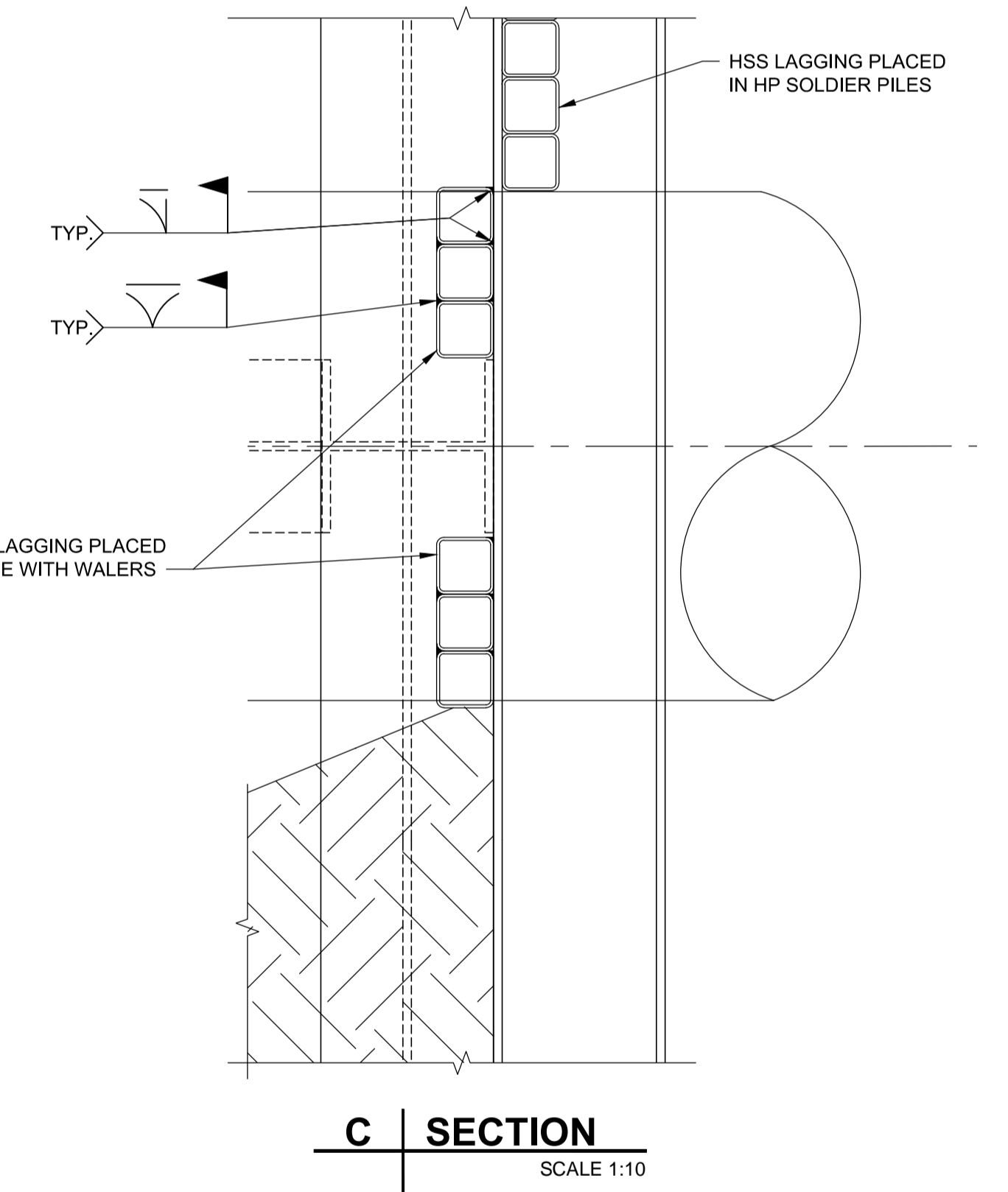
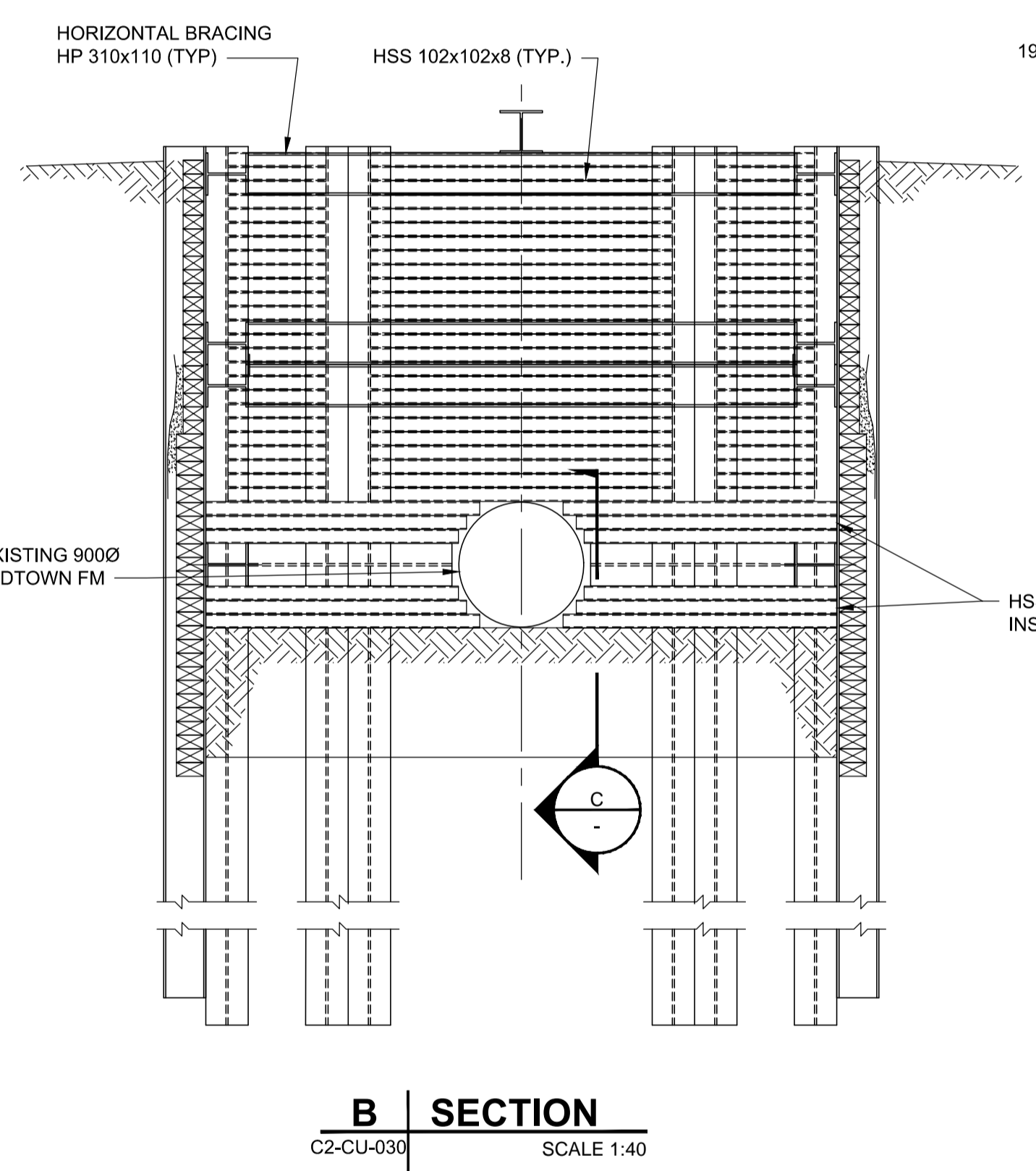
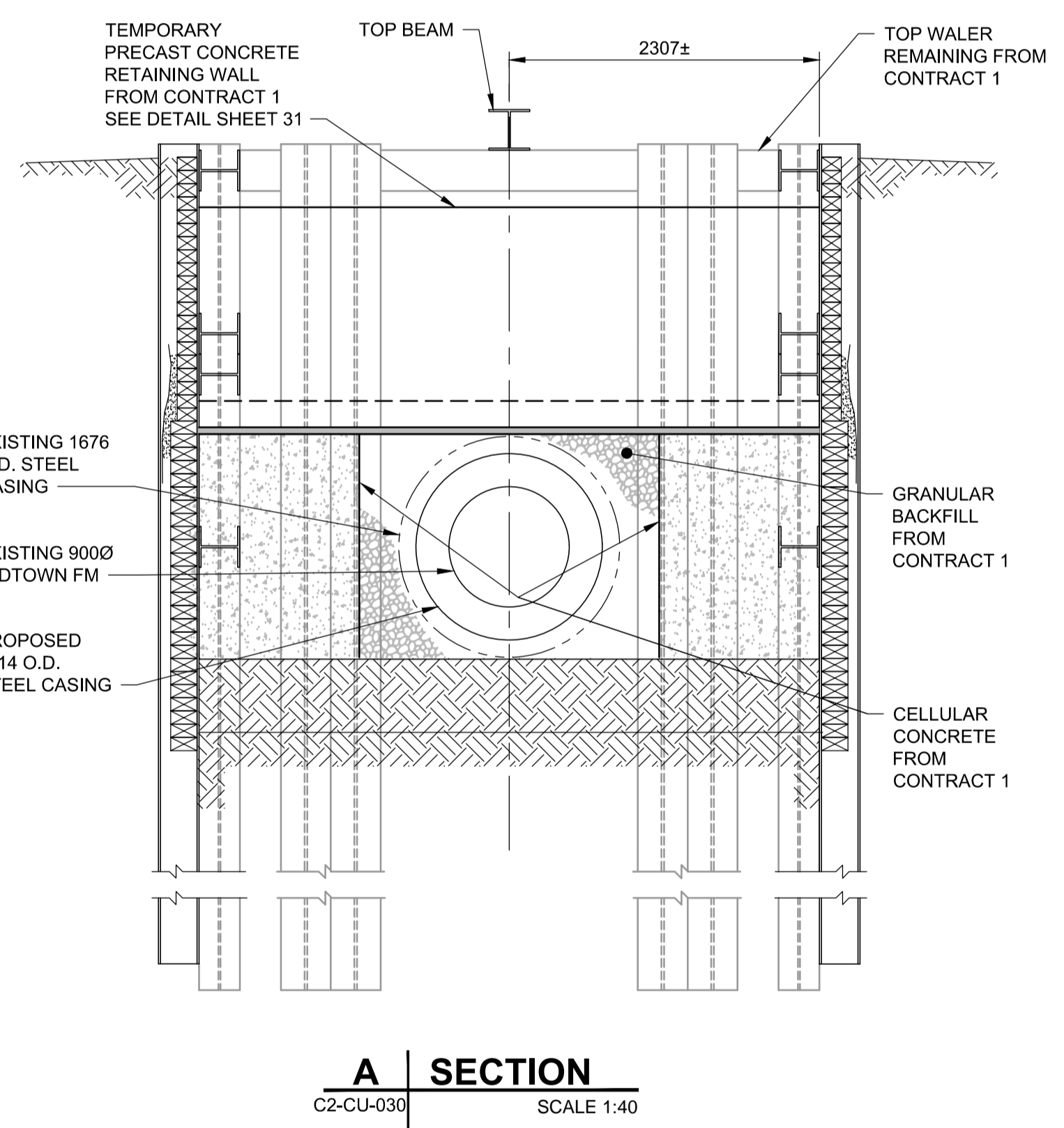


GENERAL NOTES

- STRUCTURAL DESIGN BASED ON AREMA. DESIGN LOAD:
 - EARTH PRESSURE AT REST CONDITION ($K_0=1$)
 - LIVE LOAD:
 - COOPER E-90
 - 20kPa CONSTRUCTION LIVE LOAD SURCHARGE AT TOP OF EXCAVATION AND 2m SETBACK FROM SHORING
 - SEISMIC SITE CLASSIFICATION: NOT APPLICABLE.
 - DO NOT SCALE DRAWINGS.
 - ALL DIMENSIONS ARE TO BE VERIFIED WITH THE PROJECT DRAWINGS AND EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION.
 - THESE STRUCTURAL DRAWINGS SHOW THE STRUCTURE AND DO NOT INDICATE ALL COMPONENTS NECESSARY FOR SAFETY DURING CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SAFETY ON AND AROUND THE JOB SITE DURING CONSTRUCTION.
 - LOCATE ALL UNDERGROUND SERVICES BEFORE INSTALLING SHORING.
 - SURVEY TOP OF SOLDIER PILES AND LATERAL POSITION OF SHORING IMMEDIATELY AFTER INSTALLATION. RE-SURVEY WEEKLY AND PROVIDE DATA TO CONTRACT ADMINISTRATOR. PROVIDE DATA SHOWING WEEK-TO-WEEK DISPLACEMENTS AS WELL AS CUMULATIVE DISPLACEMENTS.
 - CONSTRUCTION EQUIPMENT NOT PERMITTED AT TOP OF EXCAVATION BETWEEN SHORING AND TRACK.
 - SHIMS CAN BE USED IF REQUIRED, MINIMUM THICKNESS SHALL BE 12mm.
- STEEL**
- STRUCTURAL STEEL TO CONFORM TO CSA-G40.21, "STRUCTURAL QUALITY STEELS" AND CSA-G40.20 "GENERAL REQUIREMENTS FOR ROLLED OR WELDED STRUCTURAL QUALITY STEEL." ALL STEEL TO BE G40.21-350W GRADE OR APPROVED EQUAL.
 - FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE PERFORMED IN ACCORDANCE WITH AREMA.
 - ALL WELDING SHALL CONFORM TO THE LATEST EDITION OF CSA W59, WELDED STEEL CONSTRUCTION". FABRICATORS SHALL BE PROPERLY CERTIFIED IN ACCORDANCE WITH CSA W47.1, "CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL STRUCTURES".
 - NO HOLES PERMITTED IN SHORING. UNLESS SPECIFICALLY NOTED ON DRAWINGS.
- TIMBER**
- TIMBER LAGGING SHALL BE SPECIES (S.P.F.) BEAMS AND STRINGERS GRADE NO.2 OR BETTER IN ACCORDANCE WITH AREMA CHAPTER 7.

CONSTRUCTION SEQUENCE

- LOCATE AND VERIFY DIAMETER OF EXISTING FEEDER MAIN AND CASING.
- INSTALL PRE-BORED HOLES TO SIZE AND DEPTH SHOWN. INSTALL ALL H PILES. NOTE THAT DUE TO THE PROXIMITY OF SOME PILES, SOME OF THE PREBORES WILL OVERLAP; THIS WILL NEED TO BE TAKEN INTO ACCOUNT FOR SCHEDULING THE PREBORES, PILE INSTALLATION AND FILLING THE VOIDS AROUND THE PILES.
- FILL VOID AROUND PILES WITH 0.5 MPa STRENGTH CONCRETE.
- EXCAVATE THE SHORING UNIFORMLY TO ELEVATION 233.200. INSTALL LAGGING AS EXCAVATION PROGRESSES.
- INSTALL TOP LAYER OF WALER AND BRACING AT ELEVATION 233.600.
- EXCAVATE THE SHORING UNIFORMLY TO ELEVATION 231.655. INSTALL LAGGING AS EXCAVATION PROGRESSES.
- INSTALL DOUBLE LAYER OF WALERS AND BRACING AT ELEVATION 232.365 & 232.055.
- EXCAVATE THE SHORING UNIFORMLY TO ELEVATION 230.355. INSTALL LAGGING AS EXCAVATION PROGRESSES.
- INSTALL BOTTOM LAYER OF WALERS AND BRACING IN BOTH DIRECTIONS AT ELEVATION 230.755.
- EXCAVATE THE SHORING UNIFORMLY TO ELEVATION 229.338. INSTALL LAGGING AS EXCAVATION PROGRESSES.
- FILL GAP BETWEEN SOIL AND LAGGING WITH FREE DRAINING SAND AS EXCAVATION PROGRESSES. EXCAVATE SOIL FACES NEATLY TO ENSURE A TIGHT FIT FOR LAGGING. WEDGE AT PILES AS NECESSARY. PACK ALL VOIDS BEHIND LAGGING WITH GRANULAR MATERIAL RAMMED INTO PLACE.
- DO NOT OVER EXCAVATE.
- REMOVE GRANULAR BACK FILL MATERIAL FROM CONTRACT 1 IN BETWEEN CELLULAR CONCRETE AND SHORING WALL.
- AFTER THE PROPOSED PIPE CASING HAS BEEN INSTALLED, REMOVE LAGGING AND BACKFILL IN 200mm LIFTS TO ELEVATION 231.602 (CELLULAR CONCRETE AROUND THE CASING FOR THE FULL LENGTH OF THE CASING AND GRANULAR BACKFILL BEYOND THE CASING). PROVIDE INSULATION AS SHOWN ON THE PIPE CASING DRAWINGS AND PROVIDE GRANULAR FILL BEHIND THE INSULATION. WHERE THERE IS NO INSULATION REQUIRED FOR THE PIPE, PROVIDE 12mm THICK BEAD BOARD INSULATION AROUND THE PILE TO PROVIDE A BOND BREAK BETWEEN THE PILES AND THE CELLULAR CONCRETE. REMOVE THE DOUBLE WALER AND BRACING ONCE BACKFILL HAS BEEN COMPLETED TO ELEVATION 231.602
- BACKFILL FROM ELEVATION 231.602 TO 233.500 WITH GRANULAR BACKFILL. REMOVE LAGGING AND BACKFILL IN 200mm LIFTS. INSTALL HSS 152x152x8 LAGGING BETWEEN END WALL SHORING PILE LEFT IN FROM CONTRACT 1 SO THAT THE PRECAST RETAINING CAN BE REMOVED LATER. REMOVE WALER BRACING ONLY WHEN BACKFILL IS WITHIN 150mm OF THE BOTTOM OF THE BRACING.
- REMOVE ALL PILES AND WALERS EXCEPT REMAINING PILES AND WALERS FROM CONTRACT 1 USED FOR CONTRACT 2.
- INSTALL EXISTING TRACK BACK.
- AFTER THE SHOOFLY HAS BEEN TAKEN OUT OF SERVICE, EXCAVATE AND REMOVE THE TEMPORARY PRECAST RETAINING WALL. THEN BACK FILL UP TO FINAL GRADE. REMOVE LAGGING AND BACKFILL IN 200mm LIFTS. REMOVE WALERS AND BRACING ONLY WHEN BACKFILL IS WITHIN 150mm OF THE BOTTOM OF THE WALERS AND BRACING.
- REMOVE ALL REMAINING PILES.



WARNING

- IF POWER EQUIPMENT ARE TO BE USED FOR EXCAVATION ON THIS PROJECT THE CONTRACTOR MUST:
- NOTIFY ALL UTILITY COMPANY'S OF THE PROPOSED LOCATION OF EXCAVATION.
 - TAKE PRECAUTION TO AVOID DAMAGE TO UTILITY SEE PROVINCIAL REGULATION 210/72 FOR DETAILS.
 - OBTAIN EXCAVATION PERMITS PRIOR TO CONSTRUCTION.

P:\60321148\900-Work\910-CAD\20-SHEETS\60321148-SHT-30-0000-S-0032.dwg

150 WM	WATER MAIN	150 WM	PIPE ABANDONMENTS	150 WM	WATER MAIN	150 WM
○	HYDRANT	⬇	SURVEY BAR	⬆	HYDRANT	⬆
⊕	VALVE	⊕	CURB STOP	⊕	VALVE	⊕
300 LDS	LAND DRAINAGE SEWER	300 LDS	REDUCER	300 LDS	LAND DRAINAGE SEWER	300 LDS
250 WWS	WASTE WATER SEWER	250 WWS	COUPLING	250 WWS	WASTE WATER SEWER	250 WWS
---	SEWER SERVICE PIPE	---	ANODE	---	PAVEMENT CROWN	---
---	DRAINAGE CONNECTION PIPE	---	HYDRO	---	N/W PROPERTY LINE	---
○	MANHOLE	●	MTS	○	S/E PROPERTY LINE	○
□	CATCH BASIN	■	GAS	□	N/W GUTTER	□
△	CURB INLET	▲	TESTHOLE	△	S/E GUTTER	△
---	CULVERT	---	LAMP STANDARD	---	LEGEND - PROFILE	---
---	EXISTING	---	LEGEND - PLAN	---	LEGEND - PROFILE	---
---	NEW	---	LEGEND - PLAN	---	LEGEND - PROFILE	---
---	EXISTING	---	LEGEND - PLAN	---	LEGEND - PROFILE	---
---	NEW	---	LEGEND - PLAN	---	LEGEND - PROFILE	---

UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES DATE

LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE. BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

B.M. ELEV.	NO.	REVISIONS	DATE	BY
	1	ISSUED FOR ADDENDUM 1	17/01/25	DKD
	0	ISSUED FOR TENDER	17/01/09	DKD

AECOM

DESIGNED BY	DKD	CHECKED BY	FT/SBB
DRAWN BY	KC	APPROVED BY	SBB
HOR. SCALE	AS NOTED	RELEASED FOR CONSTRUCTION	
VERTICAL			

ENGINEER'S SEAL

PROVINCE OF MANITOBA

DK DAS
Member
35493

REGISTERED PROFESSIONAL ENGINEER

CONSULTANT PROJECT NUMBER
60321148

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

Waverley Street Underpass at CN Mile 3.89 Rivers Sub
Contract 2: Underpass Structure, Railworks, Roadworks, Land Drainage Sewer, Pumping Station and Landscaping Works

CITY DRAWING NUMBER
U239-2016-C2-CU-032

SHEET 32 OF 41

CONSULTANT DRAWING NUMBER
C2-CU-032

SHORING DETAILS FOR EXISTING
MIDTOWN FEEDER MAIN - SHEET 3

BID OPPORTUNITY NO. 473-2016