

MSU TUNNEL STRUCTURAL REPAIRS

PROJECT LOCATION:

MIDWESTERN STATE UNIVERSITY
Wichita Falls, Texas



CLIENT:

MIDWESTERN STATE UNIVERSITY

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TEXAS REGISTERED ENGINEERING FIRM F-0093

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SEAL:



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COVER & SHEET INDEX

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<div><div><div>WJE</div><div>ENGINEERS ARCHITECTS MATERIALS SCIENTISTS</div></div><div><div>Wiss, Janney, Elstner Associates, Inc.</div><div>9511 N. Lake Creek Parkway Austin, Texas 78717 512.257.4800 tel 512.219.9883 fax</div><div>TEXAS REGISTERED ENGINEERING FIRM F-0093</div><div>Atlanta Austin Boston Chicago Cleveland Dallas Denver Detroit Doylestown Honolulu Houston Indianapolis London Los Angeles Minneapolis New Haven Northbrook (HQ) New York Philadelphia Pittsburgh Portland Princeton Raleigh San Antonio San Diego San Francisco Seattle South Florida Washington, D.C.</div></div></div>		
SEAL:		
<div><div><div><div>STATE OF TEXAS</div><div><div>★</div></div><div>BRIAN D. MEHRILL</div><div>63924</div><div>LICENSED PROFESSIONAL ENGINEER</div></div><div></div><div>OCTOBER 4, 2023</div></div></div>		
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	1	2	3	4	5	6	7		
A	<div>STRUCTURAL NOTES (CONTINUED)</div> <div>STRUCTURAL STEEL</div> <div>1. SPlicing OF STRUCTURAL STEEL MEMBERS IS PROHIBITED WITHOUT THE APPROVAL AS TO LOCATION AND TYPE. ANY MEMBER HAVING A SPLICE NOT SHOWN AND DETAILED ON THE SHOP DRAWINGS WILL BE REJECTED.</div> <div>2. BURNING OF HOLES IN STRUCTURAL STEEL IS PROHIBITED. ANY MEMBER WITH BURNED HOLES SHALL BE REPLACED.</div> <div>3. PREGROUTING OF COLUMN BASE PLATES WILL NOT BE PERMITTED.</div> <div>4. ALL MISCELLANEOUS WELDS (FIELD OR SHOP) SHALL BE MINIMUM SIZE FILLET ALL AROUND IN ACCORDANCE WITH A.I.S.C. WELDING OF CONTINUOUS MEMBERS SHALL BE A MINIMUM OF 2 INCHES OF 3/16 INCH FILLET STITCH WELDS AT 12 INCHES ON CENTER, STAGGERED EACH SIDE, UNLESS OTHERWISE NOTED.</div> <div>5. ALL WELDS SHALL BE DE-SLAGGED, CLEANED AND PRIMED.</div> <div>6. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH A.W.S. D1.1 CODE, BY CERTIFIED WELDERS.</div> <div>7. WELDING ELECTRODES SHALL BE E70XX, UNLESS NOTED OTHERWISE.</div> <div>8. ALL STRUCTURAL STEEL TO BE SHOP PAINTED PER MANUFACTURER'S REQUIREMENTS.</div> <div>A. APPROVED COATING SYSTEMS</div> <div>I. CARBOLINE COMPANY: PRIMER: CARBOGUARD 635, 4 TO 6 MILS DFT. TOPCOAT: CARBOTHANE 133 FC, 3 TO 5 MILS DFT.</div> <div>II. SHERWIN WILLIAMS: PRIMER: MACROPOXY 646, 4 TO 6 MILS DFT. TOPCOAT: ACROLON 218 HS, 3 TO 5 MILS DFT</div> <div>III. TNEMEC CO., INC.: PRIMER: CHEMBUILD SERIES 135, 4 TO 6 MILS DFT. TOPCOAT: ENDURA-SHIELD SERIES 73, 3 TO 5 MILS DFT.</div> <div>IV. PPG INDUSTRIES, INC.: PRIMER: AMERLOCK 400, 4 TO 6 MILS DFT. TOPCOAT: AMERCOAT 450H, 3 TO 5 MILS DFT.</div> <div>V. EQUAL APPROVED BY EOR</div> <div>9. COLOR OF THE COATING SHALL BE SUBMITTED AND APPROVED BY THE OWNER.</div> <div>10. STRUCTURAL SHAPES AND PLATES SHALL CONFORM TO THE FOLLOWING, UNLESS NOTED OTHERWISE ON THE DRAWINGS:</div> <div>A. ALL TUBULAR MEMBERS:ASTM A500, GRADE B</div> <div>B. ALL OTHER SHAPES AND PLATES:ASTM A36</div> <div>ANCHORS</div> <div>1. ALL ANCHORS USED SHALL BE HOT-DIPPED GALVANIZED OR STAINLESS STEEL OF AN APPROVED TYPE, UNLESS NOTED OTHERWISE.</div> <div>2. EXPANSION ANCHORS SHALL BE HILTI KWIK-BOLT OR APPROVED SUBSTITUTE, UNLESS NOTED OTHERWISE.</div> <div>3. ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.</div> <div>4. THE CONTRACTOR SHALL LOCATE ALL EXISTING REINFORCING STEEL AND OTHER EMBEDDED ITEMS CONTAINED IN THE CONCRETE USING NON-DESTRUCTIVE METHODS AND SHALL POSITION ANCHOR LOCATIONS TO AVOID CONFLICTS WITH EXISTING EMBEDDED ITEMS. DO NOT DRILL INTO OR DAMAGE EXISTING REINFORCEMENT OR POST-TENSIONING STRANDS.</div> <div>5. FOR THE ADHESIVE ANCHORING OF BOLTS, THREADED RODS, AND REINFORCING BAR INTO DRILLED CONCRETE, SEE THE SPECIFICATION FOR CONCRETE REPAIR - ANCHORING EPOXY ON SHEET S1.2</div> <div>6. ALL ABANDONED HOLES SHALL BE FILLED WITH NON-SHRINK GROUT.</div> <div>BELOW GRADE WATERPROOFING</div> <div>1. WATERPROOFING SYSTEMS FOR BELOW GRADE APPLICATION SHALL CONSIST OF THE FOLLOWING PRODUCTS OR AN APPROVED SUBSTITUTE.</div> <div>A. PEEL-AND-STICK SHEET APPLIED BITUMINOUS WATERPROOFING (DETAILS SHOWN ON SHEET S6.0)</div> <div>I. PRIMER: MEL PRIME BY WR MEADOWS</div> <div>II. SHEET APPLIED BITUMINOUS WATERPROOFING MEMBRANE: MEL-ROL BY WR MEADOWS</div> <div>III. BACKFILL PROTECTION AND DRAINAGE MAT: MEL-DRAIN</div> <div>V. COLD APPLIED SEALING COMPOUND: POINTING MASTIC BY WR MEADOWS</div> <div>V. BULK COLD APPLIED MEMBRANE FOR 90 DEGREE TRANSITIONS: BEM BY WR MEADOWS</div> <div>VI. ELASTOMERIC JOINT TAPE: DETAIL STRIP BY WR MEADOWS</div> <div>VII. PLASTIC STRIP TERMINATION AT UPWARD FACING VERTICAL TERMINATIONS: TERMINATION BAR BY WR MEADOWS</div> <div>B. LIQUID APPLIED BITUMINOUS WATERPROOFING (DETAILS NOT PROVIDED, CONTRACTOR TO PROVIDE DETAILS IF ALTERNATIVE IS DESIRED).</div> <div>I. BITUMINOUS LIQUID APPLIED WATERPROOFING: HYDROLASTIC 836 BY WR MEADOWS</div> <div>II. BULK COLD APPLIED MEMBRANE FOR 90 DEGREE TRANSITIONS: BEM BY WR MEADOWS.</div> <div>III. POLYESTER REINFORCING FABRIC: REINFORCING FABRIC HCR BY WR MEADOWS.</div> <div>IV. SHEET APPLIED WATERPROOFING TRANSITION FROM EXISTING TO NEW PRODUCTS: MEL-ROL BY WR MEADOWS WITH TERMINATIONS SEALED WITH POINTING MASTIC BY WR MEADOWS.</div> <div>2. WATERPROOFING SHALL BE APPLIED TO CONCRETE THAT HAS CURED SUFFICIENTLY, AS DEFINED BY THE WATERPROOFING MANUFACTURER, AND IS CLEAN OF ALL DUST, DIRT, OR OIL, DRY, SMOOTH, AND FREE OF VOIDS.</div> <div>3. WATERPROOFING PRODUCTS SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATIONS.</div>			<div>CATHODIC PROTECTION</div> <div>GENERAL LOCATION AND DESCRIPTION OF REPAIR LOCATIONS ARE INDICATED ON THE DRAWINGS.</div> <div>1. COMPLETE GALVANIC ANODE INSTALLATION PER THE GENERAL NOTES PROVIDED ON SHEET S5.0 AND MANUFACTURER'S RECOMMENDATIONS.</div> <div>2. CATHODIC PROTECTION SHALL CONSIST OF THE FOLLOWING PRODUCTS OR AN APPROVED SUBSTITUTE:</div> <div>A. DRILLED IN GALVANIC ANODES</div> <div>I. GALVASHIELD CC-4 BY VECTOR TECHNOLOGIES</div> <div>B. DISCRETE ANODES IN CONCRETE REPAIRS</div> <div>I. GLAVASHIELD XP2 BY VECTOR TECHNOLOGIES</div> <div>C. EMBEDDING MORTAR</div> <div>I. GALVASHIELD EMBEDDING MORTAR BY VECTOR TECHNOLOGIES</div> <div>D. REBAR CONNECTORS</div> <div>I. VECTOR REBAR CONNECTORS BY VECTOR TECHNOLOGIES</div> <div>II. GALVASHIELD CC RIVET CONNECTOR KITS BY VECTOR TECHNOLOGIES</div> <div>3. A REPRESENTATIVE OF THE MANUFACTURER SHOULD BE ON SITE FOR THE INSTALLATION OF THE FIRST PRODUCTION MOCK UP.</div> <div>TESTING AND INSPECTION REQUIREMENTS</div> <div>1. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER AND MSU FACILITIES SERVICES DEPARTMENT TO PERFORM ALL REQUIRED INSPECTIONS.</div> <div>2. MSU FACILITIES SERVICES DEPARTMENT SHALL CONTRACT OUT TESTING OF CAST-IN-PLACE AND CONCRETE REPAIR MATERIALS.</div> <div>3. MSU FACILITIES SERVICES DEPARTMENT SHALL CONTRACT OUT THE FOLLOWING CONSTRUCTION INSPECTION SERVICES:</div> <div>A. SOILS AND EXCAVATION</div> <div>I. PERIODIC OBSERVATIONS OF EXCAVATIONS FOR PROPER DEPTH AND EXTENTS.</div> <div>II. PERIODIC OBSERVATIONS OF SUBGRADE CONDITIONS PRIOR TO COMPLETION OF BACKFILL ACTIVITIES.</div> <div>III. PERIODIC OBSERVATIONS OF BACKFILL OPERATIONS TO VERIFY PROPER MATERAILS, DENSITIES, AND LIFT THICKNESSES.</div> <div>B. CONCRETE CONSTRUCTION</div> <div>I. PERIODIC INSPECTION OF REINFORCING STEEL FOR TYPE AND SIZE, FREE OF OIL, DIRT, AND RUST, PROPER LOCATIONS AND SPACING, APPROPRIATE BENDS, TIES, AND SUPPLEMENTAL REINFORCEMENT, AND APPROPRIATE LAP LENGTHS.</div> <div>II. PERIODIC INSPECTION OF ANCHORS CAST IN CONCRETE, PER ACI 318-19 CH. 17.8.2, FOR STEEL GRADE, TYPE AND SIZE, FREE OF OIL, DIRT, AND RUST, PROPER LOCATIONS AND SPACING.</div> <div>III. PERIODIC INSPECTION OF POST INSTALLED ADHESIVE ANCHORS INSTALLED HORIZONTALLY OR UPWARDLY WHICH RESIST SUSTAINED TENSION LOADS PER THE REQUIREMENTS OF THE MANUFACTURER'S PUBLISHED RESEARCH REPORT. CURRENT DESIGN DOES NOT INCLUDE THESE INSTANCES, BUT INSPECTION REQUIREMENTS SHALL APPLY FOR ANY MODIFICATIONS TO DETAILS DURING CONSTRUCTION WHICH INDUCE THIS CONDITION.</div> <div>IV. PERIODIC INSPECTION OF ALL OTHER POST INSTALLED ANCHORS PER THE REQUIREMENTS OF THE MANUFACTURER'S PUBLISHED RESEARCH REPORT.</div> <div>V. VERIFICATION OF PROPER CONCRETE MIX DESIGN DURING EACH CAST-IN-PLACE CONCRETE PLACEMENT.</div> <div>VI. INSPECTION OF CONCRETE PLACEMENT FOR PROPER PLACEMENT TECHNIQUES DURING EACH CAST-IN-PLACE CONCRETE PLACEMENT.</div> <div>VII. INSPECTION OF APPROPRIATE CURING TEMPERATURES AND TECHNIQUES DURING EACH CAST-IN-PLACE CONCRETE PLACEMENT.</div> <div>C. STEEL CONSTRUCTION</div> <div>I. PERIODIC INSPECTION OF IDENTIFICATION MARKINGS AND MANUFACTURERS' CERTIFIED MILL TEST REPORTS FOR CONFORMANCE WITH ASTM STANDARDS SPECIFIED HEREIN.</div> <div>II. PERIODIC OBSERVATIONS OF WELD MAY BE DONE AS PIECES ARE RECEIVED ON SITE BY A COMPETENT PERSON. MSU FACILITIES SERVICES DEPARTMENT MAY UTILIZE A CERTIFIED WELDING INSPECTOR AT THEIR DISCRETION.</div> <div>III. PERIODIC INSPECTIONS OF STEEL MEMBER INSTALLATION FOR LOCATIONS AND CONNECTIONS.</div> <div>D. INSPECTIONS OF FABRICATORS OF STRUCTURAL STEEL ELEMENTS</div> <div>I. PERIODIC INSPECTIONS TO VERIFY THAT THE FABRICATOR MAINTAINS DETAILED FABRICATION AND QUALITY CONTROL PROCEDURES PER THE REQUIREMENTS OF IBC 2015 1704.2.5. EXCEPTIONS MAY BE MADE FOR FABRICATORS THAT ARE ENROLLED IN A NATIONALLY ACCEPTED INSPECTIONS PROGRAM, AS DEFINED BY IBC 2015 1704.2.5. THE APPROVED FABRICATION SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO MSU FACILITIES SERVICES DEPARTMENT AND THE ENGINEER.</div> <div>4. INSPECTION REPORTS SHALL BE PROVIDED TO MSU FACILITIES SERVICES DEPARTMENT AND ENGINEER WITHIN 7 DAYS OF COMPLETION OF OBSERVATIONS.</div> <div>UTILITY RACK REPAIR MATERIALS</div> <div>1. ALL REPLACEMENT FRAMING MATERIALS COMMONLY REFERRED TO AS "UNISTRUT" UTILIZED FOR REPAIR OR REPLACEMENT ON UTILITY RACKS ARE TO BE "POWER-STRUT P.S.200 SERIES" HOT-DIP GALVANIZED, PREFORMED SECTIONS OR AN APPROVED EQUAL. SEE ADDITIONAL UTILITY RACK FRAMING NOTES AS FOUND ON SHEETS S7.0 THROUGH S7.2.</div> <div>2. SHORING - IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO EFFECTIVELY SUPPORT ALL UTILITY PIPES AND WIRES DURING REPAIRS SUCH THAT NO DAMAGE OCCURS. SHORING IS EXPECTED TO BE NECESSARY DURING MEMBER REPLACEMENT REPAIRS AND FOOTING REPAIRS.</div>			<div>3. PREPARATION OF RUSTING "UNISTRUT" AND EXPANSION JOINT SUPPORT FRAMING - AS NOTED IN THE REPAIR QUANTITY TABLE PROVIDED ON S7.0 OR UNCOVERED IN THE PROCESS OF TUNNEL WORK, SURFACE RUSTING OF UTILITY SUPPORT FRAMES CONSTRUCTED OF GALVANIZED STEEL "UNISTRUT" FRAMING AND EXPANSION JOINT SUPPORTS CONSTRUCTED WITH COATED STEEL MEMBERS ARE TO HAVE SURFACE RUST AND SCALE REMOVED AND PREPPED AS NECESSARY WITH WIRE BRUSH, ROTARY WIRE WHEEL OR OTHER HAND-TOOLS, AND HAVE RUST-INHIBITIVE PROTECTIVE COATINGS APPLIED TO PROTECT FROM FURTHER DETERIORATION.</div> <div>4. COLD GALVANIZING COMPOUND - FOR RUSTING UTILITY RACKS AND EXPANSION JOINT SUPPORTS UTILIZE "RUST-OLEUM" HIGH PERFORMANCE 7000 COLD GALVANIZING, COMPOUND FORMULATION # 206193. THE COLD GALVANIZING IS TO BE A ZINC RICH COMPOUND OF 95% PURE METALLIC ZINC TO PROVIDE SUPERIOR PROTECTION FROM RUST. COLD-GALVANIZING IS ALSO TO BE UTILIZED FOR TOUCH-UP PAINTING OF ABRASIONS AND WELD SCARS ON OTHER SURFACE DAMAGE TO HOT-DIP GALVANIZED SURFACES. SURFACE PREPARATION, APPLICATION METHOD, AND RE-COATING SHALL BE DONE.</div> <div>5. PEDESTAL REPAIRS/REPLACEMENT - ALL DETERIORATING AND/OR DAMAGED CONCRETE SUPPORT PEDESTALS BELOW EXISTING UTILITY RACK SUPPORT FRAMES ARE TO BE EITHER REPLACED OR REPAIRED TO PROVIDE A STRUCTURALLY TIGHT AND SECURE PEDESTAL FOR SUPPORT AND PROTECTION OF THE BASE OF THE SUPPORT FRAMES.</div> <div>6. SUPPORT PEDESTAL GROUT - NON-SHRINK GROUT: SIKAGROUT 328; BASF MASTERFLOW 928; SPECICHEM SC PRECISION GROUT; DAYTON SURE-GRIP HIGH PERFORMANCE GROUIT; WR MEADOWS 588, OR APPROVED EQUAL. EACH TO BE EXTENDED WITH PEA GRAVEL. INSTALL PER MANUFACTURER'S INSTRUCTIONS.</div> <div>A. THESE MATERIALS MAY ALSO BE USED, PER THEIR MANUFACTURER'S INSTRUCTIONS, FOR ALL OTHER CONDITIONS WITHIN THE CONTRACT DRAWINGS THAT CALL FOR NON-SHRINK GROUT.</div> <div>7. PEDESTAL ANCHOR RODS - ANCHOR BOLTS/NUTS: ASTM A-307 GRADE A THREADED RODS, ASTM A-563 GRADE A NUTS, ALL HOT DIPPED GALVANIZED.</div> <div>8. FORMING OF CONCRETE PEDESTALS - CONCRETE PEDESTALS BELOW UTILITY SUPPORT RACKS SHALL BE FORMED WITH PVC PIPE SLEEVES. PVC PIPE SLEEVES SHALL BE LEFT IN PLACE. MATCH EXISTING REPAIR PEDESTALS ALREADY IN PLACE. SEE PLAN DETAILS.</div>		
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C									
D									
E									

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63924

BRIAN D. MERRILL

PROFESSIONAL ENGINEER



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STRUCTURAL NOTES
(CONTINUED)

TITLE:

SHEET No.:S1.3

REPAIR TYPE (A) : BASE BID - TOP SLAB REPAIR; REF. 1/S4.0				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL A	STA 780-840	ADJACENT TO AN EXISTING TRANSFORMER PAD THAT SHALL NOT BE DISTURBED	LF	60
TUNNEL A	STA 1030-1080	-	LF	50
TUNNEL B	STA 120-205	-	LF	85
TUNNEL B	STA 262-490	CONTRACTOR SHALL NOT DISTURB MUSTANG WALK TO COMPLETE REPAIRS. IF TOP SLAB DELAMINATIONS EXIST BELOW THE EXTENTS OF MUSTANG WALK, NOTIFY MSU FACILITIES SERVICES DEPARTMENT AND THE ENGINEER. SUFFICIENT DISTANCE FROM THE EDGE OF MUSTANG WALK SHOULD BE CONSIDERED AS SOME LENGTH OF TUNNEL THAT WILL NOT BE REPAIRED AND MUST RECEIVE THE WATERPROOFING TERMINATION SHOWN IN 5/S6.0.	LF	228
TUNNEL B	STA 1055-1208	-	LF	153
TUNNEL B	STA 1242-1350	-	LF	108
TUNNEL LIGON	STA 50-460	-	LF	410
TUNNEL DILLARD	STA 500-505	REPAIR SHALL SPAN OVER CONSTRUCTION JOINT BETWEEN DILLARD AND UNIVERSITY PRESS TUNNELS.	LF	5
TUNNEL UNIV PRESS	STA 0-10	-	LF	10
TUNNEL UNIV PRESS	STA 50-60	CAUTION: POSSIBLE UNDERGROUND ELECTRIC, REF. X1.1	LF	10
TUNNEL UNIV PRESS	STA 95-105	REPAIR SHALL BE CENTERED ON THE JUNCTION BETWEEN DILLARD AND UNIV. PRESS TUNNELS.	LF	10
			TOTAL	1129

REPAIR TYPE (B) : ALTERNATE BID - TOP SLAB REPAIR; REF. 1/S4.0 SIM.				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL A	STA 20-140	-	LF	120
TUNNEL A	STA 140-275	STRUCTURAL CAP REPAIR OR PARTIAL DEPTH CONCRETE REPAIRS SHALL BE COMPLETED. UNDERGROUND UTILITIES MAY MAKE PROVIDING A STRUCTURAL CAP DIFFICULT.	LF	135
			TOTAL	255

REPAIR TYPE (C) : NEW WALL SHORING; REF. 3/S4.1				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL B	STA 850-1100	-	EA	84
			TOTAL	84

REPAIR TYPE (D) : BASE BID - WALL CRACK INJECTION REPAIR; REF. 5/S4.2				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL DILLARD	STA 0	EXPOSED WALL	LF	8
TUNNEL DILLARD	STA 0	PIPE RACK WALL	LF	8
			TOTAL	16

REPAIR TYPE (E) : ALTERNATE BID - WALL CRACK INJECTION REPAIR; REF. 5/S4.2				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL B	STA 1560	-	LF	8
TUNNEL B	STA 1640	HORIZONTAL CRACK	LF	15
TUNNEL B	STA 1910	-	LF	4
TUNNEL B	STA 1920	EXPOSED WALL	LF	4
TUNNEL B	STA 1920	PIPE RACK WALL	LF	4
TUNNEL B	STA 1955	-	LF	8
TUNNEL B	STA 2030	-	LF	8
			TOTAL	51

REPAIR TYPE (F) : TOP SLAB CRACK INJECTIONS; REF. 5/S4.2				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL A	STA 275-744	-	LF	564
TUNNEL DILLARD	STA 0	-	LF	6
			TOTAL	570

REPAIR TYPE (G) : ALTERNATIVE BID - TOP SLAB CRACK INJECTIONS; REF. 5/S4.2				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL A	STA 20-140	-	LF	144
TUNNEL A	STA 140-275	INJECTIONS WOULD OCCUR TO ADDRESS LEAKAGES BETWEEN OR UNDERNEATH CONCRETE REPAIR AREAS.	LF	168
TUNNEL A	STA 840-1030	-	LF	228
TUNNEL A	STA 1080-1200	-	LF	144
TUNNEL BOLIN	STA 0-125	-	LF	156
TUNNEL B	STA 0-97	-	LF	120
TUNNEL B	STA 205-245	-	LF	48
TUNNEL B	STA 500-1055	-	LF	672
TUNNEL B	STA 1920	-	LF	6
TUNNEL FFA	STA 0-230 & ANNEX	-	LF	300
TUNNEL CLARK	STA 0-75	-	LF	96
TUNNEL DORM	STA 0-175 & RHM	-	LF	240
TUNNEL LIGON	STA 0-43	-	LF	60
TUNNEL MOFFETT	STA 0-250	-	LF	300
			TOTAL	2766

REPAIR TYPE (H) : PIPE RACK WALL PARTIAL DEPTH REPAIR; REF. 1/S4.2				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL A	STA 155	-	SF	4
TUNNEL A	STA 170	-	SF	2
TUNNEL A	STA 325	-	SF	12
TUNNEL A	STA 365	-	SF	30
TUNNEL A	STA 380	-	SF	8
TUNNEL A	STA 390	-	SF	30
TUNNEL A	STA 410	-	SF	15
TUNNEL A	STA 420	-	SF	16
TUNNEL A	STA 512	-	SF	10
TUNNEL A	STA 526	-	SF	6
TUNNEL A	STA 556-565	-	SF	40
TUNNEL A	STA 575-582	-	SF	21
TUNNEL A	STA 625	-	SF	4
TUNNEL A	STA 666	-	SF	4
TUNNEL A	STA 865	-	SF	3
TUNNEL A	STA 881	-	SF	2
TUNNEL A	STA 915	-	SF	1
TUNNEL A	STA 1096	-	SF	6
TUNNEL B	STA 485	-	SF	8
TUNNEL B	STA 1105-1110	-	SF	30
TUNNEL B	STA 1122	-	SF	5
TUNNEL B	STA 1232	-	SF	2
TUNNEL B	STA 1285	-	SF	15
TUNNEL B	STA 1326	-	SF	1
TUNNEL B	STA 1425	-	SF	12
TUNNEL B	STA 1520-1535	-	SF	60
TUNNEL B	STA 1619	-	SF	32
TUNNEL B	STA 1669	-	SF	16
			TOTAL	395

REPAIR TYPE (J) : EXPOSED WALL PARTIAL DEPTH REPAIR; REF. 1/S4.2				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL A	STA 7	-	SF	8
TUNNEL A	STA 75-80	-	SF	12
TUNNEL A	STA 305	-	SF	4
TUNNEL A	STA 325	-	SF	6
TUNNEL A	STA 390	-	SF	4
TUNNEL A	STA 462	-	SF	1
TUNNEL A	STA 490	-	SF	1
TUNNEL A	STA 498	-	SF	1
TUNNEL A	STA 541	-	SF	1
TUNNEL A	STA 546	-	SF	2
TUNNEL A	STA 665	-	SF	2
TUNNEL A	STA 1000	-	SF	2
TUNNEL B	STA 150	-	SF	2
TUNNEL B	STA 404	-	SF	4
TUNNEL B	STA 746	-	SF	4
TUNNEL B	STA 1339-1355	-	SF	32
TUNNEL B	STA 1414	-	SF	1
TUNNEL B	STA 1430	-	SF	3
TUNNEL B	STA 1980	-	SF	3
TUNNEL LIGON	STA 85-90	-	SF	4
			TOTAL	97

REPAIR TYPE (K) : TOP SLAB (SOFFIT) PARTIAL DEPTH REPAIR; REF. 1/S4.2				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL A	STA 140-275	STRUCTURAL CAP REPAIR OR PARTIAL DEPTH CONCRETE REPAIRS SHALL BE COMPLETED. UNDERGROUND UTILITIES MAY MAKE PROVIDING A STRUCTURAL CAP DIFFICULT.	SF	275
TUNNEL A	STA 554	-	SF	6
TUNNEL A	STA 720	-	SF	5
TUNNEL A	STA 767-779	BENEATH AN EXISTING TRANSFORMER PAD THAT SHALL NOT BE DISTURBED	SF	60
TUNNEL A	STA 874	-	SF	12
TUNNEL A	STA 950	-	SF	3
TUNNEL A	STA 964	-	SF	1
TUNNEL A	STA 987	-	SF	12
TUNNEL A	STA 1181	-	SF	6
TUNNEL MOFFETT	STA 162	-	SF	12
TUNNEL MOFFETT	STA 182	-	SF	2
TUNNEL MOFFETT	STA 255	-	SF	6
TUNNEL B	STA 824	-	SF	1
TUNNEL B	STA 985	-	SF	3
TUNNEL B	STA 1012	-	SF	3
TUNNEL B	STA 1020	-	SF	6
TUNNEL B	STA 1038	-	SF	24
TUNNEL B	STA 1116	-	SF	1
TUNNEL DORM	STA 55	-	SF	6
TUNNEL CROSSOVER	STA 311	FIELD VERIFY IN-SITU CONDITION OF PREVIOUS REPAIR	LF	8
			TOTAL	452

REPAIR TYPE (L) : PREVIOUS TOP SLAB REPAIR STABILIZATION; REF. 2/S4.1				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL A	STA 744-756	-	LF	12
TUNNEL B	STA 97-120	-	LF	23
TUNNEL B	STA 245-262	-	LF	17
TUNNEL B	STA 1208-1242	-	LF	34
TUNNEL B	STA 1350-1695	-	LF	345
			TOTAL	431

REPAIR TYPE (M) : BEAM REPAIR; REF. 4/S4.2				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL LIGON	STA 370	CONTRACTOR SHOULD CONSIDER THAT THERE MAY BE ELECTRICAL CONDUCT WITHIN THIS BEAM.	LF	6
			TOTAL	6

REPAIR TYPE (N) : ALTERNATIVE BID - DRILLED IN GALVANIC CATHODIC PROTECTION, REF. 5.0				
TUNNEL ID.	STATION NO.	COMMENTS	UNIT	EST. QTY
TUNNEL A	STA 140-275	ESTIMATED BY TOTAL ANODES NEEDED, ASSUMED ALL ANODES WILL BE DRILLED IN	EA	244
TUNNEL A	STA 756-780	ESTIMATED BY TOTAL ANODES NEEDED, ASSUMED ALL ANODES WILL BE DRILLED IN	EA	48
TUNNEL B	STA 205-245	ESTIMATED BY TOTAL ANODES NEEDED, ASSUMED ALL ANODES WILL BE DRILLED IN	EA	76
TUNNEL B	STA 500-1055	ESTIMATED BY TOTAL ANODES NEEDED, ASSUMED ALL ANODES WILL BE DRILLED IN	EA	992
			TOTAL	1360

WJE ENGINEERS
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MATERIALS SCIENTISTS

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SEAL:



PROJECT:

**MSU TUNNEL
STRUCTURAL REPAIRS**

**MIDWESTERN
STATE UNIVERSITY**
Wichita Falls, Texas

CLIENT:

**Midwestern
State University**
3410 Taft Blvd
Wichita Falls, Texas 76308

Contact: Kyle Owen
kyle.owen@msutexas.edu

No.	DATE	DESCRIPTION

WJE PROJECT No.:	2022.4649.0
ISSUE DATE:	OCTOBER 4, 2023
PROJECT MANAGER:	BDM
REVIEWED BY:	RDD
DRAWN BY:	FV/ADP
SCALE:	AS NOTED

**REPAIR TYPE
QUANTITY SCHEDULES**

TITLE:

SHEET No.:

S1.4



1 OVERALL SITE PLAN
FULL SCALE (24x36): 1" = 100'-0"
HALF SCALE (11x17): 1" = 200'-0"

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PROJECT:

MSU TUNNEL STRUCTURAL REPAIRS

**MIDWESTERN
STATE UNIVERSITY**
Wichita Falls, Texas

CLIENT:

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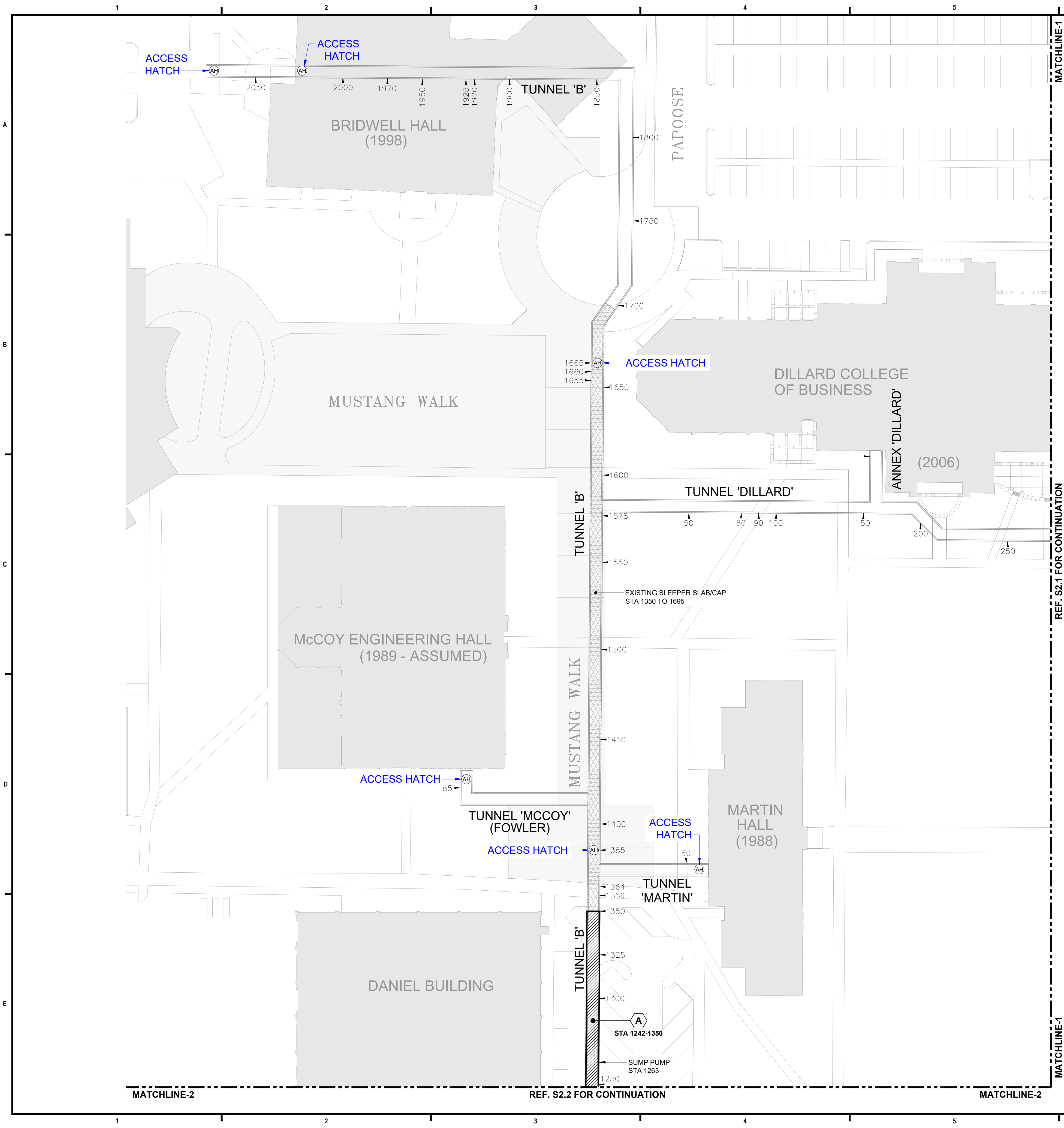
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PROJECT MANAGER:	BDM
REVIEWED BY:	RDD
DRAWN BY:	FV/ADP
SCALE:	AS NOTED

OVERALL SITE PLAN

TITLE:

SHEET No.:

S1.5



KEY PLAN			
<p>MATCHLINE-1</p> <p>MATCHLINE-2</p> <p>MATCHLINE-3</p>			
EXISTING CONDITIONS LEGEND			
SYMBOL	DESCRIPTION		
	EXISTING SLEEPER SLAB/CAP		
	ACCESS HATCH		
REPAIR TYPE LEGEND			
REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
		BASE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0
		ALTERNATE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0 SIM



1 ENLARGED PARTIAL TUNNEL REPAIR PLAN: EXTERIOR
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

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SEAL:

OCTOBER 4, 2023

PROJECT:

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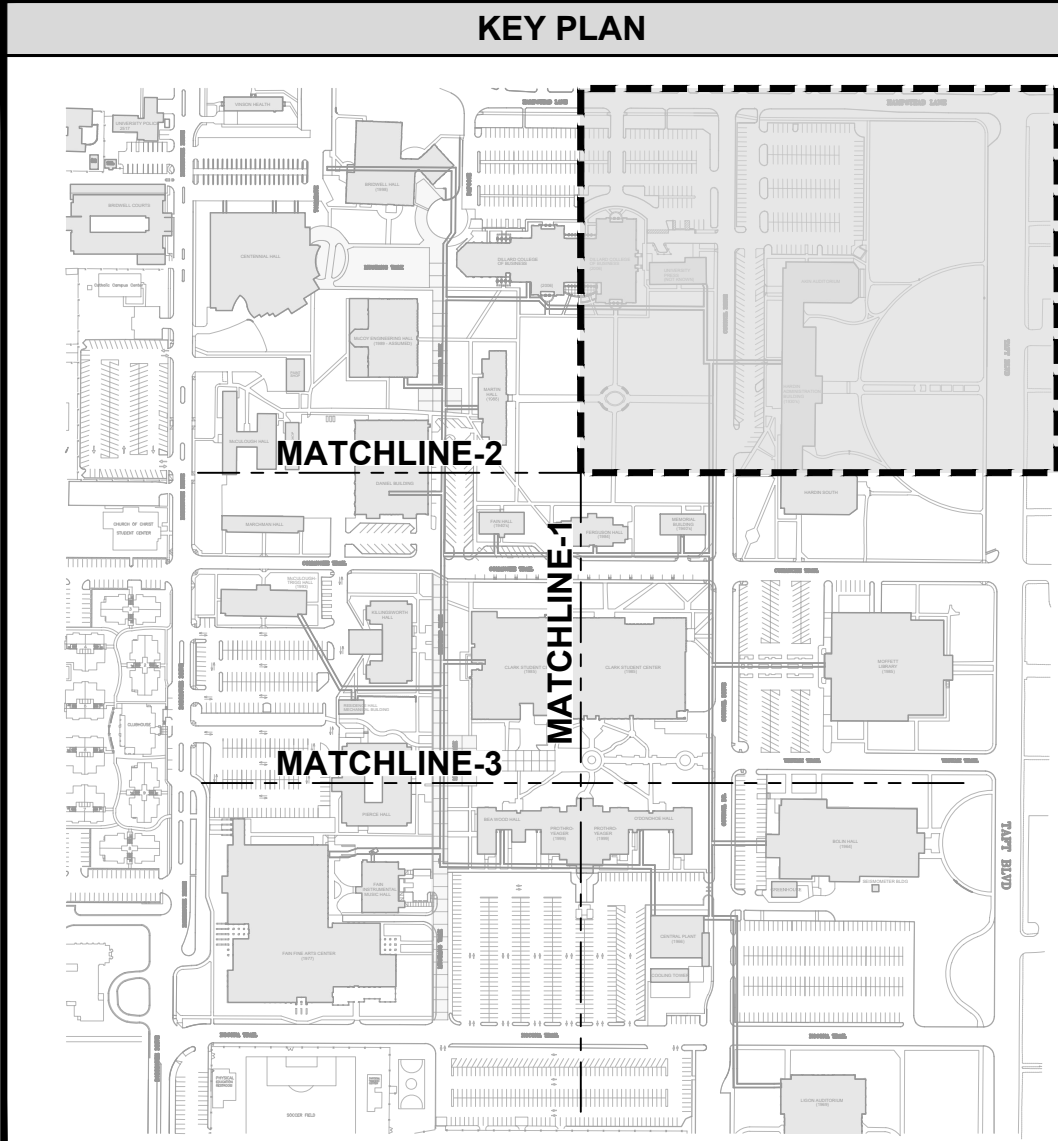
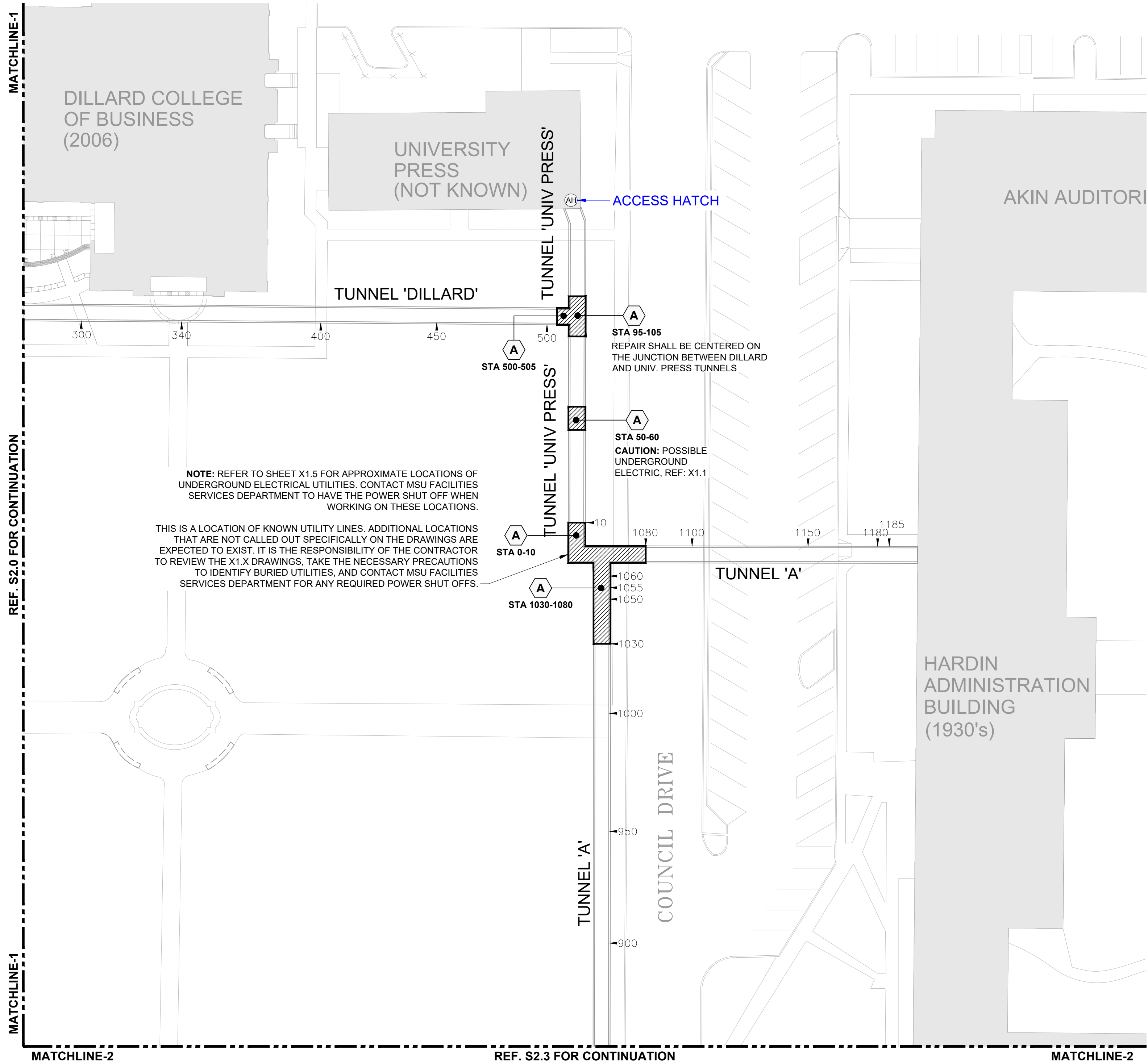
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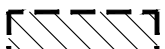
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REVIEWED BY:	RDD
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SCALE:	AS NOTED

**ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
EXTERIOR**

TITLE:

SHEET No.: **S2.0**



EXISTING CONDITIONS LEGEND			
SYMBOL	DESCRIPTION		
	EXISTING SLEEPER SLAB/CAP		
	ACCESS HATCH		
REPAIR TYPE LEGEND			
REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
		BASE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0
		ALTERNATE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0 SIM



1 ENLARGED PARTIAL TUNNEL REPAIR PLAN: EXTERIOR
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

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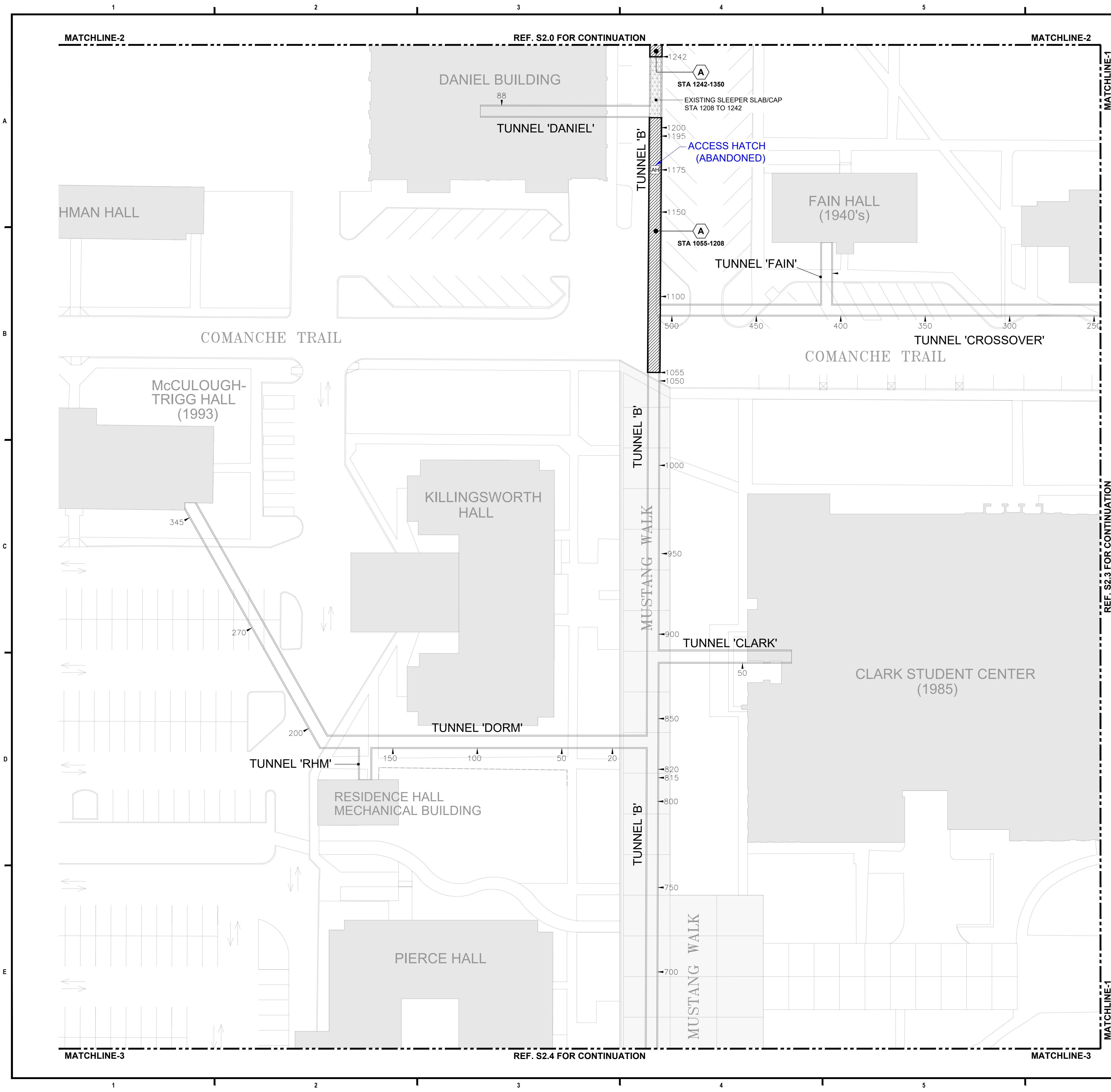
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REVIEWED BY:	RDD
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SCALE:	AS NOTED

**ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
EXTERIOR**

TITLE:

SHEET No.:

S2.1



KEY PLAN

EXISTING CONDITIONS LEGEND			
SYMBOL	DESCRIPTION		
	EXISTING SLEEPER SLAB/CAP		
	ACCESS HATCH		

REPAIR TYPE LEGEND			
REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
A		BASE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0
B		ALTERNATE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0 SIM

PLAN NORTH

1 ENLARGED PARTIAL TUNNEL REPAIR PLAN: EXTERIOR
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

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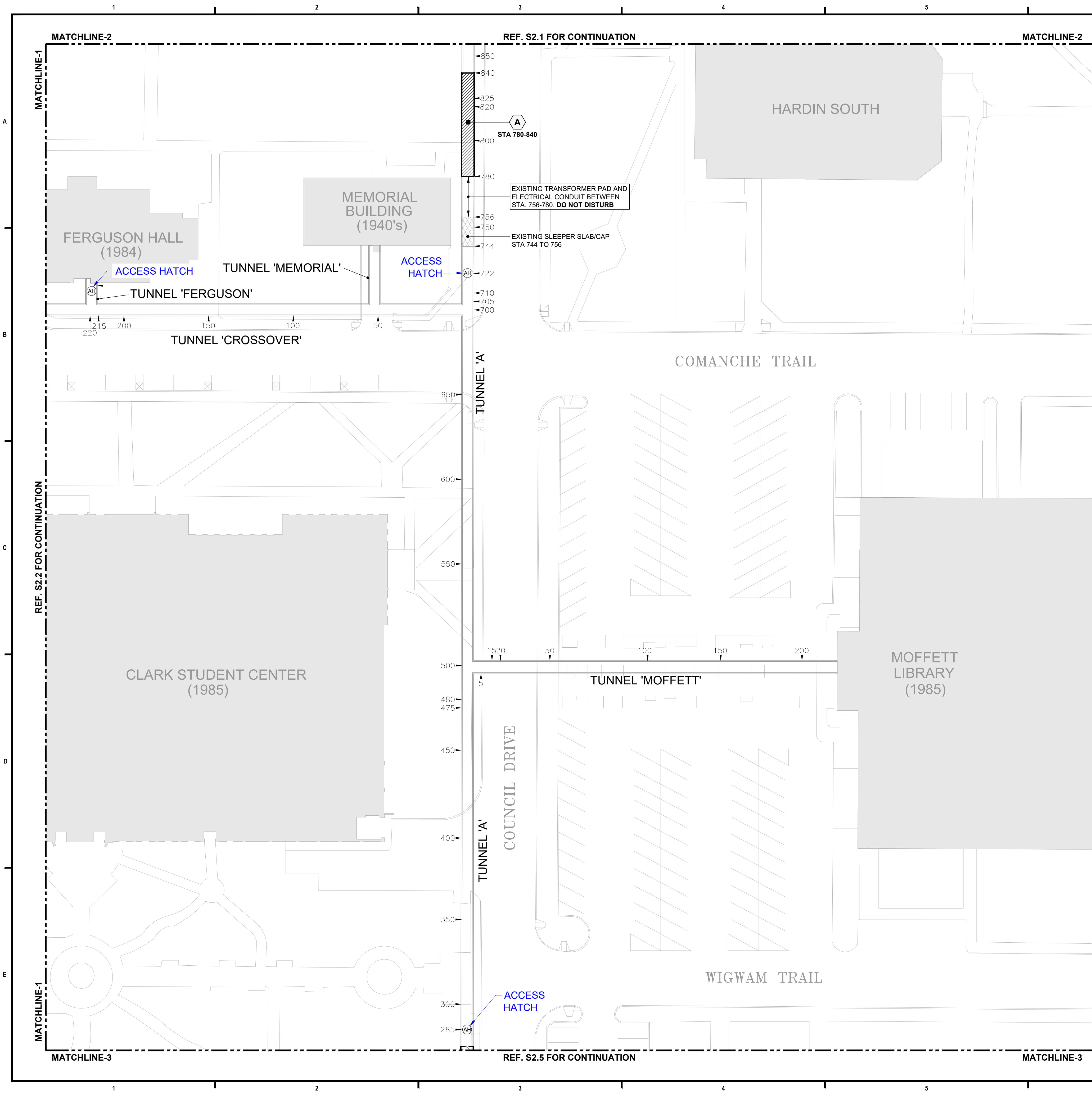
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DRAWN BY:	FV/ADP
SCALE:	AS NOTED

TITLE:

**ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
EXTERIOR**

SHEET No.:

S2.2



KEY PLAN

EXISTING CONDITIONS LEGEND

SYMBOL	DESCRIPTION
	EXISTING SLEEPER SLAB/CAP
	ACCESS HATCH

REPAIR TYPE LEGEND

REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
A		BASE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0
B		ALTERNATE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0 SIM

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SEAL:

PROJECT:

MSU TUNNEL
STRUCTURAL REPAIRS

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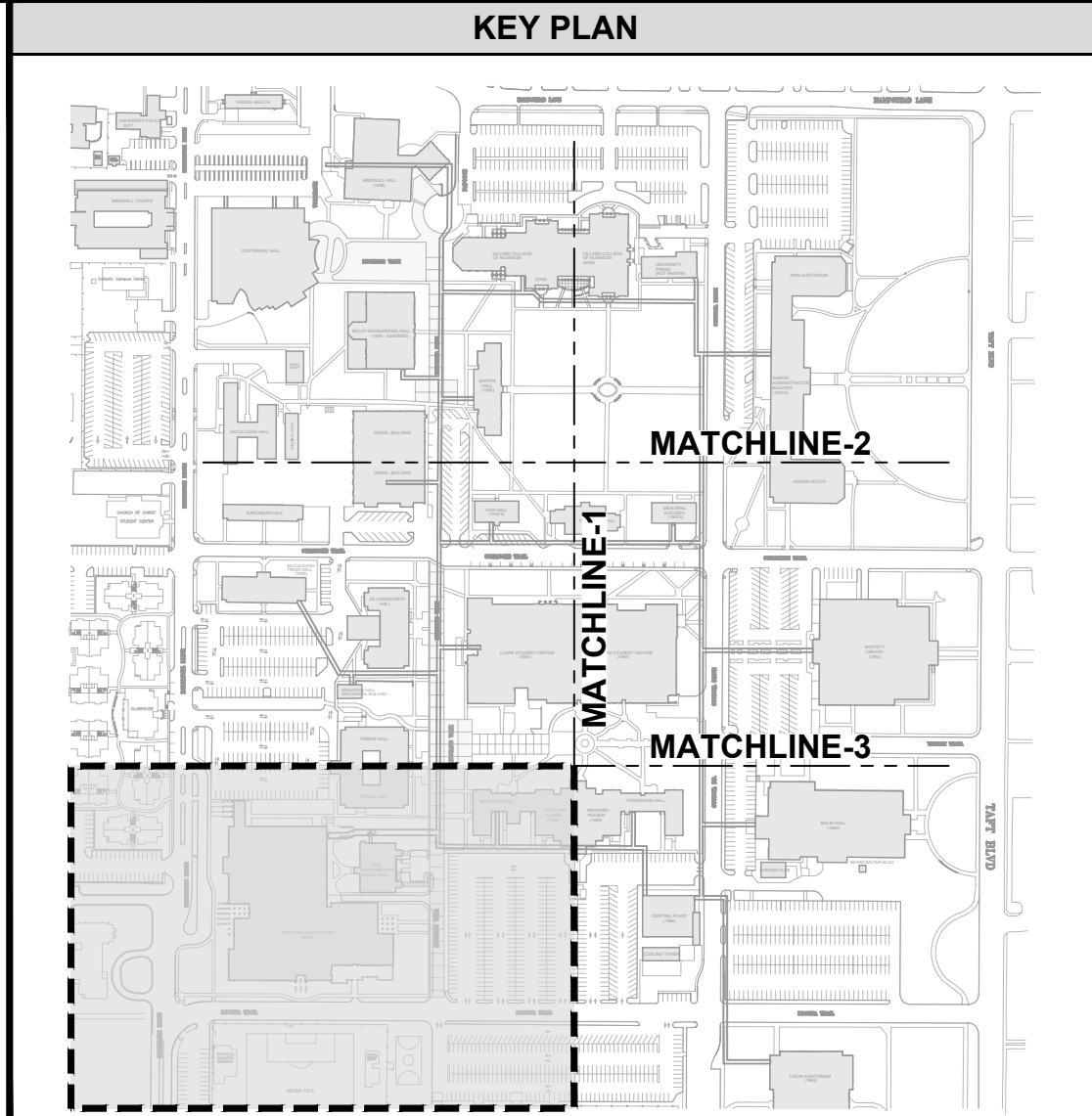
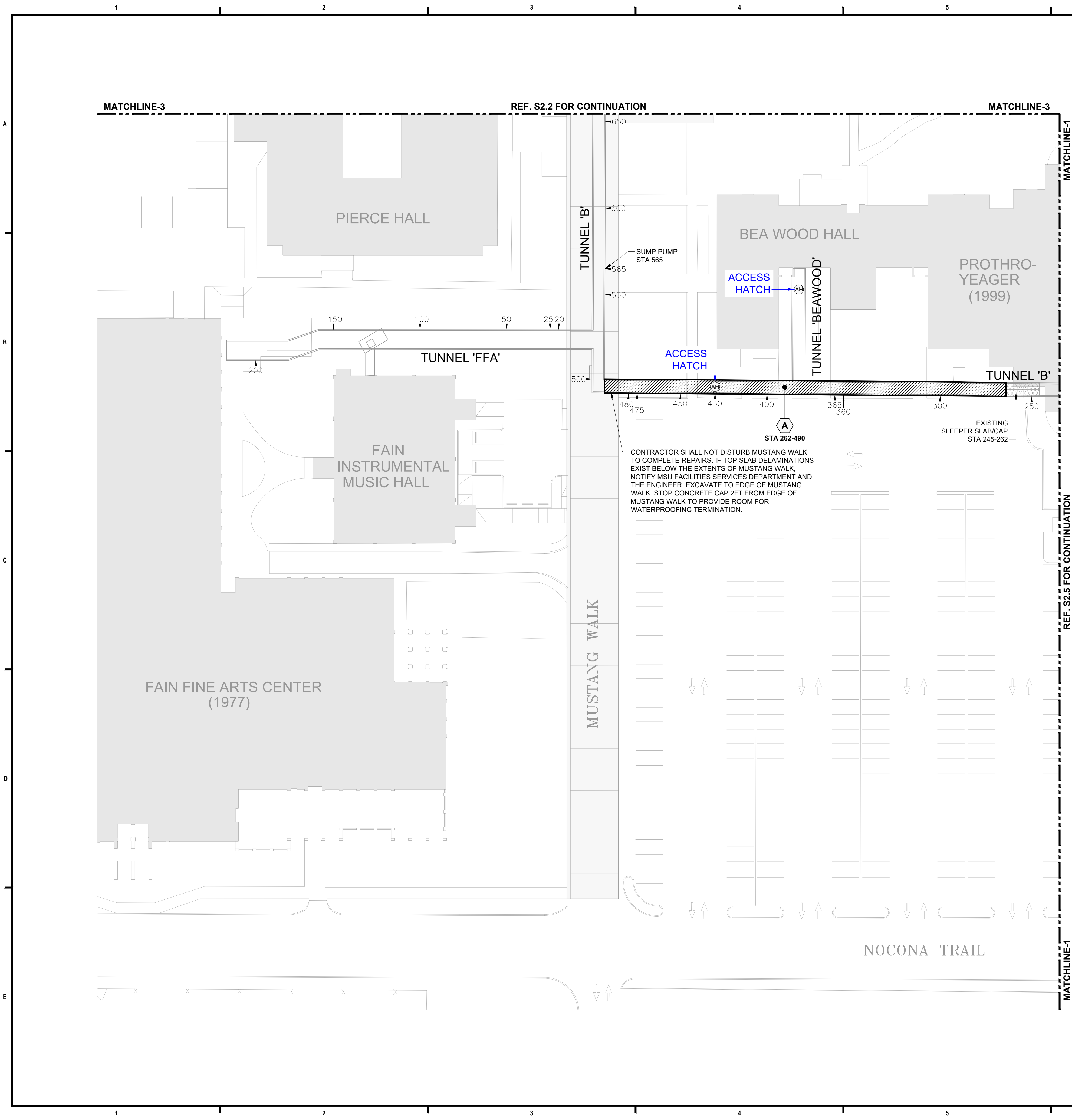
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



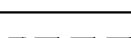
ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
EXTERIOR

TITLE:

SHEET No.: S2.3

1 ENLARGED PARTIAL TUNNEL REPAIR PLAN: EXTERIOR
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"



EXISTING CONDITIONS LEGEND			
SYMBOL	DESCRIPTION		
	EXISTING SLEEPER SLAB/CAP		
	ACCESS HATCH		
REPAIR TYPE LEGEND			
REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
		BASE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0
		ALTERNATE BID: NEW CONCRETE CAP ON TOP OF TUNNEL	1/S4.0 SIM



1 ENLARGED PARTIAL TUNNEL REPAIR PLAN: EXTERIOR
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

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MATERIALS SCIENTISTS

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SEAL:

PROJECT:

MSU TUNNEL
STRUCTURAL REPAIRS

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CLIENT:

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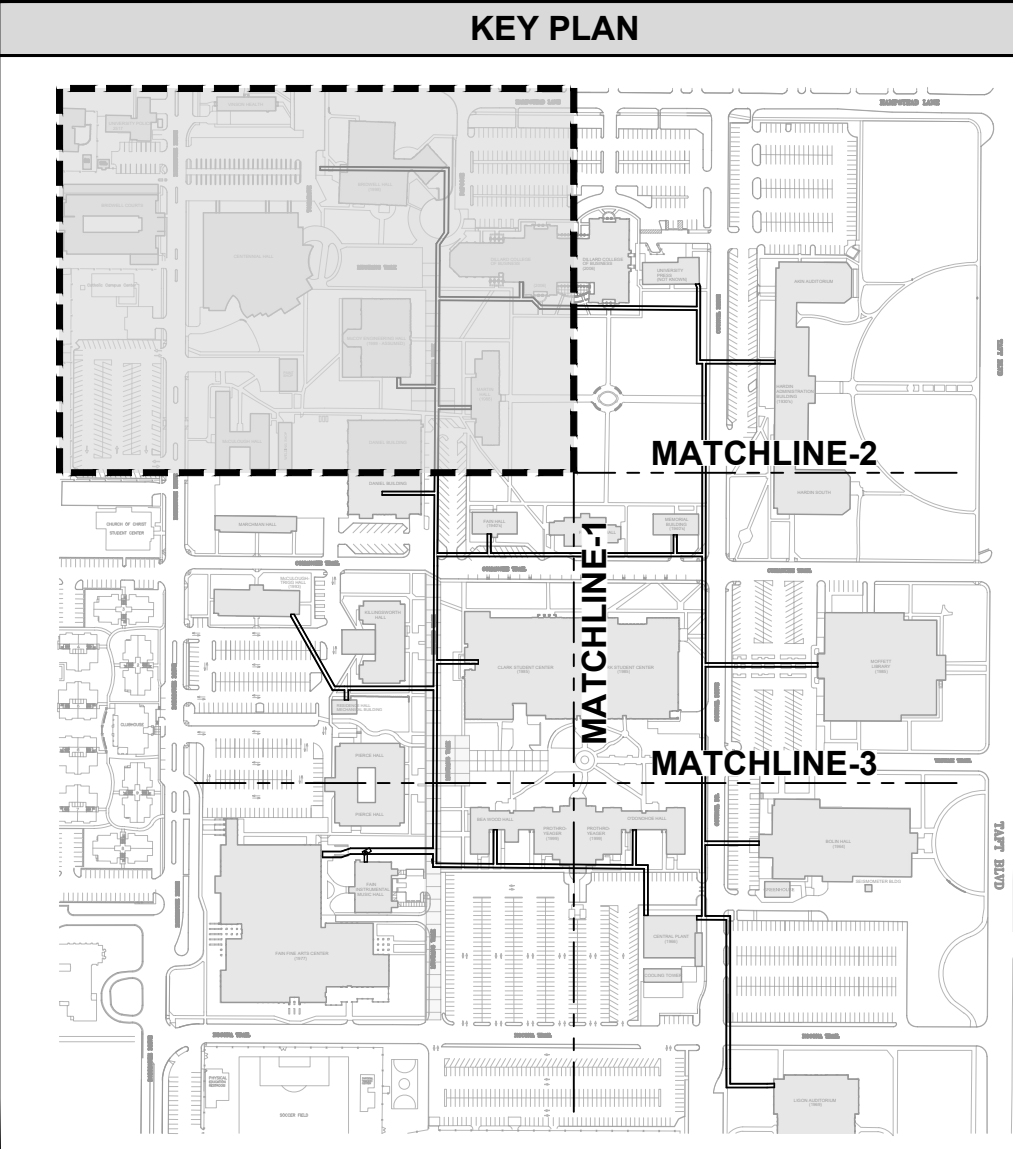
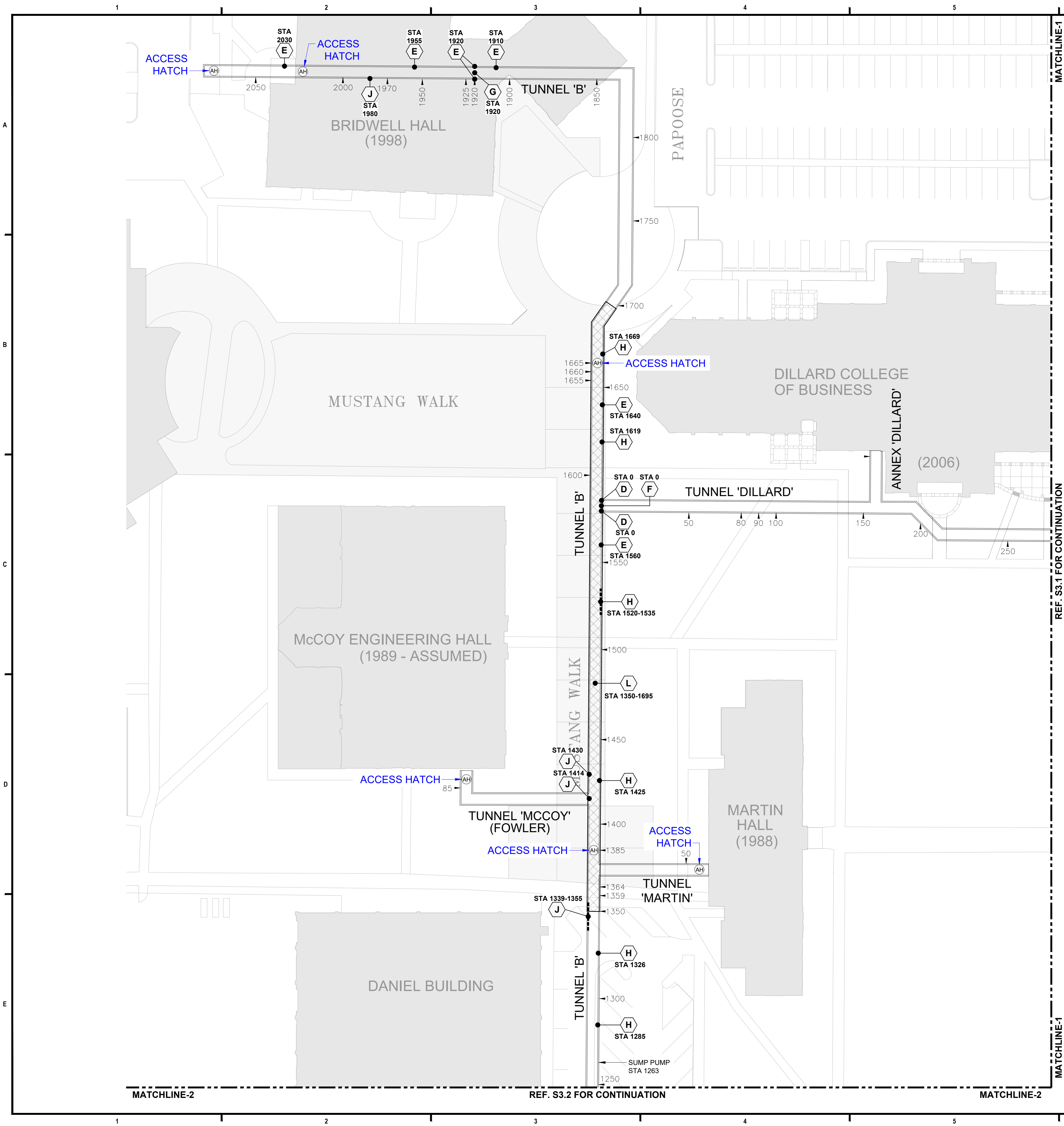
No.	DATE	DESCRIPTION

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ISSUE DATE:	OCTOBER 4, 2023
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REVIEWED BY:	RDD
DRAWN BY:	FV/ADP
SCALE:	AS NOTED

TITLE:

S2.4

SHEET No.:



REPAIR TYPE LEGEND			
REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
C		WALL SHORING	3/S4.1
D	N/A	WALL CRACK INJECTIONS	5/S4.2
E	N/A	ALTERNATIVE BID: WALL CRACK INJECTIONS	5/S4.2
F		TOP SLAB CRACK INJECTIONS	5/S4.2
G		ALTERNATIVE BID: TOP SLAB CRACK INJECTIONS	5/S4.2
H		PARTIAL DEPTH REPAIR AT PIPE RACK WALL	1/S4.2
J		PARTIAL DEPTH REPAIR AT EXPOSED WALL	1/S4.2
K		TOP SLAB PARTIAL DEPTH REPAIR.	1/S4.2
L		CONCRETE REPAIR STABILIZATION AT TOP SLAB (SOFFIT)	2/S4.1
M	N/A	BEAM REPAIR	4/S4.2
N	N/A	ALTERNATIVE BID: DRILLED IN GALVANIC CORROSION PROTECTION	S5.0

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PROJECT:

MSU TUNNEL
STRUCTURAL REPAIRS

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No.	DATE	DESCRIPTION

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ISSUE DATE: OCTOBER 4, 2023

PROJECT MANAGER: BDM

REVIEWED BY: RDD

DRAWN BY: FV/ADP

SCALE: AS NOTED

ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
INTERIOR

TITLE:

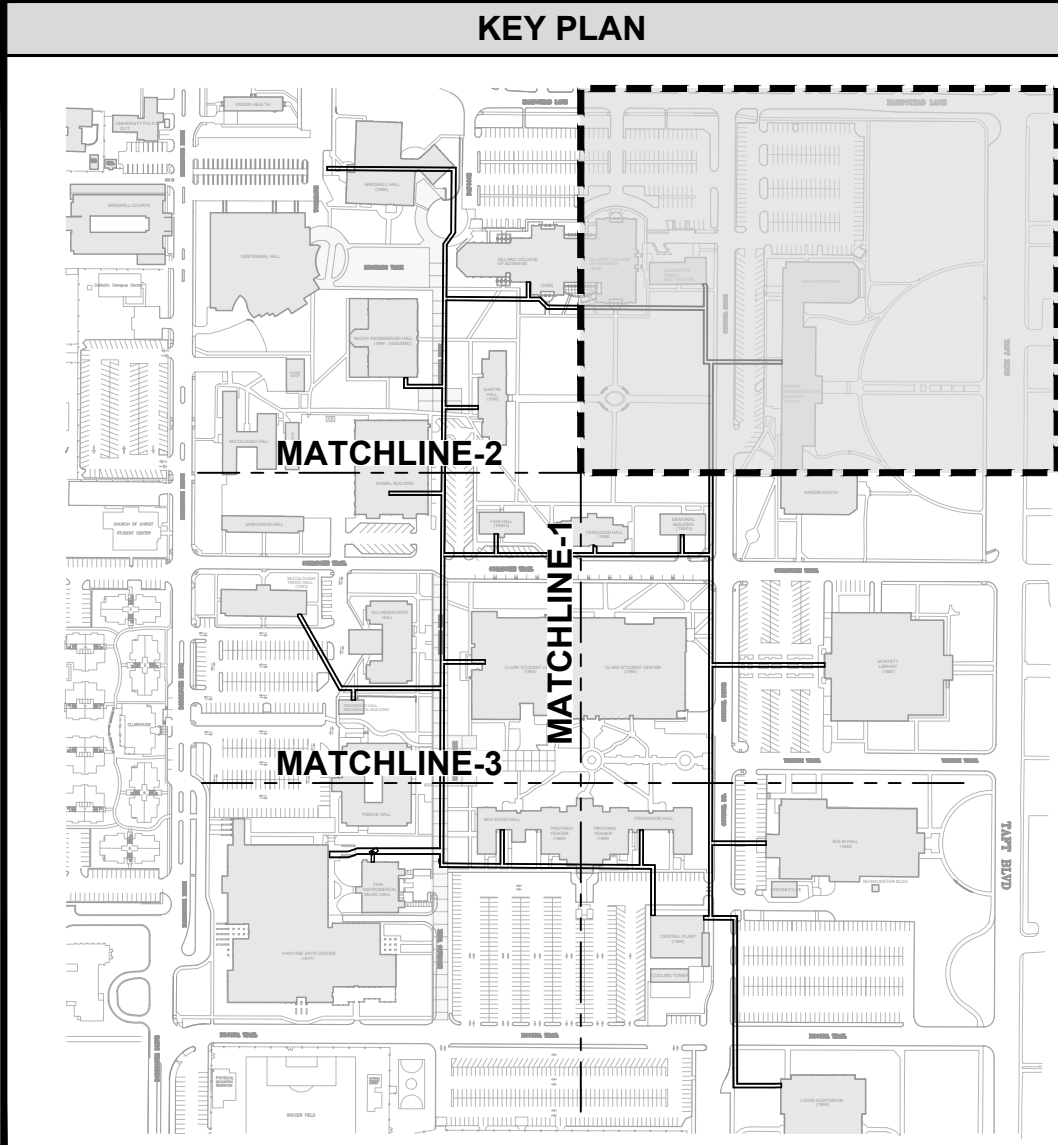
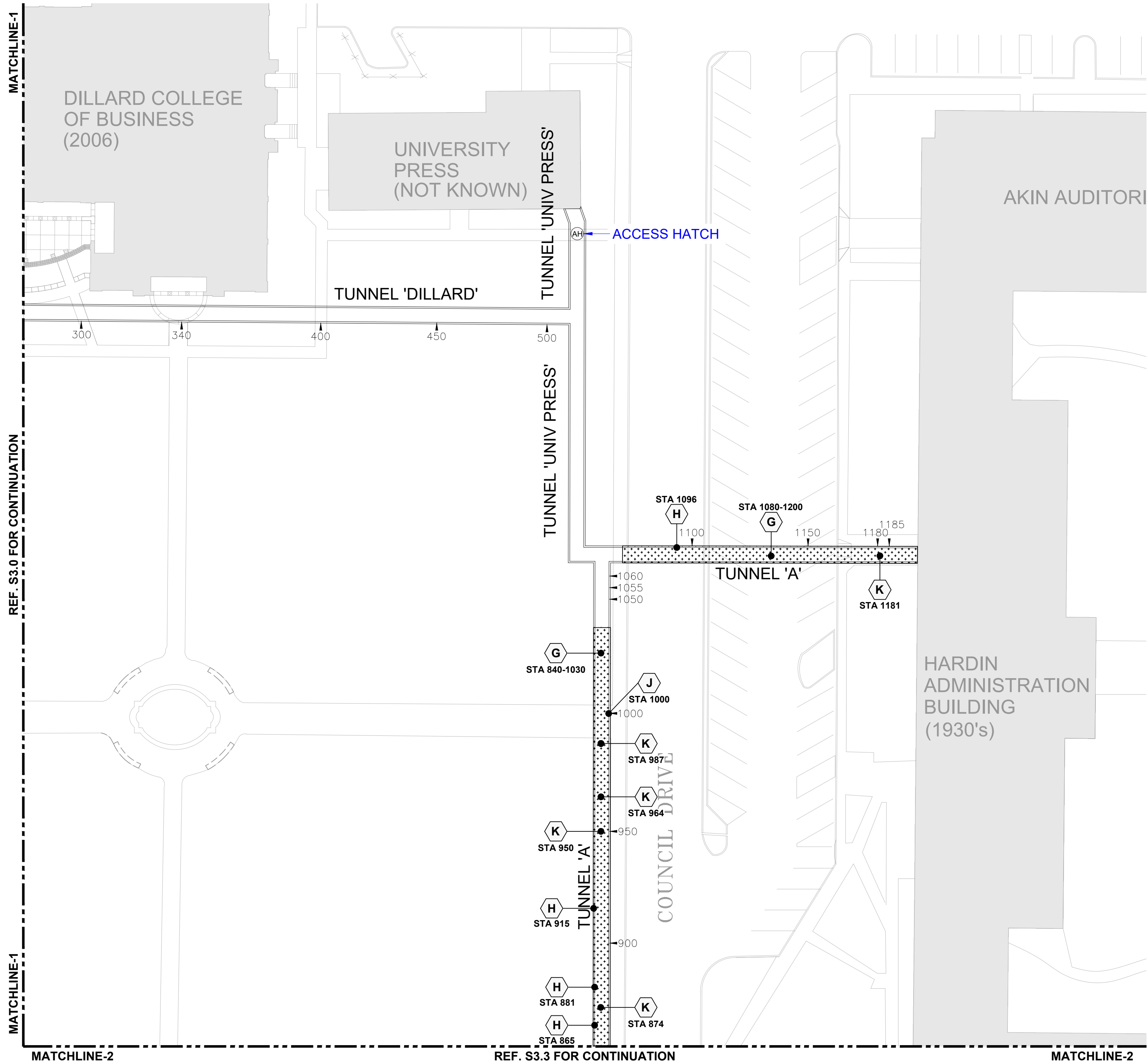
SHEET No.: **S3.0**

1

ENLARGED PARTIAL TUNNEL REPAIR PLAN: INTERIOR

FULL SCALE (22x34): 1" = 30'-0"

HALF SCALE (11x17): 1" = 60'-0"



REPAIR TYPE LEGEND			
REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
C		WALL SHORING	3/S4.1
D	N/A	WALL CRACK INJECTIONS	5/S4.2
E	N/A	ALTERNATIVE BID: WALL CRACK INJECTIONS	5/S4.2
F		TOP SLAB CRACK INJECTIONS	5/S4.2
G		ALTERNATIVE BID: TOP SLAB CRACK INJECTIONS	5/S4.2
H		PARTIAL DEPTH REPAIR AT PIPE RACK WALL	1/S4.2
J		PARTIAL DEPTH REPAIR AT EXPOSED WALL	1/S4.2
K		TOP SLAB PARTIAL DEPTH REPAIR.	1/S4.2
L		CONCRETE REPAIR STABILIZATION AT TOP SLAB (SOFFIT)	2/S4.1
M	N/A	BEAM REPAIR	4/S4.2
N	N/A	ALTERNATIVE BID: DRILLED IN GALVANIC CORROSION PROTECTION	S5.0



1

ENLARGED PARTIAL TUNNEL REPAIR PLAN: INTERIOR
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

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SEAL:



PROJECT:

**MSU TUNNEL
STRUCTURAL REPAIRS**

**MIDWESTERN
STATE UNIVERSITY**
Wichita Falls, Texas

CLIENT:

**Midwestern
State University**
3410 Taft Blvd
Wichita Falls, Texas 76308

Contact: Kyle Owen
kyle.owen@msutexas.edu

No.	DATE	DESCRIPTION

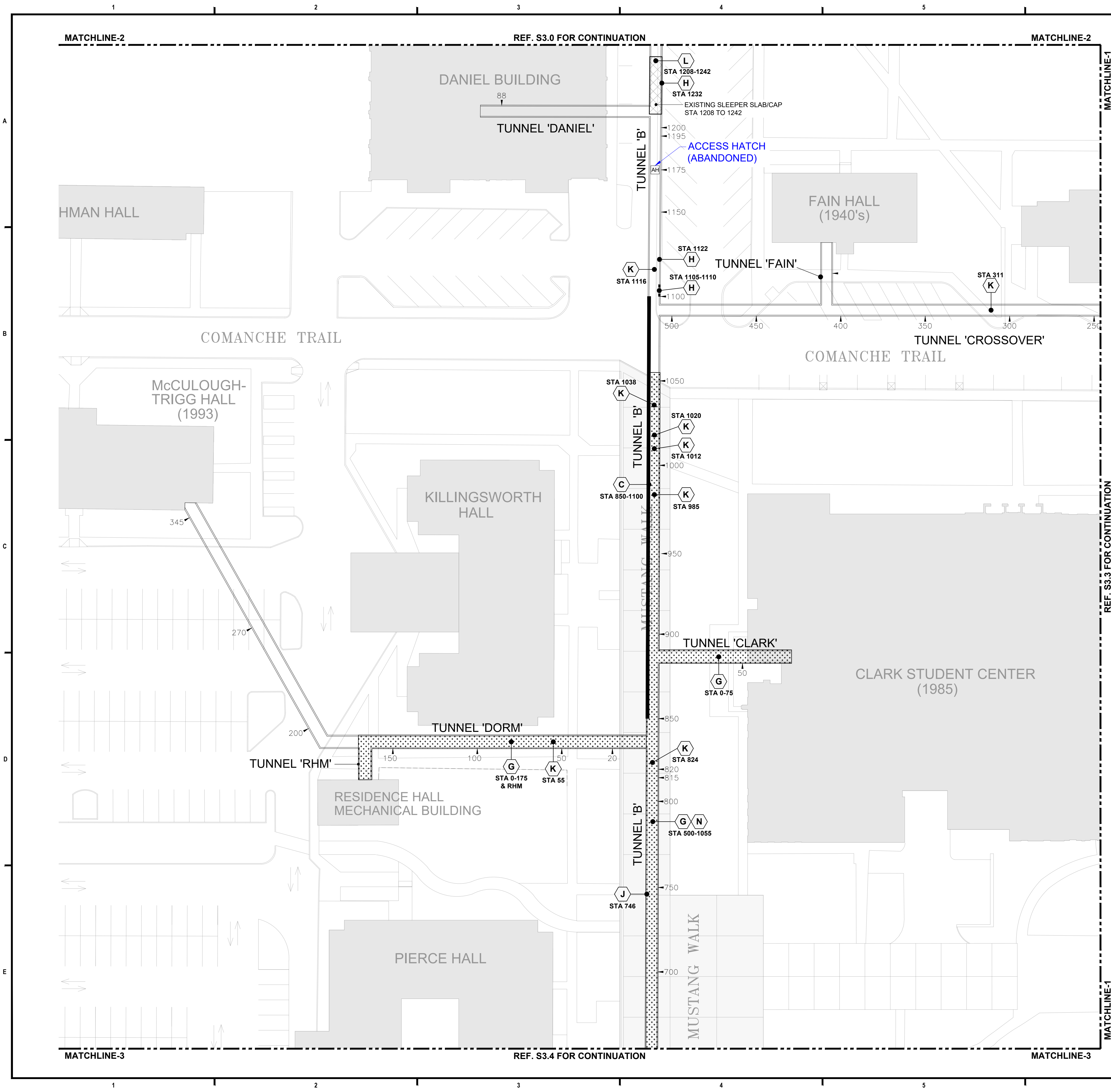
WJE PROJECT No.:	2022.4649.0
ISSUE DATE:	OCTOBER 4, 2023
PROJECT MANAGER:	BDM
REVIEWED BY:	RDD
DRAWN BY:	FV/ADP
SCALE:	AS NOTED

**ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
INTERIOR**

TITLE:

SHEET No.:

S3.1



KEY PLAN

REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
C	[Solid black line]	WALL SHORING	3/S4.1
D	N/A	WALL CRACK INJECTIONS	5/S4.2
E	N/A	ALTERNATIVE BID: WALL CRACK INJECTIONS	5/S4.2
F	[Dotted pattern]	TOP SLAB CRACK INJECTIONS	5/S4.2
G	[Dotted pattern]	ALTERNATIVE BID: TOP SLAB CRACK INJECTIONS	5/S4.2
H	[Dashed line]	PARTIAL DEPTH REPAIR AT PIPE RACK WALL	1/S4.2
J	[Dashed line]	PARTIAL DEPTH REPAIR AT EXPOSED WALL	1/S4.2
K	[Diagonal hatching]	TOP SLAB PARTIAL DEPTH REPAIR.	1/S4.2
L	[Cross-hatching]	CONCRETE REPAIR STABILIZATION AT TOP SLAB (SOFFIT)	2/S4.1
M	N/A	BEAM REPAIR	4/S4.2
N	N/A	ALTERNATIVE BID: DRILLED IN GALVANIC CORROSION PROTECTION	S5.0

PLAN NORTH

1 ENLARGED PARTIAL TUNNEL REPAIR PLAN: INTERIOR
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

WJE ENGINEERS
ARCHITECTS
MATERIALS SCIENTISTS

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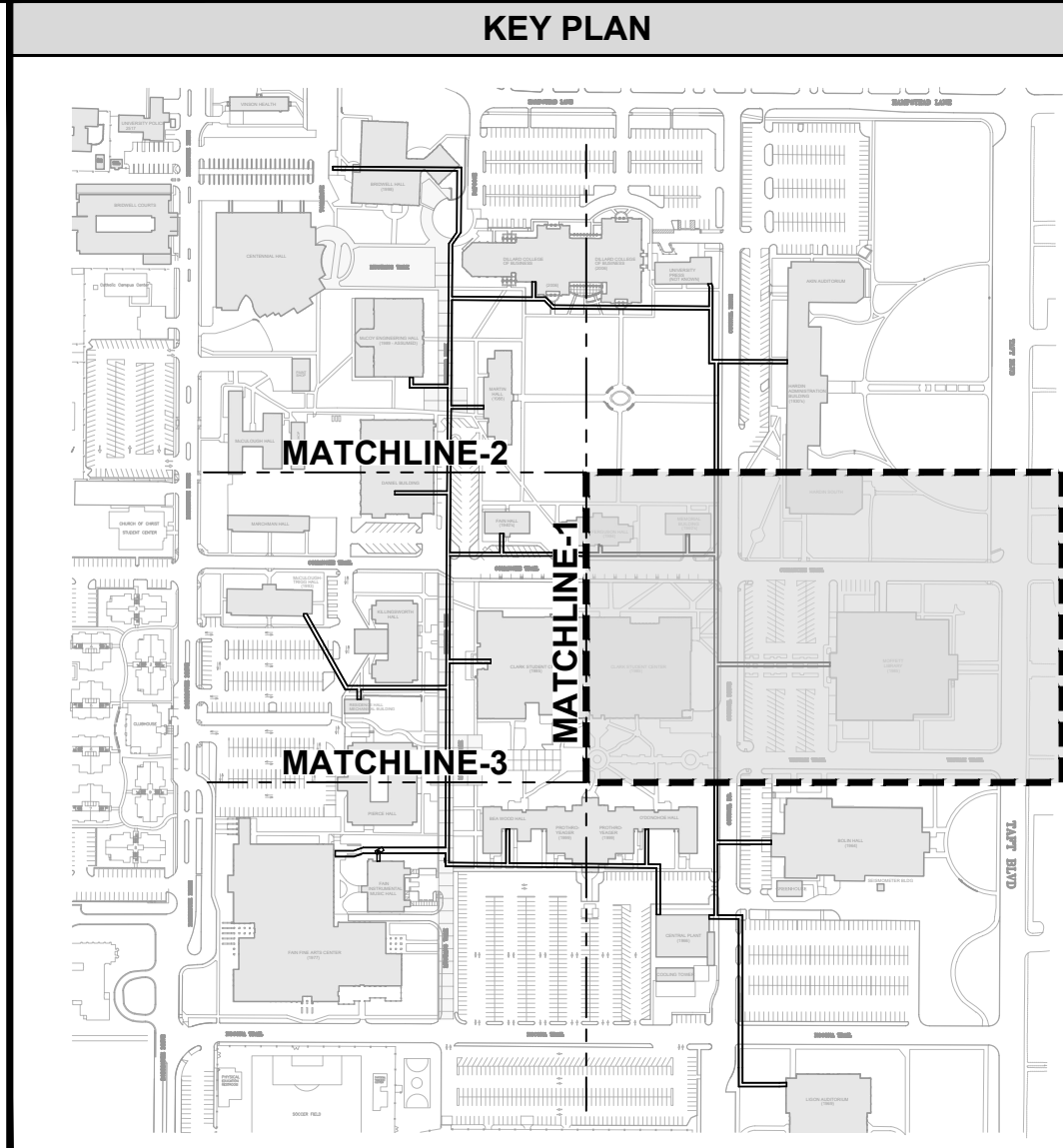
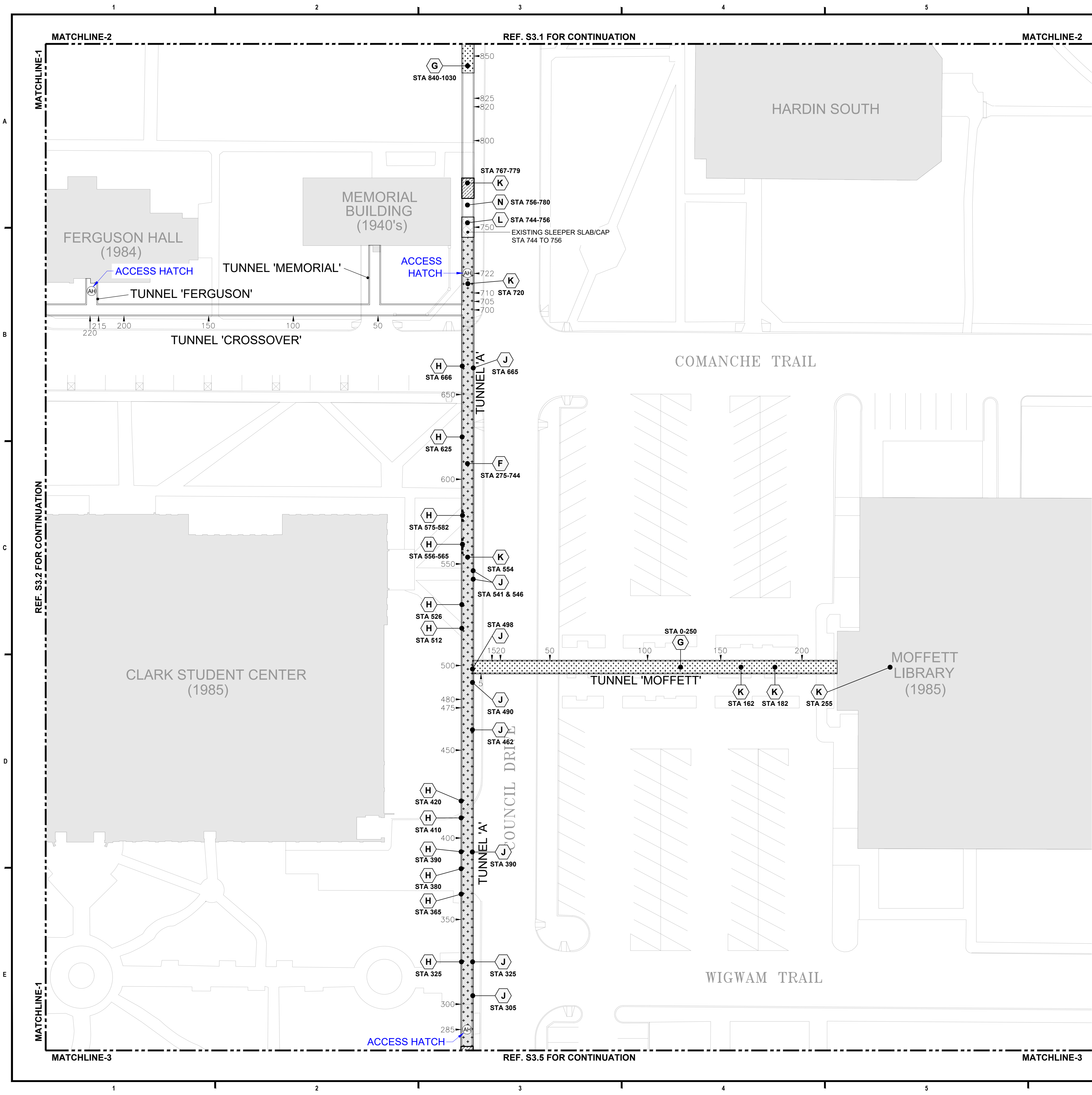
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SCALE: AS NOTED

**ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
INTERIOR**

TITLE:

SHEET No.: **S3.2**



REPAIR TYPE LEGEND			
REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
C		WALL SHORING	3/S4.1
D	N/A	WALL CRACK INJECTIONS	5/S4.2
E	N/A	ALTERNATIVE BID: WALL CRACK INJECTIONS	5/S4.2
F		TOP SLAB CRACK INJECTIONS	5/S4.2
G		ALTERNATIVE BID: TOP SLAB CRACK INJECTIONS	5/S4.2
H		PARTIAL DEPTH REPAIR AT PIPE RACK WALL	1/S4.2
J		PARTIAL DEPTH REPAIR AT EXPOSED WALL	1/S4.2
K		TOP SLAB PARTIAL DEPTH REPAIR.	1/S4.2
L		CONCRETE REPAIR STABILIZATION AT TOP SLAB (SOFFIT)	2/S4.1
M	N/A	BEAM REPAIR	4/S4.2
N	N/A	ALTERNATIVE BID: DRILLED IN GALVANIC CORROSION PROTECTION	S5.0



1 ENLARGED PARTIAL TUNNEL REPAIR PLAN: INTERIOR
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

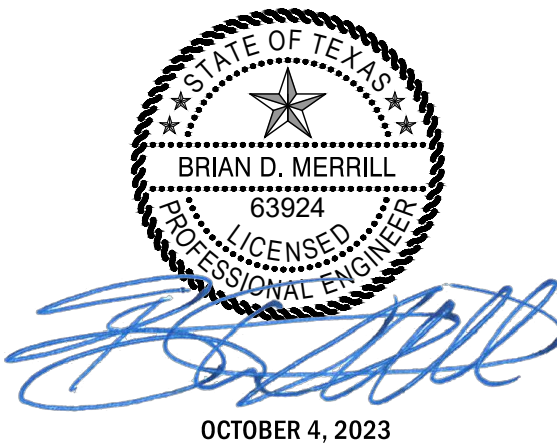
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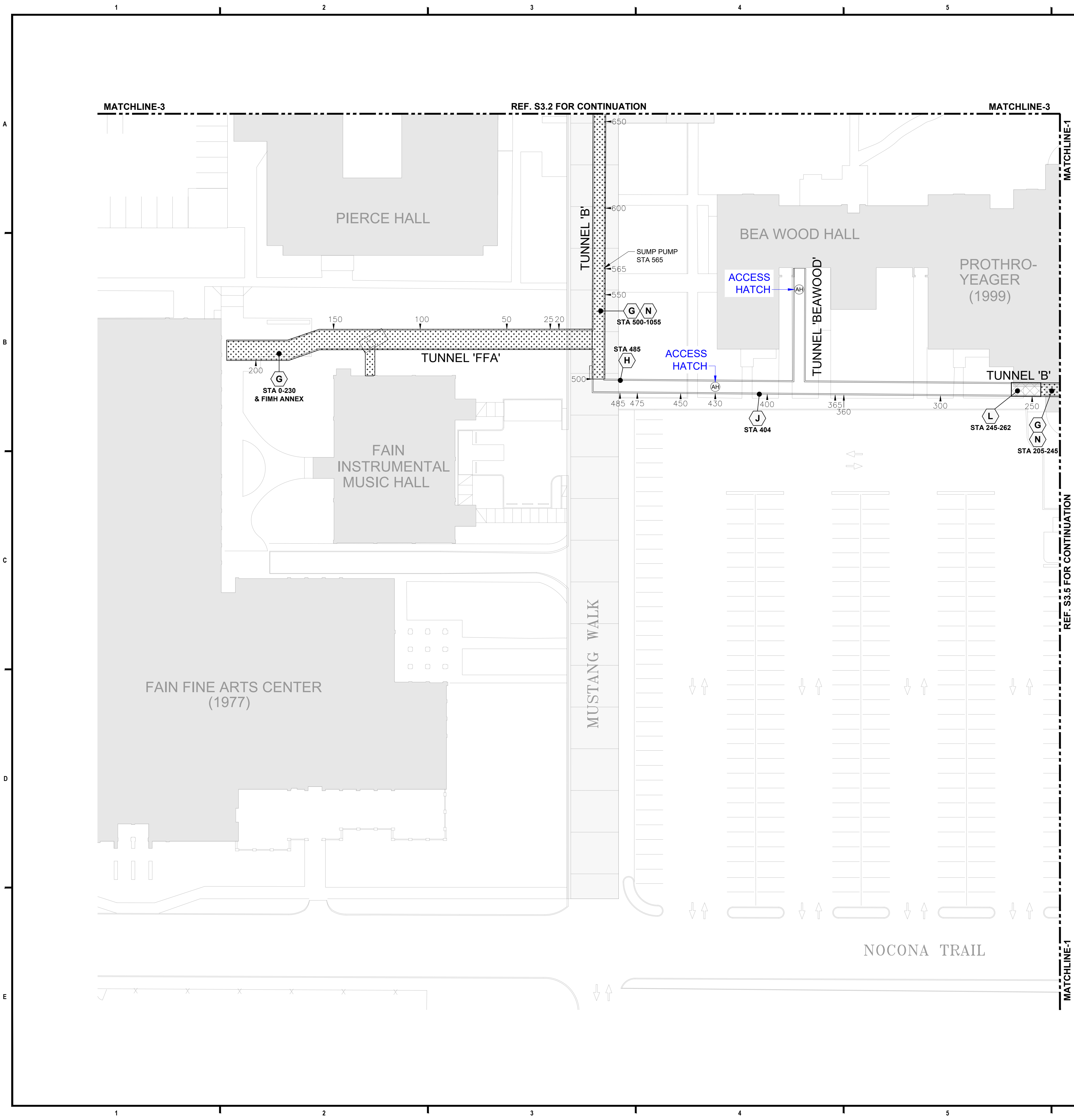
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SCALE:	AS NOTED

**ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
INTERIOR**

TITLE:

SHEET No.:

S3.3



KEY PLAN

REPAIR TYPE LEGEND			
REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
C		WALL SHORING	3/S4.1
D	N/A	WALL CRACK INJECTIONS	5/S4.2
E	N/A	ALTERNATIVE BID: WALL CRACK INJECTIONS	5/S4.2
F		TOP SLAB CRACK INJECTIONS	5/S4.2
G		ALTERNATIVE BID: TOP SLAB CRACK INJECTIONS	5/S4.2
H		PARTIAL DEPTH REPAIR AT PIPE RACK WALL	1/S4.2
J		PARTIAL DEPTH REPAIR AT EXPOSED WALL	1/S4.2
K		TOP SLAB PARTIAL DEPTH REPAIR.	1/S4.2
L		CONCRETE REPAIR STABILIZATION AT TOP SLAB (SOFFIT)	2/S4.1
M	N/A	BEAM REPAIR	4/S4.2
N	N/A	ALTERNATIVE BID: DRILLED IN GALVANIC CORROSION PROTECTION	S5.0

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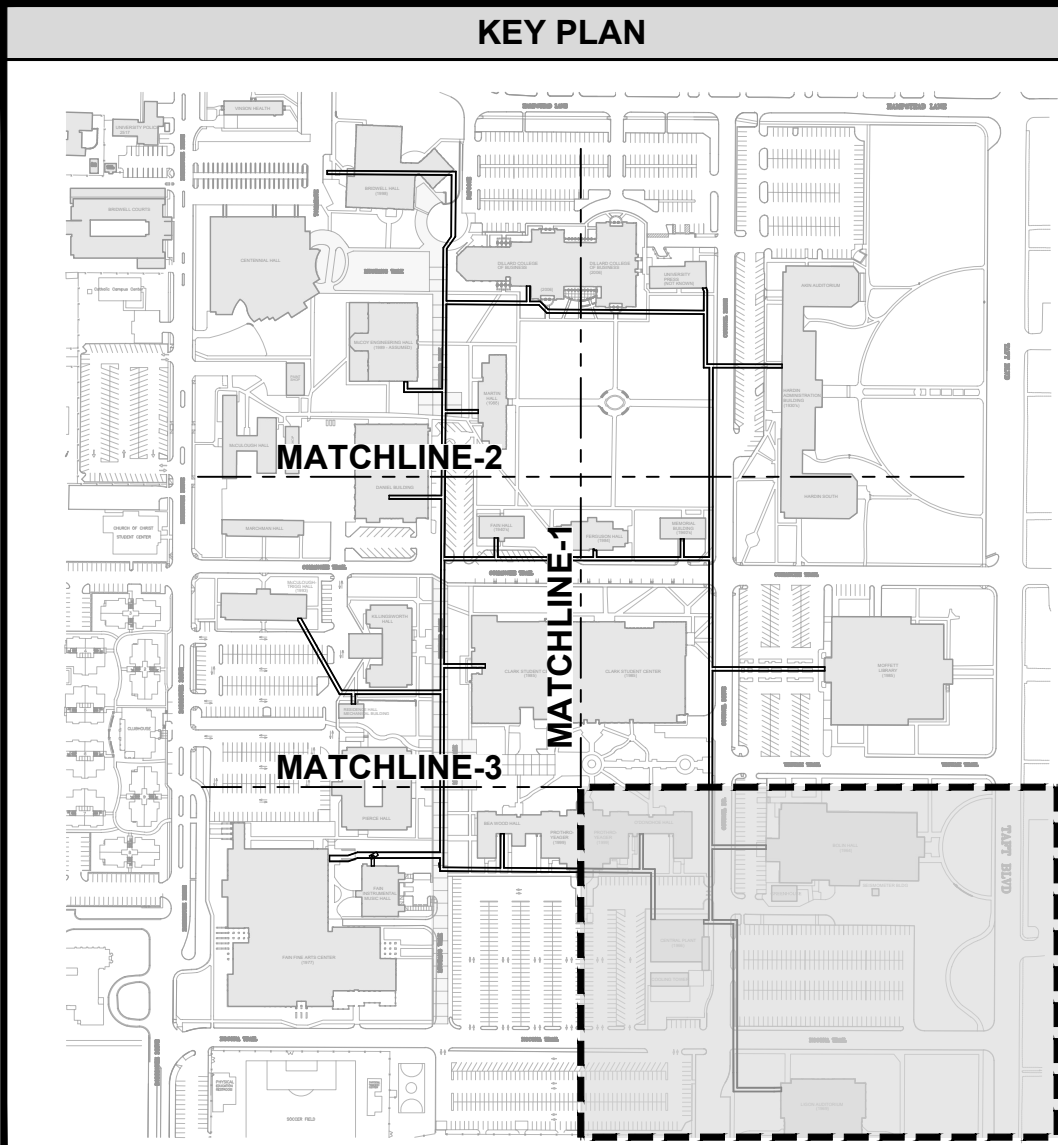
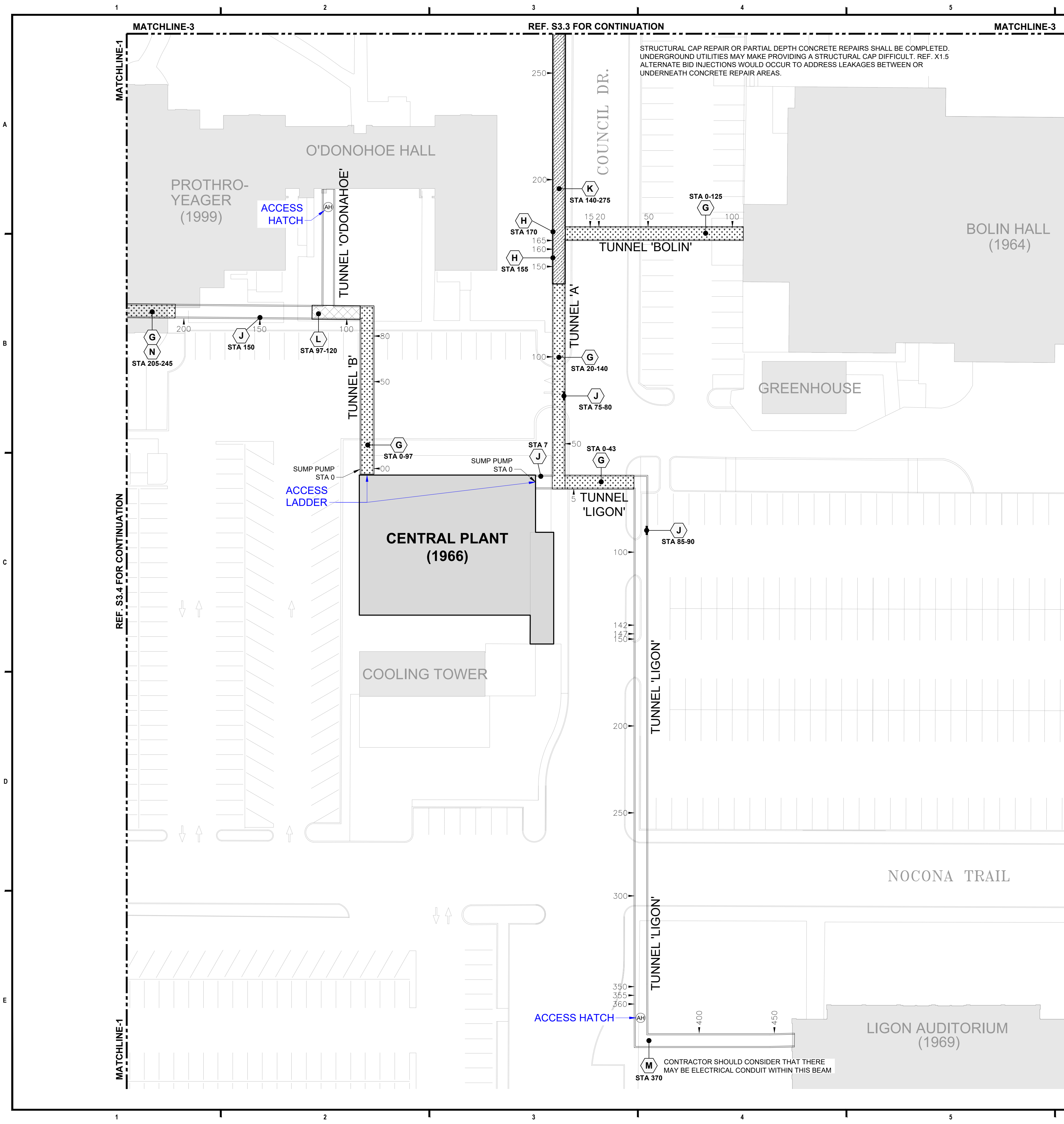
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SCALE: AS NOTED

**ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
INTERIOR**

TITLE:

SHEET No.: **S3.4**



REPAIR TYPE LEGEND			
REPAIR ID	SYMBOL	DESCRIPTION	DETAIL
C		WALL SHORING	3/S4.1
D	N/A	WALL CRACK INJECTIONS	5/S4.2
E	N/A	ALTERNATIVE BID: WALL CRACK INJECTIONS	5/S4.2
F		TOP SLAB CRACK INJECTIONS	5/S4.2
G		ALTERNATIVE BID: TOP SLAB CRACK INJECTIONS	5/S4.2
H		PARTIAL DEPTH REPAIR AT PIPE RACK WALL	1/S4.2
J		PARTIAL DEPTH REPAIR AT EXPOSED WALL	1/S4.2
K		TOP SLAB PARTIAL DEPTH REPAIR.	1/S4.2
L		CONCRETE REPAIR STABILIZATION AT TOP SLAB (SOFFIT)	2/S4.1
M	N/A	BEAM REPAIR	4/S4.2
N	N/A	ALTERNATIVE BID: DRILLED IN GALVANIC CORROSION PROTECTION	S5.0



1 ENLARGED PARTIAL TUNNEL REPAIR PLAN: INTERIOR
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

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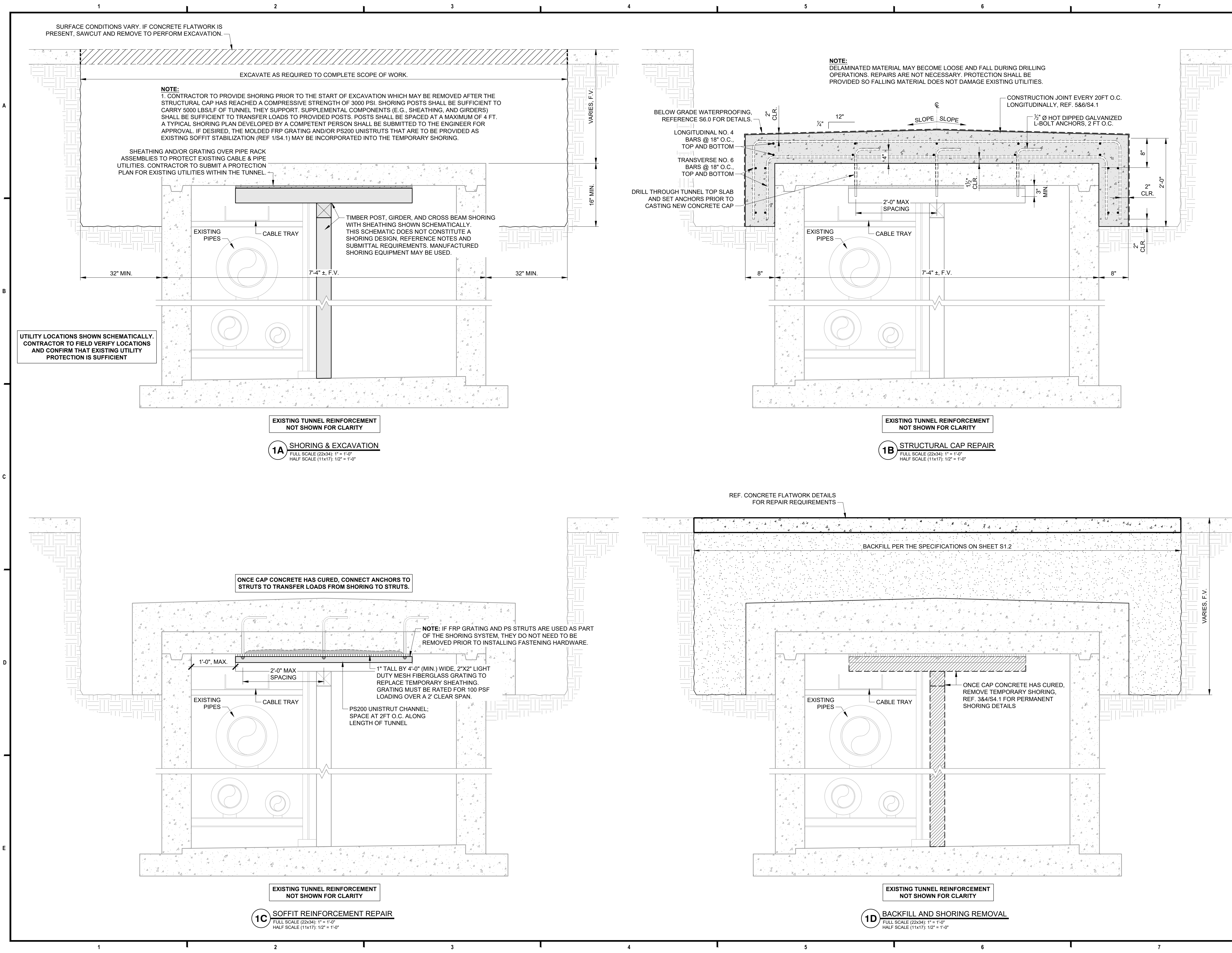
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REVIEWED BY:	RDD
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SCALE:	AS NOTED

ENLARGED PARTIAL
TUNNEL REPAIR PLAN:
INTERIOR

TITLE:

SHEET No.:

S3.5



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SEAL:

STATE OF TEXAS

63924

BRIAN D. MERRILL

LICENSED
PROFESSIONAL ENGINEER

OCTOBER 4, 2023

PROJECT:

MSU TUNNEL
STRUCTURAL REPAIRS

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SCALE:

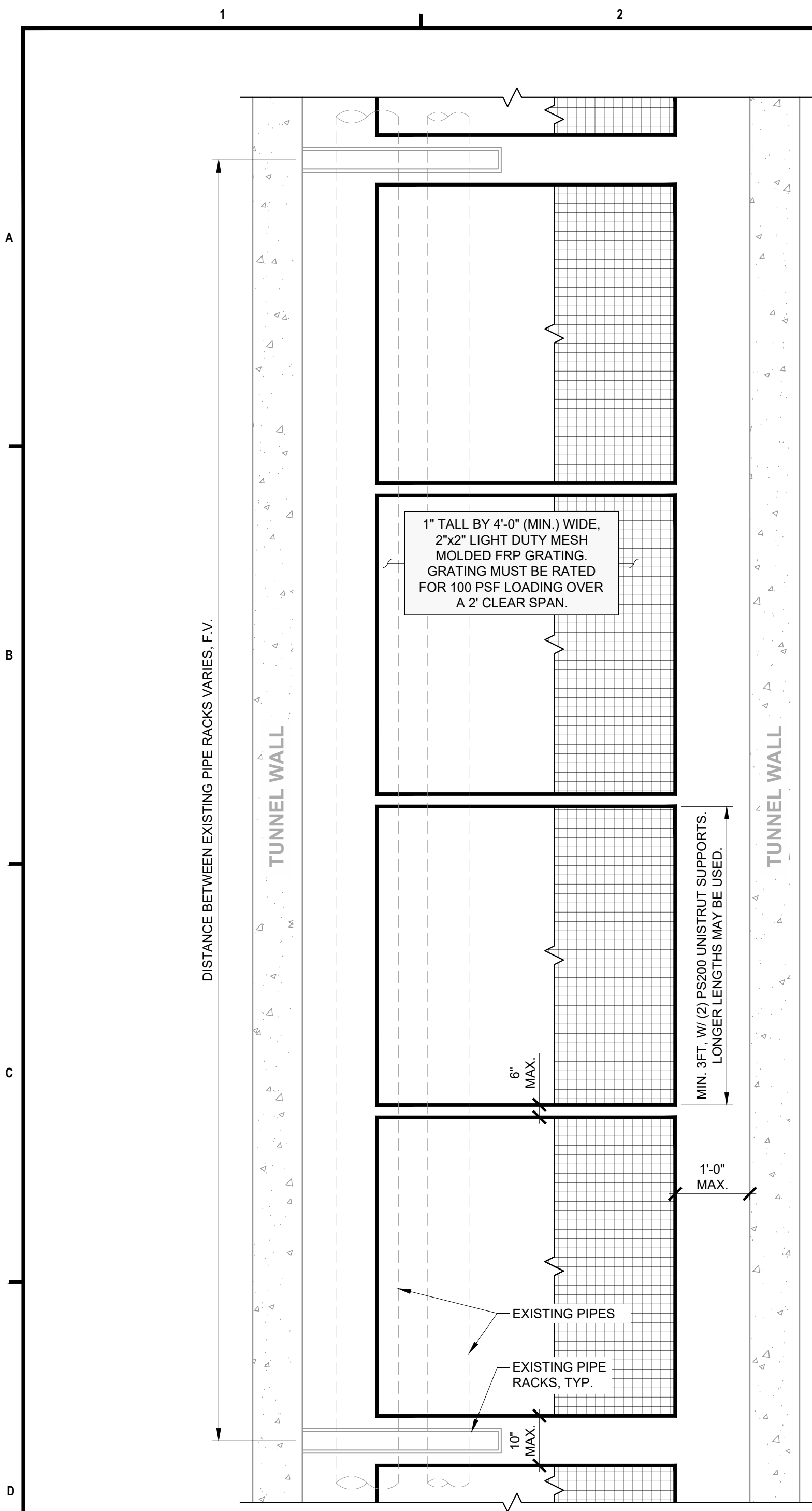
AS NOTED

REPAIR SEQUENCE
AT NEW CONCRETE
CAP ADDITION

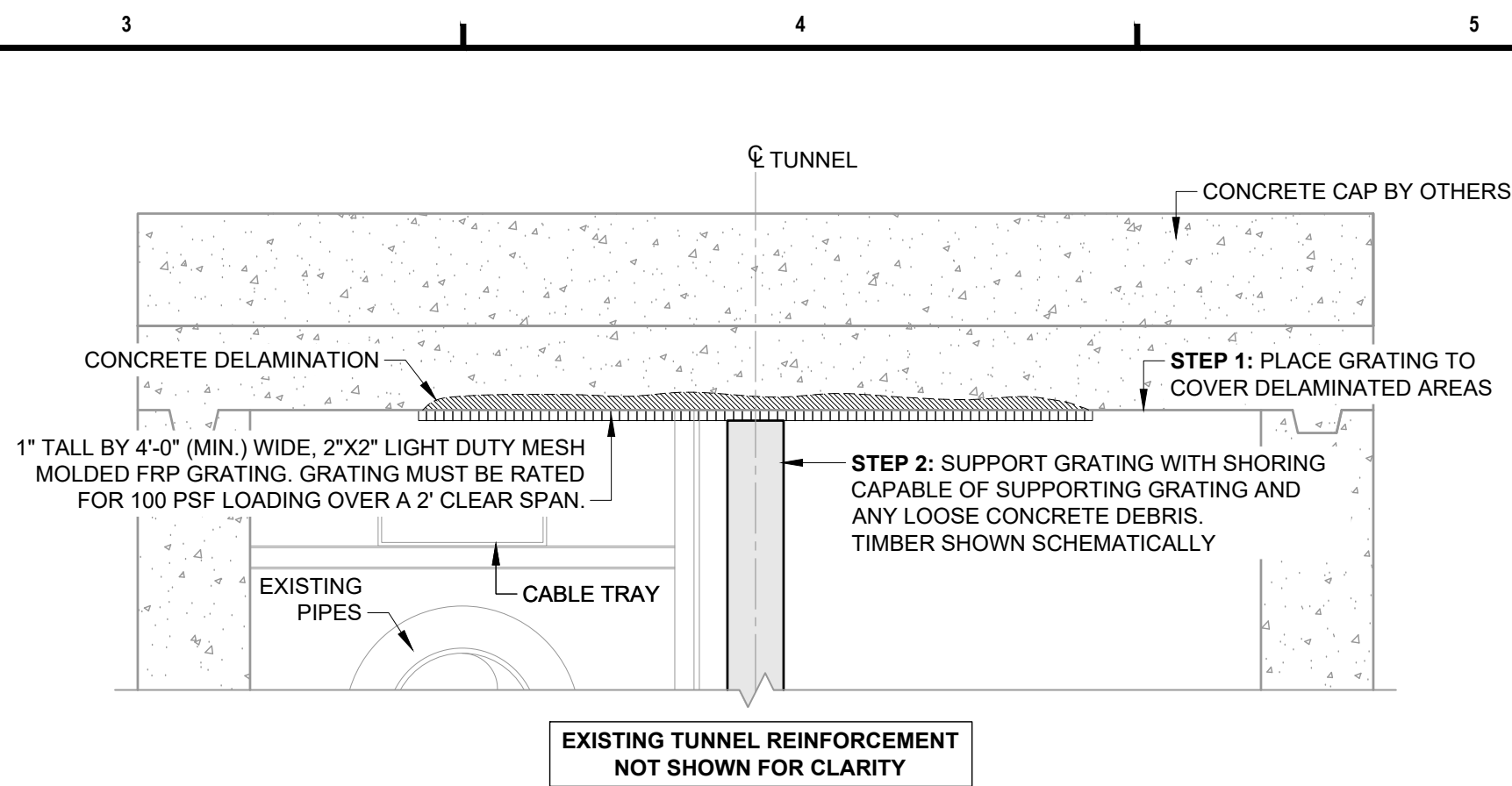
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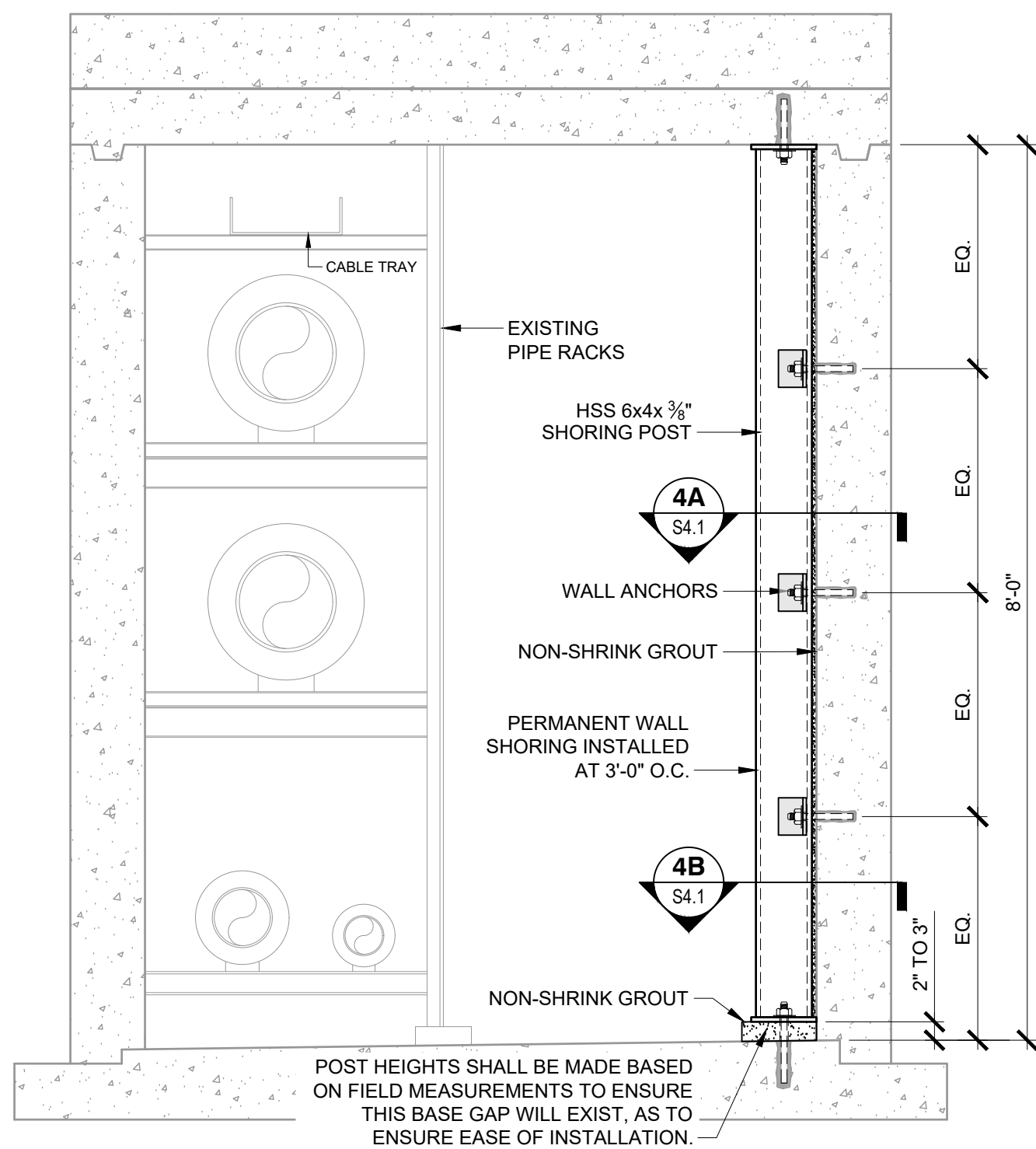
S4.0



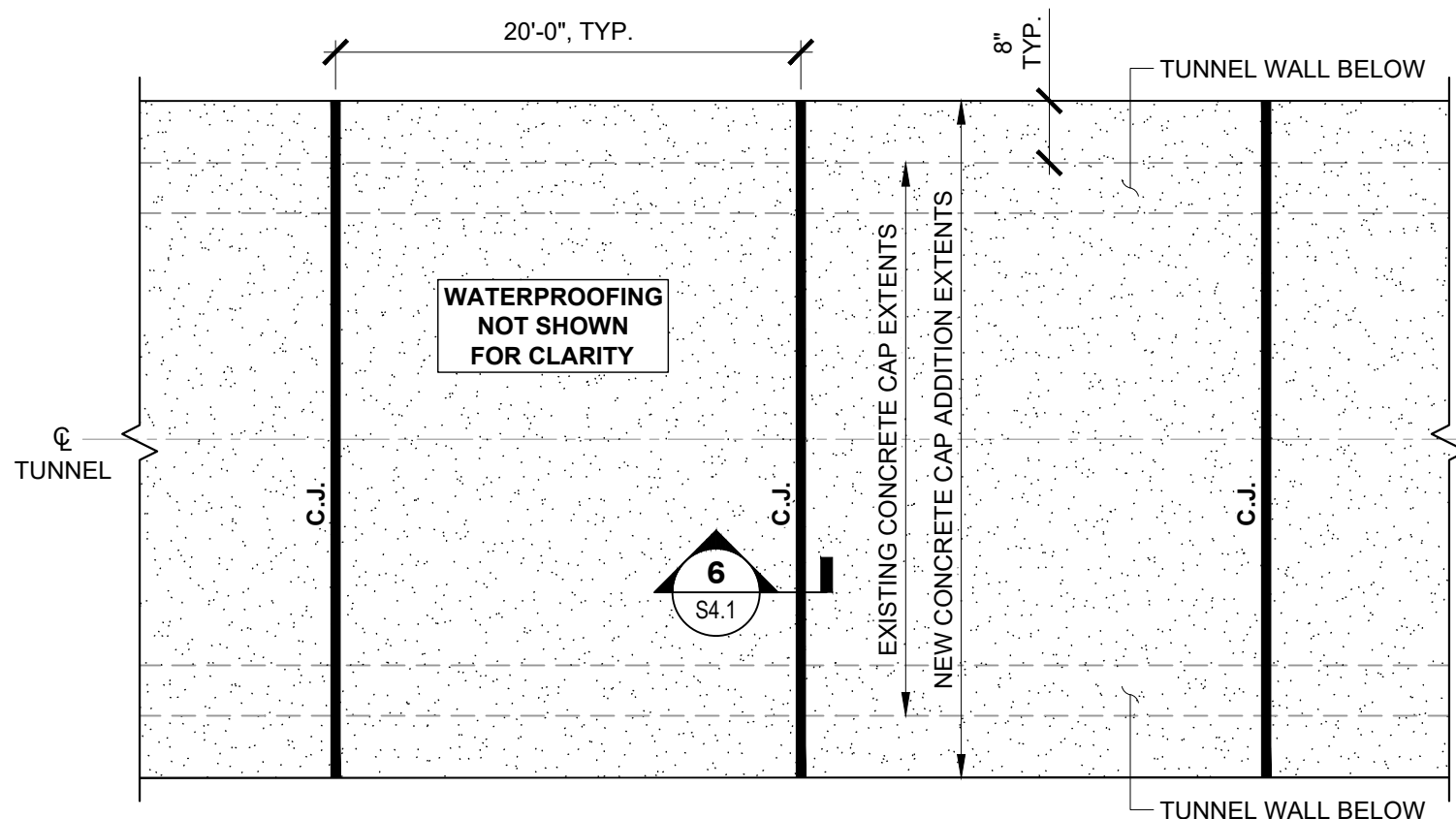
1 GRATING INSTALLATION PLAN FOR SOFFIT DELAMINATION REGIONS
FULL SCALE (22x34): 3/4" = 1'-0"
HALF SCALE (11x17): 3/8" = 1'-0"



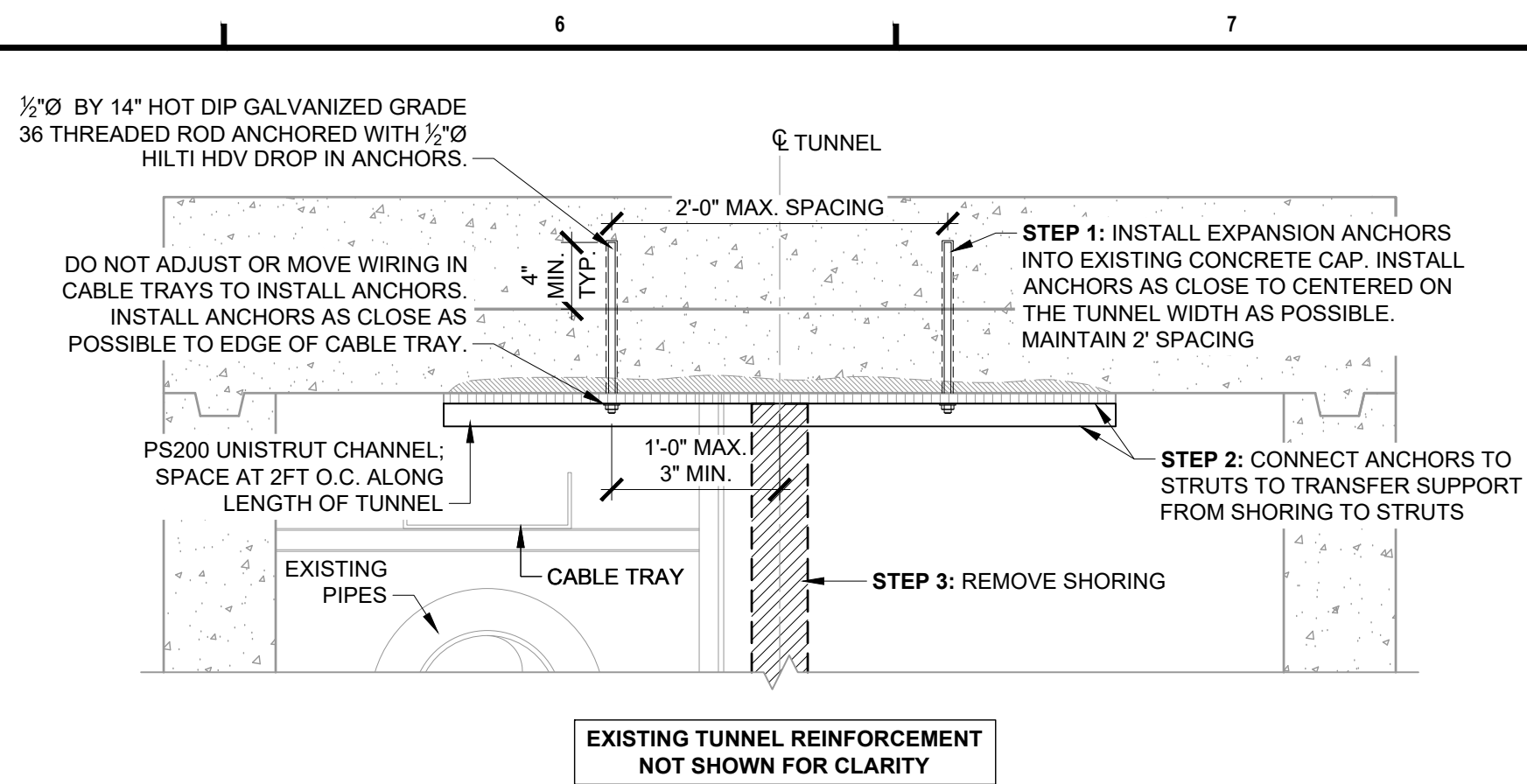
2A SOFFIT REINFORCEMENT AT EXISTING TOP SLAB - GRATE PLACEMENT & SHORING
FULL SCALE (22x34): 1" = 1'-0"
HALF SCALE (11x17): 1/2" = 1'-0"



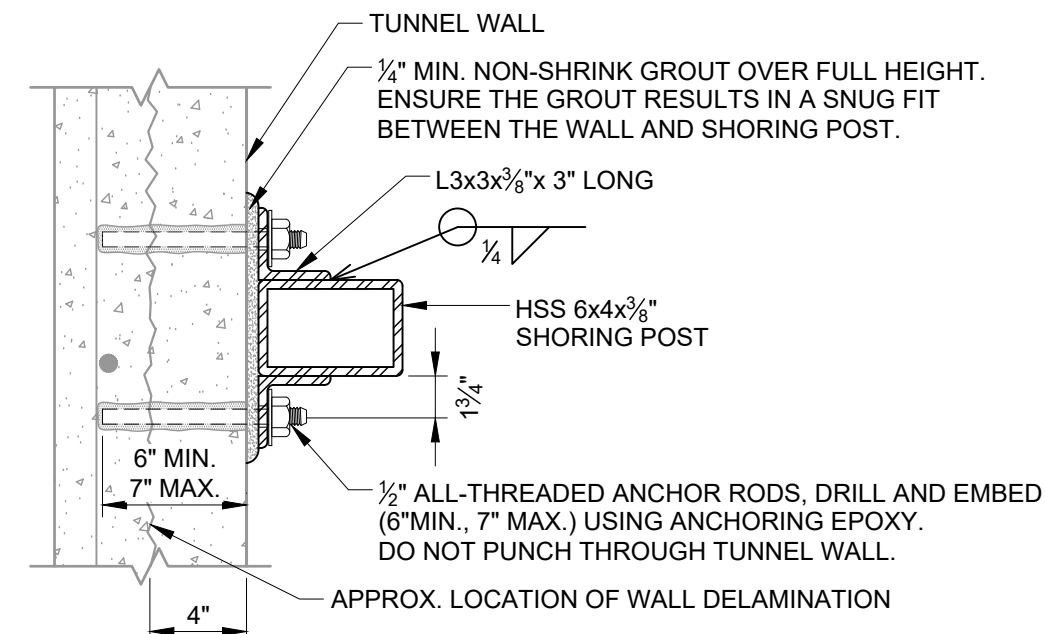
3 PERMANENT WALL SHORING DETAIL
FULL SCALE (22x34): 3/4" = 1'-0"
HALF SCALE (11x17): 3/8" = 1'-0"



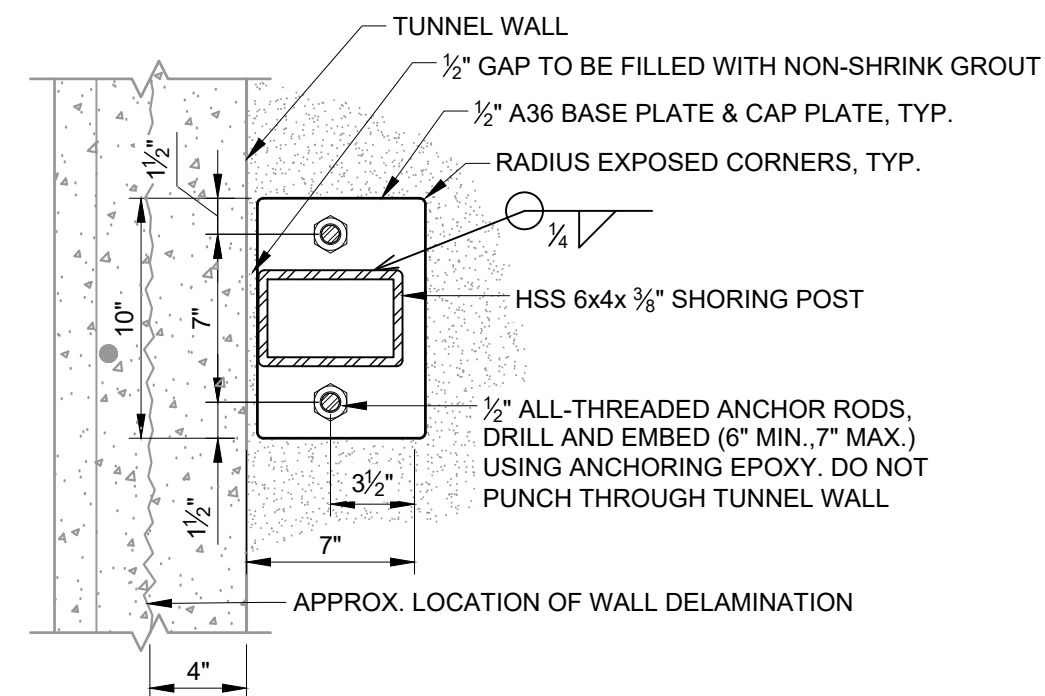
5 NEW CONSTRUCTION JOINT AT TUNNEL CAP REPAIR, TYP. (PLAN)
NOT TO SCALE



2B SOFFIT REINFORCEMENT AT EXISTING TOP SLAB - REPAIR & SHORING REMOVAL
FULL SCALE (22x34): 1" = 1'-0"
HALF SCALE (11x17): 1/2" = 1'-0"

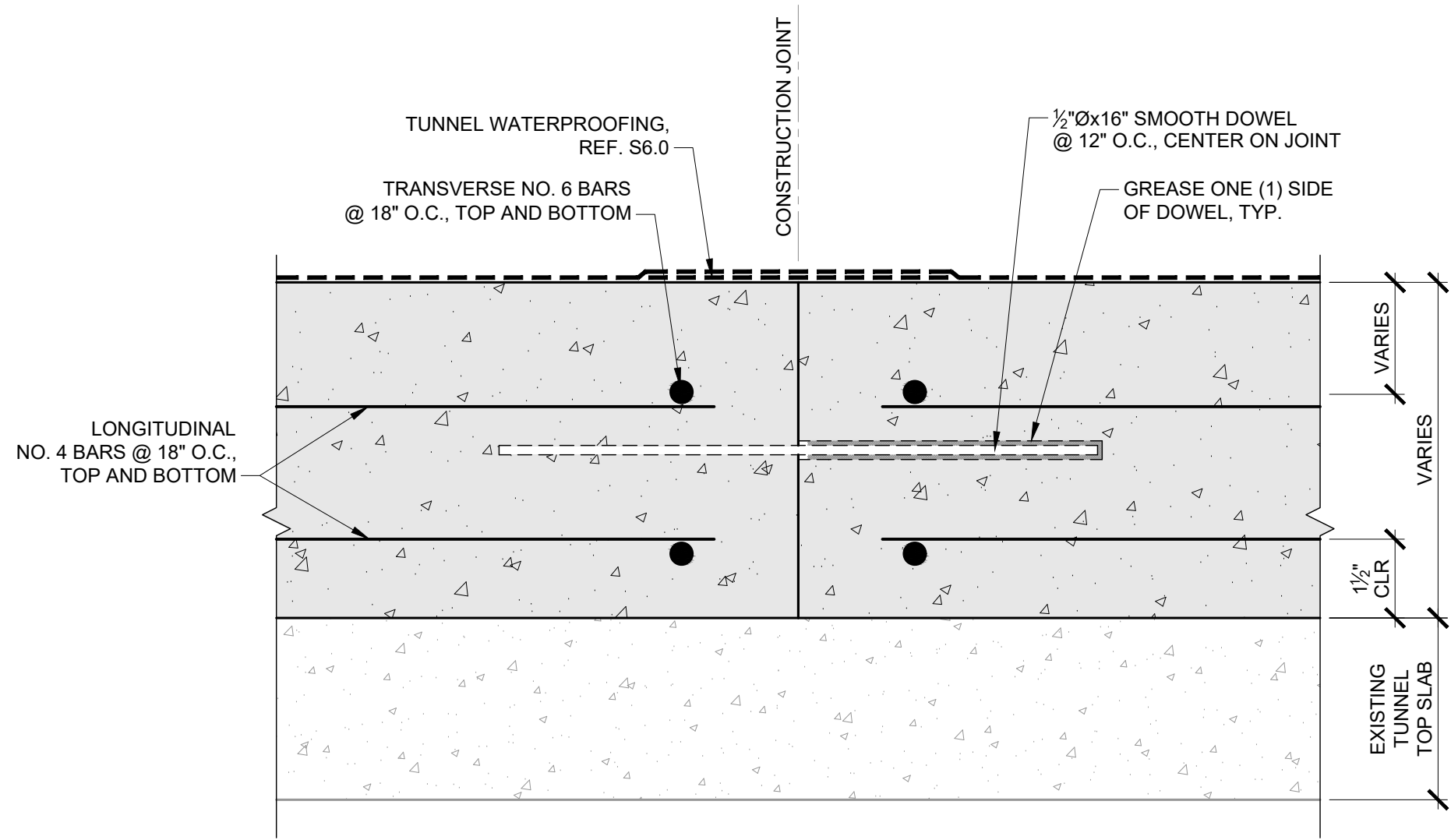


4A: SECTION



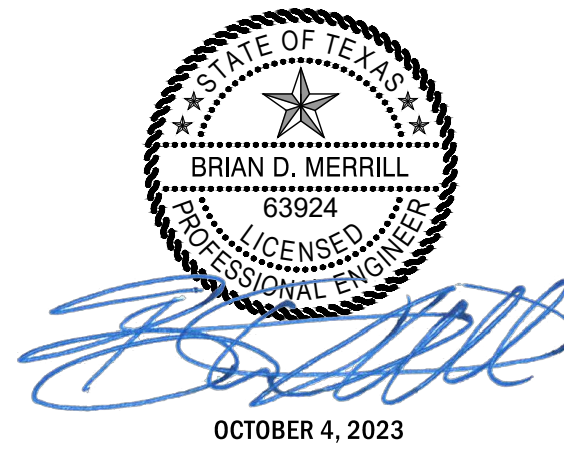
4B: BASE & CAP PLATE

4 TYPICAL WALL SHORING ATTACHMENT DETAILS
FULL SCALE (22x34): 1-1/2" = 1'-0"
HALF SCALE (11x17): 3/4" = 1'-0"



6 NEW CONSTRUCTION JOINT AT TUNNEL CAP REPAIR, TYP. (SECTION)
FULL SCALE (22x34): 3" = 1'-0"
HALF SCALE (11x17): 1-1/2" = 1'-0"

SEAL:



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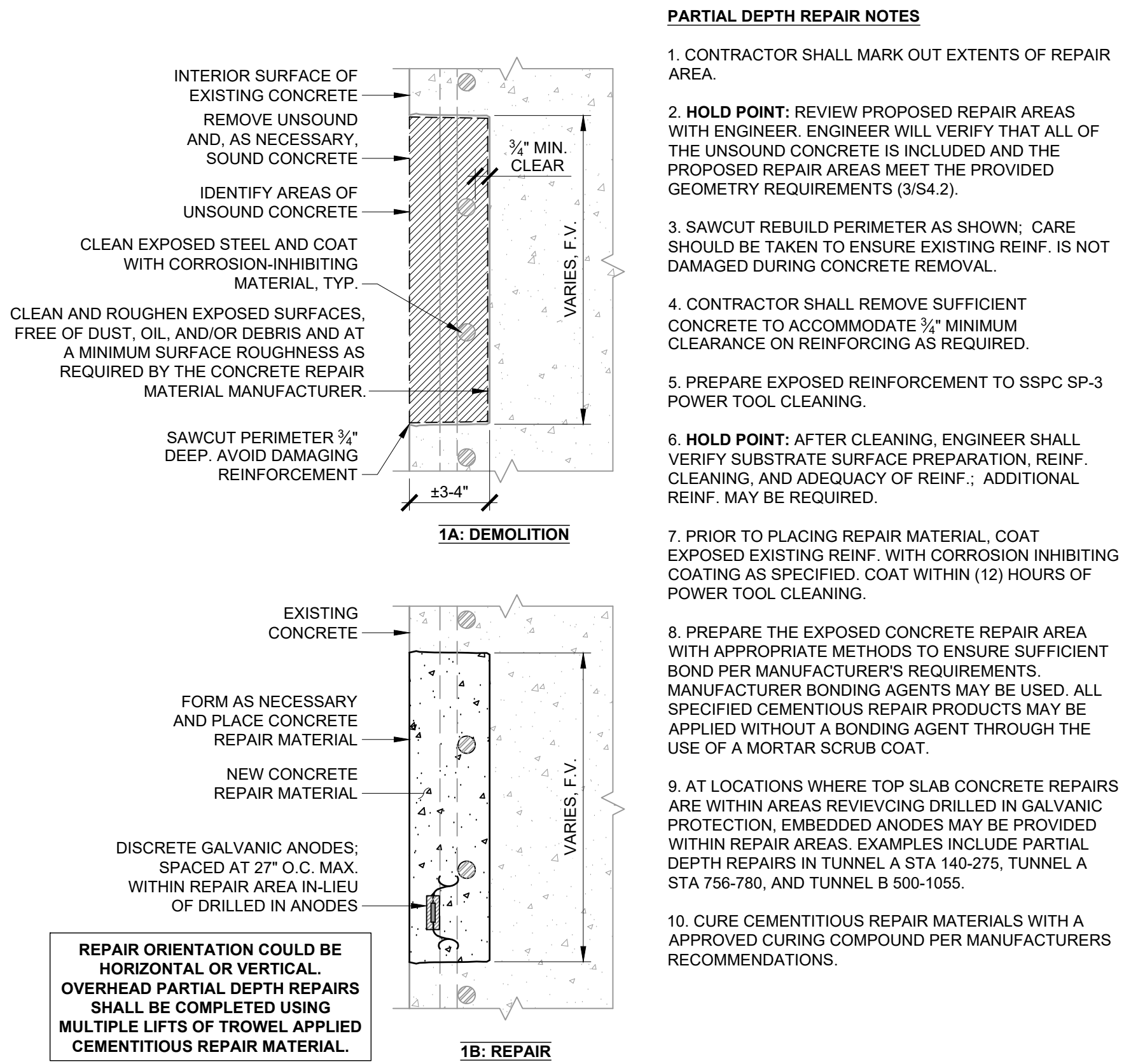
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SUPPLEMENTAL TUNNEL REPAIR DETAILS

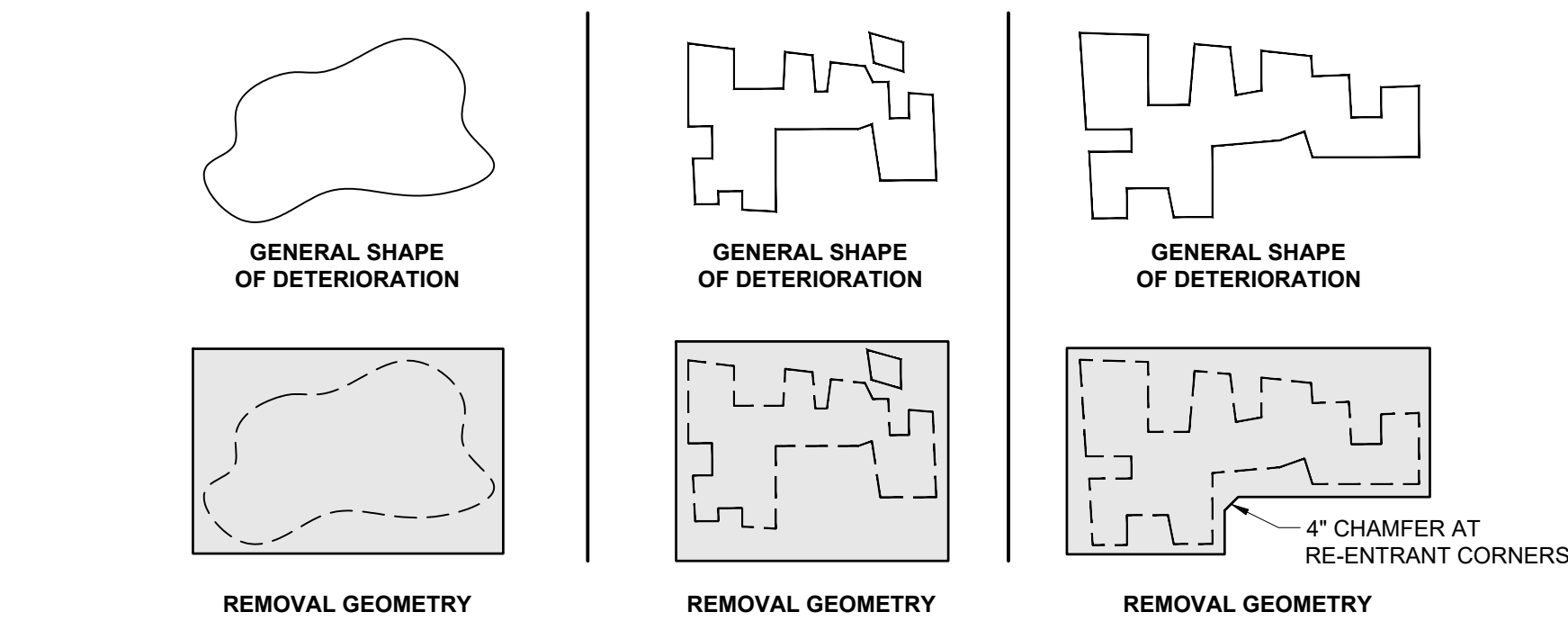
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S4.1

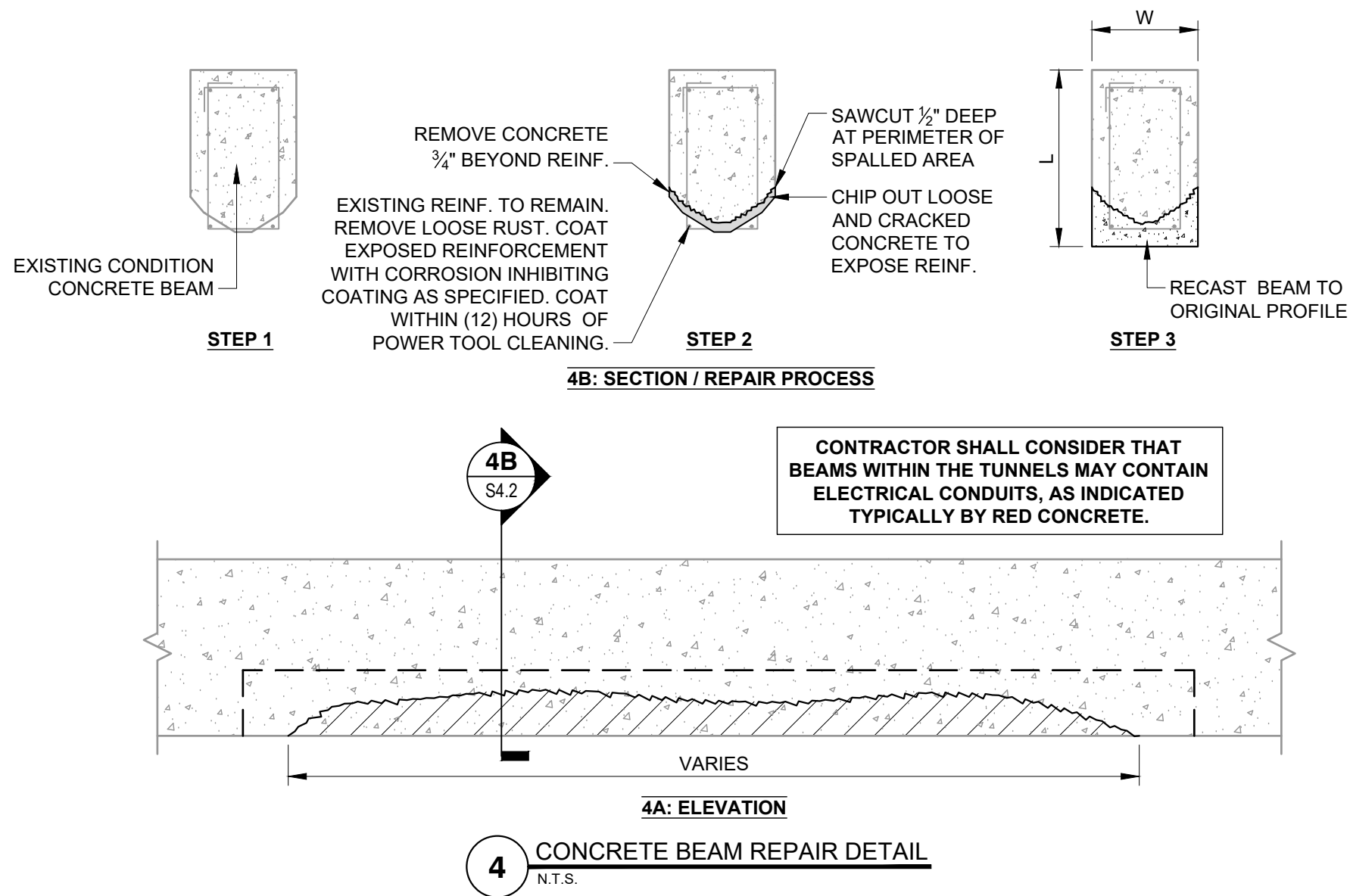
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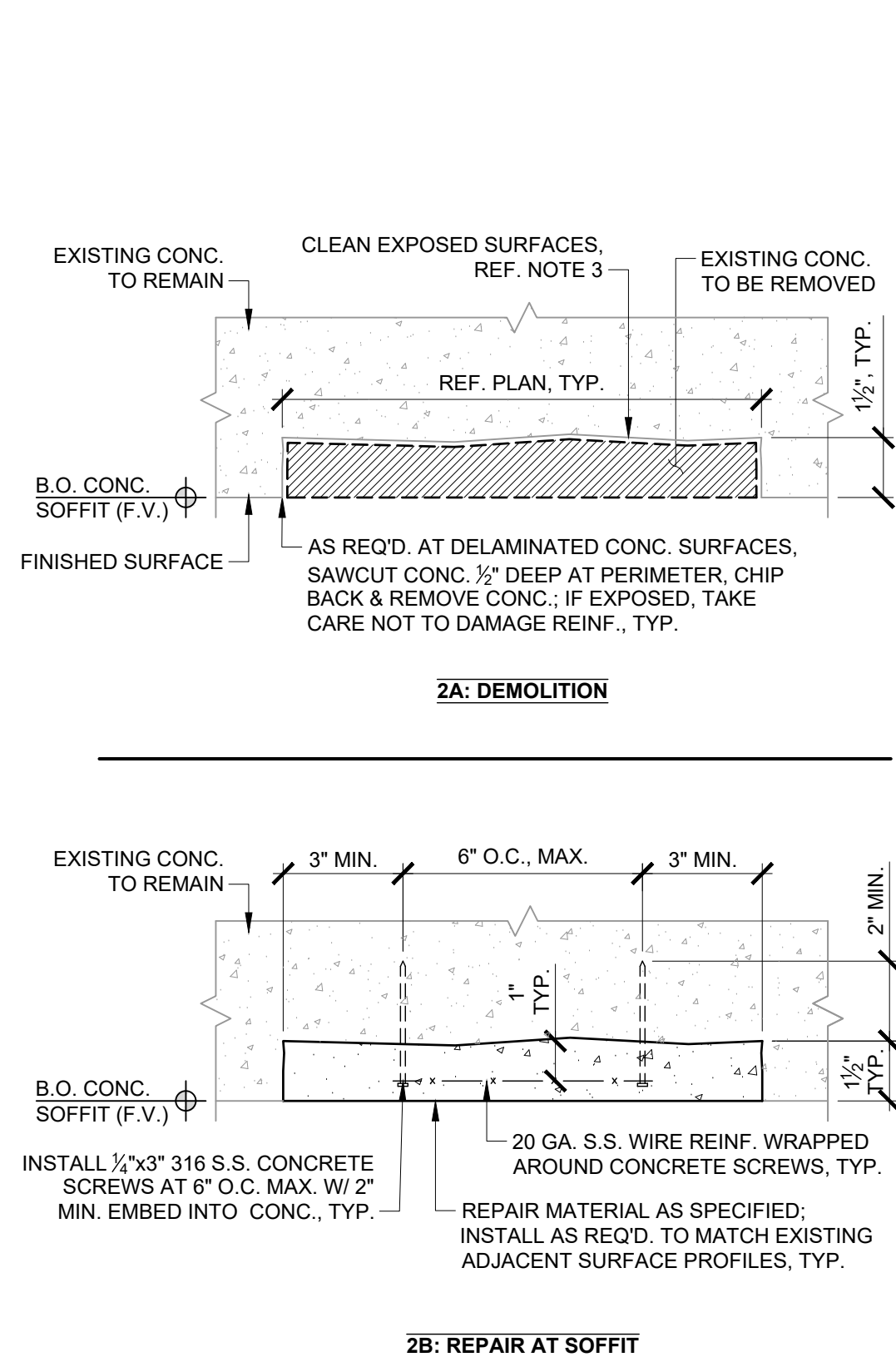
1 PARTIAL-DEPTH CONCRETE REPAIR - WITH EXPOSED REINFORCING STEEL
N.T.S.



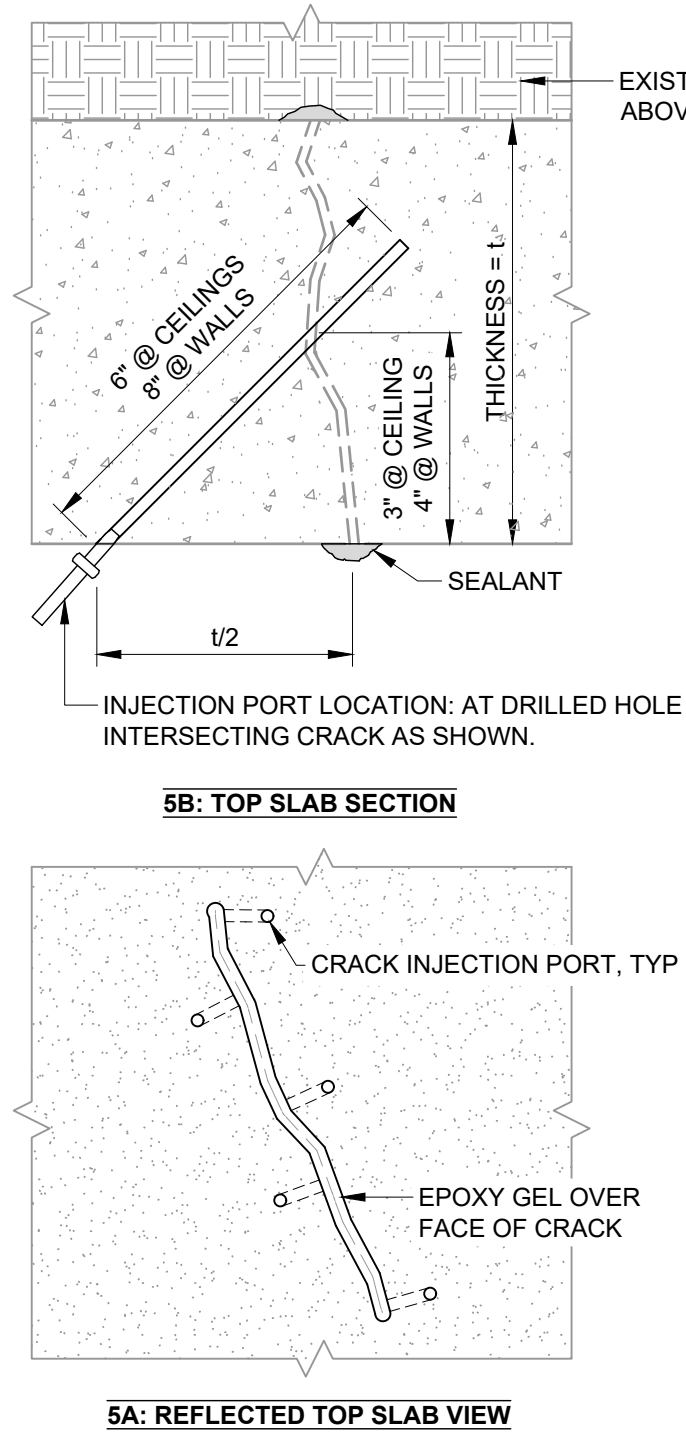
3 TYPICAL CONCRETE REPAIR GEOMETRY
N.T.S.



4 CONCRETE BEAM REPAIR DETAIL
N.T.S.



2 TYPICAL SHALLOW-DEPTH CONCRETE REPAIR - NO EXPOSED REINFORCING STEEL
N.T.S.



5 CRACKING INJECTION REPAIRS
N.T.S.

- SHALLOW-DEPTH REPAIR NOTES:**
- SCREWS MAY BE INSTALLED DIAGONALLY TO ACHIEVE MINIMUM EMBEDMENT.
 - REMOVAL OF MISCELLANEOUS STEEL TO BE COORDINATED WITH ENGINEER.
 - CLEAN AND ROUGHEN EXPOSED SURFACES, FREE OF DUST, OIL, AND/OR DEBRIS AND AT A MINIMUM SURFACE ROUGHNESS AS REQUIRED BY THE CONCRETE REPAIR MATERIAL MANUFACTURER.
- FOR REPAIRS WITH EXPOSED REINFORCEMENT, PERFORM PARTIAL-DEPTH REPAIR PER 1/S4.2**
- INSTALL 1/2"x3" 316 S.S. CONCRETE SCREWS AT 6" O.C. MAX. AT TOP & BOTTOM; PROVIDE 2" MIN. EMBED INTO EXISTING CONC., TYP.
- 16 GA. S.S. WIRE REINF., WRAP AROUND CONC. SCREWS EA. WAY, TYP.
- REPAIR MATERIAL, TROWELLED AS SPECIFIED; INSTALL AS REQ'D. TO MATCH EXISTING ADJACENT SURFACE PROFILES, TYP.
- IF APPLICABLE, EXISTING CONC. SLAB TO REMAIN
- T.O. CONC. EL. VARIES
- CRACK INJECTION SPECS**
- CONTRACTOR TO VERIFY EXISTING DIMENSIONS AND DETAILS PRIOR TO INSTALLATION OF REPAIR MATERIALS. ANY CHANGES TO SITE CONDITION WILL BE REPORTED TO EOR.
 - AT LOCATIONS WHERE TOP SLAB CRACKS CONTINUE INTO THE ADJACENT WALLS, INJECTIONS SHALL BE COMPLETED ON THE WALL TO THE LESSER OF THE COMPLETE CRACK EXTENTS OR 3 FEET FROM THE TOP OF THE WALL. IF INJECTIONS CANNOT BE COMPLETED IN THIS MANNER DUE TO THE VISCOSITY OF THE INJECTION MATERIAL, THE CONTRACTOR SHALL CONSULT THE MANUFACTURER AND THE ENGINEER.
 - PREPARE CRACKS TO BE REPAIRED PER MANUFACTURER'S RECOMMENDATIONS.
 - HOLD POINT:** REVIEW WITH ENGINEER PRIOR TO PLACEMENT OF REPAIR MATERIALS. ENGINEER WILL FIELD VERIFY ALL CRACKS RECOMMENDED FOR REPAIR ARE PREPARED FOR PROPER IMPLEMENTATION OF CRACK SEALING MATERIALS AND INJECTION PORTS. PROPOSED INJECTION PORT LOCATIONS SHOULD BE MARKED.
 - INSTALL INJECTION PORTS TO ACHIEVE COMPLETE FILLING OF CRACK.
 - NUMBER, SPACING AND LOCATIONS OF PORTS SHALL BE APPROVED BY REPRESENTATIVE OF INJECTION MATERIAL MANUFACTURER.
 - INJECTION PORTS SHOULD BE INSTALLED VIA DRILLED HOLES THAT INTERSECT THE CRACKS AT A 45 DEGREE ANGLE AT THE MID DEPTH OF THE MEMBER.
 - APPLY APPROVED EPOXY GEL TO SEAL THE EXTERIOR OF THE CRACKS BEING REPAIRED.
 - FLUSH THE CRACKS WITH POTABLE WATER TO REMOVE DIRT OR FOREIGN OBJECTS.
 - COMPLETE INJECTION PER MANUFACTURER'S INSTRUCTIONS.
 - START INJECTION PROCESS AT LOWEST INJECTION PORT AND CONTINUE INJECTION UNTIL MATERIAL EMERGES FROM THE ADJACENT PORT.
 - CONTINUE INJECTION PROCESS UPWARD, PORT TO PORT, CONFIRMING UPWARD AND THROUGH THICKNESS PORT TRAVEL.
 - IF PORT-TO-PORT TRAVEL DOES NOT OCCUR, STOP WORK AND MODIFY INJECTION SETUP AS TO ACHIEVE PORT-TO-PORT TRAVEL.

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**TYPICAL CONCRETE
REPAIR DETAILS**

TITLE:

SHEET No.:

S4.2

SEAL:



PROJECT:

MSU TUNNEL STRUCTURAL REPAIRS

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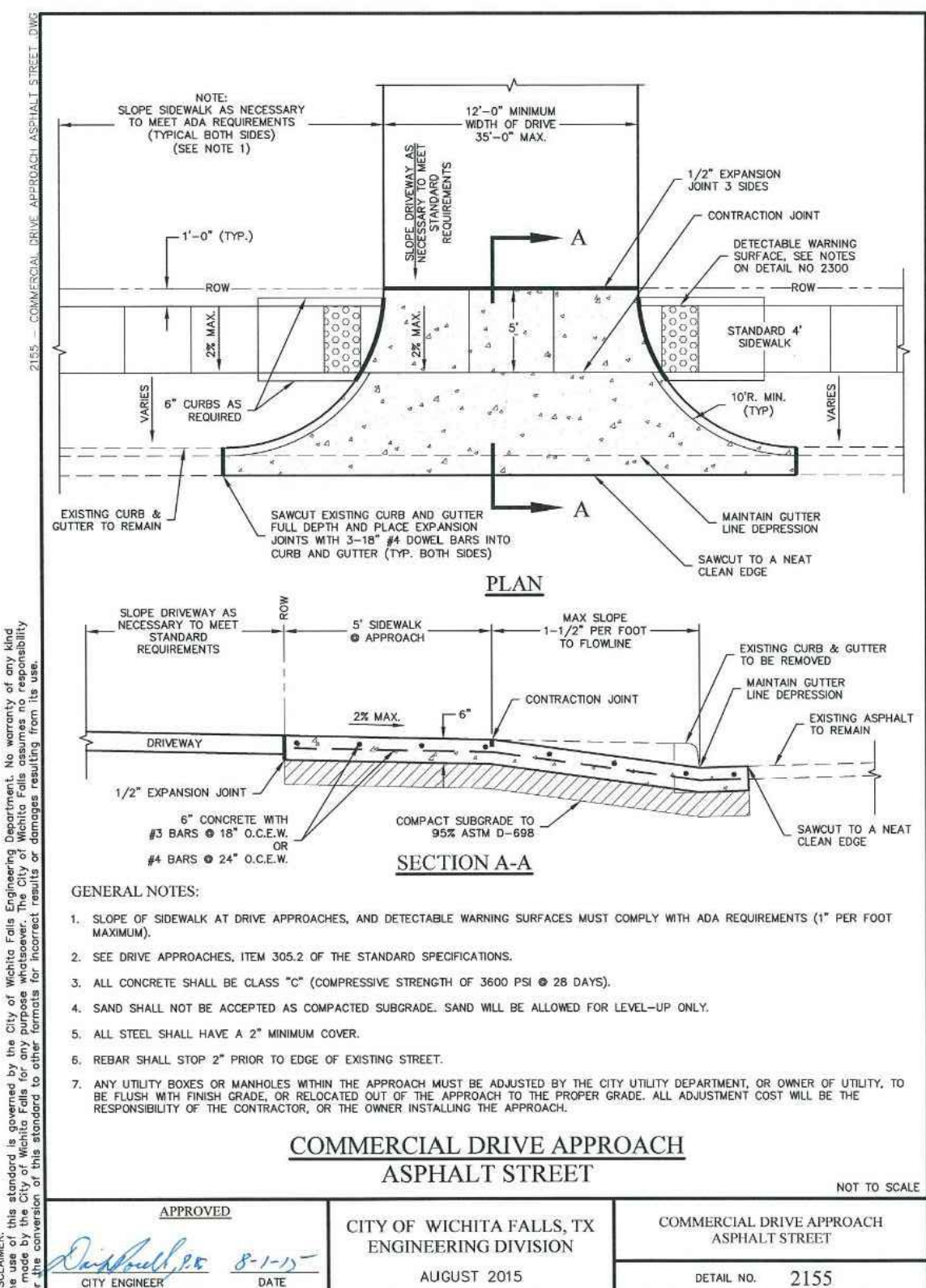
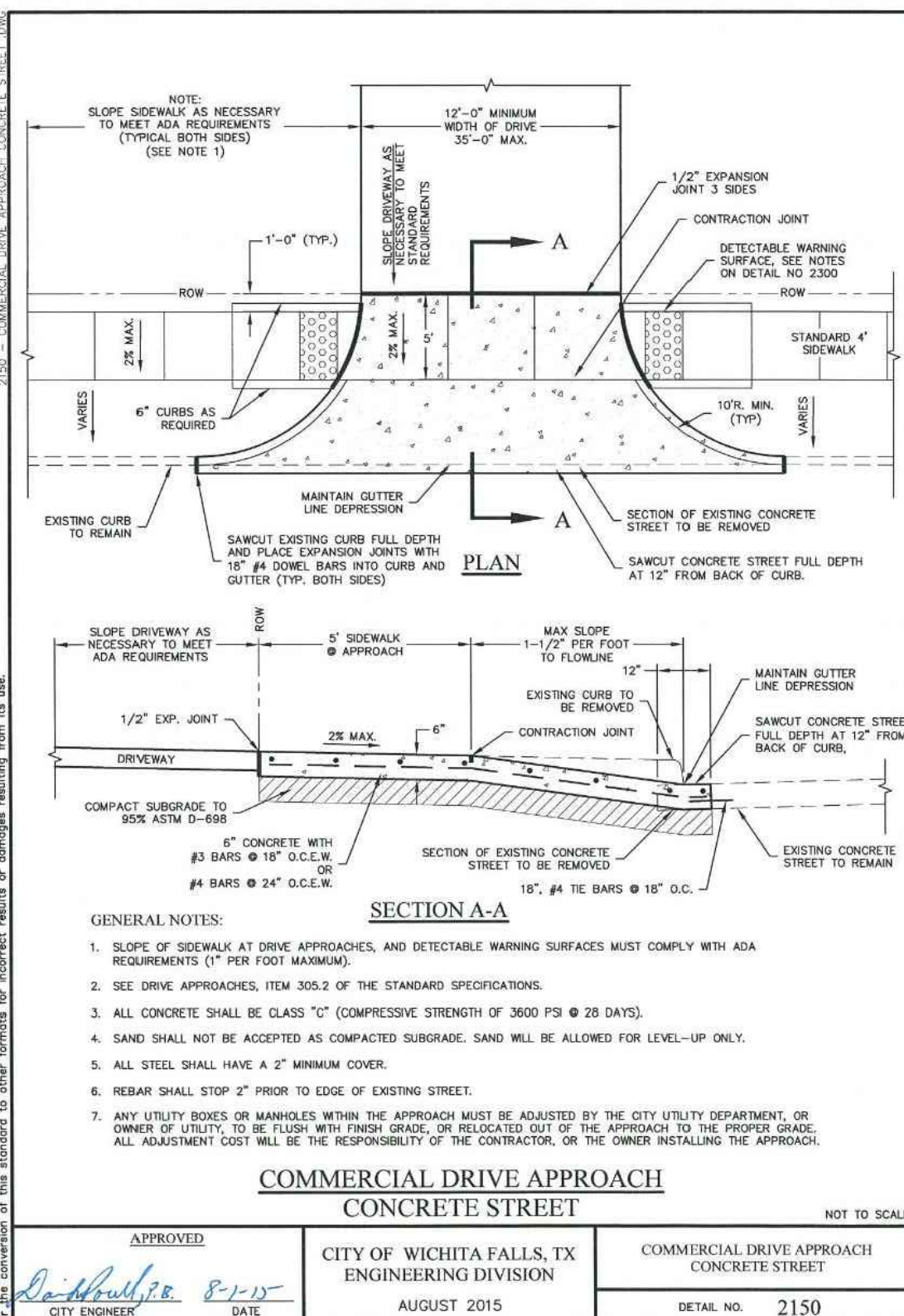
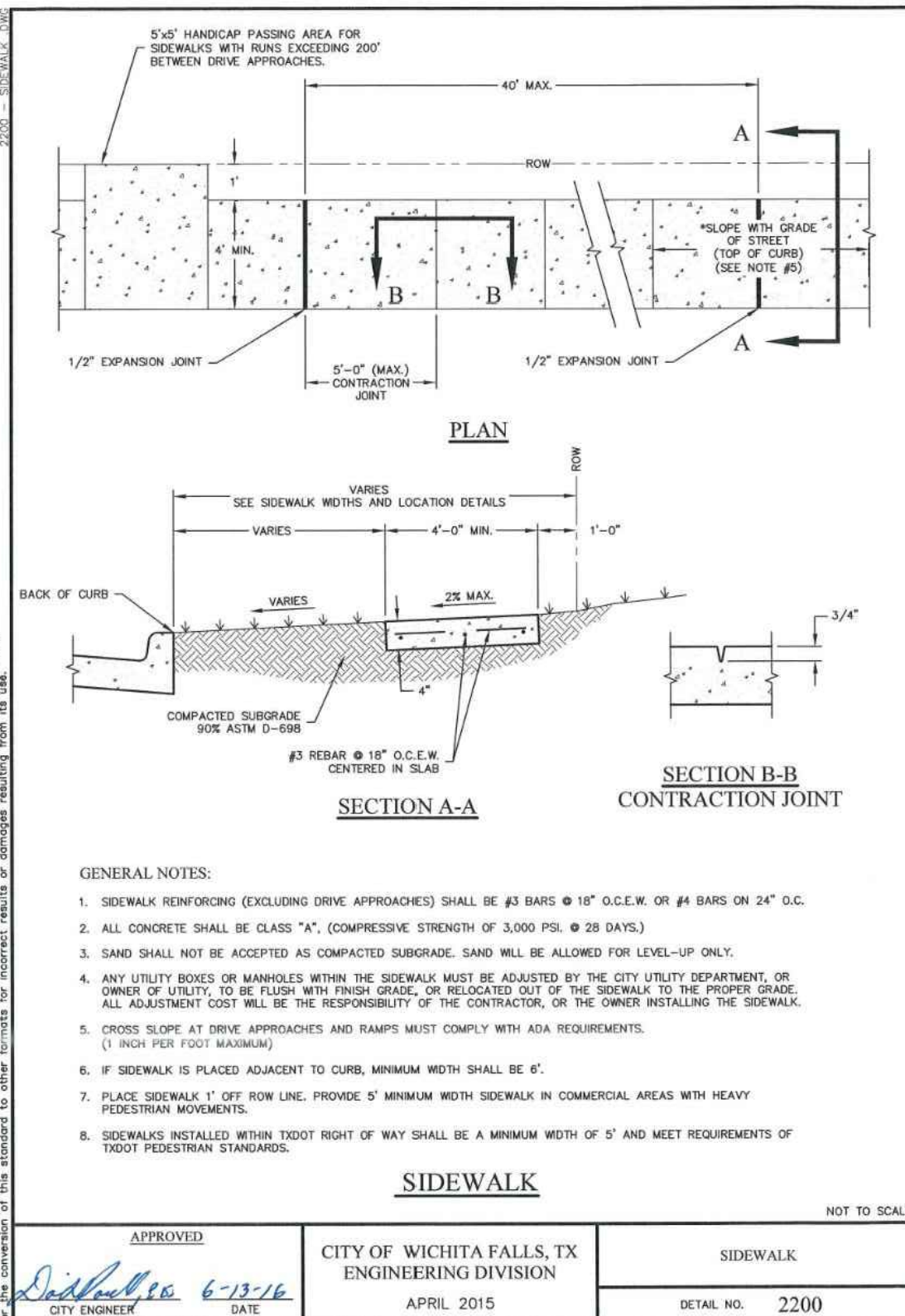
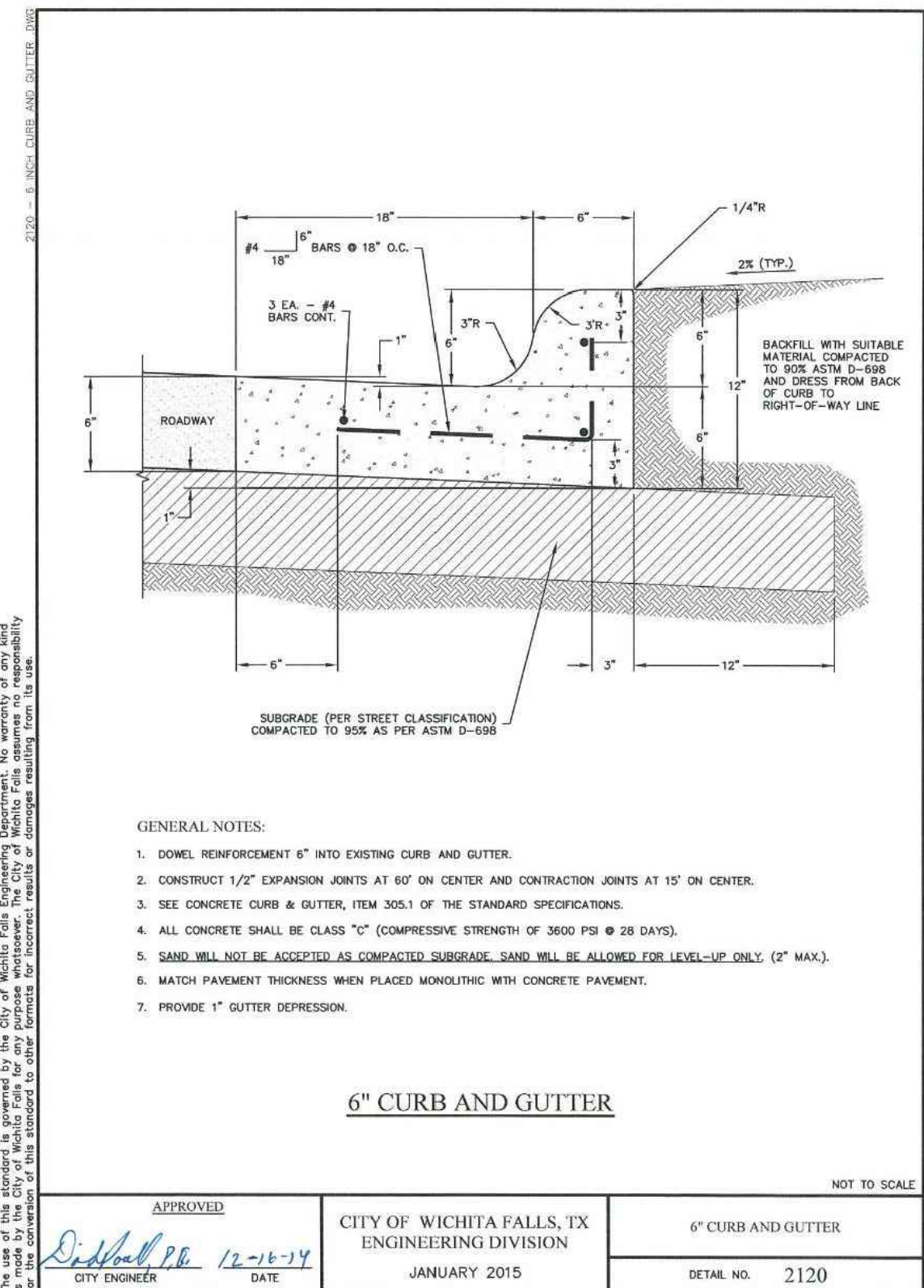
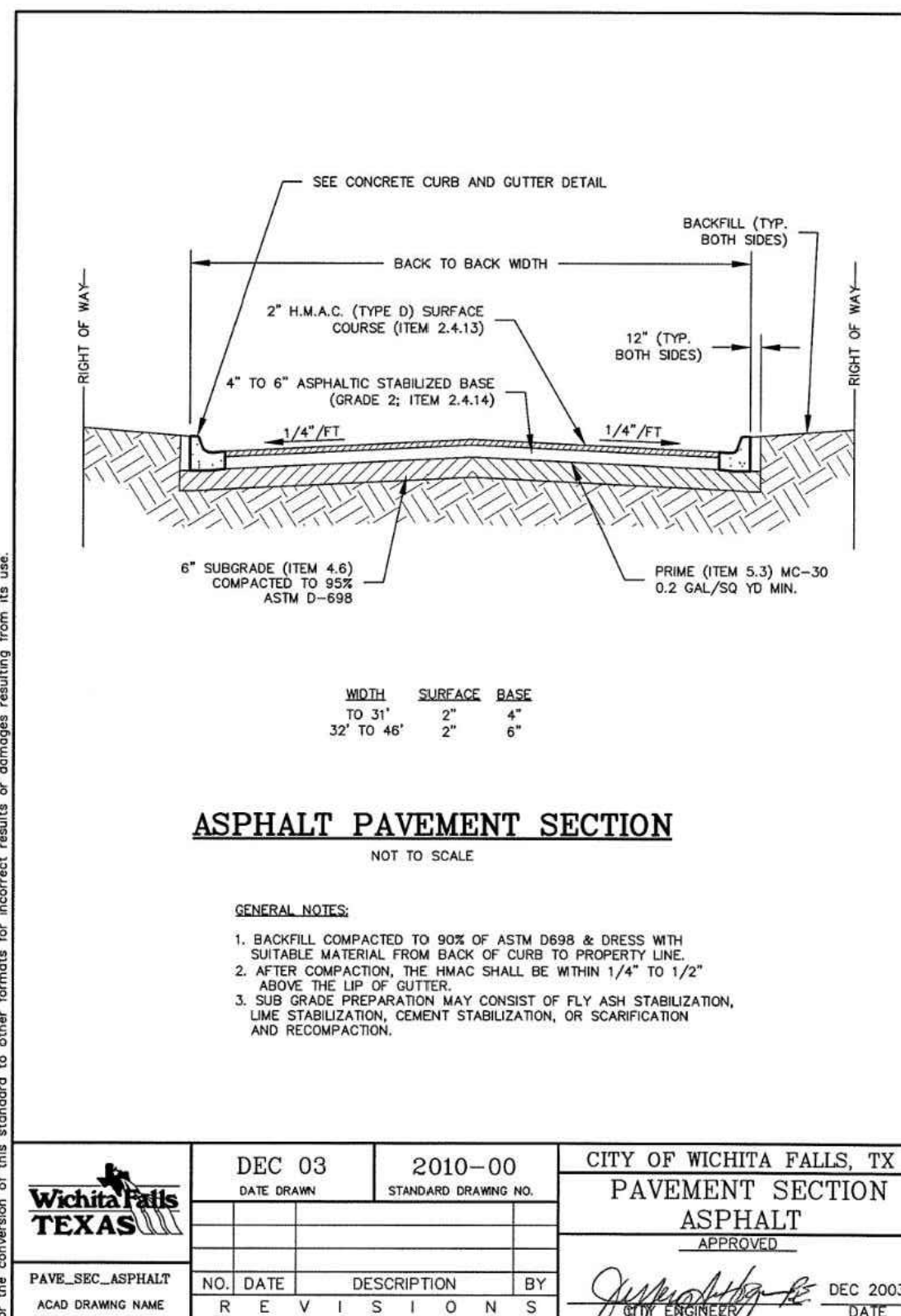
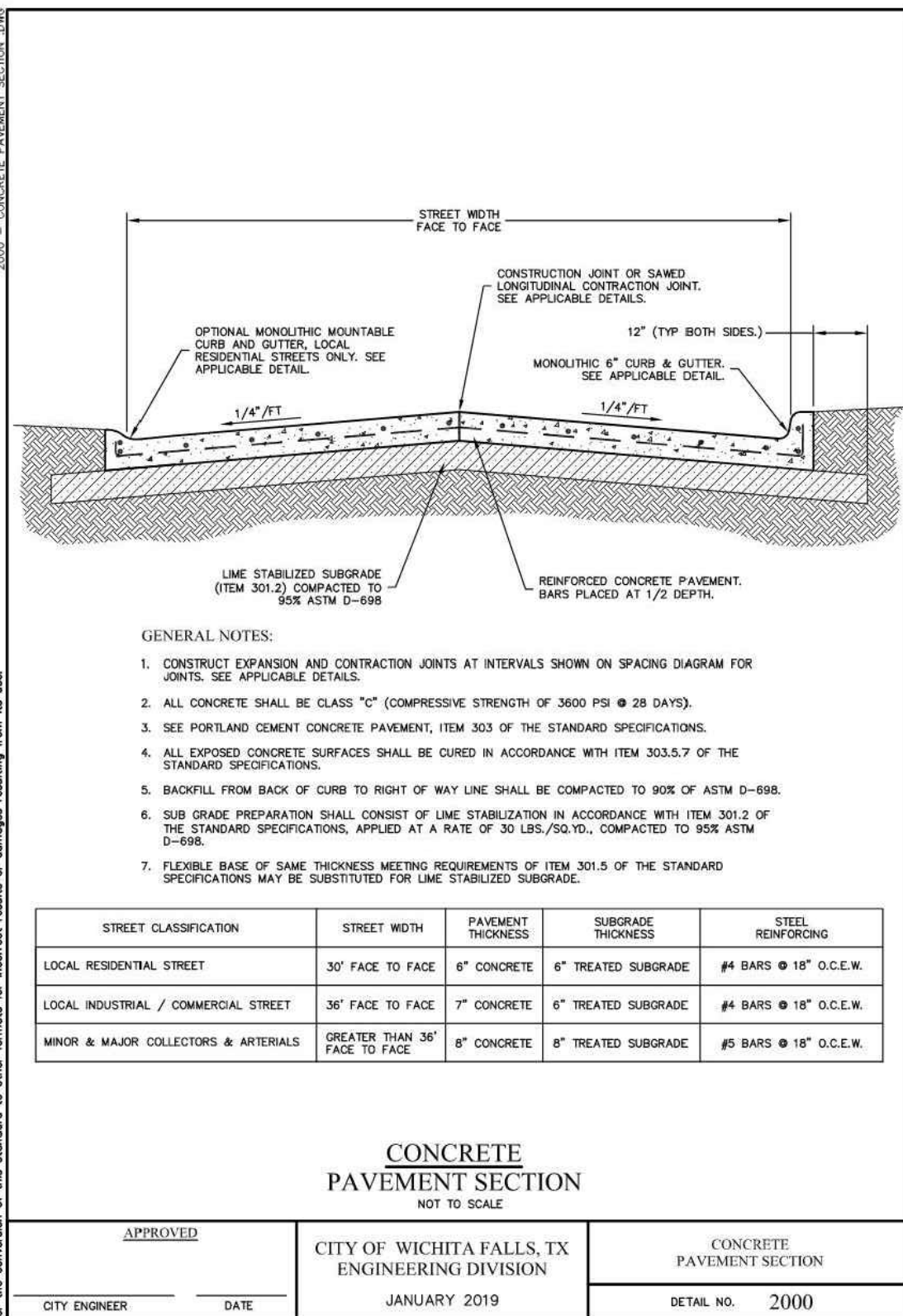
No.	DATE	DESCRIPTION

WJE PROJECT No.:	2022.4649.0
ISSUE DATE:	OCTOBER 4, 2023
PROJECT MANAGER:	BDM
REVIEWED BY:	RDD
DRAWN BY:	FV/ADP
SCALE:	AS NOTED

CITY OF
WICHITA FALLS, TX
PAVEMENT STANDARDS

SHEET No.:

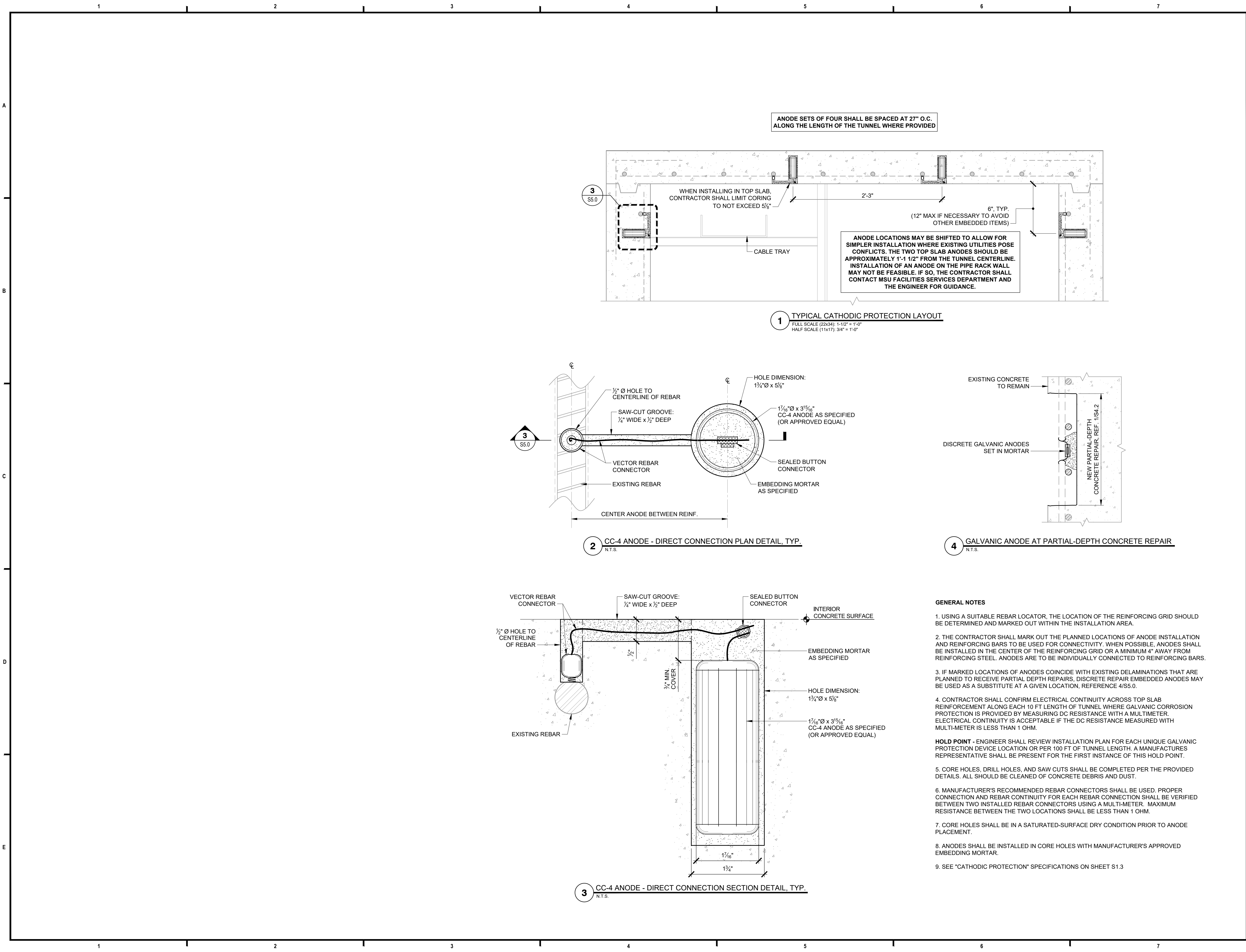
S4.4



GENERAL NOTES

1. IF ANY REPAIRS CAUSE DAMAGE TO EXISTING LANDSCAPE OR HARDSCAPE, LIKE-IN-KIND REPAIRS SHALL BE COMPLETED.
2. STANDARD WICHITA FALLS PAVEMENT DETAILS SHALL BE USED AS A REFERENCE FOR ANY CONDITIONS THAT ARE NOT PROVIDED ON THIS SHEET. THE CONTRACTOR SHALL SUBMIT A REPAIR PLAN FOR ANY UNFORESEEN REPAIRS TO EXISTING HARDSCAPE.
3. ANY DEMOLISHED CURB OR HANDICAP ACCESSIBLE RAMPS SHALL BE DOCUMENTED AND DETERMINED WHAT TYPE THEY ARE SO LIKE-IN-KIND REPLACEMENT SHALL BE ACHIEVED. RAMP DETAILS ARE NOT PROVIDED IN THIS DRAWING SET.

DETAILS FOUND ON THIS SHEET WERE EXTRACTED FROM
CITY OF WICHITA FALLS PAVEMENT STANDARDS



WJE

ENGINEERS
ARCHITECTS
MATERIALS SCIENTISTS

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Pittsburgh | Portland | Princeton | Raleigh | San Antonio | San Diego
San Francisco | Seattle | South Florida | Washington, D.C.

SEAL:

STATE OF TEXAS

63924

BRIAN D. MERRILL

PROFESSIONAL ENGINEER

OCTOBER 4, 2023

PROJECT:

MSU TUNNEL
STRUCTURAL REPAIRS

MIDWESTERN
STATE UNIVERSITY
Wichita Falls, Texas

CLIENT:

Midwestern
State University
3410 Taft Blvd
Wichita Falls, Texas 76308

Contact: Kyle Owen
kyle.owen@msutexas.edu

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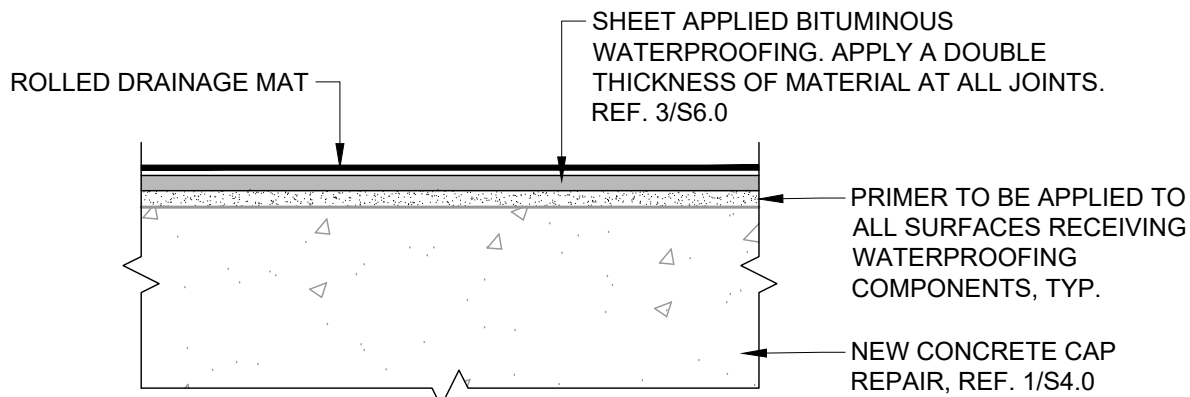
TYPICAL CATHODIC
PROTECTION DETAILS

TITLE:

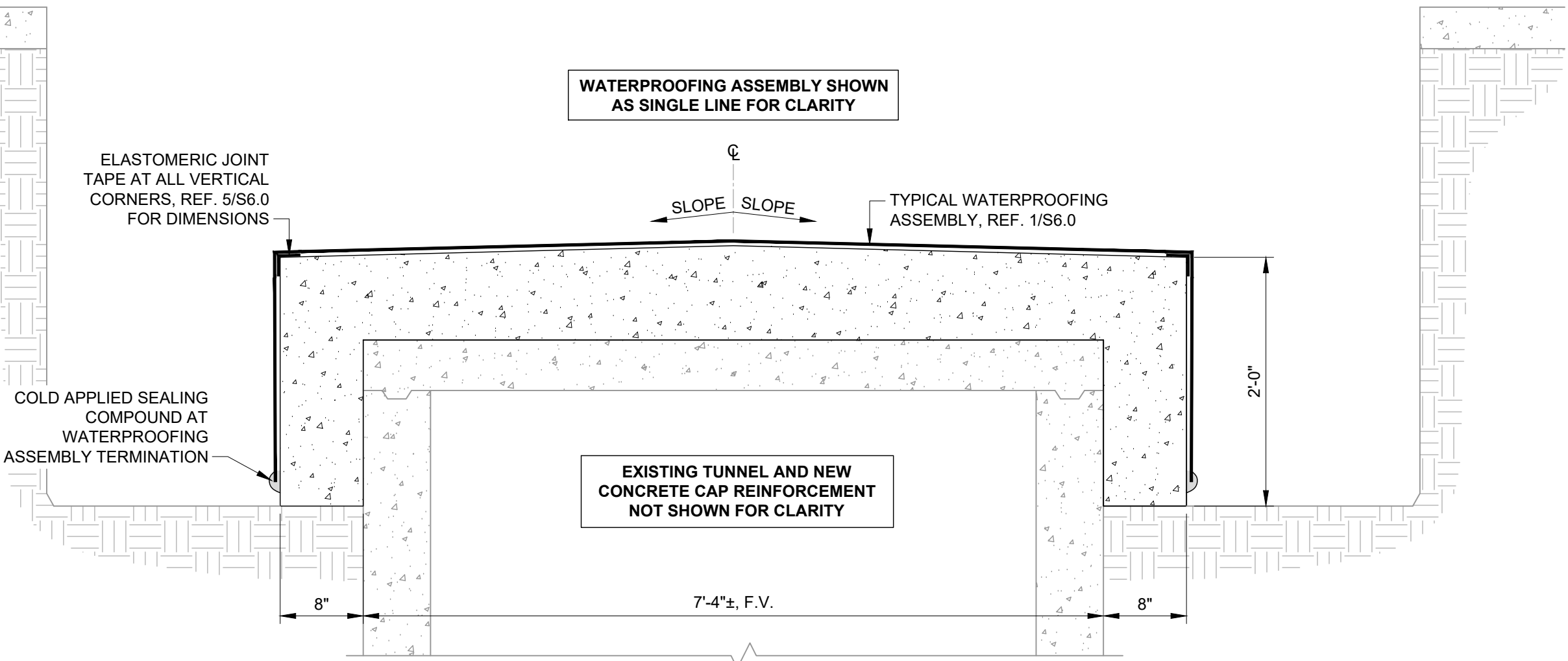
SHEET No.:S5.0

WATERPROOFING ASSEMBLY NOTES

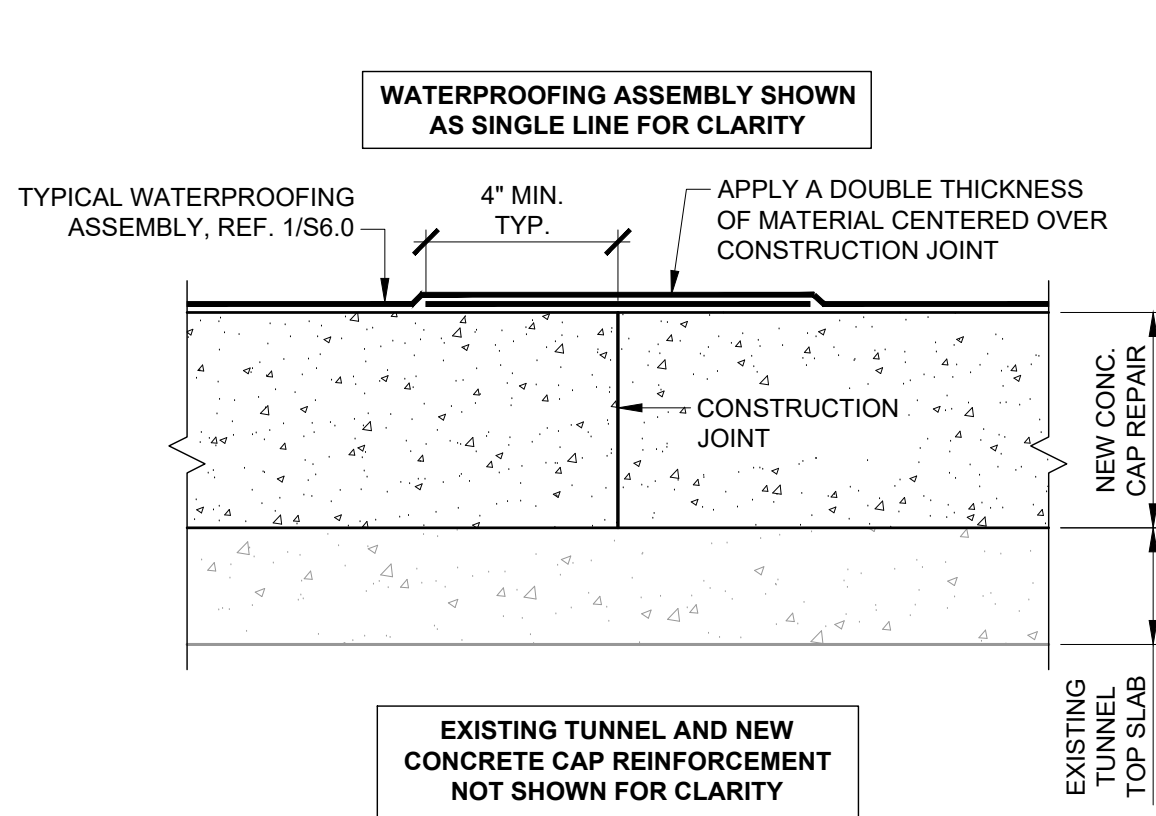
1. WATERPROOFING ASSEMBY FOR BELOW GRADE APPLICATION SHALL CONSIST OF THE PRODUCTS REFERENCED ON SHEET S1.2
2. WATERPROOFING SHALL BE APPLIED TO CONCRETE THAT HAS CURED SUFFICIENTLY, AS DEFINED BY THE WATERPROOFING MANUFACTURER, AND IS CLEAN OF ALL DUST, DIRT, OR OIL, AND BE DRY, SMOOTH, AND FREE OF VOIDS. THE DETAILED SHEET APPLIED BITUMINOUS WATERPROOFING ASSEMBLY SHOWN ON THIS SHEET REQUIRES AT LEAST 72 HOURS OF CONCRETE CURING PRIOR TO APPLICATION.
3. WATERPROOFING PRODUCTS SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATIONS.
4. USE COLD APPLIED SEALING COMPOUND AT TRANSITIONS BETWEEN WATERPROOFING AND EXPOSED CONCRETE.



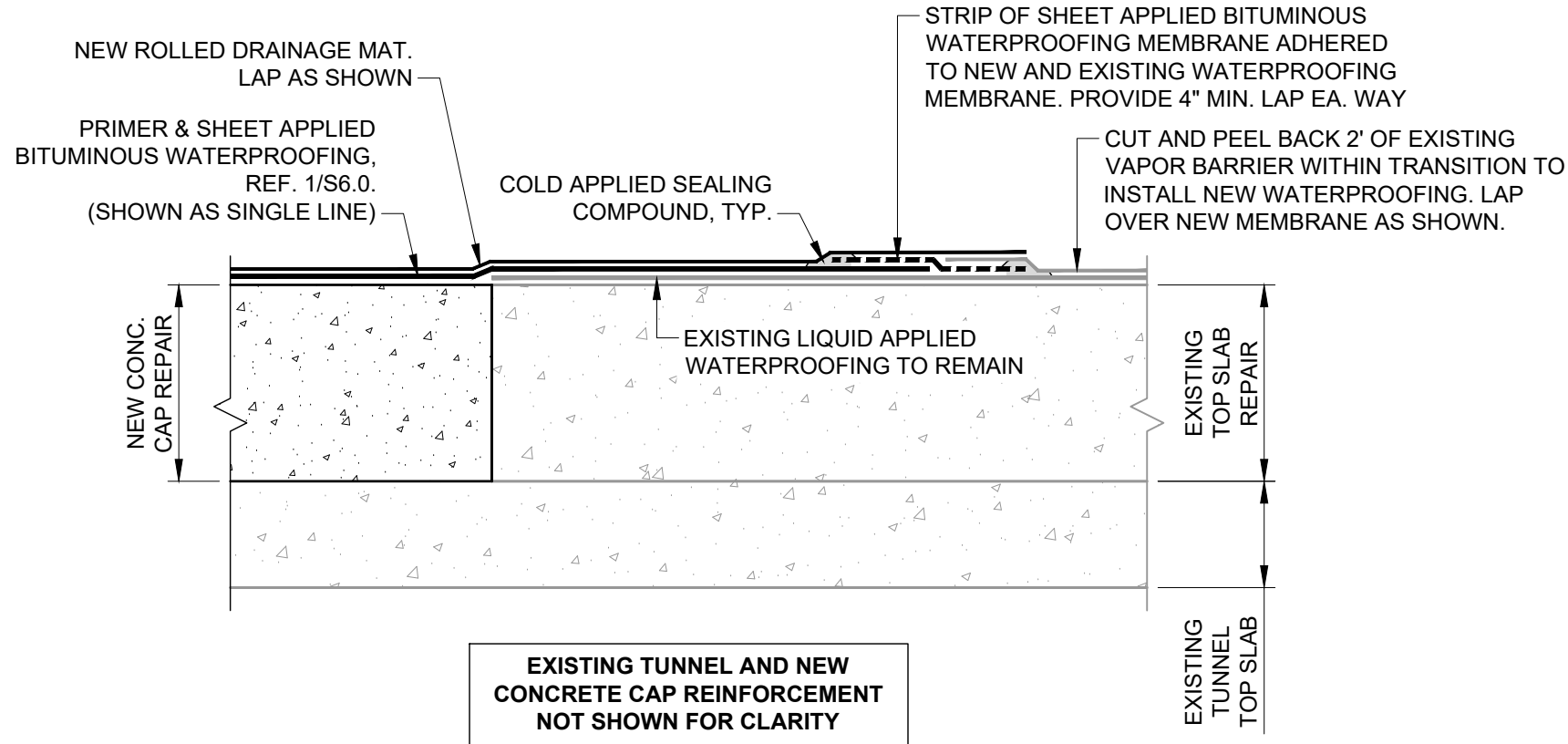
1 TYPICAL WATERPROOFING ASSEMBLY
FULL SCALE (22x34): 3" = 1'-0"
HALF SCALE (11x17): 1-1/2" = 1'-0"



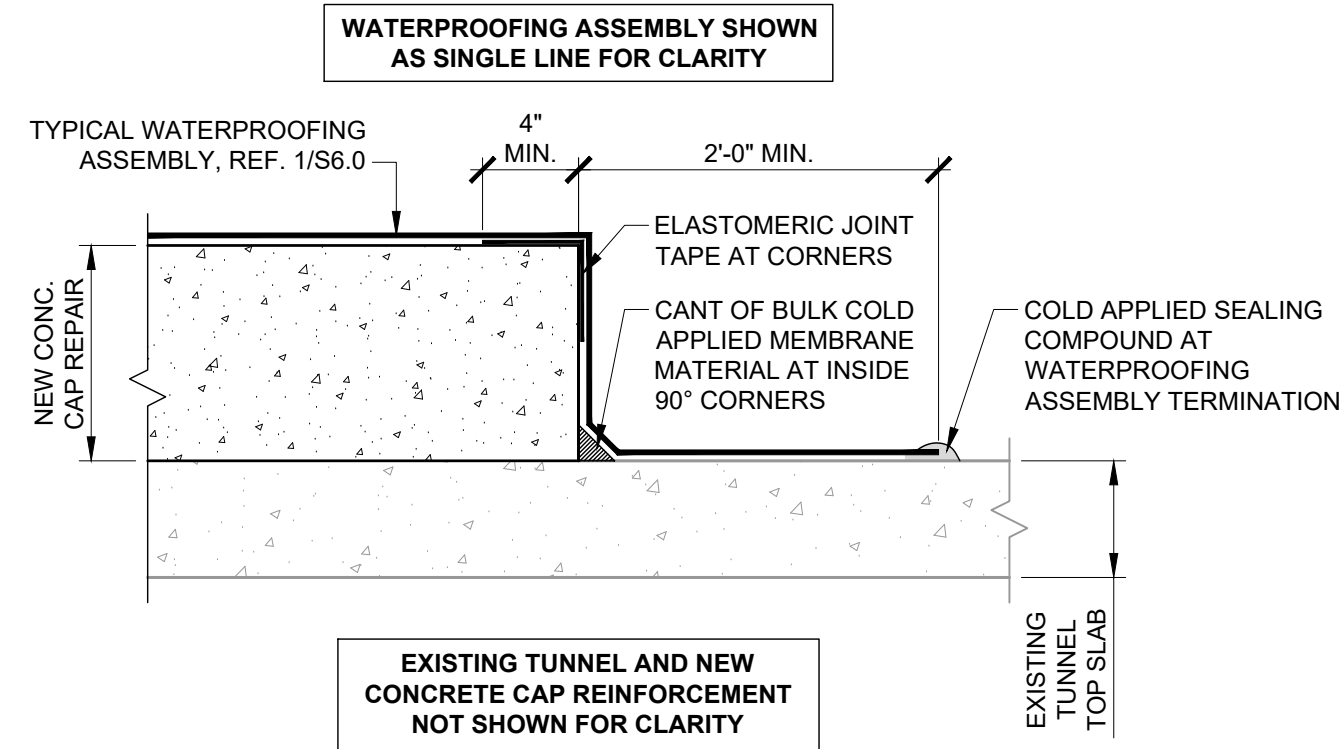
2 TYPICAL WATERPROOFING AT STRUCTURAL CAP REPAIR SECTION
FULL SCALE (22x34): 1" = 1'-0"
HALF SCALE (11x17): 1/2" = 1'-0"



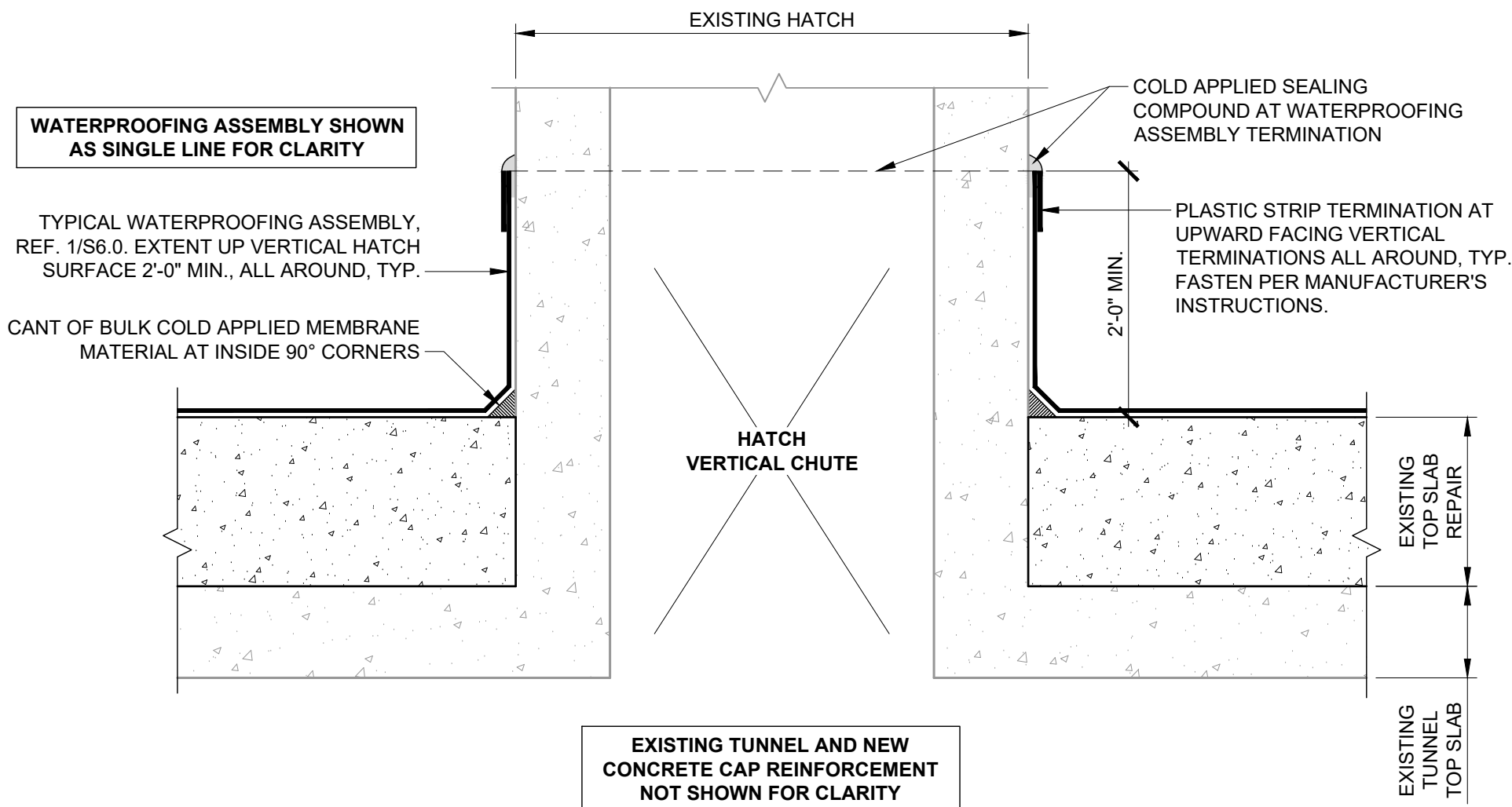
3 WATERPROOFING AT NEW CONSTRUCTION JOINT
FULL SCALE (22x34): 1-1/2" = 1'-0"
HALF SCALE (11x17): 3/4" = 1'-0"



4 WATERPROOFING TERMINATION AT CAP REPAIR END
FULL SCALE (22x34): 1-1/2" = 1'-0"
HALF SCALE (11x17): 3/4" = 1'-0"



5 WATERPROOFING TERMINATION AT CAP REPAIR END
FULL SCALE (22x34): 1-1/2" = 1'-0"
HALF SCALE (11x17): 3/4" = 1'-0"



6 WATERPROOFING TERMINATION AT CAP REPAIR END
FULL SCALE (22x34): 1-1/2" = 1'-0"
HALF SCALE (11x17): 3/4" = 1'-0"

SEAL:



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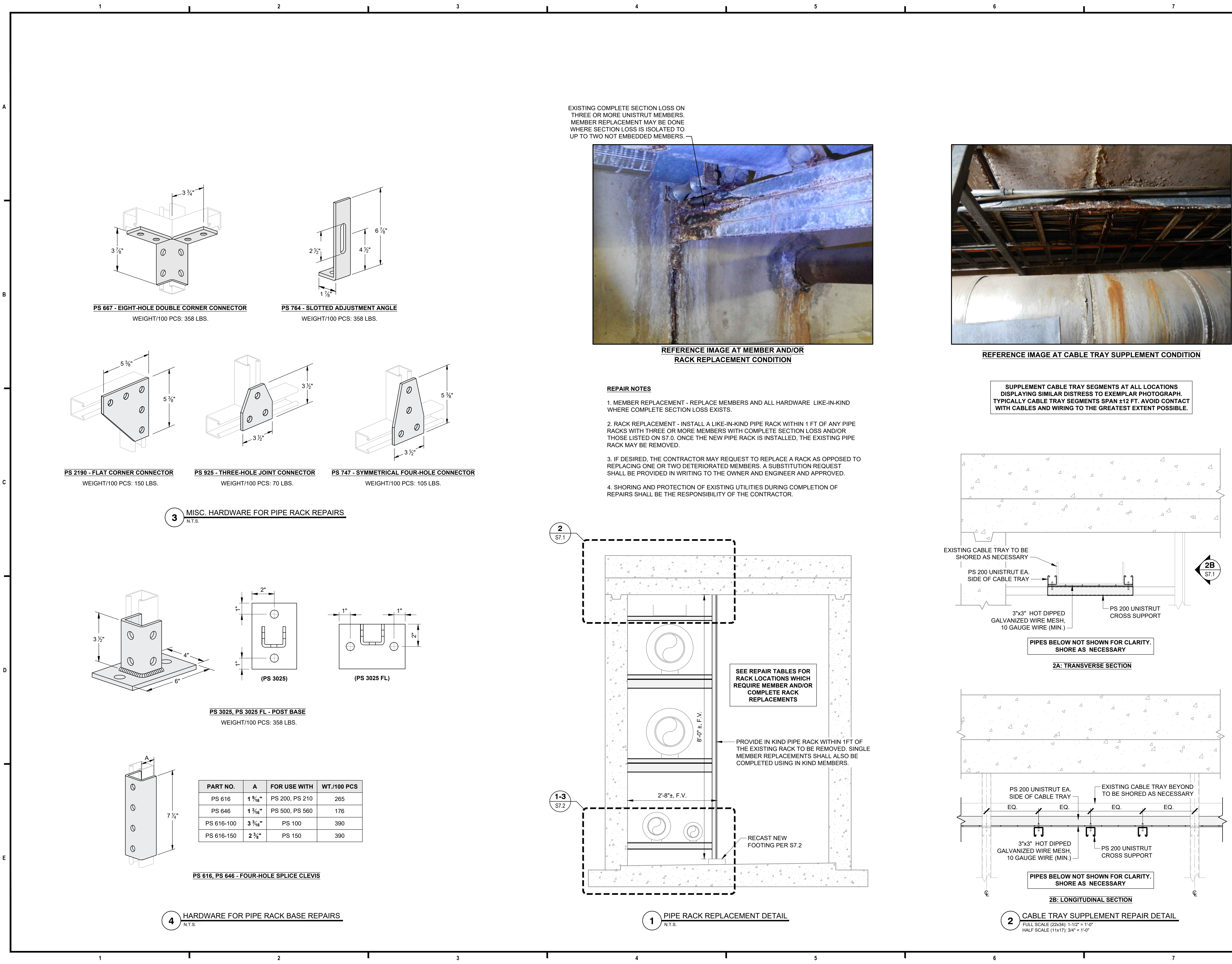
TYPICAL
WATERPROOFING
DETAILS

TITLE:

SHEET No.:

S6.0

A	UNISTRUT RACK REPLACEMENT (REF. 1/S7.1)		UNISTRUT MEMBER REPLACEMENT (REF. 1/S7.1)		PIPE RACK FOOTING REPLACEMENT (REF. S7.2)		PIPE RACK FOOTING REPLACEMENT (REF. S7.2)		COLD GALVANIZING COATING REPAIRS (REF. 1/S7.3)		COLD GALVANIZING COATING REPAIRS (REF. 1/S7.3)		COLD GALVANIZING COATING REPAIRS (REF. 1/S7.3)	
	TUNNEL ID.	STATION NO.	TUNNEL ID.	STATION NO.	TUNNEL ID.	STATION NO.	TUNNEL ID.	STATION NO.	TUNNEL ID.	STATION NO.	TUNNEL ID.	STATION NO.	TUNNEL ID.	STATION NO.
	TUNNEL A	255	TUNNEL A	170	TUNNEL A	180	TUNNEL CLARK	5	TUNNEL A	12	TUNNEL B	752	TUNNEL MARTIN	33
	TUNNEL A	295	TUNNEL A	395	TUNNEL A	420	TUNNEL CLARK	42	TUNNEL A	35	TUNNEL B	766	TUNNEL LIGON	130
	TUNNEL A	325	TUNNEL A	512	TUNNEL A	435	TUNNEL CLARK	54	TUNNEL A	75	TUNNEL B	780	TUNNEL LIGON	183
	TUNNEL A	380	TUNNEL A	695	TUNNEL A	512	TUNNEL CLARK	66	TUNNEL A	132	TUNNEL B	806	TUNNEL LIGON	197
	TUNNEL A	525	TUNNEL A	800	TUNNEL A	554	TUNNEL CLARK	78	TUNNEL A	148	TUNNEL B	811	TUNNEL LIGON	240
	TUNNEL A	555	TUNNEL BOLIN	6	TUNNEL A	596	TUNNEL CLARK	90	TUNNEL A	155	TUNNEL B	852	TUNNEL LIGON	337
	TUNNEL A	610	TUNNEL MOFFETT	82	TUNNEL A	733	TUNNEL CLARK	102	TUNNEL A	170	TUNNEL B	928	TUNNEL LIGON	368
	TUNNEL A	665	TUNNEL B	248	TUNNEL A	800	TUNNEL CLARK	126	TUNNEL A	198	TUNNEL B	942	TUNNEL LIGON	375
	TUNNEL A	732	TUNNEL B	264	TUNNEL A	817	TUNNEL LIGON	240	TUNNEL A	212	TUNNEL B	970	TUNNEL LIGON	402
	TUNNEL A	745	TUNNEL B	280	TUNNEL A	1108	TUNNEL LIGON	350	TUNNEL A	225	TUNNEL B	985	TUNNEL LIGON	415
	TUNNEL A	760	TUNNEL B	311	TUNNEL A	1125	TUNNEL LIGON	375	TUNNEL A	240	TUNNEL B	1000	TUNNEL LIGON	430
	TUNNEL A	835	TUNNEL B	327	TUNNEL A	1146	TUNNEL LIGON	415	TUNNEL A	268	TUNNEL B	1026	TUNNEL LIGON	445
	TUNNEL A	987	TUNNEL B	344	TUNNEL A	1156	TUNNEL LIGON	450	TUNNEL A	310	TUNNEL B	1040	TUNNEL LIGON	450
	TUNNEL A	1036	TUNNEL B	1078	TUNNEL A	1172	TUNNEL LIGON	456	TUNNEL A	366	TUNNEL B	1054	TUNNEL LIGON	456
	TUNNEL MOFFETT	92	TUNNEL B	1054	TUNNEL BOLIN	6	TUNNEL CROSSOVER	205	TUNNEL A	395	TUNNEL B	1096	TUNNEL CROSSOVER	205
	TUNNEL MOFFETT	192	TUNNEL B	1546	TUNNEL BOLIN	22	TUNNEL DILLARD	0	TUNNEL A	422	TUNNEL B	1110	TUNNEL FAIN	4
	TUNNEL MOFFETT	202	TUNNEL B	1560	TUNNEL BOLIN	41	TUNNEL DILLARD	17	TUNNEL A	435	TUNNEL B	1124	TUNNEL FAIN	14
	TUNNEL B	1505	TUNNEL B	1574	TUNNEL BOLIN	50	TUNNEL DILLARD	27	TUNNEL A	437	TUNNEL B	1152	TUNNEL DILLARD	207
	TUNNEL CLARK	16	TUNNEL B	1588	TUNNEL BOLIN	62	TUNNEL DILLARD	37	TUNNEL A	512	TUNNEL B	1192	TUNNEL DILLARD	217
TUNNEL CLARK	30	TUNNEL B	1602	TUNNEL BOLIN	72	TUNNEL DILLARD	47	TUNNEL A	562	TUNNEL B	1245	TUNNEL DILLARD	230	
TUNNEL MCCOY	30	TUNNEL B	1616	TUNNEL BOLIN	83	TUNNEL DILLARD	57	TUNNEL A	582	TUNNEL B	1259	TUNNEL DILLARD	240	
TUNNEL LIGON	100	TUNNEL B	1794	TUNNEL BOLIN	93	TUNNEL DILLARD	67	TUNNEL A	625	TUNNEL B	1273	TUNNEL DILLARD	250	
TUNNEL LIGON	115	TUNNEL B	1804	TUNNEL MOFFETT	42	TUNNEL DILLARD	77	TUNNEL A	653	TUNNEL B	1380	TUNNEL DILLARD	260	
TUNNEL LIGON	155	TUNNEL B	2002	TUNNEL MOFFETT	80	TUNNEL DILLARD	87	TUNNEL A	774	TUNNEL B	1414	TUNNEL DILLARD	270	
TUNNEL LIGON	170	TUNNEL B	2012	TUNNEL MOFFETT	142	TUNNEL DILLARD	97	TUNNEL A	788	TUNNEL B	1428	TUNNEL DILLARD	280	
TUNNEL LIGON	225	TUNNEL B	2022	TUNNEL MOFFETT	152	TUNNEL DILLARD	107	TUNNEL A	800	TUNNEL B	1476	TUNNEL DILLARD	290	
TUNNEL LIGON	255	TUNNEL B	2032	TUNNEL MOFFETT	172	TUNNEL DILLARD	117	TUNNEL A	817	TUNNEL B	1490	TUNNEL DILLARD	298	
TOTAL	27	TUNNEL B	2042	TUNNEL MOFFETT	192	TUNNEL DILLARD	127	TUNNEL A	844	TUNNEL B	1518	TUNNEL DILLARD	308	
		TUNNEL B	2052	TUNNEL MOFFETT	202	TUNNEL DILLARD	137	TUNNEL A	856	TUNNEL B	1532	TUNNEL DILLARD	318	
		TUNNEL B	2073	TUNNEL MOFFETT	212	TUNNEL DILLARD	147	TUNNEL A	868	TUNNEL B	1546	TUNNEL DILLARD	328	
		TUNNEL DORM	25	TUNNEL MOFFETT	222	TUNNEL DILLARD	157	TUNNEL A	892	TUNNEL B	1560	TUNNEL DILLARD	338	
		TUNNEL DORM	82	TUNNEL MOFFETT	252	TUNNEL DILLARD	162	TUNNEL A	904	TUNNEL B	1574	TUNNEL DILLARD	348	
		TUNNEL DORM	166	TUNNEL MOFFETT	262	TUNNEL DILLARD	174	TUNNEL A	916	TUNNEL B	1588	TUNNEL DILLARD	358	
		TUNNEL CLARK	5	TUNNEL MOFFETT	272	TUNNEL DILLARD	185	TUNNEL A	940	TUNNEL B	1602	TUNNEL DILLARD	368	
		TUNNEL CLARK	54	TUNNEL MOFFETT	282	TUNNEL DILLARD	197	TUNNEL A	952	TUNNEL B	1616	TUNNEL DILLARD	378	
		TUNNEL CLARK	66	TUNNEL MOFFETT	292	TUNNEL DILLARD	207	TUNNEL A	964	TUNNEL B	1630	TUNNEL DILLARD	388	
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		TUNNEL CLARK	102	TUNNEL MOFFETT	322	TUNNEL DILLARD	230	TUNNEL A	1012	TUNNEL B	1680	TUNNEL DILLARD	418	
		TUNNEL LIGON	130	TUNNEL MOFFETT	352	TUNNEL DILLARD	240	TUNNEL A	1050	TUNNEL B	1688	TUNNEL DILLARD	428	
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		TUNNEL CROSSOVER	205	TUNNEL B	135	TUNNEL DILLARD	270	TUNNEL A	1146	TUNNEL B	1804	TUNNEL DILLARD	458	
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		TUNNEL DILLARD	328	TUNNEL B	453	TUNNEL DILLARD	308	TUNNEL BOLIN	30	TUNNEL B	1962	TUNNEL DILLARD	494	
		TUNNEL DILLARD	338	TUNNEL B	472	TUNNEL DILLARD	318	TUNNEL BOLIN	41	TUNNEL B	1972	TUNNEL DILLARD	502	
		TUNNEL DILLARD	348	TUNNEL B	625	TUNNEL DILLARD	328	TUNNEL BOLIN	50	TUNNEL B	1982	TOTAL	244	
		TUNNEL DILLARD	358	TUNNEL B	655	TUNNEL DILLARD	338	TUNNEL BOLIN	62	TUNNEL B	2002			
		TUNNEL DILLARD	368	TUNNEL B	668	TUNNEL DILLARD	348	TUNNEL BOLIN	72	TUNNEL B	2012			
		TUNNEL DILLARD	378	TUNNEL B	682	TUNNEL DILLARD	358	TUNNEL BOLIN	82	TUNNEL B	2022			
		TUNNEL DILLARD	388	TUNNEL B	696	TUNNEL DILLARD	368	TUNNEL MOFFETT	32	TUNNEL B	2032			
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				TUNNEL B	1110	TUNNEL DILLARD	502	TUNNEL B	151	TUNNEL FFA	111			
				TUNNEL B	1274	DILLARD ANNEX	1	TUNNEL B	184	TUNNEL FFA	118			
				TUNNEL B	1490	DILLARD ANNEX	2	TUNNEL B	200	TUNNEL FFA	132			
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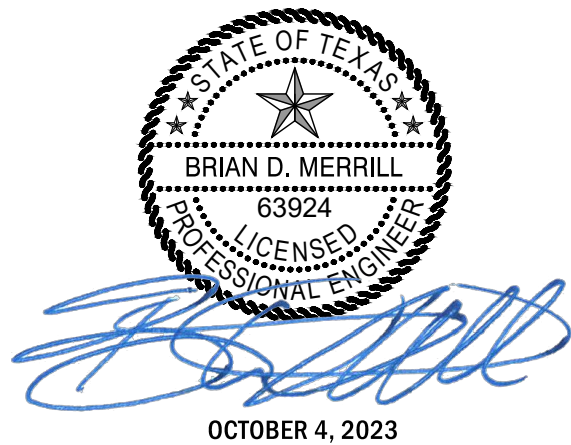


Wiss, Janney, Elstner Associates, Inc.
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512.257.4800 tel | 512.219.9883 fax

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Doylestown | Honolulu | Houston | Indianapolis | London | Los Angeles
Minneapolis | New Haven | Northbrook (HQ) | New York | Philadelphia
Pittsburgh | Portland | Princeton | Raleigh | San Antonio | San Diego
San Francisco | Seattle | South Florida | Washington, D.C.

SEAL:



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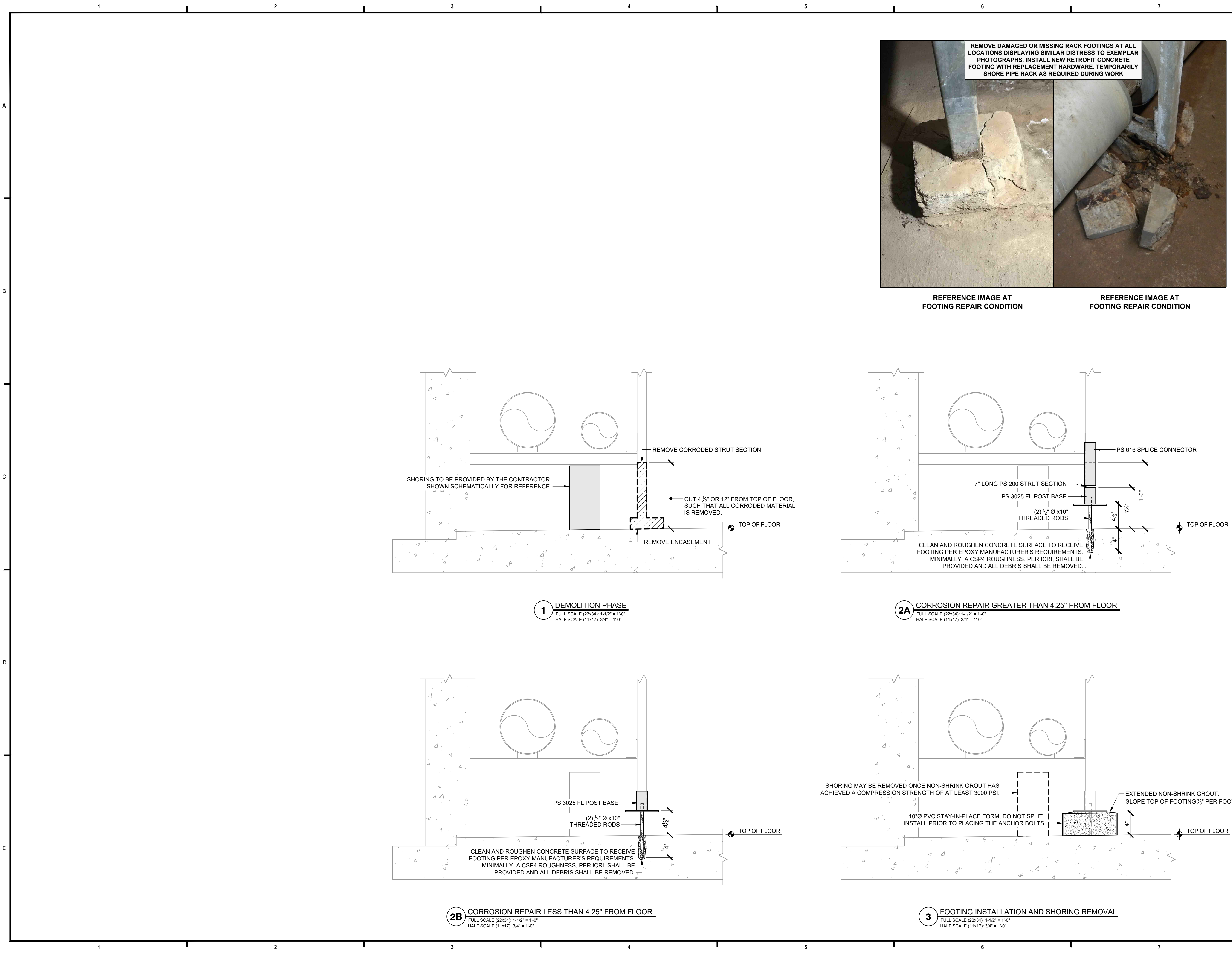
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TYPICAL PIPE RACK
REPAIR DETAILS

TITLE:

S7.1

SHEET No.:



WJE

ENGINEERS
ARCHITECTS
MATERIALS SCIENTISTS

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Pittsburgh | Portland | Princeton | Raleigh | San Antonio | San Diego
San Francisco | Seattle | South Florida | Washington, D.C.

SEAL:

STATE OF TEXAS

63924

BRIAN D. MERRILL

PROFESSIONAL ENGINEER

OCTOBER 4, 2023

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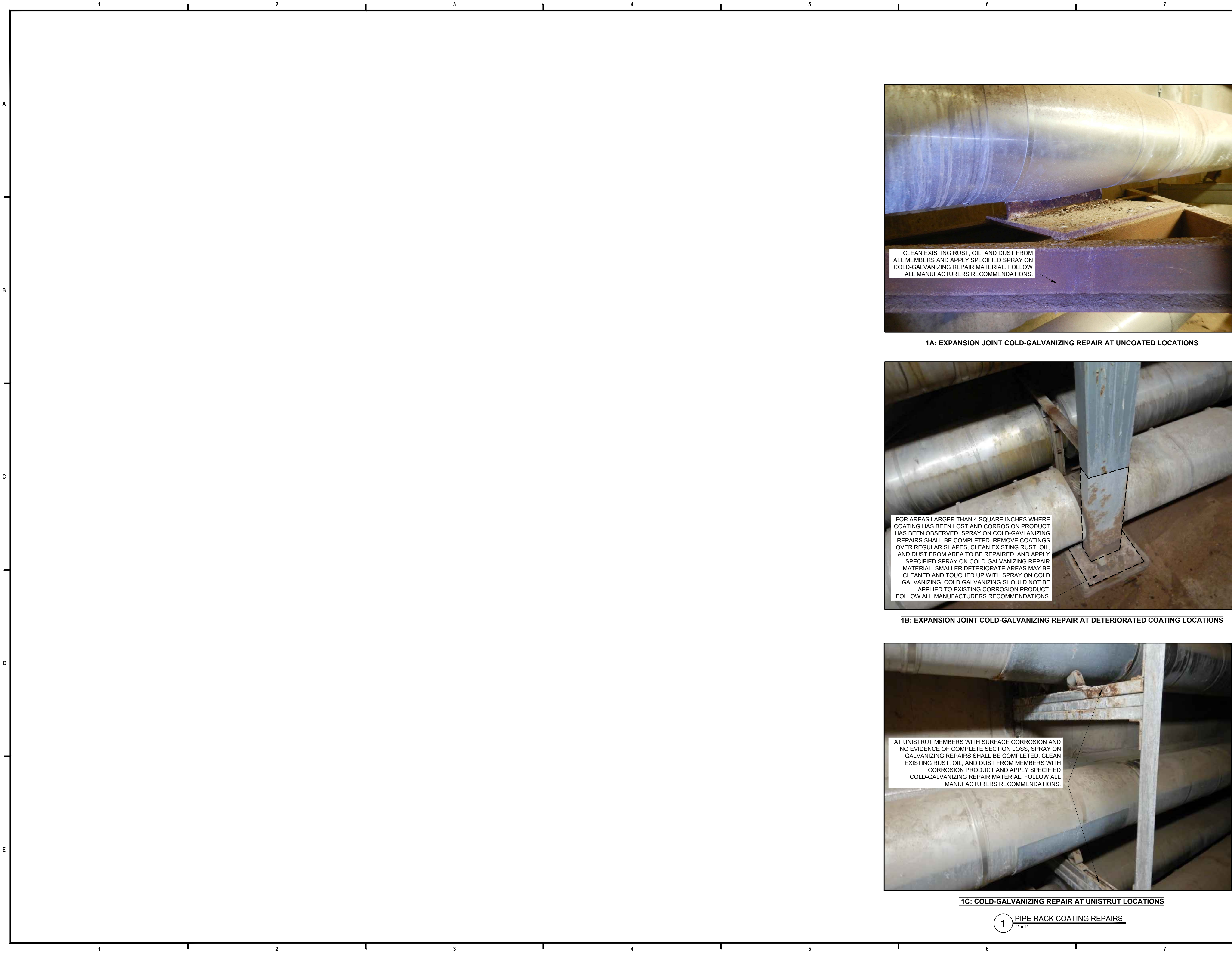
AS NOTED

TITLE:

PIPE RACK
FOOTING REPAIR
SEQUENCE

SHEET No.:

S7.2



WJE

ENGINEERS
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MATERIALS SCIENTISTS

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TEXAS REGISTERED ENGINEERING FIRM F-0093

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SEAL:

STATE OF TEXAS

BRIAN D. MERRILL

63924

LICENSED
PROFESSIONAL ENGINEER

OCTOBER 4, 2023

PROJECT:

MSU TUNNEL
STRUCTURAL REPAIRS

MIDWESTERN
STATE UNIVERSITY
Wichita Falls, Texas

CLIENT:

Midwestern
State University
3410 Taft Blvd
Wichita Falls, Texas 76308

Contact: Kyle Owen
kyle.owen@msutexas.edu

No.	DATE	DESCRIPTION

WJE PROJECT No.:

2022.4649.0

ISSUE DATE:

OCTOBER 4, 2023

PROJECT MANAGER:

BDM

REVIEWED BY:

RDD

DRAWN BY:

FV/ADP

SCALE:

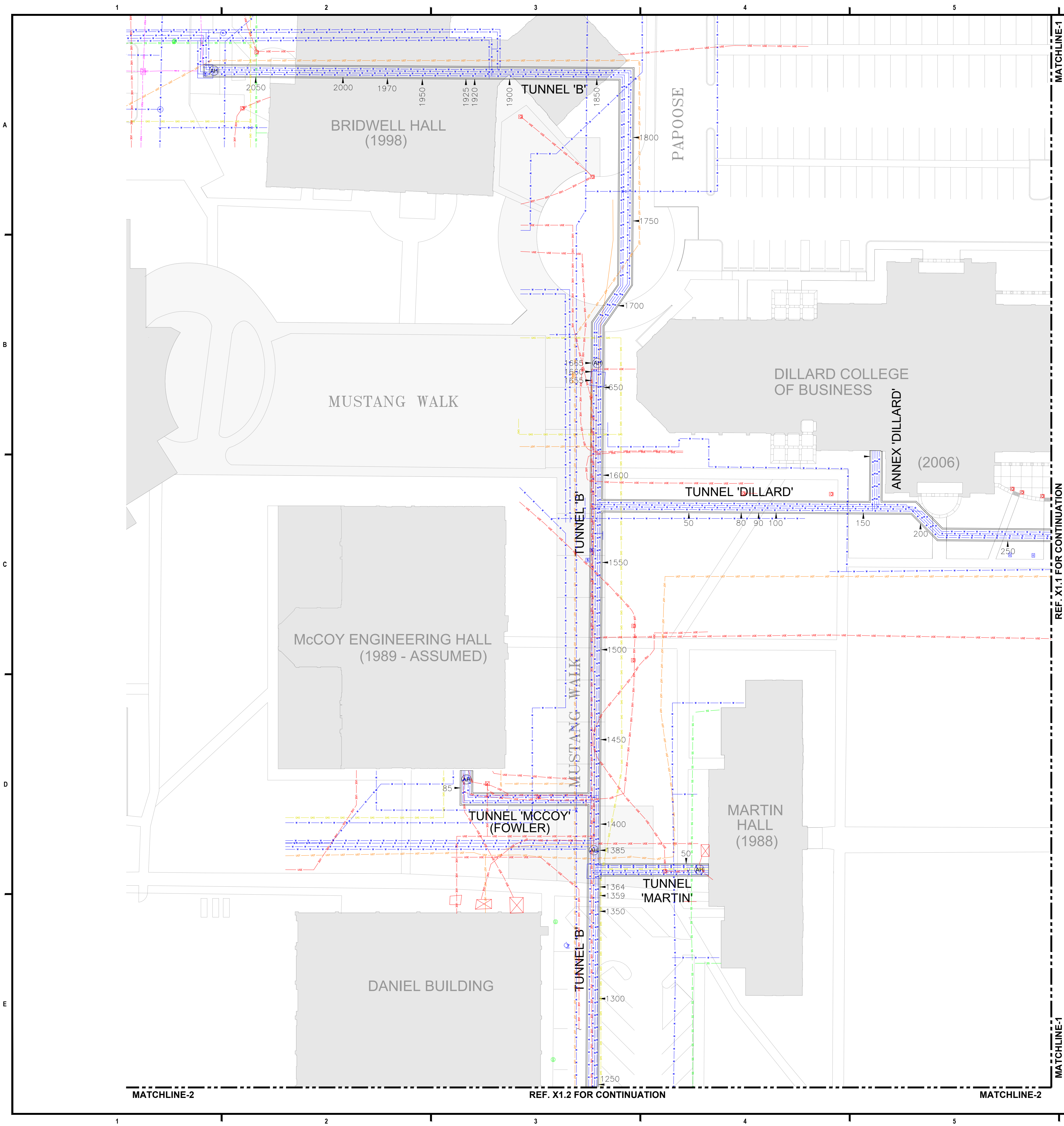
AS NOTED

TITLE:

PIPE RACK
COATING REPAIRS

SHEET No.:

S7.3



KEY PLAN

LEGEND

- UNDERGROUND ELECTRIC LINE
- WATER LINE; SIZE AND TYPE VARIES
- WASTE WATER LINE; SIZE AND TYPE VARIES
- TELEPHONE LINE
- FOC1-D LINE
- FOC1 LINE
- GAS LINE
- ELECTRIC LIGHT POLE
- FIRE HYDRANT
- IRRIGATION VALVE
- WATER VAULT OR VENT
- WATER VALVE
- WATER METER
- FOC HANDHOLE
- WASTEWATER MANHOLE
- WASTEWATER CLEANOUT
- ELECTRIC TRANSFORMER; SIZE VARIES

WJE ENGINEERS
ARCHITECTS
MATERIALS SCIENTISTS

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SEAL:

PROJECT:

**MSU TUNNEL
STRUCTURAL REPAIRS**

**MIDWESTERN
STATE UNIVERSITY**
Wichita Falls, Texas

CLIENT:

**Midwestern
State University**
3410 Taft Blvd
Wichita Falls, Texas 76308

Contact: Kyle Owen
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ISSUE DATE: OCTOBER 4, 2023

PROJECT MANAGER: BDM

REVIEWED BY: RDD

DRAWN BY: FV/ADP

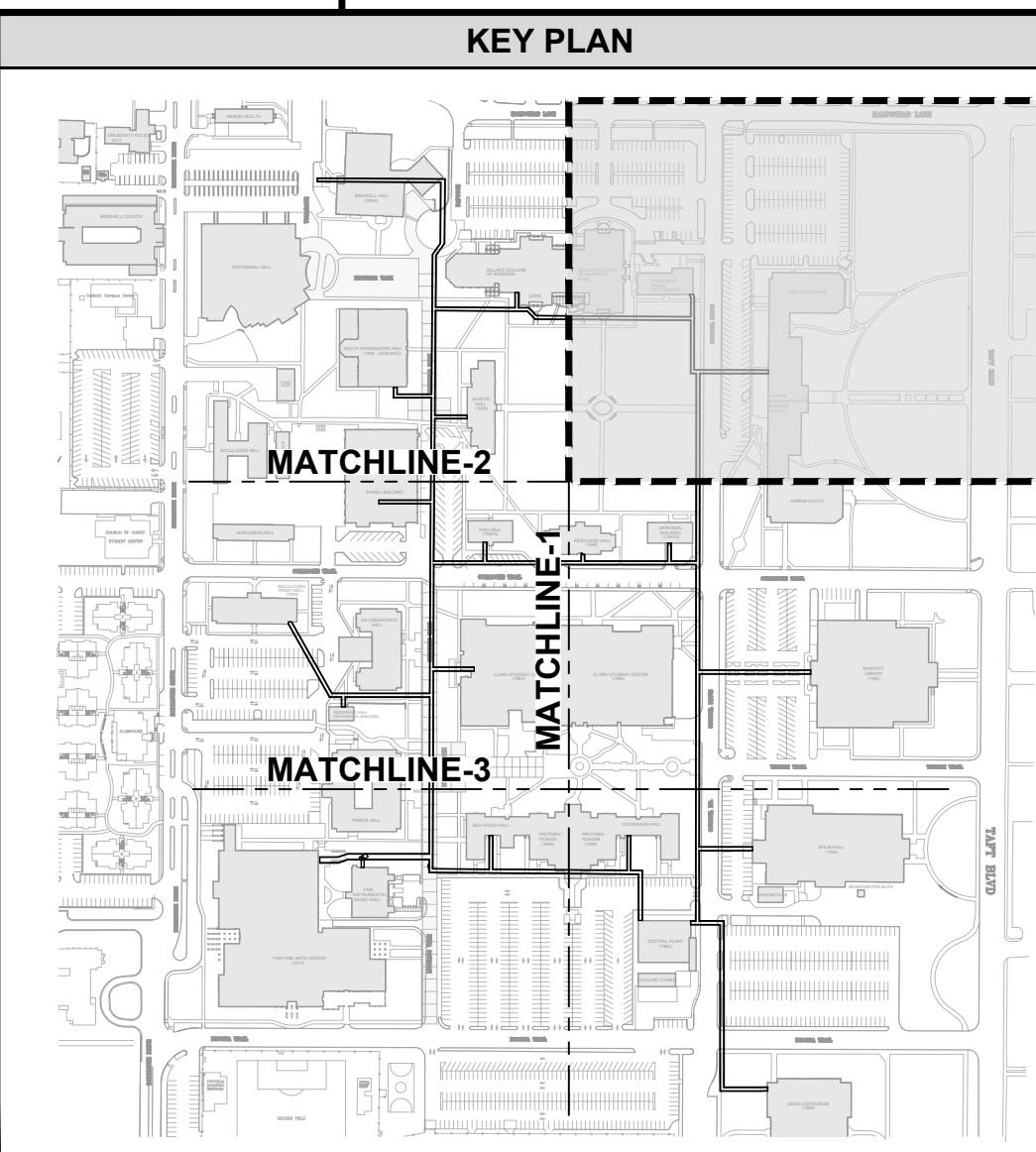
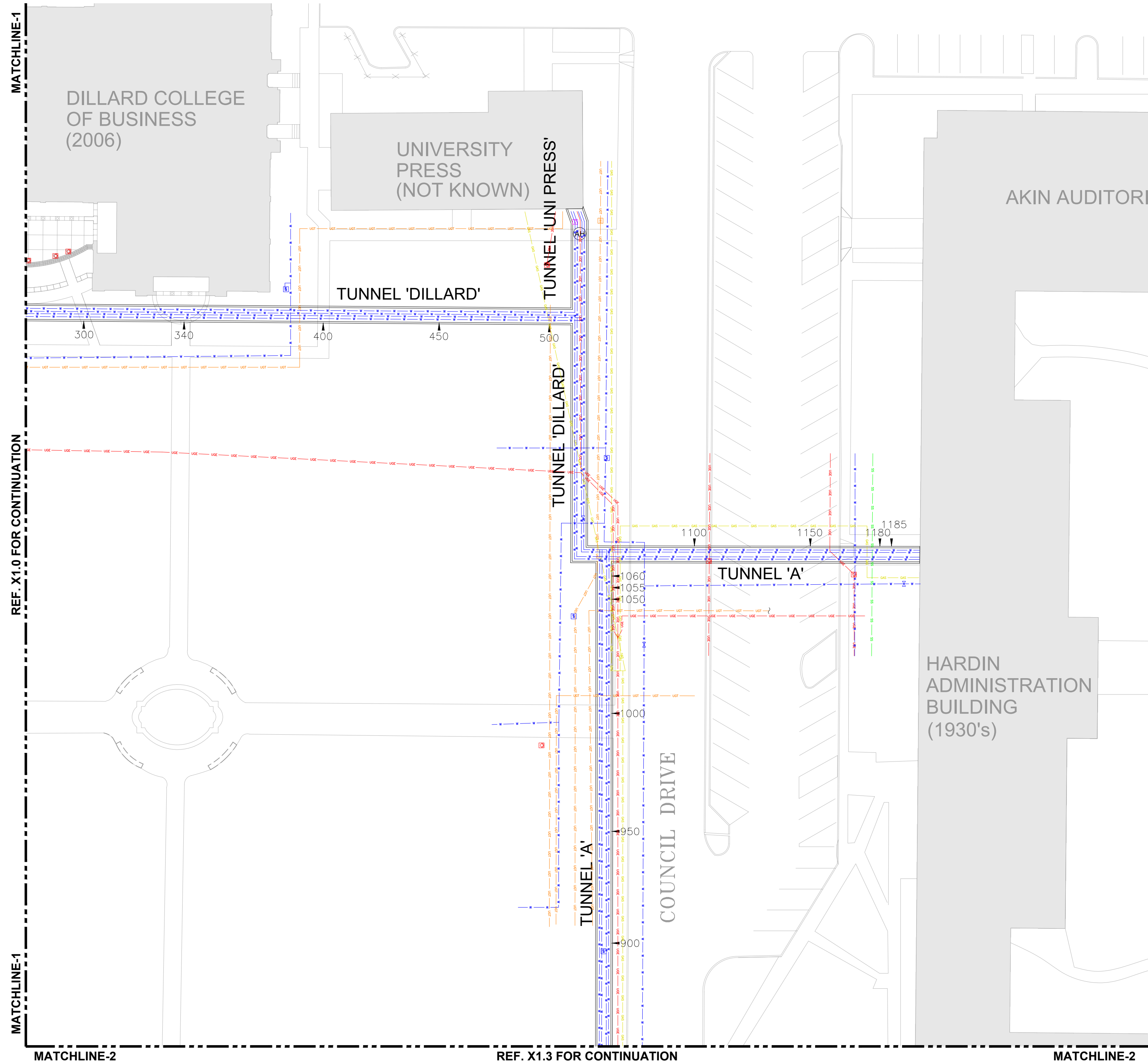
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**ENLARGED PARTIAL PLAN:
EXISTING UTILITIES**

TITLE:

X1.0

SHEET No.:



- LEGEND**
- UNDERGROUND ELECTRIC LINE
 - WATER LINE; SIZE AND TYPE VARIES
 - WASTE WATER LINE; SIZE AND TYPE VARIES
 - TELEPHONE LINE
 - FOC1-D LINE
 - FOC1 LINE
 - GAS LINE
 - ELECTRIC LIGHT POLE
 - FIRE HYDRANT
 - IRRIGATION VALVE
 - WATER VAULT OR VENT
 - WATER VALVE
 - WATER METER
 - FOC HANDHOLE
 - WASTEWATER MANHOLE
 - WASTEWATER CLEANOUT
 - ELECTRIC TRANSFORMER; SIZE VARIES

PLAN NORTH

1 ENLARGED PARTIAL PLAN: EXISTING UTILITIES
 FULL SCALE (22x34): 1" = 30'-0"
 HALF SCALE (11x17): 1" = 60'-0"

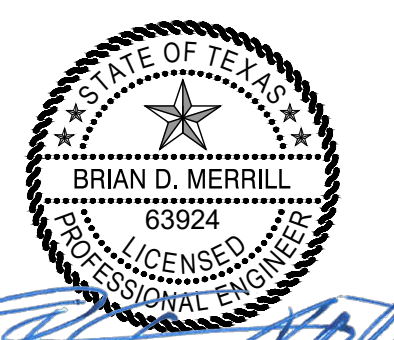
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SEAL:



OCTOBER 4, 2023

PROJECT:

**MSU TUNNEL
 STRUCTURAL REPAIRS**

**MIDWESTERN
 STATE UNIVERSITY**
 Wichita Falls, Texas

CLIENT:

**Midwestern
 State University**
 3410 Taft Blvd
 Wichita Falls, Texas 76308

Contact: Kyle Owen
 kyle.owen@msutexas.edu

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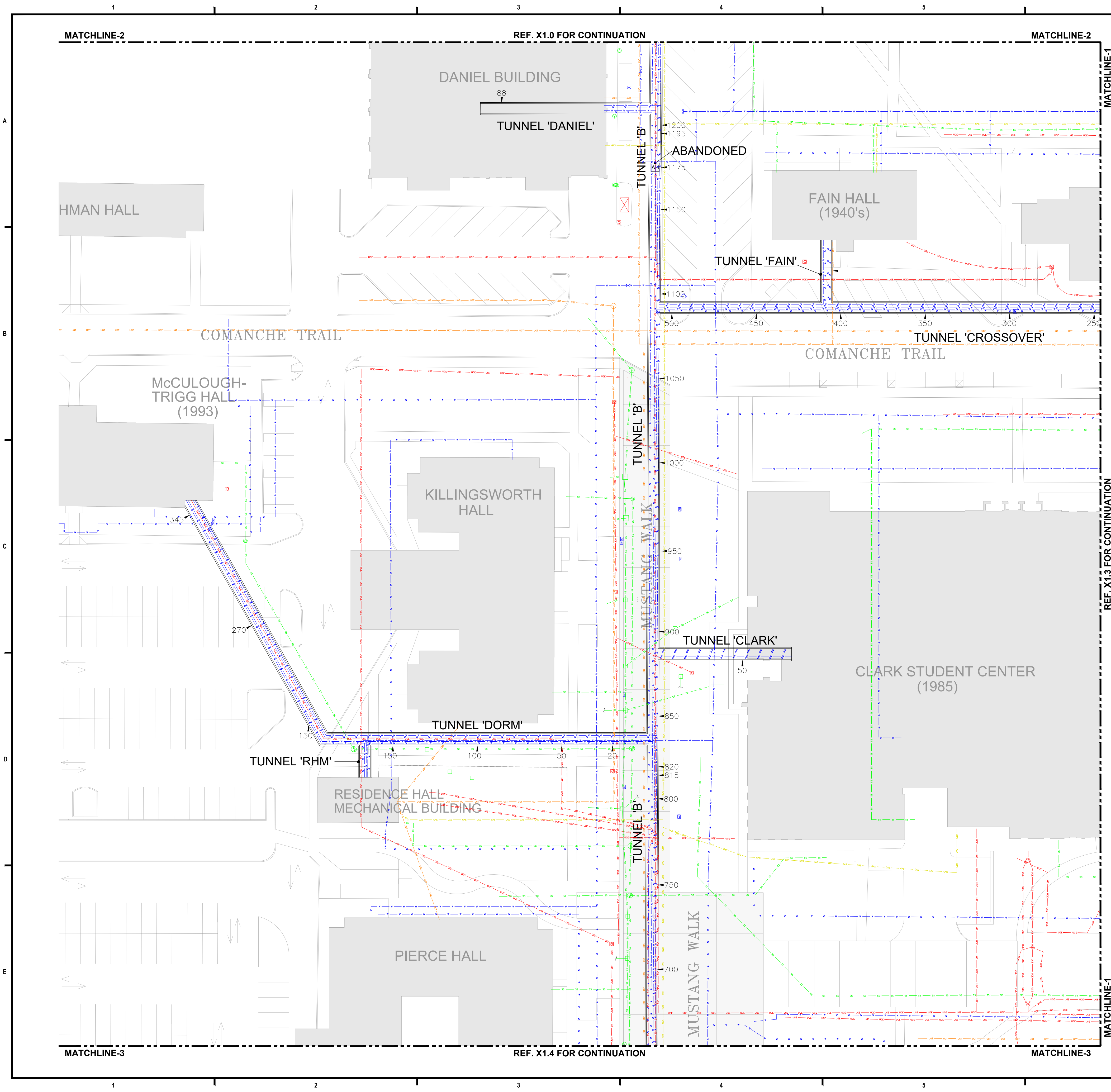
WJE PROJECT No.:	2022.4649.0
ISSUE DATE:	OCTOBER 4, 2023
PROJECT MANAGER:	BDM
REVIEWED BY:	RDD
DRAWN BY:	FV/ADP
SCALE:	AS NOTED

**ENLARGED PARTIAL PLAN:
 EXISTING UTILITIES**

TITLE:

X1.1

SHEET No.:



KEY PLAN

LEGEND

- UNDERGROUND ELECTRIC LINE
- WATER LINE; SIZE AND TYPE VARIES
- WASTE WATER LINE; SIZE AND TYPE VARIES
- TELEPHONE LINE
- FOC1-D LINE
- FOC1 LINE
- GAS LINE
- ELECTRIC LIGHT POLE
- FIRE HYDRANT
- IRRIGATION VALVE
- WATER VAULT OR VENT
- WATER VALVE
- WATER METER
- FOC HANDHOLE
- WASTEWATER MANHOLE
- WASTEWATER CLEANOUT
- ELECTRIC TRANSFORMER; SIZE VARIES

PLAN NORTH

1 ENLARGED PARTIAL PLAN: EXISTING UTILITIES
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

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SEAL:

OCTOBER 4, 2023

PROJECT:

**MSU TUNNEL
STRUCTURAL REPAIRS**

**MIDWESTERN
STATE UNIVERSITY**
Wichita Falls, Texas

CLIENT:

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State University**
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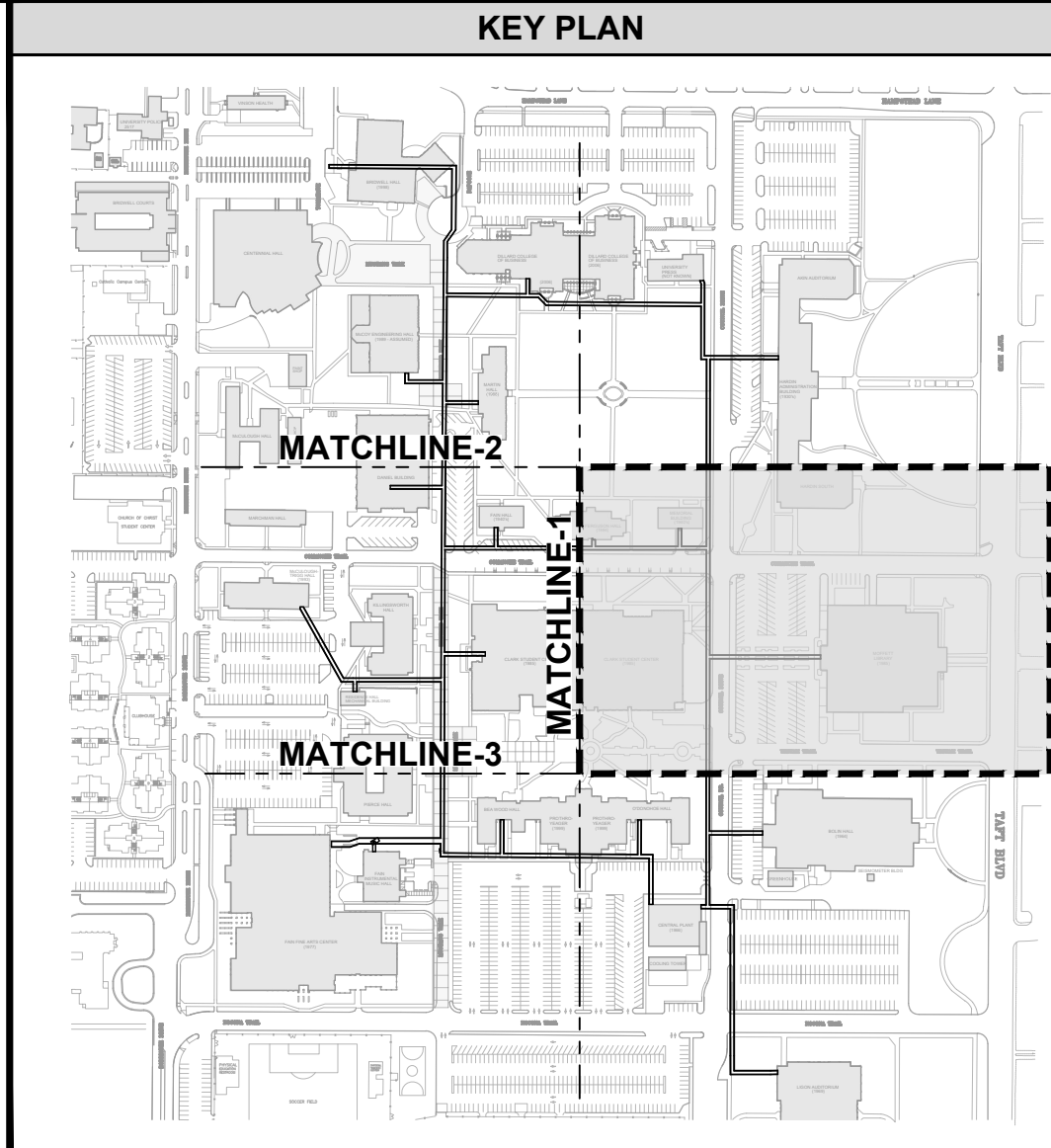
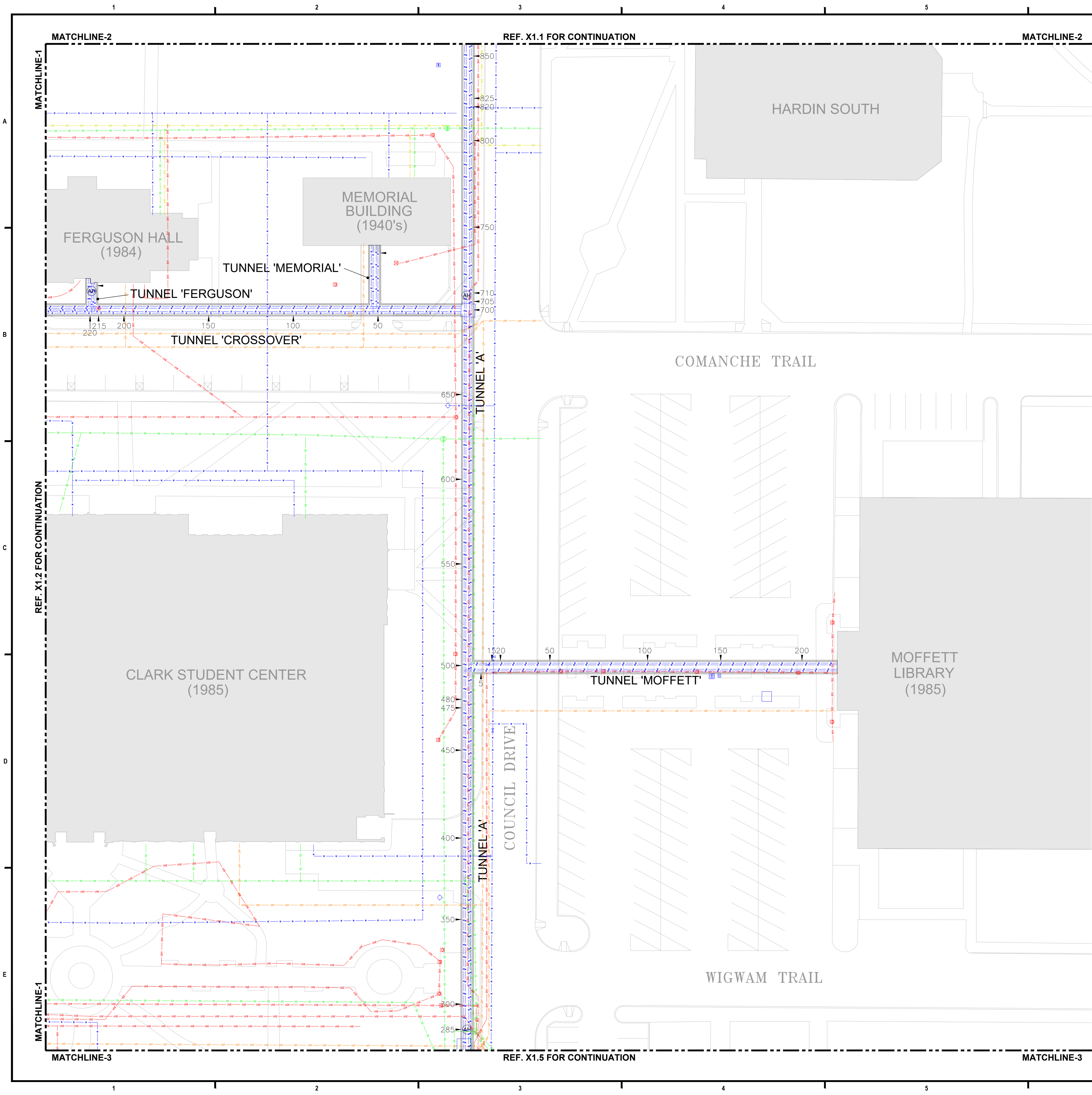
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SCALE:	AS NOTED

TITLE:

**ENLARGED PARTIAL PLAN:
EXISTING UTILITIES**

SHEET No.:

X1.2



LEGEND	
	- UNDERGROUND ELECTRIC LINE
	- WATER LINE; SIZE AND TYPE VARIES
	- WASTE WATER LINE; SIZE AND TYPE VARIES
	- TELEPHONE LINE
	- FOC1-D LINE
	- FOC1 LINE
	- GAS LINE
	- ELECTRIC LIGHT POLE
	- FIRE HYDRANT
	- IRRIGATION VALVE
	- WATER VAULT OR VENT
	- WATER VALVE
	- WATER METER
	- FOC HANDHOLE
	- WASTEWATER MANHOLE
	- WASTEWATER CLEANOUT
	- ELECTRIC TRANSFORMER; SIZE VARIES



1 ENLARGED PARTIAL PLAN: EXISTING UTILITIES
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

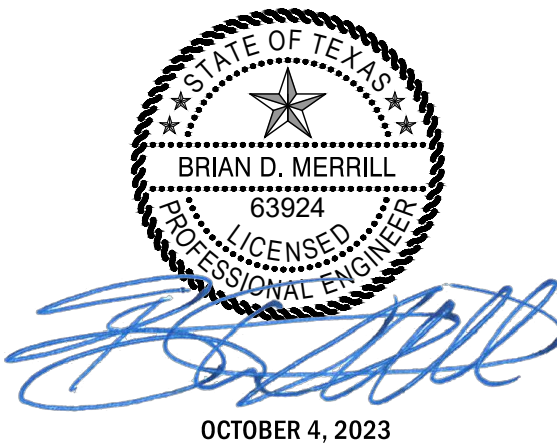
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PROJECT:

**MSU TUNNEL
STRUCTURAL REPAIRS**

**MIDWESTERN
STATE UNIVERSITY**
Wichita Falls, Texas

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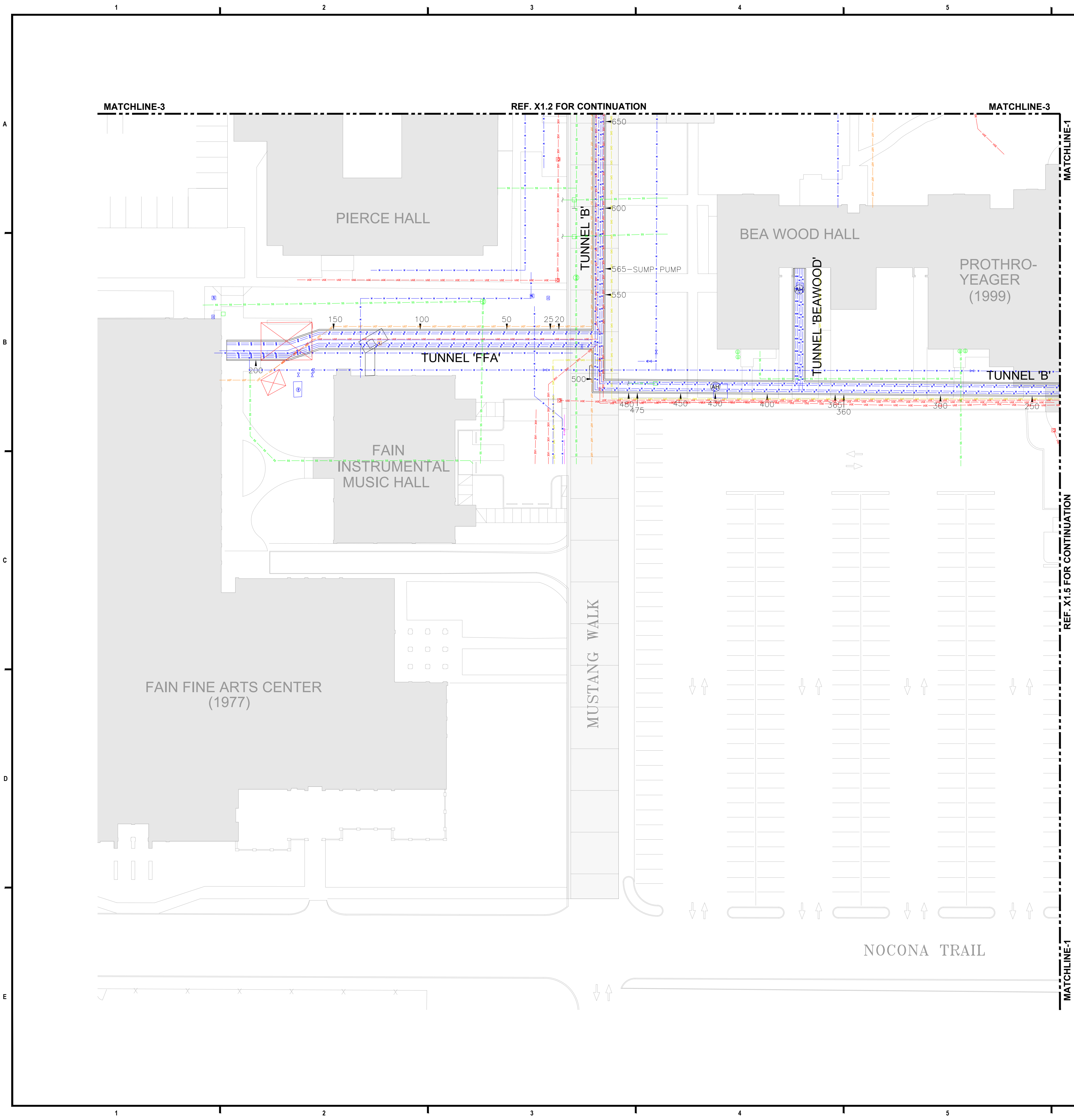
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**ENLARGED PARTIAL PLAN:
EXISTING UTILITIES**

TITLE:

SHEET No.:

X1.3



KEY PLAN

LEGEND

- UNDERGROUND ELECTRIC LINE
- WATER LINE; SIZE AND TYPE VARIES
- WASTE WATER LINE; SIZE AND TYPE VARIES
- TELEPHONE LINE
- FOC1-D LINE
- FOC1 LINE
- GAS LINE
- ELECTRIC LIGHT POLE
- FIRE HYDRANT
- IRRIGATION VALVE
- WATER VAULT OR VENT
- WATER VALVE
- WATER METER
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STRUCTURAL REPAIRS**

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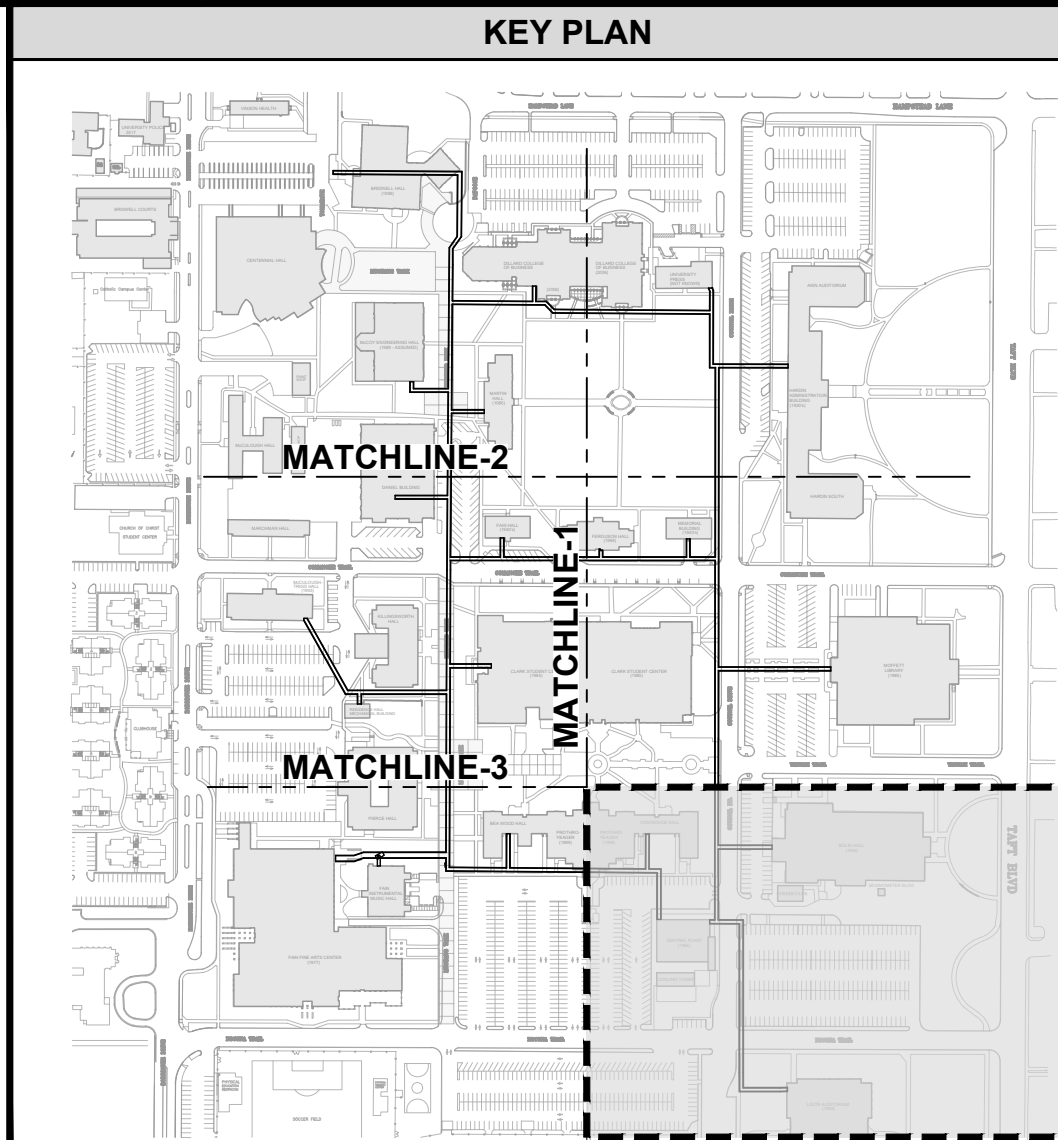
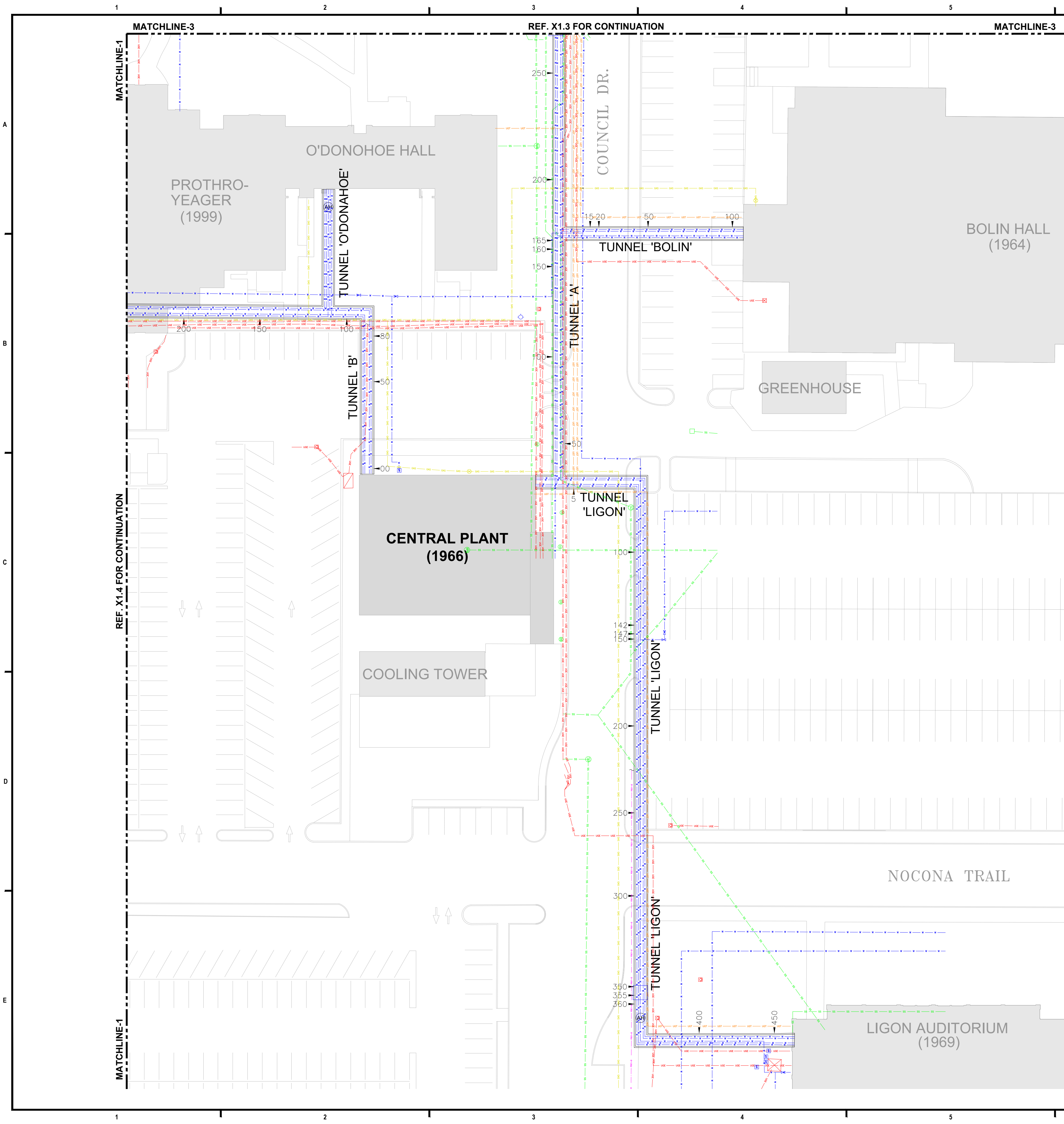
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**ENLARGED PARTIAL PLAN:
EXISTING UTILITIES**
TITLE:
X1.4

SHEET No.:



LEGEND	
	- UNDERGROUND ELECTRIC LINE
	- WATER LINE; SIZE AND TYPE VARIES
	- WASTE WATER LINE; SIZE AND TYPE VARIES
	- TELEPHONE LINE
	- FOC1-D LINE
	- FOC1 LINE
	- GAS LINE
	- ELECTRIC LIGHT POLE
	- FIRE HYDRANT
	- IRRIGATION VALVE
	- WATER VAULT OR VENT
	- WATER VALVE
	- WATER METER
	- FOC HANDHOLE
	- WASTEWATER MANHOLE
	- WASTEWATER CLEANOUT
	- ELECTRIC TRANSFORMER; SIZE VARIES



1 ENLARGED PARTIAL PLAN: EXISTING UTILITIES
FULL SCALE (22x34): 1" = 30'-0"
HALF SCALE (11x17): 1" = 60'-0"

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PROJECT:

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**ENLARGED PARTIAL PLAN:
EXISTING UTILITIES**

TITLE:

SHEET No.:

X1.5