



**SPECIAL MEETING
BOARD OF EDUCATION
GOGEBIC-ONTONAGON INTERMEDIATE SCHOOL DISTRICT
CONFERENCE ROOMS A & B
THURSDAY, AUGUST 7, 2025, 6:00 PM**

This meeting is a meeting of the Board of Education in public for the purpose of conducting the School District's business and is not to be considered a public community meeting. There is a time for public participation during the meeting as indicated on the agenda. Visitors wishing to address the board shall follow Board Policy 2504.

Mission Statement:

The Gogebic-Ontonagon ISD will serve students and families by creating, leading, supporting, and enriching educational opportunities in Gogebic and Ontonagon counties.

A. Pledge of Allegiance & Roll Call

B. Public Comment

Except during a public participation portion of a Board meeting, no member of the public or other person may address the Board during a public meeting without the express permission of the President or other presiding officer. Each person's public comments are limited to 5 minutes per public participation period. Please see Board Policy 2504 for additional information.

C. New Business

1. Approval of Center-Based Programs Principal Hire
2. Approval to post CTE Building Project Phase 1 Request for Bids

D. Adjournment

INDIVIDUALS WISHING TO PARTICIPATE VIRTUALLY MUST HAVE THEIR FIRST AND LAST NAME IN THEIR ZOOM PROFILE IN ORDER TO BE ADMITTED.

Upon request to the Title IX Coordinator, Ashley Nevins, and the Gogebic-Ontonagon Intermediate School District shall make reasonable accommodations for a person with disabilities to be able to participate in these meetings.

Please call 906-575-3438 to make arrangements.

ABBREVIATIONS:

ADJ	ADJUST	R	RADIUS
APPROX	APPROXIMATELY	RES	RESET
ASPH	ASPHALT	RIM	TOP OF UTILITY/DRAINAGE STRUCTURE
B/BANK	BOTTOM OF BANK	ROW	RIGHT-OF-WAY
CONC	CONCRETE	SAN	SANITARY
CT	CURB TRANSITION	SP	SPRING WATER
C&G	CURB AND GUTTER	SOFT	SQUARE FEET
CVT	CITY, VILLAGE, TOWNSHIP	STM	STORM
DIA	DIAMETER	SYD	SQUARE YARD
DW	DOMESTIC WATER	TC	TOP OF CURB
EA	EDGE OF ASPHALT	TELE	TELEPHONE
ELEC	ELECTRIC	TP	TRAVERSE POINT
ELEV	ELEVATION	TS&M	TOPSOIL, SEED & MULCH
EX	EXISTING	TYP	TYPICAL
F/C	FACE OF CURB	T/BANK	TOP OF BANK
FF	FINISH FLOOR	UG	UNDER GROUND
FG	FINISHED GRADE	UNO	UNLESS NOTED OTHERWISE
FT	FEET	WEL	WELL LINES
HDCP	HANDICAP	W#	WELL LINE
INV	INVERT ELEVATION	WM	WATER MAIN
OB	OBSERVATION WELL	WTR	WATER
Obs	OBSERVED	YBT	YELLOW BENCH TIE
OH	OVERHEAD		
OT	OVER TOPPING	Dso	RIPRAP SIZE WHERE 50% OF STONES ARE LARGER
PROP	PROPOSED	Dax	MAX STONE SIZE/AVG DEPTH OF RIPRAP

GENERAL NOTES

- CONTRACTOR SHALL SECURE ALL PERMITS AND POST ALL BONDS PRIOR TO CONSTRUCTION AND ENSURE THAT ALL REQUIRED PERMITS AND BONDS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING CORNERS WHEN WORKING WITHIN THE ROW OF THE VILLAGE OF ONTONAGON.
- CONTRACTOR SHALL KEEP ALL PUBLIC STREETS ADJACENT TO THE SITE FREE OF CONSTRUCTION DEBRIS AND SEDIMENT. DUST SHALL BE CONTROLLED ON SITE AT ALL TIMES BY WATERING OR OTHER NECESSARY MEANS.
- THE CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE TO STREETS, SIDEWALKS, OTHER STRUCTURES AND ADJACENT AREAS CAUSED BY DEMOLITION, HAULING, OR OTHER PERFORMANCE OF THE WORK. ANY DAMAGE CAUSED BY THE CONTRACTOR OPERATIONS SHALL BE REPAIRED AT NO COST TO THE OWNER.
- THE CONTRACTOR SHALL TAKE ALL NECESSARY ACTIONS TO ENSURE WORKER SAFETY AND COMPLIANCE WITH MI-OSHA GUIDELINES.
- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. QUANTITIES AND DIMENSIONS SHOWN ON THE PLANS ARE PROVIDED FOR INFORMATION ONLY. CONTRACTOR SHALL FIELD VERIFY PRIOR TO CONSTRUCTION. ADJUST WORK AS REQUIRED TO MEET FIELD DIMENSIONS AT NO ADDITIONAL COST TO THE OWNER. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AS SOON AS POSSIBLE.
- THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE PROPOSAL AND ACCOMPANYING SPECIFICATIONS FOR THIS PROJECT INCLUDING THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, AASHTO'S 2018 POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, THE 2011 MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND THE VILLAGE OF ONTONAGON.
- THE CONTRACTOR SHALL CONDUCT OPERATIONS IN SUCH A MANNER AS TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL CODES FOR NOISE LEVELS, HOURS OF OPERATION FOR CONSTRUCTION ACTIVITY, VIBRATIONS, OR ANY OTHER RESTRICTIONS. NO ADDITIONAL COMPENSATION WILL BE DUE TO THE CONTRACTOR FOR ANY WINTER PROTECTION MEASURES THAT MAY BE REQUIRED TO COMPLY WITH THE CONTRACT DOCUMENTS.
- COORDINATION BY THE CONTRACTOR; NO ADDITIONAL COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR ANY DELAY OR INCONVENIENCE DUE TO MATERIAL SHORTAGES OR DELAYS DUE TO THE OPERATIONS OF SUCH OTHER PARTIES DOING WORK INDICATED OR SHOWN ON THE PLANS OR IN THE PROPOSAL OR FOR ANY DELAYS IN CONSTRUCTION DUE TO THE ENCOUNTERING OF EXISTING UTILITIES THAT MAY OR MAY NOT BE SHOWN ON THE PLANS.

UTILITY TRENCH

- BEDDING UNDER THE UTILITY SHALL BE GRANULAR MATERIAL CLASS IIIA AND ANY UNDERCUT MATERIAL REPLACED WITH GRANULAR MATERIAL CLASS II. BACK FILLING SHALL BE IN ACCORDANCE TO THE CURRENT STANDARD SPECIFICATION.
- BACK FILL FOR UTILITY TRENCHES ABOVE GRANULAR MATERIAL CLASS IIIA SHALL BE PLACED AS FOLLOWS:
 - GRANULAR MATERIAL MDOT CLASS II SHALL BE USED TO BACKFILL TRENCHES UNDER PAVEMENT AND SHALL BE COMPACTED TO NOT LESS THAN 95% OF ITS MAXIMUM UNIT WEIGHT.
 - GRANULAR MATERIAL MDOT CLASS II SHALL BE USED TO BACKFILL UTILITY TRENCHES OUTSIDE THE PAVEMENT BUT WITHIN THE 1:1 ZONE OF INFLUENCE AND SHALL BE COMPACTED TO NOT LESS THAN 95% OF ITS MAXIMUM UNIT WEIGHT.
 - ACCEPTABLE MATERIAL EXCAVATED FROM THE UTILITY TRENCHES SHALL BE USED TO BACK FILL UTILITY TRENCHES OUTSIDE THE LIMITS OF THE 1:1 ZONE OF INFLUENCE AND COMPACTED TO NOT LESS THAN 90% OF ITS MAXIMUM UNIT WEIGHT.
- GRANULAR MATERIAL CLASS I, II, III, IIIA, IIIA, OR DENSE-GRADED AGGREGATE 21A, 21AA, OR 22A MAY BE USED WHERE GRANULAR MATERIAL CLASS III IS SPECIFIED ON THE PLANS.

WATER SERVICE CONNECTION SEQUENCE

- THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING RESIDENTS AND BUSINESS OWNERS OF WATER SHUT OFF AT LEAST 24 HOURS IN ADVANCE.
- THE EXISTING WATER MAIN LEAD SHALL REMAIN IN THE GROUND UNLESS THE NEW LEAD MUST GO IN THE SAME TRENCH.
- THE VILLAGE OF ONTONAGON WATER DEPARTMENT SHALL BE NOTIFIED IN WRITING OF ALL NON-COPPER SERVICE LEADS THAT ARE FOUND.
- ALL STOP BOXES ARE TO BE LOCATED OUTSIDE DRIVES AND SIDEWALKS. WHERE POSSIBLE, THE CURB BOX SHALL BE PLACED AS SHOWN ON PLANS, OR APPROVED IN THE FIELD.
- THE CONTRACTOR SHALL NOTIFY THE VILLAGE OF ONTONAGON WATER DEPARTMENT AT LEAST 24 HOURS PRIOR TO MAKING A CONNECTION TO THE VILLAGE WATER SYSTEM SO THE VILLAGE CAN INSPECT AND DOCUMENT THE CONNECTION.

UTILITY NOTES

- THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING MISS-DIG (811) AT LEAST 3 WORKING DAYS PRIOR TO EXCAVATION.
- ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. THE EXACT LOCATION OF EXISTING UTILITIES SHALL BE LOCATED BY HAND DIGGING. REPAIR SHALL BE COMMENCED IMMEDIATELY UPON SERVICE INTERRUPTION AND COMPLETED WITHOUT DELAY REGARDLESS OF NORMAL WORKING HOURS, HOLIDAYS OR WEEKENDS.
- THE UTILITY LOCATIONS ARE BASED ON FIELD OBSERVATIONS AND A CAREFUL REVIEW OF UTILITY RECORDS. HOWEVER, IT IS NOT POSSIBLE TO DETERMINE THE PRECISE SIZE, LOCATION, DEPTH, PRESSURE, OR ANY OTHER CHARACTERISTICS OF UNDERGROUND UTILITIES, TANKS OR SEPTIC FIELDS WITHOUT EXCAVATION. THEREFORE, WE CANNOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE BURIED UTILITY INFORMATION HEREON SHOWN. THE CONTRACTOR SHALL HIRE A PRIVATE UTILITY LOCATOR TO LOCATE UTILITIES ON SITE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THESE UTILITY LOCATIONS PRIOR TO CONSTRUCTION AND MAKE EVERY EFFORT TO PROTECT AND/OR RELOCATE THEM AS REQUIRED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/SURVEYOR AS SOON AS POSSIBLE IN THE EVENT A DISCREPANCY IS FOUND.
- THE CONTRACTOR SHALL NOTIFY THE VILLAGE OF ONTONAGON AT LEAST 24 HOURS PRIOR TO MAKING A CONNECTION TO THE VILLAGE WATER OR SANITARY SEWER SYSTEM SO THE VILLAGE CAN INSPECT AND DOCUMENT THE CONNECTION.

MERIT 4273 58TH ST, HOLLAND, MI 49423 CARRIE ALLEN 989-370-6559 CARRIEA@WESTERINTEL-COM.COM	COMMUNICATION
SEMCO 51732 US-41, CALUMET, MI 49913 CASEY HAINAULT 810-887-4146 CASEY.HAINAULT@SEMCOENERGY.COM	GAS
UPPCO 500 N WASHINGTON ST, ISHPEMING, MI 49849 SCOTT ROEHL 906-449-2014 SAROEHL@UPPCO.COM	ELECTRIC
VILLAGE OF ONTONAGON 315 QUARTZ ST, ONTONAGON, MI 49953 STEVE PREISS 906-884-2305	WATER/SEWER

EARTHWORK, GRADING & RESTORATION

- THE CONTRACTOR SHALL RESTORE ALL ADJACENT AREAS UPON COMPLETION OF THE PROJECT.
- ALL DISTURBED AREAS SHALL BE BROUGHT TO FINAL GRADE AND STABILIZED AS SOON AS POSSIBLE AFTER BEING DISTURBED. PERMANENT SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED WITHIN FIVE CALENDAR DAYS OF COMPLETING FINAL GRADING.
- CONTRACTOR SHALL PLACE SALVAGED AND ADDITIONAL TOPSOIL, SEED AND MULCH ON ALL DISTURBED AREAS NOT UNDER PAVEMENT OR OTHERWISE LABELED, AS DIRECTED BY THE ENGINEER TO PROVIDE A MINIMUM 3" THICKNESS. SEED MIX DESIGN FOR ALL SLOPE RESTORATION SHALL BE MDOT THM PER TABLE 816-1 & 917-1 OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- ALL FILL SHALL BE CLEAN INERT MATERIAL.
- ALL EXCAVATIONS UNDER OR WITHIN 3 FEET OF PUBLIC PAVEMENT, EXISTING OR PROPOSED, SHALL BE BACKFILLED AND COMPACTED WITH SAND (MDOT CLASS II).
- SURPLUS EXCAVATED MATERIAL MAY BE USED TO FLATTEN FILL SLOPES AS DIRECTED BY THE ENGINEER. ANY SURPLUS OR UNSUITABLE MATERIAL, INCLUDING PEAT EXCAVATION, UNABLE TO BE USED SHALL BECOME THE PROPERTY OF THE CONTRACTOR FOR DISPOSAL.
- CONTRACTOR SHALL SUBMIT LOCATIONS OF MATERIAL STOCKPILES TO THE ENGINEER FOR APPROVAL. PROTECT ADJACENT AREAS WITH SILT FENCE AS REQUIRED.

REMOVAL

- ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO STARTING REMOVALS.
- REMOVALS SHALL BE DONE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
- SAW CUTTING FOR PAVEMENT REMOVAL AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER SHALL BE TO THE DEPTH REQUIRED FOR NEAT REMOVAL OF PAVEMENT OR CONCRETE. DO NOT OVERCUT PAST ENDS OR CORNERS. REPAIR/RESTORE ALL DAMAGED AREAS.
- SAW CUTTING DEPTH SHALL BE ADEQUATE TO PREVENT SPALLING, CHIPPING, OR DAMAGE TO EXISTING PAVEMENT EDGES LEFT IN PLACE AS DIRECTED.
- ADDITIONAL WORK OUTSIDE OF THE LIMITS AS SHOWN ON THE PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO STARTING THE ADDITIONAL WORK.
- MATERIALS REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND BE PROPERLY DISPOSED OF AT AN OFF SITE LOCATION.

MAINTENANCE OF TRAFFIC

- CONTRACTOR TO PROVIDE NECESSARY SIGNAGE, BARRICADES, AND OTHER DEVICES FOR PROTECTION OF THE PUBLIC AND CONSTRUCTION WORKERS PRIOR TO PERFORMING ANY WORK.
- CONTRACTOR SHALL COORDINATE STAGING AND ACCESSIBILITY WITH OWNER.
- TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH THE 2011 MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND MDOT MAINTAINING TRAFFIC TYPICAL PLANS.

SOIL EROSION AND SEDIMENTATION CONTROL

- SOIL EROSION AND SEDIMENTATION CONTROL SHALL BE IN ACCORDANCE WITH THE 2020 MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION, AND THE CONTRACTOR SHALL COMPLY WITH LOCAL RULES AND REGULATIONS FOR SOIL EROSION AND SEDIMENTATION CONTROL.
- ALL SOIL EROSION AND SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH MDOT STANDARD PLAN R-96 SERIES.
- THE CONTRACTOR SHALL EMPLOY A MICHIGAN DEPARTMENT OF ENVIRONMENT GREAT LAKES & ENERGY (EGLE) CERTIFIED STORM WATER OPERATOR ON ALL SITES WITH A DISTURBANCE OF FIVE OR MORE ACRES (PERMIT-BY-RULE). THE OPERATOR SHALL COMPLETE ALL INSPECTIONS AND REPORTS TO COMPLY WITH SESC PERMIT REQUIREMENTS. THE PROJECT COVERS APPROXIMATELY 0.5 ACRES.
- THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO MINIMIZE THE AREAS LEFT BARREN DURING CONSTRUCTION AND TO DISTURB ONLY THOSE AREAS ABSOLUTELY REQUIRED FOR THE CONSTRUCTION OF THE PROJECT.
- EROSION CONTROL ITEMS SHALL BE INSTALLED AND MAINTAINED ON A REGULAR BASIS AS DIRECTED BY THE ENGINEER AND SHALL BE REMOVED WHEN NO LONGER EFFECTIVE AS DETERMINED BY THE ENGINEER. TEMPORARY EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL CONTROL IS IN PLACE AND STABILIZED. NO SEPARATE PAYMENT SHALL BE ALLOWED FOR EITHER MAINTENANCE OR REMOVAL OF THE EROSION CONTROL ITEMS.
- THE CONTRACTOR SHALL REMOVE SEDIMENT COLLECTED IN CULVERTS AND SUMPS OF ALL DRAINAGE STRUCTURES IN THE VICINITY OF THE PROJECT WHEN SUCH SEDIMENT EXCEEDS 1/2 OF THE SUMP DEPTH OR CULVERT DIAMETER. THE ENGINEER WILL INSPECT CULVERTS, SUMPS, AND ALL SESC ITEMS AFTER STORM EVENTS AND DIRECT THE CONTRACTOR TO CLEAN OUT ALL CULVERTS, SUMPS, AND ALL SESC ITEMS. CLEANING PIPING AND SUMPS FOR SEDIMENTATION CONTROL SHALL NOT BE PAID FOR SEPARATELY. DEBRIS REMOVED SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE REGULATIONS.
- THE CONTRACTOR SHALL FOLLOW LOCAL RULES AND REGULATIONS FOR SOIL EROSION AND SEDIMENTATION CONTROL FOR ALL MATERIALS THAT ARE DISPOSED OF OFF THE PROJECT SITE.
- IF THE PROJECT OR ANY CONSTRUCTION ACTIVITY IS STOPPED FOR ANY LENGTH OF TIME OTHER THAN THAT ENCOUNTERED IN A NORMAL WORK WEEK, EVERY PRECAUTION SHALL BE TAKEN TO PROTECT THE UNCOMPLETED WORK FROM EROSION, INCLUDING THE PLACEMENT OF RIP RAP, HAY BALES OR OTHER ACCEPTABLE TEMPORARY PRECAUTION.
- THE CONTRACTOR SHALL SWEEP PAVED ROADS AND OTHER PAVED SURFACES DAILY, OR AS REQUESTED BY THE ENGINEER, TO REMOVE TRACKED SOIL AND DEBRIS.
- THE CONTRACTOR SHALL INSTALL SILT FENCES AND ROCK FILTERS AS TEMPORARY EROSION AND SEDIMENTATION CONTROL IN DISTURBED AREAS AS REQUIRED AND AS SHOWN ON THE PLANS.
- THE CONTRACTOR SHALL SUBMIT PROPOSED STOCK PILE AND SPOIL PILE LOCATIONS TO THE ENGINEER FOR APPROVAL PRIOR TO STOCKPILING MATERIAL ON SITE.
- SPOIL PILES SHALL BE GRADED SO THAT THE SLOPES ARE NOT STEEPER THEN 3:1 AND SHALL BE SEEDED AND MULCHED.
- SPOIL PILES SHALL HAVE SILT FENCE PLACED AT THE BASE OF THE SPOIL PILES TO RETAIN SOIL UNTIL VEGETATION IS ESTABLISHED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL NECESSARY PERMITS FOR THE PROJECT INCLUDING THE SOIL EROSION AND SEDIMENTATION CONTROL PERMIT AS REQUIRED BY ONTONAGON COUNTY.

CONCRETE CONSTRUCTION

- CONCRETE USED FOR SIDEWALK SHALL MEET THE REQUIREMENTS OF SECTION 1004 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND SHALL BE MDOT GRADE 3500 WITH A MINIMUM CEMENT CONTENT OF 526 LB/CYD OR AS APPROVED BY THE ENGINEER.
- CONCRETE SIDEWALKS SHALL BE CONSTRUCTED ACCORDING TO MDOT STANDARD DETAIL R-29 SERIES.
- EXPANSION JOINTS WITH EXPANSION FILLER SHALL BE PLACED WHERE THE CONCRETE PAVEMENT ABUTS AN EXISTING PAVED SURFACE OR BUILDING OR AS DIRECTED BY THE ENGINEER.
- PROPOSED SIDEWALK CUT JOINTS SHALL BE CONSTRUCTED TO DIVIDE THE SIDEWALK INTO APPROXIMATELY 25 SQUARE FOOT AREAS OR AS DIRECTED BY THE ENGINEER.
- ALL SIDEWALKS AND BARRIER FREE RAMPS SHALL BE CONSTRUCTED WITH A MAXIMUM 1:48 CROSS-SLOPE AND A MAXIMUM 1:12 LONGITUDINAL SLOPE.
- CONCRETE PLACEMENT AND PROTECTION CONFORMING TO ACI 117 301, 305R, 306.1, AND 308.1, CURRENT EDITIONS IS REQUIRED.

AGGREGATE SURFACE CONSTRUCTION

- NEW AGGREGATE MATERIAL FOR ROAD AND TRAIL SURFACE SHALL MEET THE REQUIREMENTS OF SECTION 902 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND SHALL BE MDOT CLASS 22A OR AS APPROVED BY THE ENGINEER.
- AGGREGATE MATERIAL FOR ROAD AND TRAIL SURFACE SHALL BE CONSTRUCTED PER SECTION 306 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

HMA CONSTRUCTION

- HMA USED FOR PAVEMENT SHALL MEET THE REQUIREMENTS OF SECTION 501 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND GRADE SHALL BE AS NOTED PER PLANS AND DETAILS OR AS APPROVED BY THE ENGINEER.
- HMA PAVEMENT CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH SECTION 501 OF THE MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- HMA BOND COAT WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF HMA PAVING.

WATER & SEWER UTILITY SYMBOLS

- EXISTING**
- SANITARY MANHOLE
 - FIRE HYDRANT
 - GATE VALVE AND BOX
- PROPOSED**
- CLEAN OUT
 - GATE VALVE & BOX
 - CURB STOP AND BOX

MISCELLANEOUS UTILITY SYMBOLS

- EXISTING**
- UTILITY POLE
 - LIGHT POLE

UTILITY PATTERN

	ELECTRICAL *
	GAS\OIL
	CABLE/TELEPHONE *
	FIBER OPTIC *
	WATER
	SANITARY
	STORM
	SANITARY SEWER
	WATERMAIN
	WATERMAIN
*O.H. = OVERHEAD , U.G. = UNDERGROUND	
ROW PATTERN	
	EXISTING
	ROW
	SECTION
	PROPERTY/PARCEL

REMOVAL LEGEND

- SIDEWALK REMOVAL
- HMA SURFACE REMOVAL
- EXCAVATION, EARTH, MODIFIED

PROPOSED

- CONCRETE SIDEWALK
- ASPHALT PAVEMENT
- AGGREGATE SURFACE
- SLOPE RESTORATION



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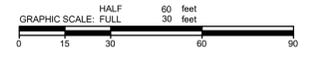
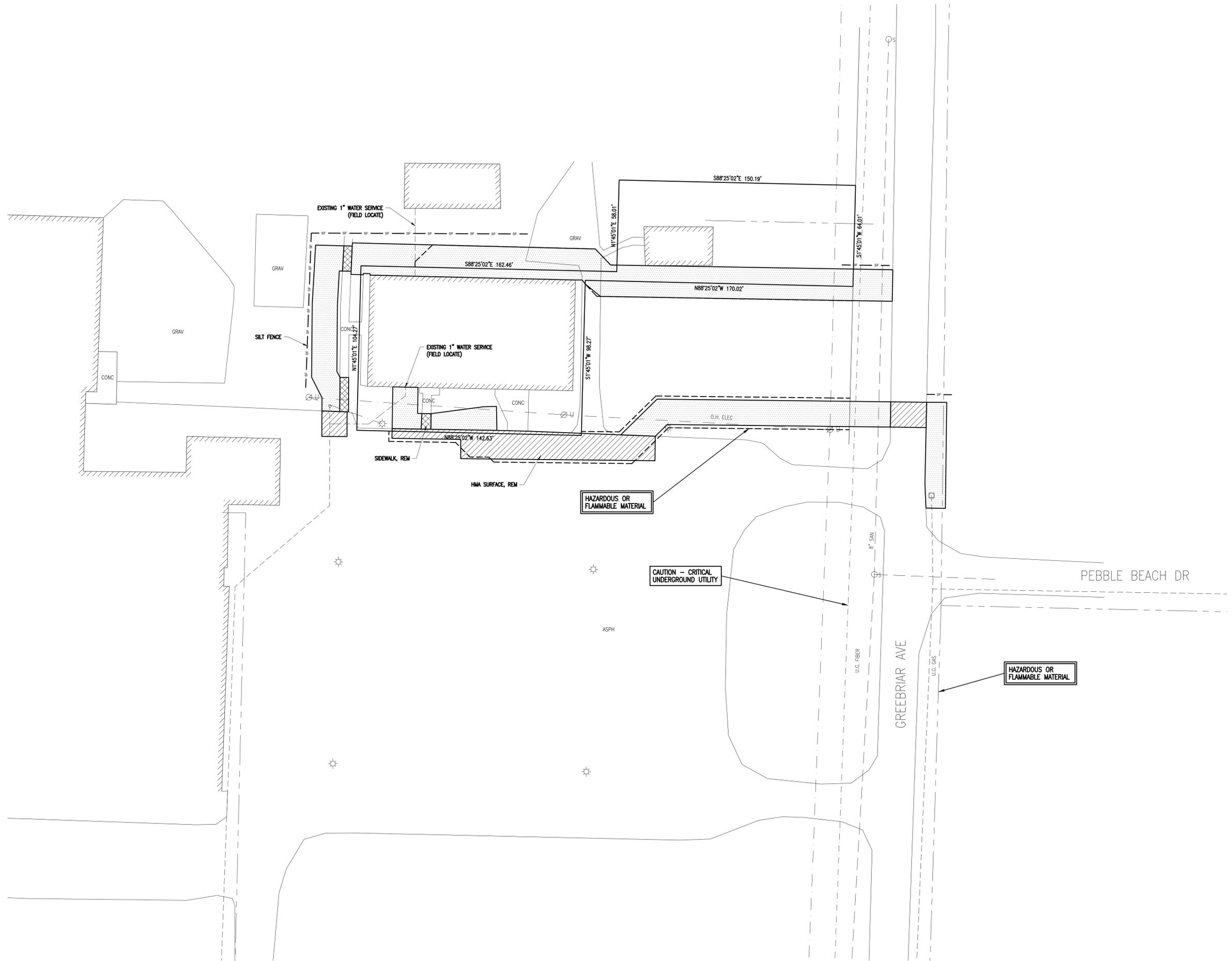
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ONTONAGON CTE UTILITY SEPARATION
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NOTES & LEGEND

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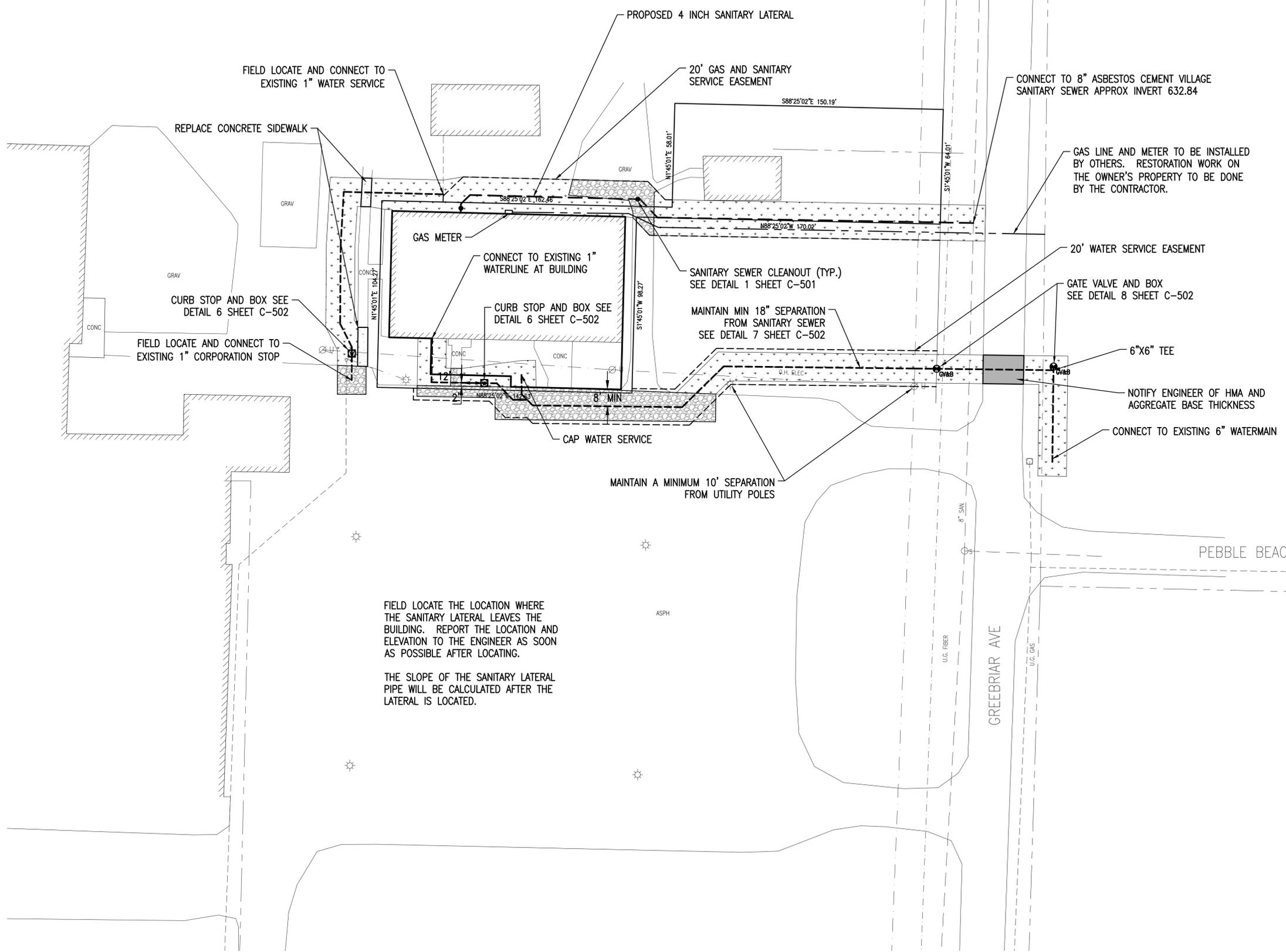
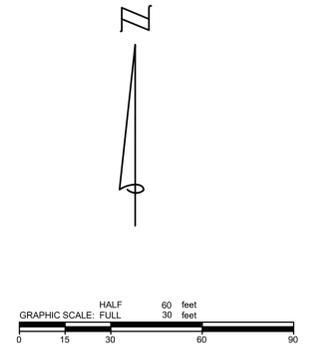
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EXISTING CONDITIONS & REMOVAL PLAN

C-120

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FIELD LOCATE THE LOCATION WHERE THE SANITARY LATERAL LEAVES THE BUILDING. REPORT THE LOCATION AND ELEVATION TO THE ENGINEER AS SOON AS POSSIBLE AFTER LOCATING.

THE SLOPE OF THE SANITARY LATERAL PIPE WILL BE CALCULATED AFTER THE LATERAL IS LOCATED.



Know what's below.
Call before you dig.

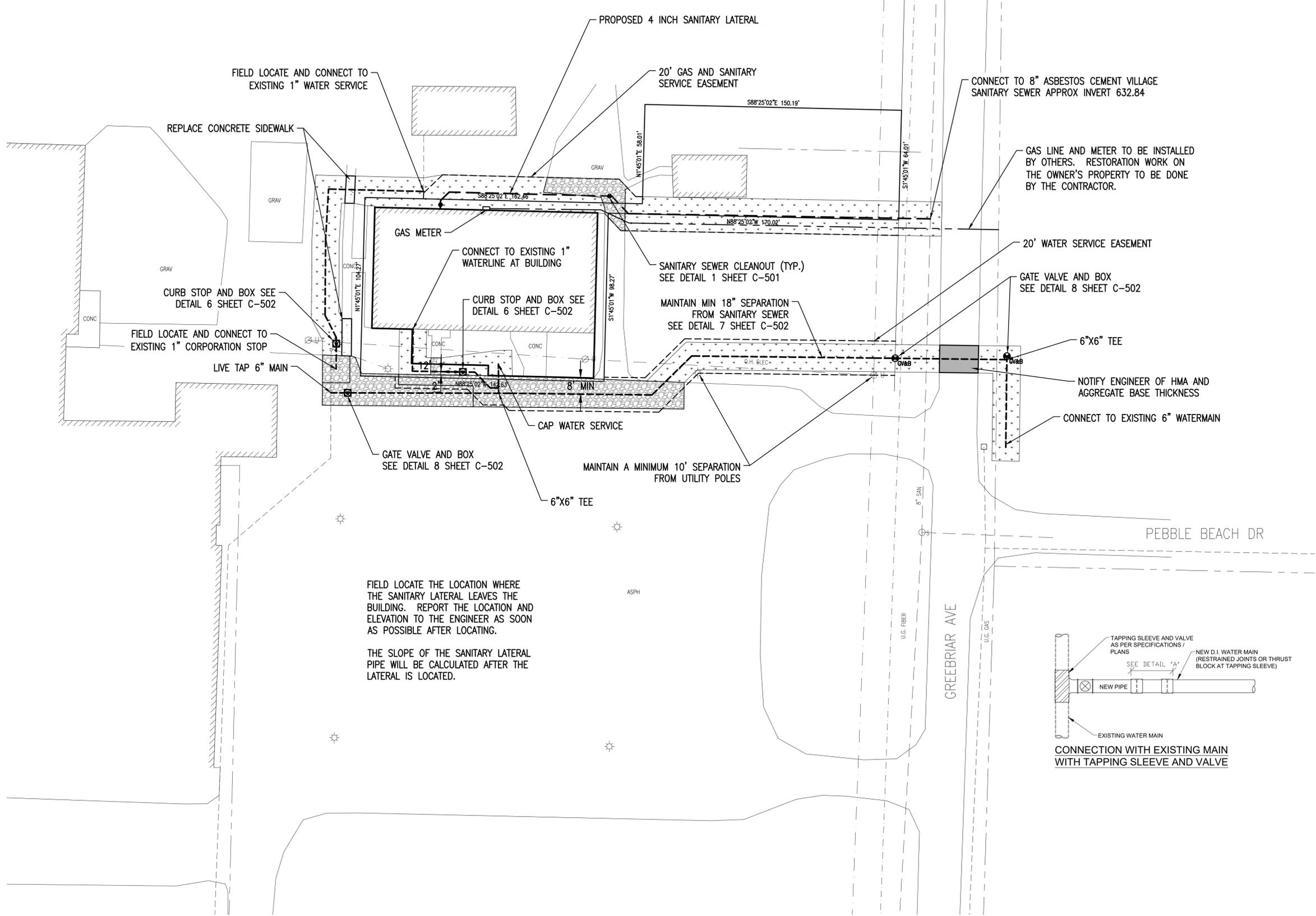
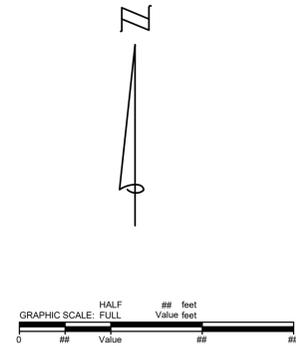
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701 Parker Ave, Ontonagon, MI 49953

UTILITY PLAN

ALTERNATE 1: LIVE TAP THE EXISTING SCHOOL WATERMAIN AND INSTALL A GATE VALVE.



FIELD LOCATE AND CONNECT TO EXISTING 1" WATER SERVICE

REPLACE CONCRETE SIDEWALK

PROPOSED 4 INCH SANITARY LATERAL

20' GAS AND SANITARY SERVICE EASEMENT

CONNECT TO 8" ASBESTOS CEMENT VILLAGE SANITARY SEWER APPROX INVERT 632.84

GAS LINE AND METER TO BE INSTALLED BY OTHERS. RESTORATION WORK ON THE OWNER'S PROPERTY TO BE DONE BY THE CONTRACTOR.

GAS METER

CONNECT TO EXISTING 1" WATERLINE AT BUILDING

SANITARY SEWER CLEANOUT (TYP.) SEE DETAIL 1 SHEET C-501

20' WATER SERVICE EASEMENT

GATE VALVE AND BOX SEE DETAIL 8 SHEET C-502

CURB STOP AND BOX SEE DETAIL 6 SHEET C-502

CURB STOP AND BOX SEE DETAIL 6 SHEET C-502

MAINTAIN MIN 18" SEPARATION FROM SANITARY SEWER SEE DETAIL 7 SHEET C-502

FIELD LOCATE AND CONNECT TO EXISTING 1" CORPORATION STOP

LIVE TAP 6" MAIN

6"x6" TEE

NOTIFY ENGINEER OF HMA AND AGGREGATE BASE THICKNESS

CONNECT TO EXISTING 6" WATERMAIN

GATE VALVE AND BOX SEE DETAIL 8 SHEET C-502

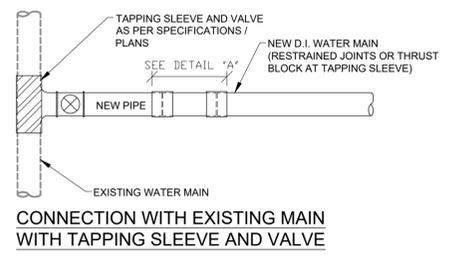
CAP WATER SERVICE

MAINTAIN A MINIMUM 10' SEPARATION FROM UTILITY POLES

6"x6" TEE

FIELD LOCATE THE LOCATION WHERE THE SANITARY LATERAL LEAVES THE BUILDING. REPORT THE LOCATION AND ELEVATION TO THE ENGINEER AS SOON AS POSSIBLE AFTER LOCATING.

THE SLOPE OF THE SANITARY LATERAL PIPE WILL BE CALCULATED AFTER THE LATERAL IS LOCATED.



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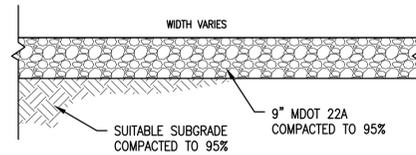
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 ALTERNATE UTILITY PLAN

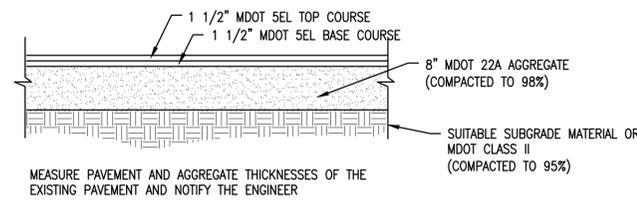


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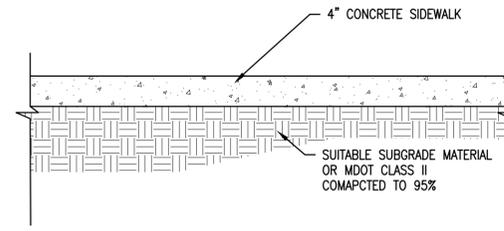
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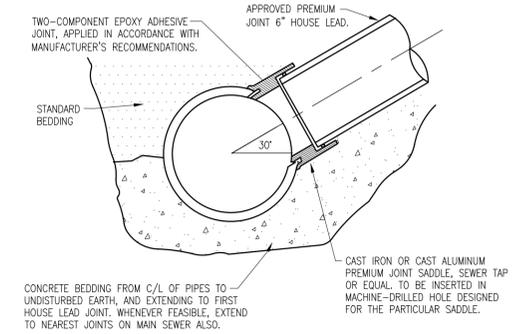
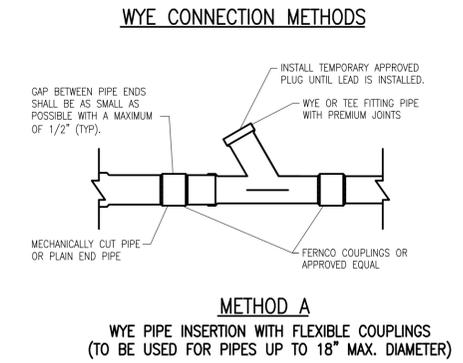
7 TYPICAL GRAVEL SECTION
NTS



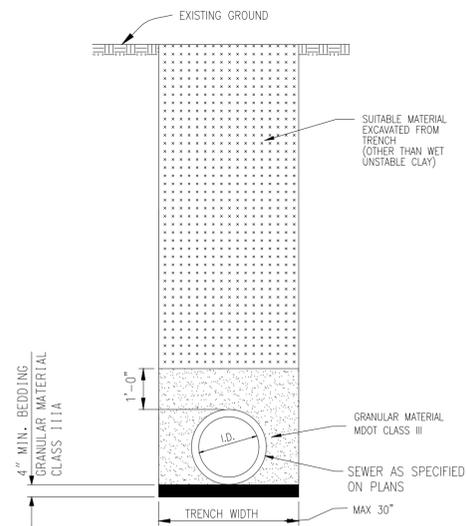
6 TYPICAL HMA PAVEMENT SECTION
NTS



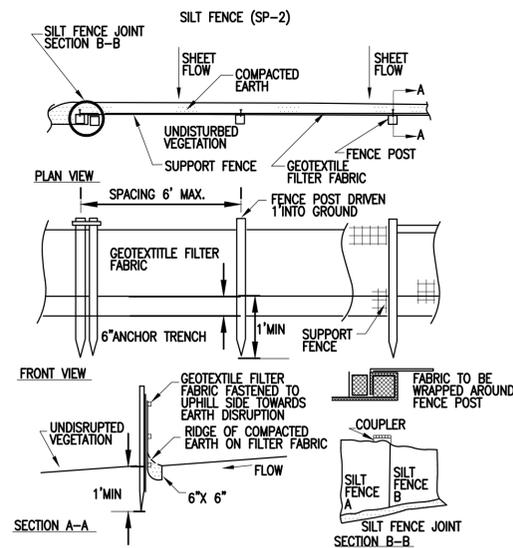
5 CONCRETE SIDEWALK SECTION
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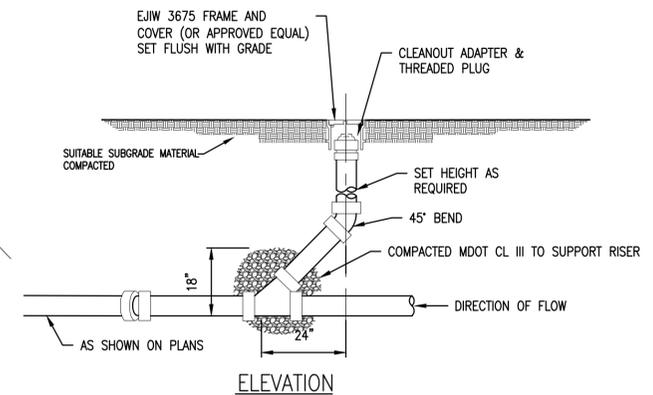
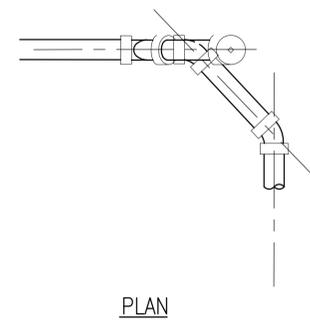
4 SANITARY SEWER CONNECTION
NTS



3 SEWER NOT UNDER ROADBED TRENCH
NTS



2 SILT FENCE
NO SCALE



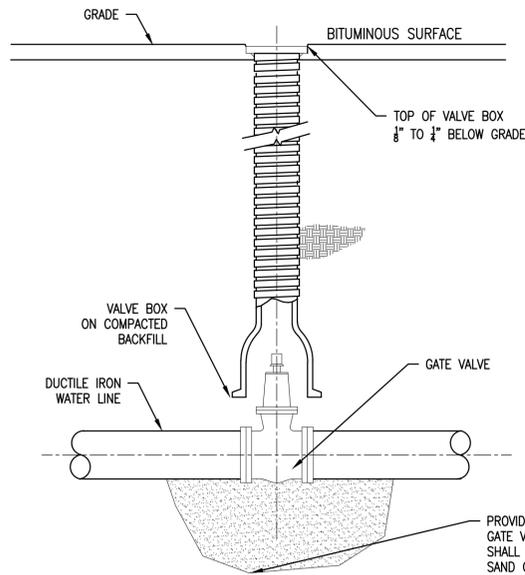
1 GRAVITY CLEAN OUT
NTS

ISSUED FOR:	BIDDING	DATE
REVISION	DESCRIPTION	

PROJECT NUMBER: PM TW
7867-24-0110
ONTONAGON CTE
ONTONAGON CTE UTILITY SEPARATION
701 Parker Ave, Ontonagon, MI 49953
DETAILS

DRAWING PATH: P:\2024\7867-24-0110_Ontonagon_CTE_Renovation\Drawings\Sheet\Sheet\01101.DWG July 23, 2025 - 12:35 PM

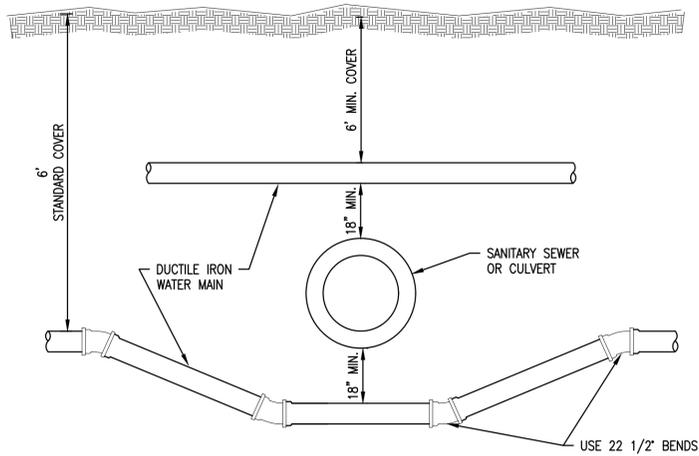
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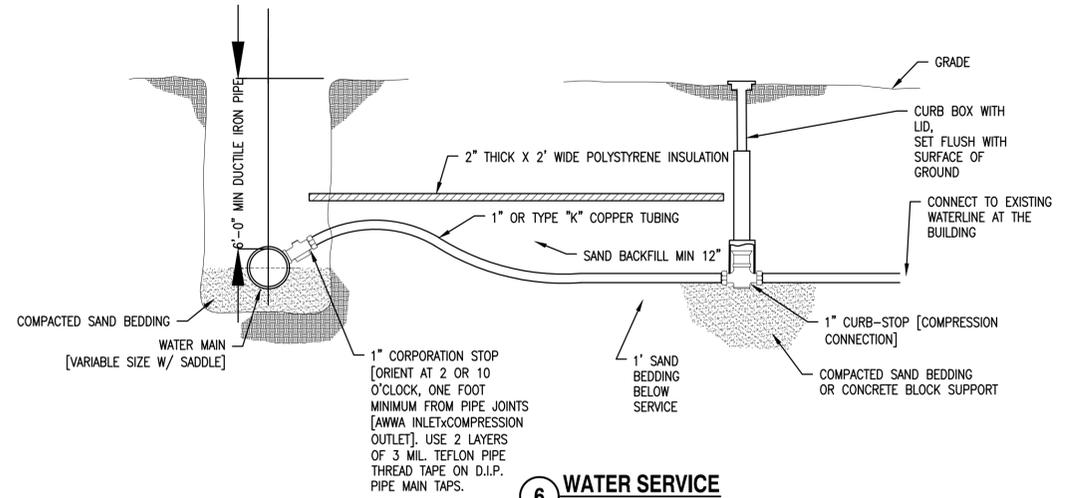
- NOTES:
1. VALVE BOXES SHALL BE INSTALLED PLUMB.
2. CONTRACTOR SHALL REMOVE AND REINSTALL VALVE BOXES IF NOT PLUMB OR VALVE IS NOT ACCESSIBLE.

8 TYPICAL VALVE BOX DETAIL
NTS

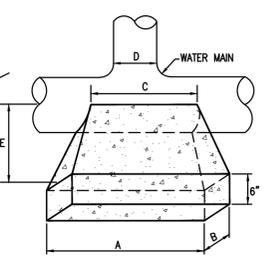
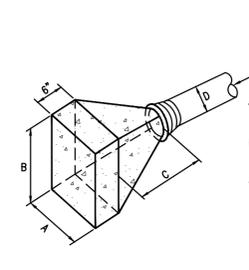
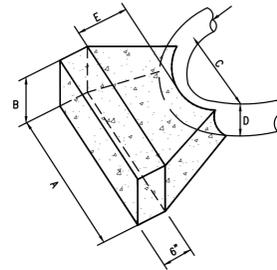
PROVIDE BEDDING FOR ALL GATE VALVES. BEDDING SHALL BE MDOT CLASS II SAND OR CONCRETE SUPPORT BLOCK UNLESS OTHER MATERIAL IS APPROVED BY THE ENGINEER.



7 SEWER OR CULVERT CROSSING
NTS



6 WATER SERVICE
NTS



FOR 90° BENDS OR SMALLER

D	A	B	C	E MIN.
20"	8"	6.5"	3.5"	2.5"
16"	6"	4"	2.5"	2"
12"	4"	3"	2"	1.75"
10"	3"	3"	2"	1.75"
8"	3"	2"	2"	1.5"
6"	2"	1.5"	2"	1.25"

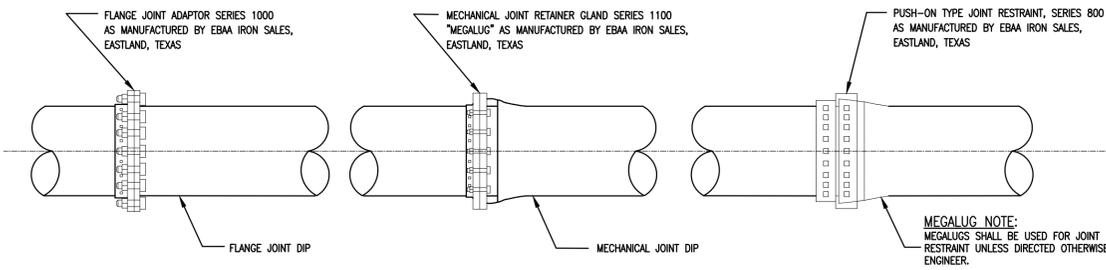
NOTE:
3000 PSI CONCRETE TO BE USED. THRUST BLOCK TO ABUT & REST AGAINST UNDISTURBED SOIL.

FOR PLUGS

D	A	B	C	E MIN.
20"	7"	5"	2.5"	
16"	4'-10"	4'-10"	2'	
12"	4'-4"	3'	1'-9"	
10"	3'	2'	1'-6"	
8"	2'-10"	2'-6"	1'-6"	
6"	1'-6"	1'-6"	3"	

FOR TEES

D	A	B	C	E MIN.
20"	6.5"	4.5"	3.5"	3"
16"	4'-8"	4'-8"	2.5"	2.75"
12"	4'	3'	2.5"	2.5"
10"	3'	2'	2'	2.25"
8"	2'-6"	2'	2'	2.25"
6"	2'	2'	2'	2.25"



JOINT NOTE:

1. ALL JOINTS TO BE RESTRAINED A MINIMUM OF 2 PIPE LENGTHS FROM ELBOWS OR FITTINGS PER MANUFACTURER RECOMMENDATIONS

5 JOINT RESTRAINT DETAIL
NTS

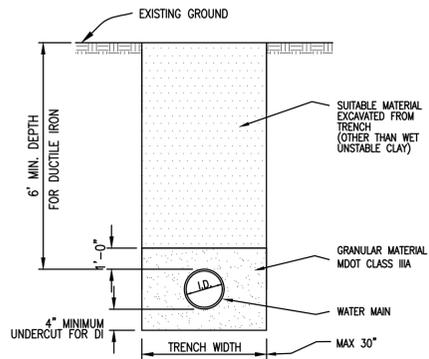
MEGALUG NOTE:
MEGALUGS SHALL BE USED FOR JOINT RESTRAINT UNLESS DIRECTED OTHERWISE BY ENGINEER.

4 THRUST BLOCK DETAILS
NTS

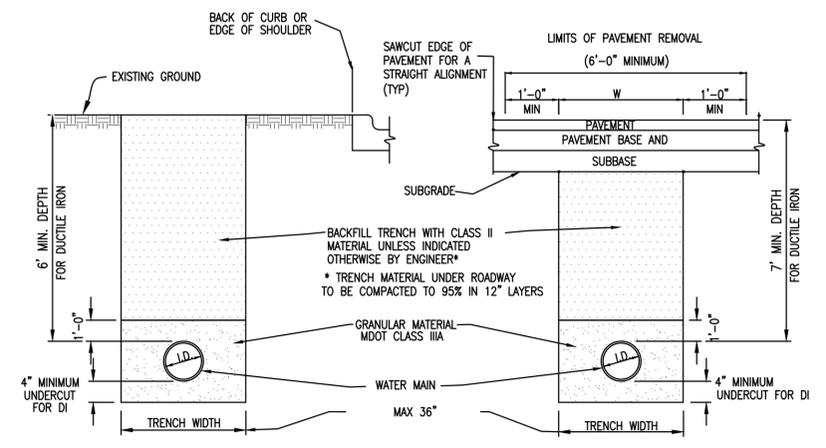
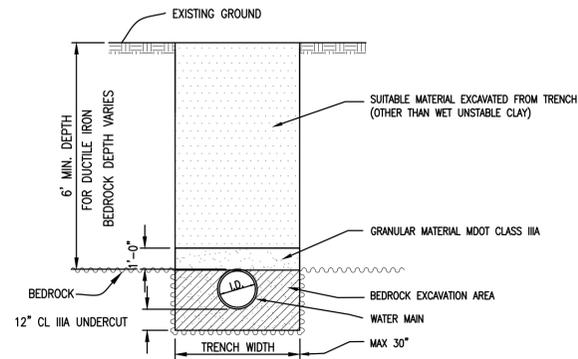
MEGALUG NOTE:
MEGALUGS SHALL BE USED FOR JOINT RESTRAINT UNLESS DIRECTED OTHERWISE BY ENGINEER.

LENGTH OF RESTRAINT REQUIRED - FEET								DESIGN STRENGTH OF RESTRAINT REQUIRED (KIPS)	
PIPE DIA.	DEF ANGLE	22 1/2'	33 3/4'	45'	56 1/4'	67 1/2'	78 3/4'	90° OR GATE VALVE	90° OR TEE
6"		3	6	11	16	23	29	37	2.0
8"		4	8	15	22	31	41	50	3.0
12"		6	13	22	33	45	59	73	6.0
16"		8	16	28	42	59	77	95	11.0

3 MEGALUG RESTRAINT - MECHANICAL JOINTS
NTS



2 WATER MAINS NOT UNDER ROADBED TRENCH A
NTS



1 WATER MAINS UNDER ROADBED OR WITHIN INFLUENCE OF ROADBED TRENCH B
NTS

ISSUED FOR BIDDING: 2025/07/28
REVISION: DESCRIPTION

PROJECT NUMBER: 7867-24-0110
DATE: TW

ONTONAGON CTE
ONTONAGON CTE UTILITY SEPARATION
701 Parker Ave, Ontonagon, MI 49953

DETAILS

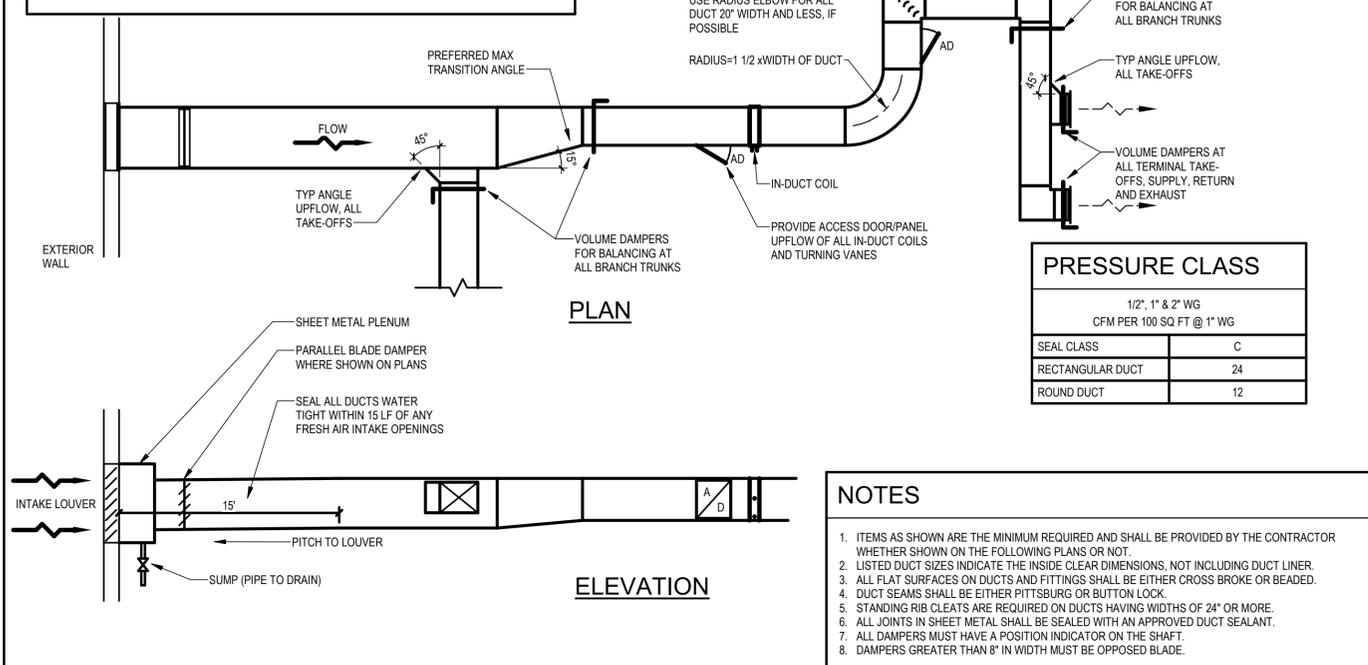
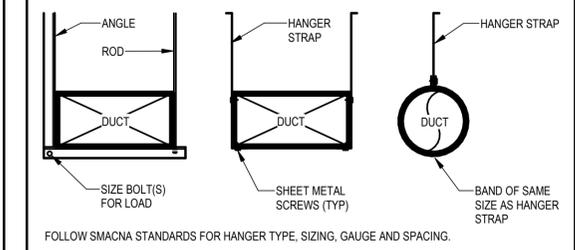
MECHANICAL ABBREVIATIONS

A	AIR	KH	KITCHEN HOOD
AAV	AUTOMATIC AIR VENT	L	LOUVER
AD	ACCESS DOOR/PANEL	LAT	LEAVING AIR TEMPERATURE
AFF	ABOVE FINISH FLOOR	LDB	LEAVING DRY BULB
AHU	AIR HANDLING UNIT	LF	LINEAL FEET
APD	AIR PRESSURE DROP	LPS	LOW PRESSURE STEAM
AS	AIR SEPARATOR	LWB	LEAVING WET BULB
		LWT	LEAVING WATER TEMPERATURE
B	BOILER		
BDD	BACK DRAFT DAMPER	M	MAXIMUM
BFP	BACK FLOW PREVENTER	MBH	THOUSAND BTU PER HOUR
		MCA	MINIMUM CIRCUIT AMPS
C		MIN	MINIMUM
CFM	CUBIC FEET PER MINUTE	MISC	MISCELLANEOUS
CG	CEILING GRID	MTD	MOUNTED
CHWR	CHILLED WATER RETURN	MJA	MAKE-UP AIR UNIT
CHWS	CHILLED WATER SUPPLY		
CND	STEAM CONDENSATE		
COND	CONDENSING UNIT	O	OUTSIDE AIR
CONV	CONVECTOR	OA	OUTSIDE AIR
CR	CONDENSATE RETURN		
CUH	CABINET UNIT HEATER	P	PUMP
		PH	PHASE
D		PRV	PRESSURE REDUCING VALVE
DB	DRY BULB	PSI	POUNDS PER SQUARE INCH
DIA Ø	DIAMETER	PSIG	POUNDS PER SQUARE INCH GAUGE
DN	DOWN		
		R	SUPPLY REGISTER
E		RA	RETURN AIR
EA	EXHAUST AIR	RAD	RADIANT HEATER
EAT	ENTERING AIR TEMPERATURE	RD	ROUND DIFFUSER
EDB	ENTERING DRY BULB	RF	RETURN FAN
EF	EXHAUST FAN	RH	GRAVITY RELIEF HOOD
ESP	EXTERNAL STATIC PRESSURE	RPM	REVOLUTIONS PER MINUTE
ET	EXPANSION TANK		
EWB	ENTERING WET BULB	S	
EWT	ENTERING WATER TEMPERATURE	SA	SUPPLY AIR
EXST	EXISTING	SC	STEAM COIL
		SD	SMOKE DAMPER
F		SF	SUPPLY FAN
FCU	FAN COIL UNIT	SP	STATIC PRESSURE
FPM	FEET PER MINUTE	STD	STANDARD
FPS	FEET PER SECOND	STM	STEAM
FT	FOOT / FEET	SWG	SIDE WALL GRILLE
FTR	FIN TUBE RADIATION	SWR	SIDE WALL REGISTER
°F	FAHRENHEIT DEGREE		
		T	TYPICAL
G			
GA	NATURAL / LP GAS		
GPH	GALLONS PER HOUR		
GPM	GALLONS PER MINUTE	UH	UNIT HEATER
		V	VENT
H		VAV	VARIABLE AIR VOLUME
HC	HOT WATER COIL	VD	VANED DIFFUSER
HP	HORSEPOWER		
HPS	HIGH PRESSURE STEAM		
HRU	HEAT RECOVERY UNIT		
HTWR	HEATING WATER RETURN		
HTWS	HEATING WATER SUPPLY	W	
HVAC	HEATING VENTILATING & AIR CONDITIONING	WH	WATER HEATER
		WPD	WATER PRESSURE DROP
HX	HEAT EXCHANGER		
I			
IN	INCH / INCHES		
K			

MECHANICAL ABBREVIATIONS

DUCTWORK REQUIREMENTS

DUCT SUPPORT DETAILS



PRESSURE CLASS

1/2", 1" & 2" WG	C
CFM PER 100 SQ FT @ 1" WG	
SEAL CLASS	C
RECTANGULAR DUCT	24
ROUND DUCT	12

NOTES

- ITEMS AS SHOWN ARE THE MINIMUM REQUIRED AND SHALL BE PROVIDED BY THE CONTRACTOR WHETHER SHOWN ON THE FOLLOWING PLANS OR NOT.
- LISTED DUCT SIZES INDICATE THE INSIDE CLEAR DIMENSIONS, NOT INCLUDING DUCT LINER.
- ALL FLAT SURFACES ON DUCTS AND FITTINGS SHALL BE EITHER CROSS BROKE OR BEADED.
- DUCT SEAMS SHALL BE EITHER PITTSBURG OR BUTTON LOCK.
- STANDING RIB CLEATS ARE REQUIRED ON DUCTS HAVING WIDTHS OF 24" OR MORE.
- ALL JOINTS IN SHEET METAL SHALL BE SEALED WITH AN APPROVED DUCT SEALANT.
- ALL DAMPERS MUST HAVE A POSITION INDICATOR ON THE SHAFT.
- DAMPERS GREATER THAN 8" IN WIDTH MUST BE OPPOSED BLADE.

GENERAL NOTES - MECHANICAL

- DRAWINGS INDICATE REQUIRED SIZES AND POINTS OF TERMINATION OF PIPES AND DUCTS AND SUGGESTED ROUTES. IT IS NOT THE INTENTION OF DRAWINGS TO INDICATE ALL NECESSARY OFFSETS. INSTALL WORK IN MANNER TO CONFORM TO STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR. DO NOT SCALE FROM DRAWINGS.
- THE CONTRACTOR SHALL FIELD VERIFY THE SIZES, LOCATION, ELEVATIONS, AND DETAILS OF ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK.
- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE PATCHING, CAPPING, OR REPAIRING OF WALLS, FLOOR, AND ROOF WHERE OPENINGS OCCUR AS A RESULT OF REMOVAL OF MECHANICAL AND ELECTRICAL COMPONENTS AS PART OF THIS CONTRACT, UNLESS THE OPENING IS BEING RE-USED OR ENLARGED IN THE RENOVATION WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF ALL EQUIPMENT AND MATERIALS IN A "NEW" CONDITION DURING CONSTRUCTION.
- PROVIDE BALANCE DAMPERS FOR EACH DIFFUSER/GRILLE AND BRANCH DUCT.
- ALL EXTERNALLY ISOLATED HVAC EQUIPMENT SHALL HAVE FLEXIBLE DUCT CONNECTORS.
- ALL CONDENSATE DRAIN PIPING TO TERMINATE TO DRAIN VIA AIR GAP.
- COORDINATE ROOF MOUNTED EQUIPMENT SIZES WITH ARCHITECTURAL TRADES PRIOR TO CONSTRUCTION.
- ROOF OPENINGS SHALL BE SEALED WEATHER-TIGHT AND WITH ROOFING MATERIALS COMPATIBLE WITH EXISTING ROOF MEMBRANE. CONTRACTOR SHALL NOT VOID ROOF WARRANTY.
- DUCT ACCESS PANELS SHALL BE PROVIDED AT ALL FIRE DAMPERS, FIRE/SMOKE DAMPERS, MOTORIZED DAMPERS, AND DUCT SMOKE DETECTORS. WHERE NECESSARY, CEILING ACCESS PANELS SHALL BE PROVIDED AS WELL.
- INSTALL ALL NEW EQUIPMENT IN COMPLIANCE WITH THE MANUFACTURER'S REQUIRED CLEARANCES. ALL DISCONNECTS AND HIGH VOLTAGE ELECTRICAL PANELS SHALL HAVE THE CLEARANCE REQUIRED BY NEC ARTICLE 110 (36" FOR 120/208V, 42" FOR 227/460V, AND 48" WHEN FACING ONE ANOTHER).
- ROUTE ALL CONTROL WIRING TO THE THERMOSTATS AND VAV BOXES WITHIN THE SOFFITS AND WALLS WHEREVER POSSIBLE. WIRING IN ANY WALLS OR EXPOSED SHALL BE IN CONDUIT. WHERE CONNECTING TO VAV BOXES IN EXPOSED AREAS, CONTROL WIRING SHALL BE RUN IN EXPOSED PAINTED CONDUIT. CONDUIT COLOR SHALL BE COORDINATED WITH ARCHITECT.

HVAC SYMBOLS LEGEND

DIFFUSERS, GRILLES, TAGS AND SYMBOLS

	CEILING DIFFUSER		MANUAL VOLUME DAMPER		CHECK VALVE
	LINEAR SLOT DIFFUSER		MOTORIZED DAMPER		GATE VALVE
	WALL DIFFUSER / GRILLE		FIRE DAMPER		BALL VALVE
	FLOOR REGISTER		SMOKE DAMPER		BUTTERFLY VALVE
	CEILING GRILLE		SMOKE AND FIRE DAMPER		2-WAY ELECTRONIC CONTROL VALVE
	TRANSFER GRILLE		THERMOSTAT		3-WAY ELECTRONIC CONTROL VALVE
	TURNING VANES		HUMIDISTAT		2-WAY PNEUMATIC CONTROL VALVE
	12x12 DUCT WIDTH x HEIGHT		CONNECT TO EXISTING		3-WAY PNEUMATIC CONTROL VALVE
	12ø ROUND DUCT DIAMETER		PIPE BREAK		RELIEF VALVE
	101.1/200 DIFFUSER INDICATOR		AVERAGING TEMPERATURE SENSOR		CIRCUIT SETTER
	EQUIPMENT TAG		AVERAGING TEMPERATURE SENSOR		BALANCE VALVE
	KEYNOTE TAG		PUMP		TRIPLE DUTY VALVE
	BREAK LINE		ELECTRIC TO PNEUMATIC TRANSDUCER		AIR VENT
	DIGITAL INPUT TO THE CONTROLLER		PNEUMATIC TO ELECTRIC TRANSDUCER		MOTORIZED VALVE
	DIGITAL OUTPUT TO THE CONTROLLER		DIFFERENTIAL PRESSURE SENSOR / SWITCH		OCCUPANCY SENSOR
	ANALOG INPUT TO THE CONTROLLER		SMOKE DETECTOR		CO2 SENSOR
	ANALOG OUTPUT TO THE CONTROLLER		RELAY		FAN
	RELAY		AIR FLOW MEASURING STATION		FILTER BANK
	CURRENT SWITCH		GAS HEAT SECTION		FINNED TUBE OR RADIANT PANEL
	PNEUMATIC DAMPER ACTUATOR		HOT WATER HEATING COIL		CHILLED WATER COOLING COIL
	SOLENOID VALVE				
	REFRIGERANT COOLING COIL				

DUCTS

	PROPOSED		EXISTING		DEMOLISH	
	RECTANGLE	ROUND	RECTANGLE	ROUND	RECTANGLE	ROUND
EXHAUST AIR						
OUTSIDE AIR						
RETURN AIR						
SUPPLY AIR						

PIPING

	NEW	EXISTING	DEMOLISH
CHILLED WATER RETURN			
CHILLED WATER SUPPLY			
HEATING WATER RETURN			
HEATING WATER SUPPLY			
STEAM CONDENSATE			
STEAM			
NATURAL GAS			

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ISSUED FOR: BIDS 2023/07/28

ONTONAGON CTE
CONTRACT 1: UTILITY SEPARATION CONTRACT 2: MECHANICAL WORK
701 Parker Avenue, Ontonagon, MI 49853
MECHANICAL NOTES & SYMBOLS

M-001

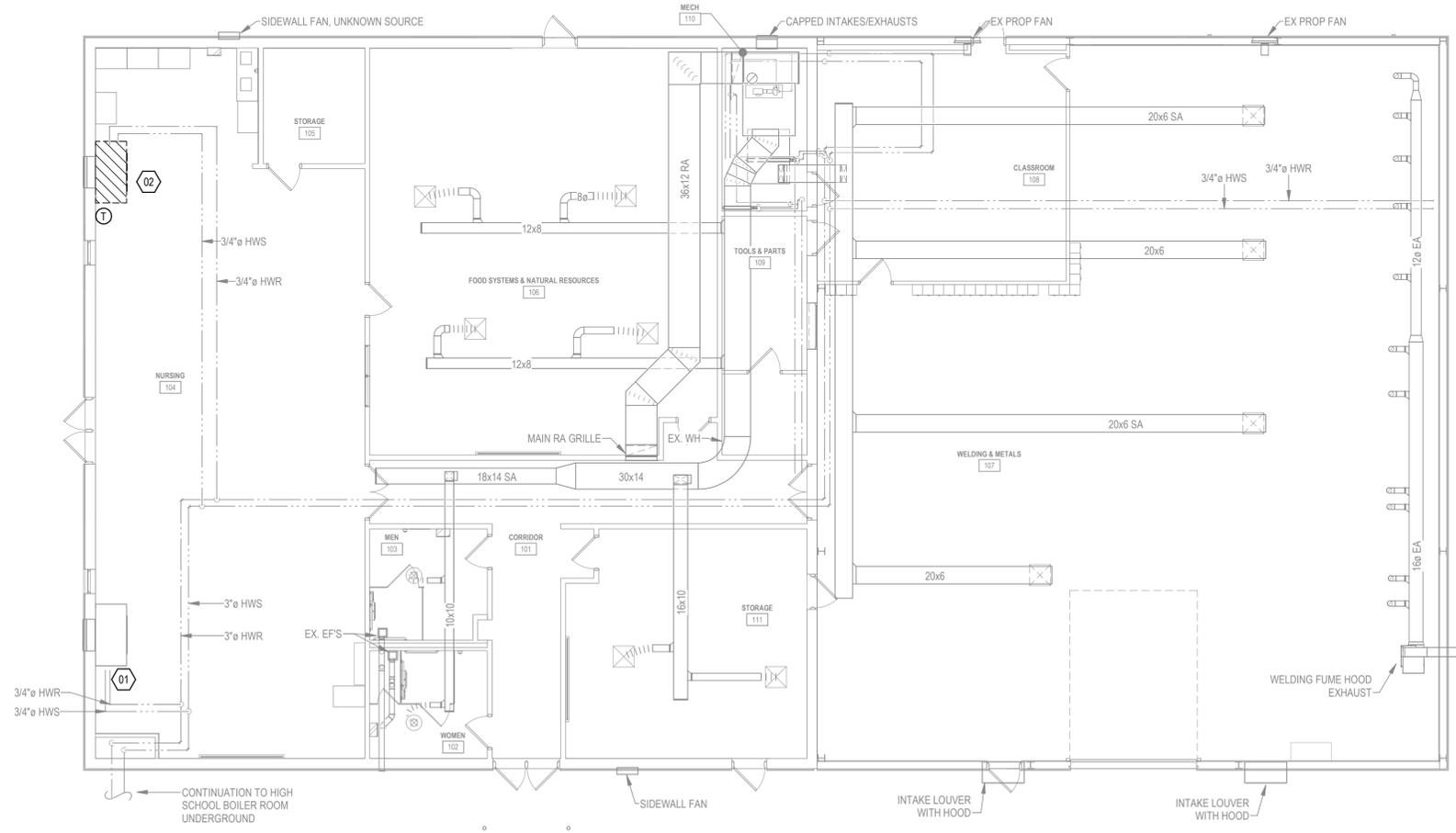
GENERAL NOTES - HVAC DEMOLITION

1. ALL BIDDING CONTRACTORS ARE REQUIRED TO FIELD VERIFY EXISTING CONDITIONS AND DESIGN INTENT. COORDINATE WITH THE CM, AND PERFORM A CONSTRUCTABILITY ANALYSIS PRIOR TO SUBMITTING A BID. QUESTIONS OR COMMENTS SHALL BE SUBMITTED IN WRITING DURING THE BIDDING PHASE. NO ADDITIONAL COSTS TO THE PROJECT WILL BE ACCEPTED AFTER PROJECT AWARD FOR CHANGES DUE TO LACK OF KNOWLEDGE OF EXISTING CONDITIONS OR LACK OF COORDINATION.
2. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE PATCHING, CAPPING, OR REPAIRING OF WALLS, FLOOR, AND ROOF WHERE OPENINGS OCCUR AS A RESULT OF REMOVAL OF MECHANICAL AND ELECTRICAL COMPONENTS AS PART OF THIS CONTRACT, UNLESS THE OPENING IS BEING RE-USED OR ENLARGED IN THE RENOVATION WORK.
3. ANY DEVICE/EQUIPMENT NO LONGER NEEDED SHALL BE PROPERLY DISPOSED OF.

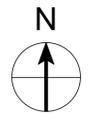


XX SHEET KEYNOTES - MECH. DEMOLITION

- 01 CLOSE SHUTOFF VALVES TO UNIT, UNIT TO REMAIN, SHUT OUTSIDE AIR DAMPER IN THE CLOSED POSITION.
- 02 DEMOLISH UNIT VENTILATOR & ASSOCIATED VALVES AND THERMOSTAT. PREPARE HYDRONIC LINES FOR NEW CONNECTION. PREPARE OUTSIDE AIR DUCT FOR NEW CONNECTION. REMOVE CEILING SURROUNDING UNIT VENT AS NEEDED AND SALGAVE FOR RE-INSTALLATION.



1 FIRST FLOOR MECHANICAL DEMOLITION PLAN PHASE 1
1/8" = 1'-0"



ISSUED FOR: BIDS 2023/07/28

ONTONAGON CTE
 CONTRACT 1: UTILITY SEPARATION CONTRACT 2: MECHANICAL WORK
 701 Parker Avenue, Ontonagon, MI 49853
 MECHANICAL DEMOLITION PLAN

MD-101

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MECHANICAL PIPE INSULATION SCHEDULE					
ITEM	THICKNESS	INSULATION TYPE	JACKET TYPE	MINIMUM INSTALLED R-VALUE	NOTES
HOT WATER SUPPLY <1-1/2"ø	1-1/2"	FIBERGLASS	ASJ WITH PVC COVERS	10	
HOT WATER RETURN <1-1/2"ø	1-1/2"	FIBERGLASS	ASJ WITH PVC COVERS	10	

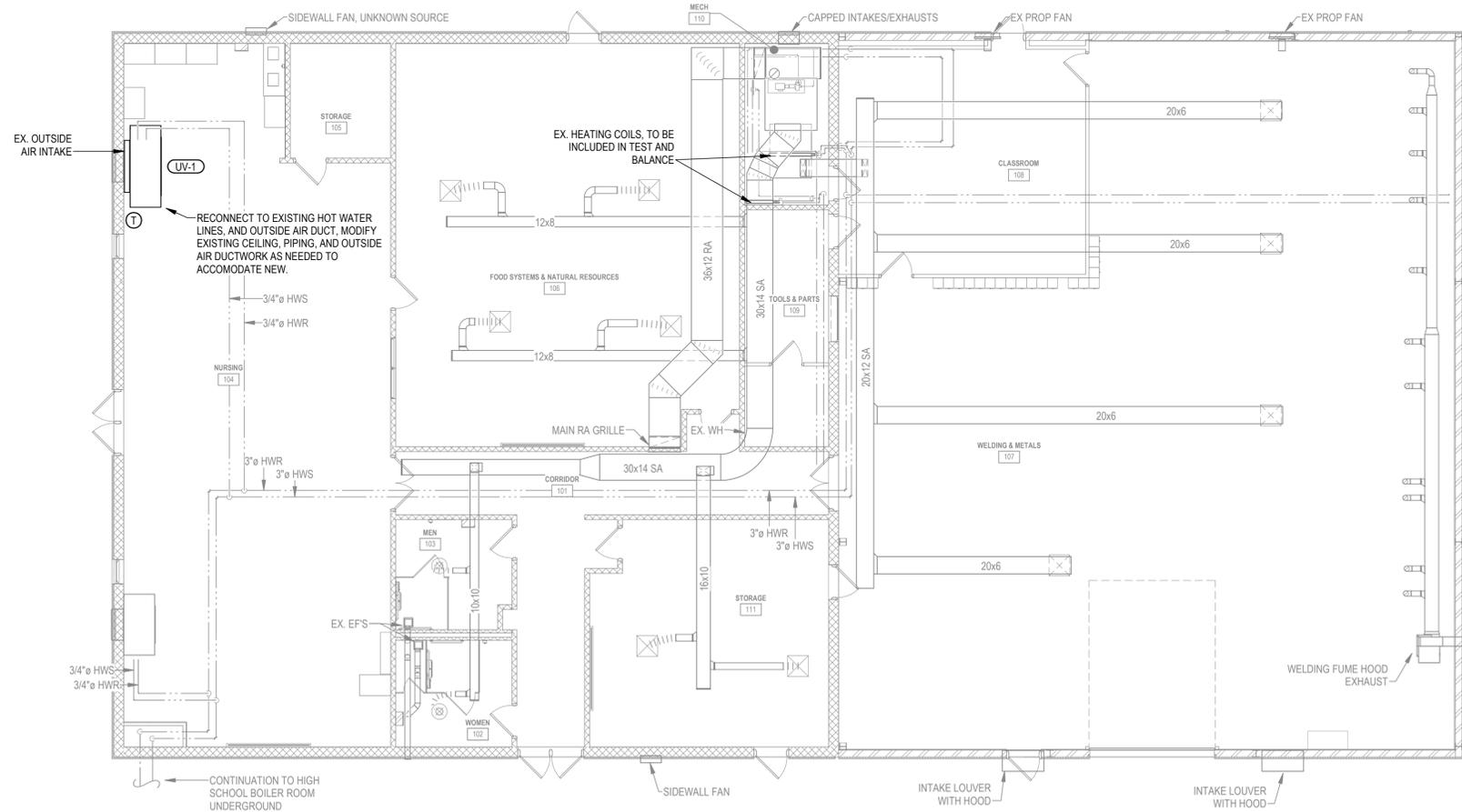
UNIT VENTILATOR SCHEDULE																		
MARK	LOCATION	SA CFM	OA CFM	DX COOLING			HOT WATER HEATING				ELECTRICAL			MANUFACTURER	MODEL	NOTES		
				GROSS MBH	EAT (DB/WB)	LAT (DB/WB)	GPM	FLUID TYPE	MBH	WPD (FT-WG)	EWT / LWT (°F)	EAT / LAT (°F)	V/PHHZ				MCA	MOCF
UV-1	NURSING 111	1,200	400	N/A	N/A	N/A	9.5	WATER	121	7.25	180/165	40.5/131	115/1/60	15	15	TRANE	HUVC12510AFGA	1-5

NOTES:

- PROVIDE PUMP FOR CONDENSATE DISPOSAL, CAP PUMP WASTE LINE FOR FUTURE USE.
- CAP REFRIGERANT CONNECTIONS AT UNIT FOR FUTURE INSTALLATION, PROVIDE UNIT WITH DX COIL INSTALLED.
- PROVIDE WITH 7 DAY PROGRAMMABLE THERMOSTAT & WIREMOLD AS NEEDED FOR CABLE.
- DURING INSTALLATION PROVIDE TRANE CONTROLLER TO OPERATE FAN TO CYCLE TO MEET ZONE SETPOINT, OPEN OUTSIDE AIR DAMPER WHEN FAN IS ON, WHEN SPACE SETPOINT IS MET FAN TO SHUT DOWN AND OUTSIDE AIR DAMPER TO CLOSE.
- PROVIDE CONTROLLER WITH THE ABILITY TO BE REPROGRAMMED IN FUTURE TO CONTROL MODULATING CONTROL VALVE, OUTSIDE AIR, AND ZONE SCHEDULING CAPABILITY.

GENERAL NOTES - MECHANICAL HVAC

- ALL BIDDING CONTRACTORS ARE REQUIRED TO FIELD VERIFY EXISTING CONDITIONS AND DESIGN INTENT PRIOR TO SUBMITTING A BID. QUESTIONS OR COMMENTS SHALL BE SUBMITTED IN WRITING DURING THE BIDDING PHASE. NO ADDITIONAL COSTS TO THE PROJECT WILL BE ACCEPTED AFTER PROJECT AWARD FOR CHANGES DUE TO LACK OF KNOWLEDGE OF EXISTING CONDITIONS OR LACK OF COORDINATION.
- DRAWINGS INDICATE REQUIRED SIZES AND POINTS OF TERMINATION OF PIPES AND DUCTS AND SUGGESTED ROUTES. IT IS NOT THE INTENTION OF DRAWINGS TO INDICATE ALL NECESSARY OFFSETS. INSTALL WORK IN MANNER TO CONFORM TO STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR. DO NOT SCALE FROM DRAWINGS.
- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE PATCHING, CAPPING, OR REPAIRING OF WALLS, FLOOR, AND ROOF WHERE OPENINGS OCCUR AS A RESULT OF REMOVAL OF MECHANICAL AND ELECTRICAL COMPONENTS AS PART OF THIS CONTRACT, UNLESS THE OPENING IS BEING RE-USED OR ENLARGED IN THE RENOVATION WORK.
- PROVIDE BALANCE DAMPERS FOR EACH DIFFUSER/GRILLE AND BRANCH DUCT.
- SIZES INDICATED FOR EXISTING DUCTWORK AND PIPING ARE PER THE ORIGINAL DOCUMENTS. FIELD VERIFY EXACT SIZES AND PROVIDE TRANSITIONS ACCORDINGLY.
- COORDINATE LOCATIONS OF THE THERMOSTATS WITH OTHER TRADES.



1 FIRST FLOOR MECHANICAL PLAN PHASE 1
1/8" = 1'-0"



ISSUED FOR: BIDS 2025/07/28

ONTONAGON CTE
 CONTRACT 1: UTILITY SEPARATION CONTRACT 2: MECHANICAL WORK
 PROJECT NUMBER 7267-24-1010 PM TW
 701 Parker Avenue, Ontonagon, MI 49853
 MECHANICAL PLAN

M-101

PROJECT MANUAL

ONTONAGON CTE

ONTONAGON CTE CONTRACT 1: UTILITY SEPARATION CONTRACT 2: MECHANICAL WORK

Ontonagon, MI



PROJECT NO. 7267-24-0010

Date: July 28, 2025

Architects, Engineers & Planners:



424 Hancock Street
Hancock, Michigan 49930

906-482-0535

www.ohm-advisors.com

Gogebic Ontonagon Intermediate School District
Ontonagon CTE Contract 1: Utility Separation Contract 2: Mechanical Work

Tracie Williams, PE
906.482.0535

Project Manager
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Schools District
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PROCUREMENT AND CONTRACTING REQUIREMENTS

SECTION 001113 – ADVERTISEMENT FOR BIDS

FROM:

1.1 THE OWNER (HEREINAFTER REFERRED TO AS OWNER):

- A. Gogebic-Ontonagon Intermediate School District
- B. Address:
 - 200 S Elm St
 - Ewen, MI 49925

1.2 AND THE ENGINEER (HEREINAFTER REFERRED TO AS ENGINEER):

- A. OHM Advisors
- B. Address:
 - 424 Hancock Street
 - Hancock, Michigan 49930

1.3 TO: POTENTIAL BIDDERS

- A. Your firm is invited to submit an offer under seal to Owner for proposed work at a facility located at 224 Greenbriar Street, Ontonagon, Michigan 49953, before 2:00 pm local daylight time on Friday, August 22, 2025.
- B. Project: Ontonagon CTE Contract 1: Utility Separation, Contract 2: Mechanical Work.
- C. Engineer's Project Number: 7267-24-0010.
- D. Project Description: Install new water and sewer services to connect the CTE building to the village water and sewer system as shown on the drawings as well as all associated restoration work. Two-unit vents in the nursing area of the building will be demolished and removed and a new unit vent will be installed. The existing booster pump will also be demolished and removed.
- E. Bid Documents for a Stipulated Sum contract may be obtained from the office of the Design Professional upon receipt of a payment, by cash or check, in the amount of \$50.00 for one set. You may contact Taylor Nettell for the bidding documents at 906-482-0535 or at taylor.nettell@ohm-advisors.com or online at Quest CDN (questcdn.com).
- F. Bidders will be required to provide Bid security in the form of a Bid Bond of a sum no less than 5 percent of the Bid Amount.
- G. Refer to other bidding requirements described in Document 002113 - Instructions to Bidders.
- H. Submit your offer on the Bid Form provided. Bidders may supplement this form as appropriate.
- I. Your offer will be required to be submitted under a condition of irrevocability for a period of 60 days after submission.
- J. The Owner reserves the right to accept or reject any or all offers.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 001113

Ontonagon CTE
Ontonagon CTE Contract 1: Utility
Separation, Contract 2:
Mechanical Work
OHM File No.: 7267-24-0010

Advertisement for Bids
001113 - 1
07/28/2025

SECTION 002113 – INSTRUCTIONS TO BIDDERS

SUMMARY

- 1.1 SEE AIA A701, INSTRUCTION TO BIDDERS.
- 1.2 THE INSTRUCTIONS IN THIS DOCUMENT AMEND OR SUPPLEMENT THE INSTRUCTIONS TO BIDDERS AND OTHER PROVISIONS OF THE BIDDING AND CONTRACT DOCUMENTS.
- 1.3 DOCUMENT INCLUDES
 - A. Invitation
 - 1. Bid Submission
 - B. Bid Documents and Contract Documents
 - 1. Definitions
 - 2. Contract Documents Identification
 - 3. Availability
 - 4. Examination
 - 5. Inquiries/Addenda
 - 6. Product/Assembly/System Substitutions
 - C. Site Assessment
 - 1. Site Examination
 - 2. Prebid Conference
 - D. Qualifications
 - 1. Qualifications
 - 2. Prequalification
 - 3. Subcontractors/Suppliers/Others
 - E. Bid Submission
 - 1. Bid Depository
 - 2. Bid Ineligibility
 - F. Bid Enclosures/Requirements
 - 1. Security Deposit
 - 2. Insurance
 - 3. Bid Form Requirements
 - 4. Fees for Changes in the Work
 - 5. Bid Form Signature
 - 6. Additional Bid Information
 - 7. Selection and Award of Alternates
 - G. Offer Acceptance/Rejection
 - 1. Duration of Offer
 - 2. Acceptance of Offer
- 1.4 RELATED DOCUMENTS
 - A. Document 011000 - Summary.
 - B. Document 001113 - Advertisement for Bids.

- C. Document 004100 - Bid Form.

INVITATION

2.1 BID SUBMISSION

- A. Bids signed and under seal, executed, and dated will be received at the office of the Owner at 224 Greenbriar Street, Ontonagon, Michigan 49953 before 2:00 p.m. local standard time on Friday, August 22, 2025.
- B. Offers submitted after the above time will be returned to the bidder unopened.
- C. Offers will be opened publicly immediately after the time for receipt of bids.

BID DOCUMENTS AND CONTRACT DOCUMENTS

3.1 DEFINITIONS

- A. Bid Documents: Contract Documents supplemented with Invitation To Bid, Instructions to Bidders, Information Available to Bidders, Bid Form Supplements To Bid Forms and Appendices identified.
- B. Bid, Offer, or Bidding: Act of submitting an offer under seal.
- C. Bid Amount: Monetary sum identified by the Bidder in the Bid Form.

3.2 AVAILABILITY

- A. Bid documents may be obtained at Marquette Builders Exchange Website, Quest CDN or at OHM Advisors with prior regards to obtaining the documents.
- B. Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not grant a license for other purposes.

3.3 EXAMINATION

- A. Bid Documents are available online at Marquette Builders Exchange and Quest CDN (questcdn.com). You may register for a free membership with Quest CDN and download the digital plan documents for \$22.00 by inputting Quest project #9809439 or the OHM Advisors project #7267-24-0010 on the website's Project Search page. Please contact QuestCDN.com at 952-233-1632 or info@questcdn.com for assistance in free membership registration, downloading, and working with the digital project information.
- B. Upon receipt of Bid Documents verify that documents are complete. Notify Engineer should the documents be incomplete.
- C. Immediately notify Engineer upon finding discrepancies or omissions in the Bid Documents.

3.4 INQUIRIES/ADDENDA

- A. Direct questions to Tracie Williams and Taylor Nettell, email; tracie.williams@ohm-advisors.com and taylor.nettell@ohm-advisors.com.
- B. Addenda may be issued during the bidding period. All Addenda become part of Contract Documents. Include resultant costs in the Bid Amount.
- C. Verbal answers are not binding on any party.

Ontonagon CTE

Ontonagon CTE Contract 1: Utility

Separation, Contract 2:

Mechanical Work

OHM File No.: 7267-24-0010

Instructions to Bidders

002113 - 2

07/28/2025

3.5 PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS

- A. General Requirements for Substitution Requests:
 - 1. Project Manual establishes standards for products, assemblies, and systems.
 - 2. Provide sufficient information to determine acceptability of proposed substitutions.
 - 3. Provide complete information on required revisions to other work to accommodate each proposed substitution.
- B. Substitution Request Time Restrictions:
 - 1. Where the Bid Documents stipulate a particular product, substitutions will be considered up to 7 days before receipt of bids.
- C. Substitution Request Form:
- D. Review and Acceptance of Request:
 - 1. may approve the proposed substitution and will issue an Addendum to known bidders.
 - 2. For approved substitutions, include representation of changes in the bid, if any, required in the work and changes to Contract Time and Contract Sum to accommodate such substitutions. A later claim by the bidder for an addition to the Contract Time or Contract Sum because of changes in work necessitated by use of substitutions will not be considered.

SITE ASSESSMENT

4.1 SITE EXAMINATION

- A. Examine the project site before submitting a bid.

4.2 PREBID CONFERENCE

- A. A mandatory bidders conference has been scheduled for 1:00 p.m. on Wednesday, August 13, 2025 at the Ontonagon CTE Building.
- B. Information relevant to the Bid Documents will be recorded in an Addendum, issued to Bid Document recipients.

QUALIFICATIONS

5.1 EVIDENCE OF QUALIFICATIONS

- A. To demonstrate qualification for performing the Work of this Contract, bidders may be requested to submit written evidence of financial position, license to perform work in the State and references.

BID SUBMISSION

6.1 SUBMISSION PROCEDURE

- A. Submit one copy of the executed offer on the Bid Forms provided, signed and sealed with the required security in a closed opaque envelope, clearly identified with bidder's name, project name and Owner's name on the outside.

6.2 BID INELIGIBILITY

- A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may at the discretion of the Owner, be declared unacceptable.
- B. Bid Forms, Appendices, and enclosures that are improperly prepared may, at the discretion of Owner, be declared unacceptable.

BID ENCLOSURES/REQUIREMENTS

7.1 SECURITY DEPOSIT

- A. Bids shall be accompanied by a security deposit as follows:
 - 1. Bid Bond of a sum no less than 5 percent of the Bid Amount.
 - 2. Or, a certified check in the amount of 5 percent of the Bid Amount.
- B. The security deposit will be returned after delivery to the Owner of the required Performance and Payment Bond(s) by the accepted bidder.
- C. Include the cost of bid security deposit in the Bid Amount.
- D. If no contract is awarded, all security deposits will be returned.

7.2 PERFORMANCE ASSURANCE

- A. Accepted Bidder: Provide a Performance and Payment bond as described in the AIA requirements.
- B. Include the cost of Performance and Payment Bonds in the Bid Amount.

7.3 BID FORM REQUIREMENTS

- A. Complete all requested information in the Bid Form and Appendices.

7.4 BID FORM SIGNATURE

- A. The Bid Form shall be signed by the bidder, as follows:
 - 1. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.
 - 2. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.
 - 3. Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the president and secretary of the company, or the president/secretary/treasurer of the company, a copy of the by-law resolution of their board of directors authorizing them to do so, must also be submitted with the Bid Form in the bid envelope.
 - 4. Joint Venture: Each party of the joint venture shall execute the Bid Form under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

OFFER ACCEPTANCE/REJECTION

8.1 DURATION OF OFFER

- A. Bids shall remain open to acceptance and shall be irrevocable for a period of sixty (60) days after the bid closing date.

8.2 ACCEPTANCE OF OFFER

- A. Owner reserves the right to accept or reject any or all offers.
- B. After acceptance by Owner, Engineer on behalf of Owner, will issue to the successful bidder, a written Bid Acceptance.

END OF SECTION 002113

Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

Ontonagon CTE Contract 1: Utility Separation Contract 2: Mechanical Work
224 Greenbriar Street
Ontonagon, MI 49953

THE OWNER:
(Name, legal status, address, and other information)

Gogebic-Ontonagon ISD
Ewen, MI 49925

THE ARCHITECT:
(Name, legal status, address, and other information)

OHM Advisors
424 Hancock Street
Hancock, MI 49930

TABLE OF ARTICLES

- 1 DEFINITIONS
- 2 BIDDER'S REPRESENTATIONS
- 3 BIDDING DOCUMENTS
- 4 BIDDING PROCEDURES
- 5 CONSIDERATION OF BIDS
- 6 POST-BID INFORMATION
- 7 PERFORMANCE BOND AND PAYMENT BOND
- 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

ADDITIONS AND DELETIONS:
The author of this document may have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for a non-refundable fee of **\$50.00**

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.3 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.4 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and

the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter “No Change” or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder’s refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent’s authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instruction to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:
(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within

the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner's Financial Capability

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals

§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.4 Drawings

Number	Title	Date
G-000	COVER	7/28/2025
C-010	NOTES & LEGENDS	7/28/2025
C-120	EXISTING CONDITIONS & REMOVAL PLAN	7/28/2025
C-140	UTILITY PLAN	7/28/2025
C-501	DETAILS	7/28/2025
C-502	DETAILS	7/28/2025
M-001	MECHANICAL NOTES & SYMBOLS	7/28/2025
MD-101	MECHANICAL DEMOLITION PLAN	7/28/2025
M-101	MECHANICAL PLAN	7/28/2025
E-501	ELECTRICAL DETAILS	7/28/2025

.5 Specifications

Section	Title	Date	Pages
01 10 00	SUMMARY	7/28/2025	2
01 20 00	PRICE AND PAYMENT PROCEDURES	7/28/2025	4
01 23 00	ALTERNATES	7/28/2025	2
01 30 00	ADMINISTRATIVE REQUIREMENTS	7/28/2025	9
01 57 13	TEMPORARY EROSION AND SEDIMENT CONTROL	7/28/2025	5
01 60 00	PRODUCT REQUIREMENTS	7/28/2025	3
01 70 00	EXECUTION AND CLOSEOUT REQUIREMENTS	7/28/2025	7
23 05 53	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT	7/28/2025	2
23 05 93	TESTING, ADJUSTING, AND BALANCING FOR HVAC	7/28/2025	4
23 21 13	HYDRONIC PIPING	7/28/2025	5
23 82 23	UNIT VENTILATORS	7/28/2025	5
26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES	7/28/2025	5
26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS	7/28/2025	3
26 05 29	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	7/28/2025	3
26 05 33.13	CONDUIT FOR ELECTRICAL SYSTEMS	7/28/2025	5

26 22 00	LOW-VOLTAGE TRANSFORMERS	7/28/2025	1
31 10 00	SITE CLEARING	7/28/2025	5
31 22 00	GRADING	7/28/2025	3
31 23 16.13	TRENCHING	7/28/2025	2
31 23 23	FILL	7/28/2025	7
32 11 20	SUBBASE AND AGGREGATE BASE COURSES	7/28/2025	3
32 12 16	ASPHALT PAVING	7/28/2025	5
32 13 13	CONCRETE PAVING	7/28/2025	7
32 92 19	SEEDING	7/28/2025	6
33 14 15	SITE WATER DISTRIBUTION PIPING	7/28/2025	11
33 31 13	SITE SANITARY SEWERAGE GRAVITY PIPING	7/28/2025	5

.6 Addenda:

Number	Date	Pages
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.7 Other Exhibits:

.8 Other documents listed below:

SECTION 002213 – SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

1.1 INSTRUCTIONS TO BIDDERS

- A. Instructions to Bidders for Project consist of the following:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. AIA Document A701, "Instructions to Bidders," a copy of which is bound in this Project Manual.
 - 3. The following Supplementary Instructions to Bidders that modify and add to the requirements of the Instructions to Bidders.

1.2 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS, GENERAL

- A. The following supplements modify AIA Document A701, "Instructions to Bidders." Where a portion of the Instructions to Bidders is modified or deleted by these Supplementary Instructions to Bidders, unaltered portions of the Instructions to Bidders shall remain in effect.

1.3 ARTICLE 2 - BIDDER'S REPRESENTATIONS

- A. Add Section 2.1.3.1:
 - 1. 2.1.3.1 - The Bidder has investigated all required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted bid the cost of such fees, permits, and requirements not otherwise indicated as provided by Owner.
- B. Add Section 2.1.5:
 - 1. 2.1.5 - The Bidder is a properly licensed Contractor according to the laws and regulations of the State of Michigan and meets qualifications indicated in the Procurement and Contracting Documents.
- C. Add Section 2.1.6:
 - 1. 2.1.6 - The Bidder has incorporated into the Bid adequate sums for work performed by installers whose qualifications meet those indicated in the Procurement and Contracting Documents.

1.4 ARTICLE 3 - BIDDING DOCUMENTS

- A. 3.4 - Addenda:
 - 1. Delete Section 3.4.3 and replace with the following:
 - a. 3.4.3 - Addenda may be issued at any time prior to the receipt of bids.
 - 2. Add Section 3.4.4.1:
 - a. 3.4.4.1 - Owner may elect to waive the requirement for acknowledging receipt of 3.4.4 Addenda as follows:
 - 1) 3.4.4.1.1 - Information received as part of the Bid indicates that the Bid, as submitted, reflects modifications to the Procurement and Contracting Documents included in an unacknowledged Addendum.
 - 2) 3.4.4.1.2 - Modifications to the Procurement and Contracting Documents in an unacknowledged Addendum do not, in the opinion of Owner, affect the Contract Sum or Contract Time.

1.5 ARTICLE 4 - BIDDING PROCEDURES

- A. 4.1 - Preparation of Bids:
 - 1. Add Section 4.1.1.1:

- a. 4.1.1.1 - Printable electronic Bid Forms and related documents are available from Architect.
- 2. Add Section 4.1.8:
 - a. 4.1.8 - The Bid shall include unit prices when called for by the Procurement and Contracting Documents. Owner may elect to consider unit prices in the determination of award. Unit prices will be incorporated into the Contract.
- 3. Add Section 4.1.9:
 - a. 4.1.9 - Owner may elect to disqualify a bid due to failure to submit a bid in the form requested, failure to bid requested alternates or unit prices, failure to complete entries in all blanks in the Bid Form, or inclusion by the Bidder of any alternates, conditions, limitations or provisions not called for.
- 4. Add Section 4.1.10:
 - a. 4.1.10 - Bids shall include sales and use taxes. Contractors shall show separately with each monthly payment application the sales and use taxes paid by them and their subcontractors in the form indicated. Reimbursement of sales and use taxes, if any, shall be applied for by Owner for the sole benefit of Owner.
- B. 4.4 - Modification or Withdrawal of Bids:
- C. Add the following sections to 4.4.2:
 - a. 4.4.2.1 - Such modifications to or withdrawal of a bid may only be made by persons authorized to act on behalf of the Bidder. Authorized persons are those so identified in the Bidder's corporate bylaws, specifically empowered by the Bidder's charter or similar legally binding document acceptable to Owner, or by a power of attorney, signed and dated, describing the scope and limitations of the power of attorney. Make such documentation available to Owner at the time of seeking modifications or withdrawal of the Bid.
 - b. 4.4.2.2 - Owner will consider modifications to a bid written on the sealed bid envelope by authorized persons when such modifications comply with the following: the modification is indicated by a percent or stated amount to be added to or deducted from the Bid; the amount of the Bid itself is not made known by the modification; a signature of the authorized person, along with the time and date of the modification, accompanies the modification. Completion of an unsealed bid form, awaiting final figures from the Bidder, does not require power of attorney due to the evidenced authorization of the Bidder implied by the circumstance of the completion and delivery of the Bid.
- D. 4.5 - Break-Out Pricing Bid Supplement:
 - 1. Add Section 4.5:
 - 2. 4.5 - Provide detailed cost breakdowns no later than two business days following Architect's request.

1.6 ARTICLE 5 - CONSIDERATION OF BIDS

- A. 5.2 - Rejection of Bids:
 - 1. Add Section 5.2.1:
 - a. 5.2.1 - Owner reserves the right to reject a bid based on Owner's and Architect's evaluation of qualification information submitted following opening of bids. Owner's evaluation of the Bidder's qualifications will include: status of licensure and record of compliance with licensing requirements, record of quality of completed work, record of Project completion and ability to complete, record of financial management including financial resources available to complete Project and record of timely

payment of obligations, record of Project site management including compliance with requirements of authorities having jurisdiction, record of and number of current claims and disputes and the status of their resolution, and qualifications of the Bidder's proposed Project staff and proposed subcontractors.

1.7 ARTICLE 6 - POSTBID INFORMATION

- A. 6.1 - Contractor's Qualification Statement:
 - 1. Add Section 6.1.1:
 - a. 6.1.1 - Submit Contractor's Qualification Statement no later than ten business days following Architect's request.
- B. 6.3 - Submittals:
 - 1. Add Section 6.3.1.4:
 - 2. 6.3.1.4 - Submit information requested in Sections 6.3.1.1, 6.3.1.2, and 6.3.1.3 no later than ten business days following Architect's request.
- C. 6.4 - Cost Breakdown
 - 1. Add Section 6.4:
 - a. 6.4 – Bidders to whom award of Contract is under consideration shall submit to the Architect a detailed cost breakdown no later than 10 days after issues of a Notice of Award.
- D. 6.5 - Construction Schedule:
 - 1. Add Section 6.5:
 - a. 6.5 – Bidders to whom award of Contract is under consideration shall submit to the Architect a construction schedule no later than ten days after issuance of a Notice of Award.

1.8 ARTICLE 7 - PERFORMANCE BOND AND PAYMENT BOND

- A. 7.1 - Bond Requirements:
 - 1. Add Section 7.1.1.1:
 - a. 7.1.1.1 - Both a Performance Bond and a Payment Bond will be required, each in an amount equal to 100 percent of the Contract Sum.
- B. 7.2 - Time of Delivery and Form of Bonds:
 - 1. Delete the first sentence of Section 7.2.1 and insert the following:
 - a. The Bidder shall deliver the required bonds to Owner no later than 10 days after the date of Notice of Intent to Award and no later than the date of execution of the Contract, whichever occurs first. Owner may deem the failure of the Bidder to deliver required bonds within the period of time allowed a default.
 - 2. Delete Section 7.2.3 and insert the following:
 - a. 7.2.3 - Bonds shall be executed and be in force on the date of the execution of the Contract.

1.9 ARTICLE 9 - EXECUTION OF THE CONTRACT

- A. Add Article 9:
 - 1. 9.1.1 - Subsequent to the Notice of Intent to Award, and within 10 days after the prescribed Form of Agreement is presented to the Awardee for signature, the Awardee shall execute and deliver the Agreement to Owner through Architect, in such number of counterparts as Owner may require.
 - 2. 9.1.2 - Owner may deem as a default the failure of the Awardee to execute the Contract and to supply the required bonds when the Agreement is presented for signature within the period of time allowed.

3. 9.1.3 - Unless otherwise indicated in the Procurement and Contracting Documents or the executed Agreement, the date of commencement of the Work shall be the date of the executed Agreement.
4. 9.1.4 - In the event of a default, Owner may declare the amount of the Bid security forfeited and elect to either award the Contract to the next responsible bidder or re-advertise for bids.

END OF SECTION 002213

SECTION 002600 – PROCUREMENT SUBSTITUTION PROCEDURES

1.1 DEFINITIONS

- A. Procurement Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Procurement and Contracting Documents, submitted prior to receipt of bids.
- B. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted following Contract award. See Section 012500 "Substitution Procedures" for conditions under which Substitution requests will be considered following Contract award.

1.2 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.3 PROCUREMENT SUBSTITUTIONS

- A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.
- B. Procurement Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action:
 - 1. Extensive revisions to the Contract Documents are not required.
 - 2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
 - 3. The request is fully documented and properly submitted.

1.4 SUBMITTALS

- A. Procurement Substitution Request: Submit to Architect. Procurement Substitution Request must be made in writing by prime contract Bidder only in compliance with the following requirements:
 - 1. Requests for substitution of materials and equipment will be considered if received no later than 10 days prior to date of bid opening.
 - 2. Submittal Format: Submit CSI Substitution Request Form 1.5C.
 - 3. Documentation: Show compliance with requirements for substitution and the following as applicable.
 - a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and drawing numbers.
 - b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
 - 1) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
 - 2) Copies of current, independent third-party test data of salient product or system characteristics.
 - 3) Samples where applicable or when requested by Architect.

- 4) Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - 5) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - 6) Research reports, where applicable, evidencing compliance with building code in effect for Project, from ICC-ES.
 - 7) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.
4. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.
 - a. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Procurement Substitution Request.
- B. Architect's Action:
1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Architect will notify all bidders of acceptance of the proposed substitute by means of an Addendum to the Procurement and Contracting Documents.
- C. Architect's approval of a substitute during bidding does not relieve Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents.

END OF SECTION 002600



SUBSTITUTION REQUEST (During the Bidding Phase)

Project _____ Substitution Request Number: _____

 From: _____
 To: _____ Date: _____

 A/E Project Number: _____
 Re: _____ Contract For: _____

Specification Title: _____ Description: _____
 Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____
 Manufacturer: _____ Address: _____ Phone: _____
 Trade Name: _____ Model No.: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____
 Signed by: _____
 Firm: _____
 Address: _____
 Telephone: _____

A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01330.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____

Date: _____

Supporting Data Attached: Drawings Product Data Samples Tests Reports _____

SECTION 004100 – BID FORM

THE PROJECT AND THE PARTIES

1.1 TO:

- A. Owner
200 S Elm St
Ewen, Michigan 49925

1.2 FOR:

- A. Project: Ontonagon CTE Contract 1: Utility Separation, Contract 2: Mechanical Work.
- B. Design Professional's Project Number: 7267-24-0010
224 Greenbriar St
Ontonagon, Michigan 49953

1.3 DATE: _____ (BIDDER TO ENTER DATE)

1.4 SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)

- A. Bidder's Full Name _____
 - 1. Address _____
 - 2. City, State, Zip _____

1.5 OFFER

- A. Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Bid Documents prepared by OHM Advisors for the above-mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

B. Contract 1: Utility Separation:

- 1. _____ dollars
(\$ _____), in lawful money of the United States of America.
- 2. We have included the required security deposit as required by the Instruction to Bidders.
- 3. We have included the required performance assurance bonds in the Bid Amount as required by the Instructions to Bidders.
 - a. The cost of the required performance assurance bonds is _____ dollars
(\$ _____), in lawful money of the United States of America.

C. Contract 2: Mechanical Work

- 1. _____ dollars
(\$ _____), in lawful money of the United States of America.
- 2. We have included the required security deposit as required by the Instruction to Bidders.
- 3. We have included the required performance assurance bonds in the Bid Amount as required by the Instructions to Bidders.
 - a. The cost of the required performance assurance bonds is _____ dollars
(\$ _____), in lawful money of the United States of America.

1.6 ACCEPTANCE

- A. This offer shall be open to acceptance and is irrevocable for sixty days from the bid closing date.
- B. If this bid is accepted by Owner within the time period stated above, we will:
 - 1. Execute the Agreement within seven days of receipt of Notice of Award.
 - 2. Furnish the required bonds within seven days of receipt of Notice of Award.
- C. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.
- D. In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

1.7 CONTRACT TIME

- A. If this Bid is accepted, we will:
 - 1. Work will be substantially completed by October 24, 2025, with a final completion date of November 21, 2025.

1.8 ADDENDA

- A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.
 - 1. Addendum # _____ Dated _____.
 - 2. Addendum # _____ Dated _____.
 - 3. Addendum # _____ Dated _____.

1.9 BID FORM SUPPLEMENTS

- A. The following Supplements are attached to this Bid Form and are considered an integral part of this Bid Form:
 - 1. Submit proposed schedule with bid.

1.10 BID FORM SIGNATURE(S)

- A. _____
- B. (Bidder - print the full name of your firm)
- C. _____
- D. (Authorized signing officer, Title)

END OF SECTION 004100

SECTION 004313 – BID SECURITY FORMS

1.1 BID FORM SUPPLEMENT

- A. A completed bid bond form is required to be attached to the Bid Form.

1.2 BID BOND FORM

- A. AIA Document A310-2010 "Bid Bond" is the recommended form for a bid bond. A bid bond acceptable to Owner, or other bid security as described in the Instructions to Bidders, is required to be attached to the Bid Form as a supplement.
- B. Copies of AIA standard forms may be obtained from The American Institute of Architects; <https://www.aiacontracts.org/>; email: docspurchases@aia.org; (800) 942-7732.

END OF SECTION 004313

 **AIA**® Document A101® – 2017**Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum**

AGREEMENT made as of the day of in the year 2025.
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

Gogebic-Ontonagon ISD
Ewen, MI 49925

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

Ontonagon CTE Contract 1: Utility Separation Contract 2: Mechanical Work
224 Greenbriar Street
Ontonagon, MI 49953

The Architect:
(Name, legal status, address and other information)

OHM Advisors
424 Hancock Street
Hancock, MI 49930

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:

The author of this document may have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

[] Not later than () calendar days from the date of commencement of the Work.

[X] By the following date: Contract 1: Utility Separation - Substantial Completion Date: October 24, 2025. Final Completion Date: November 21, 2025. Contract 2: Mechanical Work – Substantial Completion Date: October 24, 2025. Final Completion Date: November 21, 2025

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
-----------------	-----------------------------

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be (\$), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
------	-------

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. *(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

Item	Price	Conditions for Acceptance
------	-------	---------------------------

§ 4.3 Allowances, if any, included in the Contract Sum: *(Identify each allowance.)*

Item	Price
------	-------

§ 4.4 Unit prices, if any:

(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

§ 4.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

Successful bidder shall begin the work on receipt of the Notice of Award and shall have the Work for Contract 1: Utility Separation substantially completed by October 24, 2025, with a final completion date of November 21, 2025. For Contract 2: Mechanical Work, substantially completed by October 24, 2025, with a final completion date of November 21, 2025.

§ 4.6 Other:

(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the 1st day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 1st day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Thirty (30) days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™-2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201-2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201-2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

Until the work is fifty (50%) completed the Owner will pay ninety (90%) of the amount due the Contractor on account of progress payments. At the time the work is fifty percent (50%) complete and thereafter, if the manner

of completion of the work and its progress are and remain satisfactory to the Architect and Owner, and in the absence of other good and sufficient reasons, the Architect will (on presentation by the Contractor of Consent of Surety) authorize any remaining partial payments to be paid in full. The full contract retainage may be reinstated if the manner of completion of the work and its progress do not remain satisfactory to the Architect and Owner (or if the Surety withholds its consent), or for good and sufficient reasons.

§ 5.1.7.1.1 The following items are not subject to retainage:

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner’s final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

%

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

Arbitration pursuant to Section 15.4 of AIA Document A201–2017

Litigation in a court of competent jurisdiction

Other (*Specify*)

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:

(Name, address, email address, and other information)

Ashley Nevins, Associate Superintendent of Career & Technical Education/Early College Coordinator
Gogebic-Ontonagon ISD
Email: anevins@goisd.org
Phone Number : 906-575-3438

§ 8.3 The Contractor’s representative:

(Name, address, email address, and other information)

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with a building information modeling exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with a building information modeling exhibit, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction

.4 Drawings

Number	Title	Date
G-000	COVER	7/28/2025
C-010	NOTES & LEGEND	7/28/2025
C-120	EXISTING CONDITIONS & REMOVAL PLAN	7/28/2025
C-140	UTILITY PLAN	7/28/2025
C-501	DETAILS	7/28/2025
C-502	DETAILS	7/28/2025
M-001	MECHANICAL NOTES & SYMBOLS	7/28/2025
MD-101	MECHANICAL DEMOLITION PLAN	7/28/2025
M-101	MECHANICAL PLAN	7/28/2025
E-501	ELECTRICAL DETAILS	7/28/2025

.5 Specifications

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01 10 00	SUMMARY	7/28/2025	2
01 20 00	PRICE AND PAYMENT PROCEDURES	7/28/2025	3
01 23 00	ALTERNATES	7/28/2025	2
01 30 00	ADMINISTRATIVE REQUIREMENTS	7/28/2025	9
01 57 13	TEMPORARY EROSION AND SEDIMENT CONTROL	7/28/2025	5
01 60 00	PRODUCT REQUIREMENTS	7/28/2025	3
01 70 00	EXECUTION AND CLOSEOUT REQUIREMENTS	7/28/2025	7
23 05 53	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT	7/28/2025	2
23 05 93	TESTING, ADJUSTING, AND BALANCING FOR HVAC	7/28/2025	4
23 21 13	HYDRONIC PIPING	7/28/2025	5
23 23 00	REFRIGERANT PIPING	7/28/2025	4
23 82 23	UNIT VENTILATORS	7/28/2025	5
26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES	7/28/2025	5
26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS	7/28/2025	3
26 05 29	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	7/28/2025	3
26 05 33.13	CONDUIT FOR ELECTRICAL SYSTEMS	7/28/2025	5
26 22 00	LOW-VOLTAGE TRANSFORMERS	7/28/2025	1
31 10 00	SITE CLEARING	7/28/2025	5
31 22 00	GRADING	7/28/2025	3
31 23 16.13	TRENCHING	7/28/2025	2
31 23 23	FILL	7/28/2025	7
32 11 20	SUBBASE AND AGGREGATE BASE COURSES	7/28/2025	3
32 12 16	ASPHALT PAVING	7/28/2025	5
32 13 13	CONCRETE PAVING	7/28/2025	7
32 92 19	SEEDING	7/28/2025	6
33 14 15	SITE WATER DISTRIBUTION PIPING	7/28/2025	11
33 31 13	SITE SANITARY SEWERAGE GRAVITY PIPING	7/28/2025	5

.6 Addenda, if any:

Number

Date

Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*

BY: Ashley Nevins, GOISD

(Printed name and title)

CONTRACTOR *(Signature)*

(Printed name and title)



AIA Document A101® – 2017 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the day of in the year 2025.
(In words, indicate day, month and year.)

for the following **PROJECT**:
(Name and location or address)

Ontonagon CTE Contract 1: Utility Separation Contract 2: Mechanical Work
224 Greenbriar Street
Ontonagon, MI 49953

THE OWNER:
(Name, legal status and address)

Gogebic-Ontonagon ISD
Ewen, MI 49925

THE CONTRACTOR:
(Name, legal status and address)

TABLE OF ARTICLES

- A.1 GENERAL
- A.2 OWNER'S INSURANCE
- A.3 CONTRACTOR'S INSURANCE AND BONDS
- A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required in Document A201-2017 General Conditions for the Contract for Construction.

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in

ADDITIONS AND DELETIONS:

The author of this document may have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A201®–2017, General Conditions of the Contract for Construction. Article 11 of A201®–2017 contains additional insurance provisions.

this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than One Million (\$1,000,000) each occurrence, One Million (\$1,000,000) general aggregate, and One Million (\$1,000,000) aggregate for products-completed operations hazard, providing coverage for claims including

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
- .4 bodily injury or property damage arising out of completed operations; and
- .5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- .1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- .2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- .3 Claims for bodily injury other than to employees of the insured.
- .4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
- .5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- .6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- .7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- .8 Claims related to roofing, if the Work involves roofing.

- .9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- .10 Claims related to earth subsidence or movement, where the Work involves such hazards.
- .11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than One Million (\$1,000,000) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

- § A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:

(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

- § A.3.3.2.2 Railroad Protective Liability Insurance, with policy limits of not less than (\$) per claim and (\$) in the aggregate, for Work within fifty (50) feet of railroad property.

- § A.3.3.2.3 Asbestos Abatement Liability Insurance, with policy limits of not less than (\$) per claim and (\$) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

- § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the

construction site on an “all-risks” completed value form.

§ A.3.3.2.5 Property insurance on an “all-risks” completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

§ A.3.3.2.6 Other Insurance
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage

Limits

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:

(Specify type and penal sum of bonds.)

Type

Penal Sum (\$0.00)

Payment Bond

Performance Bond

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:



AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

Ontonagon CTE Contract 1: Utility Separation Contract 2: Mechanical Work
224 Greenbriar Street
Ontonagon, MI 49953

THE OWNER:

(Name, legal status and address)

Gogebic-Ontonagon ISD
Ewen, MI 49925

THE ARCHITECT:

(Name, legal status and address)

OHM Advisors
424 Hancock Street
Hancock, MI 49930

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- 13 MISCELLANEOUS PROVISIONS

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This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™–2017, Guide for Supplementary Conditions.

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15 CLAIMS AND DISPUTES



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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon written protocols governing the transmission and use of, and reliance on, Instruments of Service or any other information or documentation in digital form.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to written protocols governing the use of, and reliance on, the information contained in the model shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or

contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor

has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any

existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and

similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term “Subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term “Sub-subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor’s Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor’s Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless

otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor’s control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor’s right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or

entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents.

When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or

polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract

Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a

Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

SPECIAL CONDITIONS OF CONTRACT

FOR SCHOOL PROJECTS

TIME OF COMPLETION

Contractor shall organize the project immediately after notification of intent to enter into Contract, and shall start immediately, providing he has complied with requirements of the Invitation to Bid and General Conditions with regard to insurance, Performance Bond, Labor and Material Bond, Subcontractors, Cost Breakdown, etc. Work shall be expedited to completion as rapidly as possible. Contract states the date of Substantial Completion.

Subcontractors shall agree to complete their work according to the schedule prepared by the Contractor and approved at the first project meeting.

ELECTRONIC DOCUMENTS - DRAWINGS

Electronically transmitted copies of certain A/E drawings may be made available for Contractor/Subcontractor use to assist in preparation of shop drawings, etc. These drawings, without title blocks, will be made available for a fixed fee of \$200.00 per request, payable in advance when drawings are requested.

CODES

The Contractor and all Subcontractors shall comply with all applicable federal, state or local laws, ordinances and regulations.

PERMITS, PERMIT & HOOKUP FEES

The Contractor shall be responsible for securing all necessary permits and/or licenses and pay for such. The Owner will submit plans and specifications to the Bureau of Construction Codes and Fire Safety for plan review and pay per such.

Service and/or disconnect/hookup fees as required by servicing utilities for the project shall be paid by the Contractor.

Copies of permits and final inspection certificates shall be submitted to A/E.

Contractor shall obtain required permits and be responsible for all costs except plan review fees, which are by the Owner.

MICHIGAN RIGHT-TO-KNOW LAW:

All contractors must conform to the provisions of the Michigan Right-to-Know Law, 1986 PA 80, which requires employers to: 1) develop a communication program designed to safeguard the handling of hazardous chemicals through labeling of chemical containers and development and availability of Material Safety Data Sheets; 2) provide training for employees who work with these chemicals; and 3) develop a written hazard communications program.

The law also provides for specific employee rights. These include: 1) the right to be notified (by employer or contractor posting) of the location of Material Safety Data Sheet; 2) the right to be notified (by employer or contractor posting) of new or revised Material Safety Data Sheet no later than five working days after receipt; and 3) the right to request copies of Material Safety Data Sheet from their employers.

Provision of the State of Michigan's Right-to-Know Law may be found in those sections of the Michigan Occupational Safety and Health Act, which contains Right-to-Know provisions and the Federal Hazard Community Standard, which is part of the Michigan Occupational Safety and Health Act's Right-to-Know Law through adoption.

"MISS DIG"

The Contractor shall notify "Miss Dig" - Utility Communications System at (800-482-7171) two days prior to starting any excavation with power equipment outside the building.

DAMAGED WORK

It will be the Contractor's responsibility to adequately protect the new construction, the existing building and the adjacent property from wind, water, snow, ice, frost, etc. He shall do any pumping or temporary drainage of any nature as required. Provide temporary closure for roof openings in connection with placing new work, provide guard lights and barricades as necessary to protect the public and workmen from hazardous areas, erect temporary railings. Provide fire extinguishers in areas having particular danger of fire.

COORDINATION WITH SUBCONTRACTORS

The Contractor shall plan his work so as to coordinate to the fullest extent with the work of Subcontractors to see that they are given every opportunity to install their work properly and in proper sequence.

The Contractor shall have control of the site, and his Construction Superintendent shall act as coordinator of the work with the Owner.

The Contractor shall notify Subcontractors with as much advance notice as possible when they should install the various phases of their work to assure the most efficient progress. This requirement shall not in any way relieve the Subcontractors of their responsibility to follow up job progress to assure that their work is installed in proper time.

JOB MAINTENANCE AND CLEANUP

Keep entire construction site free of debris and rubbish accumulation. Cooperation in this regard between Contractors is mandatory. All Contractors shall effect daily cleanup of the work areas, and dispose of trash and waste materials. No burning on site.

Before final acceptance, in addition to the specific requirements of the specification technical sections regarding final cleanup, the entire site shall be policed, raked, and all rubbish removed.

SAFETY REQUIREMENTS

Maintenance and observance of safety standards shall be the responsibility of the Contractor and each Subcontractor, who shall designate a responsible person to be alert for and make recommendations regarding job safety. Enforce and abide by the provisions of the Michigan Occupational Safety and Health Act (MIOSHA). Owner shall provide similar information for contractors.

OSHA'S HAZCOM STANDARD

The Contractor and Subcontractors shall comply with the Occupational Safety and Health Administration's (OSHA) Hazard Communications Standard (HCS) also called HazCom and the "Right to Know Law." A written record of all "Hazardous Chemicals" shall be kept and displayed on the worksite per the standard.

ASBESTOS

No asbestos containing materials shall be installed under these contracts. The Contractor shall submit a letter at project completion stating to the best of his knowledge no asbestos was installed on the project.

The Contractor shall comply with current EPA regulations on asbestos, National Emission Standards for Asbestos, requirements of AHERA, and all applicable Federal, State and local government regulations. All costs shall be borne by Contractor causing damage by Contractor.

Owner shall be advised immediately by Contractor if any additional/unknown source of asbestos is

CLOSEOUT DOCUMENTS

Ontonagon CTE Contract 1: Utility Separation, Contract 2: Mechanical Work

OHM Project No. 7267-24-0010

Date



FINAL COMPLETION CHECKLIST

<i>Owner:</i>	<i>Contractor:</i>	<i>Architect/Engineer:</i>
GOISD	Contractor Name	OHM Advisors
Email Address	Email Address	
Phone Number	Phone Number	

The following is a list of contractual items that the owner and architect have found to be incomplete or in need of correction. The failure to include any items on the list does not alter the responsibility of the Contractor to complete all Work in accordance with the contract documents.

General Items:

Items to Complete	Date of Completion
Provide extra material as follows:	
Provide occupancy permit and final inspection reports for mechanical, plumbing and electrical.	
Provide one year written warranty and specific product warranties as follows:	
Provide maintenance manuals and instructions.	
Provide record drawings.	
Provide start-up, test reports and operation instructions as required.	
Provide air and water balance reports.	
Provide Consent of Surety for final payment.	
Provide Guaranty.	
Provide Sworn Statement.	
Provide Final Wavier of Liens.	
Provide a letter indicating that no hazardous materials were used on the project.	
Certificate of Substantial Completion.	
Provide meter readings and turn utilities over to the owner.	
Provide Final Completion Checklist with completion dates and signature	



AIA® Document G704® – 2017

Certificate of Substantial Completion

PROJECT: *(name and address)*
Ontonagon CTE Contract 1: Utility
Separation, Contract 2: Mechanical Work

CONTRACT INFORMATION:
Contract For:
7267-24-0010
Date:
07-30-2025

CERTIFICATE INFORMATION:
Certificate Number:

Date:

OWNER: *(name and address)*
Gogebic-Ontonagon ISD
200 E. Elm Street
Ewen, MI 49925

ARCHITECT: *(name and address)*
OHM Advisors
424 Hancock Street
Hancock, MI 49930

CONTRACTOR: *(name and address)*

The Work identified below has been reviewed and found, to the Architect’s best knowledge, information, and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated below is the date established by this Certificate. *(Identify the Work, or portion thereof, that is substantially complete.)*

ARCHITECT *(Signature)* BY: Tracie Williams
(Printed name, title, and license number if required) _____
Date Of Substantial Completion

WARRANTIES

The date of Substantial Completion of the Project or portion designated above is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:
(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)

WORK TO BE COMPLETED OR CORRECTED

A list of items to be completed or corrected is attached hereto, or transmitted as agreed upon by the parties, and identified as follows:
(Identify the list of Work to be completed or corrected.)

The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment, whichever occurs first. The Contractor will complete or correct the Work on the list of items attached hereto within () days from the above date of Substantial Completion.

Cost estimate of Work to be completed or corrected: \$

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and other items identified below shall be as follows:
(Note: Owner’s and Contractor’s legal and insurance counsel should review insurance requirements and coverage.)

The Owner and Contractor hereby accept the responsibilities assigned to them in this Certificate of Substantial Completion:

CONTRACTOR *(Signature)* _____
(Printed name and title) _____
Date

OWNER *(Signature)* BY: Ashley Nevins
(Printed name and title) _____
Date

GUARANTY

The CONTRACTOR, as a condition precedent to final payment, shall execute this Guaranty to the OWNER, guaranteeing for one (1) year from the date of substantial completion, to keep in good order and repair any defect in all the work completed under the Agreement. This includes work which may develop during said period due to improper materials, defective equipment, improper materials workmanship, or arrangements and in any work which may be affected in correcting any repairs or defects. This Guaranty will be binding upon the CONTRACTOR, his subcontractors and/or material suppliers and will be without any expense to the OWNER.

OWNER:

CONTRACTOR:

Print

Print

Signature

Signature

Date

Date

OHM ADVISORS:

Print

Signature

Date



AIA[®] Document G707[™] – 1994

Consent of Surety to Final Payment

PROJECT: *(Name and address)*

Ontonagon CTE Contract 1: Utility Separation, Contract 2: Mechanical Work
224 Greenbriar Street, Ontonagon 49953

ARCHITECT'S PROJECT NUMBER:

7267-24-0010

CONTRACT FOR:

CONTRACT DATED:

07-30-2025

OWNER: []

ARCHITECT: []

CONTRACTOR: []

SURETY: []

OTHER: []

TO OWNER: *(Name and address)*

Gogebic-Ontonagon ISD
200 E. Elm Street
Ewen, MI 49925

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

on bond of

(Insert name and address of Contractor)

, SURETY,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to

(Insert name and address of Owner)

Gogebic-Ontonagon ISD

, CONTRACTOR,

as set forth in said Surety's bond.

, OWNER,

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:

(Insert in writing the month followed by the numeric date and year.)

SURETY *(Signature)*

(Printed name and title)

Attest:

(Seal):

Deponent further says that he or she makes the foregoing statement as the (contractor) (subcontractor) or as _____ of the (contractor) (subcontractor) for the purpose of representing to the owner or lessee of the premises described on the reverse side and his or her agents that the property described on the reverse side is free from claims of construction liens, or the possibility of construction liens, except as specifically set forth on the reverse side.

WARNING: AN OWNER OR LESSEE OF THE PROPERTY DESCRIBED ON THE REVERSE SIDE MAY NOT RELY ON THIS SWORN STATEMENT TO AVOID THE CLAIM OF A SUBCONTRACTOR, SUPPLIER, OR LABORER WHO HAS PROVIDED A NOTICE OF FURNISHING TO THE DESIGNEE OR TO THE OWNER OR LESSEE IF THE DESIGNEE IS NOT NAMED OR HAS DIED.

Deponent

Subscribed and sworn to before me this _____ day of _____, 20 _____

Notary Public

_____ County, Michigan

My Commission Expires: _____

PARTIAL UNCONDITIONAL WAIVER

I/we have a contract with _____
(other contracting party)

to provide _____ for the improvements to the
property described as _____

and by signing this waiver waive my/our construction lien in the amount of \$ _____,

for labor/materials provided through _____
(date of draw cutoff or actual payment)

This waiver, together with all previous waivers, if any (circle one) does/does not cover all amounts due me/us for contract improvement provided through the date shown above.

If the owner or lessee of the property or the owner's or lessee's designee has received a notice of furnishing from me/one of us or if I/we are not required to provide one, and the owner, lessee, or designee has not received this waiver directly from me/one of us, the owner, lessee, or designee may not rely upon it without contacting me/one of us, either in writing, by telephone, or personally, to verify that it is authentic.

STATEMENT OF ACCOUNT

Contract Price	\$ _____
Extras	\$ _____
Deduct Credit	\$ _____
Previously Paid	\$ _____
Retention	\$ _____
Balance	\$ _____
This Payment	\$ _____
Balance To	\$ _____
Become Due	\$ _____

Signed on: _____

(Printed Name of Lien Claimant)

(Signature of Lien Claimant)

Address: _____

Telephone: _____

DO NOT SIGN BLANK OR INCOMPLETE FORMS. RETAIN A COPY

FULL UNCONDITIONAL WAIVER

My/our contract with _____ to provide
(other contracting party)
_____ for the improvement of the property described as

_____ having been

fully paid and satisfied, by signing this waiver, all my/our construction lien rights against such property are hereby waived and released.

If the improvement is provided to property that is a residential structure and if the owner or lessee of the property or the owner's or lessee's designee has received a notice of furnishing from me/one or us or if I/we are not required to provide one, and the owner, lessee, or designee has not received this waiver directly from me/one of us, the owner, lessee, or designee may not rely upon it without contacting me/one of us, either in writing, by telephone, or personally, to verify that it is authentic.

(Printed Name of Lien Claimant)

(Signature of lien claimant)

Signed on: _____

Address: _____

Telephone: _____

DO NOT SIGN BLANK OR INCOMPLETE FORMS. RETAIN A COPY.

TECHNICAL SPECIFICATIONS

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SECTION 011000 – SUMMARY

PART 1 GENERAL

1.1 PROJECT

- A. Project Name: Ontonagon CTE Contract 1: Utility Separation, Contract 2: Mechanical Work.
- B. Owner's Name: Gogebic-Ontonagon Intermediate School District.
- C. Engineer's Name: OHM Advisors.
- D. The Project consists of installing new water and sewer services to connect the CTE building to the village water and sewer system as shown on the drawings as well as all associated restoration work. Two-unit vents in the nursing area of the building will be demolished and removed and a new unit vent will be installed. The existing booster pump will also be demolished and removed.

1.2 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on a Stipulated Price.

1.3 DESCRIPTION OF ALTERATIONS WORK

- A. Scope of alterations work is indicated on drawings.

1.4 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
- B. Owner intends to occupy the Project upon Substantial Completion.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy.

1.5 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
 - 1. Locate and conduct construction activities in ways that will limit disturbance to site.
- B. Provide access to and from site as required by law and by Owner:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.
- C. Time Restrictions:
 - 1. Limit conduct of especially noisy exterior work to the hours of 8:00 am to 6:00 pm.
 - 2. Limit conduct of especially noisy interior work, to be performed when nearby spaces are not occupied.
 - 3. All work performed during the school year must be completely cleaned up and functional for the next morning with no disruptions to building operations and teaching operations.
- D. Utility Outages and Shutdown:
 - 1. Prevent accidental disruption of utility services to other facilities.

1.6 WORK SEQUENCE

- A. Coordinate construction schedule and operations with Owner and the Village of Ontonagon.

1.7 SPECIFICATION SECTIONS APPLICABLE TO EVERY CONTRACT

- A. Unless otherwise noted, provisions of the sections listed below apply to every contract. Specific items of work listed under individual contract descriptions constitute exceptions.
- B. Section 012000 - Price and Payment Procedures.
- C. Section 013000 - Administrative Requirements.
- D. Section 014000 - Quality Requirements.
- E. Section 016000 - Product Requirements.
- F. Section 017000 - Execution and Closeout Requirements.
- G. Section 017800 - Closeout Submittals.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 011000

SECTION 012000 – PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

1.2 SCHEDULE OF VALUES

- A. Use Schedule of Values Form: AIA G702 and Form AIA G703, edition stipulated in the Agreement or approved by Owner and Design Professional..
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Engineer for approval.
- C. Forms filled out by hand will not be accepted.
- D. Submit Schedule of Values electronically within 15 days after date of Owner-Contractor Agreement.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization, bonds and insurance, Temporary Facilities, and Contractor's Overhead and Profit.
- F. Revise schedule to list approved Change Orders, with each Application For Payment.
- G. Schedule of Values to be rounded to nearest dollar.

1.3 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
 - 1. Submit draft copy of Application for Payment five days prior to due date for review by Engineer.
- B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
- C. Forms filled out by hand will not be accepted.
- D. Notarize and Execute certification by signature of authorized officer.
- E. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- F. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- G. Submit all documents into a single combined electronic copy of each Application for Payment.
- H. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
- I. Allowances: Provide a separate line item in the schedule of values for each allowance.
- J. Stored Materials: Materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site:

Ontonagon CTE

Ontonagon CTE Contract 1: Utility

Separation, Contract 2:

Mechanical Work

OHM File No.: 7267-24-0010

Price and Payment Procedures

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1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
 2. Provide supporting documents that verifies amount required, such as paid invoices. Do not include overhead and profit on stored materials.
 3. Provide photos of stored materials off-site.
- K. Waivers: Submit waivers from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Submit executed waivers on forms acceptable to Owner.
- L. When Engineer requires substantiating information, submit data justifying dollar amounts in question.
- M. Include the following with the application:
1. Required documents as noted in Owner Agreement.
 2. Construction progress schedule, revised and current as specified in Section 013000.
 3. Waivers as applicable.
 4. Off-site stored materials documentation.

1.4 APPLICATION FOR INITIAL PAYMENT

- A. Items that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Contractor's construction schedule.
 4. Submittal schedule.
 5. List of Contractor's staff assignments.
 6. Copies of permits.

1.5 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Engineer will issue instructions directly to Contractor.
- B. For other required changes, Engineer will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 2. Promptly execute the change.
- C. For changes for which advance pricing is desired, Engineer will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change. Contractor shall prepare and submit a fixed price quotation within 10 days.
- D. Contractor may propose a change by submitting a request for change to Engineer, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 016000.
- E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

1. For change requested by Engineer for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Engineer.
 3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
 4. For change ordered by Engineer without a quotation from Contractor, the amount will be determined by Engineer based on the Contractor's substantiation of costs as specified for Time and Material work.
- F. Substantiation of Costs: Provide full information required for evaluation.
1. On request, provide the following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 2. Support each claim for additional costs with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
- G. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- H. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- I. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- J. Promptly enter changes in Project Record Documents.

1.6 APPLICATION FOR FINAL PAYMENT

- A. Application for Final Payment will not be considered until the following have been accomplished:
1. All closeout procedures specified in Section 017000.
- B. After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Certification of completion of punch list items.
 3. Insurance certificates for products and completed operations where required.
 4. Updated final statement, accounting for final changes to the Contract Sum.
 5. Contractor's Affidavits for final payments to claims.
 6. Consent of Surety to final payments.
 7. Final meter readings for utilities.
 8. Final liquidated damages settlement statement.
 9. Waivers and releases.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 012000

SECTION 012300 – ALTERNATES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Description of Alternates.
- B. Procedures for pricing Alternates.
- C. Documentation of changes to Contract Price and Contract Time.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Execute accepted alternates under the same conditions as other work of the Contract.
- C. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

1.4 ACCEPTANCE OF ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.5 SCHEDULE OF ALTERNATES

- A. Alternate 1: Install a tee where the water service changes direction to enter the building and continue installing 6 inch ductile iron pipe to the east to live tap the existing school water service.
 - 1. Base Bid: Install the water service line as shown on sheet C-140.
 - 2. Alternate: Install the water service line as shown on sheet C-141.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 012300

Ontonagon CTE
Ontonagon CTE Contract 1: Utility
Separation, Contract 2:
Mechanical Work
OHM File No.: 7267-24-0010

Alternates
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SECTION 013000 – ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General administrative requirements.
- B. Electronic document submittal service.
- C. Preconstruction meeting.
- D. Progress meetings.
- E. Construction progress schedule.
- F. Contractor's daily reports.
- G. Progress photographs.
- H. Submittals for review, information, and project closeout.
- I. Number of copies of submittals.
- J. Requests for Interpretation (RFI) procedures.
- K. Submittal procedures.

1.2 RELATED REQUIREMENTS

- A. Section 016000 - Product Requirements: General product requirements.
- B. Section 017000 - Execution and Closeout Requirements: Additional coordination requirements.
- C. Section 017800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.3 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Comply with requirements of Section 017000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- B. Make the following types of submittals to Engineer:
 - 1. Requests for Interpretation (RFI).
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Coordination drawings.
 - 10. Final Correction Punch List for Substantial Completion.
 - 11. Closeout submittals.
- C. Make the following types of submittals to the Authority having jurisdiction.
 - 1. Delegated design documentation.
 - 2. Special Inspection reports.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document.
 - 1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
 - 2. Submittals for review, information, and closeout will be transmitted via an Internet based submittal services that receives, logs, and stores documents, unless otherwise approved by the engineer.
 - 3. All other documents will utilize e-mail for distribution or other agreed upon method if the size of files are limiting.
 - 4. Contractor and Engineer are required to use this service.
 - 5. It is the Contractor's responsibility to submit documents in allowable format.
 - 6. Use of the Internet based submittal service will be between Owner, Engineer, and Contractor.
 - 7. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
 - 8. Paper document transmittals will not be reviewed.
 - 9. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

3.2 PRECONSTRUCTION MEETING

- A. Engineer will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. Owner.
 - 2. Engineer.
 - 3. Contractor.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of subcontractors, list of products, schedule of values, and construction progress schedule.
 - 5. Designation of personnel representing the parties to Contract, including, but not limited to Owner, Contractor, Key Subcontractors, testing agencies, and Engineer.
 - 6. Site Safety.
 - 7. Procedures and processing of field decisions, submittals, substitutions, RFI's, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.

9. Use of premises including review of temporary facilities, staging and storage areas, deliveries, temporary utility requirements and procedures, security, progress cleanings, and contractor parking.
 10. Critical work sequencing and long lead items.
 11. Procedures for shut downs and coordination with Owner work or requirements.
 12. Permitting and inspection requirements.
 13. Maintaining redlined plans.
- D. Entity responsible for conducting meeting will record minutes and distribute copies within five days after meeting to participants, with copies to Engineer, Owner, participants, and those affected by decisions made.

3.3 PROGRESS MEETINGS

- A. Engineer will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- B. Attendance Required:
1. Contractor.
 2. Owner.
 3. Engineer.
 4. Contractor's superintendent.
 5. Subcontractors, suppliers, or other entities concerned with current progress or involved in planning, coordination, or performance of future activities and authorized to conclude matters related to the Work..
- C. Agenda:
1. Safety.
 2. Review minutes of previous meetings.
 3. Review of work progress.
 4. Field observations, problems, and decisions.
 5. Identification of problems that impede, or will impede, planned progress.
 6. Review of submittals schedule and status of submittals.
 7. Review of RFIs log and status of responses.
 8. Maintenance of progress schedule.
 9. Corrective measures to regain projected schedules.
 10. Planned progress during succeeding work period.
 11. Maintenance of quality and work standards.
 12. Testing and inspections.
 13. Effect of proposed changes on progress schedule and coordination.
 14. Other business relating to work.
 15. Review status of payment requests, change orders, or pending claims and disputes.
 16. Review future sequence of operations required for identified work.
- D. Entity responsible for conducting the meeting will record minutes and distribute copies within five days after meeting to participants, with copies to Engineer, Owner, participants, and those affected by decisions made.
- E. Conduct progress meetings at bi-weekly intervals or intervals deemed necessary and acceptable to Owner, Engineer, and Contractor.

3.4 CONSTRUCTION PROGRESS SCHEDULE

- A. Submittal

1. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.
 2. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
 3. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - a. Include written certification that major contractors have reviewed and accepted proposed schedule.
 4. Within 10 days after joint review, submit complete schedule.
 5. Submit updated schedule with each Application for Payment.
- B. Format
1. Sheet Size: Multiples of 8-1/2 x 11, or 11 x 17 inches.
 2. Prepare in the form of a horizontal bar chart.
- C. Content:
1. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
 2. Identify work of separate stages and other logically grouped activities.
 3. Include conferences and meetings in schedule, including pre-installation meetings.
 4. Indicate progress of each activity and changes required to maintain date of Substantial Completion.

3.5 DAILY CONSTRUCTION REPORTS

- A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.
- B. Submit initial Daily Construction report format for review by Owner and Engineer for approval.
- C. In addition to transmitting electronically a copy to Owner and Engineer, maintain one printed copy at the job site.
- D. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
 1. Date.
 2. High and low temperatures, and general weather conditions.
 3. List of subcontractors at Project site.
 4. Approximate count of personnel at Project site.
 - a. Include a breakdown for supervisors, laborers, journeymen, equipment operators, and helpers.
 5. Major equipment at Project site.
 6. Material deliveries.
 7. Safety, environmental, or industrial relations incidents.
 8. Meetings and significant decisions.
 9. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
 10. Directives and requests of Authority(s) Having Jurisdiction (AHJ).
 11. Testing and/or inspections performed.
 12. List of verbal instruction given by Owner and/or Engineer.
 13. Include pertinent photos to demonstrate days activities for record.
 - a. Photos should document any work that will be covered up.
 14. Signature of Contractor's authorized representative.

3.6 PROGRESS PHOTOGRAPHS

- A. Photography Type: Digital; electronic files.
- B. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Engineer.
- C. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
 - 1. Delivery Medium: Via email.
 - 2. File Naming: nclude project identification, date and time of view, and view identification.

3.7 REQUESTS FOR INTERPRETATION (RFI)

- A. Definition: A request seeking one of the following:
 - 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 - 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 - 2. Prepare in a format and with content acceptable to Owner.
 - 3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 - 1. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions (see Section - 016000 - Product Requirements)
 - c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
 - d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
 - 2. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response.
 - 3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
 - 1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 - 2. Owner's, Engineer's, and Contractor's names.

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Administrative Requirements

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3. Discrete and consecutive RFI number, and descriptive subject/title.
 4. Issue date, and requested reply date.
 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 2. Note dates of when each request is made, and when a response is received.
 3. Highlight items requiring priority or expedited response.
- H. Review Time: Engineer will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
 3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
 4. Notify Engineer within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.8 SUBMITTAL SCHEDULE

- A. Submit to Engineer for review a schedule for submittals in tabular format.
1. Coordinate with Contractor's construction schedule and schedule of values.
 2. Format schedule to allow tracking of status of submittals throughout duration of construction.
 3. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
 4. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.

- a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.
- 5. Coordinate submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- 6. Submit actional submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

3.9 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Engineer for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 017800 - Closeout Submittals.

3.10 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Other types indicated.
- B. Submit for Engineer's knowledge as contract administrator or for Owner.

3.11 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 017800 - Closeout Submittals:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

3.12 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Samples: Submit the number specified in individual specification sections;
 - 1. After review, produce duplicates if required.
 - 2. One sample will be retained by Engineer.
 - 3. One sample will be retained at Project Site.
 - 4. Retained samples will not be returned to Contractor unless specifically so stated.

3.13 SUBMITTAL PROCEDURES

- A. General Requirements:
 - 1. Use a single transmittal for related items.
 - 2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
 - 3. Transmit using approved form.
 - a. Use Contractor's form, subject to prior approval by Engineer.
 - 4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
 - 5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
 - 6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
 - 7. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
 - b. For sequential reviews involving Engineer's consultants, Owner, or another affected party, allow an additional 7 days.
 - c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Engineer's approval, allow an additional 30 days.
 - 8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
 - 9. Provide space for Contractor and Engineer review stamps.
 - 10. When revised for resubmission, identify all changes made since previous submission.
 - 11. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
 - 12. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work and have received prior approval for their use.
- B. Product Data Procedures:
 - 1. Submit only information required by individual specification sections.
 - 2. Collect required information into a single submittal.
 - 3. Submit concurrently with related shop drawing submittal.
 - 4. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
 - 1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.

2. Do not reproduce Contract Documents to create shop drawings.
 3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
1. Transmit related items together as single package.
 2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
 3. Include with transmittal high-resolution image files of samples to facilitate electronic review and approval.

3.14 SUBMITTAL REVIEW

- A. Submittals for Review: Engineer will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Engineer will acknowledge receipt and review. See below for actions to be taken.
- C. Engineer's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.
- D. Engineer's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. "Approved", or language with same legal meaning.
 - b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
 - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
 - c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
 - 1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
 2. Not Authorizing fabrication, delivery, and installation:
 - a. "Revise and Resubmit".
 - 1) Resubmit revised item, with review notations acknowledged and incorporated.
 - b. "Rejected".
 - 1) Submit item complying with requirements of Contract Documents.
 - c. "Submit Specified Item".
 - 1) Submit item complying with requirements of Contract Documents.
- E. Engineer's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
 - a. "Acknowledge Receipt" - to notify the Contractor that the submittal has been received for record.

END OF SECTION 013000

Ontonagon CTE Contract 1: Utility Separation, Contract 2: Mechanical Work			Contractor:
OHM File No.: 7267-24-0010			
Section Number	Section Title	Tag	Paragraph Text
013000:RIB	Administrative Requirements	CT	Include written certification that major contractors have reviewed and accepted proposed schedule.
015713:RIB	Temporary Erosion and Sediment Control	PD	Product Data: Submit product data for each product indicated.
015713:RIB	Temporary Erosion and Sediment Control	FR	Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.
016000:RIB	Product Requirements	PD	Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
016000:RIB	Product Requirements	SD	Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
016000:RIB	Product Requirements	SA	Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
016000:RIB	Product Requirements		For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
017000:RIB	Execution and Closeout Requirements	SD	Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
017000:RIB	Execution and Closeout Requirements	DC	Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
017000:RIB	Execution and Closeout Requirements		Include a summary of safety procedures.
017000:RIB	Execution and Closeout Requirements	IQ	For demolition work, employ a firm specializing in the type of work required.
017000:RIB	Execution and Closeout Requirements	PE	For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
017000:RIB	Execution and Closeout Requirements	CT	Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Engineer's Substantial Completion inspection.
230553:RIB	Identification for HVAC Piping and Equipment	PD	Product Data: Provide manufacturers catalog literature for each product required.
230593:RIB	Testing, Adjusting, and Balancing for HVAC	SD	TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Include at least the following in the plan:
230593:RIB	Testing, Adjusting, and Balancing for HVAC		List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Discussion of what notations and markings will be made on the duct and piping drawings during the process.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Final test report forms to be used.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Procedures for formal deficiency reports, including scope, frequency and distribution.
230593:RIB	Testing, Adjusting, and Balancing for HVAC	TR	Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Revise TAB plan to reflect actual procedures and submit as part of final report.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Engineer and for inclusion in operating and maintenance manuals.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Include actual instrument list, with manufacturer name, serial number, and date of calibration.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASTM C1602 / C1602M.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Units of Measure: Report data in I-P (inch-pound) units only.
230593:RIB	Testing, Adjusting, and Balancing for HVAC	IQ	TAB Agency Qualifications:

Ontonagon CTE Contract 1: Utility Separation, Contract 2: Mechanical Work		Contractor:	
OHM File No.: 7267-24-0010			
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Company specializing in the testing, adjusting, and balancing of systems specified in this section.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		Certified by one of the following:
230593:RIB	Testing, Adjusting, and Balancing for HVAC		AABC, Associated Air Balance Council: www.aabc.com/#sle ; upon completion submit AABC National Performance Guaranty.
230593:RIB	Testing, Adjusting, and Balancing for HVAC		NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle .
230593:RIB	Testing, Adjusting, and Balancing for HVAC	IQ	TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.
232113:RIB	Hydronic Piping	PD	Product Data:
232113:RIB	Hydronic Piping		Include data on pipe materials, pipe fittings, valves, and accessories.
232113:RIB	Hydronic Piping		Provide manufacturers catalog information.
232113:RIB	Hydronic Piping		Indicate valve data and ratings.
260519:RIB	Low-Voltage Electrical Power Conductors and Cables	PD	Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.
260526:RIB	Grounding and Bonding for Electrical Systems	PD	Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.
260529:RIB	Hangers and Supports for Electrical Systems	PD	Product Data: Provide manufacturer's standard catalog pages and data sheets for channel/strut framing systems, nonpenetrating rooftop supports, and post-installed concrete/masonry anchors.
260533.13:RIB	Conduit for Electrical Systems	PD	Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.
311000:RIB	Site Clearing	PR	Existing Conditions Report: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by clearing.
311000:RIB	Site Clearing	PR	Photographs and Videos: Use sufficiently detailed photographs or video recordings.
311000:RIB	Site Clearing	PR	Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.
311000:RIB	Site Clearing	PD	Stockpile Locations: Identify and accurately show locations of stockpiled materials.
312200:RIB	Grading	PR	Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.
312323:RIB	Fill	PD	Product Data: Warning tapes and geotextiles.
312323:RIB	Fill	QS	Qualification Data: For qualified testing agency.
312323:RIB	Fill	TR	Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
312323:RIB	Fill		Classification according to ASTM D2487.
312323:RIB	Fill		Particle size distribution (gradation) according to ASTM D6913.
312323:RIB	Fill	TR	Compaction Density Test Reports.
321120:RIB	Subbase and Aggregate Base Courses	QS	Qualification Data: For qualified testing agency.
321120:RIB	Subbase and Aggregate Base Courses	TR	Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
321120:RIB	Subbase and Aggregate Base Courses		Classification according to ASTM D2487.
321120:RIB	Subbase and Aggregate Base Courses		Particle size distribution (gradation) according to ASTM D6913.
321216:RIB	Asphalt Paving	PD	Hot-Mix Asphalt Designs:
321216:RIB	Asphalt Paving		Certification, by authorities having jurisdiction, of approval of each hot-mix asphalt design proposed for the Work.
321216:RIB	Asphalt Paving		For each hot-mix asphalt design proposed for the work.
321216:RIB	Asphalt Paving	QS	Qualification Data: For paving-mix manufacturer.
321216:RIB	Asphalt Paving	CT	Material Certificates: Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.
321216:RIB	Asphalt Paving		Aggregates.
321216:RIB	Asphalt Paving		Asphalt binder.
321216:RIB	Asphalt Paving		Asphalt cement.
321216:RIB	Asphalt Paving		Tack coat.
321313:RIB	Concrete Paving	PD	Product Data: For each type of product.
321313:RIB	Concrete Paving	PD	Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
321313:RIB	Concrete Paving	QS	Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.
321313:RIB	Concrete Paving	CT	Material Certificates: For the following, from manufacturer:

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321313:RIB	Concrete Paving		Cementitious materials.
321313:RIB	Concrete Paving		Admixtures.
321313:RIB	Concrete Paving		Curing compounds.
321313:RIB	Concrete Paving		Applied finish materials.
321313:RIB	Concrete Paving		Joint fillers.
321313:RIB	Concrete Paving	TR	Material Test Reports: For each of the following:
321313:RIB	Concrete Paving		Aggregates: Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.
321313:RIB	Concrete Paving	TR	Field quality-control reports.
329219:RIB	Seeding	PD	Product Data:
329219:RIB	Seeding		Fertilizer.
329219:RIB	Seeding		Mulch Blanket.
329219:RIB	Seeding		Hydroseed.
329219:RIB	Seeding	CT	Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and certified weed free. Include the year of production and date of packaging.
329219:RIB	Seeding	CT	Product Certificates: For fertilizers, from manufacturer.

SECTION 015713 – TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Prevention of erosion due to construction activities.
- B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- C. Restoration of areas eroded due to insufficient preventive measures.
- D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.2 RELATED REQUIREMENTS

- A. Section 311000 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.
- B. Section 329219 - Seeding: Permanent turf for erosion control.

1.3 REFERENCE STANDARDS

- A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.
- B. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.
- C. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015 (Reapproved 2023).
- D. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).
- E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.
- F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).
- G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.
- H. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control; 1995.
- I. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 2015.

1.4 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.
- B. Also comply with all more stringent requirements of State of Michigan Erosion and Sedimentation Control Manual.

- C. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
- D. Comply with all requirements of the County soil erosion and sedimentation control.
- E. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
 - 1. Owner will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.
- F. Timing: Put preventive measures in place prior to or immediately after disturbance of surface cover and before precipitation occurs.
- G. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
 - 1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
- H. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
 - 1. Control movement of sediment and soil from temporary stockpiles of soil.
 - 2. Prevent development of ruts due to equipment and vehicular traffic.
 - 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- I. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
 - 1. Prevent windblown soil from leaving the project site.
 - 2. Prevent tracking of mud onto public roads outside site.
 - 3. Prevent mud and sediment from flowing onto sidewalks and pavements.
 - 4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- J. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
 - 2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
- K. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
- L. Open Water: Prevent standing water that could become stagnant.
- M. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.5 SUBMITTALS

- A. Product Data: Submit product data for each product indicated.

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- B. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.1 MATERIALS

A. Silt Fence

1. Provide geotextile for fabricating silt fence from one of the following qualified products.
 - a. LS125N - ACF Environmental Richmond, VA.
 - b. ANITA-100SF - Anita Plastics, Inc., Solon, OH.
 - c. ANITA-124SF - Anita Plastics, Inc., Solon, OH.
 - d. ANITA-140SF - Anita Plastics, Inc., Solon, OH.
 - e. Belton 940 - Belton Industries, Inc., Norcross, SC.
 - f. Geoturf S1200 - CSI Geoturf, Inc., Highland, MI.
 - g. Geoturf S1240 - CSI Geoturf, Inc. Highland, MI.
 - h. Geoturf S1240OR - CSI Geoturf, Inc., Highland, MI.
 - i. Geoturf S1400 - CSI Geoturf, Inc., Highland, MI
 - j. Kintex SF-3 - Geoproducts, Inc., Birmingham, MI.
 - k. GTF-180 - LinQ Industrial Fabrics.
 - l. Propex 2130 - Propex Fabrics, Inc., Austell, GA.
 - m. SKAPS W100 - Skaps Industries, Athens, GA.
 - n. TerraTex SF-D - Hanes Geo Components, Winston-Salem, NC.
 - o. Willacoochee, Style 1210 - Willacoochee Industrial Fabrics, Inc., Willacoochee, GA.
 - p. WINFABAB 105SF - Willacoochee Industrial Fabrics, Inc., Willacoochee, GA.
2. Geotextile for silt fence must have a nominal height of 3 feet (91.44 cm) and must meet the following requirements.
 - a. Grab Tensile Strength: ASTM D4632/D4632M 100 lb minimum.
 - b. Elongation at the specified grab tensile strength no greater than 40%.
 - c. Trapezoid Tear Strength: ASTM D4533/D4533M 45 lb minimum.
3. Permittivity: ASTM D4491/D4491M 0.1 per second minimum.
 - a. Apparent Opening Size: ASTM D4751 0.02 inch (0.6 mm) maximum.
4. Geotextiles for silt fence must have a retained strength of at least 70% after 500 hours of UV exposure when testing in accordance with ASTM D4355/D4355M.
5. Geotextile shall be attached to machine-pointed No. 2 common grade hardwood posts with at least five staples through wood lath at least 3/8 inch (9.52 mm) thick and 2 feet (60.96 cm) long. Maximum post spacing is 6.5 feet (198.12 cm).
6. Posts shall be at least 36 inches (914.4 mm) long with a cross-sectional area of at least 2.25 square inches and a smallest dimension of 1.5 inches (38.1 mm).
7. Fabricator shall be identified by at least two permanent markings or affixed labels on each assembled roll of silt fence.
8. Approved manufactures of fully assembled silt fence include: (Silt fence must be assembled with fabric listed under 2.1A)
 - a. ACF Environmental - Ferguson Waterworks - Richmond VA.
 - b. American Excelsior Co. Inc. - Westland, MI.
 - c. C.S.I. / Geo Turf, Inc. - Highland, MI
 - d. DGI Industries - Bennington, NH.
 - e. Environmental Protection Products - Williamsburg, MI.
 - f. Enviroscope ECM, Ltd. - Deshler, OH.
 - g. Geo-Synthetics - Waukesha, WI.

- h. Geoproducts, Inc. - Birmingham, MI.
- i. Hanes Geo Components - Charlotte, NC, Wixom and Wyoming, MI.
- j. Klein Brothers Hardwood Inc. - Milford, MI.
- k. Pallen Enterprises - Conyer, GA.
- l. Rhino Seed and Landscape Supply - Bradley, MI.
- m. WINFAB (Willacoochee) Industrial Fabrics, Inc. -- Nashville, GA.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.2 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.3 INSTALLATION

- A. Silt Fences:
 1. Store and handle fabric in accordance with ASTM D4873/D4873M.
 2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch (405 mm) high barriers with minimum 36 inch (905 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 4 inches (100 mm) in ground.
 3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch (710 mm) high barriers, minimum 48 inch (1220 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
 4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet (6 m), use nominal 32 inch (810 mm) high barriers with woven wire reinforcement and steel posts spaced at 4 feet (1220 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
 5. Install with top of fabric at nominal height and embedment as specified.
 6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches (460 mm), with extra post.
 7. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches (300 mm) high with post spacing not more than 4 feet (1220 mm).

3.4 MAINTENANCE

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches (13 mm) or more rainfall at the project site, and daily during prolonged rainfall.
- B. Repair deficiencies immediately.
- C. Silt Fences:
 1. Promptly replace fabric that deteriorates unless need for fence has passed.
 2. Remove silt deposits that exceed one-third of the height of the fence.
 3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

- D. Clean out temporary sediment control structures weekly and relocate soil on site.
- E. Place sediment in appropriate locations on site; do not remove from site.

3.5 CLEAN UP

- A. Remove temporary measures after permanent measures have been established, unless permitted to remain by Engineer.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION 015713

SECTION 016000 – PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Procedures for Owner-supplied products.
- F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.2 RELATED REQUIREMENTS

- A. Section 014000 - Quality Requirements: Product quality monitoring.

1.3 SUBMITTALS

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.1 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.2 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. See Section 014000 - Quality Requirements, for additional source quality control requirements.

2.3 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

2.4 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver and place in location as directed; obtain receipt prior to final payment.

PART 3 EXECUTION

3.1 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.2 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
 - 1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.
- E. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- F. For exterior storage of fabricated products, place on sloped supports above ground.

- G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- H. Comply with manufacturer's warranty conditions, if any.
- I. Do not store products directly on the ground.
- J. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- K. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- L. Prevent contact with material that may cause corrosion, discoloration, or staining.
- M. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- N. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 016000

SECTION 017000 – EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Demonstration and instruction of Owner personnel.
- H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- I. General requirements for maintenance service.

1.2 RELATED REQUIREMENTS

- A. Section 011000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 013000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
- C. Section 015000 - Temporary Facilities and Controls.
- D. Section 017800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.

1.3 SUBMITTALS

- A. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
 - 2. Include a summary of safety procedures.
- B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.

1.4 QUALIFICATIONS

- A. For demolition work, employ a firm specializing in the type of work required.
- B. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.5 PROJECT CONDITIONS

- A. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
 - 2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- D. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Minimize amount of bare soil exposed at one time.
 - 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- E. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
 - 1. Outdoors: Limit conduct of especially noisy exterior work to 8 am to 6 pm.
 - 2. Indoors: Limit conduct of especially noisy interior work to 4 pm to 7 am.
- F. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- G. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.6 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Coordinate completion and clean-up of work of separate sections.
- D. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.1 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

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PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Engineer four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Engineer, Owner, participants, and those affected by decisions made.
- F. Promptly notify Engineer of any discrepancies discovered.
- G. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- H. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.
- I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
- J. Periodically verify layouts by same means.

3.4 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.5 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Engineer before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 2. Remove items indicated on drawings.
 - 3. Relocate items indicated on drawings.
 - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
- F. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
- G. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- H. Refinish existing surfaces as indicated:
 - 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 - 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- I. Clean existing systems and equipment.
- J. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

- K. Do not begin new construction in alterations areas before demolition is complete.
- L. Comply with all other applicable requirements of this section.

3.6 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-complying work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- F. Restore work with new products in accordance with requirements of Contract Documents.
- G. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
- I. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.7 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.8 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.

- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.9 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

3.10 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.11 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean filters of operating equipment.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Engineer and Owner.
- B. Perform preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
- C. Notify Engineer when work is considered ready for Engineer's Substantial Completion inspection.

- D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Engineer's Substantial Completion inspection.
- E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Engineer's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Engineer.
- F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- G. Notify Engineer when work is considered finally complete and ready for Engineer's Substantial Completion final inspection.
- H. Complete items of work determined by Engineer listed in executed Certificate of Substantial Completion.

3.13 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION 017000

SECTION 230553 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Nameplates.
- B. Tags.
- C. Pipe markers.

1.2 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.

1.3 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers catalog literature for each product required.

PART 2 PRODUCTS

2.1 IDENTIFICATION APPLICATIONS

- A. Piping: Pipe markers.

2.2 PIPE MARKERS

- A. Manufacturers:
 - 1. Brady Corporation
 - 2. Brimar Industries, Inc
- B. Color: Comply with ASME A13.1.
- C. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- D. Color code as follows:
 - 1. Heating, Cooling, and Boiler Feedwater: Green with white letters.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 INSTALLATION

- A. Install tags with corrosion resistant chain.

- B. Install plastic pipe markers in accordance with manufacturer's instructions.
- C. Use tags on piping 3/4 inch (20 mm) diameter and smaller.
 - 1. Locate identification not to exceed 20 feet (6 m) on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
- D. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.

3.3 SCHEDULE

- A. Pipe Label Color Schedule
 - 1. Heating Water Piping: White letters on a safety-green background.

END OF SECTION 230553

SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Testing, adjustment, and balancing of air systems.
- B. Testing, adjustment, and balancing of hydronic systems.

1.2 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2024.
- C. NEBB (TAB) - Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems; 2019, with Errata (2022).

1.3 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
 - 1. Include at least the following in the plan:
 - a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
 - b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
 - c. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
 - d. Final test report forms to be used.
 - e. Procedures for formal deficiency reports, including scope, frequency and distribution.
- C. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
 - 1. Revise TAB plan to reflect actual procedures and submit as part of final report.
 - 2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Engineer and for inclusion in operating and maintenance manuals.
 - 3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 - 4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
 - 5. Units of Measure: Report data in I-P (inch-pound) units only.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

Ontonagon CTE
Ontonagon CTE Contract 1: Utility
Separation, Contract 2:
Mechanical Work
OHM File No.: 7267-24-0010

Testing, Adjusting, and Balancing
for HVAC
230593 - 1
07/28/2025

3.1 GENERAL REQUIREMENTS

- A. Perform total system balance in accordance with one of the following:
 - 1. AABC (NSTSB), AABC National Standards for Total System Balance.
 - 2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. TAB Agency Qualifications:
 - 1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
 - 2. Certified by one of the following:
 - a. AABC, Associated Air Balance Council: www.aabc.com/#sle; upon completion submit AABC National Performance Guaranty.
 - b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.
- D. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.2 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
 - 1. Systems are started and operating in a safe and normal condition.
 - 2. Proper thermal overload protection is in place for electrical equipment.
 - 3. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 - 4. Duct systems are clean of debris.
 - 5. Fans are rotating correctly.

3.3 ADJUSTMENT TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.

3.4 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- E. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- F. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- G. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.

- H. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.

3.5 PROCEDURES FOR CONSTANT VOLUME SYSTEMS

A. MECHANICAL ROOM AIR HANDLER

1. Measure total airflow.
 - a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.
 - b. Where duct conditions allow, measure airflow by main Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses close to the fan and prior to any outlets, to obtain total airflow.
 - c. Where duct conditions are unsuitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
2. Obtain approval from Architect for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in HVAC Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
3. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload occurs. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.

3.6 WATER SYSTEM PROCEDURE

- A. Adjust water systems to provide required or design quantities.
- B. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.
- C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- D. Effect system balance with automatic control valves fully open to heat transfer elements.
- E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.
- F. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.

3.7 SCOPE

- A. Test, adjust, and balance the following:
 1. UNIT VENTILATOR, AJUST TO MEET SCHEDULED PARAMETERS.
 2. Air Coils. - VERIFY GENERAL FUNCTION. REPORT
 3. Air Handling Unit. VERIFY GENERAL FUNCTION. REPORT

3.8 MINIMUM DATA TO BE REPORTED

- A. Electric Motors:
 1. Manufacturer.
 2. Model/Frame.

3. HP/BHP.
4. Phase, voltage, amperage; nameplate, actual, no load.
5. RPM.
6. Service factor.
7. Starter size, rating, heater elements.
8. Sheave Make/Size/Bore.

B. Heating Coils: GENERAL FUNCTION -ADDITONAL MEASUREMENTS BELOW IF FUNCTION IS NOT OPERABLE.

1. Water flow, design and actual.
2. Water pressure drop, design and actual.
3. Entering water temperature, design and actual.
4. Leaving water temperature, design and actual.
5. Entering air temperature, design and actual.
6. Leaving air temperature, design and actual.
7. Air pressure drop, design and actual.

END OF SECTION 230593

SECTION 232113 – HYDRONIC PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Hydronic system requirements.
- B. Heating water piping, above grade.
- C. Unions, flanges, mechanical couplings, and dielectric connections.
- D. Valves:
 - 1. Ball valves.
 - 2. Pressure independent temperature control valves and balancing valves.

1.2 RELATED REQUIREMENTS

- A. Section 230553 - Identification for HVAC Piping and Equipment.

1.3 REFERENCE STANDARDS

- A. ASME B16.15 - Cast Copper Alloy Threaded Fittings: Classes 125 and 250; 2024.
- B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- D. ASME B16.34 - Valves — Flanged, Threaded, and Welding End; 2025.
- E. ASME B16.51 - Copper and Copper Alloy Press-Connect Pressure Fittings; 2021.
- F. ASME B31.9 - Building Services Piping; 2020.
- G. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2024.
- H. ASTM B32 - Standard Specification for Solder Metal; 2020.
- I. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.
- J. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
- K. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.
- L. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40; 2024.
- M. ASTM D2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80; 2024.
- N. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2019.
- O. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).

1.4 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Include data on pipe materials, pipe fittings, valves, and accessories.

2. Provide manufacturers catalog information.
3. Indicate valve data and ratings.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.

PART 2 PRODUCTS

2.1 HYDRONIC SYSTEM REQUIREMENTS

- A. Comply with ASME B31.9 and applicable federal, state, and local regulations.
- B. Piping: Provide piping, fittings, hangers, and supports as required, as indicated, and as follows:
 1. Where more than one piping system material is specified, provide joining fittings that are compatible with piping materials and ensure that the integrity of the system is not jeopardized.
 2. Use non-conducting dielectric connections whenever jointing dissimilar metals.
 3. Provide pipe hangers and supports in accordance with ASME B31.9 or MSS SP-58 unless indicated otherwise.
- C. Pipe-to-Valve and Pipe-to-Equipment Connections: Use flanges or unions to allow disconnection of components for servicing; do not use direct welded, soldered, or threaded connections.
- D. Valves: Provide valves where indicated:
 1. Provide drain valves where indicated, and if not indicated, provide at least at main shut-off, low points of piping, bases of vertical risers, and at equipment. Use 3/4 inch (20 mm) gate valves with cap; pipe to nearest floor drain.
 2. For throttling, bypass, or manual flow control services, use globe, ball, or butterfly valves.
 3. In heating water, chilled water, or condenser water systems, butterfly valves may be used interchangeably with gate and globe valves.
 4. For shut-off and to isolate parts of systems or vertical risers, use gate, ball, or butterfly valves.

2.2 HEATING WATER PIPING, ABOVE GRADE

- A. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), drawn, using one of the following joint types:
 1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22 solder wrought copper fittings.
 - a. Solder: ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
 - b. Braze: AWS A5.8M/A5.8 BCuP copper/silver alloy.
 2. Tee Connections: Mechanically extracted collars with notched and dimpled branch tube.
 3. Mechanical Press Sealed Fittings: Double pressed type complying with ASME B16.51, utilizing EPDM, nontoxic synthetic rubber sealing elements.

2.3 UNIONS, FLANGES, MECHANICAL COUPLINGS, AND DIELECTRIC CONNECTIONS

- A. Unions for Pipe of 2 Inches (50 mm, DN) and Less:
 1. Ferrous Piping: 150 psi (1034 kPa) brass or malleable iron, threaded.
 2. Copper Pipe: Bronze, soldered joints.

- B. Flanges for Pipe 2 Inches (50 mm, DN) and Greater:
 - 1. Ferrous Piping: 150 psig (1034 kPa) forged steel, slip-on.
 - 2. Copper Piping: Bronze.
 - 3. Gaskets: 1/16 inch (1.6 mm) thick, preformed neoprene.
- C. Dielectric Connections:
 - 1. Flanges:
 - a. Dielectric flanges with same pressure ratings as standard flanges.
 - b. Water impervious insulation barrier capable of limiting galvanic current to 1 percent of short circuit current in a corresponding bimetallic joint.
 - c. Dry insulation barrier able to withstand 600-volt breakdown test.
 - d. Construct of galvanized steel with threaded end connections to match connecting piping.
 - e. Suitable for the required operating pressures and temperatures.
 - 2. Unions:
 - a. 1/2 to 1 Inches (15 to 25 mm): Brass solder to galvanized FPT.
 - b. 1/2 to 2 Inches (15 to 50 mm): Brass solder to galvanized FPT.
 - c. 1/2 to 1 Inches (15 to 25 mm): Brass to galvanized FPT or FIP (Female Iron Pipe).
 - d. 3/4 to 1/2 Inch (20 to 15 mm) Reducer: Brass solder to galvanized FPT.
 - e. Service: 250 psi (1,723.6 kPa), minus 20 to 180 deg F (minus 28.9 to 82.2 deg F).

2.4 BALL VALVES

- A. Up To and Including 2 Inches (50 mm):
 - 1. Bronze one piece body, chrome plated brass ball, teflon seats and stuffing box ring, lever handle with balancing stops, solder ends with union.

2.5 PRESSURE INDEPENDENT TEMPERATURE CONTROL VALVES AND BALANCING VALVES

- A. Control Valves: Factory-fabricated pressure independent with internal differential pressure regulator (DPRV), which automatically adjusts to normal changes in system pressure and provides 100 percent control valve authority at all positions of the valve.
 - 1. Maintain proportional and linear flow coil characteristics.
 - 2. Provide control valve to incorporate control, balancing, and flow limiting. Hydronic system pressure independent control valve bodies to comply with ASME B16.34 or ASME B16.15 pressure and temperature class ratings based on the design operating temperature and 150 percent of the system design operating pressure and have the following characteristics:
 - a. 2 NPS (50 DN) and Smaller: Class 150 bronze or brass body with union connections, stainless steel trim, stainless steel rising stem, stainless steel disc or ball, and screwed ends with backseating capacity repackable under pressure.
 - b. Pressure Control Seat: Brass construction with vulcanized EPDM.
 - c. Sizing: Line-size.
 - d. Fittings and Components: All fittings and components to meet ANSI standards and be compatible with readily available components. 8-inch (200 mm) valves and above to be provided with proper companion flanges.
 - e. Close-Off (Differential) Pressure Rating: Combination of actuator, DPRV action, and trim to provide a minimum close-off pressure rating of 150 percent of total system (pump) head. Provide actuator from the same manufacturer as the pressure independent control valve.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment using jointing system specified.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Route piping in orderly manner, parallel to building structure, and maintain gradient.
- C. Install piping to conserve building space and to avoid interference with use of space.
- D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
- G. Install piping to permit valve servicing.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install piping to allow application of insulation.
- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Group piping whenever practical at common elevations.
- M. Slope piping and arrange to drain at low points.
- N. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- O. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
- P. Install branch connections to mains using mechanically formed tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.
- Q. Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
- R. Install flanges in piping, NPS 2-1/2 and larger, at final connections of equipment and elsewhere as indicated.
- S. Joint construction
 - 1. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.

- b. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
2. Welded Joints
3. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.3 SCHEDULES

- A. Hanger Spacing for Copper Tubing.
 1. 1/2 Inch (15 mm) and 3/4 inch (20 mm): Maximum span, 5 feet (1500 mm); minimum rod size, 1/4 inch (6 mm).
 2. 1 Inch (25 mm): Maximum span, 6 feet (1800 mm); minimum rod size, 1/4 inch (6 mm).

END OF SECTION 232113

SECTION 238223 – UNIT VENTILATORS

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2023.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- C. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.
- D. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 2020.
- E. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2019.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- I. UL 1995 - Heating and Cooling Equipment; Current Edition, Including All Revisions.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. Section includes unit ventilators and accessories with the following heating and cooling features: The refrigerant coil to be furnished and not put into commission during this contract.
 - 1. Hydronic heating coil.
 - 2. Direct-expansion refrigerant cooling coil.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product
 - 1. Include rated capacities, operating characteristics, and furnished specialties and accessories for each unit type and configuration.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Detail anchorages and attachments to structure and to supported equipment.
 - 4. Include diagrams for power, signal, and control wiring.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For unit ventilators to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
- C. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

1.7 COORDINATION

- A. Coordinate layout and installation of unit ventilators and suspension system components with other construction that penetrates or is supported by ceilings, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.
- B. Coordinate size and location of wall sleeves for outdoor-air intake.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of condensing units that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Compressor failure.
 - b. Condenser coil leak.
 - 2. Warranty Period: Four years from date of Substantial Completion.
 - 3. Warranty Period (Compressor Only): Five years from date of Substantial Completion.
 - 4. Warranty Period (Condenser Coil Only): Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Factory-packaged and -tested units rated according to AHRI 840, ASHRAE 33, and UL 1995.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Carrier Global Corporation.
 - 2. Daikin Applied.
 - 3. Trane.
 - 4. Airedale.

2.3 MANUFACTURED UNITS

- A. Description: Unit ventilators consisting of finished cabinet, filter, cooling coil, drain pan, supply-air fan and motor in blow- or draw-through configuration, and hydronic cooling coil.
 - 1. Unit Ventilator Coil Configurations: Row split.
 - a. Number of Heating Coils: One with two-pipe system.
 - b. Number of Cooling Coils: One with two -pipe system.

2.4 CABINETS

- A. Insulation: Minimum 1-inch- thick, foil-covered, closed-cell foam complying with ASTM C1071 and attached with adhesive complying with ASTM C916.
 - 1. Surface-Burning Characteristics: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E84 by a qualified testing agency.
 - 2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- B. Coil Section Insulation: Insulate coil section.
 - 1. Surface-Burning Characteristics: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E84 by a qualified testing agency.
 - 2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- C. Cabinet Frame and Access Panels: Welded-steel frame with removable panels with latches and hinged access doors.
 - 1. Steel components exposed to moisture shall be baked-enamel finished.
- D. Cabinet Finish: Powder coat, in manufacturer's standard color as selected by ENGINEER.
- E. Indoor-Supply-Air Grille: Aluminum, double deflection, adjustable.
- F. Return-Air Inlet: bottom for ceiling mounted
- G. Outdoor-Air Wall Box: EXISTING TO REMAIN, RECONNECT.

2.5 COILS

- A. Test and rate unit ventilator coils according to ASHRAE 33.
- B. Hydronic Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch (2.54 mm), rated for a minimum working pressure of 200 psig (1378.95 kPa) and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain valve.
- C. Indoor Refrigerant Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch (2.54 mm), and brazed joints at fittings. Comply with AHRI 210/240 and leak test to minimum 450 psig (3102.64 kPa) for a minimum 300-psig working pressure. Include thermal expansion valve.

2.6 INDOOR FAN

- A. Fan and Motor Board: Removable.
 - 1. Fan: Forward curved, double width, centrifugal; directly connected to motor. Thermoplastic or painted-steel wheels, and aluminum, painted-steel, or galvanized-steel fan scrolls.
 - 2. Fan Shaft and Bearings: Hollow-steel shaft with permanently lubricated, resiliently mounted bearings.

3. Motor: Permanently lubricated, multispeed, resiliently mounted on motor board. Comply with requirements in Section 230513 "Common Motor Requirements for HVAC Equipment."
4. Wiring Termination: Connect motor to chassis wiring with plug connection.

2.7 DAMPERS

- A. Outdoor-Air Dampers: Galvanized-steel blades with edge and end seals and nylon bearings; with electric actuator.
- B. Comply with ASHRAE/IES 90.1.

2.8 ACCESSORIES

- A. Duct flanges for outdoor-air connection.
- B. Customizable OA opening back of cabinet.
- C. Filters:
 1. Minimum Efficiency Reporting Value and Average Arrestance: According to ASHRAE 52.2.
 2. Minimum Efficiency Reporting Value: According to ASHRAE 52.2.
 3. Material: Pleated cotton-polyester media, MERV 7.

2.9 BASIC UNIT CONTROLS

- A. INCLUDE WITH TRANE CONTROLLER AND WALL MOUNT TEMPERATURE SENSOR, SEE SCHEDULE M SHEETS FOR FUNCTION, PROVIDE NECESSARY ACCESSORIES TO ACHIEVE.
 1. Control voltage transformer.
 2. Wall-mounting thermostat with the following features.
 - a. Heat-cool-off switch.
 - b. Fan on-auto switch.
 - c. Fan-speed switch.
 - d. Manual changeover.
 - e. Adjustable deadband.
 - f. Exposed set point.
 - g. Exposed indication.
 - h. Degree F indication.
 3. Unoccupied-period-override push button.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, to receive unit ventilators for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for piping and electrical connections to verify actual locations before unit ventilator installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install unit ventilators to comply with NFPA 90A.
- B. Suspend horizontal unit ventilators from structure with threaded steel rods and minimum 1.0-inch static-deflection spring hangers.
- C. Verify location of thermostats, humidistats, and other exposed control sensors with Drawings and room details before installation. Install devices 48 inches (1219.2 mm) above finished floor.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties. Specific connection requirements are as follows:
 - 1. Install piping adjacent to machine to allow service and maintenance.
 - 2. Connect piping to unit ventilator factory hydronic piping package. Install piping package if shipped loose.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections:
 - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 2. Operate electric heating elements through each stage to verify proper operation and electrical connections.
 - 3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.
 - 4. Record temperatures entering and leaving energy recovery wheel when outdoor-air temperature is a minimum of 15 deg F higher, or 20 deg F lower, than room temperature.
- C. Remove and replace malfunctioning units and retest as specified above.
- D. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Adjust initial temperature set point.
- B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.6 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain unit ventilators.

END OF SECTION 238223

SECTION 260519 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Single conductor building wire.
- B. Wiring connectors.
- C. Electrical tape.
- D. Wire pulling lubricant.
- E. Cable ties.

1.2 RELATED REQUIREMENTS

- A. Section 260526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.

1.3 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2024).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).
- E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2024.
- F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- G. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.
- H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
 - 3. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.

Ontonagon CTE

Ontonagon CTE Contract 1: Utility

Separation, Contract 2:

Mechanical Work

OHM File No.: 7267-24-0010

Low-Voltage Electrical Power
Conductors and Cables
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- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

1.6 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

PART 2 PRODUCTS

2.1 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Nonmetallic-sheathed cable is not permitted.
- D. Metal-clad cable is not permitted.

2.2 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductor Material:
 - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 - 2. Provide copper conductors except where aluminum conductors are specifically indicated. Substitution of aluminum conductors for copper is not permitted. Conductor sizes indicated are based on copper unless specifically indicated as aluminum. Conductors designated with the abbreviation "AL" indicate aluminum.
 - 3. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 4. Tinned Copper Conductors: Comply with ASTM B33.
- H. Minimum Conductor Size:
 - 1. Branch Circuits: 12 AWG.
- I. Conductor Color Coding:
 - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 - 2. Color Coding Method: Integrally colored insulation.
 - 3. Color Code:
 - a. 480V, 3 Phase, 3 Wire System:

- 1) Phase A: Brown.
- 2) Phase B: Orange.
- 3) Phase C: Yellow.
- b. 208Y/120 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
- c. Equipment Ground, All Systems: Green.

2.3 SINGLE CONDUCTOR BUILDING WIRE

- A. Manufacturers:
 - 1. Copper Building Wire:
 - a. General Cable Technologies Corporation: www.generalcable.com.
 - b. Service Wire Co: www.servicewire.com.
 - c. Southwire Company: www.southwire.com.
- B. Description: Single conductor insulated wire.
- C. Conductor Stranding:
 - 1. Feeders and Branch Circuits:
 - a. Size 10 AWG and Smaller: Stranded.
 - b. Size 8 AWG and Larger: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation:
 - 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
 - a. Size 4 AWG and Larger: Type XHHW-2, THHN/THWN, or THHN/THWN-2.
 - b. Installed Underground: Type XHHW-2.

2.4 METAL-CLAD CABLE

- A. Manufacturers:
 - 1. Encore Wire Corporation: www.encorewire.com/#sle.
 - 2. Service Wire Co: www.servicewire.com/#sle.
 - 3. Southwire Company: www.southwire.com/#sle.
- B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569 and listed for use in classified firestop systems to be used.
- C. Conductor Stranding:
 - 1. Size 10 AWG and Smaller: Solid.
 - 2. Size 8 AWG and Larger: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.
- F. Grounding: Full-size integral equipment grounding conductor.
- G. Armor: Steel, interlocked tape.

2.5 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 260526.
- C. Wiring Connectors for Splices and Taps:
 - 1. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
- D. Wiring Connectors for Terminations:
 - 1. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
 - 2. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
- E. Mechanical Connectors: Provide bolted type or set-screw type.
- F. Compression Connectors: Provide circumferential type or hex type crimp configuration.
- G. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.

2.6 ACCESSORIES

- A. Electrical Tape:
 - 1. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
- B. Wire Pulling Lubricant:
 - 1. Listed and labeled as complying with UL 267.
 - 2. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
 - 3. Suitable for use at installation temperature.
- C. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Circuiting Requirements:
 - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
 - 2. When circuit destination is indicated without specific routing, determine exact routing required.
 - 3. Arrange circuiting to minimize splices.
 - 4. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is not permitted.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Install metal-clad cable (Type MC) in accordance with NECA 120.
- E. Installation in Raceway:

1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 2. Pull all conductors and cables together into raceway at same time.
 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
- H. Terminate cables using suitable fittings.
1. Metal-Clad Cable (Type MC):
 - a. Use listed fittings.
 - b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
- I. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.
- J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- K. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- L. Make wiring connections using specified wiring connectors.
1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 3. Do not remove conductor strands to facilitate insertion into connector.
 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
 5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- M. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
- N. Insulate ends of spare conductors using vinyl insulating electrical tape.
- O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.
- P. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

END OF SECTION 260519

SECTION 260526 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.2 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- B. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2022.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.3 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.

PART 2 PRODUCTS

2.1 GROUNDING AND BONDING REQUIREMENTS

- A. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- D. Grounding Electrode System:
 - 1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
 - a. Provide continuous grounding electrode conductors without splice or joint.
 - b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
 - 2. Metal Underground Water Pipe(s):
 - a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet (3.0 m) at an accessible location not more than 5 feet (1.5 m) from the point of entrance to the building.
 - b. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.

- c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
 - 3. Concrete-Encased Electrode:
 - a. Provide connection to concrete-encased electrode consisting of not less than 20 feet (6.0 m) of either steel reinforcing bars or bare copper conductor not smaller than 4 AWG embedded within concrete foundation or footing that is in direct contact with earth in accordance with NFPA 70.
 - 4. Ground Rod Electrode(s):
 - a. Provide two electrodes unless otherwise indicated or required.
 - b. Space electrodes not less than 10 feet (3.0 m) from each other and any other ground electrode.
 - 5. Ground Bar: Provide ground bar, separate from service equipment enclosure, for common connection point of grounding electrode system bonding jumpers as permitted in NFPA 70. Connect grounding electrode conductor provided for service-supplied system grounding to this ground bar.
 - a. Ground Bar Size: 1/4 by 2 by 12 inches (6 by 50 by 300 mm) unless otherwise indicated or required.
 - b. Where ground bar location is not indicated, locate in accessible location as near as possible to service disconnect enclosure.
- E. Separately Derived System Grounding:
 - 1. Separately derived systems include, but are not limited to:
 - a. Transformers (except autotransformers such as buck-boost transformers).
 - 2. Provide grounding electrode conductor to connect derived system grounded conductor to nearest effectively grounded metal building frame. Unless otherwise indicated, make connection at neutral (grounded) bus in source enclosure.
 - 3. Provide bonding jumper to connect derived system grounded conductor to nearest metal building frame and nearest metal water piping in the area served by the derived system, where not already used as a grounding electrode for the derived system. Make connection at same location as grounding electrode conductor connection.
 - 4. Provide system bonding jumper to connect system grounded conductor to equipment ground bus. Make connection at same location as grounding electrode conductor connection. Do not make any other connections between neutral (grounded) conductors and ground on load side of separately derived system disconnect.
 - 5. Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.

2.2 GROUNDING AND BONDING COMPONENTS

- A. General Requirements:
 - 1. Provide products listed, classified, and labeled as suitable for the purpose intended.
 - 2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:
 - 1. Use insulated copper conductors unless otherwise indicated.
 - a. Exceptions:
 - 1) Use bare copper conductors where installed underground in direct contact with earth.
 - 2) Use bare copper conductors where directly encased in concrete (not in raceway).
- C. Connectors for Grounding and Bonding:
 - 1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.

2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use compression connectors for accessible connections.
 - a. Exceptions:
 - 1) Use exothermic welded connections for connections to metal building frame.
- D. Ground Bars:
 1. Description: Copper rectangular ground bars with mounting brackets and insulators.
 2. Size: As indicated.
 3. Holes for Connections: As indicated or as required for connections to be made.
- E. Ground Rod Electrodes:
 1. Comply with NEMA GR 1.
 2. Material: Copper-bonded (copper-clad) steel.
 3. Size: 3/4 inch (19 mm) diameter by 10 feet (3.0 m) length, unless otherwise indicated.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.
- D. Make grounding and bonding connections using specified connectors.
 1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
 2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
 3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
 4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- E. Identify grounding and bonding system components in accordance with Section 260553.

END OF SECTION 260526

SECTION 260529 – HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.2 RELATED REQUIREMENTS

- A. Section 260533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.

1.3 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel/strut framing systems, nonpenetrating rooftop supports, and post-installed concrete/masonry anchors.

PART 2 PRODUCTS

2.1 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
 - 1. Comply with the following. Where requirements differ, comply with most stringent.
 - a. NFPA 70.
 - b. Requirements of authorities having jurisdiction.
 - 2. Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
 - 3. Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.
 - 4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 5. Do not use products for applications other than as permitted by NFPA 70 and product listing.

6. Steel Components: Use corrosion-resistant materials suitable for environment where installed.
 - a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.
 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
 2. Conduit Clamps: Bolted type unless otherwise indicated.
- C. Outlet Box Supports: Hangers and brackets suitable for boxes to be supported.
- D. Metal Channel/Strut Framing Systems:
 1. Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.
 2. Comply with MFMA-4.
- E. Hanger Rods: Threaded, zinc-plated steel unless otherwise indicated.
 1. Minimum Size, Unless Otherwise Indicated or Required:
 - a. Equipment Supports: 1/2-inch (13 mm) diameter.
 - b. Single Conduit up to 1-inch (27 mm) Trade Size: 1/4-inch (6 mm) diameter.
 - c. Trapeze Support for Multiple Conduits: 3/8-inch (10 mm) diameter.
- F. Anchors and Fasteners:
 1. Manufacturers - Mechanical Anchors:
 2. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.
 3. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
 4. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
 5. Hollow Masonry: Use toggle bolts.
 6. Hollow Stud Walls: Use toggle bolts.
 7. Steel: Use beam clamps, machine bolts, or welded threaded studs.
 8. Sheet Metal: Use sheet metal screws.
 9. Wood: Use wood screws.
 10. Plastic and lead anchors are not permitted.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install hangers and supports in accordance with NECA 1.
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- D. Unless specifically indicated or approved by Engineer, do not provide support from suspended ceiling support system or ceiling grid.
- E. Unless specifically indicated or approved by Engineer, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- G. Equipment Support and Attachment:
 1. Use metal, fabricated supports or supports assembled from metal channel/strut to support equipment as required.

2. Use metal channel/strut secured to studs to support equipment surface mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 3. Use metal channel/strut to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- H. Secure fasteners in accordance with manufacturer's recommended torque settings.
- I. Remove temporary supports.

END OF SECTION 260529

SECTION 260533.13 – CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Galvanized steel rigid metal conduit (RMC).
- B. Liquidtight flexible metal conduit (LFMC).
- C. Galvanized steel electrical metallic tubing (EMT).
- D. Rigid polyvinyl chloride (PVC) conduit.

1.2 RELATED REQUIREMENTS

- A. Section 078400 - Firestopping.
- B. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Cable assemblies consisting of conductors protected by integral metal armor.
- C. Section 260526 - Grounding and Bonding for Electrical Systems.
- D. Section 260529 - Hangers and Supports for Electrical Systems.
- E. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.3 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts.
 - 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment.
 - 4. Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.
 - 5. Notify Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

1.5 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

PART 2 PRODUCTS

2.1 CONDUIT APPLICATIONS

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.
- C. Underground:
 - 1. Under Slab on Grade: Use rigid PVC conduit.
 - 2. Exterior, Direct-Buried: Use rigid PVC conduit.
- D. Concealed Within Hollow Stud Walls: Use galvanized steel electrical metallic tubing (EMT).
- E. Concealed Above Accessible Ceilings: Use galvanized steel electrical metallic tubing (EMT).
- F. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit (RMC).
- G. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit (RMC).
- H. Exposed, Exterior, Not Subject to Severe Physical Damage: Use galvanized steel electrical metallic tubing (EMT).
- I. Flexible Connections to Vibrating Equipment:
 - 1. Use liquidtight flexible metal conduit (LFMC).

2.2 CONDUIT - GENERAL REQUIREMENTS

- A. Comply with NFPA 70.
- B. Provide conduit, fittings, supports, and accessories required for complete raceway system.
- C. Provide products listed, classified, and labeled as suitable for purpose intended.
- D. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.3 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- B. Fittings:
 - 1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.
 - 2. Material: Use steel or malleable iron.
 - 3. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.
- B. Fittings:
 - 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel or malleable iron.

2.5 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)

- A. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
- B. Fittings:
 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 2. Material: Use steel or malleable iron.
 3. Connectors and Couplings: Use compression/gland or set-screw type.
 - a. Do not use indenter type connectors and couplings.

2.6 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

- A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
- B. Fittings:
 1. Manufacturer: Same as manufacturer of conduit to be connected.
 2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install conduit in accordance with NECA 1.
- C. Galvanized Steel Rigid Metal Conduit (RMC): Install in accordance with NECA 101.
- D. Rigid Polyvinyl Chloride (PVC) Conduit: Install in accordance with NECA 111.
- E. Conduit Routing:
 1. Arrange conduit to provide no more than equivalent of three 90-degree bends between pull points.
 2. Route conduits above water and drain piping where possible.
 3. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
- F. Conduit Support:
 1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 260529.
 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- G. Connections and Terminations:
 1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
 2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
 3. Use suitable adapters where required to transition from one type of conduit to another.

4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
 5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
 6. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
 7. Secure joints and connections to provide mechanical strength and electrical continuity.
- H. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
 2. Make penetrations perpendicular to surfaces unless otherwise indicated.
 3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
 4. Conceal bends for conduit risers emerging above ground.
 5. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
 6. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty.
 7. Install firestopping to preserve fire resistance rating of partitions and other elements; see Section 078400.
- I. Underground Installation:
1. Minimum Cover, Unless Otherwise Indicated or Required:
 - a. Underground, Exterior: 18 inches (460 mm).
 - b. Under Slab on Grade:
 - c. 12 inches (300 mm) to bottom of slab.
 2. Provide underground warning tape along entire conduit length for service entrance where not concrete-encased; see Section 260553.
- J. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
 3. Where conduits are subject to earth movement by settlement or frost.
- K. Conduit Sealing:
1. Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:
 - a. Where conduits enter building from outside.
 - b. Where service conduits enter building from underground distribution system.
 - c. Where conduits enter building from underground.
 - d. Where conduits may transport moisture to contact live parts.
 2. Where conduits cross barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to:
 - a. Where conduits pass from outdoors into conditioned interior spaces.
 - b. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

L. Provide grounding and bonding; see Section 260526.

END OF SECTION 260533.13

SECTION 262200 – LOW-VOLTAGE TRANSFORMERS

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS

2.1 TRANSFORMERS - GENERAL REQUIREMENTS

- A. Description: Factory-assembled, dry type transformers for 60 Hz operation designed and manufactured in accordance with NEMA ST 20 and listed, classified, and labeled as suitable for the purpose intended.
- B. Unless noted otherwise, transformer ratings indicated are for continuous loading according to IEEE C57.96 under the following service conditions:
 - 1. Altitude: Less than 3,300 feet (1,000 m).
 - 2. Ambient Temperature:
 - a. Greater than 10 kVA: Not exceeding 104 degrees F (40 degrees C).
 - b. Less than 10 kVA: Not exceeding 77 degrees F (25 degrees C).
- C. Core: High grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses. Keep magnetic flux densities substantially below saturation point, even at 10 percent primary overvoltage. Tightly clamp core laminations to prevent plate movement and maintain consistent pressure throughout core length.
- D. Impregnate core and coil assembly with non-hygroscopic thermo-setting varnish to effectively seal out moisture and other contaminants.
- E. Basic Impulse Level: 10 kV.
- F. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.
- G. Isolate core and coil from enclosure using vibration-absorbing mounts.
- H. Nameplate: Include transformer connection data, ratings, wiring diagrams, and overload capacity based on rated winding temperature rise.

PART 3 EXECUTION (NOT USED)

END OF SECTION 262200

SECTION 311000 – SITE CLEARING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Clearing and grubbing.
- B. Selective removal and trimming.
- C. Earth stripping and stockpiling.
- D. Repair and restoration.
- E. Debris removal.
- F. Disconnecting, capping, sealing and removal of site utilities.

1.2 RELATED REQUIREMENTS

- A. Section 312323 - Fill: Material for filling holes, pits, and excavations generated as result of removal operations.
- B. Section 015713 - Temporary Erosion and Sediment Control.

1.3 DEFINITIONS

- A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials.
- D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

- A. Existing Conditions Report: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by clearing.
- B. Photographs and Videos: Use sufficiently detailed photographs or video recordings.
- C. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.
- D. Stockpile Locations: Identify and accurately show locations of stockpiled materials.

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1.6 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: Notify MissDig and engage a private utility locating company prior to site clearing.
- C. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.
- D. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.
- E. Temporary Erosion and Sediment Control: Comply with other requirements specified in Section 015713 - Temporary Erosion and Sediment Control.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312323 "Fill."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.
- B. Sedimentation Barrier: See Section 015713 - Temporary Erosion and Sediment Control.

PART 3 EXECUTION

3.1 PREPARATION

- A. Coordinate work with utility companies; notify before starting work and comply with local requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Protect existing structures and other elements that are to remain.
- E. Protect existing vegetation to remain from damage and monitor according to ANSI A300 Part 5.
 - 1. Photograph vegetation with documentation indicating data, time, weather, and brief description of health condition.
- F. Install sedimentation barrier according to Section 015713 - Temporary Erosion and Sediment Control.
- G. Protect and maintain survey benchmarks.

3.2 EXISTING UTILITIES AND ABOVE GROUND STRUCTURES

- A. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer and Owner not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Owner's written permission.
- B. Remove above ground structures as indicated on the drawings.
- C. Locate, identify, disconnect, and seal or cap utilities indicated to be abandoned in place. Arrange with utility companies to shut off indicated utilities.
- D. Excavate for and remove underground utilities indicated to be removed.

3.3 CLEARING AND GRUBBING

- A. Clearing: Cut trees, stumps, shrubs, downed timber, and other vegetation for removal within identified area as indicated on drawings according to 29 CFR 1910.266. Follow recommendations of ANSI Z133 and best local practices for species involved.
- B. Clear site after relocating vegetation in accordance with ANSI A300 Part 6.
- C. Do not remove or damage vegetation beyond limits indicated on drawings.
1. Paving: 10 feet each side of surface walkways, patios, surface parking, and utility lines less than 12 inches in diameter.
 2. Minor Utility Trenches: 10 feet each side of utility lines less than 12 inches (305 mm) in diameter.
 3. Roadways and Main Utility Trenches: 15 feet each side.
- D. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum subsoil disturbance.
- E. Grubbing: Remove stumps, roots, buried timber, and other vegetation minimum depth 18 inches from ground. Remove rocks minimum depth 6 inches (15 cm) from ground.
- F. Fill depressions caused by clearing and grubbing operations with satisfactory soil material as specified in Section 312323 Fill, unless further excavation or earthwork is indicated.

3.4 SELECTIVE REMOVAL AND TRIMMING

- A. Selective Removal: Individual tree and shrub identified for removal as indicated on drawings according to 29 CFR 1910.266.
1. Includes trees, stumps, shrubs, downed timber, and other vegetation identified for removal as indicated on drawings.
 2. Fell trees away from vegetation identified to remain.
 3. Pull stumps, remove roots, buried timber, and other vegetation identified for removal 12 inches, minimum depth, from ground. Remove rocks 6 inches, minimum depth, from ground.
 4. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and matching existing grade.
 - a. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.
- B. Selective Trimming: Individual limbs and branches cut back according to ANSI A300 Part 1 identified for removal as indicated on drawings. Follow recommendations of ANSI Z133 and best local practices for species involved.
1. Prune dead branches and balance overall appearance; see Section 329300.

3.5 EARTH STRIPPING AND STOCKPILING

- A. Stripping:

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1. Cut sod into portable sections for undamaged removal.
 2. Remove sod and grass before stripping topsoil.
 3. Strip topsoil to depth in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - a. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.
 4. Remove topsoil within identified area as indicated on drawings.
- B. Stockpiling:
1. Limit height of topsoil stockpiles to 72 inches.
 2. Do not stockpile topsoil within protection zones.
 3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.

3.6 REMOVED VEGETATION PROCESSING

- A. Do not leave on-site.
- B. Trees: Sell if marketable.
- C. Sod: Reuse on-site if possible; otherwise sell if marketable.
- D. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; give preference to on-site uses.

3.7 REPAIR AND RESTORATION

- A. Remaining Existing Facilities, Utilities, and Site Features: If damaged due to this work, repair or replace to original condition.
- B. Vegetation: Replace damaged or destroyed vegetation identified to remain as indicated on drawings at no cost to Owner:
 1. Outside removal limits.
 2. Inside protection limits.
- C. Apply tree wound compound according to manufacturer's recommendations.

3.8 ROCK

- A. Remove from construction area naturally formed rocks that measure more than 1 foot across in least dimension.

3.9 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, vegetation, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

3.11 DEBRIS REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and windblown debris from public and private lands.

3.12 CLEANING

- A. Remove unused stockpiled subsoil. Grade stockpile area to prevent standing water.
- B. Leave site clean and ready to receive work.

END OF SECTION 311000

SECTION 312200 – GRADING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Rough grading.
- B. Fine grading.

1.2 RELATED REQUIREMENTS

- A. Section 311000 - Site Clearing.
- B. Section 312316.13 Trenching.
- C. Section 312323 - Fill.

1.3 SUBMITTALS

- A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.4 QUALITY ASSURANCE

- A. Perform in accordance with State of Michigan, Highway Department standards.
 - 1. Maintain one copy on-site.

1.5 FIELD CONDITIONS

- A. Ambient Conditions: Terminate work during hazardous environmental conditions in accordance with 29 CFR 1910.266.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Gravel: Salvaged on-site.
 - 1. Salvaged gravel must be free of debris and organic material.
- B. Other Fill Materials: See Section 312323.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify survey bench mark and intended elevations for grading areas are as indicated.
- B. Verify the absence of standing or ponding water.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.

- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect above- and below-grade utilities to remain.
- D. Notify utility company to remove and relocate utilities.
- E. Provide temporary means and methods to remove standing or ponding water from areas prior to grading.
- F. Protect site features to remain, including but not limited to bench marks, survey control points, and fences.
- G. Remove topsoil in accordance with Section 311000.
- H. Excavate materials in accordance with Section 312316.13.
- I. Fill and backfill in accordance with Section 312323.

3.3 ROUGH GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations.
- C. Replace displaced subgrade in accordance with Section 312323.
- D. Remove and replace unsuitable materials as specified fill.
- E. See Section 311000 & 312316.13 for stockpiling procedures.

3.4 FINE GRADING

- A. Scrape and spread subgrade material uniformly smooth and without disruptions as indicated on drawings.
- B. Slopes: Transition smoothly to adjacent areas.
- C. See Section 312323 for final compaction.

3.5 TOLERANCES

- A. Turf or Unpaved Areas: Plus or minus 1/2 inch.
- B. Walks: Plus or minus 1/4 inch.
- C. Pavements: Plus or minus 1/4 inch.
- D. Top Surface: Plus or minus 1/2 inch.

3.6 CLEANING

- A. Remove unused stockpiled subsoil. Grade stockpile area to prevent standing water.
- B. Leave site clean and raked, ready to receive work.

3.7 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.
 - 2. Disposal of surplus and waste material off site.
- D. DISPOSAL OF SURPLUS AND WASTE MATERIALS
 - 1. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312200

SECTION 312316.13 – TRENCHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Trench excavation.
- B. Utility bedding and cover.

1.2 RELATED REQUIREMENTS

- A. Section 311000 - Site Clearing.
- B. Section 312323 - Fill.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate trenching with utility installation.

1.4 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: For each type of the following manufactured products required:
 - 1. Controlled low-strength material, including design mixture.
- C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by trenching operations.
- B. Protect and maintain erosion and sedimentation controls during trenching operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 TRENCH EXCAVATION

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
 - 1. Clearance: 12 inches each side of pipe or conduit.
- C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
 - 1. Excavate trenches 12 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

END OF SECTION 312316.13

SECTION 312323 – FILL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Filling, backfilling, and compacting for slabs-on-grade and paving.
- B. Backfilling and compacting for utilities outside the building to utility main connections.

1.2 RELATED REQUIREMENTS

- A. Section 015713 - Temporary Erosion and Sediment Control: Slope protection and erosion control.
- B. Section 311000 - Site Clearing.
- C. Section 312316.13 Trenching: Removal and handling of soil to be re-used.

1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving or concrete slabs on grade.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Drainage Course: Aggregate layer that minimizes upward capillary flow or pore water also used as filter material around underdrains and as stone filter material for erosion control.
- F. Fill: Soil materials used to raise existing grades.
- G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D1586.
- H. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and base course of cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- I. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

1.4 SUBMITTALS

- A. Product Data: Warning tapes and geotextiles.
- B. Qualification Data: For qualified testing agency.
- C. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 - 1. Classification according to ASTM D2487.
 - 2. Particle size distribution (gradation) according to ASTM D6913.

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D. Compaction Density Test Reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- B. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where indicated.
 - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 - 2. Prevent contamination.
 - 3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487, or a combination of these groups; free of rock or gravel larger than 3 inches (76.2 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Engineered Fill: MDOT CL II or Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Bedding Course: MDOT CL IIIA or Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; MDOT 6A or ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.
- G. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; MDOT 34R or ASTM D448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.
- H. Sand: ASTM C33/C33M; fine aggregate.
- I. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 ACCESSORIES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Survivability: As follows:
 - a. Grab Tensile Strength: 90 lbf; ASTM D4632.
 - b. Sewn Seam Strength: 142 lbf; ASTM D4632.
 - c. Tear Strength: 45 lbf; ASTM D4533.
 - d. Puncture Strength: 45 lbf; ASTM D4833.
 - 3. Apparent Opening Size: No. 60 sieve, maximum; ASTM D4751.
 - 4. Permittivity: 0.5 per second, minimum; ASTM D4491.
 - 5. UV Stability: 50 percent after 500 hours' exposure; ASTM D4355.
- B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Survivability: As follows:
 - a. Grab Tensile Strength: 247 lbf; ASTM D4632.
 - b. Sewn Seam Strength: 222 lbf; ASTM D4632.
 - c. Tear Strength: 90 lbf; ASTM D4533.
 - d. Puncture Strength: 90 lbf; ASTM D4833.
 - 3. Apparent Opening Size: No. 60 sieve, maximum; ASTM D4751.
 - 4. Permittivity: 0.02 per second, minimum; ASTM D4491.
- C. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
 - 1. Red: Electric.
 - 2. Yellow: Gas, oil, steam, and dangerous materials.
 - 3. Orange: Telephone and other communications.
 - 4. Blue: Water systems.
 - 5. Green: Sewer systems.

2.3 SOURCE QUALITY CONTROL

- A. Where fill materials are specified by reference to a specific standard, testing of samples for compliance will be provided before delivery to site.
- B. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Verify areas to be filled are not compromised with surface or ground water.

3.2 PREPARATION

- A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with subbase material.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.3 STORAGE OF MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
- B. Geotextiles:
 - 1. Prevent excessive mud, wet concrete, epoxy or other deleterious materials from coming in contact with and affixing to the geotextile materials.
 - 2. Store materials at temperatures above -20 degrees Fahrenheit.
 - 3. Rolled materials may be laid flat or stood on end.
 - 4. Materials should not be left directly exposed to sunlight for extended period. Follow manufacturers recommendation for storage.
 - 5. Contractor shall check the materials upon delivery to verify the proper material has been received and is free of damage or flaws from manufacturing, shipping or handling.

3.4 FILLING

- A. Fill to contours and elevations indicated using unfrozen materials.
- B. Employ a placement method that does not disturb or damage other work.
- C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Granular Fill: Place and compact materials in equal continuous layers not exceeding 8 inches compacted depth.
 - 1. Under steps and ramps, use engineered fill.
 - 2. Under and adjacent to building slabs, use engineered fill.
 - 3. Under footings and foundations, use engineered fill.
- F. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
- G. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- H. Correct areas that are over-excavated.
- I. Compaction Density Unless Otherwise Specified or Indicated:
 - 1. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.
 - 2. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

- 3. Under paving, slabs-on-grade, and similar construction: 95 percent of maximum dry density.
- J. Reshape and re-compact fills subjected to vehicular traffic.
- K. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Engineer. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.5 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Backfill voids with satisfactory soil while removing shoring and bracing.
- D. Initial Backfill:
 - 1. Soil Backfill: Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch (25.4 mm) in any dimension, to a height of 12 inches (304.8 mm) over the pipe or conduit.
 - a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Final Backfill:
 - 1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
- F. Warning Tape: Install warning tape directly above utilities, 12 inches (304.8 mm) below finished grade, except 6 inches (152.4 mm) below subgrade under pavements and slabs.

3.6 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.7 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D1557:
 - 1. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.

2. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

3.8 TOLERANCES

- A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.
- B. Top Surface of Filling Under Paved Areas: Plus or minus 1 inch from required elevations.

3.9 FIELD QUALITY CONTROL

- A. Special Inspections: Contractor will engage a qualified special inspector to perform the following special inspections:
 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 2. Determine that fill material classification and maximum lift thickness comply with requirements.
 3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2167, ASTM D2937, and ASTM D6938, as applicable. Tests will be performed per the following:
 1. Paved and building slab/slab on grade Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved and building slab/slab on grade area but in no case fewer than three tests.
 2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 or less of trench length but no fewer than two tests.
 3. Gradation: Perform aggregate gradation for imported material per MDOT requirements.
- E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.10 PROTECTION

- A. Protect Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 1. Scarify or removed and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.11 CLEANING

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION 312323

SECTION 321120 – SUBBASE AND AGGREGATE BASE COURSES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Subbase course.
- B. Aggregate base course.

1.2 RELATED REQUIREMENTS

- A. Section 312323 - Fill.
- B. Section 321216 - Asphalt Paving.
- C. Section 321313 - Concrete Paving.

1.3 REFERENCE STANDARDS

- A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2019.
- B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012 (Reapproved 2021).
- C. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)); 2012 (Reapproved 2021).
- D. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2023.

1.4 SUBMITTALS

- A. Qualification Data: For qualified testing agency.
 - 1. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 - 2. Classification according to ASTM D2487.
 - 3. Particle size distribution (gradation) according to ASTM D6913.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Subbase Material: MDOT CL II or Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- B. Base Course: MDOT 22A or Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

PART 3 EXECUTION

3.1 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and recompacting.
- B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.2 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
 - 1. Place base course material over subbase course under hot-mix asphalt pavement.
 - 2. Shape subbase course and base course to required crown elevations and cross-slope grades.
 - 3. Place subbase course and base course 8 inches or less in compacted thickness in a single layer.
 - 4. Place subbase course and base course that exceeds 8 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 8 inches thick or less than 3 inches thick.

3.3 PLACEMENT AND COMPACTION

- A. Place subbase and aggregate base in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place subbase and aggregate base evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact materials to not less than the following percentages of maximum dry unit weight according to ASTM D1557.
- D. Under HMA:
 - 1. Subbase Compacted Thickness: According to design drawings.
 - a. Compact to 95 percent of maximum dry density.
 - 2. Aggregate Base Compacted Thickness: According to design drawings.
 - a. Compact to 98 percent of maximum dry density.
- E. Under concrete paving:
 - 1. Subbase Compacted Thickness: According to design drawings.
 - a. Compact to 95 percent of maximum dry density.
- F. Level and contour surfaces to elevations and gradients indicated.
- G. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

- A. Variation From Design Elevation: Within 1/2 inch.
- B. Flatness: Maximum variation of 1/2 inch measured with 10 foot straight edge.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- B. Subbase Compaction Density Testing: In accordance with ASTM D1556/D1556M, ASTM D2167, or ASTM D6938.
 - 1. Subbase: Locations and frequencies as specified in the MDOT Density Testing and Inspection Manual.
- C. Aggregate Base Compaction Density Testing: In accordance with ASTM D1556/D1556M, ASTM D2167, or ASTM D6938.
 - 1. Aggregate base: Locations and frequencies as specified in the MDOT Density Testing and Inspection Manual.
- D. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent, 98 percent under HMA pavements of maximum dry unit weight according to ASTM D1557.

3.6 PROTECTION

- A. Protect Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.7 CLEANING

- A. Remove unused materials and grade areas to prevent standing surface water.

END OF SECTION 321120

SECTION 321216 – ASPHALT PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Hot-mix asphalt paving.
- B. Hot-mix asphalt patching.

1.2 RELATED REQUIREMENTS

- A. Section 312200 - Grading: Preparation of site for paving and base.
- B. Section 312323 - Fill: Compacted subgrade for paving.
- C. Section 321120 - Subbase and Aggregate Base Courses.

1.3 ACTION SUBMITTALS

- A. Hot-Mix Asphalt Designs:
 - 1. Certification, by authorities having jurisdiction, of approval of each hot-mix asphalt design proposed for the Work.
 - 2. For each hot-mix asphalt design proposed for the work.

1.4 INFORMATION SUBMITTALS

- A. Qualification Data: For paving-mix manufacturer.
- B. Material Certificates: Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.
 - 1. Aggregates.
 - 2. Asphalt binder.
 - 3. Asphalt cement.
 - 4. Tack coat.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with State of Michigan Highways standard.
- B. Mixing Plant: Complying with State of Michigan Highways standard.
- C. Obtain materials from same source throughout.
- D. Testing Agency Qualifications: Qualified in accordance with ASTM D3666 for testing indicated.
- E. Regulator Requirements: Comply with materials, workmanship, and other applicable requirements of MDOT for asphalt paving work.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 - 1. Do not place asphalt when ambient air or base surface temperature is less than 35 degrees F.

2. Place only HMA courses that are greater than 200 pounds per square yard if the temperature of the surface being paved is greater than 35 degrees F.
3. Place only HMA courses that are greater than 120 pounds per square yard if the temperature of the surface being paved is greater than 40 degrees F.
4. Place any HMA course if the temperature of the surface being paved is greater than 50 degrees F.

PART 2 PRODUCTS

2.1 MATERIALS

A. Aggregates

1. General: Use materials and gradations that have performed satisfactorily in previous installations.
2. Coarse Aggregate: ASTM D692/D692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
3. Fine Aggregate: ASTM D1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
 - a. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.
4. Mineral Filler: ASTM D242/D242M or AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.

B. Asphalt Materials

1. Asphalt Binder: ASTM D6373 or AASHTO M 320 binder designation PG 58-34. Meet MDOT requirements.
2. Tack Coat: ASTM D977 or AASHTO M 140 emulsified asphalt, or ASTM D2397/D2397M or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.
3. Water: Potable.

C. Auxiliary Materials

1. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires asphalt shingles glass from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.

2.2 ASPHALT PAVING MIXES AND MIX DESIGN

- A. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and complying with the following requirements:
 1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
 2. Leveling/Base Course: As indicated on drawings. Meet MDOT requirements.
 3. Surface Course: As indicated on drawings. Meet MDOT requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 PREPARATION

- A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

3.3 PATCHING

- A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- C. Placing Two-Course Patch Material: Partially fill excavated pavements with hot-mix asphalt base course mix and, while still hot, compact. Cover asphalt base course with compacted layer of hot-mix asphalt surface course, finished flush with adjacent surfaces.

3.4 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
 - 1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

3.5 SURFACE PREPARATION

- A. Ensure that prepared subgrade has been proof-rolled and is ready to receive paving. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces.
- B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.6 HOT-MIX ASPHALT PLACEMENT

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
 - 2. Place hot-mix asphalt surface course in single lift.
 - 3. Spread mix at a minimum temperature of 250 deg F.
 - 4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
 - 5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches from strip to strip to ensure proper compaction of mix along longitudinal joints.
 2. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.7 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
 3. Offset transverse joints, in successive courses, a minimum of 24 inches.
 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method in accordance with AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.8 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
1. Average Density, Superpave Gyrotory Compactor test method: Comply with MDOT standards for superpave mix.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.9 TOLERANCES

- A. Pavement Thickness: Compact each course to produce thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: 1/4 inch.
 - 2. Surface Course: 1/8 inch.
 - 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor to Engage a qualified testing agency to perform Quality Control tests and inspections.
- B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined in accordance with ASTM D3549/D3549M.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. In-place Density: Density of in-place compacted pavements will be determined by nuclear method in accordance with ASTM D2950/D2950M.
 - 1. Use of a nuclear density gauge requires measuring the pavement density using the Gmm from the Job Mix Formula (JMF) for the density control target.
 - 2. The required in-place density of the HMA mixture shall be 92 to 98 percent of the density control target.
 - 3. Nuclear density testing and frequency shall be done in accordance with the MDOT Density Testing and Inspection Manual.
 - 4. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.11 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for 1 days or until surface temperature is less than 140 degrees F (60 degrees C).

END OF SECTION 321216

SECTION 321313 – CONCRETE PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete Sidewalks.

1.2 RELATED REQUIREMENTS

- A. Section 312200 - Grading: Preparation of site for paving and base and preparation of subsoil at pavement perimeter for planting.
- B. Section 321120 - Subbase and Aggregate Base Courses.

1.3 REFERENCE STANDARDS

- A. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2025.
- B. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.

1.4 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.
- B. Material Certificates: For the following, from manufacturer:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Curing compounds.
 - 4. Applied finish materials.
 - 5. Joint fillers.
- C. Material Test Reports: For each of the following:
 - 1. Aggregates: Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.
- D. Field quality-control reports.

1.7 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").
- B. Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

1.8 FIELD CONDITIONS

- A. Traffic Control: Maintain access for pedestrian traffic as required for other construction activities.
- B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- C. Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 PRODUCTS

2.1 FORM MATERIALS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
 - 1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (3048 cm) or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 CONCRETE MATERIALS

- A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C150/C150M, gray portland cement Type I, Type II, or Type III. Per Section 9 & 10 of the MDOT 2020 Standard Specification for Construction.
 - 2. Fly Ash: ASTM C618, Class C or Class F.
 - 3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
 - 4. Blended Hydraulic Cement: ASTM C595/C595M, Type IP, portland-pozzolan cement.
- B. Normal-Weight Aggregates: ASTM C33/C33M, Per Section 902 and table 1004-1 for 3500 mix of the MDOT 2020 Standard Specifications for construction, uniformly graded. Provide aggregates from a single source.
- C. Air-Entraining Admixture: ASTM C260/C260M.
- D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
 - 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 - 2. Retarding Admixture: ASTM C494/C494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
- E. Water: Potable and complying with ASTM C94/C94M.

2.3 ACCESSORIES

- A. Curing Compound: ASTM C309, Type 2, Class B.
- B. Joint Fillers: ASTM D1751, asphalt-saturated cellulosic fiber in preformed strips. Meet MDOT requirements.

2.4 CONCRETE MIX DESIGN

- A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
 - 2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.
- B. Cementitious Materials: Comply with Section 1004 of the 2020 MDOT Standard Specifications for Construction for Portland Cement Concrete Mixtures
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
 - 1. Air Content, 7% percent plus or minus 1-1/2 percent per Table 1004-1 of the 2020 MDOT Standard Specifications of Construction.
- D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions. Concrete admixtures must be selected from the Qualified Products list. Types of admixtures are listed in Section 903.02 of the 2020 MDOT Standard Specifications for Construction.
 - 1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

- F. Concrete Mixtures: Normal-weight concrete.
 - 1. Compressive Strength (28 Days): 3500 psi (24131.66 kPa).
 - 2. Maximum W/C Ratio at Point of Placement: 0.45 per table 1004-1 of the 2020 MDOT Standard Specifications.
 - 3. Slump Limit: Per table 1004-1 of the 2020 MDOT Standard Specific, plus or minus 1 inch (25.4 mm).

2.5 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M and ASTM C1116/C1116M.
 - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
 - 1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.
- B. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated. Contractor to place joint sealant over filler strips.
 - 1. Locate expansion joints at intervals of 50 feet (1524 cm) unless otherwise indicated.
 - 2. Extend joint fillers full width and depth of joint.
 - 3. Terminate joint filler not less than 1/2 inch (12.7 mm) or more than 1 inch (25.4 mm) below finished surface if joint sealant is indicated.
 - 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 - 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.

6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- C. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing adjacent concrete paving:
 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.
- D. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.
- B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement and joint devices.
- H. Screed paving surface with a straightedge and strike off.

3.6 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
 1. Medium-to-Coarse-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.

3.7 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by curing compound or as follows:
 - 1. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.8 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
 - 1. Elevation: 3/4 inch (19.05 mm).
 - 2. Thickness: Plus 3/8 inch (9.52 mm), minus 1/4 inch (6.35 mm).
 - 3. Surface: Gap below 10-feet- long; unlevelled straightedge not to exceed 1/2 inch (12.7 mm).
 - 4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch (12.7 mm) per 12 inches (304.8 mm) of tie bar.
 - 5. Joint Spacing: 3 inches (76.2 mm).
 - 6. Contraction Joint Depth: Plus 1/4 inch (6.35 mm), no minus.
 - 7. Joint Width: Plus 1/8 inch (3.18 mm), no minus.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each concrete mixture, plus one set for each additional 50 cu. yd. or fraction thereof of each concrete mixture placed each day.
 - 2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C231/C231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
 - 5. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 - 6. Compressive-Strength Tests: ASTM C39/C39M; test one specimen at seven days and two specimens at 28 days.

- a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3447.38 kPa).
- D. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.
- G. Concrete paving will be considered defective if it does not pass tests and inspections.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- I. Prepare test and inspection reports.

3.10 REPAIR AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Engineer.
- B. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.
- C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 329219 – SEEDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Placing topsoil.
- C. Seeding, mulching and fertilizer.
- D. Hydroseeding.

1.2 RELATED REQUIREMENTS

- A. Section 312200 - Grading.

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- D. Topsoil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- F. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.4 SUBMITTALS

- A. Product Data:
 - 1. Fertilizer.
 - 2. Mulch Blanket.
 - 3. Hydroseed.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and certified weed free. Include the year of production and date of packaging.
- C. Product Certificates: For fertilizers, from manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.
- B. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Accompany each delivery of bulk materials with appropriate certificates.

1.6 FIELD CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.
 - 1. Spring Planting: Comply with MDOT 2020 Standard Specifications for Construction seasonal limitations.
 - 2. Fall Planting: Comply with MDOT 2020 Standard Specifications for Construction seasonal limitations.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 PRODUCTS

2.1 SEED MIXTURE

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species:
 - 1. Quality, State Certified: State-certified seed of grass species as listed below for solar exposure. Seed shall be certified as weed free.
- C. Grass-Seed Mixture: Proprietary seed mix as follows:
 - 1. Products: Subject to compliance with requirements, provide the following:
 - 2. Maintained lawn areas: Provide MDOT TYPE THM Mix applied at 220 lbs/acre.
 - 3. THM includes the following ratio:
 - a. Kentucky blue grass 30%. Minimum Purity 98%, 85% Germination.
 - b. Perennial ryegrass 20%. Minimum Purity 96%, 85% Germination.
 - c. Creeping red fescue 50%. Minimum Purity 97%, 85% Germination.

2.2 SOIL MATERIALS

- A. Topsoil: Excavated from site, screened and free of weeds or provide screened, weed-free topsoil for restoration.

2.3 FERTILIZERS

- A. Slow-Release Fertilizer: Granular or pelleted fertilizer.
 - 1. Maintained Lawn Areas: Fertilizers must contain a water-insoluble and water-soluble component.
 - a. Class A, evenly apply 176lbs/acre on a prepared seed bed.
 - 2. Composition:
 - a. Water-Insoluble Fertilizer. Apply 32 pounds of water-insoluble nitrogen per acre (e.g., 128 pounds of ureaform, 115 pounds of isobutylidene diurea). Provide the water-insoluble nitrogen from ureaformaldehydes, coarse grade isobutylidene diurea, or both.
 - b. Water-Soluble Fertilizer. Apply 48 pounds of nitrogen, phosphorous, and potassium nutrient per acre (e.g. 253 pounds of 19-19-19, 400 pounds of 12-12-12). Provide water-soluble fertilizer containing a 1:1:1 ratio of nitrogen, phosphorous, and potassium. Ensure that the fertilizer components include urea, diammonium phosphate, and potassium chloride.

2.4 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Mulch Blankets
 - 1. High Velocity Blankets. Use high-velocity blankets on slopes of 1:2 or steeper and on ditch bottoms, including 12 inches up the front and backslopes.
 - 2. Use mulch blankets on slopes of less than 1:2 next to shoulders and behind curbs. Place mulch blankets with the netting on top and mulch fibers contacting the soil.
- C. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- D. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.5 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a biodegradable mesh. Include manufacturer's recommended wood staples or biodegradable staples.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that prepared soil base is ready to receive the work of this Section.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 3. Uniformly moisten excessively dry soil that is not workable or which is dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Engineer and replace with new planting soil.

3.2 PREPARATION

- A. Prepare subgrade in accordance with Section 312200.
- B. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.
- C. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

- A. Placing Planting Soil: Place and mix planting soil in place over exposed subgrade.
- B. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- C. Before planting, obtain Engineer's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

- A. Prepare area as specified in "Turf Area Preparation" Article.
- B. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
- C. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 FERTILIZING

- A. Apply fertilizer in accordance with manufacturer's instructions.
- B. Apply after smooth raking of topsoil.
- C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- D. Mix thoroughly into upper 2 inches (50 mm) of topsoil.
- E. Lightly water to aid the dissipation of fertilizer.

3.6 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph.
 - 1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
 - 2. Do not use wet seed or seed that is moldy or otherwise damaged.
 - 3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of 220 lbs/acre.

- C. Rake seed lightly into top [1/8] inch ([3.18] mm) of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas with slopes exceeding 1:2 with erosion-control blankets and installed and stapled according to manufacturer's written instructions.
- E. Protect seeded areas from hot, dry weather or drying winds by applying planting soil within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly, and roll surface smooth.
- F. Do not seed areas in excess of that which can be mulched on same day.
- G. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches (100 by 100 mm).

3.7 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, slow-release fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
 - 1. Mix slurry with nonasphaltic tackifier.
 - 2. Spray-apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.
- B. Do not hydroseed area in excess of that which can be mulched on same day.
- C. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches (100 by 100 mm).

3.8 TURF MAINTENANCE

- A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
 - 1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
 - 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 - 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

3.9 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Engineer:
 - 1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by [5] inches ([127] mm).
 - 2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
- B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.10 CLEANING

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.
- C. Remove nondegradable erosion-control measures after grass establishment period.
- D. Clean surrounding areas of construction debris.

3.11 PROTECTION

- A. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

3.12 MAINTENANCE

- A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:
 - 1. Seeded Turf: 60 days from date of planting completion.
 - a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

END OF SECTION 329219

SECTION 331415 – SITE WATER DISTRIBUTION PIPING

PART 1 GENERAL

1.1 SUMMARY

- A. This work shall include the furnishing and all labor material, tools, equipment, accessories, and services necessary for providing and installing water services, and water valves of size and character at the locations shown on the drawings and specified herein, and shall include excavation, bedding, backfill, testing and sterilization.
- B. The Contractor shall protect existing utilities during construction whether the existing utilities are shown on the plans or not. Utilities damaged by construction shall be repaired in a manner satisfactory to the Engineer and at the Contractor's expense. The Contractor shall call Miss Dig, 1-800-482-7171, for flagging and locating the existing utilities.
- C. Section Includes:
 - 1. This section includes water services and testing and disinfection of water main.
- D. Reference Standards:
 - 1. AWWA C651 - AWWA Standard for disinfecting water mains.
 - 2. ANSI A21.5/AWWA C151 - American National Standard for ductile iron pipe, centrifugally case in metal molds or sand-lined molds for water or other liquids.
 - 3. ANSI A21.53/AWWA C153 – Ductile Iron Compact Fittings for Water Service.
 - 4. AWWA C509 – Resilient Seated Gate Valves for Water Supply Service.
 - 5. AWWA C515 – Reduced-Wall Resilient Seated Gate Valves for Water Supply Service.
 - 6. AWWA C600 – Installation of Ductile Iron Water Main and Other Appurtenances.
 - 7. AWWA C800 – Underground Service Line Valves and Fittings.
 - 8. ANSI/NSF 61- Drinking Water System Components – Health Effects.
 - 9. Density Control Handbook, Michigan Department of Transportation.

1.2 DEFINITIONS

- A. CDA: Copper Development Association.
- B. EPDM: Ethylene-propylene-diene terpolymer rubber.
- C. PA: Polyamide (nylon) plastic.
- D. PE: Polyethylene plastic.
- E. PP: Polypropylene plastic.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Certifications:
 - 1. All pipe and fittings delivered to the job shall be accompanied by certification papers showing that pipe and fittings have been tested in accordance with the applicable specifications and that pipe and fittings meet the specifications for this project.
 - 2. Pipe materials shall have the class designation painted thereon. Where required, other designation marks shall be painted on the pipe or fittings to indicate correct location in the pipe line in conformity to a detailed laying schedule.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each type of product indicated.
- B. Project Record Documents: Record actual locations of piping, valves, and connections. Identify and describe unexpected variations to subsoil conditions or discovery.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare piping and valves according to the following:
 - 1. Ensure that piping and valves are dry and internally protected against rust and corrosion.
 - 2. Protect threaded ends and flange faces against damage.
 - 3. Set piping and valves in best position for handling and to prevent rattling.
- B. During Storage: Use precautions for piping and valves according to the following:
 - 1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
 - 2. Protect from weather. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle products if size requires handling by crane or lift. Rig products to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.
- H. All pipe and fittings will be checked upon delivery to the job site. No cracked, broken or damaged pipe or fitting will be allowed in this work. Rejected pipe and fittings will be removed by the Contractor at his own expense.

1.6 QUALITY ASSURANCE/QUALITY CONTROL

- A. Work shall be performed in accordance with the Village of Ontonagon requirements.
- B. All coatings additives and construction materials shall be ANSI/NSF approved.

1.7 PROJECT CONDITIONS

- A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service in accordance with requirements indicated:
 - 1. Notify Owner no fewer than two days in advance of proposed interruption of service.
 - 2. Do not proceed with interruption of water-distribution service without Owner's written permission.

1.8 COORDINATION

- A. Notify the Village of Ontonagon at least 24 hours in advance to making connection to the village watermain.

PART 2 PRODUCTS

2.1 GENERAL

- A. The general requirements for types of pipe, fittings, joints, water services for the water system are specified below. All pipes shall be clear inside diameter not less than the dimensions shown on the plans.

2.2 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
- B. Comply with standards of authorities having jurisdiction for domestic water piping, including materials, installation, testing, and disinfection.
- C. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- D. Piping materials to bear label, stamp, or other markings of specified testing agency.
- E. Comply with FM Approvals' "Approval Guide" and/or UL's "Fire Protection Equipment Directory" for fire-suppression water-service products.
- F. Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-suppression water-service piping.
- G. All piping and appurtenances intended to convey or dispense water for human consumption are to comply with the U.S. Safe Drinking Water Act (SDWA), with requirements of the Authority Having Jurisdiction (AHJ), and with NSF 61/NSF 372 or are certified in compliance with NSF 61/NSF 372 by an ANSI-accredited third-party certification body, that the weighted average lead content at wetted surfaces is less than or equal to 0.25 percent.

2.3 PIPING MATERIALS

- A. Comply with requirements in "Piping Applications" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and service sizes.
- B. Potable-water piping and components comply with NSF 14, NSF 61, and NSF 372.

2.4 DUCTILE-IRON PIPE AND FITTINGS

- A. Ductile Iron Pipe:
 - 1. Trench placed pipe shall be centrifugally cast ductile iron pipe pressure class 350 of the sizes shown on the plans.
 - 2. Water main pipe within Baraga County Road Commission Village of Ontonagon right-of-way shall be thickness class 52.
 - 3. Provide water main pipe that meets all the requirements of American National Standard Institute/National Sanitation Foundation (ANSI/NSF) 61 bearing the certification seal on the pipe wall and complying with section 923 of the MDOT 2020 Standard Specifications for Construction.
 - 4. Ductile iron pipe interior shall be standard cement double thickness lined and the pipe exterior shall be seal-coated with an approved bituminous seal coat.
 - a. The cement lining shall be in accordance with AWWA C104 (ANSI Standard A21.4), latest revision.
 - 5. Pipe wall thickness, subject to tolerance allowed in AWWA C151, shall be as shown in the Owner's standard details.

- B. Joints:
 - 1. General:
 - a. Mechanical or flanged joints will be allowed for special applications subject to the approval of the ENGINEER.
 - 2. Tyton (Push-On) Joints:
 - a. Provide push on type joints that conform to section 923 of the MDOT 2020 Standard Specifications for Construction and to AWWA C111 (ANSI 21.11).
 - 1) Provide sealing gaskets, retainer glands and lubricants for joints that meet the pipe manufacturer's specifications.
 - 3. Mechanical Joints:
 - a. Provide mechanical joints that include all necessary glands (follower rings), rubber gaskets, bolts, nuts, and lubricant.
 - b. Provide mechanical joints that conform to American Water Works Association AWWA-C111 (ANSI A21.11) and be installed according to the manufacturer's specifications and instructions.

2.5 JOINT RESTRAINT

- A. Provide restraint devices listed by Underwriters Laboratories and approved Nationally Recognized Testing Laboratories.
- B. Provide devices with a working pressure rating of 350 psi (2413.17 kPa) for 3-16 inch (406.4 mm) pipes.
 - 1. Ratings are for water pressure and must include a safety factor of 2 to 1 inch (25.4 mm) all sizes.
- C. Use restrained joints when water main is installed through a casing pipe.
- D. Provide EBBA Iron Megalug series 1100 joint restraint devices or approved equal.

2.6 THRUST BLOCKS

- A. Thrust blocks shall be made of 3,500 psi (24131.66 kPa) concrete and shall be of adequate size and shape to resist the design working and surge pressures to which the main will be subjected.
- B. The thrust block shall be placed so that the pipe, valve, hydrant or fitting joints are accessible for repair.
- C. Details of placement of thrust blocks are shown on the plans.

2.7 BOLTS

- A. All bolts on flanged and mechanical joints to be domestic origin high strength, low alloy cor-blue steel conforming to AWWA/ANSI C111/A21.11.

2.8 FITTINGS

- A. Flanged and Mechanical Joint Fittings shall be of ductile iron and shall have a working pressure rating of three hundred fifty (350) pounds per square inch (psi) that meets the requirements of AWWA C110 (ANSI A21.10), or AWWA C153 (ANSI A21.53) for compact fittings with cement mortar lining.
 - 1. Cement mortar lining shall meet AWWA C104 (ANSI A21.4) specification for a double thickness lining and the exterior shall be seal coated with an approved bituminous seal coat.

- B. Short body style fittings shall be of ductile iron and shall have a working pressure rating of three hundred fifty (350) pounds per square inch (psi) that meets the requirements of AWWA C110 (ANSI A21.10), or AWWA C153 (ANSI A21.53) for compact fittings with cement mortar lining.
 - 1. Cement mortar lining shall meet AWWA C104 (ANSI A21.4) specification for a double thickness lining and the exterior shall be seal coated with an approved bituminous seal coat.
 - 2. Provide MJ sleeves for pipes routed through walls or slabs.
 - 3. Provide polyethylene jackets meeting the requirements of AWWA C105 in areas indicated and where directed by the Engineer.

2.9 CONTINUITY CONDUCTORS

- A. Provide electrical conductivity connections on all ductile iron water main, fittings, joints, hydrants, services, connectors, and valves.
 - 1. Provide external type cable or strap connections capable of carrying 600 amperes for an extended period.
 - 2. The use of conductive gaskets or "conductive wedges" as a means of maintaining conductivity is prohibited.

2.10 INSULATION BOARD

- A. Provide rigid, extruded polystyrene insulation board meeting ASTM C 578, Type VI, having a nominal board thickness of 2 inches (50.8 mm), minimum compressive strength of 40 psi (275.79 kPa) and a minimum R-Value of 10.
 - 1. Furnish the board in a minimum 4 foot (121.92 cm) by 8 foot (243.84 cm) sheets unless otherwise approved by the Engineer, and of the cumulative thickness as indicated on the plans or as determined at the time of construction and approved by the Engineer.

2.11 GATE VALVES

- A. Provide Resilient Seated Gate Valves (RSGV), 3 inches (76.2 mm) and over that meet or exceed requirements of ANSI/AWWA Standard C515, or the latest version thereof.
- B. Provide American Flow Control Series 2500 or Engineer approved equal with the following features:
 - 1. AWWA rated working pressure of 250 psi (1723.69 kPa) cold water working pressure.
 - 2. Open left, or counter-clockwise.
 - 3. 2 inch (50.8 mm) square wrench nuts.
 - 4. Bronze non-rising stem with integral thrust collar.
 - 5. Ductile iron valve body, bonnet, and operating nut that conforms to ASTM A536.
 - 6. Operating nut that has four flats at stem connection to ensure even input torque to the stem.
 - 7. Pressure energized O-Rings gaskets.
 - 8. Wedge rubber bonded to ductile iron wedge.
 - 9. Wedge that is symmetrical and seals equally with flow in either direction.
 - 10. Symmetrical seating about stem centerline.
 - 11. No depressions or cavities in seat area.
 - 12. Body and bonnet of valve to be fusion bonded epoxy coated inside and out complying with ANSI/AWWA C550.
 - 13. Triple "O" ring stem seals.
 - 14. Top two O-Rings that are replaceable while subject to full rated working pressure.
 - a. Thrust washers located with (1) above and (1) below the thrust collar to ensure trouble-free operation of the valve.

15. Smooth (No Pocket) waterway.
16. 100% Leak-tight closure.
17. Type 304 stainless steel bolts.

2.12 GATE VALVE BOXES

- A. Provide Gate Valve Boxes for buried valves.
- B. Acceptable Manufacturers:
 1. East Jordan 8560 Series.
 2. Tyler Union 6860 series.
 3. Engineer Approved Equal.
- C. Provide valve boxes complying with section 923 of the MDOT 2020 Standard Specifications for Construction with the following features;
 1. 3-Piece assembly.
 2. 5-1/4 inch (133 mm) valve box diameter.
 3. Length of boxes suitable for 6 foot (182.88 cm)-0 inch (0 mm) to top of water main.
 4. Made in USA.

2.13 COPPER PIPE, FITTINGS, AND ACCESSORIES

- A. Copper Pipe:
 1. Provide Type K, soft temper copper tubing for underground use, in accordance with ASTM B-88 and B-251.
 2. The manufacturer and pipe type shall be marked on the outside of the pipe.
 3. The weight per foot of copper tubing shall meet or exceed that specified by ASTM B-251, Table II.
- B. Corporation Stops:
 1. Provide ball type corporation stops constructed of e-brass body with fluorocarbon coated brass ball, ethylene propylene diene monomer EPDM seats and stem seals, per AWWA C800, that have the standard tapered inlet thread and a pack joint conductive compression outlet for use with copper water tube.
 - a. Provide saddles at all corporations by same manufacturer.
- C. Curb Stops:
 1. Provide ball valve type curb stops with the following features:
 - a. Conductive compression connectors for inlet and outlet ends.
 - b. Are constructed of e-brass as per AWWA C800.
 - c. Fluorocarbon coated brass ball.
 - d. EPDM seats and stem seals.
 - e. One-piece tee head and stem.
 - f. Minneapolis pattern body.
 - g. Valve key.
- D. Curb Boxes (Service Boxes):
 1. Provide service boxes (curb boxes) with the following features:
 - a. Constructed of cast iron per ASTM A48, CL25.
 - b. Painted inside and out with a suitable asphalt varnish.
 - c. Extension type curb box with Minneapolis pattern base with 2-3/4 inch (70 mm) bottom riser section designed for a 6 foot (198.12 cm) depth of bury.
 - d. Plugged lid.
- E. Service Joints:

1. Provide e-brass pack joints conforming to AWWA C800 for miscellaneous fittings and compression fittings for all connections to copper tubing.
2. Where connection must be made to existing service lines of differing materials, threaded or conductive compression pack joints, as applicable, may be provided.
3. In all cases, provision for electrical conductivity will be made at all joints and fittings.

F. Saddles:

1. All taps require Service Saddles.
2. Saddle shall be sized properly to fit outside diameter of Ductile Iron Water Main.

2.14 TAPPING SLEEVES AND VALVES

A. Solid Sleeves or cut-in sleeves are acceptable.

1. Field verify pipe diameter to ensure proper sleeve.
2. Machining of the existing pipe is not permitted.
3. Provide tapping valves that conform to the requirements outlined above, for gate valves, except that joints must consist of a flanged joint inlet end for mating with the tapping sleeve and a restrained mechanical joint outlet.
4. Provide oversize seat rings that permit entry of tapping machine cutters.
5. Tapping Sleeves:
 - a.
 - b. Stainless steel construction with 304SST lifter bar.
 - c. Flange outlet of 18-8 SST recess drilled to ANSI 125-pound standard and as required for tapping machine and valve, when a wet tap is required.
 - d. Gridded virgin Styrene Butadend Rubber (SBR) full body gasket with 360 degree of pipe coverage.
 - e. Provide Ford "Fast" sleeve or approved equal.
6. Cut-in-Sleeves:
 - a. Restrained mechanical joint long-pattern full body sleeves and a tee may be used instead of tapping sleeves where a dry connection is allowed.
7. Live Tapping Sleeve:
 - a. Smith Blair 622 Flexi-coat Epoxy coated carbon steel flange or Engineer approved equal.
 - 1) Nitrile (Buna-N) NSF 61/372 gasket with 360 degree seal.
 - 2) 18-8 type 304 Stainless Steel heavy hex nuts, stud bolts and washers coated to prevent galling.
 - b. Stainless steel tapping sleeve with epoxy-coated carbon steel flange meeting AWWA C223 Standards.

PART 3 EXECUTION

3.1 EARTHWORK

- A. Comply with excavating, trenching, and backfilling requirements in Section 312200 – Grading, Section 312316.13 – Trenching, and Section 312323 – Fill.
- B. Excavations shall be of sufficient width and depth to provide adequate room for the construction and installation of the work to the lines, grades, and dimensions as called for on the plans.

3.2 GENERAL

- A. Install pipe, fittings, and appurtenances in strict accordance with manufacturer's recommendations, AWWA C600, and these specifications.

- B. Maintain separation of water main from sewer piping in accordance with the EGLE requirements.

3.3 INSTALLATION OF PIPING

A. Line and Grade:

1. Pipe shall be carefully laid to line and grade and shall have bearing over its entire length except at joints where the joint hole shall be of such size as to give adequate room for working.
2. Pipe shall be laid with 7 feet of bury depth, with exception to the variation to match the depths at connection points.

B. Preparation of Trench Bottom:

1. Trench bottom preparation and backfilling shall be as follows:
 - a. The trench width shall be a minimum of thirty 30 inches wide or as called for in the standard details.
 - b. Trench depths shall be as shown on the plans and shall provide not less than seven (7) feet of cover from top of water service to final surface grade.
 - c. The bottom of trench in rock or cohesive soil shall be excavated neatly to the required grade.
 - d. The trench bottom shall be filled with approved granular material for bedding in accordance with the standard details and shall be thoroughly compacted by tamping before the pipe is laid.

C. Installation of Pipe:

1. Installation of pipe shall be made in accordance with the published installation guide of the pipe manufacturer except as otherwise specified herein.
 - a. Whenever instructions given by the manufacturer are at variance with the provisions specified herein, the laying standards provided herein shall govern.
2. Proper tools, including pipe pullers, special cutters, spacing yokes, machining tools, test caps, ring feeler gauges, etc. shall be provided at the site of the work for installation of the pipe.
3. Immediately before laying pipe or fitting, it shall be thoroughly cleaned of all debris; dirt or other accumulated foreign material.
4. Pipe or fitting shall be checked for damage to the coating or pipe material prior to placing in the trench.
 - a. Repairs shall be made where required.
 - b. If deemed irreparable by the Engineer, then it shall be removed from the job site.
5. The pipe shall then be secured with earth that is carefully tamped under and on each side of the pipe.

D. Insulation Board Installation:

1. Install insulation board over all service laterals.
2. Insulate the water main and water services as indicated in the plan details and determined at the time of construction. Place the insulation board on a prepared grade 1 foot (152.4 mm) above the top of the pipe or as indicated on the project details, or a minimum of 4 feet (121.92 cm) below finished grade.
3. Fasten insulation board with skewers or other means approved by the Engineer, so that backfill compaction requirements of the trench can be met.
4. Trim the surface of the grade to a smoothness of plus or minus ¼ inch per 10 feet (304.8 cm).
5. Where multiple layers of insulation board is required ensure the joints are staggered.
6. Ensure backfill and compaction equipment is approved by the Engineer.

7. Ensure asphalt or other materials having temperature exceeding 150 degrees Fahrenheit is not placed in direct contact with the insulation board.
- E. Backfill:
1. Backfill shall be placed in accordance with Section 312323 "Fill."
- F. Water-Main Connection:
1. All existing valves may not be in working order. Contractor shall coordinate and field verify operation of valves with Owner.
 2. When the Contractor's schedule of work includes shutting down all or parts of a water main, or other operation, which will disrupt service to customers of the water utility, the Contractor is responsible for notifying the affected commercial, residential, and other users.
 3. The Contractor shall maintain clean trench conditions and shall thoroughly swab all pipe and fittings with 4% chlorine solution (full strength Clorox Bleach is an acceptable equal), prior to installation.
 4. Flushing shall be completed by the Contractor and shall be supervised by the Engineer.

3.4 JOINT CONSTRUCTION

- A. Make pipe joints according to the following:
1. Copper-Tubing, Pressure-Sealed Joints: Join copper tube and pressure-seal fittings with tools and procedures recommended by pressure-seal-fitting manufacturer. Leave insertion marks on pipe after assembly.
 2. Ductile Iron.

3.5 DEFECTIVE PIPE AND FITTING

- A. No pipe or fitting known to be defective shall be laid in the work. Any piece found to be defective after it has been laid shall be removed by the Contractor and replaced.

3.6 INSTALLATION OF VALVES

- A. Excavation, bedding, and backfill for water service related structures shall be accomplished in accordance with requirements in Section 312316 and 312323.
- B. Excavations shall be of sufficient width and depth to provide adequate room for the construction and installation of the work to the lines, grades, and dimensions as called for on the plans.
- C. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.

3.7 CONNECTIONS AND TAPS

- A. Connections and Taps shall be constructed where shown on the plans or where directed by the Engineer. Curb stop and box shall not be placed in paved surfaces without approval of the Engineer.
- B. Connection to main with Tee.
1. Service side of the Tee shall exit at 45 degrees from the vertical axis of the water main.
 2. Ensure proper conditions are met for a secure connection. Remove and replace defective work.
- C. Copper pipe shall be connected to the water main through a brass corporation stop tapped at 45 degrees from the vertical axis of the water main. All service connections shall include saddles. The water main shall be drilled and tapped under pressure by use of a tapping

machine with a combination drill and tap of the appropriate size for the connection being installed.

- D. After tapping the main and installing the corporation stop, the tap shall be tested by turning the corporation on and off. Any leakage detected visually shall be corrected by the Contractor.
- E. The service lead shall be constructed of Type K, copper pipe. The copper pipe shall be laid such that there is at least 24 inches (609.6 mm) of slack in the service line at the main. In other words, the first three feet of trench adjacent to the main shall have at least five feet of copper pipe laid in it.
- F. Two inch insulation board must be placed on a prepared grade 1 foot 1 inches (152.4 mm) above the top of pipe or a minimum of 4 feet (121.92 cm) below finished grade.
- G. All joints of copper pipe shall be pack joints.
 - 1. After the copper pipe is in place and connected to the curb stop, the line shall be visually checked for leaks by closing the curb stop and opening the corporation stop.
 - 2. Before connection to existing water service lead or to an existing curb stop scheduled to remain, flush copper service lead.
- H. The Contractor shall leave the corporation stop in the open position, unless directed otherwise by the Engineer.
- I. If new curb stop is scheduled to be installed: Place curb stop and box supported upon a cement brick. Upper section of curb box shall be adjusted such that locks are engaged and set to proper elevation so cap is set at finish grade.
- J. Backfill and compact excavations in accordance with Section 312200 "Grading."
- K. Copper pipe shall be buried at 6'-0", unless otherwise directed by the Engineer.

3.8 FINAL GRADE ADJUSTMENTS

- A. Final grade adjustments to existing structures:
 - 1. Adjustment of existing structures shall apply to all final vertical changes made on existing structures where the elevation of the cover is not changed by more than 6 inches (152.4 mm).
- B. Final grade adjustments to new structures:
 - 1. Final grade adjustment of new structures shall be considered as incidental to the structure construction (includes valve boxes, curb boxes, and manhole covers for meter pits).
 - 2. Final grade adjustments may be made using either brick and mortar construction or precast concrete adjustment rings at the option of the Contractor.
 - a. Concrete grade rings less than 4 inch (101.6 mm) are not permitted.
 - 3. The maximum allowable grade adjustment using grade rings shall be fifteen (15) inches.
 - a. Final grade adjustment for manholes located in pavements and sidewalks shall be made with brick and mortar.
 - b. A minimum of three (3) or maximum of six (6) courses of brick shall be placed on top of the precast cone section.

3.9 FIELD QUALITY CONTROL

- A. Request inspection by Engineer prior to, during, and immediately after placing bedding, pipe, fittings, stops, saddles, and boxes.

3.10 IDENTIFICATION

- A. Install continuous underground warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping.

3.11 CLEANING

- A. Clean and disinfect water-distribution piping as follows:
 - 1. Provide water main disinfection in accordance with AWWA 651 or latest edition thereof and the MDOT 2020 Standard Specifications for Construction Section 823.03.V.
 - 2. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
 - 3. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or do as follows:
 - a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
 - b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for three hours.
 - c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
 - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.
- B. Prepare reports of purging and disinfecting activities.

END OF SECTION 331415

SECTION 333113 – SITE SANITARY SEWERAGE GRAVITY PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sanitary sewerage piping.
- B. Flexible couplings.

1.2 RELATED REQUIREMENTS

- A. Section 312316.13 - Trenching: Excavating, bedding, and backfilling.

1.3 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.4 SUBMITTALS

- A. Product Data:
 - 1. Sanitary sewerage piping.
 - 2. Flexible couplings.
- B. Source Quality-Control Reports: Indicate results of factory tests and inspections.

1.5 CLOSEOUT SUBMITTALS

- A. As-built documentation for all pipes installed including:
 - 1. All connected pipe invert elevations.
 - 2. Pipe slope for all new pipe.
 - 3. Location of all lateral connections in relation to the manholes.
 - 4. GPS coordinates for all manholes, cleanouts, and appurtenances.

1.6 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Company specializing in manufacturing products specified in this Section with minimum three years' experience.
- B. Installers Qualifications: Company specializing in performing Work of this Section with minimum three years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Storage:
 - 1. Store materials according to manufacturer instructions.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.

2. Block individual and stockpiled pipe lengths to prevent moving.
3. Provide additional protection according to manufacturer instructions.

1.8 CERTIFICATIONS AND QUALITY CONTROL

- A. All pipe delivered to the job shall be accompanied by certification papers showing they have been tested in accordance with the applicable standards and meet the specifications for the project.
- B. All pipes and structures will be checked upon delivery to the job site. Any cracked, damaged, broken pieces or sections shall be removed from the site at the Contractor's expense.

PART 2 PRODUCTS

2.1 SEWER PIPE MATERIALS

- A. Plastic Pipe:
 1. Material: PVC.
 2. Comply with ASTM D3034, SDR-26.
 3. Inside Nominal Diameter: As indicated on drawings.
 4. End Connections: Bell and spigot with rubber-ring sealed gasket joint.
 5. Fittings: PVC.
 6. Joints:
 - a. Solvent welded with solvent cement conforming to ASTM D2564 or Elastomeric gaskets.
 - b. Comply with ASTM D2855 or F477.

2.2 FLEXIBLE COUPLINGS

- A. Manufacturers:
 1. Fernco Inc.
 2. Romac Industries, Inc.
- B. Material: Resilient, chemical-resistant, elastomeric PVC.
- C. Attachment: Two Series-300 stainless-steel clamps, screws, and housings.

2.3 MATERIALS

- A. Bedding and Cover:
 1. As specified in Section 312323 "Fill."

2.4 MIXES

- A. Cement: Non-Shrink mortar shall conform to Section 1005 of the MDOT 2020 Standard Specifications for Construction Type R-2 Mortar.

PART 3 EXECUTION

3.1 EXAMINATION

- A. See Section 312316.13 for additional requirements.

- B. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- C. Verify that excavation base is ready to receive Work of this Section.
- D. Verify that excavations, dimensions, and elevations are as indicated on Drawings.
- E. Examine roughing-in for sanitary sewerage piping to verify actual locations of piping connections before installation.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.
- G. Notify the Village or Ontonagon within 24 hours of making connection to the Village sanitary sewer system. Make sure there is a village representative onsite to inspect and document the connection.

3.2 PREPARATION

- A. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 10 feet (3 m).
- B. Correct over-excavation with coarse aggregate.
- C. Remove large stones or other hard materials that could damage pipe or impede consistent backfilling or compaction.
- D. Protect and support existing sewer lines, utilities, and appurtenances.
- E. Utilities:
 - 1. Maintain profiles of utilities.
 - 2. Coordinate with other utilities to eliminate interference.
 - 3. Notify Engineer if crossing conflicts occur.

3.3 INSTALLATION OF SANITARY SEWERAGE PIPING

- A. Bedding:
 - 1. Excavate pipe trench as specified in Section 312323 "Fill."
 - 2. Bedding of PVC Pipe shall be in accordance with current ASTM specifications.
 - 3. Place bedding material at trench bottom.
 - 4. Level materials in continuous layer not exceeding 8 inches.
 - 5. Maintain optimum moisture content of bedding material to attain required compaction density.
- B. Piping:
 - 1. Handling pipe & fittings:
 - a. All pipes and fittings shall be unloaded and distributed along the line of work in such manner and with such care as will effectually avoid damage to any pipe or fitting. Dropping pipe or fittings directly from the truck will not be permitted. Care must also be taken to prevent abrasion of the pipe.
 - b. Bowing or warping of pipe can occur with temperature fluctuations. The Contractor shall store and protect the pipe to minimize bowing. Nominal 12' - 6" pipe lengths that have deviations from straight greater than one (1) inch shall not be used.
 - 2. Each pipe shall be checked for defects prior to being lowered into the trench. The inside of the pipe and the outside of the spigot shall be cleaned of any dirt or foreign matter.
 - 3. Install pipe, fittings, and accessories according to ASTM D2321, and seal joints watertight.
 - 4. Lay pipe to slope gradients as indicated on Drawings.
 - 5. Begin at downstream end of system and progress upstream.
 - 6. Bedding: Install at sides and over top of pipe, to minimum compacted thickness of 12 inches.

- a. Pipes shall be laid on a minimum six (6) inch sand bedding shall be provided if called for on the plan details. If the subgrade has been disturbed so that refilling is necessary to bring the pipe to grade, such refilling shall be done with sand or gravel thoroughly tamped in place. Bell holes shall be excavated so that the full strength of the pipe barrel will bear uniformly on the sand bedding.
 7. Backfill and compact as specified in Section 312323 "Fill."
 - a. Potential damage can occur to exterior walls of PVC pipe, particularly under cold weather conditions, if rocks, frozen material, or large objects strike the pipe.
 - b. The Contractor shall carefully avoid dumping any materials other than approved bedding sand or stone on the pipe until a 12-inch cover is placed on it.
 8. Do not displace or damage pipe when compacting.
 - a. Care shall be taken during bedding compaction to avoid distorting the shape of the pipe or damaging its exterior wall.
 9. Cutting of pipe where required, shall be performed using tools or equipment that will provide a neat, perpendicular cut without damage to the pipe material.
 10. Connect to municipal sewer system.
- C. Connections:
1. Wyes and Risers (Cleanouts):
 - a. Wye branches, tees, or stubs fitted with suitable stoppers shall be set for each lot shown, and at such other points as called for on the drawings.
 - b. Risers shall be six (6) inch pipe and shall be constructed where shown on the drawings. They shall connect to wye branches and shall be constructed as shown on the Owner's standard detail sheet to a depth of six (6) feet below the surface of the ground unless otherwise instructed by the Engineer.
 - c. A pipe stopper shall be placed in the top bell. Fittings and stoppers shall be equipped with the allowable type of joint used on the sewer. Backfill at all risers shall be carefully placed and tamped sufficiently to insure against damage from backfill settlement.
 2. Service Connections:
 - a. The Contractor shall construct service connections as shown on the drawings. A pipe stopper shall be placed in the end of the connection. Pipe and stopper shall be equipped with the allowable type of joint used on the sewer.
 - b. The Contractor shall also furnish and place a magnetically locatable marking post, three (3) feet in length, set directly above the end of the house connection or riser. Each marker shall be set so it will be in a vertical position when backfill is completed. The top of marker shall be three (3) inches below the ground surface.
- D. Backfilling:
1. As specified in Section 312000 "Fill."
 2. Backfill around sides and to top of pipe with cover fill in minimum lifts of 8 inches.
 3. Tamp fill in place, and compact to 95 percent of maximum density.
 4. Place and compact material immediately adjacent to pipes to avoid damage to pipe and prevent pipe misalignment.
 5. Maintain optimum moisture content of bedding material as required to attain specified compaction density.

3.4 TOLERANCES

- A. Maximum Variation from Indicated Slope: 1/8 inch in 10 feet.

3.5 PROTECTION

- A. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.
- B. Cap open ends of piping during periods of Work stoppage.

END OF SECTION 333113