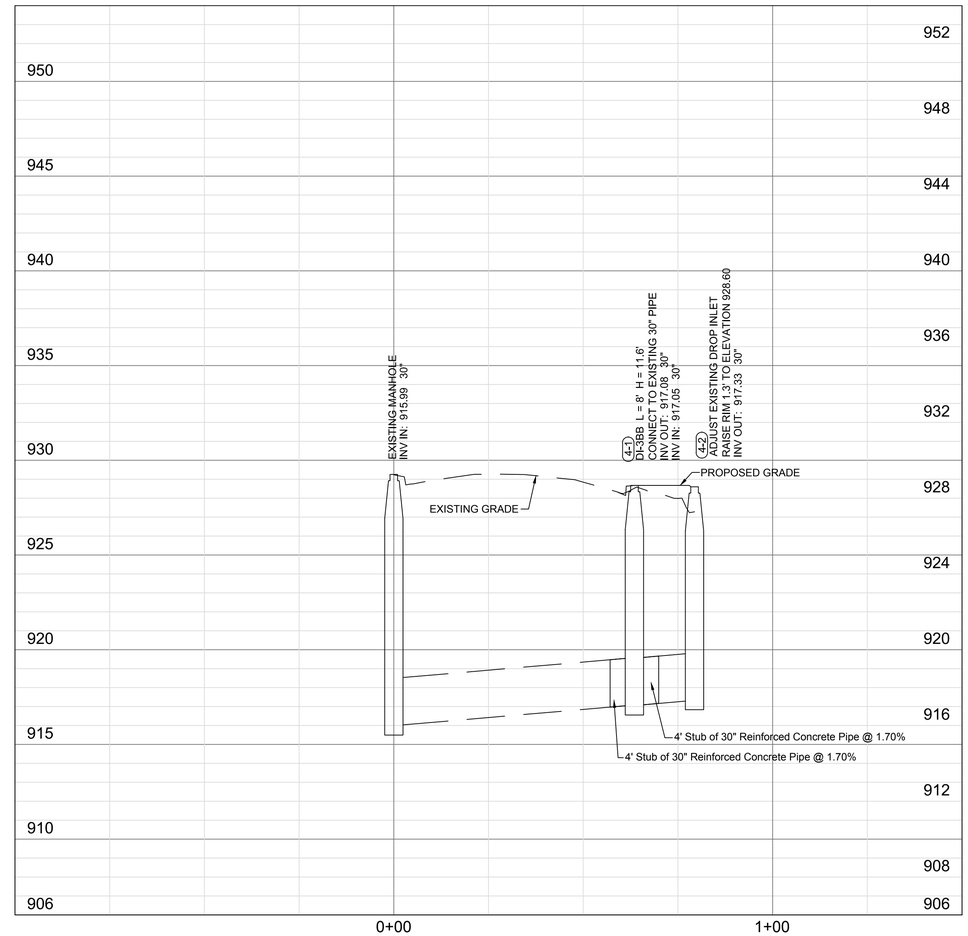
CR-302

ANSI D 22" x 34"

Existing DI to Existing MH



Existing MH to 4-2



VERTICAL: 1"=4' 4' 2' 0 4' 8'

HORIZONTAL: 1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

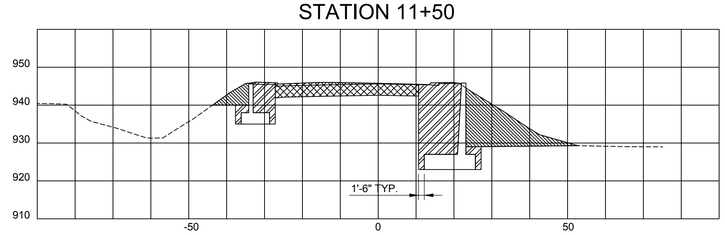
DRAINAGE PROFILES

SHEET NUMBER

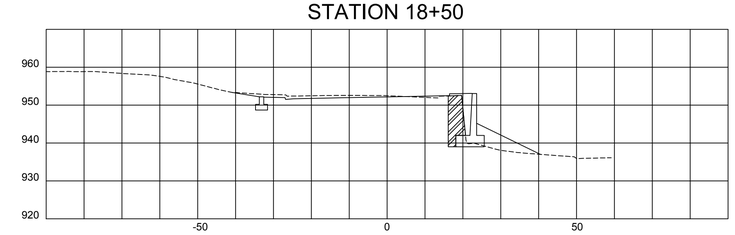
CR-303

ANSI D 22" x 34"

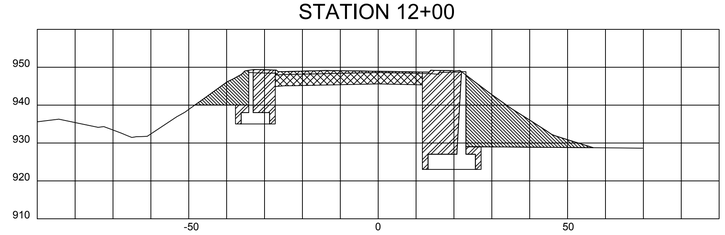
STATION 11+50



STATION 18+50



STATION 12+00



LEGEND

- AREA OF EXCAVATION FOR ROADWAY GRADING AND RECONSTRUCTION. COST TO BE INCLUDED WITH THE PRICE BID FOR EARTHWORK.
- LIMITS OF STRUCTURE EXCAVATION FOR RETAINING WALLS. COST TO BE INCLUDED WITH THE PRICE BID FOR STRUCTURE EXCAVATION.
- LIMITS OF EMBANKMENT EXCAVATION. COST TO BE INCLUDED WITH THE PRICE BID FOR EARTHWORK.

HORIZONTAL 0 20' 40'

VERTICAL 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

CROSS SECTION SHEET - APPROACH EXCAVATION

SHEET NUMBER

CR-401

ANSI D 22" X 34"

LEGEND:

- [S] SERVICE ENTRANCE
- [CC] CONTROL CABINET FOR DECORATIVE PYLON
- ● PLAZA LIGHTING POLE FOUNDATION (FRANKLIN ROAD), SEE GENERAL NOTE 22
- ROADWAY LIGHTING POLE FOUNDATION (RESERVE AVE.), SEE GENERAL NOTE 22
- STRUCTURE LIGHTING POLE (FRANKLIN ROAD BRIDGE), SEE GENERAL NOTE 22
- LINEAR LED LIGHTING
- UNDERGROUND CONDUIT
- (J) VDOT STANDARD JB-S1 JUNCTION BOX

ELECTRICAL SPECS:

1.CONDUIT

1.1. ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE FOLLOWING:

1.1.1. RIGID METALLIC CONDUIT

1.1.1.1. RIGID, THREADED ZINC-COATED STEEL CONDUIT, IN ACCORDANCE WITH ANSI C80.1 AND UL 6.

1.1.2. RIGID NONMETALLIC CONDUIT

1.1.2.1. PVC TYPE EPC-40 IN ACCORDANCE WITH NEMA TC 2 AND UL 651.

1.1.3. FITTINGS FOR RIGID METAL CONDUIT

1.1.3.1. THREADED-TYPE. SPLIT COUPLINGS UNACCEPTABLE.

1.1.4. FITTINGS FOR RIGID NONMETALLIC CONDUIT

1.1.4.1. NEMA TC 3 FOR PVC AND UL 514B.

1.2. CONDUIT INSTALLATION

1.2.1. INSTALL RIGID METALLIC CONDUIT ABOVE GRADE.

1.2.2. INSTALL RIGID NONMETALLIC CONDUIT BELOW GRADE AND ENCASED IN CONCRETE. CONVERT NONMETALLIC RIGID CONDUIT TO RIGID METALLIC CONDUIT BEFORE RISING ABOVE GRADE.

2.WIRES AND CABLES

2.1 PROVIDE WIRES AND CABLES IN ACCORDANCE APPLICABLE REQUIREMENTS OF NFPA 70 AND UL FOR TYPE OF INSULATION, JACKET, AND CONDUCTOR SPECIFIED OR INDICATED. DO NOT USE WIRES AND CABLES MANUFACTURED MORE THAN 12 MONTHS PRIOR TO DATE OF DELIVERY TO SITE.

2.1.1 CONDUCTORS

2.1.1.1. CONDUCTORS SHALL BE COPPER WITH 600V INSULATION INSTALLED IN CODE APPROVED RACEWAYS. CONDUCTORS SHALL NOT BE SMALLER THAN #12 AWG. INSULATION SHALL BE THHN-THWN AND XHHW TO COMPLY WITH UL 83, UNLESS TEMPERATURES ENCOUNTERED REQUIRE INSULATION WITH RIGHT OPERATING TEMPERATURE. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED COPPER; #10 AND #12 AWG CONDUCTORS SHALL BE SOLID COPPER. LIGHTING FIXTURE BRANCH CIRCUIT CONDUCTORS SHALL BE RATED FOR NOT LESS THAN THE REQUIRED UL LISTING OF THE FIXTURE WITH A MINIMUM RATING OF 90 DEGREES C.

2.1.2 CONDUCTOR COLOR CODING

2.1.1.1. 120/240 VOLT, SINGLE PHASE : BLACK AND RED

2.1.1.2. GROUND CONDUCTORS: GREEN

2.1.1.3. NEUTRAL CONDUCTORS: WHITE

GENERAL NOTES:

1. ELECTRICAL FACILITIES WILL BE PAID AT THE CONTRACT LUMP SUM PRICE BID. THIS PRICE SHALL BE FULL COMPENSATION FOR ALL WORK REQUIRED TO PROVIDE LIGHTING FOR BRIDGE PYLONS AND ELECTRICAL SERVICE TO THE NEW ROADSIDE AND STRUCTURE LIGHTING, INCLUDING ALL LABOR, MATERIALS AND EQUIPMENT NEEDED TO COMPLETE THE WORK DESCRIBED IN THESE PLANS. THIS WORK WILL INCLUDE, BUT MAY NOT BE LIMITED TO, CONDUIT WITH PULL STRINGS, CONNECTIONS AND FITTINGS, CONCRETE FOUNDATIONS, FOUNDATION INVESTIGATION, FOUNDATION DESIGN AND PLAN SUBMISSION, TRENCH EXCAVATION AND BACKFILL, JUNCTION BOXES, GROUNDING CONDUCTORS AND RODS, LED LIGHTING FOR PYLONS, DIMMERS AND CONTROL MODULES, CONTRACTORS, TIME CLOCKS, SAFETY SWITCHES, METER BASES, CONTROL CENTER CABINETS, AND COORDINATION WITH OTHER PARTIES FOR SEQUENCE OF WORK ELEMENTS. NEW LIGHT POLES, LIGHT FIXTURES, AND CONDUCTORS WILL BE PROVIDED AND INSTALLED BY OTHERS. RELOCATION OF EXISTING POLES WILL BE COMPLETED BY OTHERS.
2. COORDINATE ANCHOR BOLTS WITH AEP TARIFF LIGHTING AND CONDUIT PATTERN ON POLE FOUNDATIONS.
3. ALL LIGHTING STANDARDS SHALL BE PROVIDED WITH IDENTIFICATION TAGS BEARING THE CIRCUIT, PHASE, AND CONTROL CENTER NUMBER IN ADDITION TO ALL OTHER IDENTIFICATION REQUIREMENTS AS SPECIFIED IN SECTION 700 OF THE SPECIFICATIONS.
4. CONDUITS SHOWN ON THESE PLANS ARE DIAGRAMMATIC AND ACTUAL RUNS SHALL CONFORM TO THE FIELD CONDITIONS. CONDUITS SHALL NOT RUN IN BRICK BANDING WHERE BRICK BANDING IS USED. CONDUITS SHALL AVOID TREE PLANTERS.
5. AT LOCATIONS WHERE PROPOSED CONDUIT SHALL CROSS EXISTING CONDUIT, THE CONTRACTOR SHALL HAND-DIG THE TRENCH AND SHALL TAKE ADEQUATE CARE NOT TO DAMAGE THE EXISTING CONDUIT OR THE CONTENTS THEREOF. THESE REQUIREMENTS SHALL APPLY AT ALL SUCH CONDUIT CROSSINGS EXCEPT THOSE LOCATIONS WHERE PROPOSED CONDUITS WILL CROSS CONDUIT DESIGNATED TO BE ABANDONED.
6. ELECTRICAL INSTALLATION, METERING, CABLE AND CONDUIT SHALL BE INSTALLED IN ACCORDANCE WITH VDOT RBS SPECIFICATIONS.
7. CONDUITS SHALL BE INSTALLED WITH LARGE RADIUS OFFSETS (5' MINIMUM RADIUS) TO BYPASS DRAINAGE INLETS, MANHOLES, AND OTHER OBSTRUCTIONS.
8. ALL UNDERGROUND CONDUITS SHALL BE SLOPED TO DRAIN TO JUNCTION BOXES. IF THIS CANNOT BE ACCOMPLISHED, THEY SHALL BE PROVIDED WITH THE DRAINAGE TEES AT THE LOW POINT OF CONDUIT RUNS.
9. CABLES AND CONDUCTORS IN ALL JUNCTION BOXES, MANHOLES, AND ALL EQUIPMENT ENCLOSURES SHALL BE PROVIDED WITH INDIVIDUAL NONFERROUS METAL OR NYLON TAGS. (SAMPLES OF TAGS AND MARKINGS SHALL BE SUBMITTED TO THE CITY FOR APPROVAL). TAGS FOR POWER CONDUCTORS SHALL BE IDENTIFIED AS "POWER" WITH PHASE, CIRCUIT, AND SERVICE PANEL NUMBER.
10. ALL WIRING SHALL TERMINATE IN CONTROL PANELS WITH INSULATED LUGS AND BE PROPERLY LABELED, CONFORMING TO WIRING DIAGRAMS FURNISHED BY THE CONTRACTOR.
11. ALL CONDUCTORS SHALL BE COLOR-CODED AS REQUIRED IN THE SPECIFICATION. CERTIFIED CONDUCTOR TEST REPORTS SHALL BE APPROVED BY THE CITY PRIOR TO INSTALLATION.
12. THE CONTRACTOR SHALL FURNISH AND INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL NON-METALLIC CONDUIT IN ACCORDANCE WITH SECTION 700 OF THE SPECIFICATIONS. THE MINIMUM EQUIPMENT GROUNDING CONDUCTOR SIZE SHALL BE THE SAME SIZE AS THE LARGEST CONDUCTOR INDICATED ON THE PLANS FOR EACH CONDUIT RUN.
13. THE LOCATION OF THE LIGHT POLE FOUNDATION GROUNDING ROD SHALL BE MARKED ON THE TOP SURFACE OF THE FOUNDATION BY A RECESSED ARROW AND THE INITIAL "G" FORMED IN THE CONCRETE. THE GROUND ROD SHALL TYPICALLY BE PLACED TO THE LEFT OF THE LIGHTING POLE FOUNDATION AS OBSERVED FROM THE POLE HANDHOLE.
14. GROUND RODS SHALL NOT HAVE A RESISTANCE TO GROUND OF MORE THAN 25 OHMS IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 700 OF THE SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE THE CITY WITH A REPORT OF ELECTRICAL RESISTANCE MEASURED BETWEEN THE GROUND ROD AND GROUND.
15. GROUND RODS SHALL BE CONNECTED TO THE GROUND WIRING UTILIZING AN EXOTHERMIC WELD. ALL COST OF THIS ITEM SHALL BE INCLUDED IN THE BID PRICE FOR OTHER ITEMS. NO SEPARATE MEASUREMENT WILL BE MADE.
16. CONDUCTORS IN JUNCTION BOXES AND EQUIPMENT ENCLOSURES SHALL BE NEATLY ARRANGED AND LACED WITH APPROVED CABLE TIES.
17. ALL JUNCTION BOXES SHALL BE PROVIDED WITH A MEANS FOR DRAINAGE.
18. AREAS AROUND CABINETS AND JUNCTION BOXES ON THE SLOPES SHALL BE GRADED AS APPROVED BY THE CITY ENGINEER.
19. THE CONTRACTOR SHALL BE RESPONSIBLE TO RETURN ALL DISTURBED AREAS TO THEIR ORIGINAL STATE AT THE COMPLETION OF ALL WORK. DISTURBED AREAS SHALL BE SEEDED IN ACCORDANCE WITH SECTION 603 OF THE SPECIFICATIONS AND ALL COST FOR THIS ITEM SHALL BE INCLUDED IN THE PRICE BID ITEMS. NO SEPARATE MEASUREMENT WILL BE MADE.
20. THE CONTRACTOR SHALL COORDINATE ELECTRICAL SERVICE WITH THE LOCAL POWER COMPANY.
21. THE LINEAR LED FIXTURE SHALL BE THE ECOSENSE ECOSPEC LINEAR HP EXT WALL WASH MODEL NUMBER WWES-12-40-120-6F, OR APPROVED EQUAL.
22. ALL ROADWAY, PLAZA, AND STRUCTURE LIGHTING INDICATED ARE AEP TARIFF LIGHTING. LIGHT FIXTURES, POLES, AND CABLING ARE PROVIDED BY AEP AND NOT IN CONTRACTOR'S SCOPE OF WORK. ALL OTHER WORK SHOWN IN THESE PLANS, INCLUDING LIGHT POLE FOUNDATIONS, ARE THE RESPONSIBILITY OF THE CONTRACTOR.
23. FOR DETAILS OF CONDUIT SYSTEM AND JUNCTION BOXES ON BRIDGE SEE SHEET CB-056.
24. TIME CLOCK SERVING LINEAR LED LIGHTS SHALL BE PROGRAMMABLE TO ACCOUNT FOR DAYLIGHT SAVINGS AND SEASONAL CHANGES IN DAYLIGHT HOURS.
25. LIGHTING CONTACTOR SERVING LINEAR LED LIGHTS SHALL BE RATED FOR 120 VOLT AND 30 AMP USE.
26. DIMMER SERVING LINEAR LED LIGHTS SHALL BE ADJUSTABLE FROM 0 TO 10 VOLTS AND RATED FOR 120 VOLT USE.
27. DIMMING CONTROL MODULE SHALL BE PROVIDED TO CONVERT 0-10 VOLT OUTPUT TO FIXTURE.
28. FOR LANDSCAPING DETAILS, SEE L SERIES SHEETS.
29. WIRE SIZE SHALL GENERALLY BE 12 AWG. IN RUNS EXCEEDING 100 FEET 10 AWG SHALL BE USED. CONTRACTOR TO FIELD VERIFY DISTANCES OF RUNS PRIOR TO SELECTING WIRE SIZES. CONTRACTOR TO VERIFY VOLTAGE DROP DOES NOT EXCEED 3% FROM CONTROL CENTER TO LIGHT FIXTURE.
30. CONTRACTOR SHALL PREPARE AND SUBMIT CONDUIT COORDINATION PLANS TO THE CITY FOR REVIEW AND APPROVAL. THESE PLAN SHALL INDICATE THE PROPOSED CONDUIT DETAILS AND INSTALLATION PLAN. PLACEMENT OF CONDUIT EMBEDDED IN CONCRETE SHALL BE REVIEWED BY THE ELECTRICAL SUBCONTRACTOR FOR CONFORMANCE WITH THE APPROVED CONDUIT COORDINATION PLAN PRIOR TO CONCRETE PLACEMENT.

AECOM

PROJECT

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5/17/16
PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
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KEY PLAN

PROJECT NUMBER

60290893

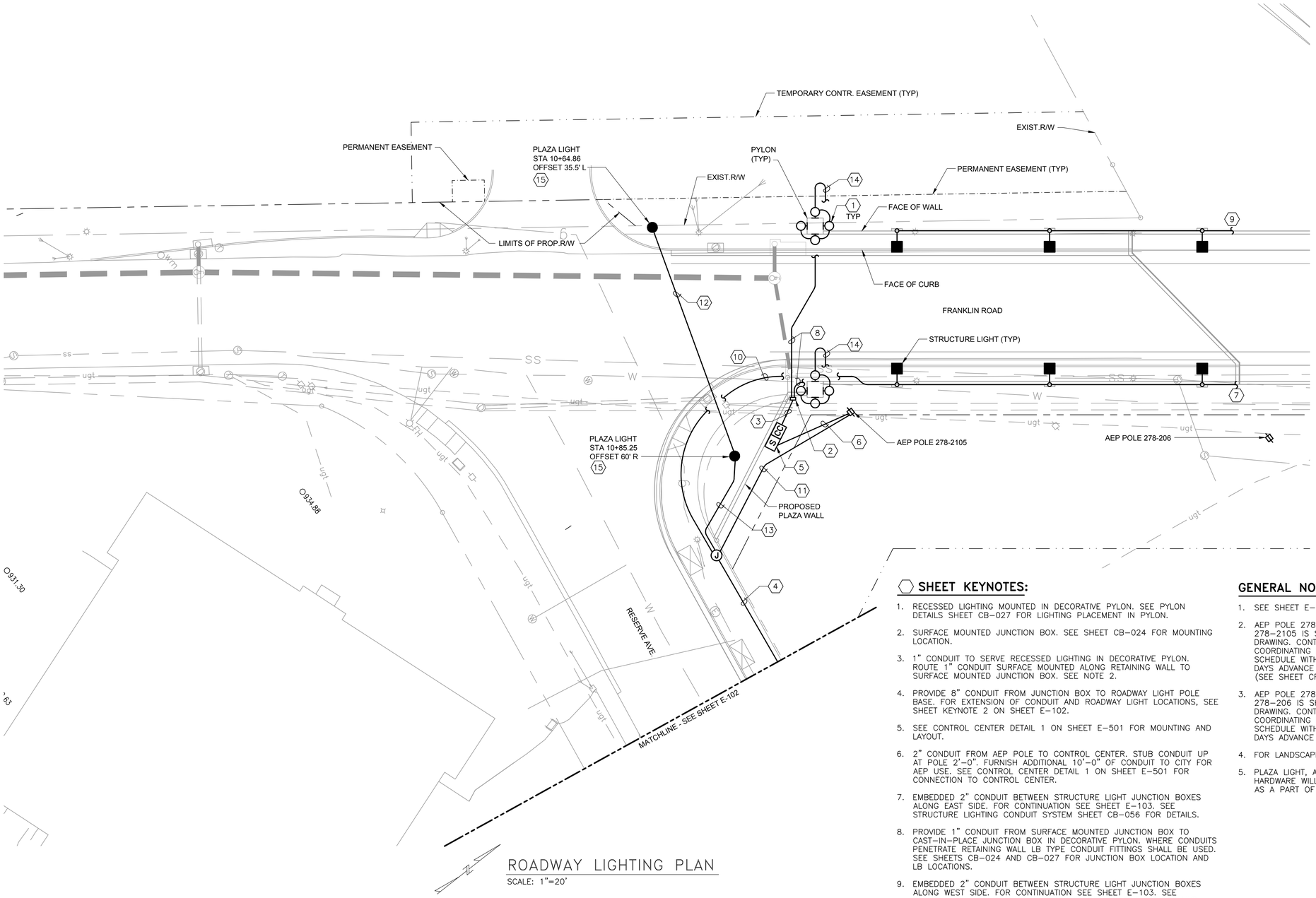
SHEET TITLE

LIGHTING LEGEND AND GENERAL NOTES

SHEET NUMBER

E-001

ANSI D 22" X 34"



ROADWAY LIGHTING PLAN

SCALE: 1"=20'

SHEET KEYNOTES:

1. RECESSED LIGHTING MOUNTED IN DECORATIVE PYLON. SEE PYLON DETAILS SHEET CB–027 FOR LIGHTING PLACEMENT IN PYLON.
2. SURFACE MOUNTED JUNCTION BOX. SEE SHEET CB–024 FOR MOUNTING LOCATION.
3. 1" CONDUIT TO SERVE RECESSED LIGHTING IN DECORATIVE PYLON. ROUTE 1" CONDUIT SURFACE MOUNTED ALONG RETAINING WALL TO SURFACE MOUNTED JUNCTION BOX. SEE NOTE 2.
4. PROVIDE 8" CONDUIT FROM JUNCTION BOX TO ROADWAY LIGHT POLE BASE. FOR EXTENSION OF CONDUIT AND ROADWAY LIGHT LOCATIONS, SEE SHEET KEYNOTE 2 ON SHEET E–102.
5. SEE CONTROL CENTER DETAIL 1 ON SHEET E–501 FOR MOUNTING AND LAYOUT.
6. 2" CONDUIT FROM AEP POLE TO CONTROL CENTER. STUB CONDUIT UP AT POLE 2'–0". FURNISH ADDITIONAL 10'–0" OF CONDUIT TO CITY FOR AEP USE. SEE CONTROL CENTER DETAIL 1 ON SHEET E–501 FOR CONNECTION TO CONTROL CENTER.
7. EMBEDDED 2" CONDUIT BETWEEN STRUCTURE LIGHT JUNCTION BOXES ALONG EAST SIDE. FOR CONTINUATION SEE SHEET E–103. SEE STRUCTURE LIGHTING CONDUIT SYSTEM SHEET CB–056 FOR DETAILS.
8. PROVIDE 1" CONDUIT FROM SURFACE MOUNTED JUNCTION BOX TO CAST–IN–PLACE JUNCTION BOX IN DECORATIVE PYLON. WHERE CONDUITS PENETRATE RETAINING WALL LB TYPE CONDUIT FITTINGS SHALL BE USED. SEE SHEETS CB–024 AND CB–027 FOR JUNCTION BOX LOCATION AND LB LOCATIONS.
9. EMBEDDED 2" CONDUIT BETWEEN STRUCTURE LIGHT JUNCTION BOXES ALONG WEST SIDE. FOR CONTINUATION SEE SHEET E–103. SEE STRUCTURE LIGHTING CONDUIT SYSTEM SHEET CB–056 FOR DETAILS.
10. 2" CND FROM JUNCTION BOX TO STRUCTURE LIGHT. ROUTE CONDUIT UNDER SIDEWALK THRU PYLON BASE TO FIRST STRUCTURE LIGHT JUNCTION BOX. COORDINATE CONDUIT ELEVATION CHANGE WITH STRUCTURE LIGHT JUNCTION BOX.
11. 2" CND FROM AEP POLE TO JUNCTION BOX. STUB CONDUIT UP AT POLE 2'–0". FURNISH ADDITIONAL 10' OF CONDUIT TO CITY FOR AEP USE.
12. 2" CND BETWEEN PLAZA LIGHT POLE BASES. CONDUCTORS FURNISHED AND INSTALLED BY AEP.
13. 2" CND FROM JUNCTION BOX TO PLAZA LIGHT POLE BASE.
14. CONNECT RECESSED LIGHTING TO CAST–IN–PLACE JUNCTION BOX IN DECORATIVE PYLON.
15. SEE ROADWAY AND PLAZA LIGHT POLE FOUNDATION DETAIL 5 ON SHEET E–501 FOR POLE BASE FOUNDATION.

GENERAL NOTES:

1. SEE SHEET E–001 FOR LEGEND AND GENERAL NOTES.
2. AEP POLE 278–2105 WILL BE RELOCATED BY AEP. POLE 278–2105 IS SHOWN IN THE FINAL LOCATION ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING EXACT LOCATION AND CONSTRUCTION SCHEDULE WITH AEP. CONTRACTOR SHALL PROVIDE 60 DAYS ADVANCE NOTICE TO AEP FOR RELOCATION WORK. (SEE SHEET CR–004 FOR ADDITIONAL NOTES).
3. AEP POLE 278–206 WILL BE RELOCATED BY AEP. POLE 278–206 IS SHOWN IN THE FINAL LOCATION ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING EXACT LOCATION AND CONSTRUCTION SCHEDULE WITH AEP. CONTRACTOR SHALL PROVIDE 60 DAYS ADVANCE NOTICE TO AEP FOR RELOCATION WORK.
4. FOR LANDSCAPING DETAILS, SEE L SERIES SHEETS.
5. PLAZA LIGHT, AND STRUCTURE LIGHT INCLUDING ALL HARDWARE WILL BE FURNISHED AND INSTALLED BY AEP AS A PART OF THE TARIFF PROGRAM.

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
215 Church Avenue, SW
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COMMONWEALTH OF VIRGINIA
RACHEL C. CAHILL
Lic. No. 031548
5/17/16
PROFESSIONAL ENGINEER

ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

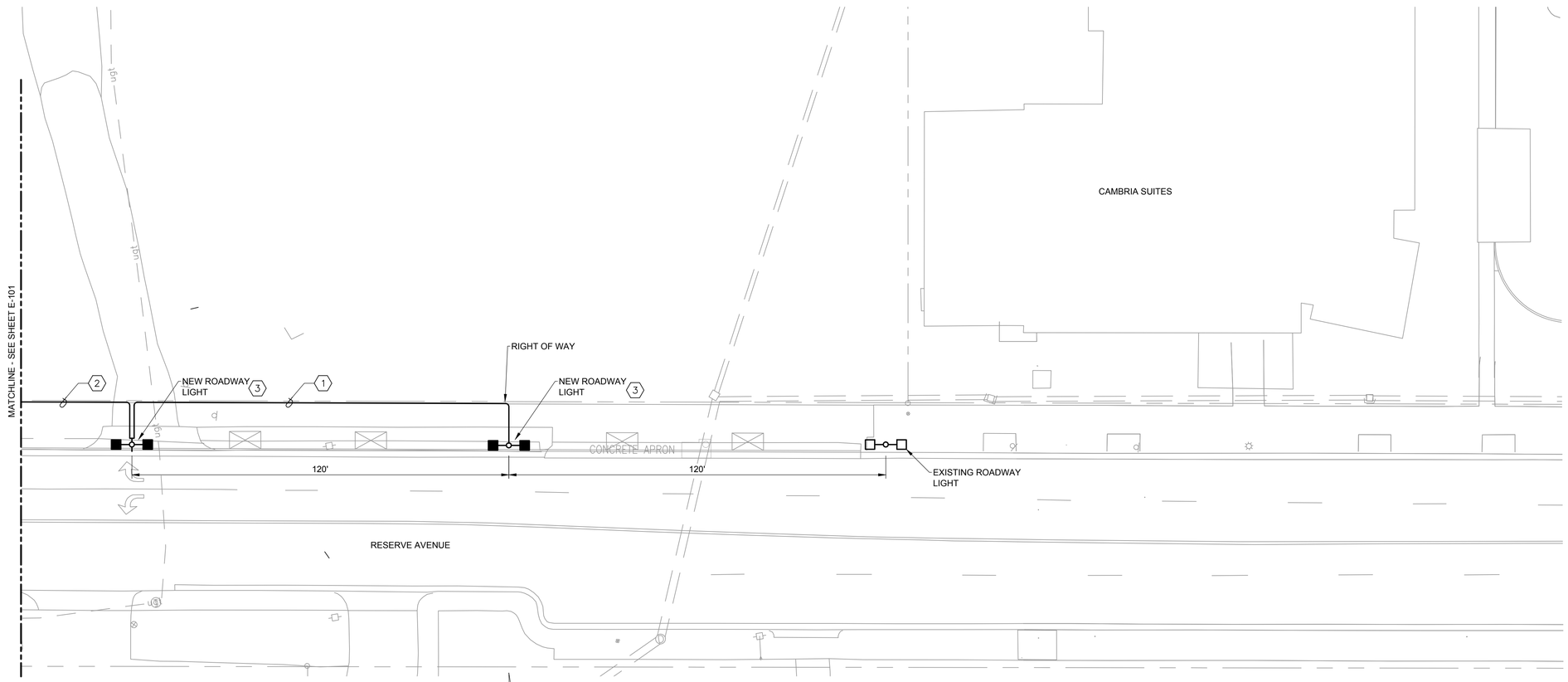
SHEET TITLE

LIGHTING PLAN

SHEET NUMBER

E-101

ANSI D 22" X 34"



ROADWAY LIGHTING PLAN

SCALE: 1" = 20'

GENERAL NOTES:

1. SEE SHEET E-001 FOR LEGEND AND GENERAL NOTES.
2. FOR LANDSCAPING PLANS, SEE L SERIES SHEETS.
3. FOR SIDEWALK AND CURB DETAILS, SEE ROADWAY PLAN SHEETS.
4. ROADWAY LIGHT, INCLUDING ALL HARDWARE WILL BE FURNISHED AND INSTALLED BY AEP AS A PART OF THE TARIFF PROGRAM.

SHEET KEYNOTES:

1. PROVIDE 2" CONDUIT FROM ROADWAY LIGHT POLE BASE TO ROADWAY LIGHT POLE BASE. CONDUCTORS FURNISHED AND INSTALLED BY AEP.
2. 2" CONDUIT FROM JUNCTION BOX TO ROADWAY LIGHT POLE BASE. SEE SHEET KEYNOTE 4 ON SHEET E-101. CONDUCTORS FURNISHED AND INSTALLED BY AEP.
3. SEE ROADWAY AND PLAZA LIGHT POLE FOUNDATION DETAIL 5 ON SHEET E-501 FOR POLE BASE FOUNDATION.

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

LIGHTING PLAN

SHEET NUMBER

E-102

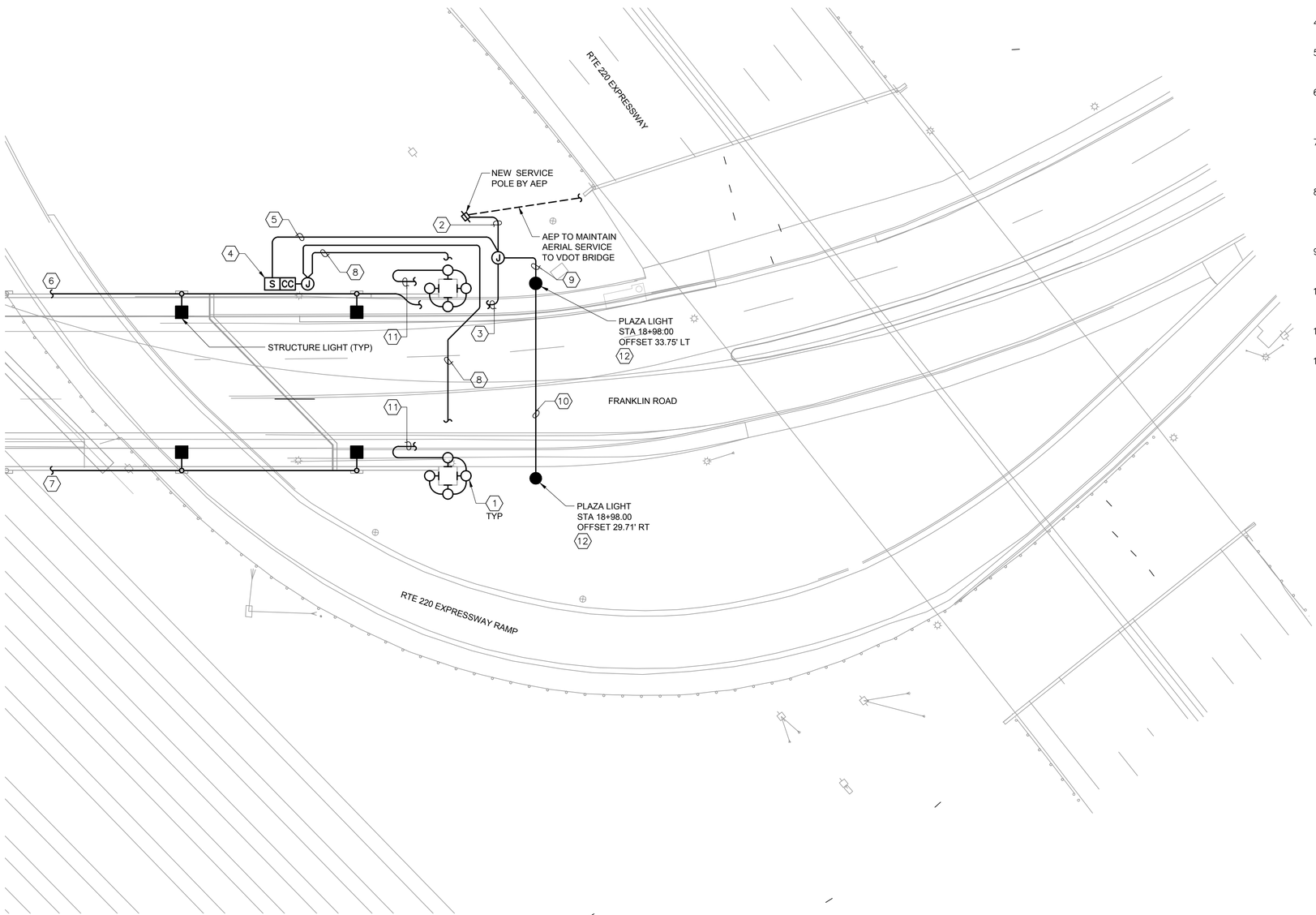
ANSI D 22" X 34"

GENERAL NOTES:

1. SEE SHEET E-001 FOR LEGEND AND GENERAL NOTES.
2. FOR SIDEWALK AND CURB DETAILS SEE ROADWAY PLAN SHEETS.
3. STRUCTURE LIGHT, INCLUDING ALL HARDWARE WILL BE FURNISHED AND INSTALLED BY AEP AS A PART OF THE TARIFF PROGRAM.
4. ROADWAY LIGHT, INCLUDING ALL HARDWARE WILL BE FURNISHED AND INSTALLED BY AEP AS A PART OF THE TARIFF PROGRAM.

SHEET KEYNOTES:

1. RECESSED LIGHTING MOUNTED IN DECORATIVE PYLON. SEE PYLON DETAILS SHEET CB-027 FOR LIGHTING PLACEMENT IN PYLON.
2. 2-2 1/2" CONDUITS FROM AEP POLE TO UNDERGROUND JUNCTION BOX. STUB CONDUITS UP AT POLE APPROXIMATELY 2'-0". FURNISH ADDITIONAL 20'-0" OF CONDUIT TO CITY FOR AEP USE.
3. 2" CND FROM JUNCTION BOX TO STRUCTURE LIGHT. ROUTE CONDUIT UNDER SIDEWALK THRU PYLON BASE TO FIRST STRUCTURE LIGHT JUNCTION BOX. COORDINATE CONDUIT ELEVATION CHANGE WITH STRUCTURE LIGHT JUNCTION BOX.
4. SEE CONTROL CENTER DETAIL 4 ON SHEET E-501 FOR MOUNTING AND LAYOUT.
5. 2" CONDUIT FROM UNDERGROUND JUNCTION BOX TO CONTROL CENTER. SEE CONTROL CENTER DETAIL 4 ON SHEET E-501 FOR CONNECTION TO CONTROL CENTER.
6. EMBEDDED 2" CONDUIT BETWEEN STRUCTURE LIGHT JUNCTION BOXES ALONG WEST SIDE. FOR CONTINUATION SEE SHEET E-101. SEE STRUCTURE LIGHTING CONDUIT SYSTEM SHEETS CB-056 FOR DETAILS.
7. EMBEDDED 2" CONDUIT BETWEEN STRUCTURE LIGHT JUNCTION BOXES ALONG EAST SIDE. FOR CONTINUATION SEE SHEET E-101. SEE STRUCTURE LIGHTING CONDUIT SYSTEM SHEETS CB-056 FOR DETAILS.
8. PROVIDE 1" CONDUIT FROM CONTROL CENTER TO CAST-IN-PLACE JUNCTION BOXES IN DECORATIVE PYLON. SEE PYLON DETAILS ON SHEET CB-027 FOR CAST-IN-PLACE JUNCTION BOX LOCATION IN DECORATIVE PYLON.
9. PROVIDE 2" CND FROM JUNCTION BOX TO ROADWAY LIGHT POLE BASE. CONDUCTORS FURNISHED AND INSTALLED BY AEP.
10. PROVIDE 2" CND FROM ROADWAY LIGHT POLE BASE TO ROADWAY LIGHT POLE BASE. CONDUCTORS FURNISHED AND INSTALLED BY AEP.
11. CONNECT RECESSED LIGHTING TO CAST-IN-PLACE JUNCTION BOX IN DECORATIVE PYLON.
12. SEE ROADWAY AND PLAZA LIGHT POLE FOUNDATION DETAIL 5 ON SHEET E-501 FOR POLE BASE FOUNDATION.



ROADWAY LIGHTING PLAN

SCALE: 1" = 20'

1"=20' 20' 10' 0 20' 40'

GRAPHIC SCALES

AECOM

PROJECT

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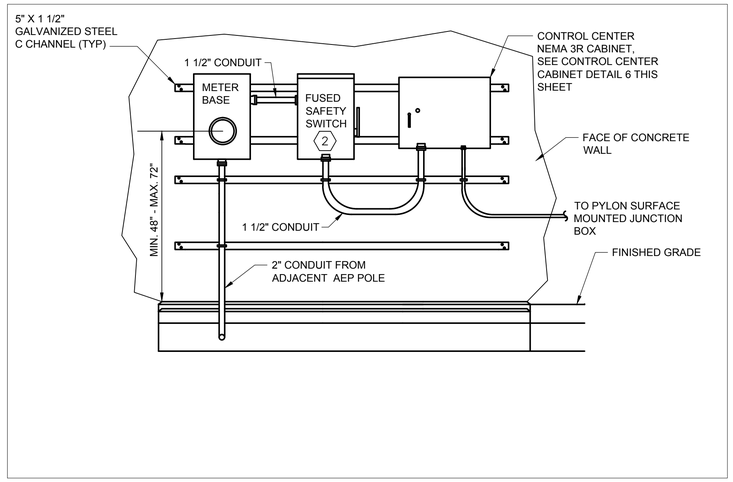
SHEET TITLE

LIGHTING PLAN

SHEET NUMBER

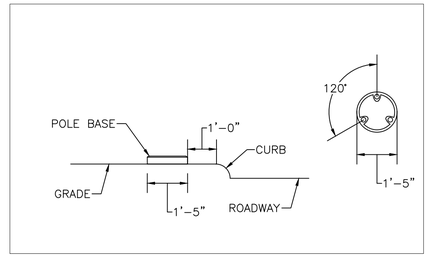
E-103

ANSI D 22" X 34"



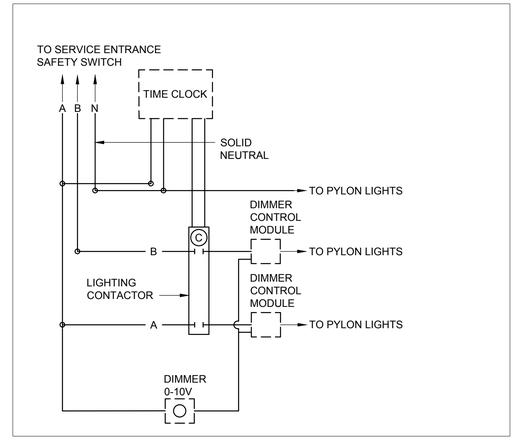
CONTROL CENTER DETAIL (1 / E-501)

NO SCALE



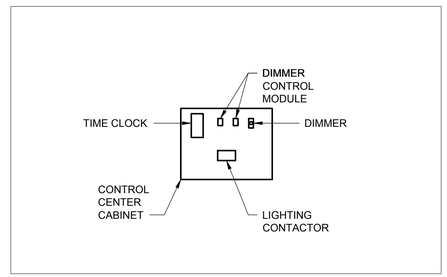
POLE OFFSET AND BOLT PATTERN DETAIL (2 / E-501)

NO SCALE



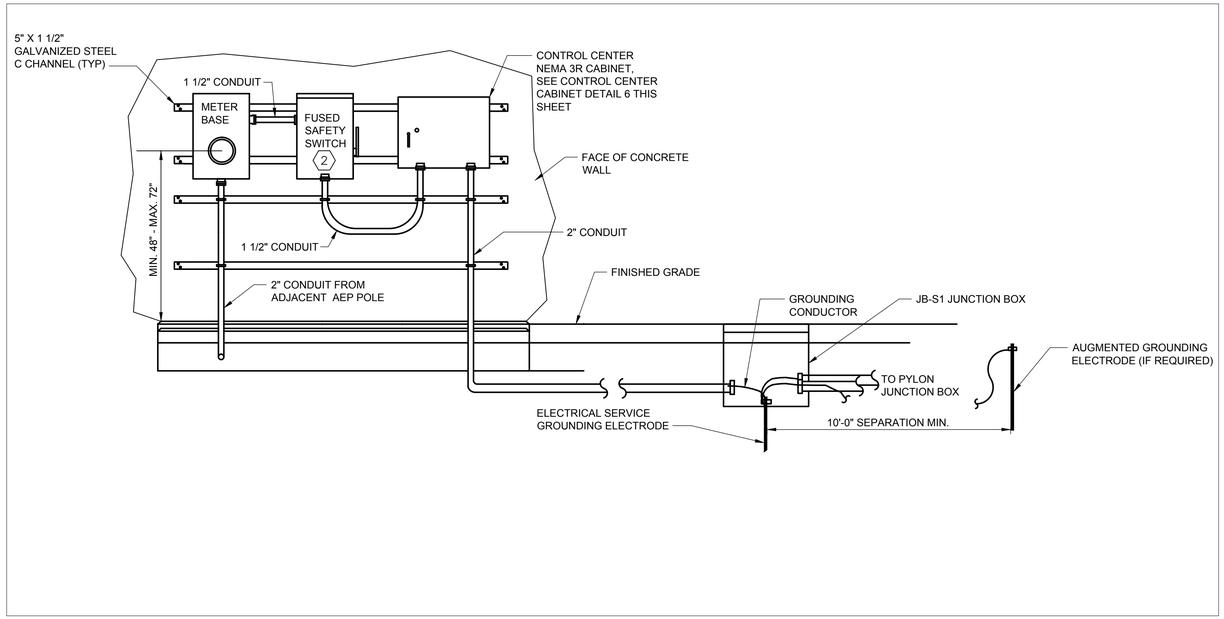
CONTROL CABINET WIRING DIAGRAM (3 / E-501)

NO SCALE



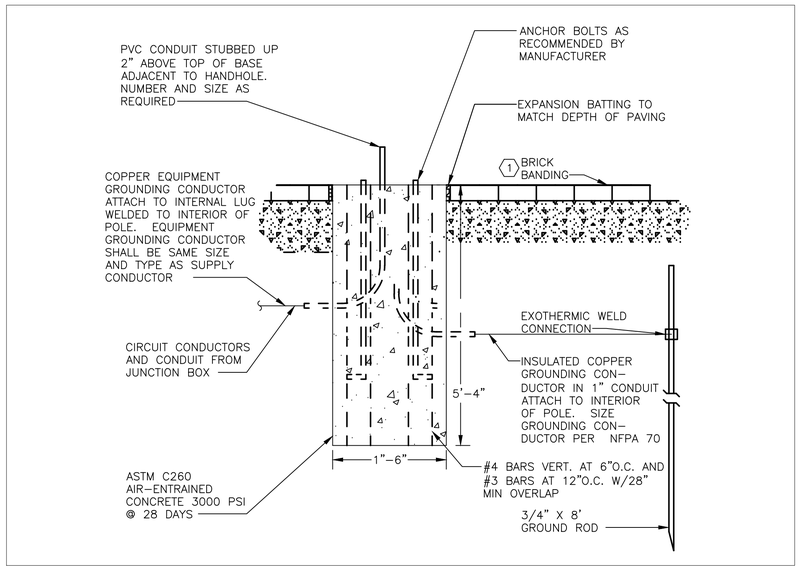
CONTROL CENTER CABINET DETAIL (6 / E-501)

NO SCALE



CONTROL CENTER DETAIL (4 / E-501)

NO SCALE



ROADWAY AND PLAZA
LIGHT POLE FOUNDATION DETAIL (5 / E-501)

NO SCALE

SHEET KEYNOTES:

1. SEE BRICK BANDING PATTERN DETAIL ON SHEET L-501 FOR MORE DETAIL.
2. NEMA 3R, 30 AMP, 3 POLE FUSED DISCONNECT. PROVIDE 20 AMP FUSES.

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

E-501

ANSI D 22" X 34"

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An Acuity Brands Company

Catalog Number	ESL 150 4K AS B 4 P SS PCS R BHC 72/1 CA BKH BHLF/200 RCA BK WDA 14 F5J 17 P08 LAB BK
Type:	Notes:

Wadsworth Aluminum Pole
Boston Harbour Crossarm
Teardrop Utility LED

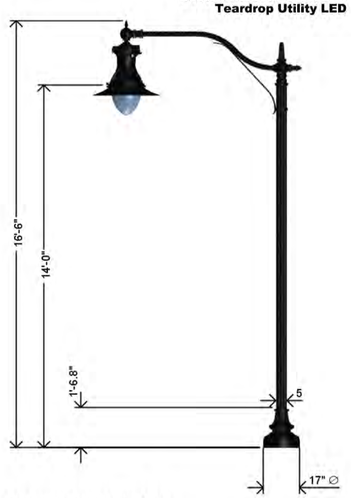
SPECIFICATIONS

FIXTURE
Teardrop Utility LED
•[ESL 150 4K AS B 4 P SS PCS R]
Prefix: Esplanade Utility LED
Source and Wattage: 150 Watt System
Color Tempature: 4,000 Series CCT
Voltage: Auto Sensing 120 thru 277, 50,60Hz
Finish: Black
Door: Asymmetric Teardrop Type Glass
Mounting: Pendant (Threaded Top Opening - 1.5 NPT)
Skirts: 30 Inch Shallow Skirt for Cutoff
Photocontrols: DTL TwistLock Photocontrol For Solid-State Lighting 120-277V
Dimming: None
Photo Receptacle: NEMA Twistlock Photocontrol Receptacle
Driver: None
Leads: None
Leveling Fitter: None
Pipe: None
Fitter Finish: None
Fitter Photocontrol Receptacle: None
Luminaire EPA: 2.37
Luminaire Weight: 66

ARM / MOUNTING BRACKET
Boston Harbour Crossarm; Oriented at 0 degrees.
•[BHC 72/1 CA BKH BHLF/200 RCA BK]
Series: BHC
Arm Length: 72" Roadway One Way Arm
Material Type: Cast Aluminum
Finish: Black
Leveling Fitter: Boston Harbour
Mounting: Rigid
Photocontrol: None
Cover for Photocontrol: None
Fitter Finish: Black
Arm EPA: 1.84
Arm Weight: 50

POLE
Wadsworth Aluminum Pole
•[WDA 14 F5J 17 P08 LAB BK]
Prefix: Wadsworth Aluminum Pole
Height: 14 feet (Actual Height: 14'-0")
Shaft Style: 5 inch diameter Fluted, .25 wall
Base: 17 inch Round Base
Tenon: 3 X 5 Tenon
Pole Mounting: Less anchor bolts
Finish: Powder Coat Paint Finish, Black
GFI Inside Base: None
Breakaway Kit: None
Breakaway Kit Finish: None
Base EPA: 1.62
Base Weight: 41

Your Assembly Wind Load status: Pass
Passed for wind speed: 90 MPH
For further details, review the Structural Analysis Report.



Anchorage/Orientation Plan

Hand Hole is at 0 deg.

Customer Approval:

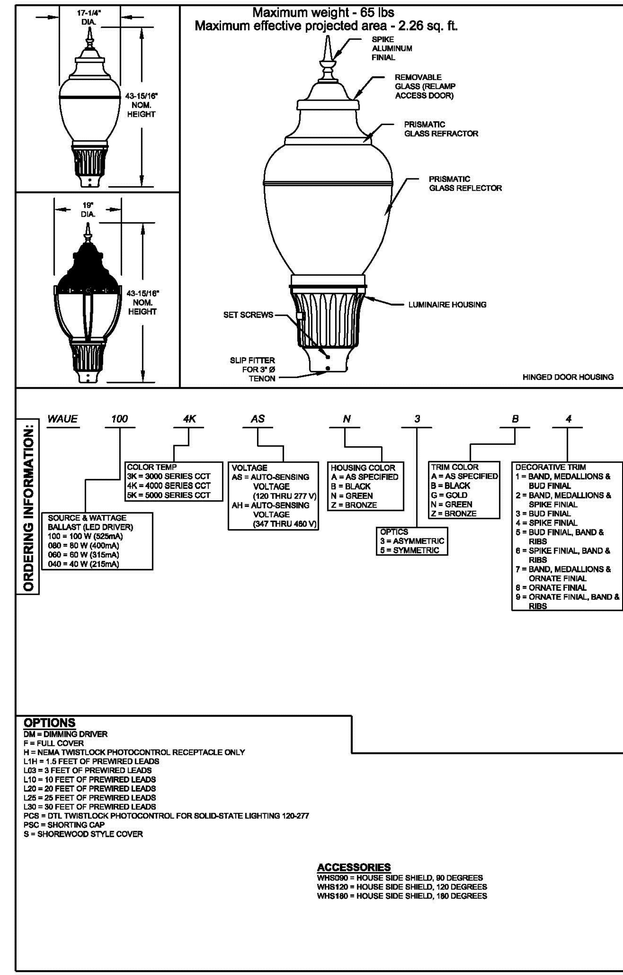
signature date

Job Name: Product Basket
Client Name:

Created By: Jim Porter Date: 19-Feb-15

Catalog #ESL 150 4K AS B 4 P SS PCS R BHC 72/1 CA BKH BHLF/200 RCA BK WDA 14 F5J 17 P08 LAB BK Dwg. # HLP-34647 Page: 2 of 2

STRUCTURE LIG□TING FI□TURE



ORDERING INFORMATION:

WAUE 100 4K AS N 3 B 4

SOURCE & WATTAGE
BALLAST (LED DRIVER)
100 = 100 W (525mA)
080 = 80 W (400mA)
060 = 60 W (315mA)
040 = 40 W (215mA)

COLOR TEMP
3K = 3000 SERIES CCT
4K = 4000 SERIES CCT
5K = 5000 SERIES CCT

VOLTAGE
AS = AUTO-SENSING VOLTAGE (120 THRU 277 V)
AH = AUTO-SENSING VOLTAGE (347 THRU 480 V)

HOUSING COLOR
A = AS SPECIFIED
B = BLACK
N = GREEN
Z = BRONZE

OPTICS
3 = ASYMMETRIC
5 = SYMMETRIC

TRIM COLOR
A = AS SPECIFIED
B = BLACK
G = GOLD
N = GREEN
Z = BRONZE

DECORATIVE TRIM
1 = BAND, MEDALLIONS & BUD FINIAL
2 = BAND, MEDALLIONS & SPIKE FINIAL
3 = BUD FINIAL
4 = SPIKE FINIAL
5 = BUD FINIAL, BAND & RIBS
6 = SPIKE FINIAL, BAND & RIBS
7 = BAND, MEDALLIONS & ORNATE FINIAL
8 = ORNATE FINIAL
9 = ORNATE FINIAL, BAND & RIBS

OPTIONS
DM = DIMMING DRIVER
F = FULL COVER
H = NEMA TWISTLOCK PHOTOCONTROL RECEPTACLE ONLY
L1H = 1.5 FEET OF PREWIRED LEADS
L03 = 3 FEET OF PREWIRED LEADS
L10 = 10 FEET OF PREWIRED LEADS
L20 = 20 FEET OF PREWIRED LEADS
L25 = 25 FEET OF PREWIRED LEADS
L30 = 30 FEET OF PREWIRED LEADS
PCS = DTL TWISTLOCK PHOTOCONTROL FOR SOLID-STATE LIGHTING 120-277
PSC = SHORTING CAP
S = SHOREWOOD STYLE COVER

ACCESSORIES
WHS090 = HOUSE SIDE SHIELD, 90 DEGREES
WHS120 = HOUSE SIDE SHIELD, 120 DEGREES
WHS180 = HOUSE SIDE SHIELD, 180 DEGREES

Utility Washington Postlite® LED Series Luminaire

DECORATIVE OUTDOOR

HOLOPHANE® LEADER IN LIGHTING SOLUTIONS An Acuity Brands Company

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ORDER #:
TYPE:
DRAWN: KRW
DATE: 7/24/12
DWG #: LUM_WAUE
1 of 2

PLA□A LIG□TING FI□TURE

NOTES:

LIGHT FIXTURES SHOWN ON THIS SHEET WILL BE PROVIDED AND INSTALLED BY AEP.

SEE SHEET E-001 FOR ADDITIONAL NOTES.

AECOM

PROJECT
REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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KEY PLAN

PROJECT NUMBER
60290893

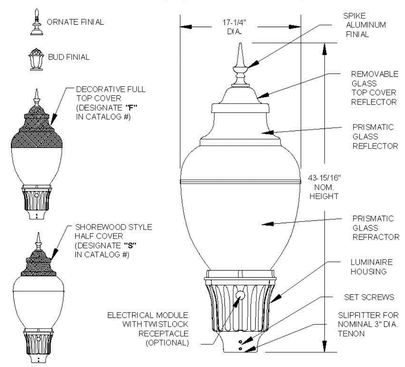
S□EET TITLE
LIGHTING EQUIPMENT DATA
1 OF 2

S□EET NUMBER
E-502

ANSI D 22" X 34"

Utility Washington Postlite® Series Luminaire

Maximum weight - 65 lbs
Maximum effective projected area - 2.26 sq. ft.



ORDERING INFORMATION

EXAMPLE: *WAU 050HP 12 B 3 B 4 **
WAU *

BALLAST TYPE (MOGUL BASE)
050HP = 50W HPS
070HP = 70W HPS
100HP = 100W HPS
15AHP = 150W 55V HPS
175MH = 175W MH
100MV = 100W MV
175MV = 175W MV
250MV = 250W MV

BALLAST TYPE (MEDIUM BASE)
50DHP = 50W HPS
70DHP = 70W HPS
100DHP = 100W HPS
15DHP = 150W 55V HPS
70DMH = 70W MH (NOT AVAIL. W/ 480V)
100DMH = 100W MH (NOT AVAIL. W/ 480V)
15DMH = 150W MH (NOT AVAIL. W/ 480V)
17DMH = 175W MH

VOLTAGE
12 = 120 VOLT
20 = 208 VOLT
24 = 240 VOLT
27 = 277 VOLT
34 = 347 VOLT (C.U.L.)
48 = 480 VOLT
MT = MULTITAP (120, 208, 240, 277 VOLT)

COLOR
B = BLACK
Z = BRONZE
N = GREEN
A = AS SPEC.

OPTICS
3 = IES TYPE III DISTRIBUTION
4 = IES TYPE IV DISTRIBUTION
5 = IES TYPE V DISTRIBUTION

TRIM COLOR
B = BLACK
Z = BRONZE
N = GREEN
G = GOLD
A = AS SPECIFIED

TRIM
3 = BUD FINIAL
4 = SPIKE FINIAL
8 = ORNATE FINIAL

OPTIONS
F = FULL DECORATIVE ALUMINUM TOP COVER
S = SHOREWOOD ALUMINUM TOP STYLE COVER (1/2 COVER)
P = PROTECTED STARTER FOR HPS UNITS ONLY
H = PHOTOCONTROL RECEPTACLE
T = BOTH NEMA TWISTLOCK RECEPTACLE AND PROTECTED STARTER TOGETHER (HPS UNITS ONLY)

ACCESSORIES
WHS090 = HOUSE SIDE SHIELD, 90 DEGREES
WHS120 = HOUSE SIDE SHIELD, 120 DEGREES
WHS180 = HOUSE SIDE SHIELD, 180 DEGREES

Specifications

GENERAL DESCRIPTION
The Utility Washington Postlite luminaire is designed for ease of maintenance with the plug-in electrical module common to each of the luminaires in Holophane's Utility Luminaire Series. The traditional acorn shaped luminaire, while reminiscent of the 1920's, contains a precision optical system that maximizes post spacings while maintaining uniform illumination.

OPTICAL SYSTEM
The optical assembly is a precisely molded thermal resistant borosilicate glass reflector and refractor. The upper portion of this system incorporates a series of reflecting prisms that redirect over 50% of the upward light into the controlling refractor while allowing a soft uplight component to define the traditional acorn shape. Two decorative aluminum top cover options are available. The lower portion uses precisely molded refracting prisms to control the distribution of light to maximize utilization, uniformity, and luminaire spacing. The very top of this assembly is a removable prismatic glass cover with decorative finial for toolless entry into the lamp chamber. Three unique optical assemblies are available, designed for IES type III, type IV, and type V distribution.

LUMINAIRE HOUSING
The luminaire housing, cast of aluminum, provides an enclosure for the plug-in electrical module. The nickel plated lamp grip socket and three station incoming line terminal block are prewired to a five conductor receptacle for ease in connection the electrical module. The slipfitter will accept a 3" by 2-7/8" to 3-1/8" O.D. tenon.

LUMINAIRE HOUSING / DOOR
Cast of aluminum, the housing / door is removable without the use of tools and is retained by a nonconductive lanyard, attached to the door and to the housing. For units with an E.E.I.-N.E.M.A. twist lock photocell receptacle, the door contains an acrylic "window" to allow light to reach the cell.

ELECTRICAL MODULE
The ballast components are mounted on a steel plate that is removable without the use of tools. A matching five conductor plug connects to the receptacle in the luminaire housing to complete the wiring. Where a starting aid is required, it is provided with a separate plug-in connector and can be replaced without the use of tools. For photoelectric operation, the electrical module is provided with an E.E.I.-N.E.M.A. twist lock photocell receptacle.

BALLASTS
(Refer to Ballast Data Sheet for specific operation characteristics)
50 watt 120 volt High Pressure Sodium (HPS) ballasts are High Power Factor Reactor type. All other HPS ballast are High Power Factor Autotransformer type.
175 watt Metal Halide (MH) ballasts are Peak Lead Autotransformer type. 70 and 100 watt MH units are available only with High Power Factor High Reactance type ballast.
All Mercury Vapor (MV) ballasts are High Power Factor Constant Wattage Autotransformer (CWA) type.

FINISH
The luminaire is finished with polyester powder paint applied after a seven stage pretreatment precess to insure maximum durability.

UL
The luminaire is UL listed as suitable for wet locations at a maximum of 40 degrees C ambient temperature.

ARCHITECTURAL OUTDOOR ORDER #: TYPE: DRAWING NO: US-3032

THIS DRAWING, WHEN APPROVED, SHALL BECOME THE COMPLETE SPECIFICATION FOR THE MATERIAL TO BE FURNISHED BY HOLOPHANE ON THE ORDER NOTED ABOVE. A UNIT OF SIMILAR DESIGN MAY BE SUPPLIED, BUT ONLY AFTER APPROVAL BY THE CUSTOMER IN WRITING. ON POLE ORDERS AN ANCHOR BOLT TEMPLATE PRINT WILL BE SUPPLIED WITH EACH ANCHOR BOLT ORDER TO MATCH THE POLE PROVIDED.

THIS PRINT IS THE PROPERTY OF HOLOPHANE AND IS LOANED SUBJECT TO RETURN UPON DEMAND AND UPON EXPRESS CONDITION THAT IT WILL NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO OUR INTERESTS, AND ONLY IN CONNECTION WITH MATERIAL FURNISHED BY HOLOPHANE.

HOLOPHANE
LEADER IN LIGHTING SOLUTIONS
An Acuity Brands Company
214 OAKWOOD AVENUE - NEWARK, OHIO 43055

SCALE: N/A
DRAWN: RAF
APP'D:
DATE: 04-28-03

ROADWAY LIG□TING FI□TURE

NOTES:

LIGHT FIXTURES SHOWN ON THIS SHEET WILL BE PROVIDED AND INSTALLED BY AEP.

SEE SHEET E-001 FOR ADDITIONAL NOTES.

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

CLIENT

CITY OF ROANOKE
Office of City Engineer
215 Church Avenue, SW
Room 350
Roanoke, VA 24011

CONSULTANT

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REGISTRATION

COMMONWEALTH OF VIRGINIA
RACHEL C. CAHILL
Lic. No. 031548
5/17/16
PROFESSIONAL ENGINEER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER
60290893

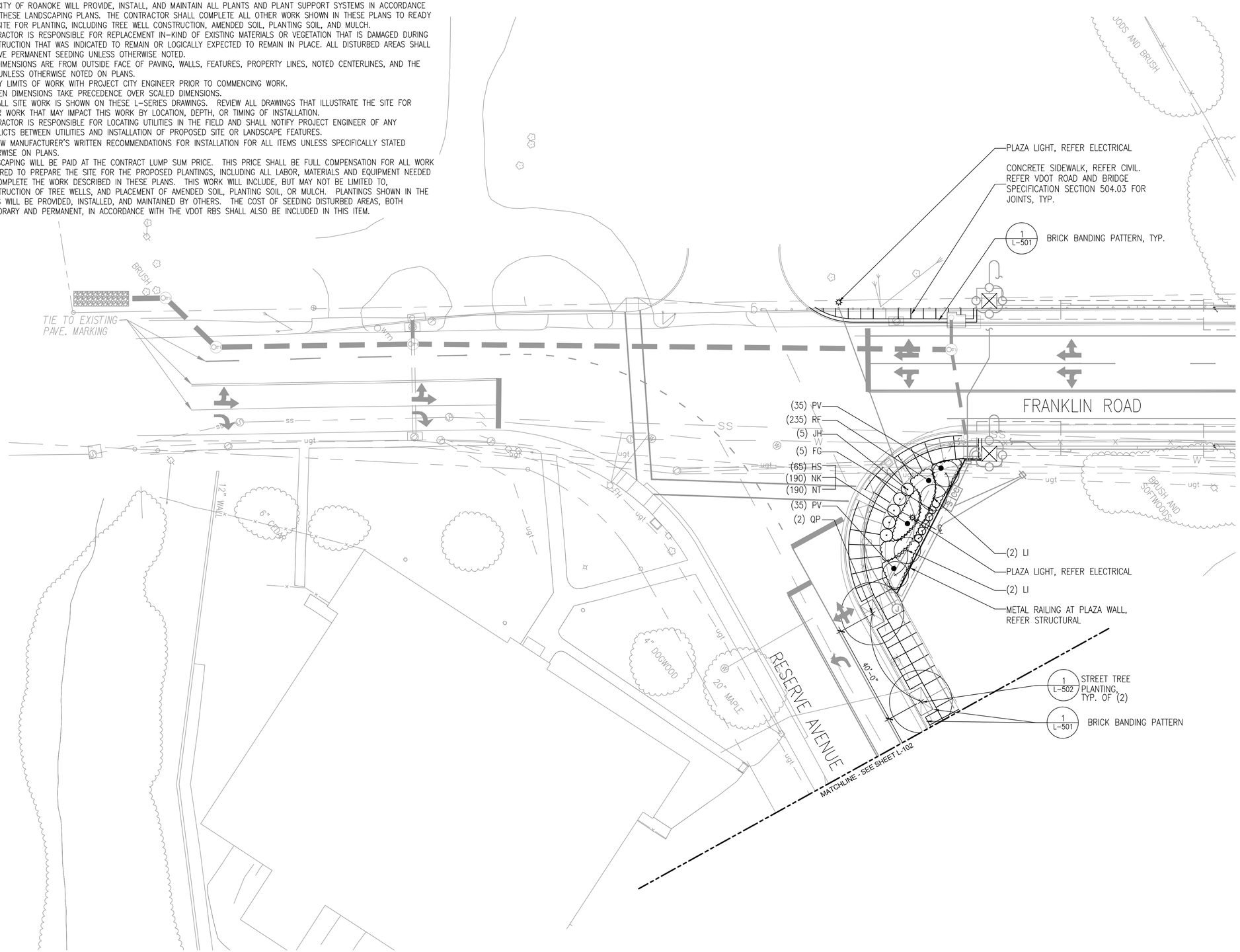
S□EET TITLE
LIGHTING EQUIPMENT DATA
2 OF 2

S□EET NUMBER
E-503

ANSI D 22" X 34"

GENERAL SITE CONSTRUCTION NOTES:

1. THE CITY OF ROANOKE WILL PROVIDE, INSTALL, AND MAINTAIN ALL PLANTS AND PLANT SUPPORT SYSTEMS IN ACCORDANCE WITH THESE LANDSCAPING PLANS. THE CONTRACTOR SHALL COMPLETE ALL OTHER WORK SHOWN IN THESE PLANS TO READY THE SITE FOR PLANTING, INCLUDING TREE WELL CONSTRUCTION, AMENDED SOIL, PLANTING SOIL, AND MULCH.
2. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT IN-KIND OF EXISTING MATERIALS OR VEGETATION THAT IS DAMAGED DURING CONSTRUCTION THAT WAS INDICATED TO REMAIN OR LOGICALLY EXPECTED TO REMAIN IN PLACE. ALL DISTURBED AREAS SHALL RECEIVE PERMANENT SEEDING UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS ARE FROM OUTSIDE FACE OF PAVING, WALLS, FEATURES, PROPERTY LINES, NOTED CENTERLINES, AND THE LIKE UNLESS OTHERWISE NOTED ON PLANS.
4. VERIFY LIMITS OF WORK WITH PROJECT CITY ENGINEER PRIOR TO COMMENCING WORK.
5. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS.
6. NOT ALL SITE WORK IS SHOWN ON THESE L-SERIES DRAWINGS. REVIEW ALL DRAWINGS THAT ILLUSTRATE THE SITE FOR OTHER WORK THAT MAY IMPACT THIS WORK BY LOCATION, DEPTH, OR TIMING OF INSTALLATION.
7. CONTRACTOR IS RESPONSIBLE FOR LOCATING UTILITIES IN THE FIELD AND SHALL NOTIFY PROJECT ENGINEER OF ANY CONFLICTS BETWEEN UTILITIES AND INSTALLATION OF PROPOSED SITE OR LANDSCAPE FEATURES.
8. FOLLOW MANUFACTURER'S WRITTEN RECOMMENDATIONS FOR INSTALLATION FOR ALL ITEMS UNLESS SPECIFICALLY STATED OTHERWISE ON PLANS.
9. LANDSCAPING WILL BE PAID AT THE CONTRACT LUMP SUM PRICE. THIS PRICE SHALL BE FULL COMPENSATION FOR ALL WORK REQUIRED TO PREPARE THE SITE FOR THE PROPOSED PLANTINGS, INCLUDING ALL LABOR, MATERIALS AND EQUIPMENT NEEDED TO COMPLETE THE WORK DESCRIBED IN THESE PLANS. THIS WORK WILL INCLUDE, BUT MAY NOT BE LIMITED TO, CONSTRUCTION OF TREE WELLS, AND PLACEMENT OF AMENDED SOIL, PLANTING SOIL, OR MULCH. PLANTINGS SHOWN IN THE PLANS WILL BE PROVIDED, INSTALLED, AND MAINTAINED BY OTHERS. THE COST OF SEEDING DISTURBED AREAS, BOTH TEMPORARY AND PERMANENT, IN ACCORDANCE WITH THE VDOT RBS SHALL ALSO BE INCLUDED IN THIS ITEM.



AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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REGISTRATION

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ISSUE REVISION

I/R	DATE	DESCRIPTION
0	08/25/2016	Issued for Construction

KEY PLAN

PROJECT NUMBER

60290893

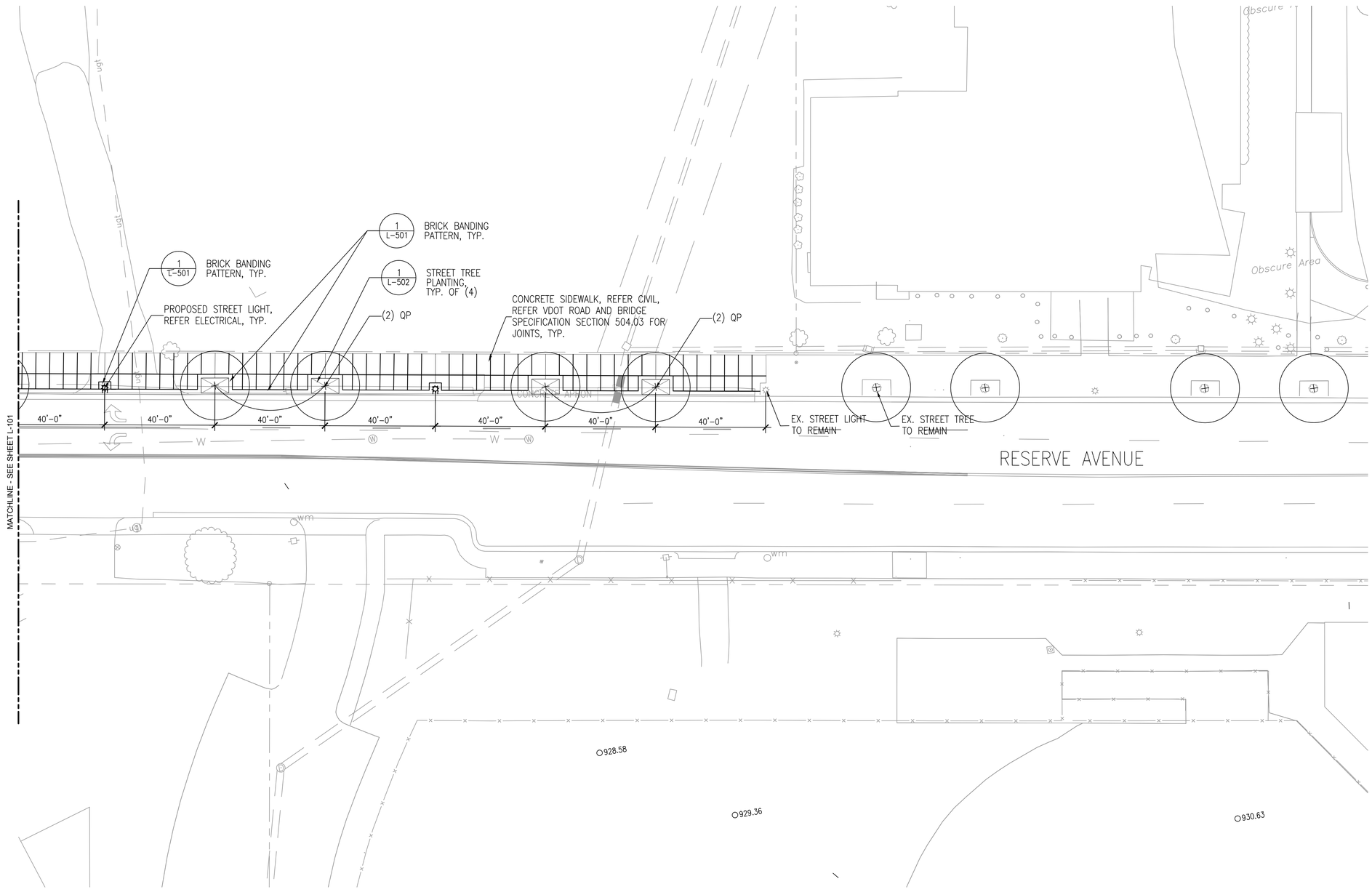
SHEET TITLE

LANDSCAPE PLAN

SHEET NUMBER

L-101

ANSI D 22" X 34"



GRAPHIC SCALES

1"=20' 20' 10' 0 20' 40'

AECOM

PROJECT

REPLACEMENT OF FRANKLIN ROAD BRIDGE OVER NORFOLK SOUTHERN RAILWAY

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PROJECT NUMBER

60290893

SHEET TITLE

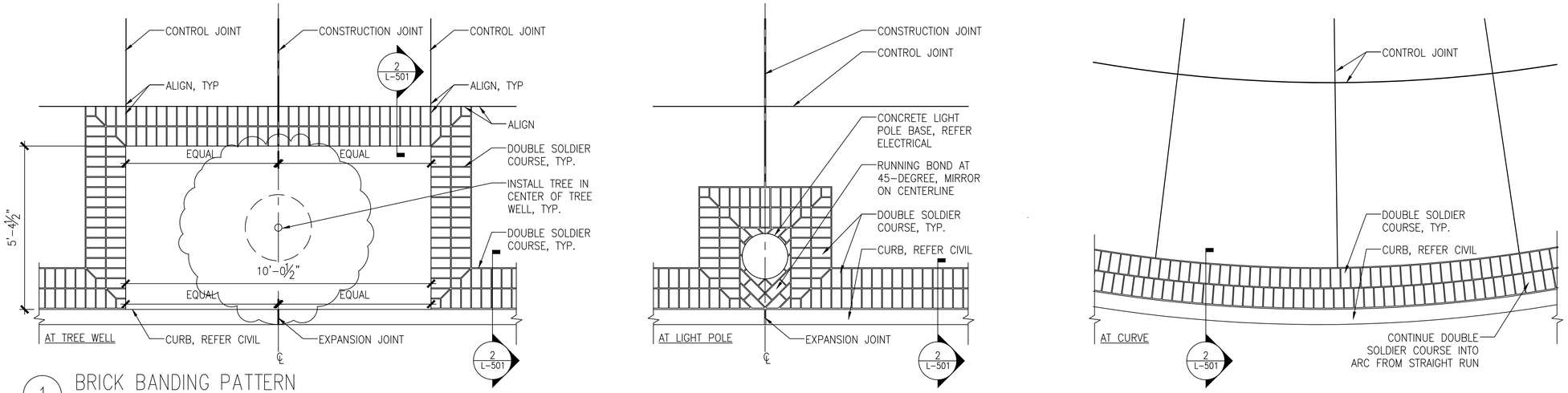
LANDSCAPE PLAN

SHEET NUMBER

L-102

ANSI D 22" X 34"

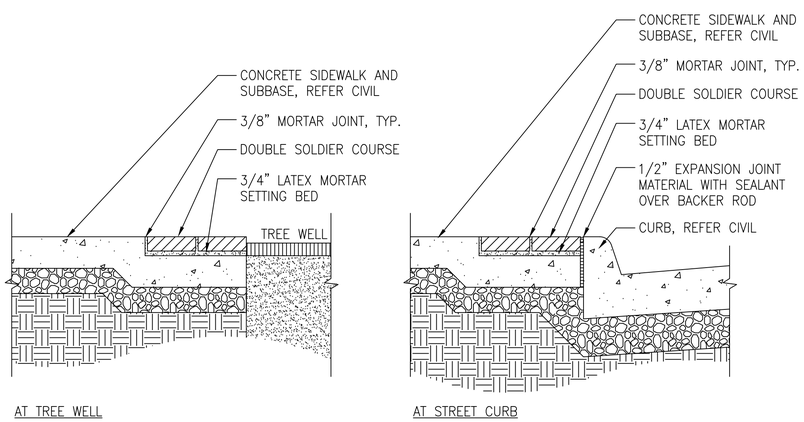
NOTE: REFER VDOT ROAD AND BRIDGE SPECIFICATION SECTION 504.03 FOR SIDEWALK CONSTRUCTION, CONTROL, AND EXPANSION JOINTS, TYP.



1 BRICK BANDING PATTERN

SCALE: 1/2" = 1'-0"

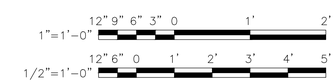
DT-PVMT-BRICK_PLAN.dwg



2 BRICK BANDING IN SIDEWALK

SCALE: 1" = 1'-0"

DT-PVMT-BRICK_SECT.dwg



GRAPHIC SCALES

AECOM

PROJECT

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KEY PLAN

PROJECT NUMBER

60290893

SHEET TITLE

LANDSCAPING DETAILS

SHEET NUMBER

L-501

ANSI D 22" X 34"

GENERAL PLANTING NOTES:

1. All planting shall be in accordance with the 2007 edition of the VDOT Road and Bridge Specifications.

2. For tree planting details, shrub planting details, and slope planting details, refer to the 2008 edition of the VDOT Road and Bridge Standards, pages 1201.04–1201.06.

3. For fertilizer and mulching procedure, refer to 2007 VDOT Road and Bridge Specifications, pages 244.02 250–251.

4. The planting season for this project shall be from: November 1 through March 31. All plants shall be in place by March 15 in order that replacements may be made prior to March 31. The establishment/warranty period is 2 years.

5. All living plants and landscape areas shall be watered to promote healthy, viable plant material. Watering schedule should take precipitation into account and supplement in periods of dryness throughout the landscape establishment period. Minimum quantities of water for each watering are as following, unless otherwise directed by the Landscape Architect:
   a. Deciduous Trees 10' Ht. or less – 6 gallons per pit
   b. Evergreen Trees – 8 gallons per plant
   c. Shrubs over 18" Ht. – 2 gallons per plant
   d. Shrubs under 18" – 1 gallon per plant
   e. Ground Covers – 0.25 gallon per plant

6. Prior to any construction, excavation, or planting operations, the contractor shall assume the responsibility of locating and verifying all utilities, above and/or below ground, public and/or private that may exist and cross through the areas of construction.

7. Certificate of Availability for all plant material (including locations of plant material prior to digging) is required. The Landscape Architect shall be given the opportunity to inspect and approve all plant material at its source prior to digging or delivery. If this opportunity is waived, a representative sample or photograph (4 megapixel minimum resolution if digital) of each species is required for approval prior to shipment of the total quantity.

8. All planting beds for shrubs, perennials, and groundcovers shall be excavated to create a continuous planting bed. Remove subsoils to a depth of 18–inches minimum and replace with a mix of 70% Type B topsoil and 30% compost (Planting Soil Mix). Prior to placement of Planting Soil Mix, loosen subgrade of planting beds to a minimum depth of 4 inches. Remove stones larger than 1–inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property. Apply fertilizer as recommended by soil testing agency directly to subgrade before loosening. Thoroughly blend Planting Soil Mix off–site before spreading. Delay mixing fertilizer with Planting Soil Mix if planting will not proceed within a few days. Mix lime with dry soil before mixing fertilizer. Spread Planting Soil Mix to a depth of 18–inches but not less than required to meet finish grade after natural settlement. Do not spread if Planting Soil Mix or subgrade is frozen, muddy, or excessively wet. Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

9. Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations. Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

10. Tree and shrub pits: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation. Subsoil removed from excavations may not be used as backfill. All tree pits shall be individually mulched according to the 2007 VDOT Road and Bridge Specifications and 2008 VDOT Road and Bridge Standards.

11. Tree wrap shall not be used for any plant.

12. No trees shall be acceptable to plant if the central leader has been cut or damaged.

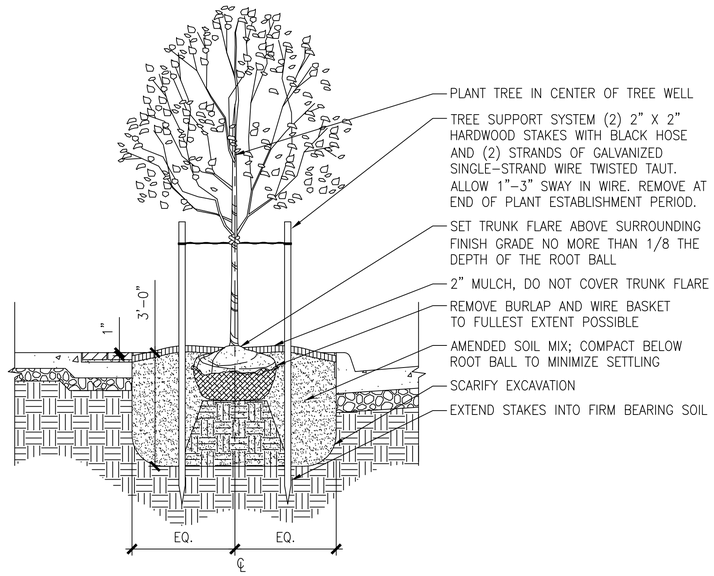
13. Trees shall be maintained in an upright position for the duration of the establishment period.

14. Plants shall not be pruned within 48 hours of planting (only thin out broken limbs or branches).

15. Trees and shrubs shall be set in the planting pit, at the proper depth, on tamped soil mix. A mix of 70% Type B Topsoil and 30% compost (Planting Soil Mix) shall then be filled around the roots to approximately 75% of the depth of the pit, tamped, and thoroughly watered. After settlement of the soil, the remainder of the pit shall be filled with soil, fertilized, tamped, and again watered, all within the same day of planting.

16. Location of plant materials shown on plan are schematic only and shall be adjusted as required for changes due to actual field conditions when directed by the Landscape Architect.

17. All trees shall maintain a 10' clearance from overhead power lines.



1 STREET TREE PLANTING DETAIL

SCALE: N.T.S. 0–OG–Tree–Pit.dwg

TREE HEIGHT	TREE CALIPER	SUPPORT SYSTEM	QTY.	WIRE OR CABLE	TURNBUCKLE	HOSE
8'–12'	LESS THAN 3"	7' UPRIGHT STAKE	2	14 GAUGE WIRE	––	1/2"
12'–14'	3" AND UP	GUY	3	12 GAUGE WIRE	––	1/2"
14'–20'	4" AND UP	GUY	3	12 GAUGE WIRE	––	3/4"
20' AND OVER	6" AND UP	DEADMAN	3*	3/16" CABLE*	3/8" X 6"*	3/4"

* OR AS APPROPRIATE

TREE SUPPORT SCHEDULE

SCALE: NO SCALE 0–OG–Tree–Support.dwg

Key	Qty	Botanical Name	Common Name	Size	Container	Spacing	Comments
STREET TREES							
QP	6	Quercus phellos	Willow Oak	2"-2.5" cal.	B&B	As Shown	Full, Specimen quality
ORNAMENTAL TREES							
LI	4	Lagerstroemia indica 'Natchez'	Natchez Crape Myrtle	8-10' ht.	B&B	As Shown	Full, Specimen quality, multi-stem 3 canes min
SHRUBS							
FG	5	Fothergilla gardenii	Dwarf Fothergilla	18" ht.	Cont.	3' o.c.	Full to ground
JH	5	Juniperus horizontalis 'Blue Chip'	Blue Chip Juniper	1 gallon	Cont.	5' o.c.	Full to ground
PERENNIALS, ORNAMENTAL GRASSES, & BULBS							
HS	65	Hemerocallis 'Stella d'Oro'	Stella D'Oro Daylily	1 gallon	Cont.	18" o.c.	Yellow, repeat bloomer
NK	190	Narcissus x 'King Alfred'	King Alfred Trumpet Daffodil	Top Size	Bulb	Distribute equally within planting bed and around shrub rootballs. Plant in naturalistic groupings	Yellow, blooms March-April
NT	190	Narcissus x 'Thalia'	Thalia Triandrus Daffodil	Top Size	Bulb	Distribute equally within planting bed and around shrub rootballs plant in naturalistic groupings	White, fragrant, blooms March-April
PV	70	Panicum virgatum 'Rotstrahlbusch'	Rotstrahlbusch Switch Grass	1 gallon	Cont.	2' o.c.	Showy seed panicles persist into winter
RF	235	Rudbeckia fulgida var. sullivantii 'Goldsturm'	Goldsturm Black-Eyed Susan	1 gallon	Cont.	12" o.c.	Yellow, blooms June-Sept

GRAPHIC SCALES

AECOM

PROJECT

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5·17·16
Michael S. Arnold
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ISSUE REVISION

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KEY PLAN

PROJECT NUMBER

60290893

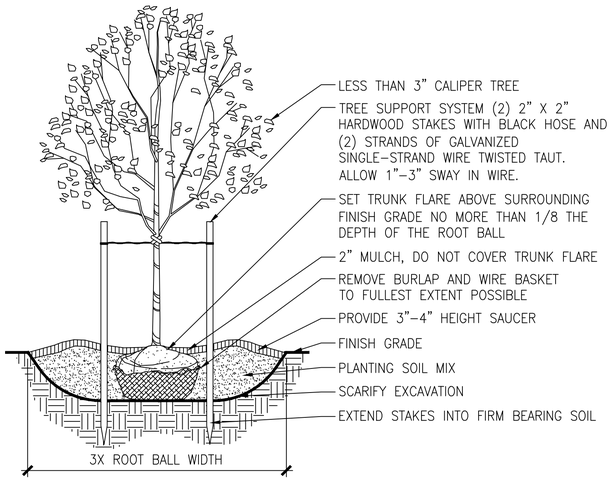
SHEET TITLE

LANSCAPING DETAILS

SHEET NUMBER

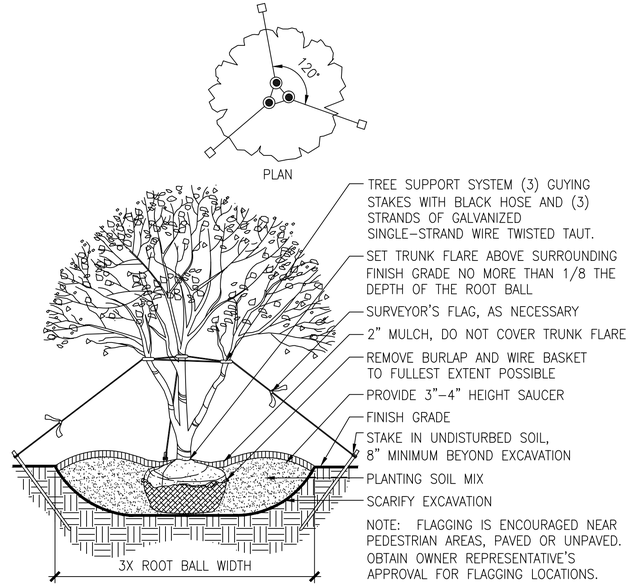
L-502

ANSI D 22" X 34"



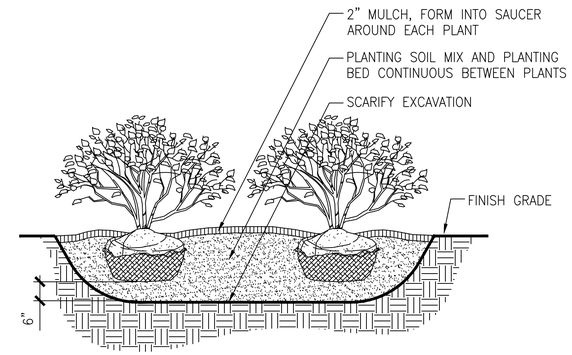
TREE PLANTING DETAIL - STAKING

SCALE: N.T.S. 0-OG-Tree-Staking.dwg



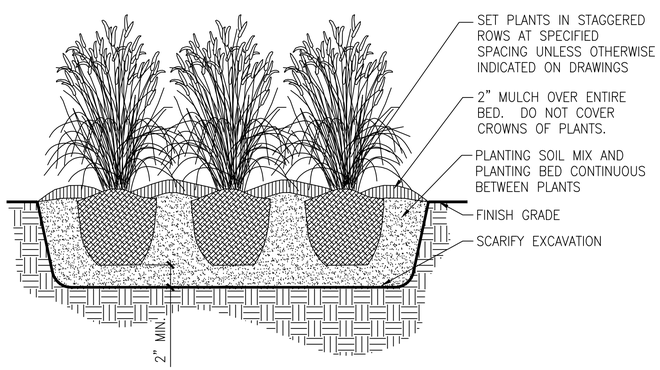
MULTI-STEM TREE PLANTING DETAIL

SCALE: N.T.S. 0-OG-Multistem.dwg



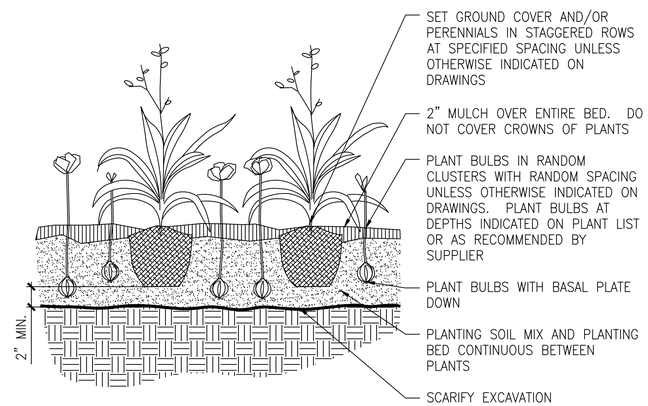
SHRUB PLANTING DETAIL

SCALE: N.T.S. 0-OG-Shrubs.dwg



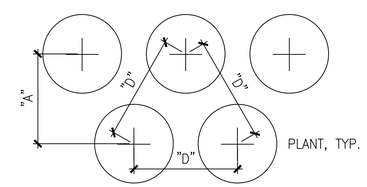
PERENNIALS & ORNAMENTAL GRASSES

SCALE: N.T.S. 0-OG-Perennials.dwg



INTERPLANTING WITH BULBS DETAIL

SCALE: N.T.S. 0-OG-GC-Bulbs.dwg



PLANT SPACING "D"	ROW "A"
6" O.C.	5" O.C.
8" O.C.	7" O.C.
10" O.C.	9" O.C.
12" O.C.	10" O.C.
15" O.C.	13" O.C.
18" O.C.	16" O.C.
24" O.C.	20" O.C.
36" O.C.	26" O.C.

NOTE: INSTALL PLANTS WITH TRIANGULAR SPACING UNLESS OTHERWISE INDICATED ON DRAWINGS.

PLANT SPACING DETAIL

SCALE: N.T.S. 0-OG-Spacing.dwg

GRAPHIC SCALES

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KEY PLAN

PROJECT NUMBER

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SHEET TITLE

LANDSCAPING DETAILS

SHEET NUMBER

L-503