RISING SUN HIGH SCHOOL WATERLINE REPLACEMENT PSC#07.022



100 Tiger Dr North East, MARYLAND 21901

BID SUBMISSION NOVEMBER 22, 2023



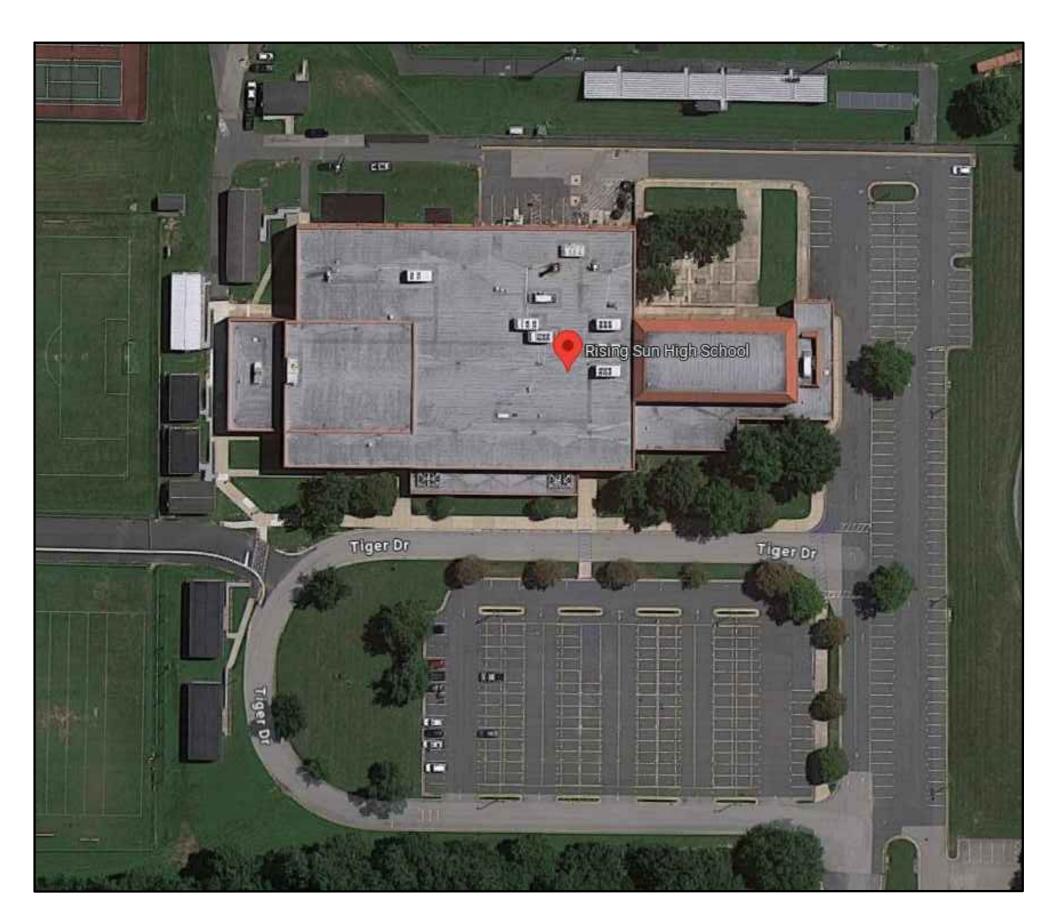
201 Booth St. ELKTON, MARYLAND 21921PH: 410-658-5577

	DRAWING LIST
CS	PROJECT COVER SHEET
P0.0	ABBREVIATIONS, GENERAL NOTES, LEGEND
P1.1	MECHANICAL ROOM & WATER VAULT DEMOLITION
P2.1	MECHANICAL ROOM & WATER VAULT NEW WORK
P3.1	PLUMBING DETAILS
P3.2	CIVIL DETAILS
P4.1	CIVIL NOTES AND SPECIFICATIONS

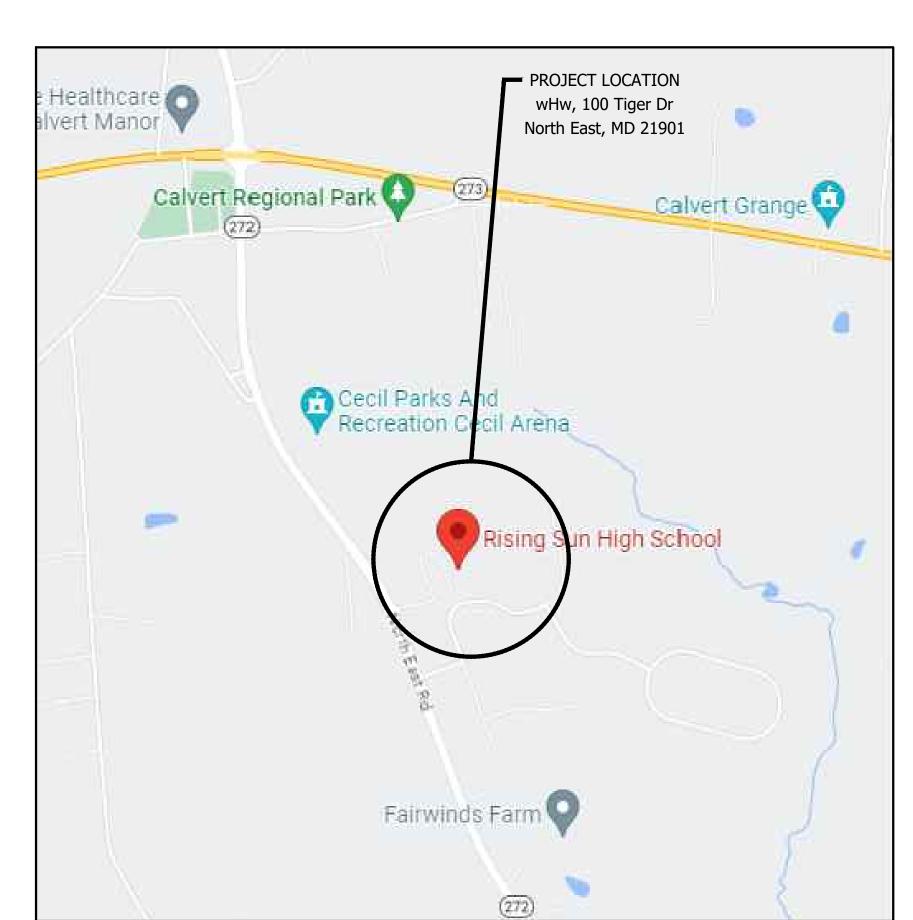
MECHANICAL/ELECTRICAL/PLUMBING
GIPE ASSOCIATES, INC.

1220 EAST JOPPA ROAD, SUITE 223
RADIO PARK BUILDING A
TOWSON, MARYLAND 21286

PH: 410-832-2420



LOCATION MAP (N)



VICINITY MAP

NO. DATE DESCRIPTIONS

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Gipe Associates Inc
Consulting Engineers

1220 East Joppa Road
Suite 223
Towson, MD. 21286
Phone: 410.832.2420
Phone: 410.832.2420

Soite 2-5
Featon, Maryland 21601
Phone: 410.832.2420

WO# 23055

DESIGNER MJK

DATE 11/22/2023

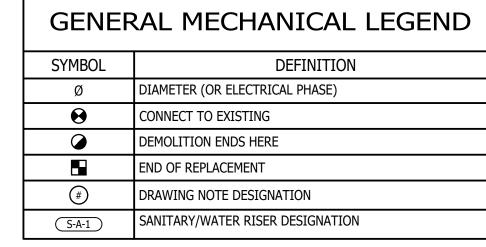
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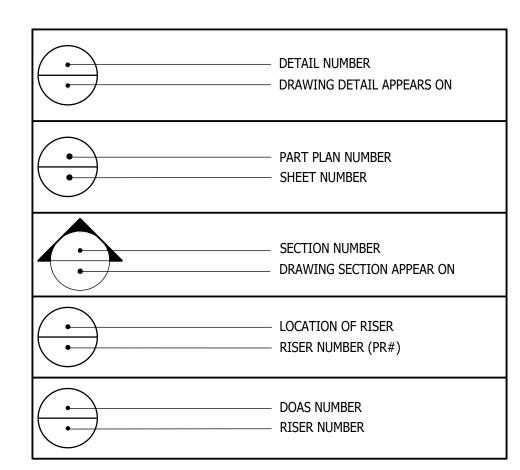
SCHOOLS - RISING SUN HIGH SCHOOL ENT

ROJECT COVER SHEET ECIL COUNTY PUBLIC SCHOOL ATERLINE REPLACEMENT

BID SUBMISSION

CS





	PLUMBING LEGEND
SYMBOL	DEFINITION
	COLD WATER
	HOT WATER
	HOT WATER RECIRCULATING
	SANITARY
IW	INDIRECT WASTE
——PC——	PUMP CONDENSATE
——GW——	GREASE WASTE
— — GV— —	GREASE VENT
——SSW——	SECONDARY STORM WATER SECONDARY STORM WATER VENT
——SWV——	MEDICAL VACUUM
MA	MEDICAL AIR
—_NO	NITRIC OXIDE
— N —	NITROGEN
TW	TEMPERED WATER
	VENT
	STORM WATER
— G —	NATURAL GAS
LP	LIQUID PETROLEUM GAS
——PD——	PUMPED DISCHARGE
	FOUNDATION DRAIN
——AW——	ACID WASTE
AV	ACID VENT
——A——	COMPRESSED AIR
	REDUCED PRESSURE BACKFLOW PREVENTOR
	DOUBLE DETECTOR CHECK VALVE
	BACKWATER VALVE
FC0 O	FLOOR CLEANOUT
wco [—	WALL CLEANOUT
U	CLEANOUT
·	PIPE UP & DOWN
<u> </u>	SIGHT GLASS
<u>_</u>	
<u> </u>	FLOAT VALVE
	FLOOR DRAIN
Ø	FLOOR DRAIN WITH TRAP PRIMER
	FLOOR SINK
O (#)	ROOF DRAIN (GPM and/or SQ. FT.)
- J	TRAP (ELEVATION)
ılı	VENT THROUGH ROOF (ELEVATION)
<u> </u>	VENT THROUGH ROOF (PLAN)
	MIXING VALVE
<u> </u>	
	METER (FLUID OR GAS) DUAL TEMPERATURE WALL HYDRANT
—— > →HB	HOSE BIBB (PLAN)
NFWH	NON-FREEZE WALL HYDRANT/ROOF HYDRANT
>+	HOSE BIBB (ELEV.)
<u> </u>	, ,
<u></u>	HOSE END DRAIN
ρ	WATER HAMMER ARRESTOR
$\overline{}$	POINT OF CONN. TO SITE UTILITIES
<u></u>	SQUARE FOOTAGE
	DUPLEX GAS OUTLET
<u> </u>	AUTOMATIC AIR VENT
φ	
H≫HI	BLOW DOWN VALVE (W/HOSE END)
	CENTER LINE BACK WATER VALVE W/ACCESS COVER
	BACK WATER VALVE W/ACCESS COVER
	FUNNEL CONNECTION @ FLOOR DRAIN

	PIPING LEGEND							
SYMBOL	DEFINITION							
—— CD ——	CONDENSATE DRAIN LINE							
—— NPW ——	NON-POTABLE WATER							
	PIPE ALIGNMENT GUIDE							
×	PIPE ANCHOR							
	EXPANSION LOOP							
x%	PITCH OF PIPE, % SLOPE							
c	PIPE-TURN DOWN							
0	PIPE-TURN UP							
	PIPE DROP INTO							
	PIPE TAP INTO BOTTOM							
<u> </u>	2-LINE PIPE DOWN							
	2-LINE PIPE UP							
	SOLENOID VALVE							
<u> </u>	END CAP							
}	DIRECTION OF FLOW							
$-\!$	GATE VALVE							
─ ₩	GLOBE VALVE							
—δ—	BALL VALVE							
	CHECK VALVE							
	BUTTERFLY VALVE							
── ₩	3-WAY MODULATING VALVE (ATC)							
<u>—————————————————————————————————————</u>	2-WAY MODULATING VALVE (ATC)							
	PRESSURE REDUCING VALVE							
	NEEDLE VALVE							
'茶'	PRESSURE RELIEF OR SAFETY VALVE							
	FLOW METER FITTING							
—⊗—	COMBINATION SHUT-OFF/BALANCING VALVE							
 	UNION							
	FLANGE							
─	CONCENTRIC REDUCER							
	ECCENTRIC REDUCER							
	FLEXIBLE CONNECTION (PIPING)							
إ	MANUAL AIR VENT							
He	THERMOMETER							
I ∳-⊙	PRESSURE GAUGE W/NEEDLE VALVE							

ABBREV	DESCRIPTION
AAV	AUTOMATIC AIR VENT
ACU AD	AIR CONDITIONING UNIT ACCESS DOOR
ADJ AFF	ADJACENT/ADJUSTABLE ABOVE FINISHED FLOOR
AHU ALT	AIR HANDLING UNIT
ANC	ANCHOR
APPROX AQ	APPROXIMATE AQUASTAT
ARCH AV	ARCHITECTURAL ACID VENT/AIR VENT
AVG AW	AVERAGE ACID WASTE
BAS	BUILDING AUTOMATION SYSTEM
BDV BF	BLOW DOWN VALVE BLIND FLANGE
BFP BHP	BACKFLOW PREVENTOR BRAKE HORSEPOWER
BLDG	BUILDING
BOP BTU	BOTTOM OF PIPE BRITISH THERMAL UNIT
BTUH BWV	BRITISH THERMAL UNIT PER HOUR BACK WATER VALVE
CAP	CAPACITY
CD CFH	CONDENSATE DRAIN CUBIC FEET PER HOUR
CI CIP	CAST IRON CAST IRON PIPE
CL CLG	CENTERLINE CEILING
CO CO2	CLEANOUT CARBON DIOXIDE SENSOR
COMP	COMPRESSOR
CONC	CONCRETE CONDENSATE
COP CPVC	COEFFICIENT OF PERFORMANCE CHLORINATED POLYVINYL CHLORIDE
CW	COLD WATER CONNECT TO EXISTING
D	DEEP/DIAMETER/DRAIN/DROP
DDCV DEG	DOUBLE DETECTOR CHECK VALVE DEGREES
DFU DESIG	DRAINAGE FIXTURE UNITS DESIGNATION
DIA	DIAMETER
DN DOAS	DOWN DEDICATED OUTSIDE AIR SYSTEM
DSHP DSS	DUCTLESS SPLIT HEAT PUMP DUCTLESS SPLIT SYSTEM
DST	DEEP SEAL TRAP DUAL TEMPERATURE WALL HYDRANT
DTWH DW	DISHWASHER
DWG DWGS	DRAWING DRAWINGS
DWH E	DOMESTIC WATER HEATER EAST/ELECTRICAL
EA EAT	EACH ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EFF EFT	EFFICIENCY ENTERING FLUID TEMPERATURE
EL ELEC	ELEVATION ELECTRIC/ELECTRICAL
ELEV TOP	ELEVATION/ELEVATOR ELEVATION TOP OF PIPE
EQ EQUIP	EQUAL EQUIPMENT
ES	EMERGENCY STATION
ESS ET	EMERGENCY SHUTDOWN SWITCH EXPANSION TANK
ETR EVAP	EXISTING TO REMAIN EVAPORATOR
EWT EX	ENTERING WATER TEMPERATURE EXISTING
EXP EXT	EXPANSION EXTERIOR
EWC	ELECTRIC WATER COOLER
F FC	FAHRENHEIT/FIRE FUNNEL CONNECTION @ FD
FCO FCU	FLOOR CLEANOUT FAN COIL UNIT
FD	FLOOR DRAIN
FF FLA	FINISHED FLOOR FULL LOAD AMPS
FLR FM	FLOOR FLOW METER/FACTORY MUTUAL GLOBAL
FPD FPM	FLUID PRESSURE DROP FEET PER MINUTE
FS FT	FLOW SWITCH FEET/FOOT
G	GAS/GRILLE
GA GAL	GAUGE GALLON
GALV GFE	GALVANIZED GROUND FLOOR ELEVATION
GI GPH	GREASE INTERCEPTOR GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GR GRD	GRADE GREASE RECOVERY DEVICE
GSV GV	GAS SOLENOID EMERGENCY SHUTOFF VALVE GREASE VENT
GW H	GREASE WASTE HEIGHT/HIGH/HUMIDITY SENSOR
HB HD	HOSE BIBB HEAD
HED	HOSE END DRAIN
HOA HP	HAND-OFF-AUTOMATIC SWITCH HORSEPOWER
HTG HVAC	HEATING HEATING, VENTILATING, AND AIR CONDITIONING
HW HWG	HOT WATER HOT WATER GENERATOR
HWR	HOT WATER RETURN
HZ	HERTZ

PI	LUMBING ABBREVIATIONS
ABBREV	DESCRIPTION
INV IPS	INVERT IRON PIPE SIZE
IT IW	INFORMATION TECHNOLOGY INDIRECT WASTE
K KW	KITCHEN EQUIPMENT TYPE KILOWATT
L LAV	LENGTH LAVATORY
LFT LP	LEAVING FLUID TEMPERATURE LIQUID PROPANE
LWT M	LEAVING WATER TEMPERATURE MECHANICAL
MAV MAX	MANUAL AIR VENT MAXIMUM
MBH MCA	THOUSAND BTU PER HOUR MINIMUM CIRCUIT AMPS
MCC MECH	MOTOR CONTROL CENTER MECHANICAL
MER MIN	MECHANICAL EQUIPMENT ROOM MINIMUM
MISC MOCP	MISCELLANEOUS MAXIMUM OVERCURRENT PROTECTION
MOD MTD MTG	MOTOR-OPERATED DAMPER MOUNTED MOUNTING
MV N	MIXING VALVE NORTH
N/A NC	NOT APPLICIBLE NOISE CRITERIA/NORMALLY CLOSED
NFRH NFWH	NON-FREEZE ROOF HYDRANT NON-FREEZE WATER HYDRANT
NIC NO	NOT IN CONTRACT NORMALLY OPEN/NUMBER
NOM NPLV	NOMINAL NON-STANDARD PART LOAD VALUE
NPSH NPSHA	NET POSITIVE SUCTION HEAD NET POSITIVE SUCTION HEAD AVAILABLE
NPSHR NPW	NET POSITIVE SUCTION HEAD REQUIRED NON-POTABLE WATER
NRS NTS	NON-RISING STEM & YOKE NOT TO SCALE
OC OHD	ON CENTER OPEN HUB DRAIN
OPP O,S&Y	OPPOSITE OUTSIDE STEM & YOKE VALVE
P PC	PIPE/PLUMBING FIXTURE TYPE/PRESSURE PUMPED CONDENSATE
PD	PRESSURE DROP/PUMP DISCHARGE PHASE
PH PRV	PRESSURE REDUCING VALVE PRESSURE SWITCH
PS PSF	POUNDS PER SQUARE FOOT PRESSURE-POUNDS PER SQUARE INCH
PSI PSIG PVC	PRESSURE-POUNDS PER SQUARE INCH PRESSURE-POUNDS PER SQUARE INCH, GAGE POLYVINYL CHLORIDE
R RD	RADIUS/REFRIGERANT/REGISTER/RISE/RISER ROOF DRAIN
REFRIG REG	REFRIGERANT/REFRIGERATION REGISTER/REGULATOR
REQD RET	REQUIRED RETURN
RL RM	RAIN LEADER/REFRIGERANT LIQUID ROOM
RPBP RPM	REDUCED PRESSURE BACKFLOW PREVENTOR REVOLUTIONS PER MINUTE
RV RX	RELIEF VALVE REMOVE EXISTING
S SAN, S	SANITARY/SOIL/SOUTH/SWITCH SANITARY
SCH SF	SCHEDULE SQUARE FEET/SQUARE FOOT
SH SP	SHOWER SPRINKLER PIPING/STATIC PRESSURE SENSOR
SP SQ	SPRINKLER LINE SQUARE
SS SSW	SERVICE SINK/STAINLESS STEEL SECONDARY STORM WATER
STD STL	STANDARD STEEL
SW SWV	STORM WATER SECONDARY STORM WATER VENT
T TD	TEMPERATURE SENSOR TRENCH DRAIN TEMPERATURE/TEMPORARY
TEMP TOP	TOP OF PIPE
TOT TP	TOTAL TOTAL PRESSURE
TS TW	TAMPER SWITCH TEMPERED WATER
TYP UR	TYPICAL URINAL
V	UNIT VENTILATOR VACUUM/VALVE/VENT/VOLTS
VB VD	VACUUM BREAKER VOLUME DAMPER
VEL VERT	VELOCITY VERTICAL VARIABLE EDECLIFACY DRIVE
VFD VOL	VARIABLE FREQUENCY DRIVE VOLUME VOLUME RECULATOR
VR VRF VRFC	VOLUME REGULATOR VARIABLE REFRIGERANT FLOW VARIABLE REFRIGERANT FLOW CASSETTE
VRFW VRFV	VARIABLE REFRIGERANT FLOW WALL UNIT VARIABLE REFRIGERANT FLOW VERTICAL UNIT
VSD VTR	VARIABLE SPEED DRIVE VENT THROUGH ROOF
VV	VAPOR VENT WASTE/WATER/WATTS/WEST/WIDTH
WB WC	WET BULB WATER CLOSET/WATER COLUMN/WHEELCHAIR ACCESSIBLE
WCO WG	WALL CLEANOUT WATER GAGE
WH WHA	WALL HYDRANT/WATER HEATER WATER HAMMER ARRESTOR
WPD WSFU	WATER PRESSURE DROP WATER SUPPLY FIXTURE UNITS
WT	WEIGHT WATER TEMPERING VALVE
	•

GENERAL NOTES

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL STATE, COUNTY AND LOCAL CODES, REGULATIONS AND ORDINANCES. MATERIAL, EQUIPMENT, INSTALLATION, AND PROCEDURES SHALL BE IN STRICT ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE LATEST CURRENT EDITION OF THE REFERENCED DOCUMENTATION.
- A. REGULATIONS OF LOCAL AUTHORITIES HAVING JURISDICTION. B. NFPA-NATIONAL FIRE PROTECTION ASSOCIATION.
- C. ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS.
- D. ASTM AMERICAN SOCIETY OF TESTING AND MATERIALS.
- E. ASHRAE AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS, INC. LATEST EDITION OF STANDARD 90.1. 2007 (LEED COMPLIANCE), 2013 CODE COMPLIANCE.
- F. INTERNATIONAL BUILDING CODE 2018.
- G. INTERNATIONAL ENERGY CONSERVATION CODE 2018. H. INTERNATIONAL EXISTING BUILDING CODE - 2018.
- I. INTERNATIONAL FIRE CODE 2018.
- J. INTERNATIONAL GREEN CONSTRUCTION CODE 2018. K. INTERNATIONAL MECHANICAL CODE- 2018.
- L. INTERNATIONAL PLUMBING CODE 2018.

N. NATIONAL STANDARD PLUMBING CODE - 2018.

CONTRACT PRIOR TO SUBMITTING THEIR BID.

M. INTERNATIONAL SWIMMING POOL AND SPA CODE - 2018.

- CONTRACTORS SHALL BE RESPONSIBLE TO VERIFY AND FAMILIARIZE THEMSELVES WITH ACTUAL FIELD CONDITIONS ASSOCIATED WITH WORK UNDER THIS
- THE LOCATION OF EXISTING UNDERGROUND UTILITIES IS SHOWN IN AN APPROXIMATE WAY ONLY. DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. REPAIR ALL DAMAGES OCCASIONED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND
- 4. RUN ALL SOIL, WASTE, AND DRAIN PIPING WITH 2% MINIMUM GRADE UNLESS OTHERWISE NOTED. HORIZONTAL VENT PIPING SHALL BE GRADED TO DRIP BACK TO THE SOIL OR WASTE PIPE BY GRAVITY.
- 5. RUN ALL CONDENSATE DRAIN PIPING WITH 2% MINIMUM GRADE UNLESS OTHERWISE NOTED.
- 6. ELEVATIONS NOTED ARE TO CENTER LINES OF PIPES FOR ALL PRESSURE LINES AND TO INVERT FOR ALL GRAVITY FLOW LINES.
- 7. ADJUST SEWER INVERTS TO KEEP TOPS OF PIPE IN-LINE WHERE PIPE SIZE CHANGES.
- 8. MAINTAIN MINIMUM OF 3'-6" COVER OVER UNDERGROUND WATER MAINS.
- 9. PROVIDE SHUT-OFF VALVES IN DOMESTIC BRANCH WATER PIPES SERVING TWO OR MORE FIXTURES.
- 10. UNLESS OTHERWISE NOTED, WHERE HOT AND COLD PIPING DROPS INTO PIPE CHASE, THE SIZE INDICATED SHALL BE PROVIDED TO THE LAST FIXTURE RUNOUT.
- 11. PROVIDE ISOLATION VALVES AS INDICATED ON THE DRAWINGS, DETAILS AND AS REQUIRED SO THAT EQUIPMENT AND INSTRUMENTS IN THE SYSTEM CAN BE
- ISOLATED FOR SERVICE AND MAINTENANCE.
- 12. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF SLAB AND STRUCTURE, WITH SPACE FOR INSULATION, IF REQUIRED.
- 13. INSTALL PIPING SO THAT ALL VALVES ARE ACCESSIBLE.
- 14. COORDINATE ALL PLUMBING WORK WITH MECHANICAL WORK, FIRE PROTECTION, AND ELECTRICAL WORK ETC., SHOWN ON OTHER DRAWINGS.
- 15. MAINTAIN MINIMUM 6'-8" CLEARANCE TO UNDERSIDE OF PIPES, SUSPENDED EQUIPMENT, ETC., THROUGHOUT 48-INCH ACCESS ROUTES IN MECHANICAL AND ELECTRICAL ROOMS.
- 16. CERTAIN ITEMS SUCH AS CLEAN-OUTS, ACCESS DOORS, RISES AND DROPS IN PIPING, ETC., ARE INDICATED ON THE DRAWINGS FOR CLARITY OR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THOSE ITEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THESE ITEMS AS REQUIRED ELSEWHERE IN THE CONTRACT DOCUMENTS.
- 17. EQUIPMENT CONNECTION SIZES MAY DIFFER FROM INDICATED PIPE SIZES. PROVIDE APPROPRIATE TRANSITIONS AT THE EQUIPMENT WHERE REQUIRED.
- 18. THE DRAWINGS ARE DIAGRAMMATIC AND ALL OFFSETS, FITTINGS, TRANSITIONS AND ACCESSORIES ARE NOT NECESSARILY SHOWN. COORDINATE THE INSTALLATION OF ALL PIPING, EQUIPMENT AND OTHER WORK WITH ALL OTHER TRADES.
- 19. IT IS THE INTENT THAT ALL WORK SHALL BE COMPLETE IN EVERY RESPECT AND THAT MATERIAL OR WORK SPECIFICALLY NOT INDICATED ON THE DRAWINGS, BUT NECESSARY TO COMPLETE THE WORK, SHALL BE PROVIDED.
- 20. CONTRACTOR IS PROHIBITED FROM ATTACHING TO THE ROOF DECK AND LOWER CHORD OF JOISTS AS A SUPPORT SYSTEM FOR DEVICES AND BUILDING
- 21. CONTRACTOR SHALL REPAIR ALL PENETRATION HOLES IN WALLS, FLOORS, CEILINGS AND ROOF AS A RESULT OF DEMOLITION WORK. REPAIRS SHALL MATCH ADJACENT CONSTRUCTION.
- 22. ALL PIPE PENETRATIONS IN EXPOSED AREAS SHALL HAVE ESCUTCHEON PLATES.
- 23. PROVIDE ALL BRANCH PIPES TO COLD WATER AND HOT WATER SYSTEMS WITH SHUTOFF VALVES.
- 27. PROVIDE ALL NECESSARY COMPONENTS FOR U.L. LISTED THROUGH PENETRATION SYSTEM AT RATED FLOORS, CEILING AND WALL PENETRATIONS IN ORDER TO MAINTAIN THE REQUIRED ASSEMBLY RATING. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY LOCATIONS AND CONSTRUCTION.
- 28. INSTALL ALL WORK SO THAT PARTS REQUIRING PERIODIC INSPECTION, OPERATION, MAINTENANCE, AND REPAIR ARE READILY ACCESSIBLE. INSTALL CONCEALED VALVES, EXPANSION JOINTS, CONTROLS, AND EQUIPMENT REQUIRING ACCESS IN LOCATIONS FREELY ACCESSIBLE THROUGH ACCESS DOORS NOT LESS THAN 18-INCHES BY 18-INCHES.
- 29. CONTRACTOR SHALL CAP ALL UTILITIES TO ESTATE PROPERTIES AND SHALL SECURE DOCUMENTATION FOR DEMOLITION PERMITS.
- 30. ALL PLUMBING FIXTURES, EQUIPMENT, AND DEVICES THAT CONTACT POTABLE WATER MUST BE LEAD FREE PER THE STATE REQUIREMENTS. POTABLE WATER SYSTEMS AND COMPONENTS SHALL COMPLY WITH NSF 61 - ANNEX G AND NSF-372.
- 38. DIVISION 22 SHALL PROVIDE EQUIPMENT DISCONNECT UNLESS OTHERWISE INDICATED UNDER DIVISION 26.

PIPING, FITTINGS AND VALVES AVAILALABLE FOR PROJECT

	All fittings a	All pipe and fittings listed below are at ASC All fittings are copper sweat All pipe is Type L copper in 20' lengths						
	Fitting Type	90	45	Coupling	Full Port Ball Valve	Type L Pipe	TEE	
I.D.								
0.50		0	0	0	0	0	0	
0.75		3	0	0	3	0	0	
1.00		3	14	1	23	0	0	
1.25		0	1	0	1	0	0	
1.50		0	0	0	10	0	0	
2.00		27	26	3	23	0	1	
2.50		3	2	9	0	200'	0	
3.00		20	0	16	0	340'	0	
3.50		0	0	0	0	0	0	
4.00		21	3	22	4	600'	0	
Reducing								
TEE								
2.5x2.5x1.5	4							
2.5x2x1	2							
2.5x2x2	2							
3x3x2	8							
3x3x1	4							
3x3x1.5	4							
3x2.5x2	3							
4x4x2	5							
4x4x1	4							
4x3x2	3							
4x4x1.5	10							
4x4x1.25	2							
4x4x.75	4							

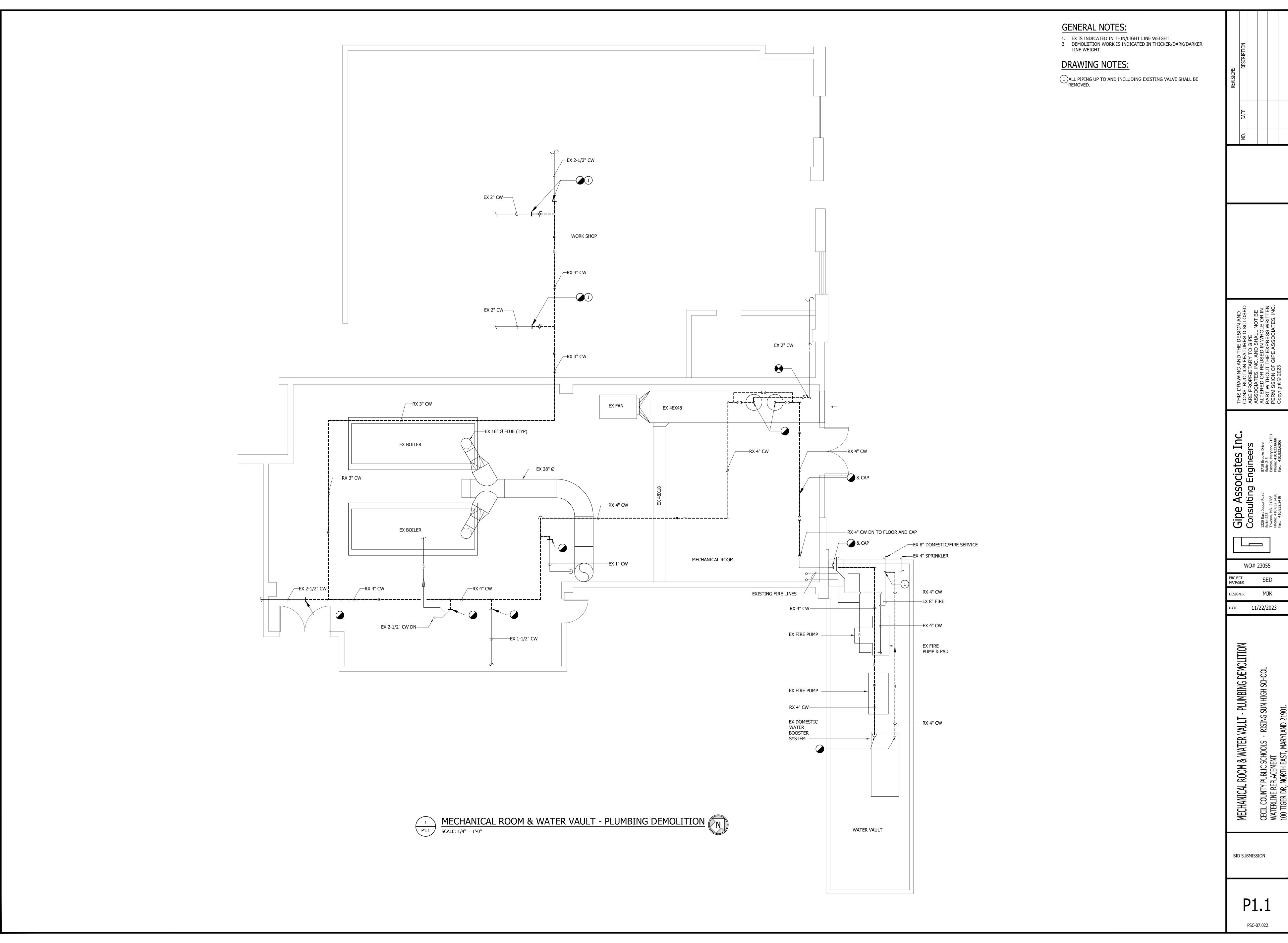
Associates Julting Engineer

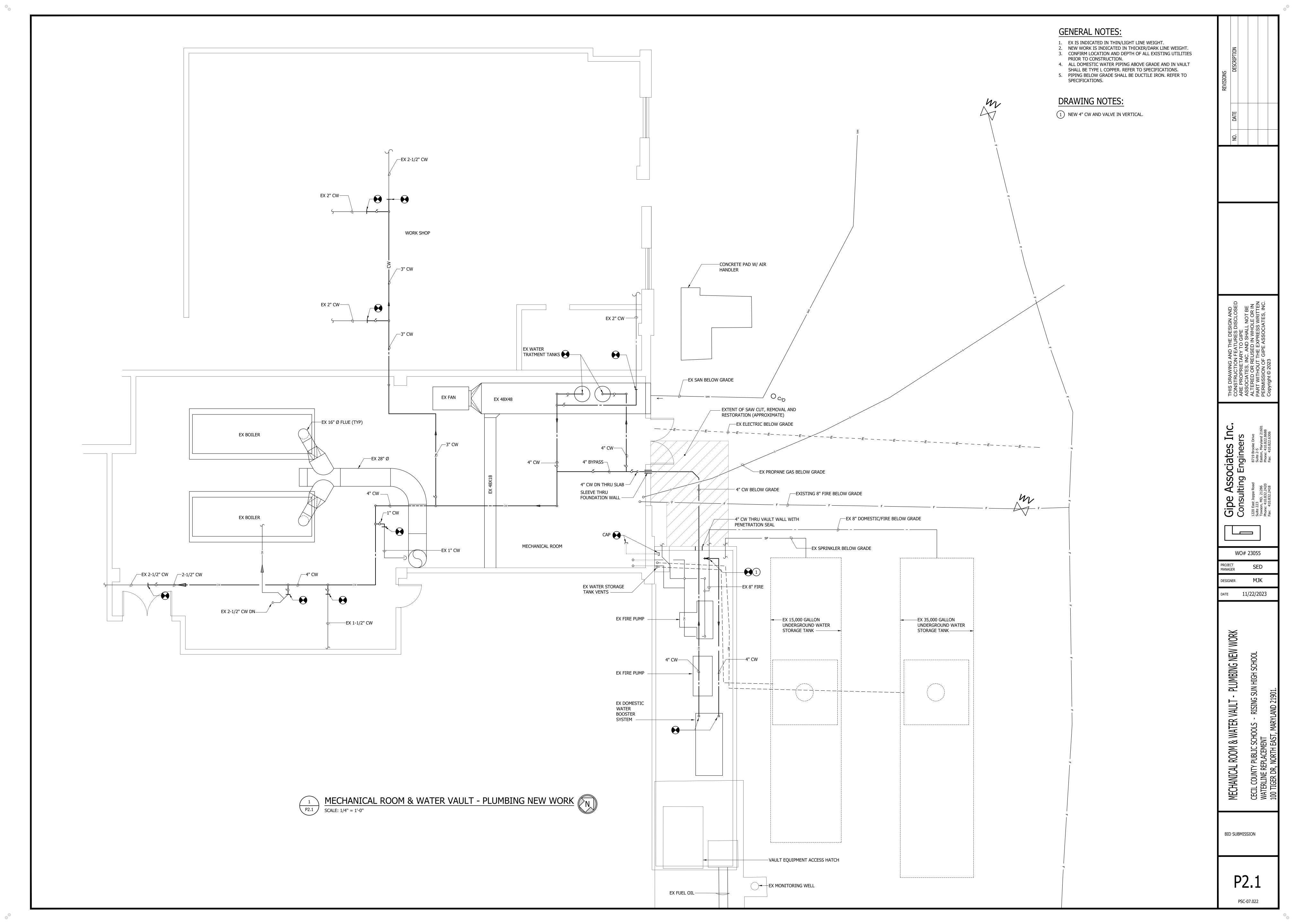
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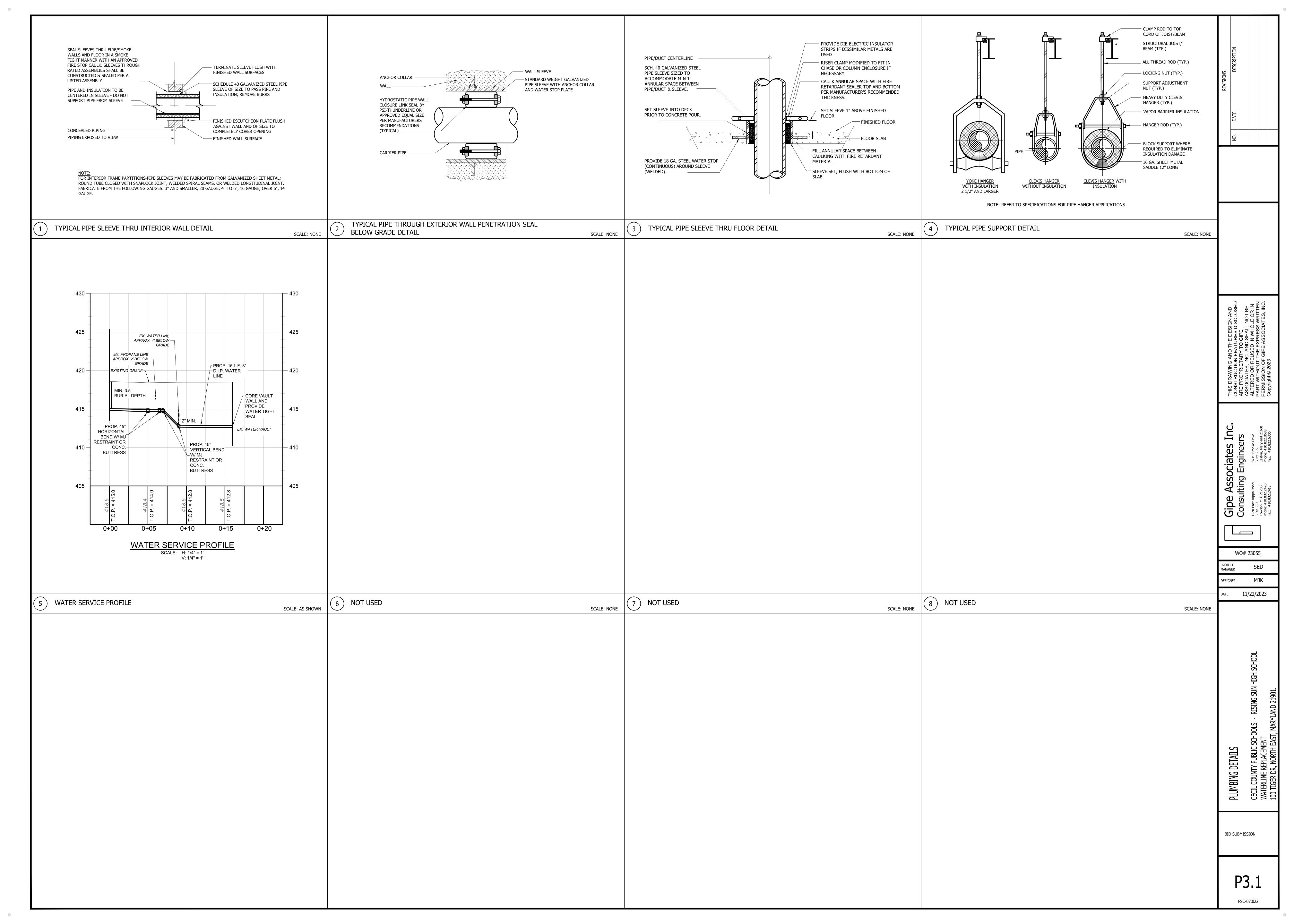
MJK DESIGNER

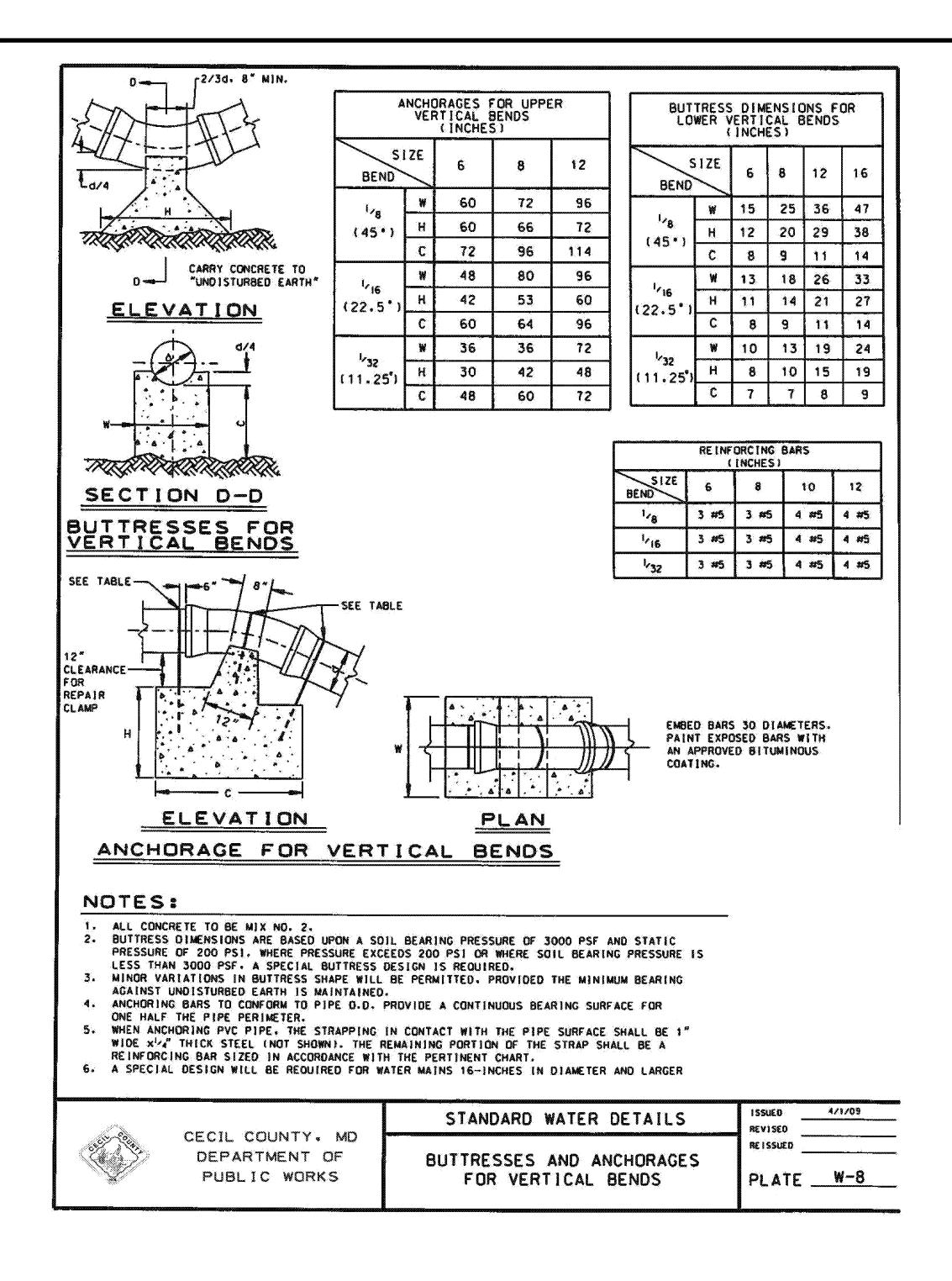
MANAGER

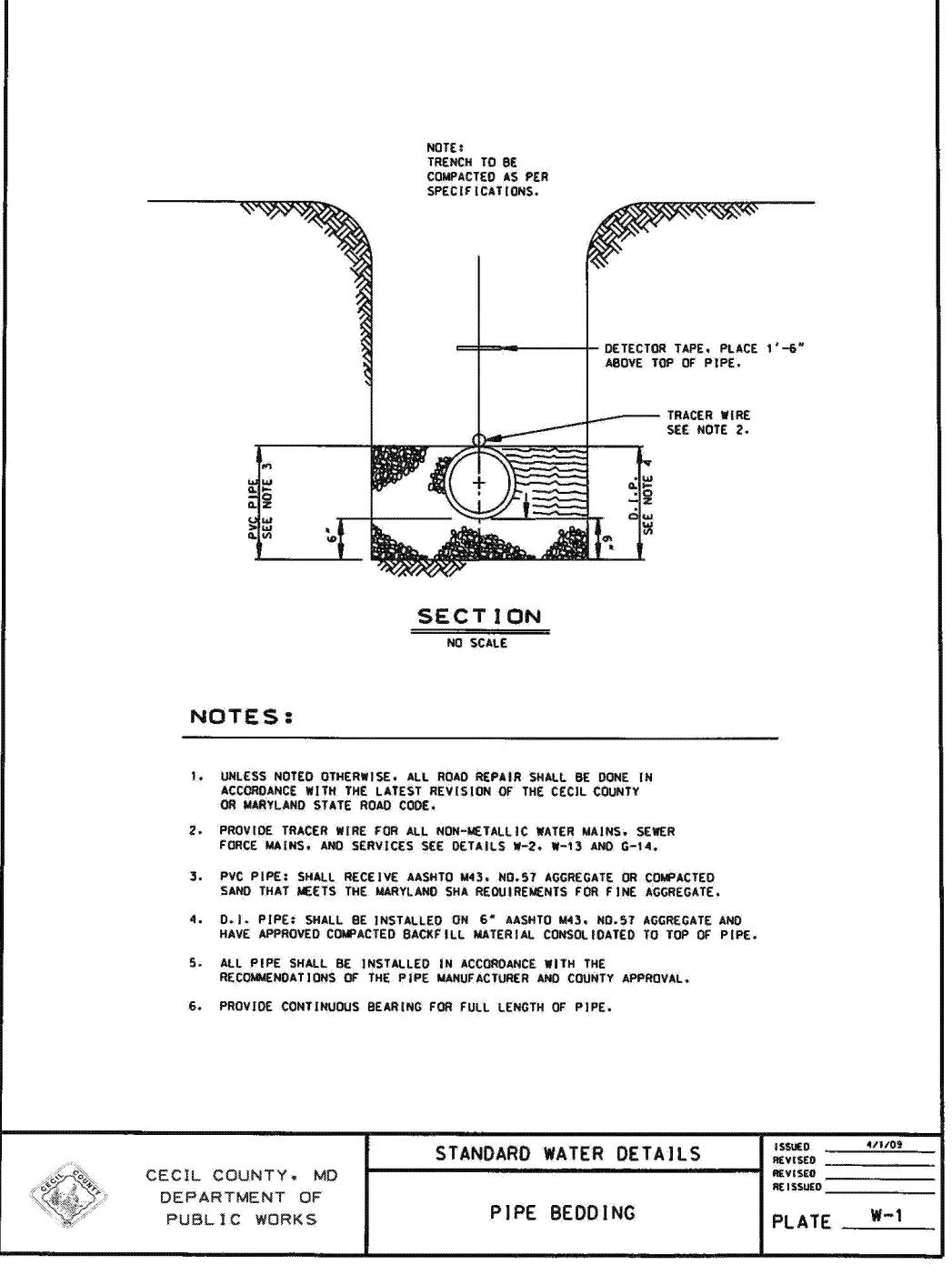
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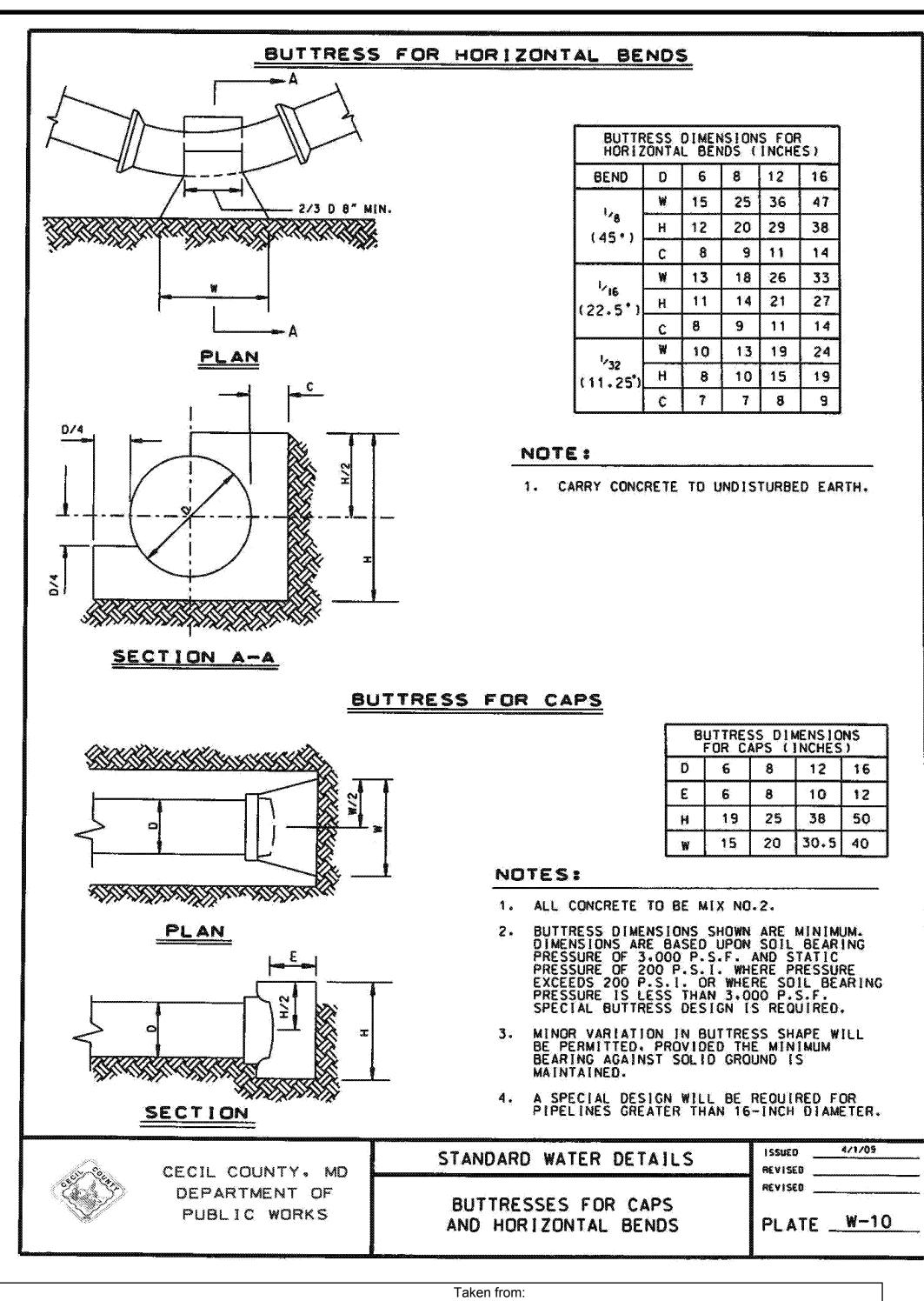


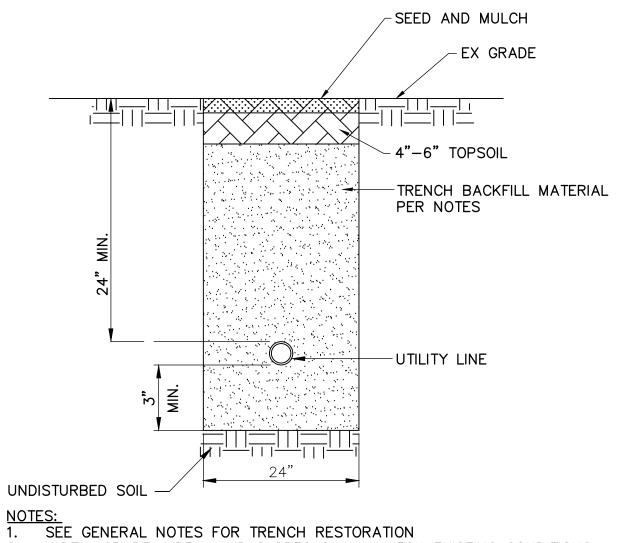






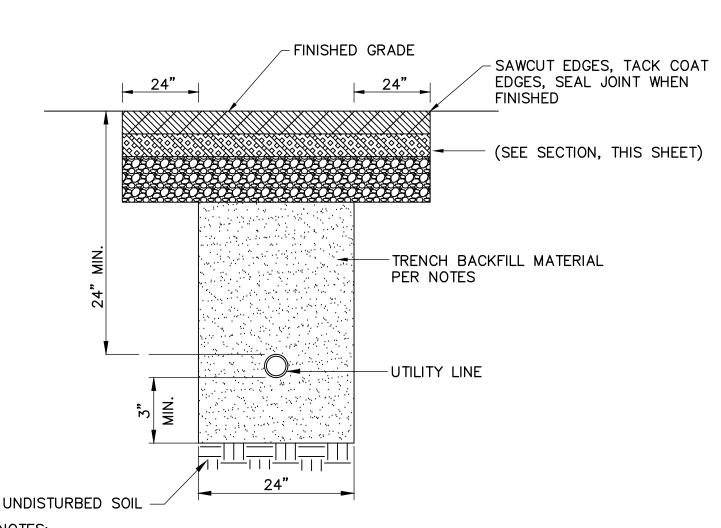






WIDTH, GRADE, AREA, AND SLOPES SHALL MATCH EXISTING CONDITIONS.

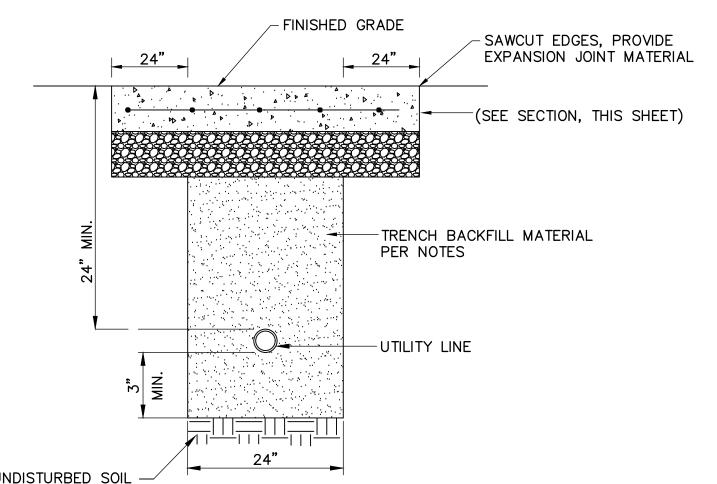
TRENCH RESTORATION (LAWN) NOT TO SCALE



NOTES:

1. SEE GENERAL NOTES FOR TRENCH RESTORATION 2. WIDTH, GRADE, AREA, AND SLOPES SHALL MATCH EXISTING CONDITIONS. TRENCH RESTORATION (ASPHALT)

NOT TO SCALE



NOTES:

1. SEE GENERAL NOTES FOR TRENCH RESTORATION WIDTH, GRADE, AREA, AND SLOPES SHALL MATCH EXISTING CONDITIONS.

TRENCH RESTORATION (CONCRETE/SIDEWALK)

NOT TO SCALE

GENERAL NOTES FOR TRENCH RESTORATION:

BACKFILL SHALL BE PLACED IN LIFTS NO LESS THAN 4" AND NO GREATER THAN 8 INCHES. PROVIDE JOINT SEALANT WHERE NEW ASPHALT MEETS EXISTING ASPHALT OR CONCRETE. WHERE TRENCH IMPACTS CONCRETE SIDEWALK OR SLAB, RESTORE CONCRETE TO NEAREST EXPANSION OR CONSTRUCTION JOINT. PROVIDE DOWELS EVERY 24" AROUND PERIMETER OF

SAWCUT FOR SLAB RESTORATION 4. WHERE TRENCH IMPACTS WITHIN TWO FEET OF AN ADJACENT DISSIMILAR SURFACE, RESTORE

TO EDGE OF DISSIMILAR SURFACE. 5. IN LAWN AREAS, TRENCH BACKFILL MATERIAL SHALL BE VIRGIN EXCAVATED TRENCH MATERIAL. COMPACTED TO 90% MODIFIED PROCTOR. WHERE EXCAVATED MATERIAL IS UNSUITABLE FOR COMPACTION DUE TO HIGH MOISTURE CONTENT, ORGANIC MATERIAL OR DEBRIS CONTENT, OR OTHER DELETERIOUS MATERIAL, USE SELECT FILL COMPACTED TO 90%

MODIFIED PROCTOR. 6. IN NON-LAWN AREAS. TRENCH BACKFILL MATERIAL SHALL BE SELECT FILL COMPACTED TO 95% MODIFIED PROCTOR. VIRGIN MATERIAL MAY BE UTILIZED IF IT CAN MEET COMPACTION RATE AND IS APPROVED FOR USE BY THE GEOTECHNICAL INSPECTOR.

CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF UNSUITABLE EXCAVATED MATERIAL

ONSITE. CONTRACTOR SHALL COORDINATE DISPOSAL WITH OWNER. 8. IF GROUNDWATER IS ENCOUNTERED IN THE TRENCH, THE CONTRACTOR SHALL DESIGN A METHOD TO DEWATER THE TRENCH THAT DOES NOT IMPACT PREVIOUSLY PLACED BACKFILL MATERIAL OR ADJACENT IMPROVEMENTS. DISCHARGE OF SEDIMENT LADEN WATER IS STRICTLY PROHIBITED. GROUNDWATER SHALL BE DEWATERED WITH THE USE OF A FILTER BAG. CONTRACTOR SHALL COORDINATE DISCHARGE OF WATER WITH NORTHROP GRUMMAN

ENVIRONMENTAL ENGINEER. CHEMICAL ANALYSIS MAY BE REQUIRED PRIOR TO DISCHARGE. 9. ALL WATER LINE SHALL BE INSTALLED IN ACCORDANCE WITH #6 ABOVE REGARDLESS OF PROPOSED GROUND COVER, REQUIRING COMPACTION TO 95% MODIFIED PROCTOR, AS MUCH OF THE WATER LINE WILL BE UNDER A FUTURE ROADWAY OR HAVE THE POTENTIAL FOR FUTURE CONSTRUCTION ABOVE.

10. REFER TO SECTION 02250 TRENCH EXCAVATION, BACKFILL AND COMPACTION IN THE CECIL COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS AND DETAILS FOR WATER MAINS & SEWER MAINS.

902.10.03 Portland Cement Concrete Mixtures The concrete mixes shall conform to the following:

TABLE 902 A

THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, DATED JULY 2018.

PORTLAND CEMENT CONCRETE MIXTURES										
MIX NO.	SPECIFIED ACCEPTANCE COMPRESSIVE STRENGTH (P.S.I.)	COMPRESSIVE STRENGTH ACCEPTANCE TEST AGE (DAYS)	STD. DEV. (P.S.I.)	CRITICAL VALUE (P.S.I.)	MIN. CEMENT FACTOR (LB/SQ. YD)	COARSE AGGREGATE SIZE (M 43 / M 195)	MAX. WATER/CEMENT RATIO (BY WEIGHT)	SLUMP RANGE (IN.)	TOTAL AIR CONTENT (%)	CONCRETE TEMP. (°F)
1	2500	28	375	2430	455	57, 67	0.55	2-5	5-8	50-95
2	3000	28	450	3010	530	57, 67	0.50	2-5	5-8	50-95
3	3500	28	525	3600	580	57, 67	0.50	2-5	5-8	50-95
4	3500	28	525	3600	615	57, 67	0.55	4-8	N/A	50-95
5	3500	28	525	3600	580	7	0.50	2-5	5-8	50-95
6	4500	28	675	4770	615	57, 67	0.45	2-5	5-8	50-80
7	4200	28	630	4420	580	57	0.50	1.5-3	5-8	50-95
8	4000	28	600	4180	750	7	0.42	2-5	5-8	50-80
9	3000	(a)	N/A	N/A	800	57, 67	0.45	4-8	5-8	60-100
10	4500	28	675	4770	700	3/4" - No.4	0.45	2-5	6-9	50-80
11	4200	28	630	4420		57, 67	0.45	2-5	5-8	50-80
12	4200	28	630	4420		3/4" - No.4	0.45	2-5	6-9	50-80
HE	3000	(b)	N/A	N/A	N/A	N/A	N/A	3-9	5-8	60-100
PC (c)	N/A	N/A	N/A	N/A	450	7, 8	0.45	N/A	15-25	N/A
WT	2500	(d)	N/A	N/A	650	57	0.45	5 MAX.	5-8	50-95

Note 1: When concrete is exposed to water exceeding 15,000 ppm sodium chloride content, Type II cement shall be used. In lieu of Type II cement, a Type I cement may be used in combined form with an amount of up to 50 percent replacement with slag cement, or an amount of up to 25 percent replacement with Class F fly ash. The Contractor shall submit to the Engineer the proposed mix proportions and satisfactory test results per C 1012 showing a sulfate resistance expansion not exceeding 0.10 percent at 180 days

Note 2: The temperature of Mix No. 6 when used for other than superstructure work as defined in TC-1.03 shall be 50 – 95 F.

Note 3: Type A or D admixture shall be added to bridge, box culvert, and retaining wall concrete.

Note 4: Nonchloride Type C admixtures may be used when approved by the Engineer

When a high range water reducing admixture Type F or Type G is specified, the slump shall be 4 to 8 in.

• When synthetic fibers are specified, the slump shall be 5 in. maximum. • When concrete is to be placed by the slip form method, the slump shall be 2-1/2 in. maximum.

• When the absorption of the coarse aggregate is greater than 10 percent, the slump shall be 3 in. maximum.

Note 6: Mix No. 9 shall contain a Type F high range water reducing admixture.

Note 7: Mix Nos. 10 and 12 shall be proportioned as specified in 211.2 of the ACI's Recommended Practices for Selection Proportions for Structural Lightweight Concrete. The maximum average Density of Cured Concrete shall be 118 lb/ft3. Control testing for Density of Cured Concrete shall be two companion cylinders for each 100 yd3, or fraction thereof, as specified in M 195.

Note 8: Mix Nos. 11 and 12 shall also conform to all requirements as specified in Table 902 C.

Note 9: Add Polyolefin Macro Fibers to Mix No. 8, Mix No. 9 and High Early Strength Patch Mix (HE). The dosage rate shall be per the manufacturer's recommendations.

a. Mix No. 9 is for concrete pavement repair only. Match cure of the samples is permissible in accordance with AASHTO PP 54. Strength tests shall be scheduled accordingly on weekdays and acceptance will be based on a minimum compressive strength of 3000 psi in 24 hours or 3600 psi in 3 days. Acceptance testing shall conform to 902.10.08 except that cylinders shall be field cured and remain in the molds until tests are conducted. Mix No. 9 when specified for incidental work and not requiring traffic control in

conformance with 522.03.15 will not require the addition of fibers. b. Match cure the samples in accordance with AASHTO PP 54. Design approval will be given based on trial batch obtaining a minimum compressive strength of 2500 psi in 6 hours. Strength tests shall be scheduled accordingly on weekdays and acceptance will be based on a minimum compressive strength of 3000 psi in 24 hours or 3600 psi in 3 days. Acceptance testing shall conform to 902.10.08 except that cylinders shall be field cured and remain in the molds until tests are conducted.

c. Pervious Concrete (PC) shall be proportioned as specified in 522R of the ACI's Recommended Practices for Pervious Concrete Mixture Proportions. Acceptance of freshly mixed Pervious Concrete shall be made based on Density and Total Void Content. Density and Total Air Voids of Freshly Mixed Pervious Concrete shall be performed per C 1688 d. Whitetopping (WT) mix shall contain a high range water reducing admixture, macro-fibers at 3 lbs/yd3 Max, and acceptance will be on a minimum compressive strength of 2500 psi in 24 hours.

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> WO# 23055 SED

ANAGER MJK ESIGNER

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 Height

BID SUBMISSION

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GENERAL NOTES

- All construction shall be marked for pedestrian and vehicular traffic.
- 2. The contractor shall grade all streets within the limits of construction and shall warp paving as necessary to ensure
- positive drainage in the direction indicated by the arrows shown. 3. The contractor shall adjust all existing utility boxes, manholes, etc., which are to remain, to conform to final grade.
- 4. All joints abutting existing paving shall be saw cut and asphalt sealant applied. 5. All disturbed areas shall be stabilized.
- 6. All materials and methods of construction shall be in strict conformance with the Cecil County Road Code and Standard Specifications and Detail, Cecil County Standard Specifications and Details for Water Mains & Sewer Mains, the Maryland State Highway Administration Book of Standards for Highway & Incidental Structures. Where these specification conflict, the most robust specification shall be followed.
- These drawings show information obtained from the best available records regarding pipes, conduits, telephone and electric lines, etc., and other structures and conditions which exist along the lines of the work, both at and below the surface of the ground. The owner and engineer disclaim any responsibility for the accuracy or completeness of said information being shown only for the convenience of the contractor, who must verify the information given to his own satisfaction. If the contractor relies on said information, he does so at his own risk. The giving of this information on the contract drawings will not relieve the contractor of his obligations to support and protect all pipes, conduits, telephone and electric lines and other structures. Sources of the existing features
- are from McCrone survey, Geo-Graf field located utilities, and CCPS provided building drawings. 8. Contractor to verify location and elevation of all existing utilities and roads prior to the start of any construction. Any discrepancies shall be brought to the attention of the Engineer with proposed modifications needed. Corrections of all discrepancies shall be the responsibility of the contractor.
- 9. It shall be the contractor's responsibility to protect all installed piping until completion of the project. Pipes with shallow cover are to be protected from damage by construction machinery with adequate temporary cover.
- 10. The contractor shall take all the necessary precautions to protect all existing utilities. Repair to damaged utilities
- shall be at the contractor's expense. 11. All borrow excavation shall be a soil or soil aggregate mixture and shall conform to section 916, Maryland State
- Highway Administration, Standard Specifications for Construction Materials, latest edition.
- 11.1. Disposal of fill, including but not limited to earthen soils, rock, rubble, construction debris, woody debris, and trash, shall not be permitted in special flood hazard areas.
- 12. The contractor shall be responsible for all existing driveway repair. 13. All water main construction shall be Class 52 ductile iron pipe (D.I.P.). Please see plans and details for location of
- material types. Pipes shall be installed in accordance with manufacturer's recommendations. 14. This drawing does not include the necessary components for construction safety. All construction must be done in compliance with the Occupational Safety and Health Act of 1970 and all rules and regulations thereto appurtenant
- and the Maryland Occupational Safety and Health Administration Standards. 15. The contractor shall install visual detector tape and tracer wire over the main (and other non-metallic underground piping). The detector tape shall be 3 inches wide (minimum) nonmetallic blue plastic tape, lettered "WATER LINE"
- 16. Ductile iron pipe (DIP) shall be Class 52 ductile iron meeting the requirements of AWWA C151. Pipe shall be double cement lined per AWWA C104 and exteriors shall be asphaltic coated. All fittings shall be mechanical joints or push-on joints in accordance with AWWA C-111.
- 17. See the latest edition of the "Cecil County Standard Specifications and Details for Water Mains and Sewer Mains" for the list of approved manufacturers. 18. Contractor shall supply CCPS with marked up "Redlined" construction plans with depth and location of the installed
- improvements. Plan deviations shall be outlined with red cloud.
- 19. All construction materials and methods to be in accordance with the Cecil County Standard Details and Specifications and as shown on these contract documents.
- 20. The contractor shall coordinate his work schedule with the owner. The owner shall have final authority on the contractor's work schedule.
- 21. McCrone and the owner are not responsible for the contractor's utilization of workers, materials, equipment or safety measures in performance of any work on this project. The contractor assumes all responsibility and liability for performing the work correctly and in conformance with all applicable codes and regulations.
- 22. Should the contractor discover discrepancies between the plans and the actual field conditions encountered, the owner and the engineer shall be notified immediately to arrive at an acceptable resolution.
- 23. The contractor shall restore all damage to roads, grass areas, sidewalk, paving, curb & gutter and gravel areas upon completion of work at no additional cost to owner and to the satisfaction of the owner.
- 24. The contractor shall be responsible for avoiding and/or cleaning up dust and mud on all roads due to vehicles arriving and leaving the job site as part of this work.
- 25. It shall be distinctly understood that failure to mention specifically any work which would normally be required to
- complete the project shall not relieve the contractor of his responsibility to complete such work 26. All plugs, caps, tees, and bends, shall be provided with concrete buttresses unless noted otherwise.
- 27. DIP coupling is required whenever there is a transition from C-900 to DIP pipe, including connection points and for fire hydrants and valves. 28. Water and sewer mains cannot be placed closer than ten feet horizontally as measured edge to edge. Water mains
- crossing sewer mains shall be laid to provide a minimum vertical distance of eighteen (18) inches between the outside of the water main and the outside of the sewer. 29. When a water main is in close proximity or crosses a sewer main, the water lines shall be placed higher than the
- sewer of non-potable water lines and the sewer or non-potable line shall be encased in concrete a minimum of ten (10) feet on each side of the main to protect the water supply from possible contamination.
- 30. All material shall be installed per manufacturer's recommendations.

STANDARD NOTES FOR UTILITY INSTALLATION

- UTILITY MARKING HAS BEEN COMPLETED, CALL GEO-GRAF AT 610.316.2184 WITH ANY QUESTIONS AT LEAST 48 HOURS PRIOR TO THE START OF WORK. ONLY ENOUGH TRENCH WILL BE EXCAVATED THAT CAN BE BACKFILLED DAILY. EXCAVATED TRENCH MATERIALS SHOULD BE PLACED ON THE HIGH SIDE OF THE
- IMMEDIATELY FOLLOWING UTILITY INSTALLATION, THE TRENCH SHALL BE BACKFILLED, COMPACTED AND STABILIZED AT THE END OF EACH WORKING DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED IN THE SAME
- FULL TRENCH COMPACTION IS REQUIRED.
- 6. MULCHING TO CECIL SOIL CONSERVATION DISTRICT SPECIFICATIONS OF ALL
- DISTURBED AREAS AND DAILY BACKFILL WILL BE REQUIRED. ANY SEDIMENT CONTROL PRACTICES WHICH ARE DISTURBED DURING UTILITY CONSTRUCTION SHALL BE REPAIRED OR REPLACED AT THE END OF EACH WORKING DAY
- 8. ANY DITCHES OR DRAINAGE WAYS DISTURBED DURING CONSTRUCTION WILL BE
- RESTORED TO ORIGINAL CONDITION. 9. IF ANY DAMAGE TO THE EXISTING ROAD OCCURS, IT WILL BE REPAIRED IN ACCORDANCE WITH THE CECIL COUNTY ROAD CODE AND STANDARD
- SPECIFICATIONS AND DETAILS. 10. FOR ALL WORK WITHIN THE PAVEMENT OF A ROAD. REPAIRS MUST BE MADE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE SANITARY SEWER PLANS.
- 11. ALL PERVIOUS AREAS DISTURBED DURING UTILITY INSTALLATION MUST BE RE-GRADED AND RE-STABILIZED IN ACCORDANCE WITH MD STANDARDS & SPECIFICATIONS AT THE END OF EACH WORK DAY. ALL PERVIOUS AREAS SHALL
- REMAIN PERVIOUS AND MUST BE RETURNED TO THEIR PREVIOUS OR BETTER 12. ALL IMPERVIOUS AREAS DISTURBED DURING UTILITY INSTALLATION MUST BE RETURNED OR RE-INSTALLED TO THEIR PREVIOUS OR BETTER CONDITION. 13. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING TRAFFIC CONTROL WITH
- NORTHROP GRUMMAN WHEN INTERNAL ROADWAYS OR PARKING AREAS WILL BE AFFECTED. THERE ARE NOT COUNTY ROADWAY IMPACTS PROPOSED BY THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR ERECTING AND MAINTAINING ALL NECESSARY SIGNS, BARRICADES, DETOUR SIGNS, AND WARNING DEVICES REQUIRED TO SAFELY DIRECT TRAFFIC OVER OR AROUND PROPOSED WORK AREA. ALL COSTS ASSOCIATED WITH TRAFFIC CONTROL ARE THE
- RESPONSIBILITY OF THE CONTRACTOR. 14. ALL APPROPRIATE FEDERAL, STATE, AND LOCAL PERMITS MUST BE OBTAINED PRIOR TO COMMENCEMENT OF AND GROUND DISTURBING ACTIVITIES.

SECTION 02660

WATER MAINS (Excerpt from Cecil County Standards and Specifications for Water Mains and Sewer Mains, 2009)

Though this water system is private and not under the specific jurisdiction of Cecil County, the water system construction should be conducted in accordance with these specifications. Should the Contractor find strict adherence to these specifications problematic, the Contractor must outline the problematic specification and bring it to the attention of the Owner and Engineer of Record, along with the specification that the Contractor would prefer. Absent written approval of the Contractor's replacement specification, these specifications (Section 02660) shall apply. Where these specifications refer to "Cecil County" and their Inspectors or Departments therein, please replace with "Owner" and Owner's representative.

PART 1 - GENERAL

A. Description

Water main installation shall include, but not necessarily be limited to, furnishing and installing water pipe, fittings, and appurtenances of the size and type shown on the Plans, installed on a firm foundation true to line and grade in accordance with the Contract Documents.

- B. Related Work Specified Elsewhere
- Aggregate Backfill: Section 02240. Trench Excavation, Backfill, and Compaction: Section 02250.
- Water Valves and Appurtenances: Section 02662.
- Water Services and Appurtenances: Section 02664. Fire Hydrants: Section 02666.
- Cast-In-Place Concrete: Section 03300. Miscellaneous Metals: Section 05500.

C. Quality Assurance

The County will inspect all materials before, during and after installation to ensure compliance with the Approved Plans.

PART 2 - MATERIALS A. General

- Materials shall be furnished in accordance with the Approved Plans and the current edition of the Approved List of suppliers and materials for Water and Sewer Main construction.
- To minimize the number of joints, only standard manufacturer length of pipe shall be furnished and installed for all water mains unless otherwise indicated on the Plans, or as approved by the County.

B. Pipe Symbols

For convenience and standardization, the various types of pipe are designated on the plans by the following symbols:

DIP - Ductile Iron Pipe PVC – Polyvinyl Chloride Pipe HDPE – High Density Polyethylene Pipe

C. Materials Furnished by the County

- The County will not furnish any materials for water main construction. Unless otherwise noted in the "Special Provisions," the County or Private Public Utility will make water available
- from its potable water system for pipeline testing at no charge to the Contractor for one attempt at a test cycle. Test cycle shall include initial flushing, filling, chlorination, hydrostatic testing and flushing with dechlorination, If any portion of the cycle fails, the Contractor will be responsible for water. The Contractor shall contact the Division of Water and Sewer or the Private/Public Utility to coordinate its use. If subsequent testing is required, the Contractor will purchase additional water from the County's or Private/Public Utility's system.

D. Contractor's Options

The Contractor shall furnish ductile iron pipe (DIP) and compatible specified fittings for water mains 3-inches in diameter and greater unless specified otherwise by the approved plans.

Detailed Material Requirements

1. Portland cement concrete for pipe fitting buttresses and anchorages shall be as specified.

2. Ductile Iron Pipe and Fittings

- 1) Pipe shall be designed and manufactured in accordance with ANSI/AWWA 151/A21.51 unless 2) All pipe and fittings shall be designed and constructed to withstand all external pressure caused by overburden as indicated on the profile and traffic loads to which the pipe may be
- 3) Pipe shall be double thickness cement mortar lined in accordance with AWWA C104 with an interior seal coat of bituminous material. The outside surface shall also be bituminous coated. 4) The minimum special standard thickness class shall be as noted herein or as shown on the plans or specified in the "Special Provisions".

* The use of class 50 ductile iron pipe will be permitted so long as the contractor at a minimum beds pipe in 4 inch minimum loose soil and backfills in accordance with Part 3 (A)(5)

Joints may be mechanical or rubber gasketed push-on type. Unless otherwise noted, all joints shall be in accordance with ANSI/AWWA C111/A21.11 Standard.

- 1) All fittings shall have mechanical joints. 2) All fittings 3-inches through 24-inches shall be manufactured in accordance with the ANSI/AWWA C153/A21.53 Standard. All fittings 30-inches through 48-inches shall be manufactured in accordance with the ANSI/AWWA C110/A21 .10 standard for a working pressure of 250 psi unless
- specified or directed otherwise by the County.
 - a. Restrained joint pipe and fittings shall be of the pipe manufacturer's standard design for ductile iron, Mechanical joint restraining systems for ductile iron pipe may be used at fittings, valves, fire hydrant leads, vault bypasses and when connecting to existing utilities unless noted otherwise by the Water and Sewer Engineering office. The mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which when actuated imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A 536-80. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11 and ANSI/AWWA C153/A21.53 of the latest revision. Twist-off nuts shall be used to insure proper actuating of the restraining devices. The 3 inch through 16 inch mechanical joint restraining device shall have a working pressure of at least 350 psi with a minimum safety factor of 2:1. The 18 inch through 48 inch mechanical joint restraining device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1. Restrained joints on straight lengths of pipe shall be as manufactured by the pipe
 - manufacturer and the restraining mechanisms shall be an integral part of the bell and spigot. Rod for tie rod assemblies shall meet the material requirements of ASTM A 193, Grade B7, and shall be threaded for at least 4 inches on both ends. Rod shall be 3/4 inch diameter unless otherwise noted. Nuts shall meet the requirements of ASTM A194. Manufactured tie rod and accessories shall result in the completed restrained joint assembly having a minimum working pressure rating of 200
- 6. Detector Tape Visual Detection Tape shall be 3 inches wide (minimum) nonmetallic blue plastic tape lettered "water" in black graphics as manufactured by Linequard, Allen Systems, Linetic or Empire Level.
- Approved Manufacturers All Water Main Pipe, Fittings and Appurtenances shall be manufactured by one of the following: a. Ductile Iron Pipe and Fittings:
- 1) U.S. Pipe and Foundry 2) Griffin Pipe 3) American Pipe 4) Atlantic States Pipe 6) Tyler Foundry Restrained DIP joints:
- 2) Griffin Snap Lock 3) American Flex Ring 4) Claw Super Lock Tyler Foundary c. Couplings for DIP C-900-AC: 1) Dresser – Style 153 4"-12"

1) U.S. Pipe and Foundry, T.R. Flex

2) Ford – Style FC 2"-24" 3) Smith-Blair – Style 441 2"-16" 4) Viking-Johnson MaxiFit 1½"-24" 5) Viking-Johnson MaxiStep 1½"-24" 6) Ramac – Style 501

All couplings must be epoxy or nylon coated.

d. Retainer Glands (DIP): 1) EBAA Iron Mega-A-Lug 2) Ford Wedge Action Series 1400 A) Continuity Test Station 1) The continuity test station aside a fire hydrant shall be a 2 ½" shaft cathodic test box constructed of ABS plastic with cast iron rim and lid. The minimum box length shall be 24" and the body shall be flared or squared at the base to prevent pull out or settling. Lid shall be locking, blue in color and have raised custom lettering noting "test". Test station shall be complete with an inset

> removable terminal board with three (3) terminals. 2) The continuity test station that is located over the water main shall be a 4 ¼" valve box with blue locking lid. Test station shall be complete with an inset removable terminal board with three (3)

PART 3 - EXECUTION

- A. Preparation 1. Trench excavation, backfill, and compaction, and pipe bedding and haunching shall be as specified in Section
 - 2. Prior to start of utility installation, all rights-of-way shall be graded to within ±0.2 feet of the proposed subgrade in paved areas and finished grade in unpaved areas.
 - Trench Water: The pipeline trench excavation shall be dewatered sufficiently to allow pipe joints to be made under dry conditions. No joint shall be made under water.
 - Laying Pipe in Freezing Weather: No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when there is danger of ice formation or frost penetration at the bottom of the excavation. In freezing weather, open trench length shall be kept to a minimum and the excavation promptly backfilled after the pipe has
 - Pipe Bedding: Each pipe shall be bedded on a solid foundation acceptable to the County and in accordance with the Standard Details. Bedding shall be installed to insure that joints are properly made and the pipe is firmly supported the full length of the barrel. Aggregate bedding shall be installed to grade prior to laying pvc pipe. Ductile Iron pipe shall be bedded in loose soil (4"min) and have approved compacted backfill material consolidated to top of pipe.
- B. Pipe Installation All pipe shall be installed in accordance with the approved manufacturers written instructions and as specified herein. These recommendations, if more restrictive than that shown in the Standard Details shall include: maximum trench width, bedding requirements, backfill material, and compaction, where applicable. In addition,
 - the following shall apply unless otherwise noted: a. Ductile iron pipe (DIP) shall be installed in accordance with the Standard Details and the recommendations of the Ductile Iron Pipe Research Association.
 - Polyvinyl Chloride water pipe (PVC) shall be installed in accordance with the standard details and the recommendations of Uni-Bell. High Density Polyethylene water pipe (HDE) shall be installed in accordance with the standard details
 - and the recommendation of the Manufacturer. 2. Equipment for Handling Pipe: Proper and suitable tools and appliances as approved for safe and convenient
 - handling and joining of pipes shall be used. Pipe Installation: Pipe shall be installed on aggregate backfill per Section 02240 as shown on Cecil County Standard Details. Pipe shall be carefully handled and lowered into the trench. Pipe shall be installed with special care to insure that each joint is watertight, has met the required manufacturers insertion depth, and has no shoulder or unevenness of any kind along the inside of the pipeline. No wedging or blocking will be permitted in
 - installing any pipe unless directed by written order or permission in writing is obtained from the County. 4. Pipe Setting and Protection: No pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place. Care shall be used to assure water tightness and prevent damage to, or disturbing of, the joints during the refilling process. After pipes have been installed and joints have been made, there shall be no walking on or working over the pipe, except as may be necessary in tamping the backfill material, until the backfill is at least 2 feet over the top of the pipe.
 - Cleaning Pipe: The pipes shall be thoroughly cleaned before being installed and shall be kept clean until acceptance of the completed work. Open ends of all pipelines shall be provided with a stopper carefully fitted to keep dirt and other substances from entering. This stopper shall remain in place at all times when installation is not in progress.
 - 6. Cutting Pipe: Whenever a pipe requires cutting, to fit into the line or bring it to the required location, the work shall be performed by an approved method that leaves a smooth, square end. Field spigots shall be stop-marked with a felt tip marker or wax crayon for the proper length of assembly insertion.
 - 7. Jointing Pipe

Before any joints are made in the trench, the Contractor shall demonstrate to the County by making a sample joint that the methods he will employ conform with the Specifications, will secure a water-tight joint, and that the workmen whom he intends to use for this work are familiar with the requirements

making proper joints. Push-On Gasketed Joints

- Prior to making gasketed joints, both mating pipe ends and the gasket shall be cleaned of all foreign material. The gasket shall then be inserted in or stretched over the cleaned gasket seat and lubricant applied as recommended by the manufacturer and approved by the County. The pipe ends shall be carefully aligned and pushed together to meet the required manufacturers insertion There shall be no shoulder or unevenness of any kind along the inside of the pipeline. In all cases, the spigot shall be inserted into the previously laid and seated bell, in order to minimize the potential of gasket roll, to prevent the bell dragging and pushing soil into the joint and to prevent the need to undercut the pipe
- Mechanical joints shall be joined in accordance with the manufacturer's recommendations as approved by the County. All nuts shall be tightened uniformly with a torque of not less than 75 or
- more than 90 foot-pounds Other methods of jointing pipe will be given consideration by the County, provided the Contractor furnishes evidence that the proposed method is equal to or better than the specified methods, and further, provided that the proposed method has been successfully used and that the joint has previously been manufactured by the company from whom the Contractor proposes to purchase pipe.
- recommendations as approved by the County. Detector Tape: Install visual detection tape 18 inches above all mains.
- Tracer Wire: All non-metallic water mains shall have tracer wire secured with duct tape to the top of the pipe at ten (10) foot centers. The Tracer Wire shall be continuous for the full length of the pipeline. Continuous conductivity shall be maintained and tested. Underground splice connections shall be made with solderless split

e. All jointing material and workmanship shall be in accordance with the manufacturer's

- bolt connectors and taped to pipe. 10. Restrained joints and joint restraint systems shall be assembled in accordance with the manufacturer's recommendations. Tie rod nuts shall be uniformly tightened and double nutted to prevent movement. Joint
- restraint systems shall be field protective coated with two coats of a bituminous coating after assembly. 11. Connections to existing work shall be made by the Contractor in the presence of the County at such a time and in such manner as directed and approved by the County. Seventy-two hours prior to the shut off the Contractor shall notify the County, the local fire company and consumers in the affected areas. The notification shall be in writing and shall provide the anticipated time of day of the shut off as well as the anticipated duration. It should also include the name and telephone number where the Contractor can be contacted for additional information. All valves necessary for making connections will be operated by the County. The Contractor shall complete the connections with the greatest possible speed and all work shall proceed without interruption until the existing
- system is returned to operation, so that the public will be inconvenienced as little as possible. 12. Buttresses and anchors shall be installed at all caps, horizontal bends, tees, branches and vertical bends as required in the Approved Plans, Standard Details, and as directed by the County.

C. Field Tests

- All portions of water mains and appurtenances shall be tested prior to connection to the existing water system. The methods used shall comply with the approved plans and contractual
- During installation water mains will be visually inspected for compliance with these specifications and the Approved Plans by the County with the assistance of the Contractor. Further inspections and tests will be conducted by both parties after the section of pipeline being inspected and tested has been backfilled and has had ample time for the curing of buttresses The Contractor shall schedule all tests with the County or the Private/Public Utility Company at least two working days in advance of the test, and shall conduct all tests in the presence of the County or

owner. On County Capital Projects, the County will witness one test at no cost to the Contractor.

- Should the pipeline fail the first County witnessed test, the Contractor shall reimburse the County for all costs resulting from such additional tests so required until the pipeline passes the test(s). The Contractor shall also reimburse the County for the cost of inspection if the Contractor is not prepared for any test, or for additional tests required. d. Prior to performing any test and filling operations, the pipeline shall be flushed free of all debris, silt,
- earth, gravel, rock or other foreign material. It shall be done in a manner to prevent debris of flushing water from entering the existing water mains. Any defective work which shows up while conducting tests shall be replaced or repaired as approved
- by the County by the Contractor at his expense. Water mains shall be tested in sections dictated by the operational breaks noted on the Approved Plans and specifications. No water mains shall be connected to existing mains, except through 3/4" loading line, at any point
- All stub valves shall be open and testing will be through caps or blow-offs at buttress. After these tests have passed, the Contractor will drain the line and connect to existing mains. After tying into existing mains the Contractor will refill and flush the lines and a representative of the County will check to see that the chlorine residual is back to acceptable levels before any water
- services are installed. k. Once the line is permanently tied into the existing system the line shall remain charged unless

until they have been tested and chlorinated

- directed otherwise by the Owner. Chlorination, testing and de-chlorination is required to be performed by a professional chlorination and testing company which has received prior written approval by the Division of Water and Sewer
- m. All water used for testing procedures must be accounted for and documented by the Contractor. Certification reports prepared by the testing company shall be provided to the owner and along with pipe size, length and number of times pipe was filled to the maintenance department prior to the

permanent tie-in. Disinfection and Hydrostatic Testing

- a. General 1) When mains are completed, they shall be chlorinated, flushed tested, and de-chlorinated. Chlorination and hydrostatic testing is performed simultaneously. The Contractor shall furnish all labor, tools, materials, and equipment necessary to perform the tests specified and to chlorinate the
- 2) Testing and tying in will be coordinated through the County on the job. Under no circumstances will any existing valves or fire hydrants be operated by the Contractor without prior approval of the County.
- 3) The section of water main being tested shall be filled from an existing fire hydrant or main as

designated by the County. The Contractor shall furnish an approved backflow preventer at the point of supply. When charging and testing water mains which are not sufficiently close to existing water mains, the Contractor may use an approved and sanitized potable water truck to haul water from an existing county owned water main as preapproved by the Water and Sewer Division. Potable water obtained from a private or municipal water main, appropriate pre-approval must be obtained from

Hydrostatic Testing These results must be submitted to the Water and Sewer Division Department within twenty four (24)

Initial Flushing

1) Prior to the simultaneous chlorination and hydrostatic testing the Contractor shall flush the water main from all debris and particulate matter adhering to the pipe interior with a minimum scouring velocity of 2.5 feet per second in accordance with AWWA C651. The purpose of this initial flush is to eliminate foreign matter which may significantly reduce the effectiveness of the disinfectant. The following table presents the flow rates necessary to properly flush the main.

Flushing duration Minimum Flow Rate per Every 100 ft Pipe Diameter (inches) (gallons per minute of pipe seconds 200 400

The contractor shall, measure and the County shall witness the flow rate provided using his meter to ensure the minimum rate has been achieved.

2) The contractor shall provide the County Inspector a minimum of 1 working day advanced written notice of flushing. The Contractor shall provide the County Inspector with size and linear feet, proposed discharge point diameter of drain (if applicable), chlorine concentration, time and date flushing will commence, and anticipated time duration of flushing. The County Inspector will in-turn

Disinfection and Hydrostatic Testing 1) Following the initial flush, the testing company shall simultaneously disinfect and

notify the Division of Water and Sewer Maintenance Superintendent.

solution, and calcium hypochlorite.

100% Chlorine

4) Hydrostatic Testing

Pipe Diameter

hydrostatically test the main. 2) Disinfection – Continuous Feed Method (a) The continuous feed method, in accordance with AWWA C651, may be utilized for

disinfection and as specified herein. (b) Approved forms of chlorine include liquid or gaseous chlorine, sodium hypochlorite

(c) At a cap and fill pipe in the new main, the water and chlorine solution shall be introduced at a constant rate to provide a uniform minimum concentration of 25 ppm available free chlorine. Air within the line shall be fully evacuated in the filling process.

(d) The following table from AWWA C651 provides a reference for the amount of chlorine requires to achieve the minimum chlorine dosage.

1% Chlorine

Solution (gallons) (pounds) 0.13 0.16 Note: Solutions of 1 percent chlorine shall be prepared with sodium hypochlorite or calcium hypochlorite. Sodium

solution, during the filling operations.

Chlorine required to produce minimum 25 ppm concentration in 100 feet of pipe.

hypochlorite requires 1 lb. of chlorine with 8 gallons of water. (e) The chlorine residual shall be tested by the testing company and verified by Cecil County no less than 24 hours after the main was completely full of chlorinated water. Valves and fire hydrants shall be operated to ensure full contact with the chlorinated

> 3) Disinfection – Slug Method (Superchlorination Method) (a) The slug method, in accordance with AWWA C651, may be utilized for disinfection.

(b) Approved forms of chlorine include liquid or gaseous chlorine, sodium hypochlorite solution, and calcium hypochlorite. (c) At a cap and fill pipe in the new main, the water and chlorine solution shall be introduced at constant rate such that the water will not have less than 100 ppm free chlorine. Air

within the line shall be fully evacuated in the filling process. (d) The chlorine residual shall be tested by the testing company and verified by Cecil County no less than 3 hours after the main was completely full of chlorinated water. Valves and fire hydrants shall be operated to ensure full contact with the chlorinated solution, during the filling operations.

(a) Hydrostatic testing shall be preformed in accordance with AWWA C600.

(b) After filling the main during the disinfection process, the main shall be hydrostatic tested by piping potable water into the main up to 200 psi measured at the highest elevation of the main in accordance with the pipeline profile shown on the contract documents. If pressure readings cannot be taken at the highest elevation, the pressure shall be increased to accommodate the difference between the highest elevation and test

elevation. An additional 0.43 psi shall be added to every additional foot in elevation (c) The test pressure shall be maintained and shall not drop for a minimum fifteen (15)

(d) If test did not pass, the Contractor shall remedy such defects and repeat the disinfection and hydrostatic test until approved by the County at the Contractor's expense for

(e) Hydrostatic testing against closed valves is prohibited.

d. Final Flushing

Upon completion of the disinfection and hydrostatic testing, the main shall be flushed to remove the chlorinated water. Flushing procedures shall be as follows: 1) The Contractor shall provide the County Inspector a minimum of 1 working day advanced written notice of flushing. The Contractor shall provide the County Inspector with size and linear feet of pipe, proposed discharge point, diameter of drain (if applicable), chlorine concentration, time and

date flushing will commence, and anticipated time duration of flushing. The County Inspector will in-turn notify the Division of Water and Sewer Maintenance Superintendent. 2) The discharge of chlorinated or dechlorinated water into the wastewater collection system is

3) In accordance with the Maryland Code of Regulations, the discharge of chlorinated water onto the ground surface or into storm drains is prohibited. In such cases, the water shall first be dechlorinated to achieve no more than 0.1 ppm free chlorine residual before disposal. 4) The main shall be considered flushed once the free chlorine residual has matched the chlorine residual in the water main from which the flushed water originated.

Bacteriological Testing 1) After final flushing, but before the main is tied into the existing system bacteriological tests shall be performed. The Contractor shall obtain the services of a Maryland-Certified water testing company to perform bacteriological testing. All test samples shall be collected in the presence of the Division of Water and Sewer Maintenance personnel. A minimum2-working day, advanced notification shall be made to the Maintenance Bacteriological tests shall be performed in accordance with AWWA C651and as specified herein. Prior to testing the free chlorine residual shall be between

2) Two consecutive sets of acceptable samples, taken at least 24 hours apart shall be collected. If acceptable, the main may be put into service. 3) A technician employed by the certified testing company shall collect all samples no less than 24 hours after the final flush. Samples shall be taken from a corporation stop with a copper-tube gooseneck assembly located at or near the end of the main. A blow-off drain, if provided as part of the testing apparatus may also be utilized.

set every branch and one set at the end of the main. 5) Samples shall be tested by the certified testing company for bacteriological quality in accordance with "The Standard Methods for the Examination of Water and Wastewater". 6) The sample results must be submitted to the Water and Sewer Maintenance Department within 24-hours of receipt. These results shall indicate free chlorine residual, concentration, the presence or absence of coliform organisms and a standard plate count. The samples shall pass if there are no presence of coliform organisms and the plate count is 500 cfu per ml or less. 7) If the results are not acceptable, the main shall be flushed and re-sampled. If the results of the second sampling are not acceptable, the Contractor shall repeat the disinfection and final flushing

4) Sample locations shall be a minimum one set at the beginning, one set every 1200 feet, one

procedures and re-test for bacteriological quality until a successful test. These results must be submitted to the Water and Sewer Maintenance Department within 24 hours

Continuity Testing for Non-Metallic Pipe 1) After backfilling, the County shall test at the Contractor's/Developer's expense, the tracer wire to demonstrate electrical continuity between valve boxes and through the length of the non-metallic pipeline installed. The Contractor shall schedule all tests with the County at least 48 hours in advance. Any discontinuity shall be located, repaired, and retested at the Contractor's expense until continuity is demonstrated. 2) On Capital Projects, the County will perform one continuity test at no cost to the Contractor.

Should the continuity test fail, the Contractor shall reimburse the County for all costs resulting from

END OF SECTION

such additional test so required until the continuity test passes.

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SED MANAGER MJK DESIGNER

DATE 11/22/2023

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BID SUBMISSION

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