

SANITARY SEWER (CONTINUED)

SANITARY SEWER GENERAL NOTES

THE CITY OF COLUMBUS CONSTRUCTION AND MATERIAL SPECIFICATIONS, 2018 VERSION INCLUDING ALL SUPPLEMENTS THERETO, SHALL GOVERN ALL CONSTRUCTION ITEMS THAT ARE PART OF THIS PLAN UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL NOTIFY THE FOLLOWING DIVISIONS AT LEAST 24 HOURS IN ADVANCE OF THE ANTICIPATED START OF CONSTRUCTION.

DIVISION OF SEWERAGE AND DRAINAGE (614) 645-7102
 DIVISION OF DESIGN AND CONSTRUCTION (614) 645-0433

THE CONTRACTOR IS RESPONSIBLE FOR THE INVESTIGATION, LOCATION, SUPPORT, PROTECTION, AND RESTORATION OF ALL EXISTING UTILITIES AND APPURTENANCES WHETHER SHOWN ON THESE PLANS OR NOT. THE CONTRACTOR SHALL EXPOSE ALL UTILITIES OR STRUCTURES PRIOR TO CONSTRUCTION TO VERIFY THE VERTICAL AND HORIZONTAL EFFECT ON THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL CALL, TOLL FREE, THE OHIO UTILITIES PROTECTION SERVICES (1-800-362-2764) 72 HOURS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO WORK IN THE VICINITY OF THEIR UNDERGROUND LINES.

CONSTRUCTION OF THIS PROJECT MAY NOT BEGIN UNTIL THE EASEMENTS INDICATED HAVE BEEN RECORDED BY THE CITY.

ANY MODIFICATION TO THE WORK AS SHOWN ON THESE DRAWINGS MUST HAVE PRIOR WRITTEN APPROVAL BY THE ADMINISTRATOR, DIVISION OF SEWERAGE AND DRAINAGE.

ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED.

ALL PVC SEWER LINES SHALL BE DEFLECTION TESTED AFTER INSTALLATION IN CONFORMANCE WITH THE REQUIREMENTS OF ITEM 901 OF THE CITY OF COLUMBUS CONSTRUCTION AND MATERIAL SPECIFICATIONS, CURRENT VERSION.

ALL CONCRETE PIPE, STORM AND SANITARY SEWER STRUCTURES WILL BE STAMPED OR HAVE SUCH IDENTIFICATION NOTING THAT SAID PIPE, STORM AND SANITARY STRUCTURES HAVE BEEN INSPECTED BY THE CITY OF COLUMBUS AND MEETS THEIR SPECIFICATIONS. PIPE AND STRUCTURES WITHOUT PROPER IDENTIFICATION WILL NOT BE PERMITTED FOR INSTALLATION.

THE CONTRACTOR SHALL ENSURE THERE IS A SURVEYOR'S LEVEL AND ROD ON THE PROJECT FOR USE IN PERFORMING GRADE CHECKS WHENEVER SEWER LINE STRUCTURES OR PIPE ARE BEING INSTALLED. THE CONTRACTOR SHALL ME THIS EQUIPMENT AVAILABLE FOR USE AND ASSIST THE INSPECTOR IN PERFORMING GRADE CHECKS WHEN REQUESTED BY THE INSPECTOR. THE INSPECTOR WILL MAKE ALL REASONABLE ATTEMPTS TO CONFINE REQUESTS FOR ASSISTANCE IN PERFORMING GRADE CHECKS TO TIMES CONVENIENT TO THE CONTRACTOR.

THESE CHECKS WILL BE PERFORMED TO ENSURE THE FOLLOWING:
 1. PROPER PLACEMENT OF EACH STRUCTURE.
 2. PROPER INSTALLATION OF INITIAL RUNS OF PIPE FROM A STRUCTURE
 3. GRADE, AFTER AND OVERNIGHT OR LONGER SHUTDOWN.
 4. GRADE, AT ANY OTHER TIME THE INSPECTOR HAS REASON TO QUESTION GRADE OF INSTALLATION.

GRADE CHECKS PERFORMED BY THE INSPECTOR IN NO WAY RELIEVE THE CONTRACTOR FROM THE ULTIMATE RESPONSIBILITY TO ENSURE CONSTRUCTION TO THE PLAN GRADE. LOCATE AND PROTECT ALL CITY OF COLUMBUS SEWER STRUCTURES WITH BARRICADES AND FENCING PLACED AROUND STRUCTURE. LOCATE AND PROTECT AREA ABOVE ALL SEWER PIPES. CONTRACTOR SHALL MAINTAIN 24-7 DRIVE UP ACCESS TO ALL CITY OF COLUMBUS VEHICLES TO ALL SEWER MANHOLES AND AREAS OVER SEWER PIPES.

CITY OF COLUMBUS MAINTAINS A FLOW MONITOR SC-MI-14 IN THE FRANKLIN MAIN AT MANHOLE 000650166 (S0166). SMC MUST BE PROVIDED ACCESS TO THIS MH AND ALL SEWER MANHOLES AND APPURTENANCES AT ALL TIMES. DO NOT STOCK PILE CONSTRUCTION MATERIALS OVER SEWER PIPES OR AROUND SEWER MANHOLE STRUCTURES. DO NOT PARK CONSTRUCTION EQUIPMENT AROUND SEWER MANHOLES OR OVER SEWER PIPES.

PAYMENT FOR THE ABOVE DESCRIBED TESTS AND CHECKS SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT SANITARY ITEMS.

ITEM 611 - MANHOLE ADJUSTED TO GRADE, AS PER PLAN

THIS ITEM SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY FOR ADJUSTMENT OF THE MANHOLE IN ACCORDANCE WITH CMSC ITEM 604.

ITEM SPECIAL - CITY OF COLUMBUS MANHOLE, TYPE C (AA-S102) (SANITARY)

MANHOLES SHALL HAVE BOLT DOWN LIDS PER CITY OF COLUMBUS SCD AA-S143. ALL EXCAVATION AND BRACING NECESSARY (PER ODOT ITEM 503) SHALL BE INCLUDED IN THE COST OF THE MANHOLE.

THIS ITEM SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY FOR CONSTRUCTION OF THE MANHOLE IN ACCORDANCE WITH CMSC ITEM 604 AND THE DETAILS SHOWN ON SHEETS 670 - 675.

ITEM SPECIAL - CITY OF COLUMBUS MANHOLE, TYPE C, AS PER PLAN (AA-S102) (SANITARY)

ANY PROPOSED MANHOLES LOCATED IN THE FREEWAY AND RAMPS PROPOSED PAVEMENT SHALL BE CONSTRUCTED 2.0' BELOW THE PAVEMENT'S SUBGRADE WITH A FRAME AND COVER WITH NO VENT HOLES. FRAME SHALL BE BOLTED TO THE MANHOLE TOP. DROPS ARE INCLUDED IN THE COST OF THE MANHOLE. ALL EXCAVATION AND BRACING NECESSARY (PER ODOT ITEM 503) SHALL BE INCLUDED IN THE COST OF THE MANHOLE.

THIS ITEM SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY FOR CONSTRUCTION OF THE MANHOLE IN ACCORDANCE WITH CMSC ITEM 604 AND THE DETAILS SHOWN ON SHEETS 670 - 675.

ITEM 202 - MANHOLE ABANDONED, AS PER PLAN "B" (SANITARY)

THE CONTRACTOR SHALL ABANDON EXISTING MANHOLES WHERE INDICATED ON THE PLANS IN ACCORDANCE WITH CMSC 202.11. STRUCTURES SHALL BE REMOVED TO A MINIMUM DEPTH OF 2 FEET BELOW FINISHED SUBGRADE OR GROUND SURFACE. AT THE CONTRACTOR'S DISCRETION, OR AND REQUIRED TO COMPLETE THE PROPOSED WORK, MANHOLES CAN BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH CMSC 202.10. BACKFILL SHALL CONSIST OF ODOT ITEM 613 - LOW STRENGTH MORTAR BACKFILL. PAYMENT FOR THE ABOVE WORK INCLUDING BACKFILL WILL BE MADE AT THE UNIT PRICE BID PER EACH FOR ITEM 202 - MANHOLE ABANDONED, AS PER PLAN, "B" REGARDLESS OF THE METHOD USED.

BULKHEADS
 SEWER PIPE BULKHEADS SHALL BE CONSTRUCTED BY THE CONTRACTOR AT THE OPEN ENDS OF ALL SEWER ABANDONED IN ACCORDANCE WITH CMSC 901.13. THE COST FOR PLACEMENT OF BULKHEADS SHALL BE INCLUDED IN THE UNIT PRICES BID FOR ITEM 202 - MANHOLE ABANDONED, AS PER PLAN "B".

ITEM 611 - CONDUIT, MISC.: SEWER VIDEO INSPECTION

PRIOR TO MOBILIZING ON SITE, THE CONTRACTOR SHALL CLOSED CIRCUIT TELEVISION (CCTV) INSPECT ALL SEWER LINES THAT ARE GOING TO BE REPLACED. THIS INFORMATION WILL BE USED TO DEVELOP A BYPASS PUMPING PLAN. CONTRACTOR SHALL ALSO PERFORM PRE AND POST CCTV INSPECTIONS ON THE FOLLOWING EXISTING SEWERS WITHIN THE PROJECT CONSTRUCTION LIMITS (NEAREST MANHOLE): OSIS, FRANKLIN MAIN, PETERS RUN/SOUTHSIDE RELIEF OUTLET REPAIRS AND PETERS RUN BRANCH SOUTHERN RELIEF SEWER. BYPASS PUMPING IS NOT EXPECTED TO BE REQUIRED IF THE INSPECTIONS ARE PERFORMED DURING OFF-PEAK OR AT NIGHT.

CONTRACTOR SHALL SUBMIT A PRE-CONDITION AND POST-CONDITION REPORT AND VIDEO WITH THE FOLLOWING INFORMATION:

1. DATE AND TIME OF INSPECTION
2. LOCATION (NEAREST MANHOLE)
3. DOCUMENT AND IDENTIFY LOCATION OF ALL VISIBLE INTERNAL DEFECTS WITHIN EACH SEWER SEGMENT.

ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS TO PERFORM THE SEWER VIDEO INSPECTION SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR ITEM 611 - CONDUIT, MISC.: SEWER VIDEO INSPECTION (FT).

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE SUBSUMMARY:

ITEM 611 - CONDUIT, MISC.: SEWER VIDEO INSPECTION 3300 FT

ITEM SPECIAL - CITY OF COLUMBUS 18" CONDUIT, C905 PIPE, WITH TYPE 1 BEDDING, WITH ITEM 912 COMPACTED GRANULAR MATERIAL (SANITARY)

THIS ITEM SHALL CONSIST OF CONDUIT MEETING THE REQUIREMENTS OF CMSC ITEM 901 SPECIFICATIONS AND LISTED IN THE CITY OF COLUMBUS PRE-APPROVED SUPPLIER LIST. CONTACT JEREMY CAWLEY WITH THE CITY'S DOSD FOR THE PRE-APPROVED SUPPLIER LIST AT 614-645-6795 OR THE CITY'S WEBSITES LISTED ON SHEET 53.

SEWER PIPE SHALL CONFORM TO CMSC 901 SPECIFICATIONS. SEWER SHALL BE PVC C905 SDR 25 (165 PSI) FOR WATERTIGHT AND WATER LINE PRESSURE GRADE PIPE. ITEM SHALL INCLUDE ALL BYPASS PUMPING, DEWATERING, PERMITS, FEES, ETC. NECESSARY TO INSTALL THE SEWER.

BYPASS PUMPING/FLOW CONTROL

1.01 SUMMARY

THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO REDUCE/CONTROL OR ELIMINATE FLOWS VIA BYPASS PUMPING, CHASES, FLUMING OR OTHER APPROPRIATE METHODS THROUGH A SEGMENT OR SEGMENTS OF PIPE, OR STRUCTURES DESIGNATED FOR THE INSPECTION AND/OR REHABILITATION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONTROLLING AND MAINTAINING ALL SEWAGE FLOWS WITHIN THE SYSTEM WHILE CONDUCTING WORK. PLUGGING OF ANY SEWER LINE SHALL NOT BE PERMITTED WITHOUT BYPASS PUMPING.

2.01 SUBMITTALS

CONTRACTOR SHALL PROVIDE A METHOD OF REDUCING/CONTROLLING THE SEWAGE FLOW THAT WILL INCLUDE BUT IS NOT LIMITED TO:

1. A RECOMMENDED SEQUENCE OF OPERATIONS
2. SKETCHES OR DRAWINGS SHOWING LOCATIONS OF THE BYPASS SEWER AND CONSTRUCTION PROCEDURES FOR CROSSING STREETS, EXCAVATIONS FOR BENCHING ALONG WITH SUPPORT METHODS, ALL REQUIRED PERMIT INFORMATION, APPLICATIONS, FEES, ETC., TO OBTAIN ACCESS TO THE STREETS WHEN REQUIRED BY THE BYPASS METHOD SELECTED BY THE CONTRACTOR.
3. KEY OPERATIONAL FACTORS, (I.E. MAXIMUM FLOW ELEVATIONS UPSTREAM OF DAMS, PUMP SIZES AND FLOW RATES)
4. LOCATIONS OF MANHOLES FROM WHICH SEWAGE IS TO BE PUMPED, LOCATIONS OF RECEIVING MANHOLES, AND NEW MANHOLES. THE CITY IS REQUIRING THE FLOW BE PICKED UP AT THE EXISTING MANHOLE ON SHORT ST. AT STA. 11+25.55, 4.9' LEFT.
5. A CONTINGENCY PLAN TO PREVENT DAMAGE DURING HIGH FLOW.
6. METHOD OF HANDLING TRAFFIC WHERE STREETS ARE TO BE EXCAVATED.

CITY OF COLUMBUS DIVISION OF SEWERAGE AND DRAINAGE SHALL REVIEW CONTRACTOR'S METHOD AND PROVIDE COMMENTS OR APPROVAL WITHIN 14 CALENDAR DAYS OF RECEIPT (SEE SHEET 53 FOR CONTACT INFORMATION). THE CONTRACTOR SHALL SUBMIT A COPY OF ALL PROPERTY OWNER/RESIDENT NOTIFICATIONS TO THE ENGINEER PRIOR TO NOTIFICATION DISTRIBUTION PER SECTION 3.01.

3.01 PREPARATION

RIGHT OF ENTRY. WHEN PRIVATE PROPERTY MUST BE CROSSED FOR BYPASS PUMPING THE CONTRACTOR SHALL OBTAIN WRITTEN RIGHT OF ENTRY (ROE) SIGNED BY THE PROPERTY OWNER. THE ROE SHALL DESCRIBE THE EXTENT OF WORK, ITEMS TO BE RESTORED, WARRANTY AND SCHEDULE. A SIGNED COPY OF THE ROE SHALL BE PROVIDED TO THE PROJECT ENGINEER PRIOR TO COMMENCING WORK. THE COST FOR OBTAINING THE RIGHT OF ENTRY AND ASSOCIATED RESTORATION WORK SHALL BE INCLUDED IN THE BID PRICE.

THE CONTRACTOR SHALL PROVIDE 48-HOUR PRIOR WRITTEN NOTIFICATION TO ALL PROPERTY OWNERS AND OR RESIDENTS WHOSE SEWER LATERAL WILL BE AFFECTED BY THE DIVERSION OF FLOW IN THE SEWER. THE NOTICE SHALL CLEARLY STATE THE APPROXIMATE TIME WHEN SEWAGE CANNOT BE RECEIVED AS WELL AS WHEN THE SEWER WILL BE AVAILABLE AGAIN FOR RECEIVING SEWAGE, AND THE PURPOSE OF THE WORK. IT SHALL ALSO ADVISE ALL AFFECTED CUSTOMERS AGAINST WATER USAGE UNTIL THE SEWER LINE IS PLACED BACK IN SERVICE, AND SHALL CLEARLY STATE THE POTENTIAL CONSEQUENCES OF THE USE OF RESIDENTIAL WASTEWATER GENERATING FACILITIES DURING THE TIME WHEN THE BUILDING SEWER SERVICE WILL BE OUT OF SERVICE (I.E. SEWER BACK-UP).

A DOOR HANGER REMINDER SHALL BE PLACED 24 HOURS (EXCLUDING WEEKENDS AND HOLIDAYS) PRIOR TO REDUCING THE SANITARY SERVICE.

3.02 INSTALLATION

BYPASS PUMPING SHALL BE ESTABLISHED PRIOR TO ANY WORK COMMENCING. BECAUSE OF THE HIGH FLOWS POSSIBLE IN THIS SEWER, THE CONTRACTOR SHALL HAVE A CONTINGENCY PLAN TO PREVENT DAMAGE DURING HIGH FLOWS. THE CITY WILL NOT BE RESPONSIBLE FOR ANY DAMAGES DUE TO HIGH FLOWS. THE CONTRACTOR SHALL ALSO BE AWARE THAT ADJACENT SEWERS MAY NOT BE AVAILABLE FOR BYPASS DISCHARGE DUE TO SURCHARGED CONDITIONS IN THOSE SEWERS DURING HEAVY RAINS. THE BYPASS SHALL BE MADE BY PLUGGING AN EXISTING UPSTREAM MANHOLE, IF NECESSARY, AND PUMPING THE SEWAGE INTO A DOWNSTREAM MANHOLES OR ADJACENT SYSTEM APPROVED BY THE CITY OF COLUMBUS SANITARY ENGINEER. WHEN REQUIRED, THE CONTRACTOR SHALL ALSO BYPASS LATERALS BY PUMPING FROM A CLEANOUT. IF A NEW CLEANOUT IS REQUIRED IT SHALL BE INSTALLED PER CITY STANDARD DRAWING AA-S161. ALL PUMPS AND TEMPORARY BYPASS SEWER PIPING SHALL BE OF ADEQUATE CAPACITY AND SIZE TO HANDLE THE PEAK FLOW AND ANY NECESSARY DEWATERING. THE BYPASS PUMPING SHALL NOT PROHIBIT ACCESS WHEN CROSSING PRIVATE ACCESS DRIVES OR PUBLIC STREETS AND SHALL EITHER HAVE TEMPORARY PAVEMENT OR BE SECURELY PLATED. THE BYPASS SEWER MAY BE LAID OVER GROUND IN ALL OTHER INSTANCES. THE BYPASS SHALL BE A HEADER FOR ALL BYPASS AND DEWATERING PUMPING. CHECK VALVES SHALL BE PLACED AHEAD OF ALL PUMPING CONNECTIONS.

THE CONTRACTOR MAY SUGGEST ALTERNATE ROUTING OR METHODS OF CONTROLLING THE SEWAGE, BUT, SHALL SUBMIT THEIR RECOMMENDATIONS TO THE CITY OF COLUMBUS SANITARY ENGINEER IN WRITING COMPLETE WITH SKETCHES OR DRAWINGS SHOWING LOCATIONS OF THE BYPASS SEWER AND CONSTRUCTION PROCEDURES FOR CROSSING STREETS, EXCAVATIONS FOR BENCHING ALONG WITH SUPPORT METHODS, ALL REQUIRED PERMIT INFORMATION, APPLICATIONS, FEES, ETC. THE CITY OF COLUMBUS SANITARY ENGINEER WILL REVIEW THE PROPOSED ALTERATIONS TO ENSURE THAT THE RECEIVING SEWERS CAN ACCEPT THE FLOW AND THAT NO ACCESS OR STREET INTERFERENCE IS CREATED. CITY OF COLUMBUS DIVISION OF SEWERAGE AND DRAINAGE SHALL REVIEW ALTERNATE METHOD AND PROVIDE COMMENTS OR APPROVAL WITHIN 14 CALENDAR DAYS OF RECEIPT. NEITHER THE CITY NOR THE PROJECT ENGINEER WILL BE RESPONSIBLE FOR DAMAGES DUE TO HIGH FLOWS.

ALL COMMERCIAL ESTABLISHMENTS SHALL BE PROVIDED WITH TEMPORARY SEWER SERVICE. THE MEANS AND METHODS SHALL BE COORDINATED WITH THE MANAGERS AND THE AFFECTED RESIDENTS.

UNDER NO CIRCUMSTANCES WILL THE DUMPING OF RAW SEWAGE ON PRIVATE PROPERTY, STREETS AND ROADS BE ALLOWED NOR WILL SURCHARGING OF THE SEWERS BE ALLOWED DUE TO INSUFFICIENT PUMPING.

3.03 REPAIR/RESTORATION

SITE RESTORATION. THE CONTRACTOR SHALL BE AWARE OF THE CONDITIONS AT EACH SITE. THIS SHALL INCLUDE BUT NOT BE LIMITED TO TREES, SHRUBBERY, LANDSCAPING, STRUCTURES, FENCES, MAILBOXES, DRIVEWAYS, CURBS, WALKS, PAVEMENTS, ETC. THE CONTRACTOR SHALL VIDEOTAPE ALL ROE AREAS PRIOR TO USE. ALL PRE-CONSTRUCTION CONDITIONS SHALL BE FULLY RESTORED AS CLOSE TO ITS ORIGINAL CONDITIONS AS PRACTICABLE.

WHEN WORKING ON PRIVATE PROPERTY, THE CONTRACTOR SHALL OBTAIN ACKNOWLEDGEMENT-OF-COMPLETION (AOC) FROM THE PROPERTY OWNER THAT WORK WAS COMPLETED IN ACCORDANCE WITH THE ROE AGREEMENT. NO PAYMENT FOR THIS WORK WILL BE MADE UNTIL THE COPY OF THE AOC IS SUBMITTED TO THE PROJECT ENGINEER.

3.04 FIELD QUALITY CONTROL

RECORD ONLY PERMITS. WHEN A NEW CLEANOUT OR OTHER ADDITIONS TO A PRIVATE LATERAL ARE REQUIRED FOR BYPASS PUMPING, THE INSPECTOR SHALL COMPLETE A RECORD ONLY PERMIT FOR THAT LATERAL WHICH SHALL DOCUMENT ALL CHANGES OR ADDITIONS.

3.05 CLEANING

PURGING. AFTER ALL CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED THE CONTRACTOR SHALL PURGE THE BYPASS SEWER SYSTEM OF ALL SEWAGE BEFORE DISCONNECTING THE PUMPS AND PIPING WITH WATER. ALL WATER USED FOR PURGING THE BYPASS SYSTEM SHALL EITHER BE COLLECTED AND DISPOSED OF OFF-SITE OR ROUTED INTO THE SANITARY SEWER. UNDER NO CIRCUMSTANCES WILL THE DUMPING OF RAW SEWAGE ON PRIVATE PROPERTY, STREETS AND ROADS BE ALLOWED DUE TO PURGING THE SYSTEM.

3.06 PROTECTION

PRECAUTIONS SHALL BE TAKEN TO ENSURE THAT BYPASS PUMPING AND FLOW CONTROL OPERATIONS SHALL NOT CAUSE FLOODING OR DAMAGE TO PUBLIC OR PRIVATE PROPERTIES. IN THE EVENT FLOODING OR DAMAGE OCCURS, THE CONTRACTOR SHALL MAKE PROVISIONS TO CORRECT SUCH DAMAGE AT NO ADDITIONAL COST TO THE CITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PUBLIC OR PRIVATE PROPERTY, OVERFLOWS FROM THE SEWER SYSTEM AND VIOLATIONS RESULTING IN FINES AS A RESULT OF THE DEWATERING/BYPASS OPERATION.

3.07 METHOD OF PAYMENT

ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS TO PERFORM THE WORK DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR ITEM 611 - CONDUIT, MISC.: 18" CONDUIT, C905 PIPE, WITH TYPE 1 BEDDING, WITH ITEM 912 COMPACTED GRANULAR MATERIAL (SANITARY).

ITEM 611 - CONDUIT, MISC.: BYPASS PUMPING FOR VIDEO INSPECTION AND PIPE REPAIRS

A CONTINGENCY QUANTITY OF BYPASS PUMPING HAS BEEN PROVIDED TO BE USED AS DIRECTED BY THE ENGINEER FOR THE VIDEO INSPECTION AND PIPE REPAIRS OF SEWERS. THIS WORK SHALL MEET THE REQUIREMENTS OF THE BYPASS PUMPING/FLOW CONTROL NOTES ON THIS SHEET.

ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS TO PERFORM THE BYPASS PUMPING SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR ITEM 611 - CONDUIT, MISC.: BYPASS PUMPING FOR VIDEO INSPECTION AND PIPE REPAIRS (EACH).

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE SUBSUMMARY:
 ITEM 611 - CONDUIT, MISC.: BYPASS PUMPING FOR VIDEO INSPECTION AND PIPE REPAIRS 25000 EACH

QUANTITIES CARRIED TO GENERAL NOTES SUBSUMMARY ON SHEET 69A

NO.	DESCRIPTION	REV. BY	DATE	NO.	DESCRIPTION	REV. BY	DATE
3	UPDATED BYPASS NOTE	CWL	11-19-2021	10	UPDATED BYPASS NOTE	CWL	12-13-2021

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SHEET NO.	201		202		202		204		208		251		SPECIAL		SPECIAL		601		607		605		611		611		611		611	
	CLEARING AND GRUBBING, AS PER PLAN		REMOVAL MISC.: TRASH RECEPTACLES		CONCRETE BARRIER REMOVED		GEOTEXTILE FABRIC		VIBRATION CONTROL AND MONITORING, AS PER PLAN		PARTIAL DEPTH PAVEMENT REPAIR (442)		PAVEMENT OVERLAY FABRIC		SAWING AND SEALING CONCRETE JOINTS		TIED CONCRETE BLOCK MAT, TYPE 1		FENCE, TYPE CL, AS PER PLAN		6" UNCLASSIFIED PIPE UNDERDRAINS WITH GEOTEXTILE FABRIC		CONDUIT, MISC.: SEWER VIDEO INSPECTION		6" CONDUIT, TYPE B		6" CONDUIT, TYPE C		CONDUIT, MISC.: BYPASS PUMPING FOR VIDEO INSPECTION AND PIPE REPAIRS	
	LS	PV	EACH	PV	FT	PV	SY	PV	LS	PV	SY	PV	SY	PV	FT	PV	SY	PV	FT	PV	FT	PV	FT	PV	FT	PV	FT	PV	FT	PV
53	LS	LS																												
54			4																											
55																														
56					119	151					500		102	129																
61															368	44														
63																	4	4			88	112			22	28	22	28		
66A									LS	LS										880	1120									
67								880	1120											880	1120									
69																													25000	
TOTALS CARRIED TO GENERAL SUMMARY	LS	LS	4		119	151	880	1120	LS	LS	500		102	129	368	44	4	4	880	1120	88	112	3300	22	28	22	28	25000		
SHEET NO.	611		611		611		611		SPECIAL		622		623		638		SPECIAL		SPECIAL		SPECIAL		SPECIAL		SPECIAL		SPECIAL			
	6" CONDUIT, TYPE E		6" CONDUIT, TYPE F		PRECAST REINFORCED CONCRETE OUTLET		CONDUIT, MISC.: INTERNAL JOINT SEAL		MISCELLANEOUS METAL		BARRIER, MISC.: CONCRETE BARRIER, TYPE B		PROVIDING ELECTRONIC INSTRUMENTATION		WATER WORK, MISC.: SURVEY COORDINATES		SURVEY CONTROL VERIFICATION		WORK INVOLVING HAZARDOUS WASTE		WORK INVOLVING SOLID WASTE		WORK INVOLVING NON-REGULATED WATER		WORK INVOLVING REGULATED WATER					
	FT	PV	FT	PV	EACH	PV	EACH	PV	LB	PV	FT	PV	LS	PV	LS	PV	TON	PV	TON	PV	GAL	PV	GAL	PV	GAL	PV	GAL	PV		
54																														
56											106	134																		
58													LS	LS																
63	22	28	110	140	2	2	26	34	440	560																				
66A																				44	56	220	280	4840	6160	4840	6160			
68													LS																	
TOTALS CARRIED TO GENERAL SUMMARY	22	28	110	140	2	2	26	34	440	560	106	134	LS	LS	LS		LS	LS	44	56	220	280	4840	6160	4840	6160				

GENERAL NOTES SUBSUMMARY
 CALCULATED CJC
 CHECKED CWL
FRA-70/71-12.68/14.86
 69A
 1815

ITEM 614 - MAINTAINING TRAFFIC

1. CONSTRUCTION OPERATIONS SHALL NOT BEGIN UNTIL ALL TRAFFIC CONTROL IS IN PLACE AND APPROVED BY ODOT PERSONNEL. THE PROJECT ENGINEER SHALL APPROVE ALL TEMPORARY TRAFFIC CONTROL DEVICES FOR CONDITION AND LOCATION BEFORE THE CONTRACTOR WILL BE ALLOWED TO BEGIN WORK. IF THE CONTRACTOR DOES NOT COMPLY WITH THE STANDARDS, HIS PERMIT SHALL BE REVOKED AND ALL WORK SHALL BE TERMINATED.

2. ALL SIGNS, BARRACADES, SIGN SUPPORTS, DRUMS, FLAGGERS, WORK ZONE TRAFFIC SIGNALS AND INCIDENTALS FOR TRAFFIC CONTROL SHALL BE FURNISHED, ERECTED, MAINTAINED AND REMOVED BY THE CONTRACTOR IN CONFORMANCE WITH THE MOST RECENT REVISIONS, CURRENT EDITION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (OMUTCD). ALL SIGNS USED FOR THE MAINTENANCE OF TRAFFIC SHALL BE NEW OR LIKE NEW CONDITION SUBJECT TO THE APPROVAL OF THE ENGINEER. DEVICES USED TO MAINTAIN TRAFFIC SHALL BE REMOVED IMMEDIATELY AFTER THE TERMINATION OF SAID WORK. PAYMENT SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614 MAINTAINING TRAFFIC.

3. FOR WORK WHICH IS CONFINED TO THE SHOULDER, TRAFFIC CONTROL SHALL CONFORM TO FIGURES TA-1, TA-3, TA-4, AND TA-6 OF THE OMUTCD AND SCD MT-95.45. IF THE CONTRACTOR FAILS TO COMPLY WITH THE PROVISIONS FOR TRAFFIC CONTROL AS SET FORTH IN THESE PLANS AND PROVISIONS OF THE OMUTCD AND FAILURE RESULTS IN A CONDITION AT THE WORK SITE WHICH IS UNSAFE FOR TRAFFIC, THE ENGINEER HAS THE AUTHORITY TO SUSPEND WORK UNTIL THE CONTRACTOR COMPLIES WITH THE NECESSARY REQUIREMENTS.

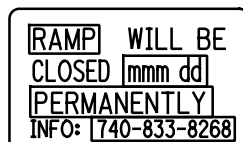
ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH CMS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT, AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614 - MAINTAINING TRAFFIC, UNLESS SEPERATELY ITEMIZED IN THE PLAN.

NOTIFICATION OF CONSTRUCTION INITIATION

AT LEAST FOURTEEN DAYS PRIOR TO STARTING INITIAL CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL ADVISE THE DISTRICT OFFICE OF COMMUNICATIONS VIA EMAIL AT DO6.PIO@DOT.OHIO.GOV, THE DISTRICT WORK ZONE TRAFFIC MANAGER VIA EMAIL AT DO6.MOT@DOT.OHIO.GOV AND THE CENTRAL OFFICE SPECIAL Haul PERMITS SECTION VIA EMAIL AT HAULING.PERMITS@DOT.OHIO.GOV OF THE ANTICIPATED START DATE OF ANY CONSTRUCTION ACTIVITIES INCLUDING BUT NOT LIMITED TO THE PLACING OF WORK ZONE SIGNS. THE NOTIFICATION SHALL ALSO INCLUDE THE PROJECT NUMBER, PID, NAME AND PHONE NUMBER OF THE CONTRACTOR, A POINT OF CONTACT AND THE ANTICIPATED IMPACT ON TRAFFIC. THE CONTRACTOR WILL IMMEDIATELY INFORM THE DISTRICT OFFICE OF COMMUNICATIONS AND THE DISTRICT WORK ZONE TRAFFIC MANAGER OF ANY AND ALL DELAYS AND/OR CHANGES REGARDING THE CONSTRUCTION INITIATION DATE.

NOTIFICATION OF PERMANENT RAMP CLOSURE

NOTICE OF CLOSURE SIGNS, AS DETAILED BELOW, SHALL BE ERECTED AT LEAST FOURTEEN DAYS PRIOR TO THE PERMANENT CLOSURE OF THE I-70 EB TO SR315 NB RAMP. THE SIGNS SHALL BE MOUNTED ON BOTH SIDES OF THE RAMP FACING TRAFFIC. THEY SHALL BE PLACED SO AS NOT TO INTERFERE WITH THE VISIBILITY OF ANY OTHER TRAFFIC CONTROL SIGNS.



W20-H13-60 (MODIFIED)

NOTIFICATION OF TRAFFIC RESTRICTIONS

THROUGHOUT THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN WRITING OF ALL TRAFFIC RESTRICTIONS AND UPCOMING MAINTENANCE OF TRAFFIC CHANGES. THE CONTRACTOR SHALL ENSURE THE WRITTEN NOTIFICATION IS SUBMITTED IN A TIMELY MANNER TO ALLOW THE PROJECT ENGINEER TO MEET THE REQUIRED TIME FRAMES SET FORTH IN THE TABLE BELOW TO INFORM THE SPECIAL HAULING PERMITS SECTION (HAULING.PERMITS@DOT.OHIO.GOV) AND THE DISTRICT PUBLIC INFORMATION OFFICE (PIO). THIS NOTIFICATION SHALL BE RECEIVED BY THE PROJECT ENGINEER PRIOR TO THE PHYSICAL SETUP OF ANY APPLICABLE SIGNS OR MESSAGE BOARDS.

INFORMATION SHOULD INCLUDE, BUT IS NOT LIMITED TO, ALL CONSTRUCTION ACTIVITIES THAT IMPACT OR INTERFERE WITH TRAFFIC AND SHALL LIST THE SPECIFIC LOCATION, TYPE OF WORK, ROAD STATUS, DATE AND TIME OF RESTRICTION, DURATION OF RESTRICTION, NUMBER OF LANES MAINTAINED, NUMBER OF LANES CLOSED, MINIMUM VERTICAL CLEARANCE, MINIMUM WIDTH OF DRIVABLE PAVEMENT, DETOUR ROUTES, IF APPLICABLE, AND ANY OTHER INFORMATION REQUESTED BY THE PROJECT ENGINEER.

NOTIFICATION TIME TABLE		
ITEM	DURATION OF CLOSURE	NOTIFICATION DUE TO PERMITS AND PIO
RAMP AND ROAD CLOSURES	>= 2 WEEKS	21 CALENDAR DAYS PRIOR TO CLOSURE
	> 12 HOURS AND < 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
	< 12 HOURS	4 BUSINESS DAYS PRIOR TO CLOSURE
LANE CLOSURES/RESTRICTIONS	>= 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
	< 2 WEEKS	5 BUSINESS DAYS PRIOR TO CLOSURE
START OF CONSTRUCTION & TRAFFIC PATTERN CHANGES	N/A	14 CALENDAR DAYS PRIOR TO IMPLEMENTATION

ANY UNFORSEEN CONDITIONS NOT SPECIFIED IN THE PLANS REQUIRING TRAFFIC RESTRICTIONS SHALL ALSO BE REPORTED TO THE PROJECT ENGINEER USING THE NOTIFICATION TIME TABLE.

PERMITTED LANE CLOSURES ON FREEWAYS, RAMPS AND CITY STREETS

THE EXISTING NUMBER OF LANES IN EACH DIRECTION ON ALL FREEWAYS SHALL BE MAINTAINED IN ACCORDANCE WITH THE LANE VALUE CONTRACT TABLE FOR EACH LOCATION UNLESS OTHERWISE SHOWN IN THE PLANS. THE EXISTING NUMBER OF LANES IN EACH DIRECTION ON ALL RAMPS AND CITY STREETS SHALL BE MAINTAINED FOR EACH LOCATION UNLESS OTHERWISE SHOWN IN THE PLANS.

IT MAY BE NECESSARY TO EXTEND THE ADVANCE WARNING, TAPER AND BUFFER ZONES BEYOND THE MINIMUM DISTANCES SHOWN ON THE STANDARD DRAWINGS DUE TO HORIZONTAL ALIGNMENT, VERTICAL ALIGNMENT, RAMP LOCATIONS, OR OTHER SIGHT OBSTRUCTIONS. TAPERS SHOULD BE PLACED IN TANGENT SECTIONS WHENEVER POSSIBLE.

LENGTH AND DURATION OF LANE CLOSURES AND RESTRICTIONS SHALL BE AT THE APPROVAL OF THE ENGINEER. IT IS THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME, AS DETERMINED BY THE ENGINEER, SHALL NOT BE PERMITTED. THE LEVEL OF UTILIZATION OF MAINTENANCE OF TRAFFIC DEVICES SHALL BE COMMENSURATE WITH THE WORK IN PROGRESS.

ALL WORK ZONE AND TRAFFIC CONTROL DEVICES SHALL BE FURNISHED, ERECTED, MAINTAINED AND REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH CMS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, APPLICABLE STANDARD DRAWINGS, AND THE OHIO MANUAL OF TRAFFIC CONTROL DEVICES (CURRENT EDITION).

PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR 614, MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

MAINTAINING TRAFFIC (TIME LIMITATION ON A DETOUR)

THE I-70 EB/I-71 NB TO FRONT STREET RAMP SHALL BE MAINTAINED AT ALL TIMES BY EITHER THE EXISTING OR PROPOSED RAMP, EXCEPT FOR A PERIOD NOT TO EXCEED 840 CONSECUTIVE CALENDAR DAYS, WHEN RAMP TRAFFIC MAY BE DETOURED TO THE FOURTH STREET/LIVINGSTON AVENUE RAMP. A DISINCENTIVE SHALL BE ASSESSED IN THE AMOUNT OF \$5,000 PER DAY FOR EACH CALENDAR DAY THE RAMP REMAINS CLOSED TO TRAFFIC BEYOND THE SPECIFIED LIMIT.

COORDINATION WITH ADJACENT PROJECTS

THE CONTRACTOR SHALL COORDINATE WORK WITH ODOT AND THE CONTRACTORS ON THE ADJACENT PROJECTS.

COORDINATION SHALL BE MADE TO PREVENT CONFLICTING ADVANCE WARNING SIGNS, CONFLICTING DETOUR ROUTES, OVERLAPING/CONFLICTING LANE CLOSURES, AND TO ENSURE THAT A MINIMUM DISTANCE OF 2 MILES BETWEEN ADJACENT LANE CLOSURES IS MAINTAINED. THIS IS NOT AN EXHAUSTIVE LIST OF COORDINATION ITEMS THAT MAY NEED TO BE RESOLVED BETWEEN PROJECTS. THE DEPARTMENT RESERVES THE RIGHT TO DECIDE WHICH PROJECT'S ACTIVITIES TAKE PRECEDENCE. PROJECTS THAT HAVE ACTIVITIES DELAYED DUE TO CONFLICTS WILL CONSIDER THIS AN EXCUSABLE, COMPENSABLE DELAY PER 108.06.D. ON PROJECTS THAT HAVE ACTIVITIES DELAYED DUE TO CONFLICTS WHERE THE CONTRACTOR FAILED TO MEET THE NOTIFICATION REQUIREMENTS, THE DELAYS SHALL NOT BE CONSIDERED EXCUSABLE OR COMPENSABLE, NOR SHALL THE COMPLETION DATE BE EXTENDED.

ATTENDANCE AT DEPARTMENT ORDERED TRAFFIC COORDINATION MEETINGS BETWEEN ADJACENT PROJECTS SHALL BE CONSIDERED MANDATORY FOR EACH PROJECT'S SUPERINTENDENT AND WORKSITE TRAFFIC SUPERVISOR (WTS), AND INCIDENTAL TO THE LUMP SUM MAINTENANCE OF TRAFFIC PAYMENT ITEM.

KNOWN ADJACENT ODOT PROJECTS ARE FRA-70/71 PROJECT 2E PID 105322, FRA-71-9.62 I-71 PID 93497, AND THE FUTURE FRA-70/71 BIG BUILD PID 77372 PROJECT (4A/1301R/4H/6A/4B).

ITEM 615 - PAVEMENT FOR MAINTAINING TRAFFIC, CLASS A, AS PER PLAN

THE EXISTING SHOULDERS SHALL BE REPLACED WITH CLASS A TEMPORARY FLEXIBLE PAVEMENT FOR AREAS LISTED IN THIS MOT NOTE (COMPOSITION PER TABLE CMS 615.05 AND FOOTNOTE 4 TO LESSEN THE THICKNESS TO ALLOW FOR DRUMS DURING MOT SHOULDER WORK. THE SHOULDER REPLACEMENT WORK ZONE SHALL BE IN ACCORDANCE WITH ODOT STANDARD CONSTRUCTION DRAWING MT-95.30. THIS LANE CLOSURE SHALL ADHERE TO THE LANE VALUE CONTRACT TABLE.

THE SHOULDER LIMITS NEEDING REPLACED IF THE DETAILED MOT PLANS ARE FOLLOWED AS SHOWN IS:
I-70EB STA. 114+40 TO 134+40 LT
I-70EB TO I-71SB RAMP STA. 8+83 TO 19+00 RT
I-70EB/I-71NB STA. 189+65 TO 193+50 RT
I-70EB/I-71NB STA. 187+88 TO 196+00 LT
I-70WB/I-71SB STA. 182+00 TO 198+92 LT
I-70WB/I-71SB STA. 184+50 TO 192+57 RT
THESE AREAS SHALL BE ADJUSTED AS NECESSARY DUE TO ANY CHANGES TO THE MOT CONCEPT.

ANY COSTS ASSOCIATED WITH THE PAVEMENT REMOVAL AND INSTALLATION INCLUDING ALL MATERIALS, MATERIAL REMOVAL, EDGE LINE REMOVAL, LABOR AND EQUIPMENT AND ALL OTHER INCIDENTALS OTHER THAN THE LANE CLOSURE SHALL BE INCLUDED IN THE BID FOR ITEM 615 - PAVEMENT FOR MAINTAINING TRAFFIC, CLASS A, AS PER PLAN.

ANY COSTS ASSOCIATED WITH THE LANE CLOSURES AS DESCRIBED IN THIS NOTE SHALL BE CONSIDERED INCIDENTAL TO AND INCLUDED IN THE LUMP SUM BID FOR ITEM 614 MAINTAINING TRAFFIC.

PN 121 CLARIFICATIONS

DESCRIPTION OR LOCATION OF CRITICAL WORK	COMPLETION DATE	TIME PERIOD	DISINCENTIVE \$ PER TIME PERIOD	INCENTIVE \$ PER TIME PERIOD	MAXIMUM INCENTIVE \$
SEE NOTE 1 BELOW	6/1/24	DAY	\$12,000	N/A	N/A
SEE NOTE 2 BELOW	5/1/24	DAY	\$5,000	N/A	N/A

THE ITEMS OF WORK THAT MUST BE COMPLETED BY THE INTERIM COMPLETION DATE ARE ITEMIZED BELOW:

- I-70/71 MAINLINE MOT PHASE 4 WORK SHALL BE COMPLETE ENOUGH FOR TRAFFIC TO BE SHIFTED TO THE MOT PHASE 5 LOCATION (SEE SHEETS 190 - 194) AND TRAFFIC SHIFTED PRIOR TO THE DATE LISTED.
- THE FULTON STREET RAMP (C5) AND STRUCTURES FRA-70-1390C AND FRA-70-1395C SHALL BE COMPLETE ENOUGH FOR TRAFFIC TO BE SHIFTED TO THE MOT PHASE 5 LOCATION (SEE SHEETS 192 - 193) AND TRAFFIC SHIFTED PRIOR TO THE DATE LISTED. THE RAMP MAY NOT CLOSE FOR ANY REASON AFTER THIS DATE.

PRE-MAINTENANCE OF TRAFFIC MEETING

A PRE-MAINTENANCE OF TRAFFIC MEETING SHALL BE HELD (MINIMUM OF 10 WORK DAYS) PRIOR TO WORK BEGINNING OR ANY CHANGE OF PHASING. THIS MEETING SHALL INCLUDE THE DISTRICT WORK ZONE TRAFFIC MANAGER (do6.mot@dot.ohio.gov) AS WELL AS THE CONTRACTOR AND ANY OF HIS SUB-CONTRACTORS INVOLVED WITH TEMPORARY TRAFFIC CONTROL. FOR COLUMBUS SECTIONS OF ROADWAY, ALSO INCLUDE THE TEMPORARY CONTROL COORDINATOR (614-645-6269 OR 614-645-5845) FROM THE CITY OF COLUMBUS TRANSPORTATION DIVISION.

WEEKLY MAINTENANCE OF TRAFFIC MEETING

AFTER THE INITIAL PRE-MAINTENANCE OF TRAFFIC MEETING, THE CONTRACTOR SHALL MEET WITH THE PROJECT ENGINEER ON A WEEKLY BASIS TO GO OVER A DETAILED MAINTENANCE OF TRAFFIC REPORT OF AT LEAST 7 CALENDAR DAYS. THIS MEETING SHOULD BE HELD ON THE SAME DAY AND TIME OF EACH WEEK.

THE CONTRACTOR WILL PROVIDE TO THE PROJECT ENGINEER A WRITTEN DETAIL OF THE INFORMATION REQUIRED BY THE NOTIFICATION OF TRAFFIC RESTRICTIONS NOTE PRIOR TO THE MEETING.

IN ADDITION TO THE DETAILED MAINTENANCE OF TRAFFIC REPORT THE CONTRACTOR SHALL GIVE A GENERAL LOOK AHEAD OF AN ADDITIONAL 2 WEEKS OF UPCOMING WORK ACTIVITIES. THIS WILL INCLUDE ANY NOTIFICATION REQUIREMENTS FOR RESTRICTIONS THAT HAVE A DURATION GREATER THAN 12 HOURS.

ITEM 614 - MAINTAINING TRAFFIC (ESTIMATED QUANTITIES)

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR USE AS DETERMINED BY THE ENGINEER FOR THE MAINTENANCE OF TRAFFIC.

ITEM 410, TRAFFIC COMPACTED SURFACE, TYPE A OR B
200 CU. YD.

MAINTENANCE OF FIRE LANE

THE FIRE LANE JUST SOUTH OF I-70/I-71 BETWEEN SHORT STREET AND SECOND STREET SHALL NOT BE UTILIZED FOR CONSTRUCTION EQUIPMENT, ACTIVITIES, OR CONSTRUCTION TRAFFIC. IT SHALL REMAIN CLEAR FOR FIRE DEPARTMENT USE AT ALL TIMES.

NO.	DESCRIPTION	REV. BY	DATE
3	NOTE CHANGES	EMW	11-16-2021
10	NOTE DATE CHANGE	EMW	12-10-2021

SHEET NUMBER					PARTICIPATION		ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.	CALCULATED ATR CHECKED CWL
69A	224	225		01/NHS/PV	05/NHS/OT/COL								
		1				638	98000	1	EACH	WATER WORK, MISC.: 24" x 6" TAPPING SLEEVE AND VALVE AND APPURTENANCES (COLUMBUS 803)	68 , 68A		
		1				638	98000	1	EACH	WATER WORK, MISC.: FIRE HYDRANT, RELOCATED (COLUMBUS 809)	68		
		1				638	98000	1	EACH	WATER WORK, MISC.: 3" WATER SERVICE LINE TRANSFER (COLUMBUS 805)	68		
		1				638	98000	1	EACH	WATER WORK, MISC.: 6" WATER SERVICE LINE TRANSFER (COLUMBUS 805)	68		
		2				638	98000	2	EACH	WATER WORK, MISC.: 6" WATER MAIN ABANDONED (COLUMBUS 808)	68		
		2				638	98000	2	EACH	WATER WORK, MISC.: 8" WATER MAIN ABANDONED (COLUMBUS 808)	68		
		1				638	98000	1	EACH	WATER WORK, MISC.: 20" WATER MAIN ABANDONED (COLUMBUS 808)	68		
	LS					638	98100	LS		WATER WORK, MISC.: SURVEY COORDINATES	68		
		40				SPECIAL	69098700	40	CY	INCREASE OR DECREASE IN EXCAVATION AND BACKFILL (COLUMBUS 811)	68		
		500				SPECIAL	69099400	500	LB	DUCTILE IRON FITTINGS, INCREASE OR DECREASE (COLUMBUS 801)	68		
										SANITARY SEWER			
	25000					611	97200	25000	EACH	CONDUIT, MISC.: BYPASS PUMPING FOR VIDEO INSPECTION AND PIPE REPAIRS	69		
	3300					611	97400	3300	FT	CONDUIT, MISC.: SEWER VIDEO INSPECTION	69		
		2				611	99655	2	EACH	MANHOLE ADJUSTED TO GRADE, AS PER PLAN	68A , 69		
		3				SPECIAL	69098000	3	EACH	CITY OF COLUMBUS MANHOLE, TYPE C (AA-S102)	69		
		1				SPECIAL	69098000	1	EACH	CITY OF COLUMBUS MANHOLE, TYPE C, AS PER PLAN (AA-S102)	69		
		204				SPECIAL	69098100	204	FT	CITY OF COLUMBUS 18" CONDUIT, C905 PIPE, WITH TYPE 1 BEDDING, WITH ITEM 912 COMPACTED GRANULAR MATERIAL	69		
										LIGHTING			
										FOR LIGHTING GENERAL SUMMARY	1164,1164A		
										ELECTRICAL			
			110			SPECIAL	69098000	110	EACH	BORE SPACERS FOR 6" SCH 40 PVC CONDUIT	921		
			2			SPECIAL	69098000	2	EACH	75kVA LOOP FEED SINGLE PHASE PADMOUNT TRANSFORMER (TDMIS-1201)	922A		
			1			SPECIAL	69098000	1	EACH	300kVA LOOP FEED THREE PHASE PADMOUNT TRANSFORMER, 14.4 kV, DELTA/208/120 (TDMIS-1202)	922A		
			1			SPECIAL	69098000	1	EACH	750kVA LOOP FEED THREE PHASE PADMOUNT TRANSFORMER, 14.4kV, DELTA/480/277 (TDMIS-1202)	922A		
			2			SPECIAL	69098000	2	EACH	FIBERGLASS FLAT PAD FOR SINGLE PHASE TRANSFORMERS (TDMIS-1009)	922A		
			4			SPECIAL	69098000	4	EACH	HANDHOLE	922A		
			1			SPECIAL	69098000	1	EACH	50'2 WOOD POLE	921		
			1			SPECIAL	69098000	1	EACH	THREE PHASE DEADEND ATTACHMENTS (TDMIS-406)	921		
			1			SPECIAL	69098000	1	EACH	WOOD CROSSARM (TDMIS-10)	921		
			2			SPECIAL	69098000	2	EACH	PRIMARY DOWN GUY (TDMIS-100)	921		
			1			SPECIAL	69098000	1	EACH	DISTRIBUTION POLE GROUND (TDMIS-7)	921		
			7			SPECIAL	69098000	7	EACH	SUBMERSIBLE SEPARABLE CONNECTOR	922A		
			1			SPECIAL	69098000	1	EACH	DISTRIBUTION RISER (TDMIS-1001)	921		
			9			SPECIAL	69098000	9	EACH	DOP MANHOLE (TDMIS-1015)	921		
			2			SPECIAL	69098000	2	EACH	4'x 4' x 4' PULLBOX	921		
			65			SPECIAL	69098000	65	EACH	BRIDGE MOUNTED CONDUIT HANGER	921		
			1			SPECIAL	69098000	1	EACH	CABLE TRAY RISER	921		
			12			SPECIAL	69098000	12	EACH	11.25" SCH 40 PVC CONDUIT SWEEP	921		
			6			SPECIAL	69098000	6	EACH	22.5" SCH 40 PVC CONDUIT SWEEP	921		
			6			SPECIAL	69098000	6	EACH	FIBERGLASS TO PVC CONDUIT COUPLER	921		
			12			SPECIAL	69098000	12	EACH	WOOD POLE, REMOVAL (TDMIS-1600)	921		
			11			SPECIAL	69098000	11	EACH	OVERHEAD TRANSFORMER, REMOVAL (TDMIS-1600)	922A		
			11			SPECIAL	69098000	11	EACH	6" FIBERGLASS CONDUIT EXPANSION FITTINGS	922A		
			4			SPECIAL	69098000	4	EACH	ADJUSTING EXISTING GRADE	921		
			12			SPECIAL	69098000	12	EACH	5" FIBERGLASS 90° SWEEP	921		
			1			SPECIAL	69098000	1	EACH	EXISTING MANHOLE REMOVAL	921		
			12			SPECIAL	69098000	12	EACH	MEDIUM VOLTAGE CABLE ACCEPTANCE TESTING	922A		
			2			SPECIAL	69098000	2	EACH	PADMOUNT TRANSFORMER RELOCATION	921		
			1			SPECIAL	69098000	1	EACH	PADMOUNT SF6 SWITCHGEAR	922A		
			3453			SPECIAL	69098100	3453	FT	(3) - 750kCMIL Cu, 15kV, XLP Ins. 133% w/ Cu TAPE SHIELD WITH (1)-350kCMIL Cu, 600V NEUTRAL	921		
			1407			SPECIAL	69098100	1407	FT	(3) - 350kCMIL Cu, 15kV, XLP Ins. 133% w/ Cu TAPE SHIELD WITH (1)-4/0 Cu, 600V NEUTRAL	921		
			282			SPECIAL	69098100	282	FT	(1) - 250kCMIL Cu, 15kV, XLP Ins. 133% w/ Cu TAPE SHIELD WITH (1)-1/0 Cu, 600V NEUTRAL	921		
			427			SPECIAL	69098100	427	FT	2x1 CONCRETE DUCT BANK - 5" PVC (TDMIS-3000)	922A		
			721			SPECIAL	69098100	721	FT	2x2 CONCRETE DUCT BANK - 5" PVC (TDMIS-3000)	922A		
			238			SPECIAL	69098100	238	FT	2x3 CONCRETE DUCT BANK - 6" PVC (TDMIS-3000)	921		
			671			SPECIAL	69098100	671	FT	3x3 CONCRETE DUCT BANK - 5" PVC (TDMIS-3000)	921		
			7400			SPECIAL	69098100	7400	FT	WIRE AND CABLE REMOVAL (TDMIS-1600)	922A		
			84			SPECIAL	69098100	84	FT	5" SCH 40 PVC CONDUIT	921		
			5254			SPECIAL	69098100	5254	FT	6" SCH 40 PVC CONDUIT	921		
			551			SPECIAL	69098100	551	FT	30" DIRECTIONAL BORE AND PIPE, 748.06	921		
			125			SPECIAL	69098100	125	FT	(2) - #2 AL, 15kV XLP, 133% INS JCN	922A		
			777			SPECIAL	69098100	777	FT	5" XHW FIBERGLASS CONDUIT	921		
			6210			SPECIAL	69098100	6210	FT	6" XHW FIBERGLASS CONDUIT	921		
			347			SPECIAL	69098100	347	FT	4" SCH 40 PVC CONDUIT	921		
			420			SPECIAL	69098100	420	FT	(3)-#1 AL, 15kV, XLP WITH (1)-#2 AL, 600V NEUTRAL	921		
			1317			SPECIAL	69098100	1317	FT	(3)-#1 Cu, 15kV, XLP Ins. 133% w/ Cu TAPE SHIELD WITH (1)-#1 Cu, 600V NEUTRAL	922A		
			1245			SPECIAL	69098100	1245	FT	(3)-500kCMIL Cu, 15kV, XLP Ins. 133% w/ Cu TAPE SHIELD WITH (1)-350kCMIL Cu, 600V NEUTRAL	922A		

GENERAL SUMMARY

FRA - 70 / 71 - 12.68 / 14.86

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**ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS
(4W8, 4W20)**

PART 1 DESCRIPTION AND OBJECTIVES

1.1 PERFORMANCE CRITERIA

A. PROJECT DESCRIPTION: THE WORK SHALL CONSIST OF DESIGNING AND CONSTRUCTING COLUMN-SUPPORTED WALLS (CSW) IN THE INSTALLATION AREAS NOTED ON THE PLANS. THE CSW DESIGNER MUST DEMONSTRATE BY CALCULATIONS THAT THE CSW SYSTEMS SATISFY THE FOLLOWING REQUIREMENTS:

1. CSW MUST SATISFY THE FACTORED BEARING RESISTANCE REQUIREMENTS OF THE PLANNED EMBANKMENTS AND WALLS AT THE DESIGNATED BEARING LEVELS.
 - A. THE DESIGNATED BEARING LEVEL FOR MSE WALLS IS THE TOP OF THE LEVELING PAD/BASE OF THE SGB.
 - B. THE DESIGNATED BEARING LEVEL FOR THE EMBANKMENTS IS EXISTING GRADE.
2. GLOBAL AND LOCAL STABILITY OF CSW SYSTEMS SUPPORTING EMBANKMENTS AND WALLS MUST EXCEED 1.3 FOR BOTH SHORT-TERM AND LONG-TERM CONDITIONS.
3. GLOBAL AND LOCAL STABILITY OF CSW SYSTEMS SUPPORTING BRIDGES MUST EXCEED 1.5 FOR BOTH SHORT-TERM AND LONG-TERM CONDITIONS.
4. LATERAL SQUEEZE CALCULATIONS MUST DEMONSTRATE A MINIMUM FACTOR OF SAFETY OF 2.0
5. A LOAD TRANSFER PLATFORM SHALL BE PROVIDED, AS NECESSARY, TO LIMIT PENETRATION (PUNCHING) OF GROUND IMPROVEMENT ELEMENTS AND DIFFERENTIAL SETTLEMENT OF MSE WALLS AND EMBANKMENTS BETWEEN CSW ELEMENTS. IF A LOAD TRANSFER PLATFORM IS NOT REQUIRED, PROVIDE A 1-FOOT LAYER OF ODOT CMS ITEM 703.16.C.3 COMPACTED PER ITEM 203 TO SUPPORT MSE LEVELING PADS AND SELECT GRANULAR EMBANKMENT MATERIALS.
6. TOTAL SETTLEMENT OF CSW SYSTEM IS TO BE LIMITED TO 3 INCHES OR LESS OCCURRING WITHIN 30 DAYS AFTER THE SUPPORTED WALL REACHES FULL DESIGN HEIGHT (LESS COPING).
 - A. AN ADDITIONAL 0.5" OF SETTLEMENT AFTER THE 30 DAY WAITING PERIOD IS ACCEPTABLE. IN ADDITION, THE CONTRACTOR SHALL TAKE SURVEY SHOTS ALONG THE CENTERLINE OF CONSTRUCTION AT 50' INTERVALS ON THE EMBANKMENTS SUPPORTED BY CSW. THESE SHOTS SHALL BE TAKEN AT THE END OF THE 30 DAY WAITING PERIOD AND AGAIN 1 WEEK PRIOR TO BEGINNING PLACEMENT OF AGGREGATE BASE. THE SURVEY SHOTS SHALL BE PROVIDED TO THE DEPARTMENT AND WILL BE CONSIDERED INCIDENTAL TO THE CSW PAY ITEMS. THE SURVEY DATA WILL BE USED TO CALCULATE ANY ADDITIONAL EMBANKMENT OR AGGREGATE BASE NEEDED TO ACCOUNT FOR 1" OR LESS OF SETTLEMENT. PAYMENT FOR EMBANKMENT AND/OR AGGREGATE BASE NEEDED FOR SETTLEMENTS EXCEEDING 1" AT THE TIME OF PAVEMENT CONSTRUCTION WILL NOT BE MADE. THE CONTRACTOR WILL BE REQUIRED TO CONTINUE MONITORING THE SETTLEMENT UNTIL PROJECT CLOSE-OUT TO VERIFY THE MAXIMUM PERMISSIBLE SETTLEMENT IS NOT EXCEEDED. PAYMENT FOR CORRECTIVE REPAIRS NEEDED RESULTING FROM SETTLEMENT EXCEEDING 1" AFTER THE 30 DAY WAITING PERIOD WILL ALSO NOT BE MADE.
- B. WICK DRAINS MAY BE UTILIZED TO ACCELERATE THE TIME RATE OF SETTLEMENT.
7. MAXIMUM DIFFERENTIAL SETTLEMENT FOR CSW'S IN THE LONGITUDINAL DIRECTION (ALONG THE WALL FACING) IS 0.5% FOR CONVENTIONAL MSE FACING PANELS AND 1.0% FOR SLIP-JOINTED PANELS. MAXIMUM DIFFERENTIAL SETTLEMENT FOR CSW'S IN THE TRANSVERSE DIRECTION (PERPENDICULAR TO THE WALL FACING) IS 1%.
8. AT A MINIMUM, THE CONTRACTOR SHALL PROVIDE TWO SURVEY POINTS FOR EVERY 50 FEET ALONG THE EMBANKMENT ALIGNMENT, WITH ONE SURVEY POINT LOCATED ABOVE A COLUMN AND ONE SURVEY POINT LOCATED AT THE CENTROID OF A UNIT CELL FORMED BY THE CENTERS OF ADJACENT COLUMNS. DIFFERENTIAL SETTLEMENT BETWEEN UNIT CELL CENTROIDS AND ADJACENT CSW COLUMNS SHOULD NOT EXCEED *INCH.
9. THE CSW SYSTEM AND CONSTRUCTION PROCESSES SHALL NOT CAUSE ANY ADDITIONAL LOADING, DETRIMENTAL SETTLEMENT, OR DAMAGE TO ADJACENT FACILITIES, UTILITIES, OR EMBANKMENTS.

B. THE DESIGN CONCEPT OF THE CSW INVOLVES CONSTRUCTING A PATTERN OF COLUMNS USING AN ACCEPTED SOIL IMPROVEMENT TECHNIQUE OF TRADITIONAL DEEP FOUNDATION ELEMENTS. DESIGN THE CSW SYSTEM TO EFFICIENTLY DISTRIBUTE EMBANKMENT AND WALL LOADS PLUS SURCHARGE LIVE AND DEAD LOADS. THE TYPE, NUMBER OF COLUMNS, SPACING, DIAMETER AND DEPTH SHALL BE DETERMINED BY THE CSW CONTRACTOR AND CSW DESIGNER. COLUMNS SHALL NOT BE LOCATED AT PROPOSED STRUCTURE PILE LOCATIONS.

1. THE CSW SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH FHWA RECOMMENDATIONS. THE FOLLOWING VARIABLES ARE USED IN THE CRITERIA BELOW:

S = COLUMN CENTER-TO-CENTER SPACING,
 A = COLUMN WIDTH,
 H = EMBANKMENT HEIGHT,
 A(S) = AREA REPLACEMENT RATIO (COLUMN AREA DIVIDED BY COLUMN TRIBUTARY AREA),
 T = COMPETENT LAYER THICKNESS.

NOTE THAT A COMPETENT LAYER IS DEFINED AS N ==10 BLOWS/FT FOR SANDS AND AN UNDRAINED SHEAR STRENGTH, SU ==500 PSF FOR CLAYS. A CONSERVATIVE, LOW AVERAGE, OF THE COMPETENT SOIL THICKNESS, T, SHOULD BE USED IN THE CRITERIA BELOW:

AT A MINIMUM, THE FOLLOWING CRITERIA SHALL BE SATISFIED:

A. THE MAXIMUM CENTER-TO-CENTER COLUMN SPACING, S, IS GIVEN BY THE RELATIONSHIP BELOW:

$$S \leq \text{MINIMUM OF } (0.67H + a + 0.5) \text{ OR } (1.23H - 1.20 a)$$

B. THE MINIMUM THICKNESS OF SELECT FILL FOR THE BRIDGING LAYER (LOAD TRANSFER PLATFORM) SHALL BE THE LARGER OF 2 FT OR 0.5(S - A).

C. THE CSW DESIGN CONCEPT SHALL INCLUDE THE DESIGN OF LOAD TRANSFER PLATFORMS, INCLUDING SELECT FILL AND GENERAL EMBANKMENT FILL MATERIALS, NUMBER OF REINFORCEMENT LAYERS, TYPE OF REINFORCEMENT, AND PROPERTIES OF THE GEOSYNTHETIC REINFORCEMENT.

D. PRIOR TO SUBMITTING THE BID, THE CONTRACTOR AND CSW DESIGNER SHALL REVIEW THE AVAILABLE SUBSURFACE INFORMATION AND VISIT THE SITE TO ASSESS SITE GEOMETRY, CSW INSTALLATION METHOD VIABILITY, EQUIPMENT ACCESS CONDITIONS, AND LOCATION OF EXISTING STRUCTURES AND ABOVE GROUND UTILITIES AND FACILITIES.

1.2 GEOTECHNICAL ENGINEER'S DESIGN CRITERIA FOR CSW

THE PURPOSE OF THE SUBGRADE IMPROVEMENT IS TO PROVIDE SUPPORT FOR MSE WALL 4W8 & 4W20 AND SUPPORT EMBANKMENTS. IT IS ANTICIPATED THAT THE CSW COLUMNS WILL EXTEND THROUGH THE VARIABLE FILL AND ALLUVIAL SOILS AND BEAR IN THE UNDERLYING GLACIAL TILL LAYERS.

SEE SHEET **11/14** FOR DESIGN CRITERIA TABLE.

1.3 CSW COLUMN TYPES AND MATERIALS

A. CSW COLUMN TYPES MAY INCLUDE, BUT ARE NOT LIMITED TO:

1. STEEL H PILES
2. STEEL PIPE PILES
3. PRE-CAST CONCRETE PILES
4. CONTINUOUS FLIGHT AUGER PILES (A.K.A. AUGERCAST PILES)
5. AGGREGATE COLUMNS (A.K.A. STONE COLUMNS)
6. RIGID INCLUSIONS
7. VIBRO-CONCRETE COLUMNS (VCC)
8. CONTROLLED MODULUS COLUMNS (CMC)

PART 2 MINIMUM CONTRACTOR QUALIFICATIONS

- 2.1 THE CONTRACTOR CONSTRUCTING THE CSW SYSTEM SHALL HAVE A MINIMUM 5+ YEARS EXPERIENCE INSTALLING GEOSYNTHETIC REINFORCEMENT AND THE COLUMN TYPE SUBMITTED IN THE CONTRACTOR'S BID PROPOSAL.
- 2.2 THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR THREE RECENT, SUCCESSFUL PROJECTS COMPLETED WITH SIMILAR SITE CONDITIONS AND IMPROVEMENT CRITERIA. THE CONTRACTOR SHALL PROVIDE NAMES AND CONTACT INFORMATION OF INDIVIDUALS WHO CAN ATTEST TO THE ADEQUACY OF THE WORK PERFORMED. THIS INFORMATION SHALL BE SUBMITTED IN THE CONTRACTOR'S BID PROPOSAL.
- 2.3 THE CONTRACTOR MUST ASSIGN A MANAGER WHO HAS BEEN RESPONSIBLE FOR THE CSW WORK ON AT LEAST THREE (3) PROJECTS. THE PROJECT MANAGER SHALL HAVE BEEN IN FULL-TIME EMPLOYMENT OF THE CONTRACTOR FOR AT LEAST TWO OF THOSE PROJECTS (PROVIDE A LIST OF PROJECTS AND DATES IN BID PROPOSAL). A DESIGNER THAT IS A CONSULTANT ON THIS PROJECT CANNOT BE THE PROJECT MANAGER.
- 2.4 THE CSW SYSTEM SHALL BE DESIGNED BY THE DESIGNER, A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OHIO WITH EXPERIENCE IN THE DESIGN OF AT LEAST THREE SUCCESSFULLY COMPLETED CSW PROJECTS OVER THE PAST FIVE YEARS. THE DESIGNER MAY BE EITHER AN EMPLOYEE OF THE CONTRACTOR OR A SEPARATE CONSULTANT DESIGN ENGINEER MEETING THE STATED EXPERIENCE REQUIREMENTS.
- 2.5 THE CONTRACTOR MUST ASSIGN A FULL-TIME PROJECT SUPERINTENDENT WITH AT LEAST THREE (3) YEARS EXPERIENCE IN CSW CONSTRUCTION AND WHO HAS BEEN RESPONSIBLE FOR A MINIMUM OF THREE (3) CSW PROJECTS (PROVIDE A LIST OF PROJECTS AND DATES IN BID PROPOSAL).
- 2.6 WRITTEN REQUESTS FOR SUBSTITUTION OF THESE KEY PERSONNEL MUST BE SUBMITTED PRIOR TO PERSONNEL CHANGES. DOCUMENTATION MUST BE SUBMITTED TO THE ENGINEER THAT DEMONSTRATES THAT THE SUBSTITUTE MEETS THE REQUIREMENTS LISTED ABOVE.

REFERENCES:

- A. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020, AND CONSTRUCTION SPECIFICATIONS, 4TH EDITION, 2017, WITH 2020 INTERIMS.
- B. FHWA NHI-16-027 AND 028, FHWA GEC 013 GROUND IMPROVEMENT METHODS: REFERENCE MANUAL VOLUMES I & II, APRIL 2017.
- C. FHWA-NHI-16-009, FHWA GEC 012: DESIGN AND CONSTRUCTION OF DRIVEN PILE FOUNDATIONS VOLUMES I & II, 2016.
- D. FHWA-RD-83-026 DESIGN AND CONSTRUCTION OF STONE COLUMNS, VOL. 1.
- E. FHWA NHI-06-089 SOILS AND FOUNDATIONS REFERENCE MANUAL VOLUMES I & II, 2006.
- F. FHWA GEC NO. 8 DESIGN AND CONSTRUCTION OF CONTINUOUS FLIGHT AUGER PILES, 2007.
- G. ASTM D 6637 STANDARD TEST METHOD FOR DETERMINING TENSILE PROPERTIES OF GEOGRIDS BY THE SINGLE OR MULTI-RIB TENSILE METHOD.
- H. ASTM D 4595 STANDARD TEST METHOD FOR TENSILE PROPERTIES OF GEOTEXTILES BY THE WIDE-WIDTH STRIP METHOD
- I. ASTM 5262 STANDARD TEST METHOD FOR EVALUATING THE UNCONFINED TENSION CREEP AND RUPTURE BEHAVIOR OF GEOSYNTHETICS



NO.	DESCRIPTION	REV. BY	DATE
1	REVISED NOTE	MOJ	11-5-2021
10	REVISED NOTE	MOJ	12-14-2021

DESIGN AGENCY
GPD GROUP
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RETAINING WALL GENERAL NOTES

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**ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS
(4W8, 4W20) (CONTINUED)**

PART 3 - EQUIPMENT

- 3.1 THE EQUIPMENT REQUIRED FOR COLUMN INSTALLATION WILL VARY DEPENDING ON THE COLUMN TYPE. EQUIPMENT FOR COLUMN INSTALLATION SHOULD MEET FHWA CRITERIA FOR THE TYPE OF COLUMN SELECTED.
- 3.2 EQUIPMENT FOR FILL AND GEOSYNTHETIC PLACEMENT SHALL NOT CAUSE EXCESSIVE LOADS OR SETTLEMENT TO THE SOFT GROUND BETWEEN COLUMNS.

PART 4 - LOAD TRANSFER PLATFORM (LTP) MATERIALS

- 4.1 LTP SELECT FILL SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIZE	% PASSING
4-INCH	100
NO. 4	15 - 70
NO. 40	10 - 60
NO. 200	5 - 15

- 4.2 THE SELECT FILL SHALL ALSO HAVE:

$$CC = \frac{D(30)^2}{D(60) \times D(10)} = 1 \text{ TO } 3$$

$$CU = \frac{D(60)}{D(10)} > 4$$

WHERE: CC = COEFFICIENT OF CURVATURE
CU = COEFFICIENT OF UNIFORMITY
D(10) = DIAMETER SIZE AT 10% PASSING
D(30) = DIAMETER SIZE AT 30% PASSING
AND, D(60) = DIAMETER SIZE AT 60% PASSING

- 4.3 SELECT FILL PASSING THE NO. 40 SIEVE SHALL HAVE A LIQUID LIMIT LESS THAN 40 AND A PLASTICITY INDEX LESS THAN 20.
- 4.4 THE ALLOWABLE STRENGTH OF THE GEOSYNTHETIC T(A) MUST BE EQUAL OF GREATER THAN THE REQUIRED STRENGTH T(G). ALLOWABLE TENSILE STRENGTH T(A) OF THE GEOSYNTHETIC SHALL BE DETERMINED USING A REDUCTION FACTOR APPROACH TO ACCOUNT FOR CREEP RUPTURE STRENGTH AND DEGRADATION MECHANISMS OF THE REINFORCEMENT. THE ALLOWABLE LONG-TERM GEOSYNTHETIC DESIGN TENSILE STRENGTH T(A) IS:

$$T(G) \leq T(A) = \frac{T(ULT)}{RF(D) \times RD(D) \times RF(CR) \times FS(UNC)}$$

WHERE:

T(G) = REQUIRED STRENGTH OF GEOSYNTHETIC,
T(A) = ALLOWABLE TENSILE STRENGTH OF GEOSYNTHETIC,
T(ULT) = ULTIMATE TENSILE STRENGTH FROM SINGLE OR MULTI-RIB TENSILE STRENGTH TESTS (ASTM D6637) FOR GEOGRIDS OR WIDE WIDTH TENSILE STRENGTH TESTS (ASTM D4595) FOR GEOTEXTILES,
RD(D) = DURABILITY REDUCTION FACTOR IS DEPENDENT ON THE SUSCEPTIBILITY OF THE GEOSYNTHETIC TO ATTACK BY MICROORGANISMS, CHEMICALS, THERMAL OXIDATION, HYDROLYSIS AND STRESS CRACKING. THE TYPICAL RANGE IS FROM 1.1 TO 2.0.
RF(D) = INSTALLATION DAMAGE REDUCTION FACTOR CAN RANGE FROM 1.05 TO 3.0, DEPENDING ON BACKFILL GRADATION AND PRODUCT MASS PER UNIT WEIGHT.
RF(CR) = CREEP REDUCTION FACTOR IS THE RATION OF THE ULTIMATE STRENGTH T(ULT) TO THE CREEP LIMITED STRENGTH OBTAINED FROM LABORATORY CREEP TESTS FOR EACH PRODUCT, AND CAN VARY TYPICALLY FROM 1.65 TO 5.0.
FS(UNC) = OVERALL FACTOR OF SAFETY OR LOAD FACTOR REDUCTION TO ACCOUNT FOR UNCERTAINTIES IN THE GEOMETRY OF THE STRUCTURE, FILL PROPERTIES, REINFORCEMENT PROPERTIES, AND EXTERNALLY APPLIED LOADS. FOR LOAD TRANSFER PLATFORMS, A MINIMUM OVERALL FACTOR OF SAFETY OF 1.5 IS TYPICAL.

THE SPECIFIC VALUES FOR THE REDUCTION FACTORS (RDF, RFID, RFCR) USED IN DESIGN SHALL BE THOSE ESTABLISHED BY THE NATIONAL TRANSPORTATION PRODUCT EVALUATION PROGRAM (NTPEP) AND CAN BE FOUND ONLINE AT:

[HTTP://NTPEP.ORG/CONTENTMANAGEMENT/PAGEBOY.ASP?PAGE_ID=26](http://ntpep.org/contentmanagement/pageboy.asp?page_id=26)

IF NTPEP REDUCTION FACTORS ARE NOT AVAILABLE FOR THE MANUFACTURER AND TYPE OF GEOSYNTHETIC PROPOSED BY THE DESIGNER, THEN THE VALUES USED SHALL BE THOSE RECOMMENDED BY THE GEOSYNTHETIC MANUFACTURER, SUPPORTED BY LABORATORY TESTING AND AS APPROVED BY THE ENGINEER.

- 4.5 IN ADDITION TO THE LONG TERM ALLOWABLE STRENGTH REQUIREMENT, THERE IS A SERVICEABILITY REQUIREMENT. FOR SERVICEABILITY, THE GEOSYNTHETIC MUST HAVE A CREEP LIMITED STRENGTH AT A STRAIN OF 5% ACCORDING TO ASTM D 5262 THAT IS EQUAL TO OR GREATER THAN THE REQUIRED STRENGTH T(G).

PART 5 - SUBMITTALS

- 5.1 FOLLOWING AWARD OF THE CONTRACT AND PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT DESIGNER-APPROVED DETAILS, SPECIFICATIONS, DRAWINGS, CONSTRUCTION SEQUENCES, DESIGN CALCULATIONS, QUALITY CONTROL PLAN, MONITORING PLAN, AND ANY OTHER REQUIRED INFORMATION FOR THE COLUMN-SUPPORTED WALL SYSTEM. THE ENGINEER SHALL REVIEW THE SUBMITTAL ITEMS FOR CONFORMANCE WITH THE PERFORMANCE SPECIFICATION. THE CONTRACTOR SHALL ALLOW A MINIMUM OF 30 DAYS FOR THE REVIEW OF THE INITIAL SUBMISSION AND SHALL ALSO ACCOUNT FOR THE SUBSEQUENT REVIEW AND ACCEPTANCE PROCESS WHICH WILL DEPEND ON THE ACCURACY AND QUALITY OF THE SUBMISSION DOCUMENTS.

- 5.2 THE FOLLOWING SHALL BE SUBMITTED TO THE ENGINEER AT LEAST 30 DAYS PRIOR TO BEGINNING WORK:

- A. PROPOSED CSW CONSTRUCTION SEQUENCE AND SCHEDULE.
- B. WORKING DRAWINGS AND DESIGN TO THE ENGINEER FOR REVIEW PRIOR TO STARTING THE WORK INDICATING THE EMBANKMENT DETAILS (MATERIAL TYPES, ELEVATIONS, GEOSYNTHETIC REINFORCEMENT, ETC.). COLUMN TYPE, COLUMN LAYOUT, COLUMN SIZE, SPACING OF COLUMNS, COLUMN TOP ELEVATIONS, AND THE DEPTH OF COLUMNS AS PROPOSED TO ACHIEVE THE CRITERIA OUTLINED IN THIS SPECIFICATION AND THE CONTRACT PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL LINES AND GRADES FOR COLUMNS, INCLUDING LOCATIONS OF ALL UTILITIES AND SURVEY MARKERS.
- C. A CSW DEMONSTRATION COLUMN/LOAD TESTING PROGRAM TO DEMONSTRATE INSTALLATION TECHNIQUES AND COMPLIANCE WITH THE PERFORMANCE CRITERIA. THE LOAD TEST PROGRAM SHALL INCLUDE THE INSTALLATION OF ONE OR MORE TYPICAL COLUMNS OF THE SIZE, TYPE AND SPACING SPECIFIED BY THE CSW DESIGNER IN EACH STABILIZED ZONE IDENTIFIED IN DESIGN CRITERIA TABLE ON SHEET 708 AND PLAN SHEETS 810, 884, & 885. THE CSW DESIGNER SHALL PERSCRIBE A LOAD TEST PROCEDURE FOR MEASURING THE PERFORMANCE OF THE CSE ELEMENTS (I.E. ASTM D1143 PROCEDURES FOR PILE ELEMENTS), SUBJECT TO ACCEPTANCE BY THE ENGINEER. THE TEST PROGRAM SHALL INCLUDE AT A MINIMUM:

1. MEASURE VERTICAL SURFACE DEFLECTIONS BOTH OVER THE TEST COLUMN BY A SUITABLE METHOD.

2. COLUMNS SHALL HAVE SUFFICIENT STRENGTH AND STIFFNESS TO SATISFY BEARING CAPACITY AT 150 PERCENT OF THE DESIGN STRESS AND TO SATISFY SETTLEMENT CRITERIA IN SECTION 1.1 (PERFORMANCE CRITERIA) AT 100 PERCENT OF THE DESIGN STRESS.

- A. IN THE EVENT THAT TEST COLUMNS FAIL TO COMPLY WITH THE DESIGN REQUIREMENTS, CONTRACTOR SHALL INSTALL ADDITIONAL TEST COLUMNS AND CONDUCT ADDITIONAL TESTS AT NO COST TO THE DEPARTMENT.

3. ANY PLANNED DEVIATIONS FROM THE ABOVE DESCRIBED LOAD TEST PROCEDURE MUST BE DESCRIBED IN THE CONTRACTOR'S DESIGN SUBMITTAL, APPROVED BY THE DESIGNER, AND ACCEPTED BY THE ENGINEER.

4. CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS FOR THE LOAD TEST REACTION ELEMENTS INCLUDING DIAMETER, TYPE, REINFORCEMENT, DEPTH AS WELL AS THE REACTION FRAME AND BEAMS FOR REVIEW BY THE ENGINEER. THE CONTRACTOR SHALL DESIGN THE REACTION PILES AND FRAME FOR MINIMUM ONE AND HALF TIMES THE MAXIMUM TEST LOAD. ALL SHOP DRAWINGS AND SUPPORTING SHOP DRAWINGS CALCULATIONS SHALL BE SIGNED AND SEALED BY PROFESSIONAL ENGINEER.

5. SUBMIT CALIBRATION RECORDS FOR LOAD CELLS, HYDRAULIC JACKS, PUMPS AND PRESSURE GAUGES AT LEAST 7 DAYS PRIOR TO PERFORMING THE LOAD TESTS.

6. SUBMIT THE FOLLOWING TO THE ENGINEER AFTER THE LOAD TESTS ARE COMPLETED:

- A. A REPORT DOCUMENTING THE OBSERVATIONS AND RESULTS OF ALL TESTS. THE REPORT WILL CERTIFY THAT THE REQUIRED BEARING RESISTANCE HAS BEEN ACHIEVED WITHIN THE SETTLEMENT TOLERANCES AS DETAILED IN SECTION 1.1 (PERFORMANCE CRITERIA).

- B. AS-BUILT DRAWINGS INDICATING THE LOCATION, DIAMETER, TOP AND BOTTOM ELEVATIONS, AND IDENTIFICATION NUMBER FOR EACH CSW COLUMN.

7. CSW COLUMN PRODUCTION SHALL ONLY START UPON COMPLETION OF TWO LOAD TESTS AND AFTER THE ENGINEER ACCEPTS THE CSW DESIGNER'S FINAL TIP ELEVATION, INSTALLATION CRITERIA, AND SPACING OF COLUMNS.

- D. LOAD TRANSFER PLATFORM SUBMITTALS

1. GRADATION, ATTERBERG LIMITS, AND THE RESULTING ODOT/AASHTO CLASSIFICATION FOR ALL FILL MATERIALS USED.

2. THE CONTRACTOR SHALL SUBMIT A CERTIFICATE STATING THAT THE GEOSYNTHETIC REINFORCEMENT MEETS THE DESIGN REQUIREMENTS FOR ULTIMATE STRENGTH, CREEP, DURABILITY, INSTALLATION DAMAGE, AND COEFFICIENT OF INTERACTION FOR SLIDING IN ACCORDANCE WITH THE DESIGN SUBMITTAL.

- E. A DETAILED WRITTEN PROCEDURE OF PLANS TO PROTECT ADJACENT FACILITIES AND EMBANKMENTS FROM DAMAGE, INCLUDING DESIGN CALCULATIONS. ADJACENT EXISTING STRUCTURES AND PAVEMENT MUST REMAIN IN SERVICE AT ALL TIMES, EXCEPT WHEN CLOSED PER MOT REQUIREMENTS.

- 5.3 ACCEPTANCE OF THE PROPOSED DESIGN AND CONSTRUCTION METHODOLOGIES SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE SAFETY OF THE METHOD OR EQUIPMENT USED OR THE RESPONSIBILITY OF CARRYING OUT THE WORK IN FULL ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

- 5.4 THE CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS TO THE ENGINEER NO-LATER-THAN 30 DAYS FOLLOWING COMPLETION OF CONSTRUCTION.

PART 6 SPOIL HANDLING REQUIREMENTS

- 6.1 MAINTAIN RECORDS (SUCH AS MANIFESTS, LANDFILL TICKETS, DAILY LOGS, ETC.) TO DOCUMENT THE SOURCE, MOVEMENT AND DESTINATION OF EACH TRUCKLOAD OF SOLID WASTE OR REGULATED MATERIAL. ALL TRANSPORT VEHICLES USED FOR THE MOVEMENT OF REGULATED MATERIALS SHALL MEET ALL APPLICABLE LOCAL, STATE AND FEDERAL REQUIREMENTS. ONE COPY OF EACH RECORD SHALL BE SUBMITTED TO THE ENGINEER.

PART 7 CSW CONSTRUCTION AND QC / QA REQUIREMENTS

- 7.1 PRE-CONSTRUCTION MEETING: A PRE-CONSTRUCTION MEETING SHALL BE HELD AMONG THE ENGINEER, CONTRACTOR, AND DESIGNER PRIOR TO MOBILIZING EQUIPMENT TO THE PROJECT SITE. AT THE MEETING, THE COLUMN INSTALLATION MEANS/METHODS, OBSERVATION, ACCEPTANCE/REJECTION PROCEDURES, TESTING AND CSW CONSTRUCTION PROCEDURES SHALL BE DISCUSSED AND FORMALIZED.

7.2 WORKING DRAWINGS

- A. THE CONTRACTOR SHALL PROVIDE WORKING DRAWINGS WHICH SHALL SHOW THE LOCATION OF EACH COLUMN, AS WELL AS THE TOP AND BOTTOM ELEVATIONS. EACH COLUMN SHALL BE IDENTIFIED WITH A REFERENCE NUMBER.

- B. THE WORKING DRAWINGS SHALL ALSO PROVIDE DETAIL ON THE SELECT FILL, GEOSYNTHETIC REINFORCEMENT, AND GENERAL EMBANKMENT FILL. A DESIGNER-APPROVED SET OF WORKING DRAWINGS AND CONTRACT SPECIFICATIONS SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION OF THE LOAD TRANSFER PLATFORM.

7.3 SITE PREPARATION

- A. THE CONTRACTOR SHALL ENSURE A FIRM WORKING PLATFORM ON WHICH HEAVY EQUIPMENT CAN BE OPERATED SAFELY UNDER ITS OWN POWER. THE WORK PLATFORM MUST COMPLY WITH ITEM 203.

- B. THE CONTRACTOR SHALL ACCURATELY LOCATE THE LIMITS OF COLUMN INSTALLATION AND EMBANKMENT EXTENTS IN ACCORDANCE WITH THE CONTRACT PLANS.

- C. THE CONTRACTOR SHALL EXERCISE CAUTION TO AVOID SETTLEMENT OR DAMAGE TO EXISTING FACILITIES AND SETTLEMENT, UNDERMINING, OR INSTABILITY TO EXISTING EMBANKMENTS.

- D. STABILITY OF ALL THE TEMPORARY SHEETING AND/OR TEMPORARY SLOPES, IF USED TO FACILITATE INSTALLATION OF THE COLUMNS IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY HIS ACTIVITIES AT NO ADDITIONAL COST TO THE DEPARTMENT.

- E. THE CONTRACTOR SHALL EXERCISE CAUTION AND ACCOUNT FOR THE TEMPORARY INSTABILITY THAT MAY BE CAUSED BY GROUND IMPROVEMENT (IF USED) UNTIL THE GROUND IMPROVEMENT FEATURES GAIN STRENGTH WITH TIME.

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RETAINING WALL GENERAL NOTES
 DESIGN AGENCY: **GPD GROUP**
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**ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS
(4W8, 4W20) (CONTINUED)**

7.4 CSW COLUMN TOLERANCES

A. THE CSW DESIGNER SHALL SPECIFY IN THE CONTRACTOR'S SUBMITTAL THE ALLOWABLE TOLERANCES FOR:

1. COLUMN VERTICALITY
2. HORIZONTAL TOLERANCE FROM PLAN LOCATION.
3. VERTICAL TOLERANCE FROM COLUMN TOP.
4. ACCEPTABLE CONDITION OF COLUMN TOPS PRIOR TO INSTALLATION OF LOAD TRANSFER PLATFORM.
5. MINIMUM COLUMN DIMENSIONS.
6. COLUMN OVERLAP REQUIREMENTS, IF APPLICABLE.
7. MINIMUM STRENGTH REQUIREMENTS OF COLUMN MATERIALS.
8. MATERIAL PROPERTIES, AS INCORPORATED INTO THE COLUMNS.
9. OTHER ITEMS, AS REQUIRED PER ODOT CMS.

B. BEFORE BEGINNING INSTALLATION, THE CONTRACTOR SHOULD ACCURATELY STAKE THE LOCATION OF THE CSW COLUMNS USING A LICENSED SURVEYOR. THE CONTRACTOR SHOULD PROVIDE AN ADEQUATE METHOD FOR LOCATING ELEMENTS TO ALLOW THE ENGINEER TO VERIFY THE AS-BUILT LOCATION OF THE ELEMENTS DURING CONSTRUCTION. THE CONTRACTOR WILL NOT BE COMPENSATED FOR ELEMENTS THAT ARE LOCATED OUTSIDE OF THE SPECIFIED TOLERANCES. IF THE ENGINEER DETERMINES THAT MISALIGNED ELEMENTS WILL INTERFERE WITH CONSTRUCTION, A METHOD OF CORRECTION SHOULD BE PREPARED BY THE CSW DESIGNER AND SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND ACCEPTANCE.

C. COLUMN ELEMENTS INSTALLED BEYOND THE MAXIMUM ALLOWABLE TOLERANCES SHALL BE ABANDONED AND REPLACED WITH NEW COLUMNS, UNLESS THE DESIGNER APPROVES THE CONDITION OR PRESCRIBES OTHER REMEDIAL MEASURES TO BE COMPLETED BY CONTRACTOR AND CSW DESIGNER. ALL MATERIAL AND LABOR REQUIRED TO REPLACE OR REMEDY REJECTED COLUMNS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE DEPARTMENT. REMEDIAL MEASURES MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE.

7.5 AS-BUILT COLUMN INSTALLATION RECORDS: THE CONTRACTOR MUST SUBMIT AS-BUILT FIELD MEASUREMENT DATA INDICATING SURVEYED AS-BUILT PLAN LOCATIONS OF EACH CSW ELEMENT, INCLUDING THE ELEMENT CENTER (PER SITE SPECIFIC COORDINATES), THE ELEMENT DIMENSION, THE COLUMN VERTICALITY, AND THE TOP AND BOTTOM ELEVATIONS OF EACH ELEMENT TO THE ACCURACY REQUIRED BY THE PROJECT SPECIFICATIONS. THE AS-BUILT DOCUMENTATION MUST BE APPROVED BY THE DESIGNER AND SUBMITTED TO THE ENGINEER NO LATER THAN 90 DAYS AFTER THE COMPLETION OF EACH CSW-STABILIZED ZONE. A DISINCENTIVE OF \$300.00 PER DAY WILL BE ASSESSED FOR EACH DAY BEYOND 90 DAYS THAT THE COMPLETED AS-BUILT DRAWINGS ARE NOT SUBMITTED TO THE ENGINEER.

7.6 SELECT FILL PLACEMENT AND QA/QC REQUIREMENTS (LOAD TRANSFER PLATFORMS)

A. NO GEOSYNTHETIC REINFORCEMENT OR FILL MATERIALS SHALL BE PLACED PRIOR TO SATISFYING THE COLUMN PERFORMANCE CRITERIA, UNLESS THE FILL MATERIAL IS REQUIRED AS A WORKING PLATFORM FOR COLUMN INSTALLATION.

B. INSTRUMENTATION FOR PERFORMANCE MEASUREMENTS AND INSTRUMENTATION FOR MONITORING OF EXISTING STRUCTURES AND EMBANKMENTS SHALL BE INSTALLED PRIOR TO PLACEMENT OF ANY SELECT FILL OR GEOSYNTHETIC REINFORCEMENT.

C. PRIOR TO CONSTRUCTION OF THE LOAD TRANSFER PLATFORM, THE CONTRACTOR SHALL PREPARE SUBGRADE, AND REMOVE ANY DELETERIOUS MATERIALS SUCH AS TREE ROOTS. THE FOUNDATION SOIL SHALL BE OBSERVED AND APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF SELECT REINFORCED FILL.

D. IF CEMENTITIOUS GROUND IMPROVEMENT METHODS ARE USED, PLACEMENT OF FILL MATERIAL SHALL NOT START UNTIL THE COLUMNS HAVE GAINED ADEQUATE STRENGTH TO SUPPORT THE FILL MATERIALS AND FILL INSTALLATION AND CONSTRUCTION EQUIPMENT.

E. SELECT REINFORCED FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 10 IN. IN UNCOMPACTED THICKNESS FOR HEAVY COMPACTION EQUIPMENT. FOR ZONES WHERE COMPACTION IS ACCOMPLISHED WITH HAND-OPERATED COMPACTION EQUIPMENT, FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 6 IN. IN UNCOMPACTED THICKNESS.

F. SELECT REINFORCED FILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH ITEM 203. THIS MAY NOT BE ACHIEVABLE FOR THE FIRST LIFT OF FILL BECAUSE OF THE WEAK SUBGRADE BETWEEN COLUMNS, HOWEVER, SUBSEQUENT LIFTS SHOULD MEET THE MINIMUM REQUIREMENTS.

G. TEST METHODS AND FREQUENCY, AND VERIFICATION OF MATERIAL SPECIFICATIONS AND COMPACTION, SHALL BE THE RESPONSIBILITY OF THE STATE.

7.7 GEOSYNTHETIC REINFORCEMENT PLACEMENT AND QA/QC REQUIREMENTS

A. PLACE REINFORCEMENT AT THE LOCATIONS AND ELEVATION SHOWN ON THE CONTRACTOR'S WORKING DRAWINGS. NO CHANGES TO THE GEOSYNTHETIC REINFORCEMENT LAYOUT, INCLUDING, BUT NOT LIMITED TO LENGTH, REINFORCEMENT TYPE (I.E., STRENGTH), DIRECTION OF REINFORCEMENT, OR ELEVATION SHALL BE MADE WITHOUT THE EXPLICIT WRITTEN APPROVAL OF THE DESIGNER. CONTRACTOR SHALL SUBMIT THE CHANGES TO THE ENGINEER FOR ACCEPTANCE.

B. CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOSYNTHETIC REINFORCEMENT. A MINIMUM FILL THICKNESS OF 150 MM (6 IN.) IS REQUIRED FOR OPERATION OF VEHICLES OVER THE REINFORCEMENT. TURNING OF VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS OR TIRES FROM DISPLACING THE FILL AND/OR GEOSYNTHETIC REINFORCEMENT.

C. MINIMUM OVERLAP OF ADJACENT ROLLS OF REINFORCEMENT SHALL BE AS INDICATED BY THE DESIGNER OF THE CONTRACTOR'S WORKING DRAWINGS.

D. EACH ROLL OF GEOSYNTHETIC REINFORCEMENT SHOULD BE INSPECTED BY THE CONTRACTOR TO ENSURE THAT IT IS UNDAMAGED PRIOR TO COVERING WITH FILL MATERIAL.

E. CARE SHALL BE TAKEN TO PREVENT EXCESSIVE MUD, WET CONCRETE, EPOXY, OR OTHER DELETERIOUS MATERIALS FROM COMING IN CONTACT WITH AND AFFIXING TO THE GEOGRID MATERIALS.

F. GEOSYNTHETIC REINFORCEMENT SHALL BE STORED AT TEMPERATURES ABOVE -20 DEGREES F (- 29 DEGREES C).

G. GEOSYNTHETIC REINFORCEMENT SHALL NOT BE LEFT DIRECTLY EXPOSED TO SUNLIGHT FOR A PERIOD LONGER THAN RECOMMENDED BY THE MANUFACTURER OR ONE MONTH WHICHEVER IS SHORTER.

H. ANY ROLL OR PORTION OF A ROLL OF GEOSYNTHETIC DAMAGED BEFORE, DURING, AND/OR AFTER INSTALLATION SHALL BE REPLACED BY THE CONTRACTOR.

I. LARGE PILES OF FILL MATERIAL SHALL NOT BE PLACED ON THE GEOSYNTHETIC REINFORCEMENT.

J. IF GEOTEXTILE SEAMS ARE SPECIFIED, THE SEAMS SHOULD BE PLACED UP AND EVERY STITCH SHOULD BE INSPECTED.

K. THE CONTRACTOR SHALL REMOVE SLACK AND WRINKLES FROM THE GEOSYNTHETIC PRIOR TO PLACING FILL.

L. THE CONTRACTOR SHALL SUBMIT THE LOT NUMBERS AND ROLL NUMBERS ALONG WITH THEIR LOCATIONS WITHIN THE EMBANKMENT FOR ALL GEOSYNTHETIC REINFORCEMENT.

PART 8 POST-INSTALLATION PERFORMANCE MONITORING INSTRUMENTATION

8.1 POST-INSTALLATION PERFORMANCE MONITORING INSTRUMENTATION: TEN (10) SETS OF CSW PERFORMANCE MONITORING INSTRUMENTATION SHALL BE INSTALLED. THIS INSTRUMENTATION WILL BE PLACED TO MONITOR THE PERFORMANCE OF THE CSW SYSTEM AFTER IT HAS BEEN SUCCESSFULLY CONSTRUCTED AND IS SUBJECT TO THE CONSTRUCTION LOADING AND SUBSEQUENT SERVICE LOADING. THE INSTALLATION MAY BE PERFORMED BY THE PRIME CONTRACTOR, THE CONTRACTOR, OR AN INSTRUMENTATION SUBCONTRACTOR OR CONSULTANT (OR IN WHOLE OR IN PART BY COMBINATIONS THEREOF). IMPORTANT NOTE: IN THE EVENT THAT THIS QA MONITORING WORK IS NOT TO BE COORDINATED OR PERFORMED BY THE CSW CONTRACTOR, THE CSW CONTRACTOR SHALL BE REQUIRED TO SPECIFICALLY COORDINATE THIS WORK AND SUBMIT A WORK PLAN TO THE ENGINEER PRIOR TO INITIATING THE CSW WORK.

A. THE INSTRUMENT SHALL BE INSTALLED AS DESCRIBED IN THE FOLLOWING SUBSECTIONS, IN AREAS TO BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER SUCH THAT CONSTRUCTION INTERFERENCE AND THE POTENTIAL FOR DAMAGE IS MINIMIZED. THE INSTALLATIONS SHALL ALSO BE PLACED SUCH THAT DATA MAY CONTINUE TO BE ACQUIRED ONCE THE FACILITY HAS BEEN PLACED IN SERVICE. DETAILS OF THE EXACT INSTALLATION LOCATIONS WILL BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.

B. MINIMUM INSTRUMENTATION PROVIDED BY THE CONTRACTOR IS TO CONSIST OF:

1. SLOPE INCLINOMETERS CASTINGS INSTALLED OUTSIDE OF AND IMMEDIATELY ADJACENT TO THE CSE/CSW STABILIZATION ZONE. THE INCLINOMETERS ARE INTENDED TO MONITOR POTENTIAL GROUND MOVEMENTS WITH THE ROGUE MATERIALS ADJACENT TO THE STABILIZED ZONE. THE CONTRACTOR WILL ALSO SELF-PERFORM OR RETAIN A CONSULTANT TO OBTAIN INCLINOMETER READINGS DURING THE REQUIRED MONITORING PERIOD.

2. SETTLEMENT PLATES, TO BE INSTALLED ON TOP OF THE LOAD/TRANSFER PLATFORM.

3. PIEZOMETERS TO MONITOR PORE PRESSURES BENEATH THE MSE WALLS AND EMBANKMENTS IN THE STABILIZED ZONE.

C. CONTRACTOR SHALL INSTRUMENTATION DATA FROM THE TIME OF INSTALLATION (END OF CSW CONSTRUCTION) UNTIL 30 DAYS AFTER THE WALLS REACH THEIR FINAL PLAN ELEVATION (LESS COPING AND PAVEMENTS). READINGS SHALL BE TAKEN TWICE WEEKLY DURING WALL AND EMBANKMENT FILL PLACEMENT AND AT INTERVALS NOT TO EXCEED 15 CALENDAR DAYS AT OTHER TIMES. DATA FROM ALL SENSORS SHALL BE READ IN A UNIFORM MANNER, SUCH THAT ALL DATA IS TAKEN WITHIN A 2-DAY PERIOD AT THE 15 (OR 30) DAY INTERVALS TO AID IN THE EVALUATION OF THE DATA AND SUBSEQUENT PRESENTATION OF RESULTS.

D. IF THE WALLS SUPPORTED OVER THE CSW ELEMENTS HAVE COMPLETED SETTLEMENT IN ACCORDANCE WITH THE PERFORMANCE CRITERIA WITHIN 30 DAYS OF SUBSTANTIAL WALL COMPLETION AS DEFINED IN 7.1.C ABOVE, THE CONTRACTOR MAY TURN OVER FURTHER MONITORING OF THE DATA TO THE DEPARTMENT. IF THE WALLS HAVE NOT COMPLETED SETTLEMENT IN ACCORDANCE WITH THE DESIGN CRITERIA, THE CONTRACTOR SHALL CONTINUE MONITORING EFFORTS (AT NO ADDITIONAL COST TO THE DEPARTMENT) AS DIRECTED BY THE ENGINEER.

E. INSTRUMENTATION SHALL BE INSTALLED AFTER THE CONSTRUCTION OF THE CSW ELEMENTS WITHIN THE IN-SITU SOILS AND PRIOR TO MSE WALL CONSTRUCTION OR EMBANKMENT FILL PLACEMENT. A MINIMUM OF 2 SETS OF BASELINE READINGS SHALL BE TAKEN AND CONFIRMED PRIOR TO THE CONSTRUCTION OF ELEMENTS ABOVE THE INSTALLED CSW CONSTRUCTION.

F. INSTRUMENTATION SHALL BE ELECTRONIC AND SELF-RECORDING, WHERE PRACTICAL. READINGS FROM SENSORS SHALL BE TAKEN WITH AUTOMATED DATA COLLECTION SYSTEMS. ANY PARTICULAR INSTRUMENT TYPE SHALL BE OBTAINED FROM THE SAME MANUFACTURER TO MINIMIZE POTENTIAL INCOMPATIBILITIES AND ERRORS. DATA ACQUISITION DEVICES (DATA LOGGERS) SHALL BE OF A TYPE COMPATIBLE WITH EACH TYPE OF INSTRUMENTATION AND RECOMMENDED BY THE MANUFACTURER.

G. INSTRUMENTATION SHALL BE PROVIDED WITH CALIBRATION CERTIFICATES FROM THE MANUFACTURER, AS APPROPRIATE.

H. ALL INSTRUMENTATION AND ASSOCIATED MONITORING AND DATA COLLECTION DEVICES (PROBES, CABLES, DATA COLLECTORS, ETC.) BECOME THE PROPERTY OF THE DEPARTMENT AT THE END OF THE MONITORING PERIOD. ELECTRONIC FILES AND ALL DATA REPORTS SHALL BE PROVIDED TO THE DEPARTMENT AT THE END OF THE MONITORING PERIOD.

I. THE DEPARTMENT RESERVES THE RIGHT TO PUBLISH THE INFORMATION FROM THE MONITORING INVESTIGATION IN INTERNAL AND EXTERNAL TECHNICAL PUBLICATIONS.

J. THE PERFORMANCE MONITORING INSTRUMENTATION AND ASSOCIATED DATA COLLECTION AND ANALYSIS SHALL NEITHER BE USED AS A BASIS OF PAYMENT NOR AS A PERFORMANCE CRITERIA FOR THE DETERMINATION OF SUCCESSFUL INSTALLATION OF THE CSW APPLICATION.

K. INSTRUMENTS SHALL MEET ACCEPTED INDUSTRY STANDARDS AND HAVE AN ACCURACY OF +/- 0.5% WITH A MINIMUM PRECISION OF +/- 0.5% OF FULL SCALE (SPAN).

L. INSTRUMENTS SHALL HAVE APPROPRIATE RUGGEDNESS TO SURVIVE INSTALLATION AND CONSTRUCTION PROCESSES SUCH THAT THEY READ WITH THE MINIMUM PRECISION AND ACCURACY OVER THE DURATION OF CONSTRUCTION AND A MINIMUM OF EIGHTEEN (18) MONTHS OF SERVICE FOLLOWING CONSTRUCTION.

M. INSTRUMENTATION SHALL HAVE AN OPERATING TEMPERATURE RANGE AS APPROPRIATE FOR CONDITIONS ANTICIPATED WHERE INSTALLED (I.E. WITHIN OR ABOVE A CSW ELEMENT).

N. CABLING TO EACH SENSOR (REQUIRING CABLING) SHALL BE INCLUDED SUCH THAT DATA MAY BE OBTAINED AT ALL PHASES OF CONSTRUCTION AND WHEN THE NEW CONSTRUCTION IS IN SERVICE. THE DISTANCE FROM THE DATA ACQUISITION SYSTEM TO ANY GIVEN SENSOR SHALL BE A MINIMUM HORIZONTAL DISTANCE FROM THE SENSOR TO THE OUTSIDE OF THE NEAREST RETAINING WALL OR ABUTMENT FACE, PLUS A MINIMUM CABLING AMOUNT TO PROVIDE FOR ANY NECESSARY VERTICAL TRAVEL TO THE GROUND SURFACE, PLUS 6 FT.

O. THE INSTRUMENTATION INSTALLATIONS SHALL BE ADEQUATELY PROTECTED FROM CONSTRUCTION IMPACTS, DURING CONSTRUCTION, AS WELL AS WEATHER EFFECTS, AND VANDALISM. APPROPRIATE LOCKED CASINGS AND/OR REMOVABLE CABLING AND PLASTIC CONNECTOR CAPS AND RELATED PROTECTIVE DEVICES SHALL BE PROVIDED TO ENSURE THE INTEGRITY OF THE INSTRUMENTATION OVER THE PROPOSED MONITORING DURATION.

P. THE PLAN FOR INSTALLATION OF INSTRUMENTATION SHALL BE APPROVED BY THE DESIGNER AND SUBMITTED TO THE ENGINEER FOR ACCEPTANCE PRIOR TO PLACEMENT.

PART 9 ACCEPTANCE CRITERIA

9.1 ACCEPTANCE CRITERIA: THE COLUMN-SUPPORTED EMBANKMENT IS CONSIDERED ACCEPTABLE WHEN THE EMBANKMENT CONSTRUCTION AND QA/QC REQUIREMENTS ARE COMPLETED IN ACCORDANCE WITH SECTION 6, COMPLIANCE WITH THE PERFORMANCE CRITERIA FROM PARAGRAPH 1.1 IS DEMONSTRATED, AND NO DAMAGE TO ADJACENT FACILITIES IS FOUND OR COMPENSATION IS MADE FOR DAMAGED CAUSED OR DAMAGE IS REPAIRED AT CONTRACTOR'S EXPENSE.

PART 10 CSW PAYMENT

10.1 ALL COST IN CONNECTION WITH MOBILIZATION AND DEMOBILIZATION OF MATERIALS, EQUIPMENT AND LABOR FOR THE CONSTRUCTION OF COLUMN-SUPPORTED WALLS (CSW) AS REQUIRED IN THIS SPECIFICATION, SHALL BE PAID FOR UNDER ITEM 203 - ROADWAY MISC; COLUMN SUPPORTED WALLS.

10.2 ALL COST IN CONNECTION WITH DESIGN, EQUIPMENT, MATERIAL, AND LABOR FOR THE INSTALLATION OF COLUMN-SUPPORTED WALLS (CSW), INCLUDING COLUMN MATERIALS AND CONSTRUCTION, QA MONITORING, INSTRUMENTATION, WORKING AND LOAD TRANSFER PLATFORM MATERIALS, WICK DRAINS IF NECESSARY TO MEET SETTLEMENT REQUIREMENTS, AND THE GEOSYNTHETIC REINFORCEMENTS AS REQUIRED IN THIS SPECIFICATION, SHALL BE INCIDENTAL TO ITEM 203. SEPARATE PAYMENT WILL NOT BE MADE FOR SITE PREPARATION, DEWATERING, TEMPORARY WORKS TO FACILITATE CONSTRUCTION, ETC. INCLUDE ALL THE ANTICIPATED COSTS IN PRICE BID FOR ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS. GROUND IMPROVEMENT AREAS HAVE BEEN DEFINED IN THE PLANS FOR BIDDING PURPOSES. ADDITIONAL COLUMN SUPPORTS SHALL BE PROVIDED AS NECESSARY BEYOND THE DEFINED AREAS TO SATISFY GLOBAL STABILITY AND SHALL BE INCIDENTAL TO THIS ITEM.

10.3 ALL COSTS ASSOCIATED WITH THE INSTALLATION OF TEST COLUMNS, REACTION FRAMES, INSTRUMENTATION, PERFORMANCE, ANALYSIS, AND REPORTING OF TEST RESULTS TO ENGINEER SHALL BE INCLUDED IN UNIT BID FOR ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS.

10.4 THE TERMS CSW AND COLUMN SUPPORTED WALLS SHALL BE USED INTERCHANGEABLY THROUGHOUT THE PLANS.



NO.	DESCRIPTION	REV. BY	DATE
1	REVISED NOTE	MOJ	11-5-2021
10	REVISED NOTE	MOJ	12-14-2021

DESIGN AGENCY
GPD GROUP
Class, Pyle, Schomer, Burns & DeLaney, Inc.
 1801 Walnutwood Drive, Suite 1300, Columbus, Ohio 43215 (614) 210-0731
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DATE
 9-6-19

REVIEWED
 T JW

STRUCTURE FILE NUMBER

DRAWN
 MOJ

REVISED

DESIGNED
 DGN

CHECKED
 RHC

RETAINING WALL GENERAL NOTES

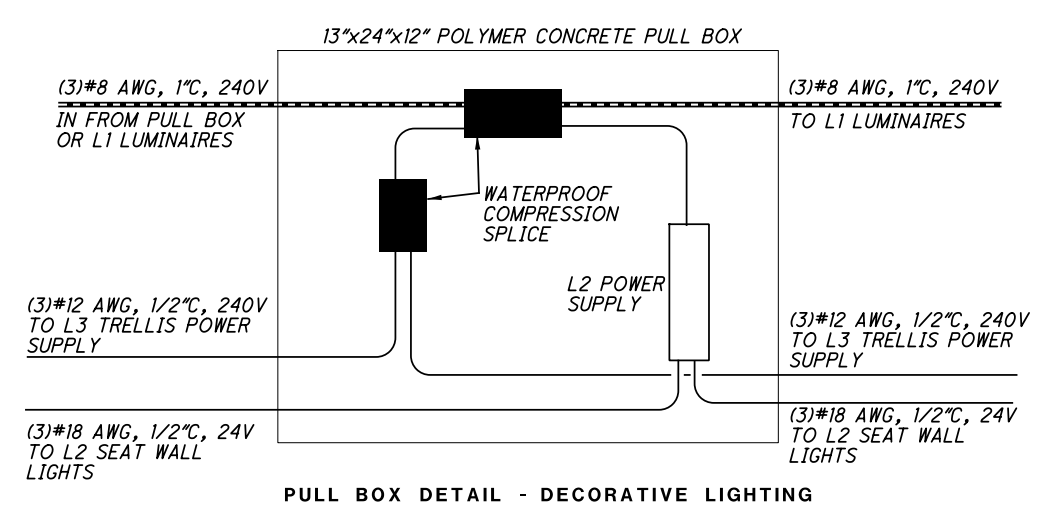
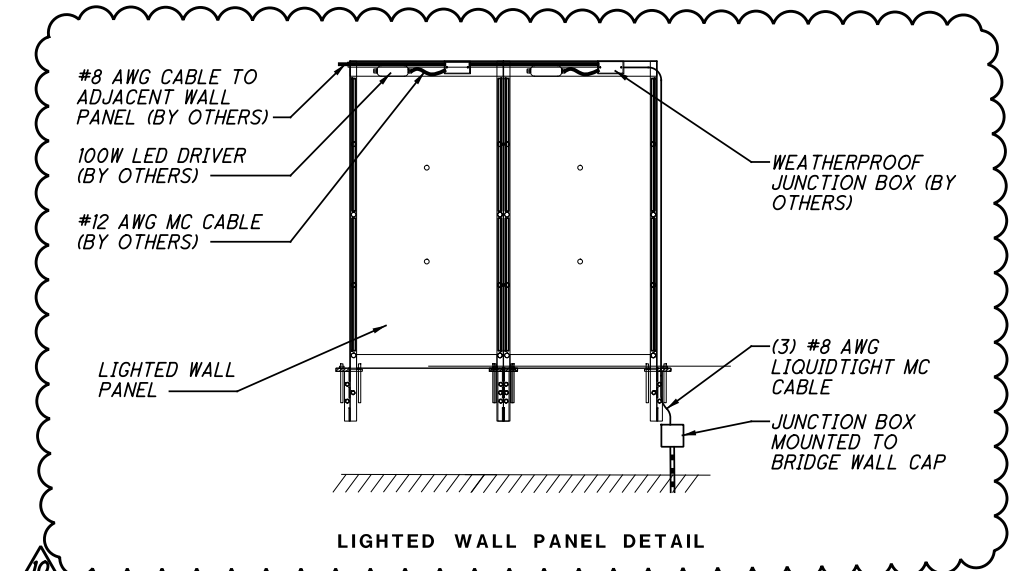
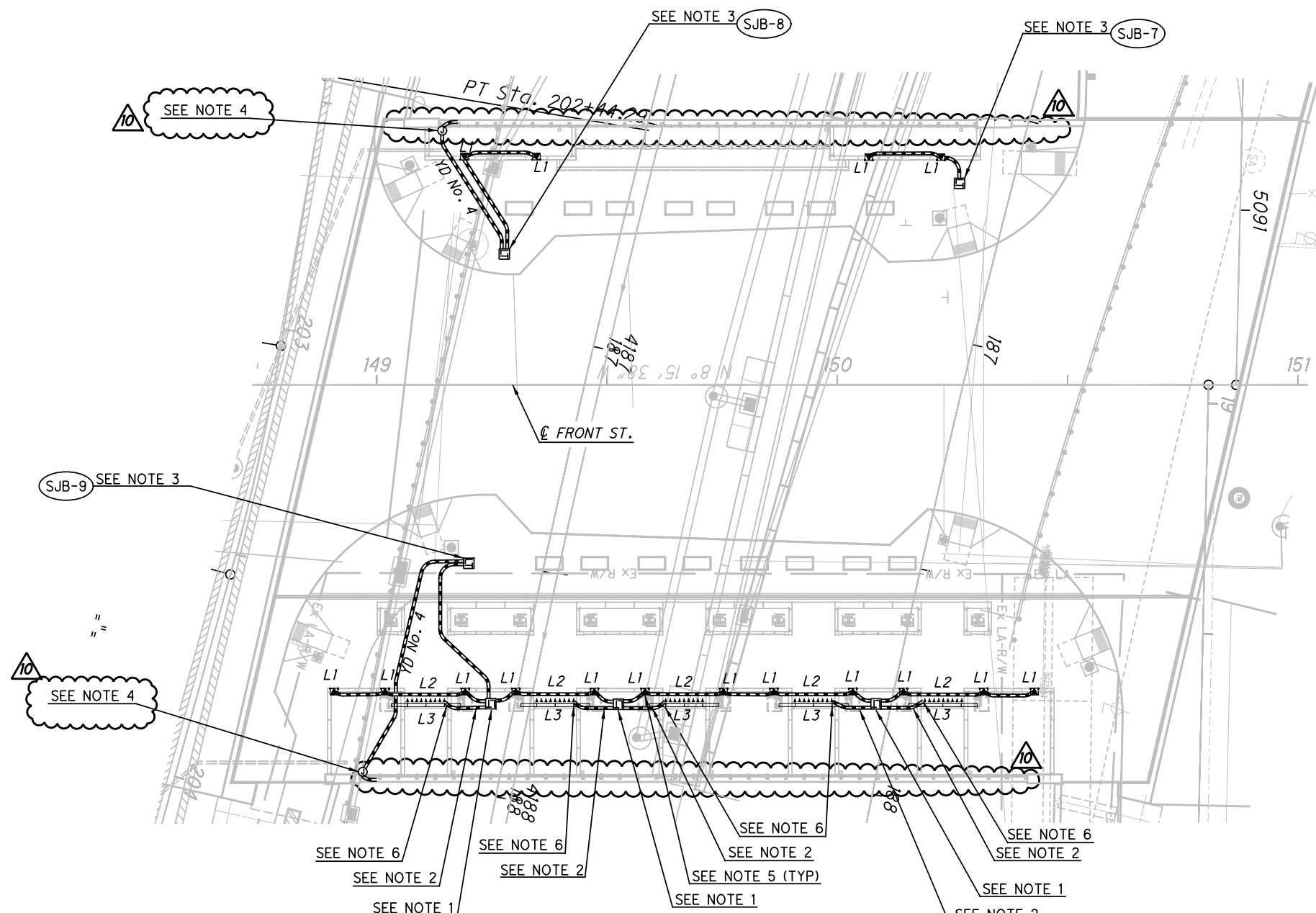
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PID No. 105523

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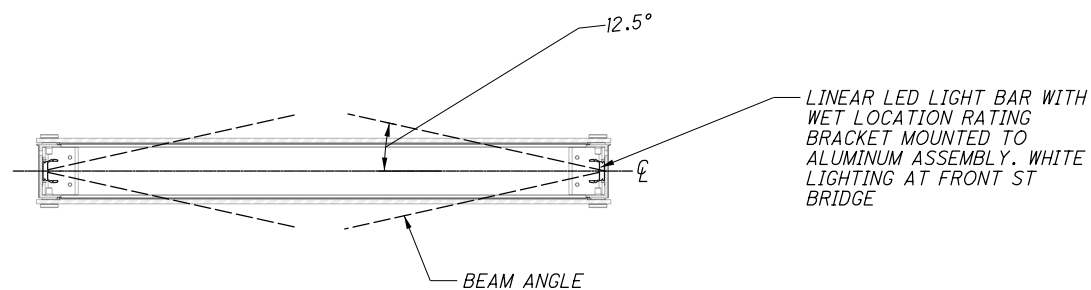
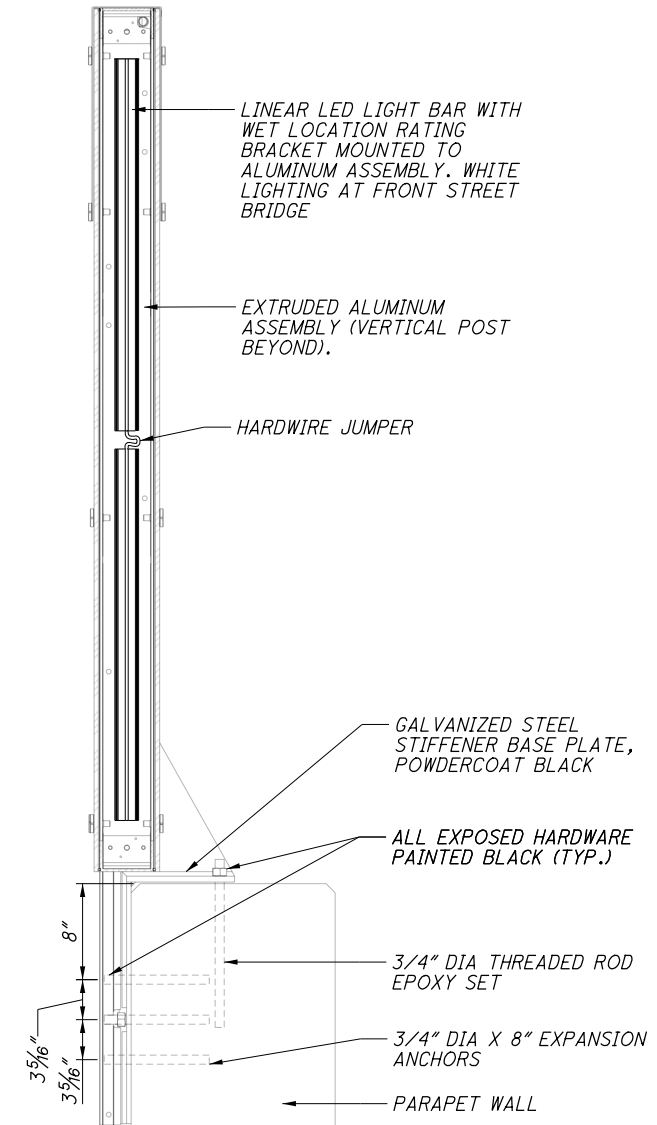
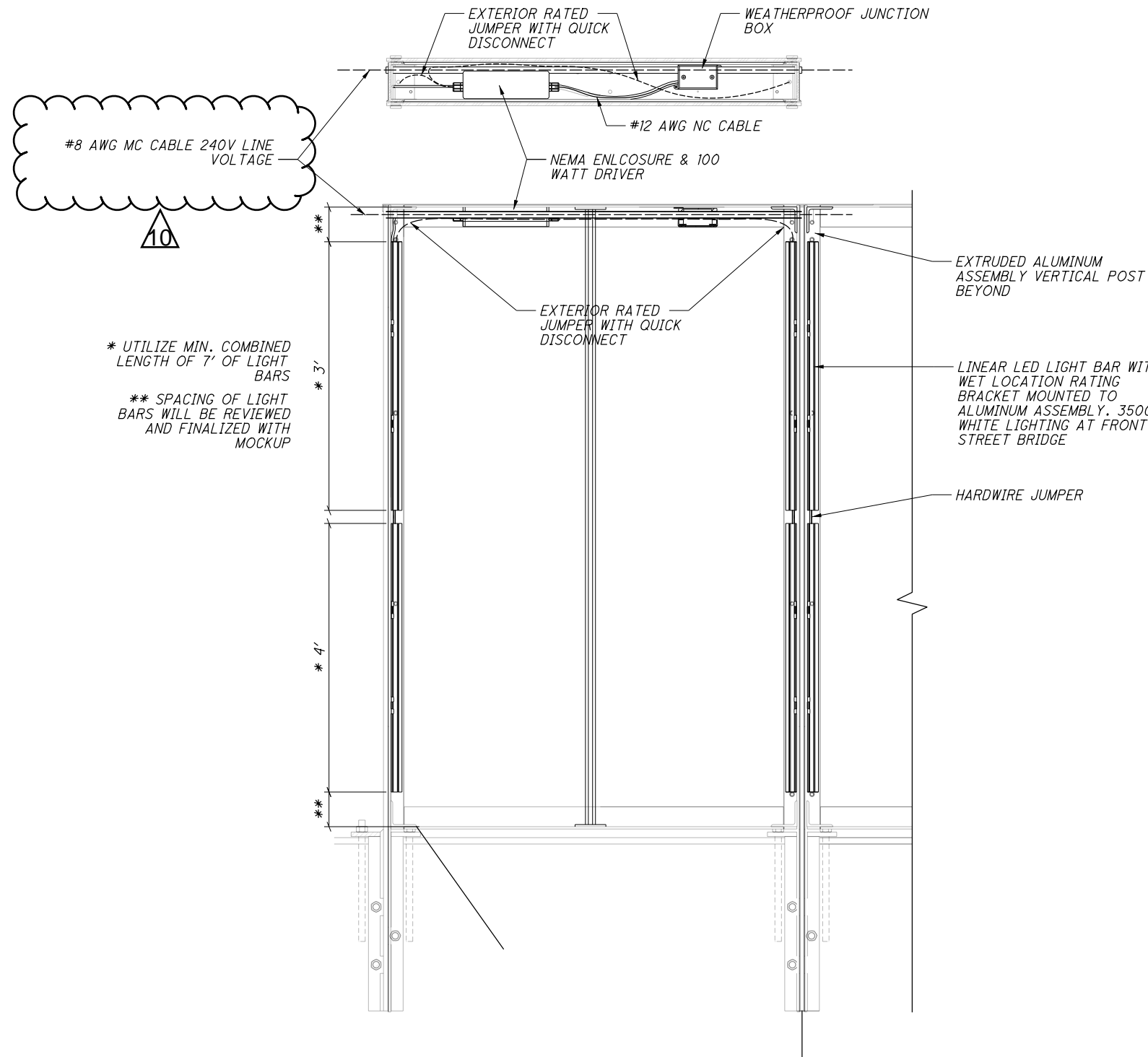
- NOTES:
- POLYMER CONCRETE PULL BOX, 13"x24"x12", BETWEEN TRELLIS STRUCTURES. SPLICE TO 240V FEED FOR TYPE 'L1' LINEAR LUMINAIRES, TO 24V POWER SUPPLY FOR L2 SEAT WALL LIGHT, AND TO REMOTE POWER SUPPLY ON BACK OF TRELLIS FOR L3 LUMINAIRES. SEE DETAIL THIS SHEET.
 - TWO CONDUITS, 725.04. ONE (1) 1/2" CONDUIT, 725.04 WITH THREE (3) No. 12 AWG CONDUCTORS, 240V, TO TRELLIS. CONNECT TO DRIVER MOUNTED ON REAR OF TRELLIS STRUCTURE. ONE (1) 1/2" CONDUIT, 725.04 WITH TWO (2) #18AWG 24V CONDUCTORS TO LED SEAT WALL LIGHTS.
 - CONNECT TO CIRCUIT YD IN STRUCTURE JUNCTION BOX. 240V, 1PH, 3W.
 - PROVIDE JUNCTION BOXES MOUNTED BRIDGE WALL CAP, BELOW EDGE OF LIGHTED WALL PANEL. EXTEND (3) #8 AWG CONDUCTORS FROM JUNCTION BOX TO INTERIOR OF WALL PANEL TO CONNECT TO INTERNAL JUNCTION BOX IN WALL PANEL. POWER TO ADJACENT WALL PANELS TO CONTINUE THROUGH INTEGRATED JUNCTION BOXES AND ROUTED THROUGH WALL PANEL CHANNEL SPACE. SEE DETAIL ON THIS SHEET AND AESTHETIC ENHANCEMENT PLANS FOR ADDITIONAL INFORMATION.
 - PROVIDE JUNCTION BOX AT REAR OF L1 RECESSED WALL LIGHTS FOR SPLICING TO LUMINAIRE, AS REQUIRED.
 - PROVIDE POWER SUPPLY, INSIGHT CE-320, FOR TRELLIS LINEAR LED LUMINAIRES, MOUNTED TO REAR OF TRELLIS. CONNECT TO CIRCUIT FROM PULL BOX, AND PROVIDE CONNECTION FROM POWER SUPPLY TO LUMINAIRES. EACH TRELLIS WILL HAVE FOUR (4) L3 LUMINAIRES: TWO (2) 36" IN LENGTH, AND TWO (2) 48" IN LENGTH. SEE AESTHETIC ENHANCEMENT PLANS FOR FURTHER INFORMATION.

DECORATIVE LIGHTING LEGEND	
	LUMINAIRE, DECORATIVE, RECESSED WALL LIGHT, 3.8W, 329 LUMENS, 240V, APP
■ L1	RECESSED WALL LIGHT WITH HOUSING CAST INTO PRECAST PLANTER WALLS, WITH INTEGRAL DRIVER. BEGA MODEL #33 166, 3.8W, 240V
..... L2	LUMINAIRE, DECORATIVE, LED SEAT WALL LIGHT, 3.5W/FT, 294 LUMENS PER FOOT, 24V DC, APP LED LIGHT FIXTURE, MOUNTED TO UNDERSIDE OF PRECAST SEATWALL, WITH REMOTE DRIVER IN POLYMER CONCRETE PULL BOX (LOCATION AS NOTED). KENDO M WET, MODEL #KMW-XX-HE48MO-30K-F-FC-BK/ PDCU-W-3X96W-24
——— L3	LUMINAIRE, DECORATIVE, LINEAR LED, 3.5W/FT, 974 LUMENS, APP LINEAR LED LUMINAIRE WITH REMOTE POWER SUPPLY (SIZE AS NOTED), INSIGHT MEDLEY X, 36" LENGTH: MODEL #MX/LO/35K/1560/D/SMS/36/REM/TBR; 48" LENGTH: #MX/LO/35K/1560/D/SMS/48/REM/TBR, 3.5W/FT
Ⓢ	12" X 12" X 4" DEEP NEMA 4X JUNCTION BOX, MOUNTED ON BRIDGE WALL FOR WIRING TO TRANSLUCENT WALL PANELS.

- GENERAL NOTES:
- ALL CONDUIT INDICATED ON THIS PLAN IS 725.04, 1" WITH THREE No. 8 AWG CONDUCTORS, UNLESS NOTED OTHERWISE. ALL CONDUCTORS IN CONDUITS ON THIS PLAN SHALL BE 600V INSULATED CONDUCTORS.
 - 480V LIGHTING CONDUITS THAT FEED STREET LIGHTING ARE NOT SHOWN ON THIS PLAN FOR CLARITY. REFER TO SHEET 1204 FOR ROADWAY LIGHTING PLAN.
 - PULL BOXES SHALL BE AT GRADE AND FLUSH WITH PAVEMENT, OR SOIL IF LOCATED IN PLANTER BED. PULL BOX COVERS SHALL BE LABELED 'LIGHTING'.
 - REFER TO AESTHETIC ENHANCEMENT PLANS FOR ADDITIONAL INFORMATION. SEE SHEETS 1748-1815.
 - LUMINAIRES ARE QUANTIFIED IN AESTHETIC ENHANCEMENT PLANS. SEE SHEETS 1748-1815.
 - ALL ELECTRICAL CONDUIT SHOWN ON THE PLAN IS SCHEMATIC IN NATURE. CONTRACTOR SHALL COORDINATE EXACT CONDUIT ROUTING WITH AESTHETIC ENHANCEMENT PLANS, CONCRETE STRUCTURES AND PLANTER BEDS.

12-13-21: LIGHTED WALL PANEL NOTES AMENDED, DETAIL ADDED

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1 SCREENWALL LIGHTING SYSTEM
SCALE: 1 1/2" = 1'-0"

NO.	DESCRIPTION	REV. BY	DATE
10	REVISED WIRE SIZES AND VOLTAGE	MKSK/LHW	12.13.2021

3486-E

1784
1815

MKSK
LANDSCAPE ARCHITECTURE + URBAN PLANNING

SCREEN WALL DETAILS
AESTHETIC ENHANCEMENTS

FRA-70/71-
12.68/14.86

CALCULATED

CHECKED