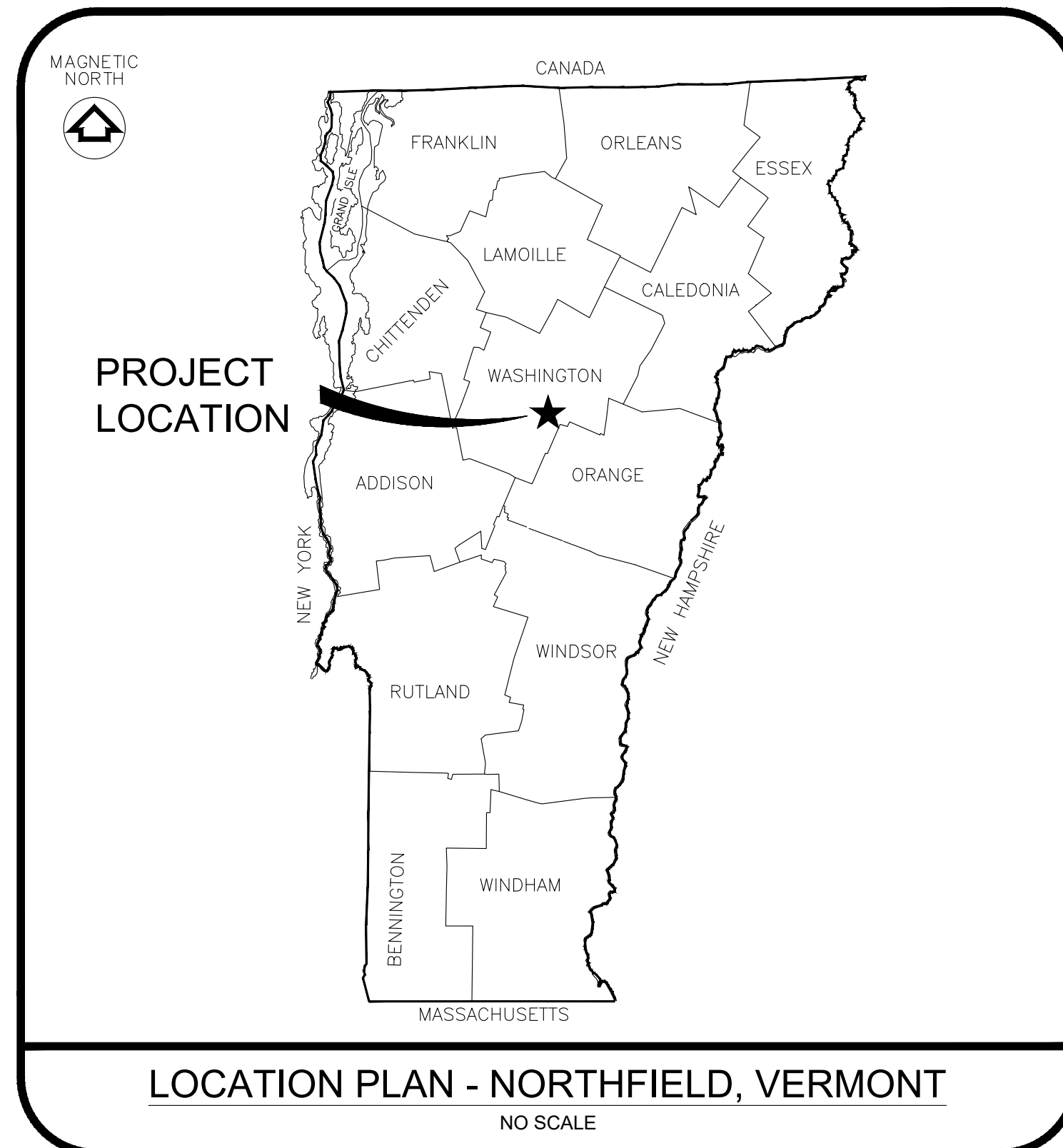


ROUTE 12 WATER MAIN REPLACEMENT

CONTRACT 2023-1

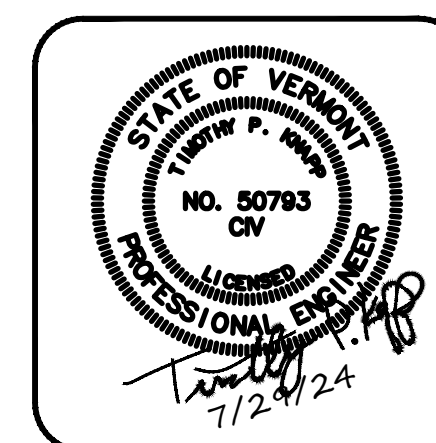
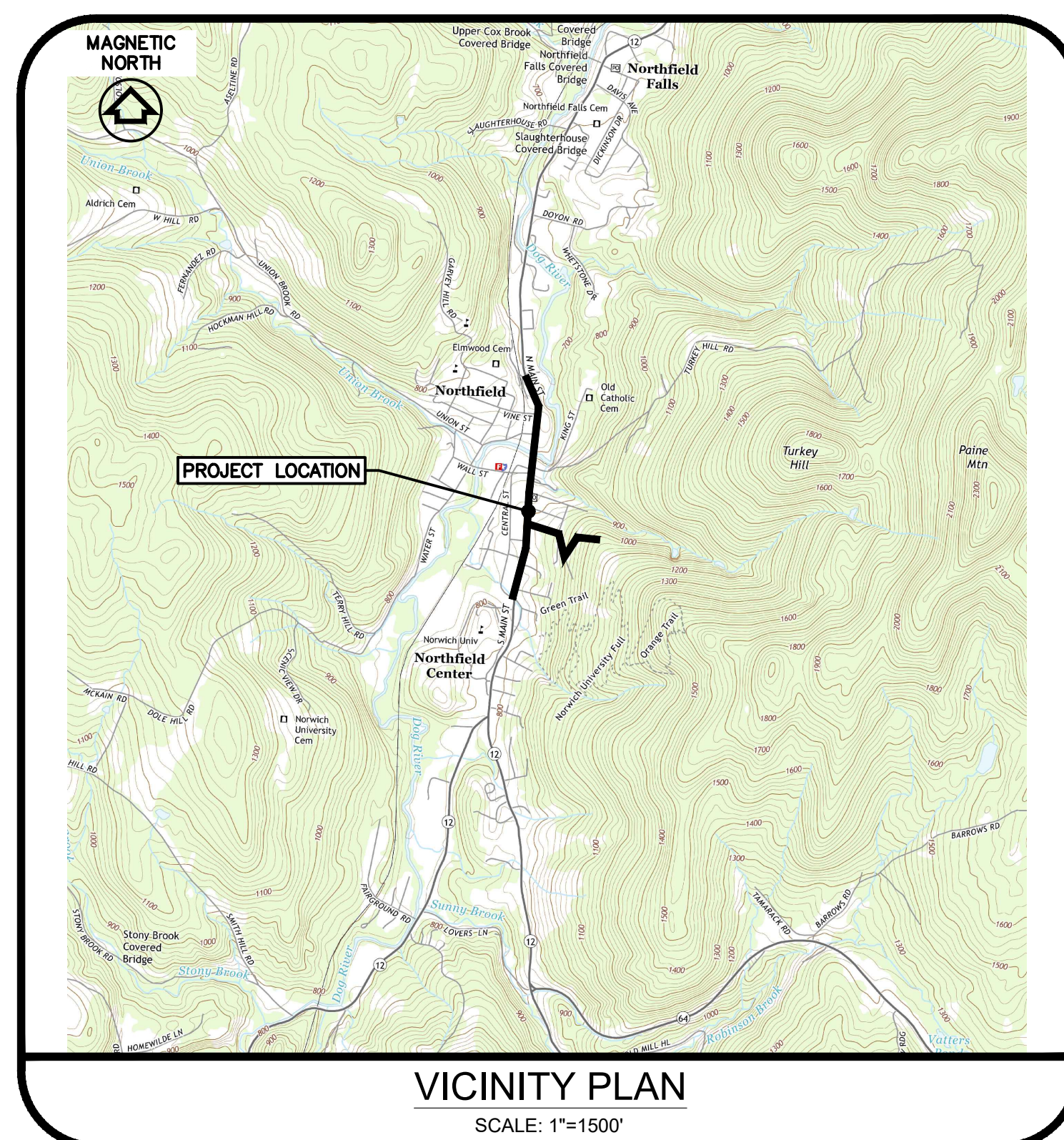
TOWN OF NORTHFIELD, VERMONT

JULY 29, 2024

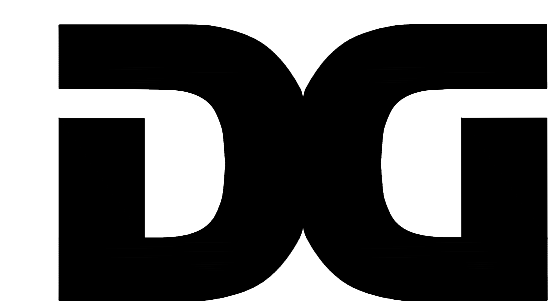


SHEET	TITLE
	COVER
G1	GENERAL NOTES, LEGEND, ABBREVIATIONS AND DETAILS
C1	WATER MAIN PLAN AND PROFILE - STATION 0+00 TO STATION 11+00
C2	WATER MAIN PLAN AND PROFILE - STATION 11+00 TO STATION 21+50
C3	WATER MAIN PLAN AND PROFILE - STATION 21+50 TO STATION 29+61
C4	WATER MAIN PLAN AND PROFILE - STATION 30+00 TO STATION 41+00
C5	WATER MAIN PLAN AND PROFILE - STATION 41+00 TO STATION 45+57
C6	WATER MAIN PLAN AND PROFILE - STATION 46+00 TO STATION 57+00
C7	WATER MAIN PLAN - STATION 57+00 TO STATION 66+58
C8	WATER MAIN PROFILE - STATION 57+00 TO STATION 66+58 AND STA 67+00 TO 69+67
C9	TYPICAL WATER DETAILS

PROJECT OFFICIALS	
	<i>TOWN MANAGER</i> JEFFERY SCHULZ
	<i>INTERIM UTILITIES SUPERVISOR</i> JIM RUSSO
	<i>SELECTBOARD</i> K. DAVID MAXWELL, CHAIR JULIE H. GOODRICH, VICE CHAIR CHARLIE MORSE LYDIA PETTY JOHN B. STEVENS



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GENERAL NOTES:

- EXISTING BASEMAP INFORMATION AND LOCATIONS OF EXISTING UTILITIES ARE BASED ON A FIELD SURVEY PERFORMED BY DUFRESNE GROUP IN NOVEMBER 2022 AND ON INFORMATION PROVIDED BY THE TOWN OF NORTHFIELD.
- RIGHT-OF-WAY INFORMATION IS SHOWN BASED ON THE TOWN OF NORTHFIELD TAX MAPS.
- SOIL BORINGS WERE PERFORMED BY MIKE'S BORING AND CORING IN 2019 AND J+J ENTERPRISES IN 2022. SOIL BORING LOCATIONS ARE SHOWN ON THE PLANS AND PROFILES. REFER TO THE SPECIFICATIONS FOR BORING LOGS.
- ALL CONSTRUCTION ACTIVITIES SHALL BE CONFINED TO LANDS OWNED BY TOWN OF NORTHFIELD, IN PUBLIC RIGHT-OF-WAY OR IN EASEMENT AREAS AVAILABLE TO THE TOWN OR CONTRACTOR.
- GENERALLY HEAVY OR DARK LINE WORK OR NOTES REFER TO PROPOSED IMPROVEMENTS. LIGHT LINE WORK OR SCREENED GENERALLY REFERS TO EXISTING FEATURES.
- ALL EXISTING UNDERGROUND UTILITIES WERE LOCATED USING THE BEST AVAILABLE INFORMATION. CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF ALL UTILITIES WHETHER OR NOT THEY ARE SHOWN ON THE PLANS. ALL REPAIRS TO DAMAGED UTILITIES SHALL BE MADE BY THE CONTRACTOR USING MATERIALS APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
- EXPLORATORY EXCAVATION IS REQUIRED TO LOCATE UNDERGROUND UTILITIES. CONTRACTOR SHALL USE EXTREME CAUTION TO PREVENT DAMAGE TO EXISTING UTILITIES. CONTRACTOR SHALL COORDINATE WITH DIG SAFE (1-888-DIG SAFE) A MINIMUM OF 48 HOURS PRIOR TO EXCAVATION.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL OVERHEAD AND UNDERGROUND ELECTRIC, CABLE AND TELEPHONE LINES AND TAKE NECESSARY PRECAUTIONS DURING CONSTRUCTION. CONTRACTOR SHALL CONTACT THE LOCAL POWER UTILITY AND TELEPHONE UTILITY REGARDING ANY NECESSARY SUPPORT OF ANY UTILITY POLES DURING CONSTRUCTION. LOCAL ELECTRIC UTILITY IS TOWN OF NORTHFIELD ELECTRIC DEPARTMENT. LOCAL PHONE UTILITY IS TDS.
- CONTRACTOR SHALL MAKE EVERY EFFORT NECESSARY TO ALLOW UNRESTRICTED ACCESS TO AND FROM DRIVEWAYS AND SIDE STREETS LOCATED ALONG THE PROJECT SITE.
- TECHNICAL SPECIFICATIONS PROVIDE NECESSARY INFORMATION AND ARE PART OF THE CONTRACT DOCUMENTS FOR THIS PROJECT.
- ALL DISTURBED GRASSED AREAS SHALL BE RESTORED TO CLASS A RESTORATION UNLESS OTHERWISE SHOWN. CONTRACTOR IS RESPONSIBLE FOR REMOVAL, CARE & REPLANTING OF ALL PLANTINGS AND SHRUBS DISTURBED DURING CONSTRUCTION.
- LISTING OF ADAPTERS, FITTINGS, NIPPLES, ETC IS FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. ADDITIONAL MATERIAL MAY BE REQUIRED.
- HORIZONTAL BENDS THAT MAY BE REQUIRED ARE SHOWN ON THE PLAN ONLY. VERTICAL BENDS THAT MAY BE REQUIRED ARE SHOWN ON THE PROFILE ONLY.
- MINIMUM VERTICAL CLEARANCE BETWEEN NEW WATER MAINS AND ALL EXISTING UTILITIES, EXCEPT SEWERS AND STORM DRAINS TO BE SIX (6) INCHES AT CROSSING LOCATIONS. FOR SEWERS AND STORM DRAINS SEE DETAIL ON SHEET C9.
- ALL BURIED FITTINGS MUST INCORPORATE A THRUST BLOCK. REFER TO THRUST BLOCK DETAILS, HYDRANT ASSEMBLY DETAIL AND TRENCH DETAIL SHOWN ON SHEETS C9. MECHANICAL JOINT FITTINGS, VALVES AND HYDRANTS SHALL INCORPORATE A MECHANICAL JOINT RETAINER GLAND IN ADDITION TO THRUST BLOCKS.
- MECHANICAL JOINT RESTRAINTS SHALL BE USED WHERE VALVES WILL BE SUBJECTED TO SERVICE PRESSURES ON ONE SIDE BEFORE BEING FULLY INCORPORATED INTO THE DISTRIBUTION SYSTEM. ANY ADJACENT PUSH-ON JOINTS SHALL BE FULLY RESTRAINED AS NECESSARY, OR AS REQUIRED BY THE ENGINEER.
- WATER MAINS TO HAVE 6 FEET MINIMUM COVER UNLESS OTHERWISE STATED OR SHOWN ON THE PROFILES. WHEN 6 FEET OF COVER CANNOT BE MAINTAINED 4" RIGID BOARD INSULATION SHALL BE USED. CONTRACTOR SHALL NOT INSTALL ANY PIPE WITH LESS THAN 6 FEET OF COVER WITHOUT APPROVAL FROM THE ENGINEER. DEPTH COVER SHALL NOT BE LESS THAN 4 FEET EVEN WITH INSULATION.
- CONTRACTOR IS RESPONSIBLE FOR FLUSHING, PRESSURE TESTING AND DISINFECTING ALL NEW WATER MAIN. ANY NECESSARY TEMPORARY CHLORINE INJECTION POINTS SHALL BE INSTALLED WHERE REQUIRED AND REMOVED UPON COMPLETION OF TESTING.
- WHERE THE WATER MAIN CROSSES OVER OR UNDER A STORM DRAIN, A FULL LENGTH OF D.I. WATER PIPE SHALL BE PLACED WITH THE MIDDLE OF THE PIPE CENTERED AT THE STORMDRAIN.
- REFER TO WATER MAIN CROSSING DETAIL ON SHEET C9 FOR SEPARATION DISTANCE REQUIREMENTS AND USE OF BELL JOINT CLAMPS. IN ALL LOCATIONS WHERE THE WATER MAIN IS WITHIN 6 FEET OF A CATCH BASIN, INSULATION SHALL BE INSTALLED VERTICALLY BETWEEN THE CATCH BASIN AND THE WATER MAIN.
- NEW WATER SERVICES ARE REQUIRED IF SHOWN. ALL SERVICES ARE EXPECTED TO CONTAIN LEAD GOOSE NECKS AND ARE PLANNED FOR REPLACEMENT. CONTRACTOR IS REQUIRED TO NOTIFY THE ENGINEER IN ADVANCE OF ANY CONNECTION TO AN EXISTING SERVICE, TO ENSURE THE ENGINEER HAS THE OPPORTUNITY TO OBSERVE AND DOCUMENT EXISTING SERVICE (I.E. THE PIPING THAT IS REMAINING FROM CURB STOP TO BUILDING). NEW WATER SERVICES SHALL BE ¾", OR MATCH EXISTING, WHICHEVER IS LARGER. NEW WATER SERVICES INCLUDE NEW CORPORATION, ¾" COPPER (OR AS OTHERWISE SHOWN ON THE PLANS) TO NEW CURB STOP PLACED AT PROPERTY LINE OR TOWN RIGHT OF WAY. FINAL LOCATION TO BE COORDINATED WITH THE OWNER AND ENGINEER.
- ANY PAVEMENT MARKINGS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED UNLESS OTHERWISE NOTED.
- TEMPORARY WATER MAY BE REQUIRED FOR SOME WATER SYSTEM CUSTOMERS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL SUBMIT A TEMPORARY WATER PLAN TO THE ENGINEER FOR REVIEW AND APPROVAL AT LEAST 1 WEEK PRIOR TO THE START OF CONSTRUCTION. ONCE THE NEW WATER MAIN IS TESTED, DISINFECTED AND ACCEPTED, THE CONTRACTOR SHALL CONNECT EXISTING WATER SERVICES TO THE NEW WATER MAIN. REFER TO THE SPECIFICATIONS FOR MORE DETAILS REGARDING REQUIREMENTS OF TEMPORARY WATER SERVICE.
- ALL WATER MAIN PIPES TO BE ABANDONED AS PART OF THIS PROJECT SHALL BE REMOVED AND DISPOSED OF AT ALL LOCATIONS WHERE THE PIPES ARE ENCOUNTERED WITHIN THE CONSTRUCTION TRENCH LIMITS, UNLESS NOTED OTHERWISE. PIPES SHALL BE DEWATERED AND PLUGGED OR CAPPED AT THE CONSTRUCTION TRENCH LIMITS.
- ONCE THE NEW WATER MAIN IS IN SERVICE AND ALL SERVICES AND INTERCONNECTIONS ARE COMPLETED, THE CONTRACTOR SHALL CLOSE ALL REMAINING VALVES ON THE WATER MAIN TO BE ABANDONED AND REMOVE THE VALVE BOXES TO A MINIMUM DEPTH OF 2 FEET BELOW GRADE IN AREAS WHERE ABANDONED WATER MAIN WAS NOT REMOVED.
- CONTRACTOR SHALL BE AWARE THAT THERE ARE SEVERAL EXISTING SEWER SERVICES IN THE PROJECT AREA THAT MAY BE ENCOUNTERED DURING THE CONSTRUCTION OF THE NEW WATER MAIN. FOR APPROXIMATE MAXIMUM SERVICE DEPTH, REFER TO SEWER MAIN INVERT INFORMATION LISTED AT EACH EXISTING SEWER MANHOLE STRUCTURE SHOWN ON THESE PLANS. ANY PIPE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL ADEQUATELY PLAN AHEAD FOR CROSSING THESE SERVICES AND PROVIDING REQUIRED SEPARATION DISTANCES, INCLUDING ADJUSTING THE ELEVATION OF THE NEW WATER MAIN.
- ALL TRAFFIC CONTROL AND SIGNAGE SHALL BE IN ACCORDANCE WITH MUTCD.
- OPERATION OF VALVES WILL BE PERFORMED BY THE OWNER'S STAFF ONLY.
- CONTRACTOR SHALL PROVIDE FULL WIDTH REMOVAL OF ALL EXISTING CONCRETE ROAD SUBBASE ON ROUTE 12 AS SHOWN IN THE DRAWINGS. THESE LIMITS ARE SHOWN ON THESE PLANS. CONCRETE AND ROAD SUBBASE, WHERE REMOVED, SHALL BE REPLACED WITH 12-INCHES OF COARSE CRUSHED GRAVEL AND 6-INCHES OF FINE CRUSHED GRAVEL. UPON COMPLETION OF UTILITY REPLACEMENT, THE PROJECT AREA (TO THE LIMITS SHOWN ON THE PLANS) SHALL BE FULL-WIDTH PAVED WITH 2.5" OF TYPE II BASE COURSE AND 1.5" OF TYPE III TOP COURSE PAVEMENT.
- AREAS OUTSIDE OF THE FULL-WIDTH PAVEMENT AREA SHALL BE RESTORED WITH PERMANENT TRENCH PATCH. REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- THE PROJECT AREA IS WITHIN A DESIGNATED URBAN BACKGROUND SOIL AREA. REFER TO SUPPLEMENTARY CONDITIONS IN SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING SOILS HANDLING AND DISPOSAL.
- CONTRACTOR SHALL INSTALL WATER MAIN FROM STA 26+00 TO 29+75 (SEE SHEET C3) IN 2024 IN CONJUNCTION WITH DUCT BANK CONSTRUCTION AS SHOWN ON VTRANS PLANS FOR PROJECT NO: BF 0241(58) INCLUDED IN THE APPENDICES OF THE SPECIFICATION.

ABBREVIATION LIST

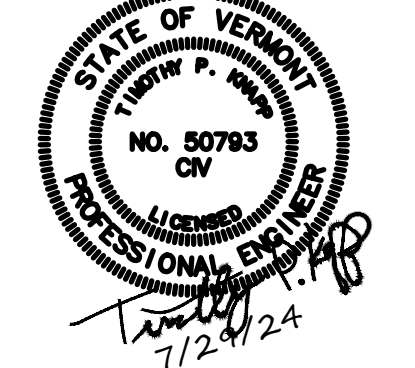
ABB	DESCRIPTION	ABB	DESCRIPTION
ASP	ASPHALT	IRS	IRON ROD SET
BLD	BUILDING	LP	LIGHT POLE
BM	BENCH MARK	LSC	LANDSCAPING
BNK	BANK	MB	MAIL BOX
BOT	BOTTOM	MH	MANHOLE
BRK	BROOK	MJ	MECHANICAL JOINT
CB	CATCH BASIN	MON	MONUMENT
CI	CAST IRON	MW	MONITORING WELL
CL	CENTER LINE	OHU	OVERHEAD UTILITY
CMP	CORRUGATED METAL PIPE	PC	POINT CURVE
CPP	CORRUGATED PLASTIC PIPE	PCC	POINT OF COMPLEX CURVE
CU	COPPER	POC	POINT ON CURVE
DI	DUCTILE IRON	POR	PORCH
DIA	DIAMETER	POT	POINT OF TANGENCY
DIST	DISTANCE	PT	POINT
DR	DRIVE	RCP	REINFORCED CONCRETE PIPE
DRI	DROP INLET	RD	ROAD
ED	EDGE	RIP	RIP RAP
EL	ELEVATION	SD	STORM DRAIN
END	END	SL	SEWER LINE
EOG	EDGE OF GRAVEL	SMH	SEWER MANHOLE
EOP	EDGE OF PAVEMENT	ST	STREET
EOW	EDGE OF WATER	STA	STATION
FD	FOUND	SW	STONE WALL
GND	GROUND	TBM	TEMPORARY BENCH MARK
GR	GUARD RAIL	TEL	TELEPHONE
GV	GATE VALVE	TOE	TOE OF SLOPE
HOR	HORIZONTAL ANGLE	TOP	TOP OF SLOPE
INV	INVERT	TP	TURNING POINT
IP	IRON PIPE	TRS	TREE LINE
IPF	IRON PIPE FOUND	TYP	TYPICAL
IPS	IRON PIPE SET	UG	UNDERGROUND
IRF	IRON ROD FOUND	UGE	UNDERGROUND ELECTRIC
		UP	UTILITY POLE
		WELL	WELL
		WL	WATER LINE
		WSO	WATER SHUTOFF

LEGEND

EXISTING		PROPOSED	
--- 981 ---	MINOR CONTOUR	—W—W—	WATER MAIN
--- 985 ---	MAJOR CONTOUR	—WS—WS—	WATER SERVICE
	PAVED ROAD/DRIVE	⊗	FIRE HYDRANT
	GRAVEL ROAD/DRIVE	⊕	WATER SHUTOFF
	ROAD CENTERLINE	⊗	WATER VALVE
	RIGHT OF WAY	┌ ┐ ┌ ┐ ┌ ┐	PIPE FITTINGS
—W—W—	WATER MAIN	⌢	PIPE CAP
—S—	SEWER MAIN	⊞	SOLID SLEEVE
—D—D—	STORM DRAIN	⌢⌢⌢	CLEARING LIMIT
—OHU—	OVERHEAD POWER		
—uge—	UNDERGROUND ELECTRIC		
—t—t—	UNDERGROUND TELEPHONE		
⌢⌢⌢	BUILDING/STRUCTURE OUTLINE		
⊗	STONE WALL		
⊕	GUARDRAIL		
⊗	WOOD FENCE		
⌢⌢⌢	DRAIN LINE DITCH		
⌢⌢⌢	TREE LINE		
⊗	FIRE HYDRANT		
⊕	WATER SHUTOFF		
⊗	WATER VALVE		
┌ ┐ ┌ ┐ ┌ ┐	PIPE FITTINGS		
⌢	PIPE CAP		
⊞	SEWER MANHOLE		
⊞	STORM MANHOLE		
⊞	CATCH BASIN		
⊞	WELL		
⊞	ELECTRICAL MANHOLE		
[E]	ELECTRICAL PANEL		
—	SIGNS		
⊕	LIGHTS		
—	UTILITY POLE/GUY WIRE		
MB	MAILBOX		
⊗	DECIDUOUS TREE		
⊗	CONIFEROUS TREE		
⊗	SHRUB/BUSH		
△ ¹	TRAVERSE		
⊕	BENCHMARK		
⊕ ^{B-1}	BORING		
←	FLOW DIRECTION		
○	BOLLARD		
⊙	FLAG POLE		



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			DATE	BY

ROUTE 12 WATER MAIN REPLACEMENT
 CONTRACT 2023-1

**GENERAL NOTES, LEGEND,
 AND ABBREVIATIONS**

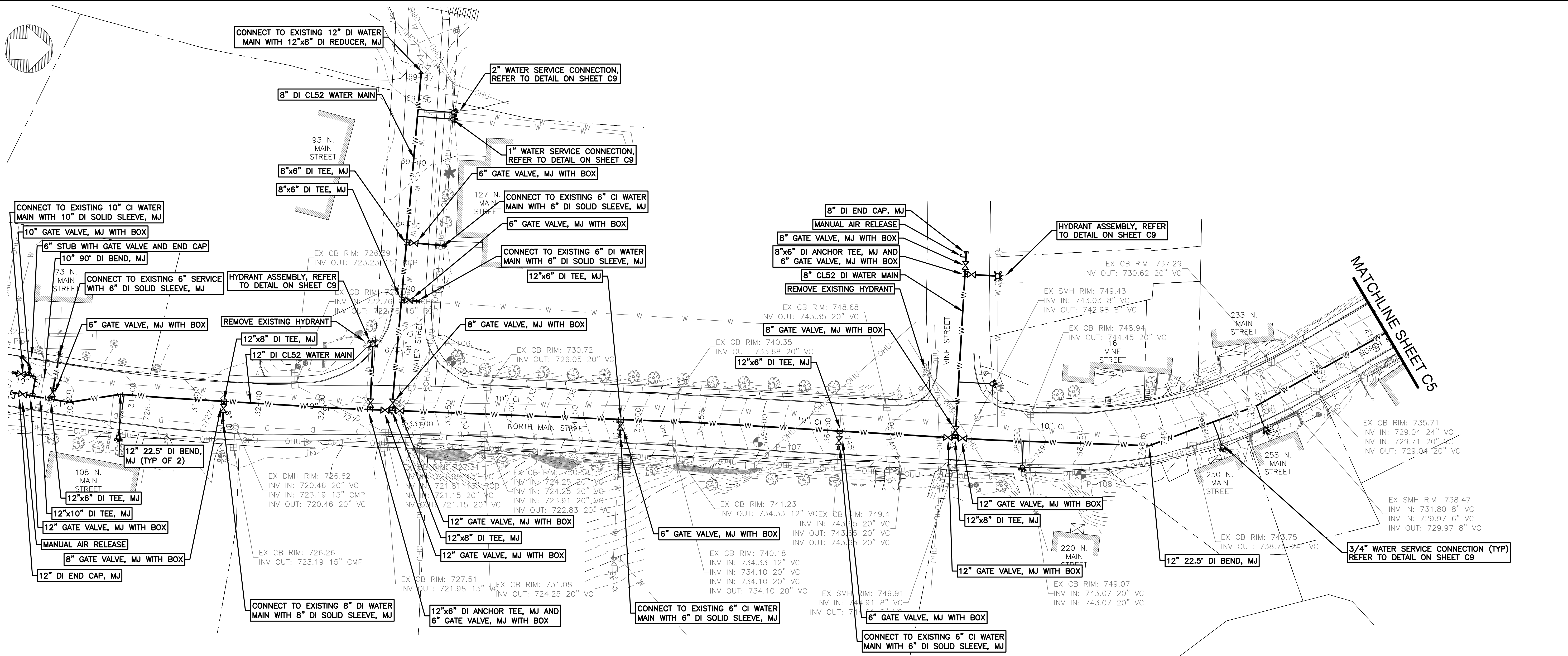
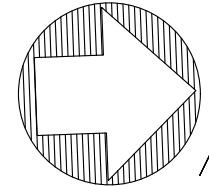
NORTHFIELD, VERMONT

Project #	4122021
Project Mgr.	N.R. JOHNSON
Design by	T.P. KNAPP
Drawn by	M.C. BISSELL
Reviewed by	T.P. KNAPP
Approved by	T.P. KNAPP
Date	JULY 29, 2024
Scale	AS SHOWN

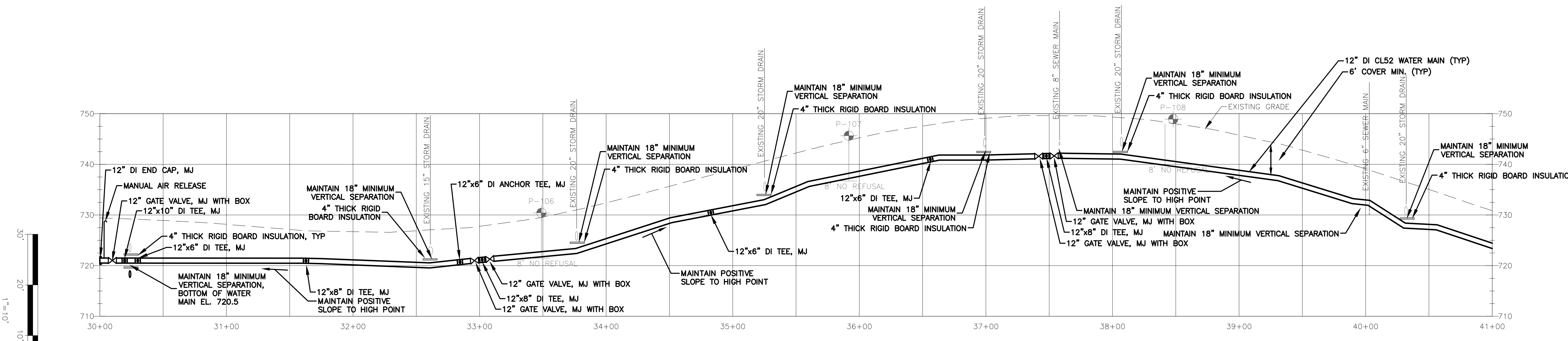
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G1

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WATER MAIN PLAN STA 30+00 TO 41+00
SCALE: 1"=40'



WATER MAIN PROFILE STA 30+00 TO 41+00
SCALE: H- 1"=40'
V- 1"=10'

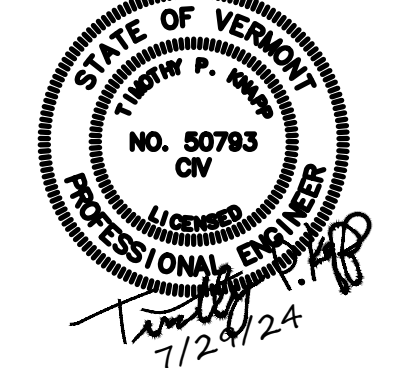
- NOTES:**
- REFER TO SHEET G1 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
 - REFER TO SHEET C9 FOR WATER DETAILS.
 - REFER TO SHEET C8 FOR WATER STREET PROFILE.

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ROUTE 12 WATER MAIN REPLACEMENT
CONTRACT 2023-1

WATER MAIN PLAN AND PROFILE
STA 30+00 TO STA 41+00

NORTHFIELD, VERMONT

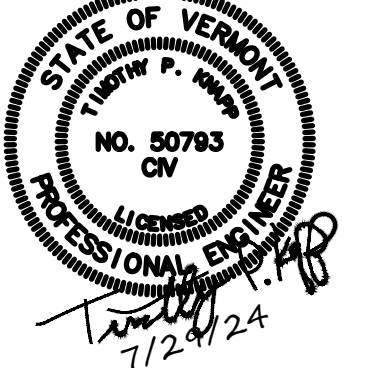
Project #	4122021
Project Mgr.	N.R. JOHNSON
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Approved by	T.P. KNAPP
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Scale	AS SHOWN

C4

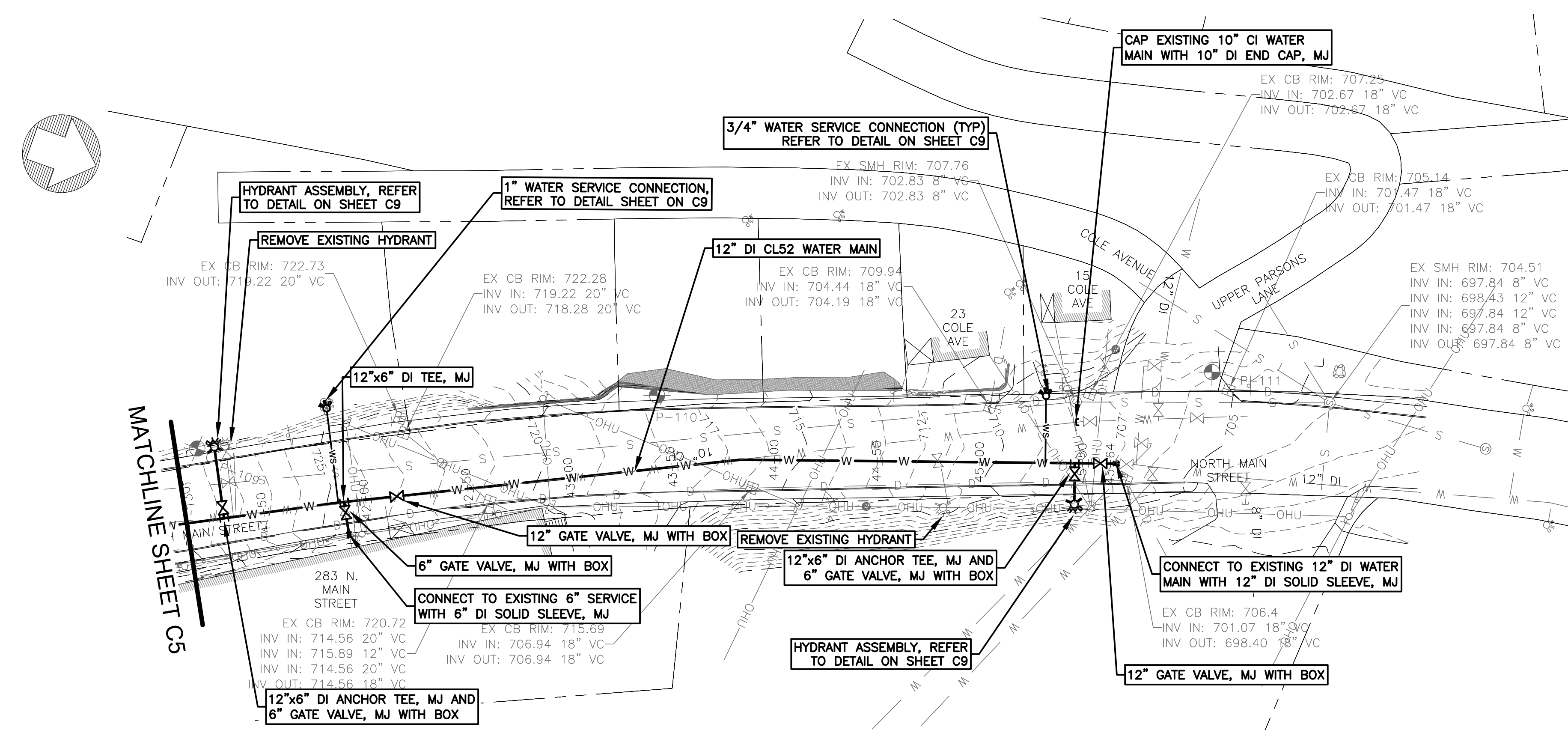
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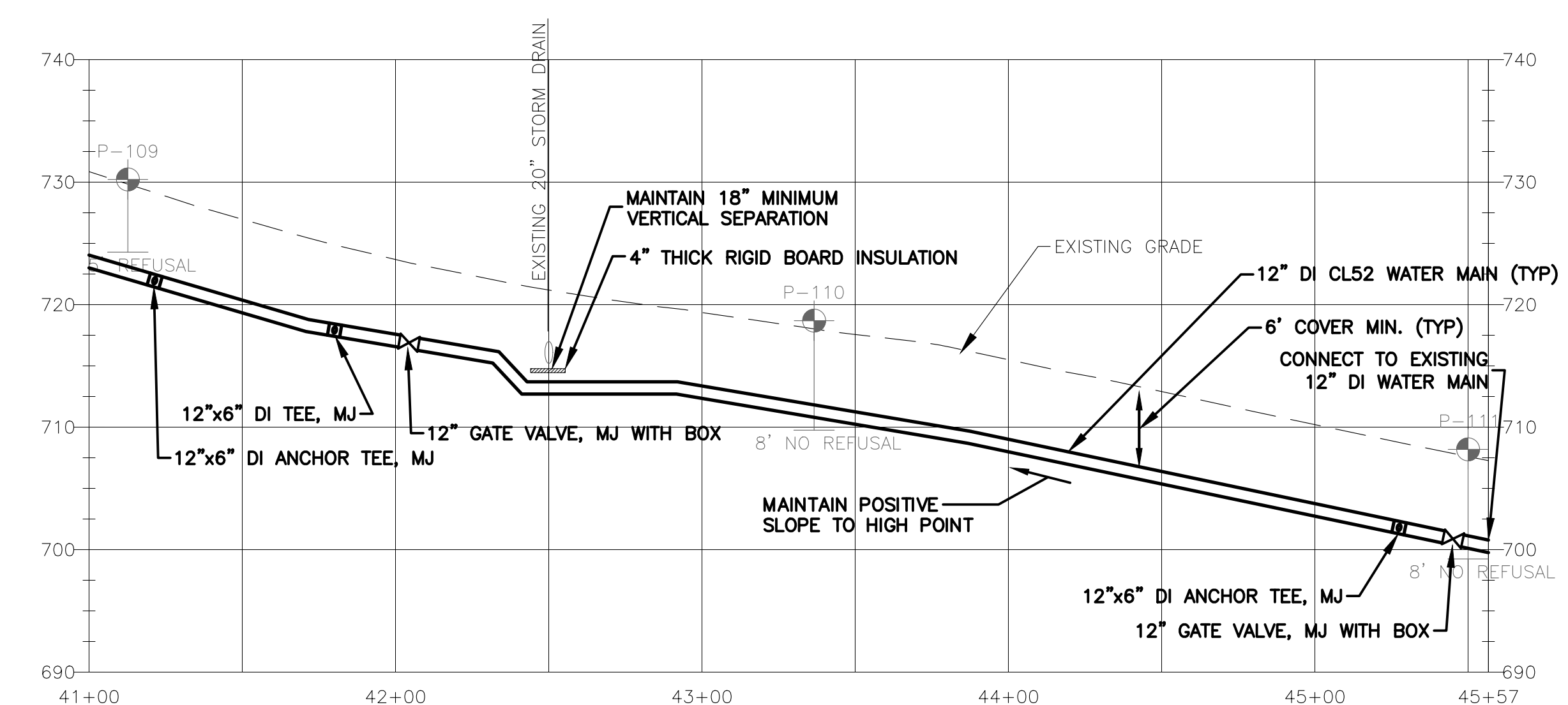
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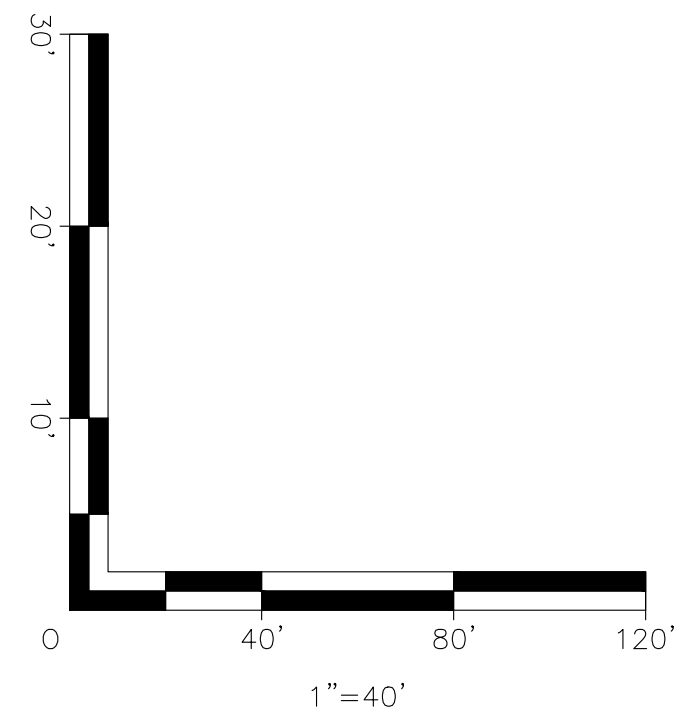
REVISIONS	
DATE	COMMENTS



WATER MAIN PLAN STA 41+00 TO 45+57
SCALE: 1"=40'



WATER MAIN PROFILE STA 41+00 TO 45+57
SCALE: H=1"=40'
V=1"=10'



- NOTES:**
- REFER TO SHEET G1 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
 - REFER TO SHEET C9 FOR WATER DETAILS.

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ROUTE 12 WATER MAIN REPLACEMENT
CONTRACT 2023-1

**WATER MAIN PLAN AND PROFILE
STA 41+00 TO STA 45+57**

NORTHFIELD, VERMONT

Project #	4122021
Project Mgr.	N.R. JOHNSON
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Date	JULY 29, 2024
Scale	AS SHOWN

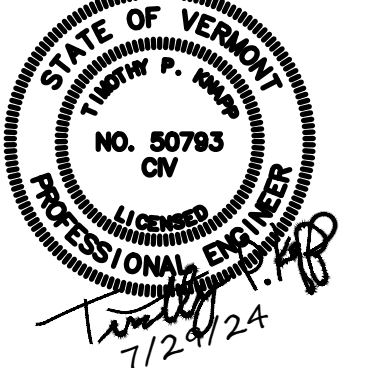
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ROUTE 12 WATER MAIN REPLACEMENT
CONTRACT 2023-1

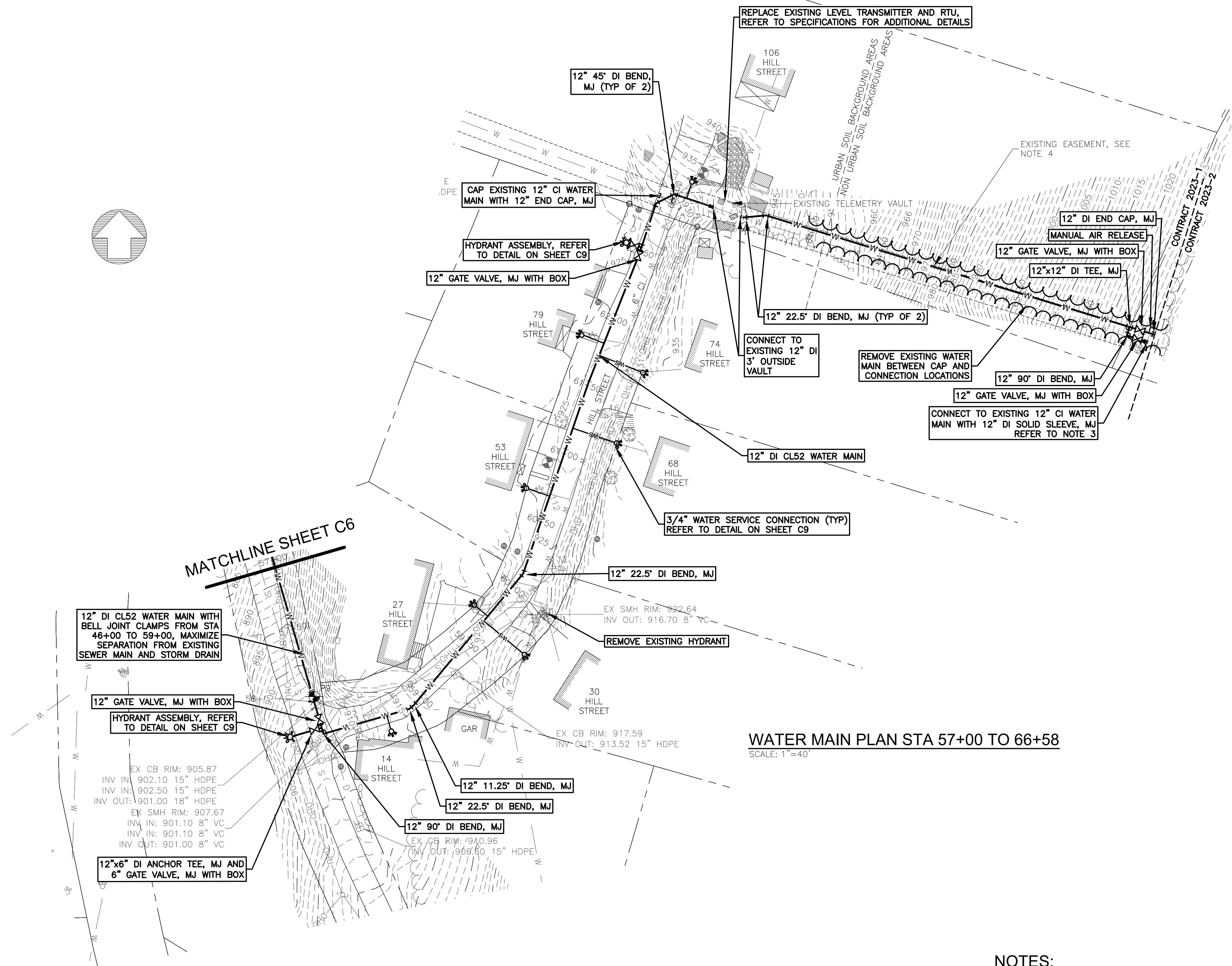
WATER MAIN PLAN
STA 57+00 TO STA 66+58

NORTHFIELD, VERMONT

Project #	4122021
Project Mgr.	N.R. JOHNSON
Design by	T.P. KNAPP
Drawn by	M.C. BISSELL
Reviewed by	T.P. KNAPP
Approved by	T.P. KNAPP
Date	JULY 29, 2024
Scale	AS SHOWN

C7

SHEET 8 OF 10



NOTES:

- REFER TO SHEET G1 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
- REFER TO SHEET C9 FOR WATER DETAILS.
- CONTRACTOR SHALL BE AWARE OF ADJACENT TANK REPLACEMENT PROJECT. DEPENDING ON CONSTRUCTION SCHEDULES, THE DETAILS FOR WATER MAIN INTERCONNECTION AT APPROXIMATE STA 66+58 MAY CHANGE. CONTRACTOR SHALL COORDINATE WITH ENGINEER FOR FINAL DETAILS.
- THE EXISTING AVAILABLE EASEMENT ON THE PROPERTY OF 106 HILL STREET IS 15 FEET WIDE CENTERED ON THE EXISTING WATER MAIN. THE EASEMENT SHALL BE FLAGGED PRIOR TO START OF CONSTRUCTION BY THE CONTRACTOR AND MAINTAINED FOR THE DURATION OF CONSTRUCTION WORK ON THIS PROPERTY. NO CONSTRUCTION ACTIVITY SHALL OCCUR OUTSIDE THIS EASEMENT, UNLESS PERMISSION FROM THE PROPERTY OWNER IS OTHERWISE COORDINATED BY THE CONTRACTOR. THE PROPOSED WATER MAIN IS SHOWN IN AN APPROXIMATELY LOCATION, BUT MUST BE CONSTRUCTED WITHIN THE EASEMENT AREA. REFER TO SUPPLEMENTARY CONDITIONS FOR OTHER ACCESS AND WORK RESTRICTIONS FOR THIS PROPERTY.

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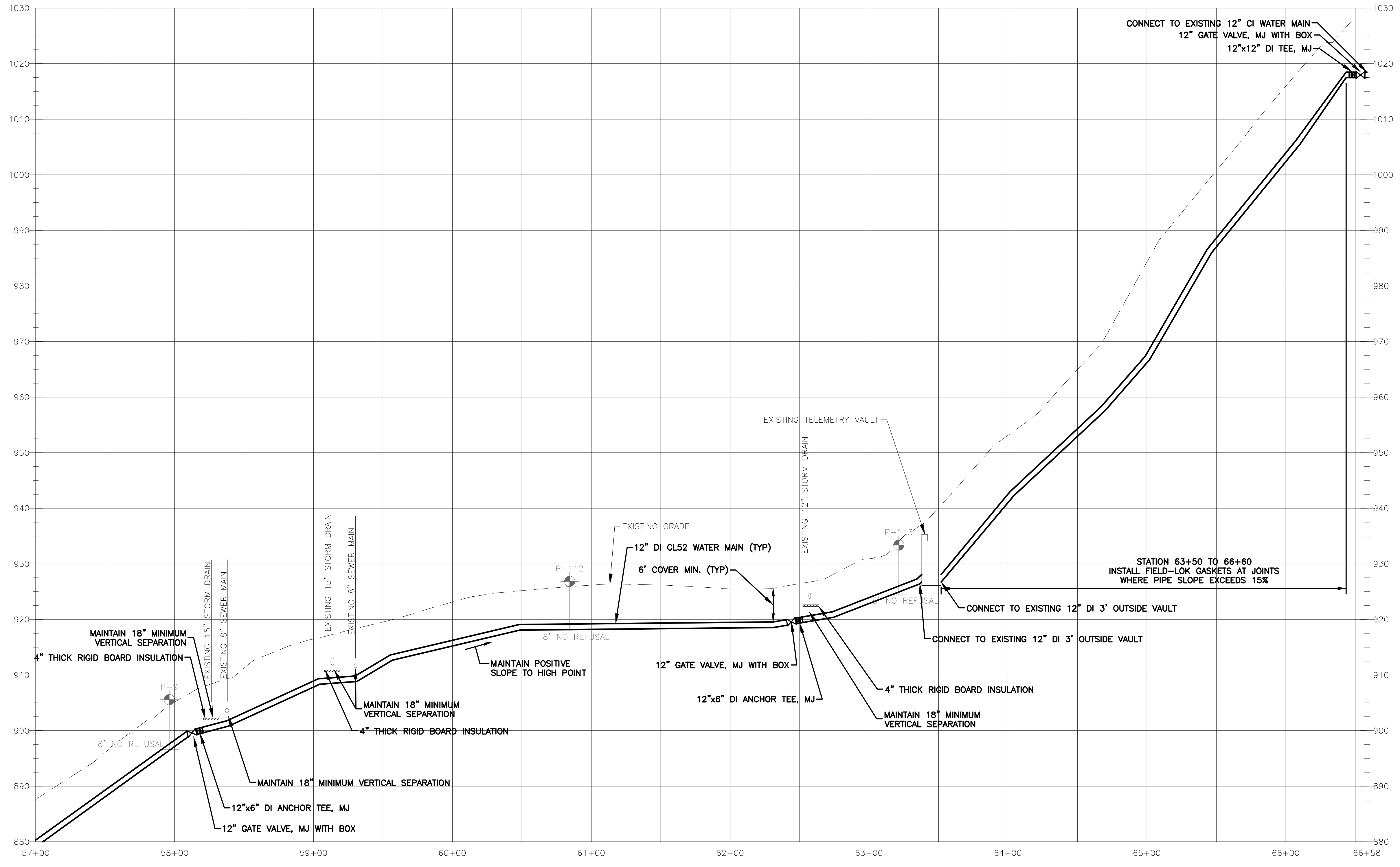
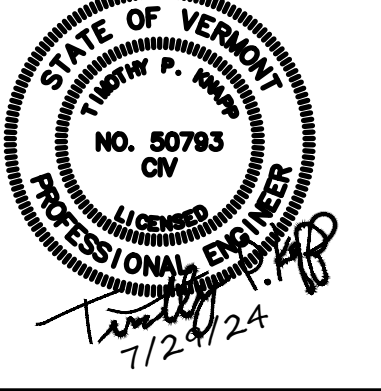
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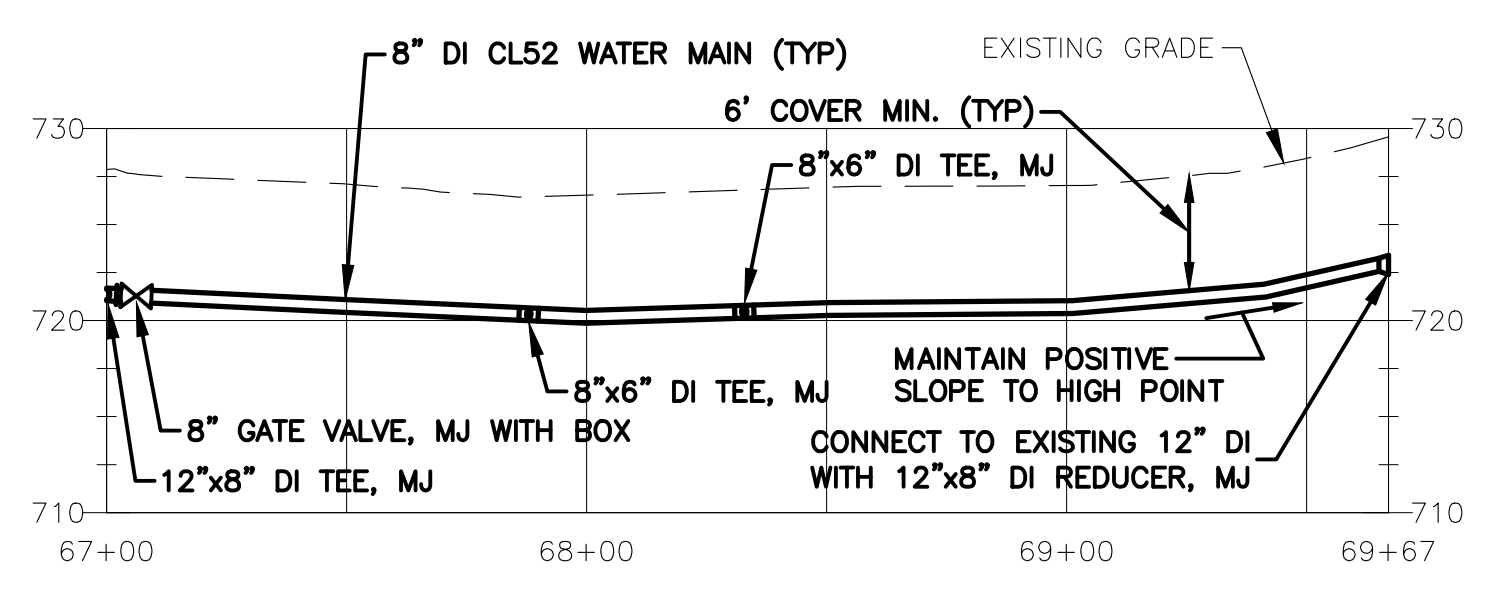
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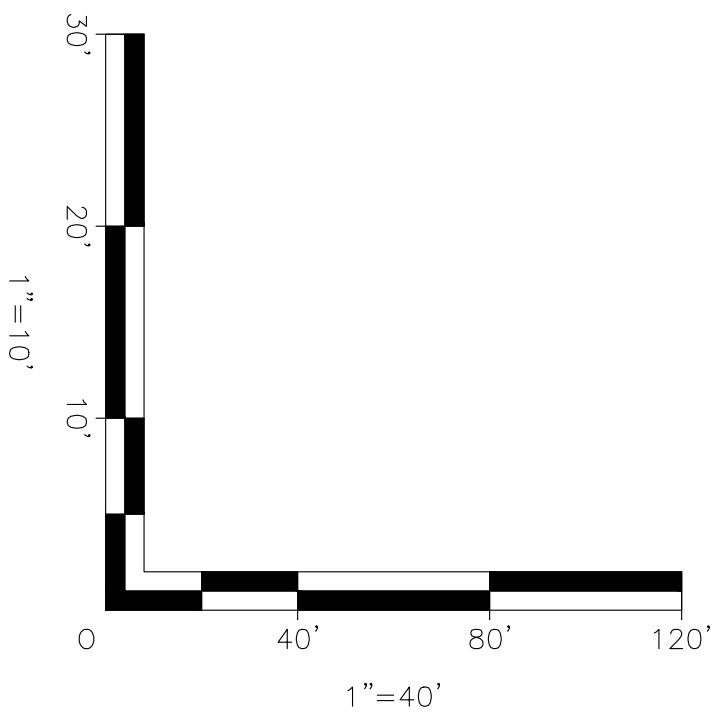
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WATER MAIN PROFILE STA 57+00 TO 66+58
 SCALE: H- 1"=40'
 V- 1"=10'



WATER MAIN PROFILE STA 67+00 TO 69+67
 SCALE: H- 1"=40'
 V- 1"=10'



- NOTES:**
- REFER TO SHEET G1 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
 - REFER TO SHEET C9 FOR WATER DETAILS.
 - CONTRACTOR SHALL BE AWARE OF ADJACENT TANK REPLACEMENT PROJECT. DEPENDING ON CONSTRUCTION SCHEDULES, THE DETAILS FOR WATER MAIN INTERCONNECTION AT APPROXIMATE STA 66+58 MAY CHANGE. CONTRACTOR SHALL COORDINATE WITH ENGINEER FOR FINAL DETAILS.

BID DOCUMENTS
 DO NOT REVISE

REVISIONS	
DATE	COMMENTS

ROUTE 12 WATER MAIN REPLACEMENT
 CONTRACT 2023-1

WATER MAIN PROFILE
 STA 57+00 TO STA 66+58 AND
 STA 67+00 TO 69+67

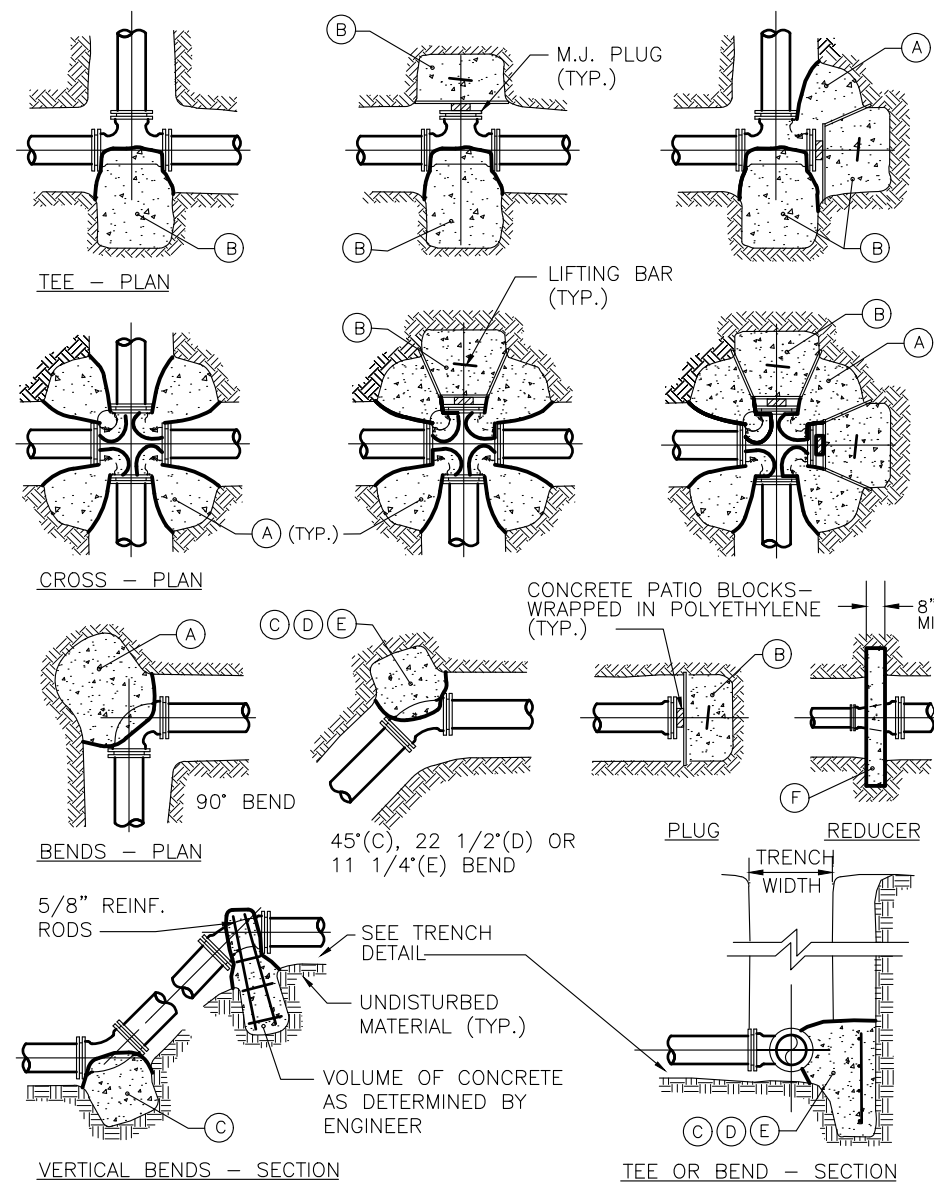
NORTHFIELD, VERMONT

Project #	4122021
Project Mgr.	N.R. JOHNSON
Design by	T.P. KNAPP
Drawn by	M.C. BISSELL
Reviewed by	T.P. KNAPP
Approved by	T.P. KNAPP
Date	JULY 29, 2024
Scale	AS SHOWN

C8

SHEET 9 OF 10

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THRUST BLOCK SCHEDULE
SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL

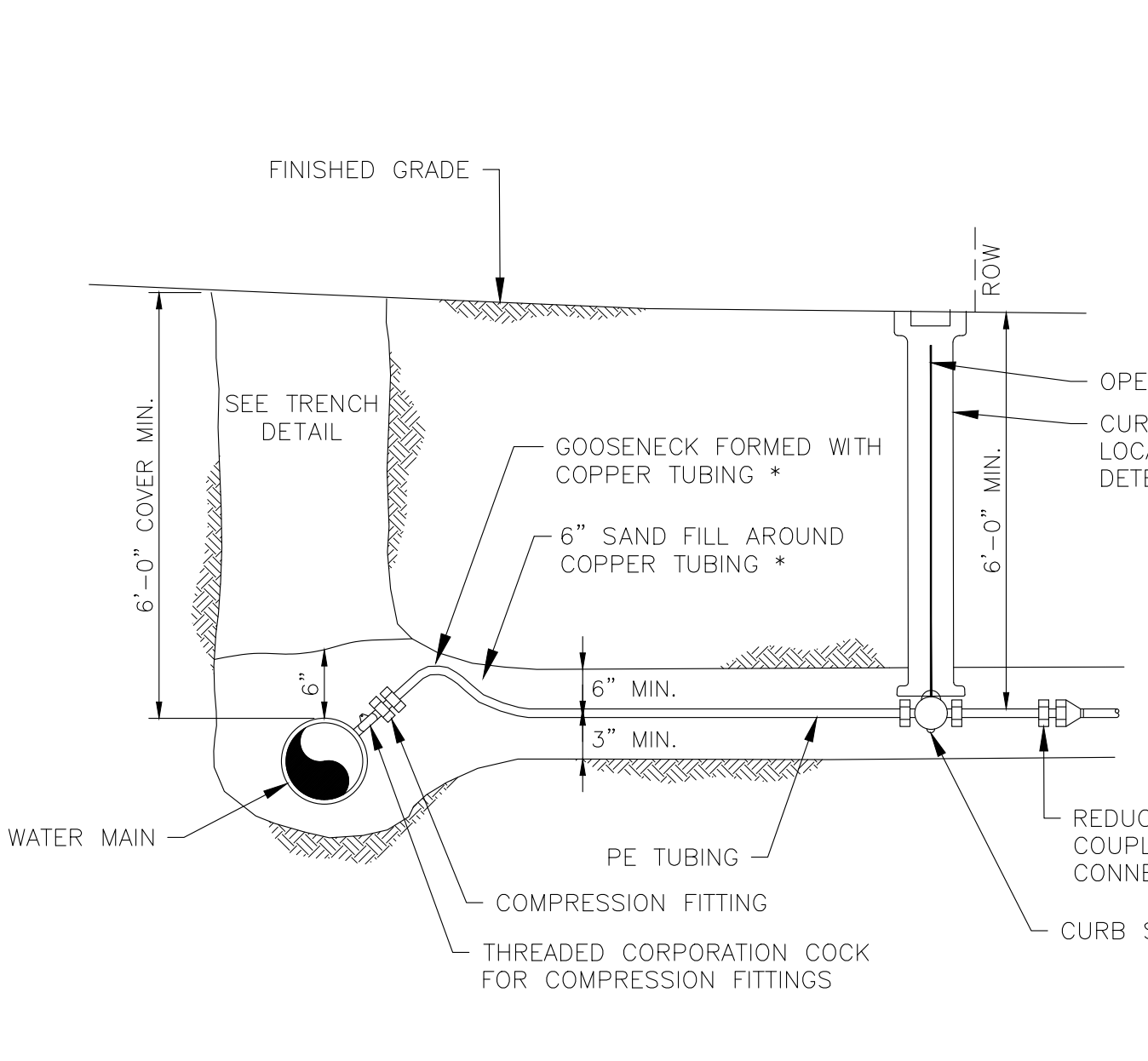
REACTION TYPE	PIPE SIZE											
	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"		
①	5	11	19	28	39	52	67	85	104	148		
②	4	8	13	20	28	37	48	60	74	105		
③	3	6	10	15	21	29	37	46	57	81		
④	2	3	6	8	11	15	19	24	29	41		
⑤	1	2	3	4	6	8	10	12	15	21		
⑥	-	4	10	16	24	30	41	47	54	77		

- NOTES:**
- THRUST RESTRAINT IS REQUIRED FOR ALL TEES, BENDS, REDUCERS, CAPS, PLUGS, OR CROSSES.
 - POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
 - ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
 - PLACE CONCRETE PATIO BLOCKS IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCK.
 - PRE-FORMED AND PRE-POURED THRUST BLOCKS ARE NORMALLY NOT ACCEPTABLE AND SHALL ONLY BE USED WHEN SPECIFICALLY APPROVED BY THE OWNER.
 - THE USE OF A MECHANICAL JOINT RESTRAINT SYSTEM DOES NOT REDUCE THE REQUIREMENTS SHOWN IN THIS DETAIL.
 - ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE OR BUILDING PAPER PRIOR TO INSTALLATION OF CONCRETE RESTRAINT.
 - IF THREADED ROD IS USED, IT SHALL BE ANSI A242 F550 PIPE RESTRAINT NUTS TO MATCH AWWA C111.
 - SIZES FOR REDUCERS SHOWN ARE BASED ON THE SMALLEST AVAILABLE RUN SIZE FOR A GIVEN PIPE SIZE.
 - INSTALL LIFT HOOKS INTO THRUST BLOCKS AT END CAPS AND PLUGS.
 - TEST PRESSURE TO BE 200 PSI MIN. AT LOW END OF THE TEST SECTION. SQUARE FEET OF CONCRETE THRUST BLOCKING FOR OTHER TEST PRESSURES IS DIRECTLY PROPORTIONAL TO THE ABOVE TABLE. FOR INSTANCE, AT 300 PSI TEST PRESSURE, THE NUMBERS SHOWN IN THE ABOVE TABLE ARE MULTIPLIED BY 1.5. SEE BELOW FOR EXAMPLE CALCULATION.
 - THRUST BLOCK AREA IS BASED ON A SOIL BEARING STRENGTH OF 1500 LBS/SF AND A SAFETY FACTOR OF 1.5. MULTIPLY THE BEARING AREA FROM ABOVE (WITH CONSIDERATION OF TEST PRESSURE) AND MULTIPLY BY THE FOLLOWING FACTORS TO DETERMINE BEARING AREA REQUIRED FOR VARIOUS SOIL CONDITIONS:

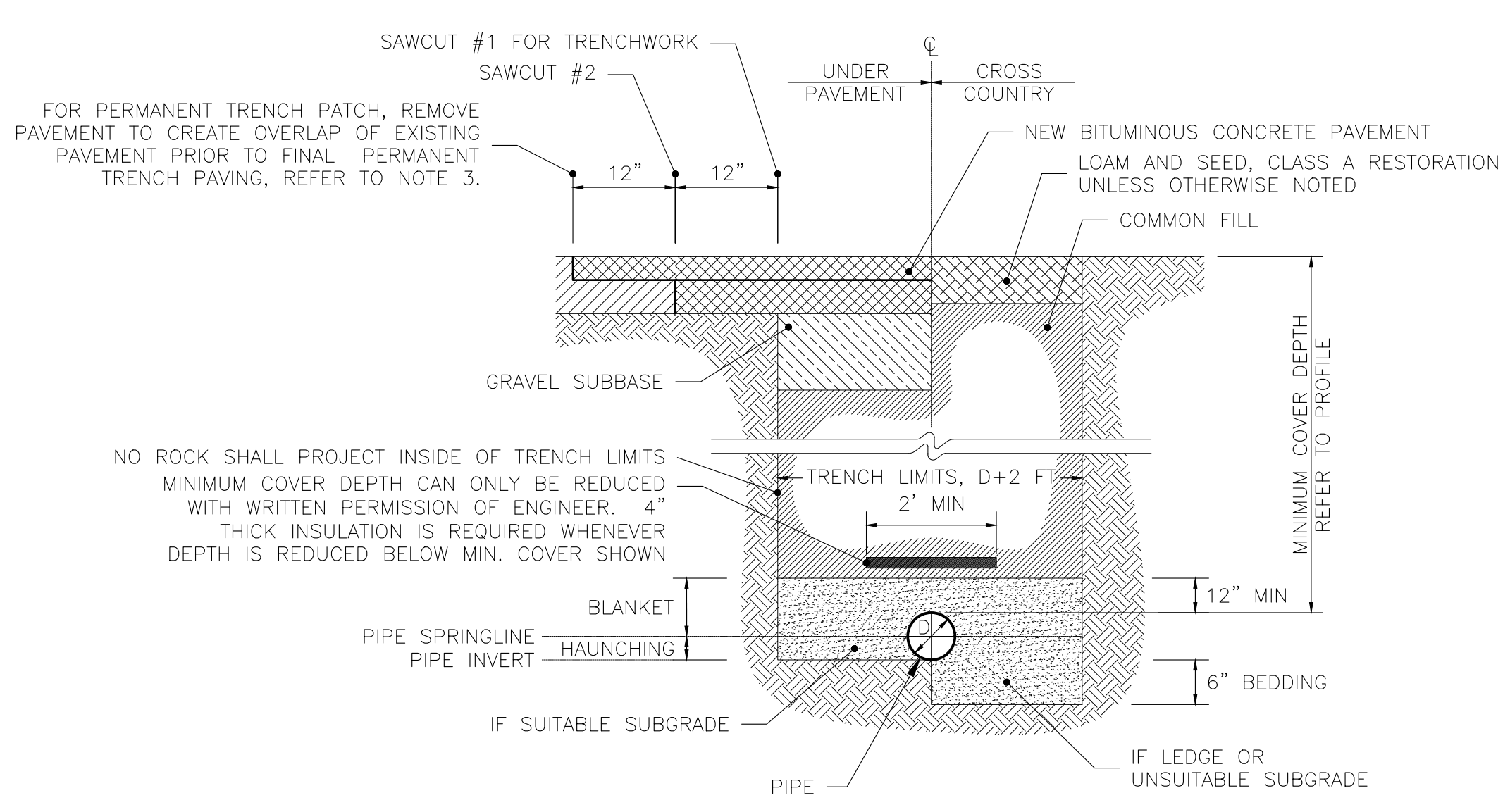
SOIL TYPE	BEARING CAPACITY (LB/SF)	FACTOR
SOFT CLAY	1,000	1.50
SILT	1,500	1.00
SANDY SILT	3,000	0.50
SAND	4,000	0.38
SANDY GRAVEL	5,000	0.30
SANDY CLAY	6,000	0.25
GRAVEL W/ ROCK	7,000	0.21
HARD CLAY	9,000	0.17

EXAMPLE: AN 8-INCH 90° BEND IN SANDY GRAVEL SOILS, TEST PRESSURE OF 200 PSI: AREA REQUIRED = 19 SF x 1 x 0.30 = 5.7 SF

THRUST BLOCK DETAILS AND NOTES
NOT TO SCALE

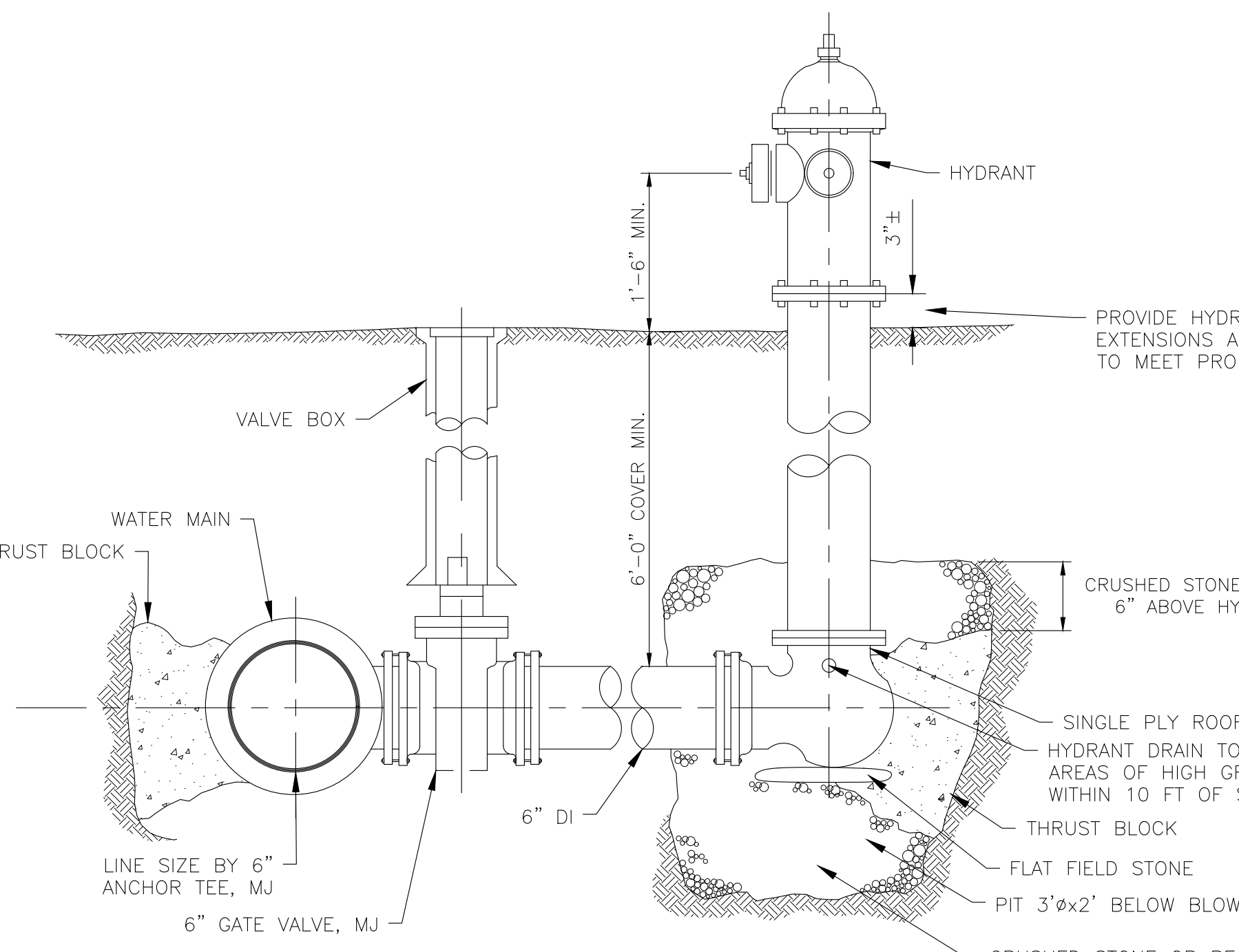


TYPICAL WATER SERVICE CONNECTION
NOT TO SCALE



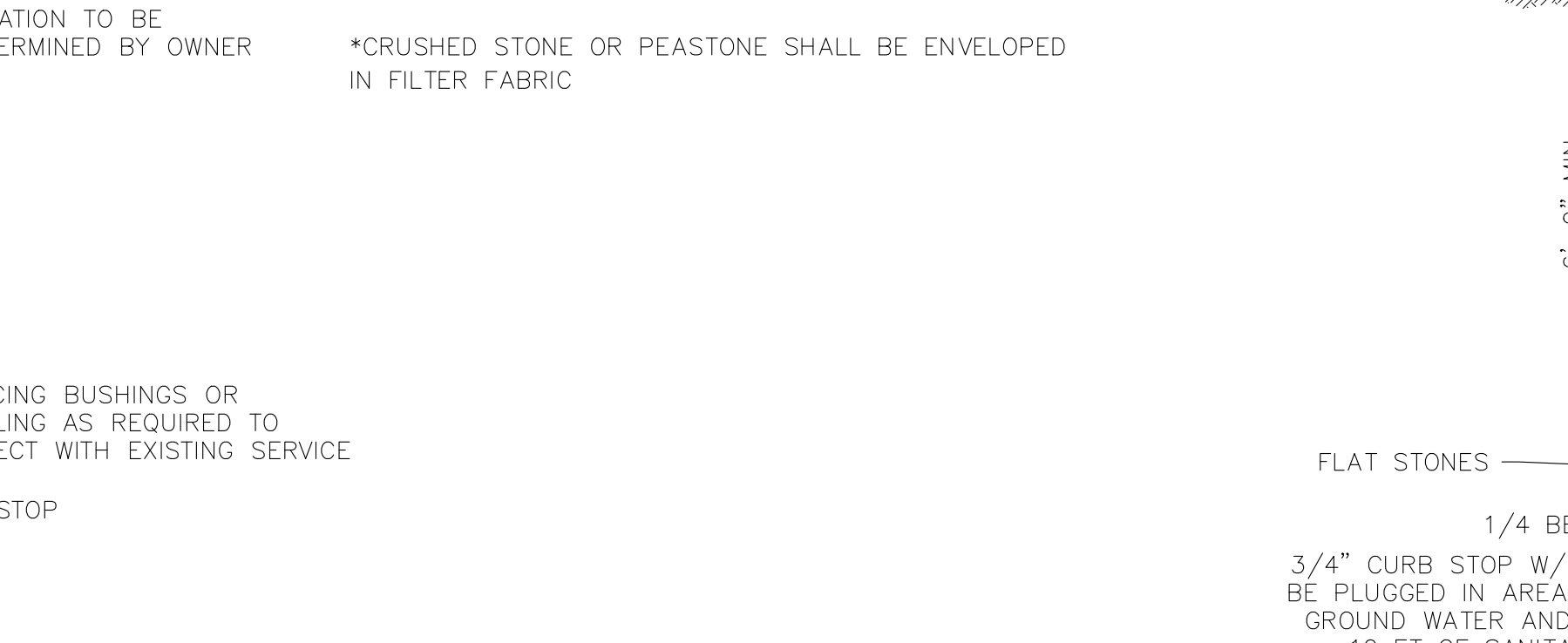
WATER MAIN TYPICAL TRENCH DETAIL
NOT TO SCALE

- NOTES:**
- REFER TO SPECIFICATIONS FOR PAVEMENT THICKNESS REQUIREMENTS.
 - REFER TO THE SPECIFICATIONS FOR COMPACTION, PAY LIMITS, AND SPECIALTY MATERIALS FOR BLANKET, HAUNCHING, BEDDING, AND GRAVELS. HAND TAMP HAUNCHING TO REMOVE ALL VOIDS UNDER PIPE.
 - REMOVE EXISTING PAVEMENT TO A DEPTH EQUAL TO NEW WEARING COURSE PAVEMENT THICKNESS FOR A MINIMUM DISTANCE OF 12-INCHES FROM SAWCUT #2. CLEAN SURFACES AND TACK COAT ALL EDGES OF EXISTING PAVEMENT.
 - TRENCH WIDTH SHALL BE SUFFICIENT TO ALLOW PIPE TO BE LAID AND JOINED PROPERLY AND FOR PLACEMENT AND COMPACTION OF BEDDING. TRENCH SUPPORT SHALL BE ADEQUATE TO PERMIT SAFE ACCESS BY INSPECTOR FOR COMPACTION SAMPLES.
 - WHERE PIPE IS INSTALLED IN GRAVEL SHOULDER OR IN GRAVELED ROAD, GRAVEL SUBBASE MATERIAL AND COMPACTION SHALL BE AS SPECIFIED.
 - REFER TO THE NOTES ON SHEET G1 AND SECTION 02740 FOR PAVEMENT RESTORATION REQUIREMENTS.

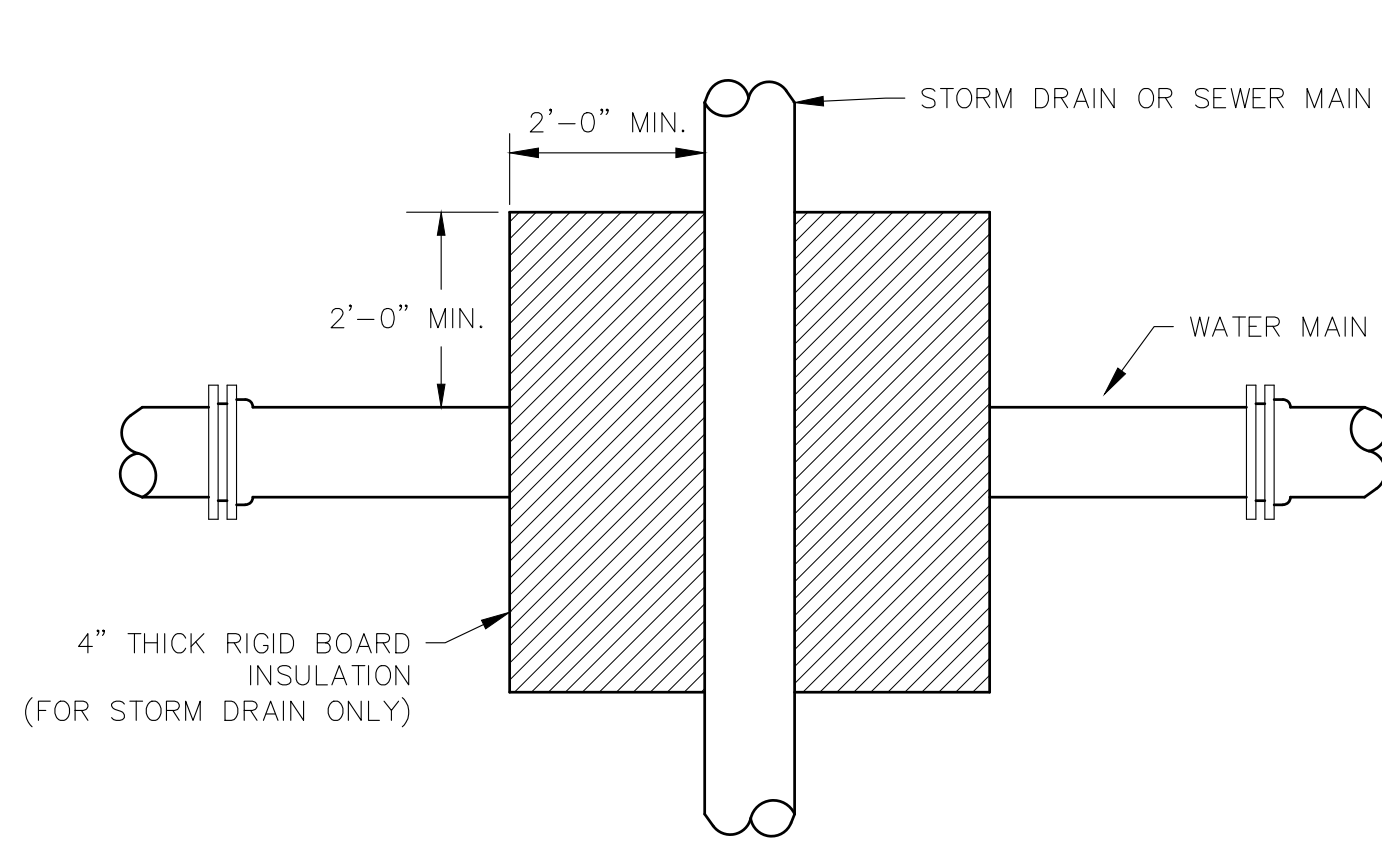


HYDRANT ASSEMBLY DETAIL
NOT TO SCALE

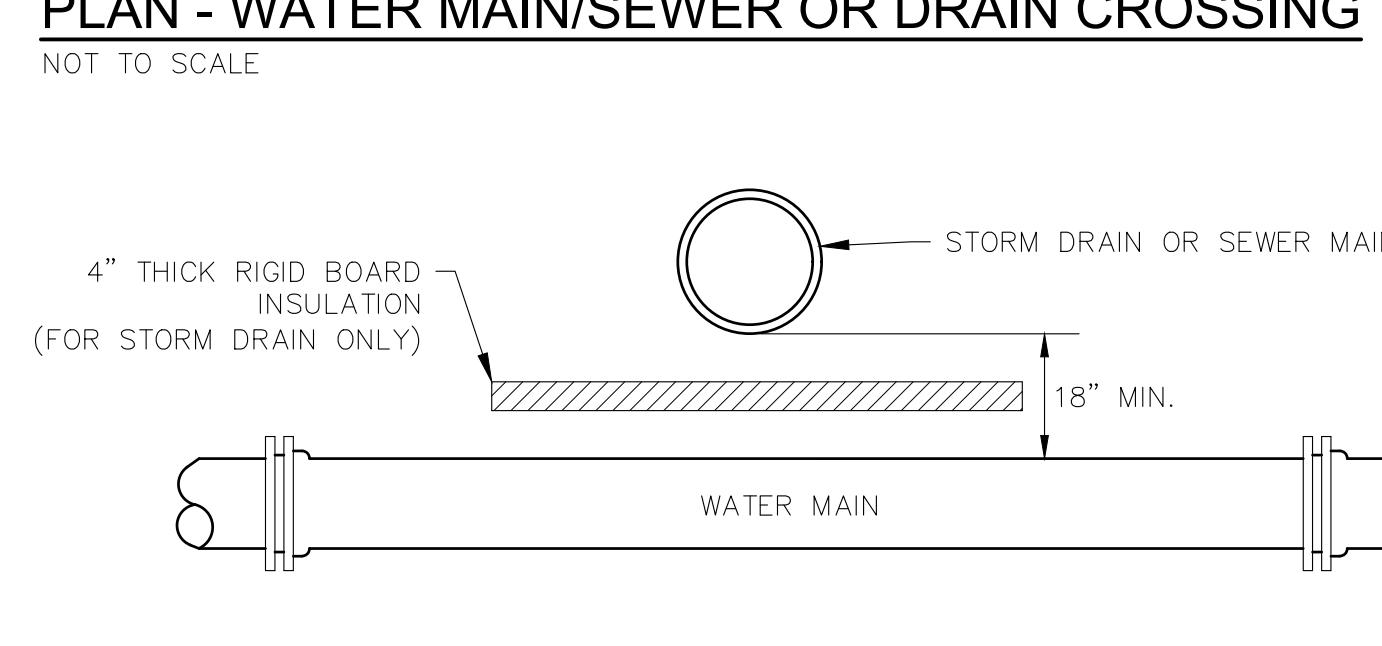
*CRUSHED STONE OR PEASTONE SHALL BE ENVELOPED IN FILTER FABRIC



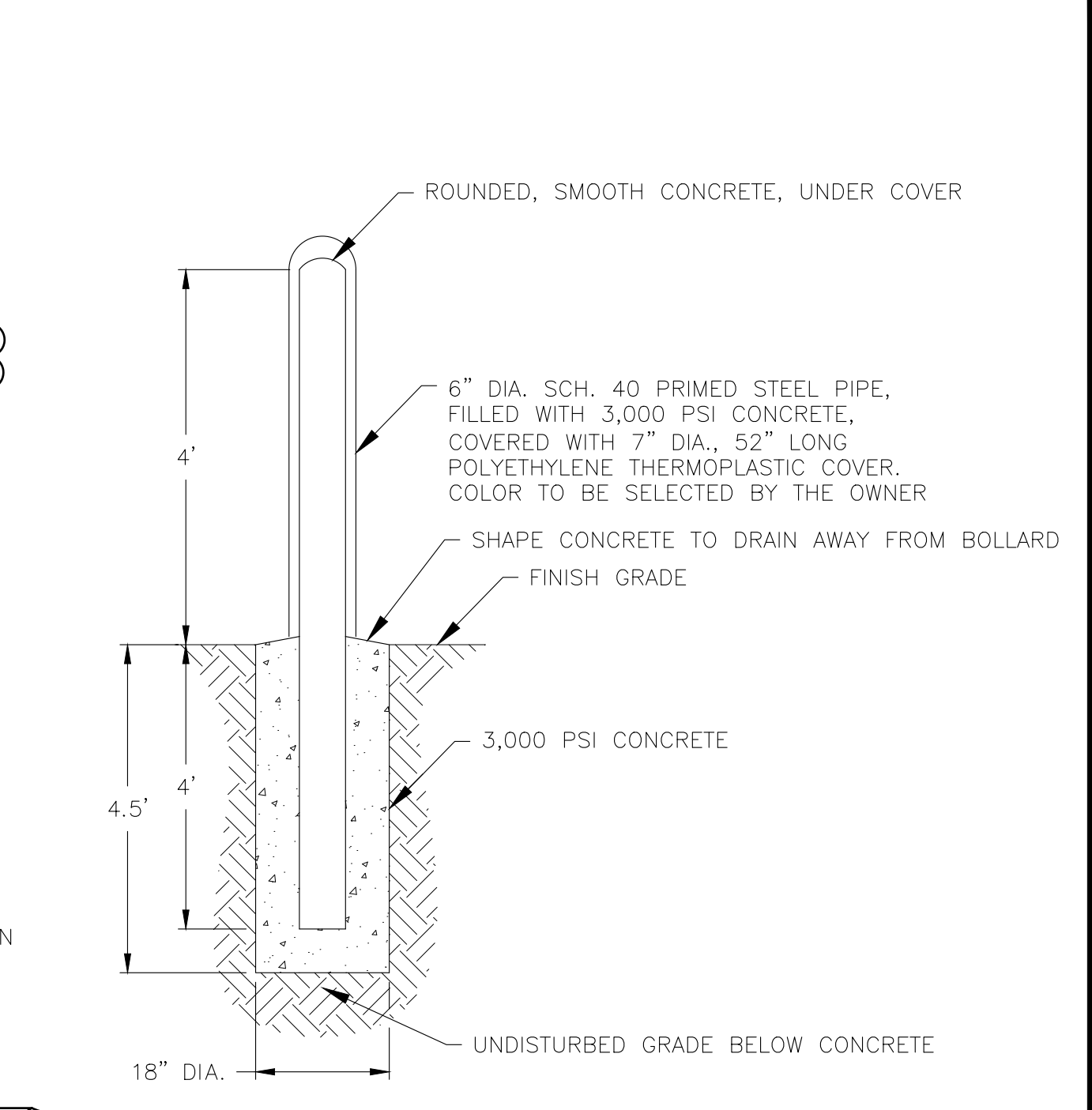
MANUAL AIR RELEASE
NOT TO SCALE



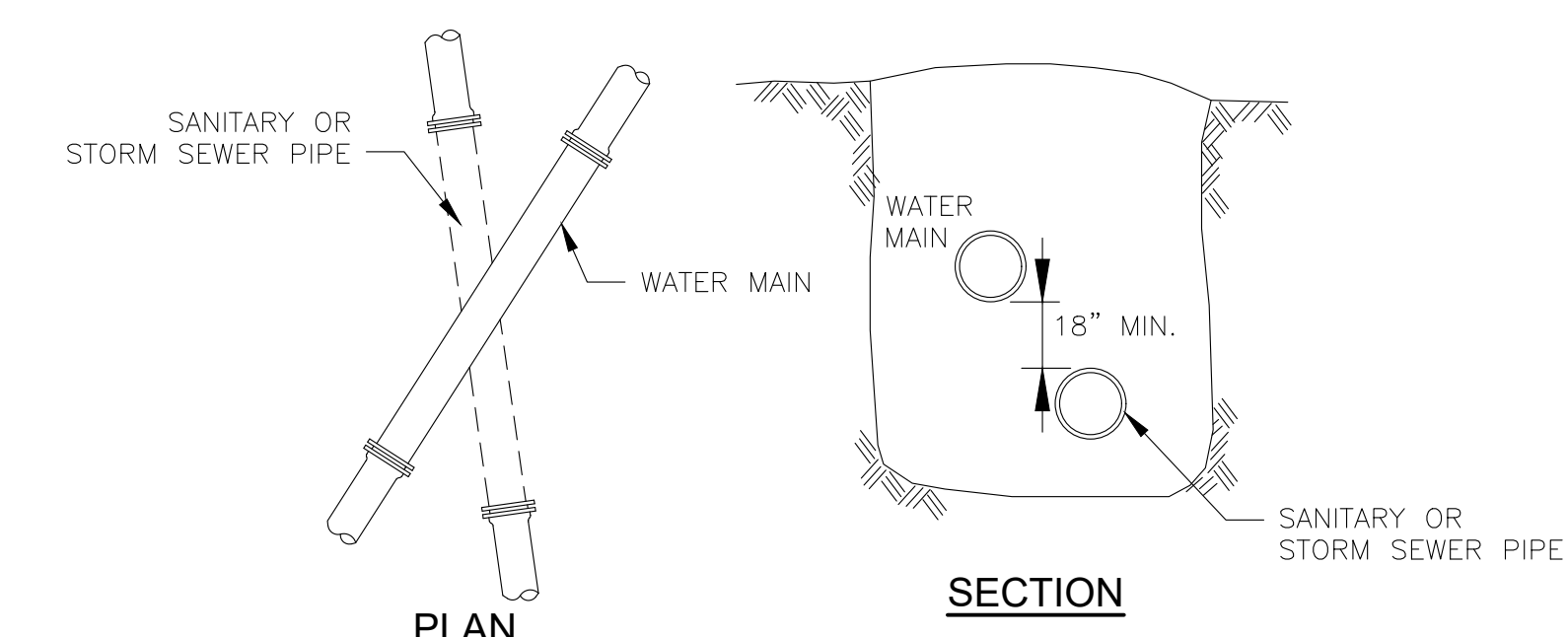
PLAN - WATER MAIN/SEWER OR DRAIN CROSSING
NOT TO SCALE



SECTION - WATER MAIN/SEWER OR DRAIN CROSSING
NOT TO SCALE



TYPICAL BOLLARD DETAIL
NOT TO SCALE

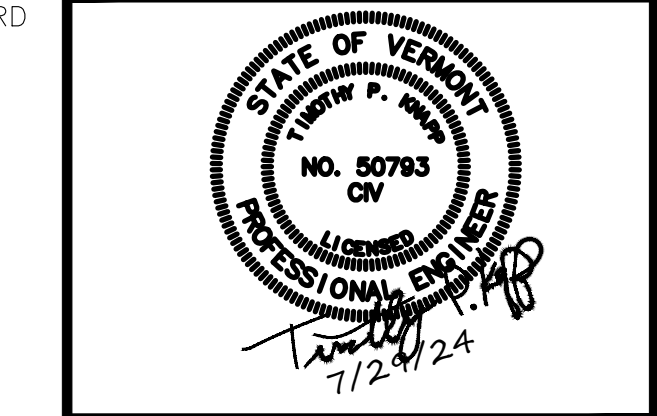


PLAN SECTION

- NOTES:**
- PARALLEL INSTALLATION: WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED MANHOLE OR SANITARY SEWER. THIS DISTANCE CAN BE REDUCED TO 5 FEET FOR STORM SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
 - CROSSINGS: WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SANITARY OR STORM SEWER. THIS SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SEWER. AT CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE. IF THE SEWER MAIN IS OVER THE WATER MAIN, THE FIRST SEWER PIPE JOINTS ON EACH SIDE OF THE WATER MAIN MUST BE CONCRETE ENCASED. SPECIAL STRUCTURAL SUPPORT FOR THE WATER AND SEWER PIPES MAY BE REQUIRED. WATER MAINS SHALL NOT PASS THROUGH SEWER MANHOLES OR BE SUBMERGED IN BASINS CONTAINING SEWAGE OR OTHER GROSSLY CONTAMINATED OR HAZARDOUS MATERIAL.
 - EXCEPTION: THE ENGINEER MUST SPECIFICALLY APPROVE ANY VARIANCE FROM THESE REQUIREMENTS WHEN IT IS IMPOSSIBLE TO OBTAIN THE SPECIFIED SEPARATION DISTANCES. SUCH DEVIATION MAY ALLOW INSTALLATION OF THE WATER MAIN CLOSER TO A SEWER, PROVIDED THAT THE WATER MAIN IS LAID IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SEWER AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
 - BELL JOINT CLAMPS ON THE PUSH-ON JOINTS OF DUCTILE IRON WATER MAIN SHALL BE UTILIZED IN LOCATIONS WHERE THE MINIMUM SEPARATION REQUIREMENTS CANNOT BE MET. ENGINEER MUST BE NOTIFIED AND APPROVE OF EACH INDIVIDUAL USE PRIOR TO INSTALLATION.

SANITARY AND/OR STORM SEWER PIPE AND WATER MAIN CROSSING DETAIL
NOT TO SCALE

DG
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REVISIONS	DATE	COMMENTS	BY	TPK
	8.21.23	NOTES ON CROSSING DETAIL UPDATED		

ROUTE 12 WATER MAIN REPLACEMENT
CONTRACT 2023-1
TYPICAL WATER DETAILS
NORTHFIELD, VERMONT

Project #	4122021
Project Mgr.	N.R. JOHNSON
Design by	T.P. KNAPP
Drawn by	M.C. BISSELL
Reviewed by	T.P. KNAPP
Approved by	T.P. KNAPP
Date	JULY 29, 2024
Scale	AS SHOWN

BID DOCUMENTS
DO NOT REVISE
C9
SHEET 10 OF 10