Town of Waterloo
Indiana

Standard Utility Details

www.jheng.com

Date Issued: August 2018

Table of Contents

Table of Contents (continued)

ALL SEWER PIPING SHALL BE TESTED IN ACCORDANCE WITH INDIANA CODE AND IDEM REGULATIONS.

AIR PRESSURE ACCEPTANCE TEST

1) CONTRACTOR SHALL PERFORM AN AIR PRESSURE TEST ON ALL GRAVITY SEWER PIPE IN ACCORDANCE WITH ASTM F-1417 SPECIFICATIONS.
2) THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT, MATERIALS, LABOR, AND CONDUCT THE TEST UNDER OBSERVATION OF TOWN PERSONAL.
3) TEST METHOD:

   A. LOW PRESSURE AIR TEST METHOD SHALL BE THE TIME PRESSURE DROP METHOD. THE PRESSURE USED IN THE TEST SHALL BE THE STATED PRESSURE GREATER THAN THE AVERAGE BACK PRESSURE OF ANY GROUND WATER ABOVE THE PIPE. THE TIME REQUIRED FOR THE PRESSURE IN THE TEST SECTION TO DROP 1.0 psig SHALL BE MEASURED USING A STOP WATCH. IF THE TIME EXCEEDS THE TIME DETERMINED FROM ASTM F-1417 THE SECTION FAILS.

FORCE MAIN LEAKAGE TESTS

1) CONTRACTOR SHALL FURNISH ALL EQUIPMENT, LABOR, AND MATERAILS NECESSARY FOR THE HYDROSTATIC PRESSURE AND LEAKAGE TEST ON ALL MAINS UNDER THE SUPERVISION OF TOWN PERSONAL.
2) TESTS PRESSURE SHALL BE 100 PSI OR 150% OF NORMAL PIPE OPERATING PRESSURE, WHICH EVER IS GREATER.
3) LEAKAGE TEST PRESSURE SHALL NOT BE LESS THAN THE MAXIMUM OPERATING PRESSURE OF THE PIPE. THE DURATION OF THE LEAKAGE TEST SHALL NOT BE LESS THAN TWO HOURS. ALLOWABLE LEAKAGE SHALL NOT EXCEED 9 gal/in OF PIPE DIAMETER PER MILE OF PIPE IN 24hr.

DEFLECTION TEST OF PVC SEWER PIPE

1) VERTICAL RING DEFLECTION – BEFORE FINAL ACCEPTANCE OF SEWER LINES, ALL SECTIONS OF SEWER PIPE 8-INCHES AND LARGER SPECIFIED DIAMETER SHALL BE MEASURED FOR VERTICAL RING DEFLECTION BY THE CONTRACTOR AND WITNESSED BY THE TOWN. MAXIMUM DEFLECTION UNDER FULL LOAD SHALL NOT EXCEED 5% OF THE ASTM DESIGNATED AVERAGE INSIDE DIAMETER AS DETERMINED BY THE LABORATORY FOR THE SPECIFIED PIPING.
2) FAILURES – SHOULD A PIPE EXCEED THE ALLOWABLE DEFLECTION, THE CONTRACTOR SHALL REPLACE THOSE PIPES AND RETEST THE SECTION. TESTING SHALL BE GO-NO-GO PULL THROUGH GAGES OF A TYPE APPROVED BY THE TOWN.
3) EQUIPMENT- PLASTIC GAUGING RING OF DIAMETER EQUAL TO 95% OF THE SPECIFIED AVERAGE INSIDE PIPE DIAMETER SHALL BE WITH EACH GAGE.
4) THE CONTRACTOR SHALL FURNISH TESTING EQUIPMENT AND PERSONNEL AND PERFORM THE REQUIRED TESTS. TESTS MUST BE WITNESSED BY TOWN PERSONNEL.
5) USE OF MECHANICAL PULLING DEVICES IS NOT PERMITTED.
6) DEFLECTION TESTING SHALL NOT BE PERFORMED UNTIL THE COMPLETED AND ACCEPTED TRENCH BACKFILL HAS BEEN IN PLACE FOR AT LEAST 30 DAYS.

TOWN OF Waterloo INDIANA		TESTING SPECIFICATIONS
APRIL 2016 Drawing: 01	Scale: Not To Scale	Jones & Henry Engineers, Ltd. www.jheng.com Fluid Thinking

CONCRETE SPECIFICATIONS

1) MATERIALS

A) CEMENT: ASTM C150 TYPE I OR II

B) AGGREGATE: ASTM C33

C) ADMIXTURES:
1. AIR ENTRAINING: ASTM C260
2. FIBER: AASHTO M213
3. PROHIBITED ADMIXTURES: CALCIUM CHLORIDE, THIOCYANATES, OR ADMIXTURES CONTAINING MORE THAN 0.05% CHLORIDE IONS ARE NOT PERMITTED.

D) CLASS A CONCRETE SHALL BE AS FOLLOWS:

28-DAY COMPRESSIVE STRENGTH (PSI)	3500
MAXIMUM WATER/CEMENT RATIO	0.45
MINIMUM CEMENT CONTENT (POUNDS/CY)	564
SLUMP (INCHES)	2-4
AIR CONTENT	6.0%

E) PREMOLDED JOINT FILLER: ASPHALT TYPE IN CONFORMANCE WITH ASTM D994. W.R. MEADOWS SEALTIGHT, OR EQUAL.

F) REINFORCING BARS: ASTM A615 OR ASTM A616, GRADE 60.

TOWN OF WATERLOO INDIANA		CONCRETE SPECIFICATIONS
APRIL 2016 Drawing: 02	Scale: Not To Scale	www.jheng.com

SEWER PIPE

1) ALL SEWER PIPE SHALL BE PVC PIPE MIN. SDR 35

2) FOR PIPE 15–INCHES DIAMETER AND SMALLER: PIPE, FITTINGS, AND JOINTING SYSTEMS SHALL CONFORM TO ASTM D–3034 EXCEPT THAT THE STANDARD DIMENSION RATIO OF THE OUTSIDE DIAMETER OF THE PIPE TO WALL THICKNESS SHALL NOT EXCEED 35.

3) FOR PIPE 18–INCHES DIAMETER AND LARGER: PIPE, FITTINGS, AND JOINTING SYSTEMS SHALL CONFORM TO ASTM F–679 WITH A T–1 WALL THICKNESS

4) JOINT SYSTEMS SHALL BE ELASTOMERIC SEAL (GASKET) TYPE. SEALS SHALL CONFORM TO ASTM F–477 REQUIREMENTS. JOINT MATERIALS AND TESTING SHALL CONFORM TO ASTM D–3212 REQUIREMENTS.

5) ALL SERVICE CONNECTIONS SHALL BE MADE USING A WYE AND A BEND. TEES SHALL BE USED ONLY AS DIRECTED BY THE TOWN. TEES AND WYES SHALL BE DIE CAST OR FACTORY FABRICATED. ALL SERVICE PIPE SHALL BE SDR 35.

6) CONNECTIONS TO EXISTING PIPING SHALL BE MADE USING FLEXIBLE REINFORCED 'NO–SHEAR' REPAIR COUPLINGS BY FERNCO OR EQUAL.

TOWN OF WATERLOO INDIANA		PIPE SPECIFICATIONS
APRIL 2016 Drawing: 03	Scale: Not To Scale	www.jheng.com

PRESSURE PIPE JOINT RESTRAINT TABLE										
LENGTH OF PIPE TO BE RESTRAINED IN EACH DIRECTION FROM ℄ OF BEND BASED ON 150 PSI TEST PRESSURE										
DEGREE OF BEND	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"
90°, TEES & PLUGS	27'	35'	42'	50'	58'	65'	73'	80'	95'	115'
45^	7'	9'	11'	13'	15'	17'	19'	21'	24'	29'
22-1/2^	3'	4'	5'	6'	7'	8'	9'	10'	12'	14'
11-1/4^	2'	2'	3'	3'	4'	4'	4'	5'	6'	7'

RESTRAINED JOINTS SHALL BE MECHANICAL JOINT WITH RETAINER GLANDS, US PIPE TR FLEX JOINT SYSTEM, US PIPE FIELD LOK GASKET SYSTEM, OR EQUAL.

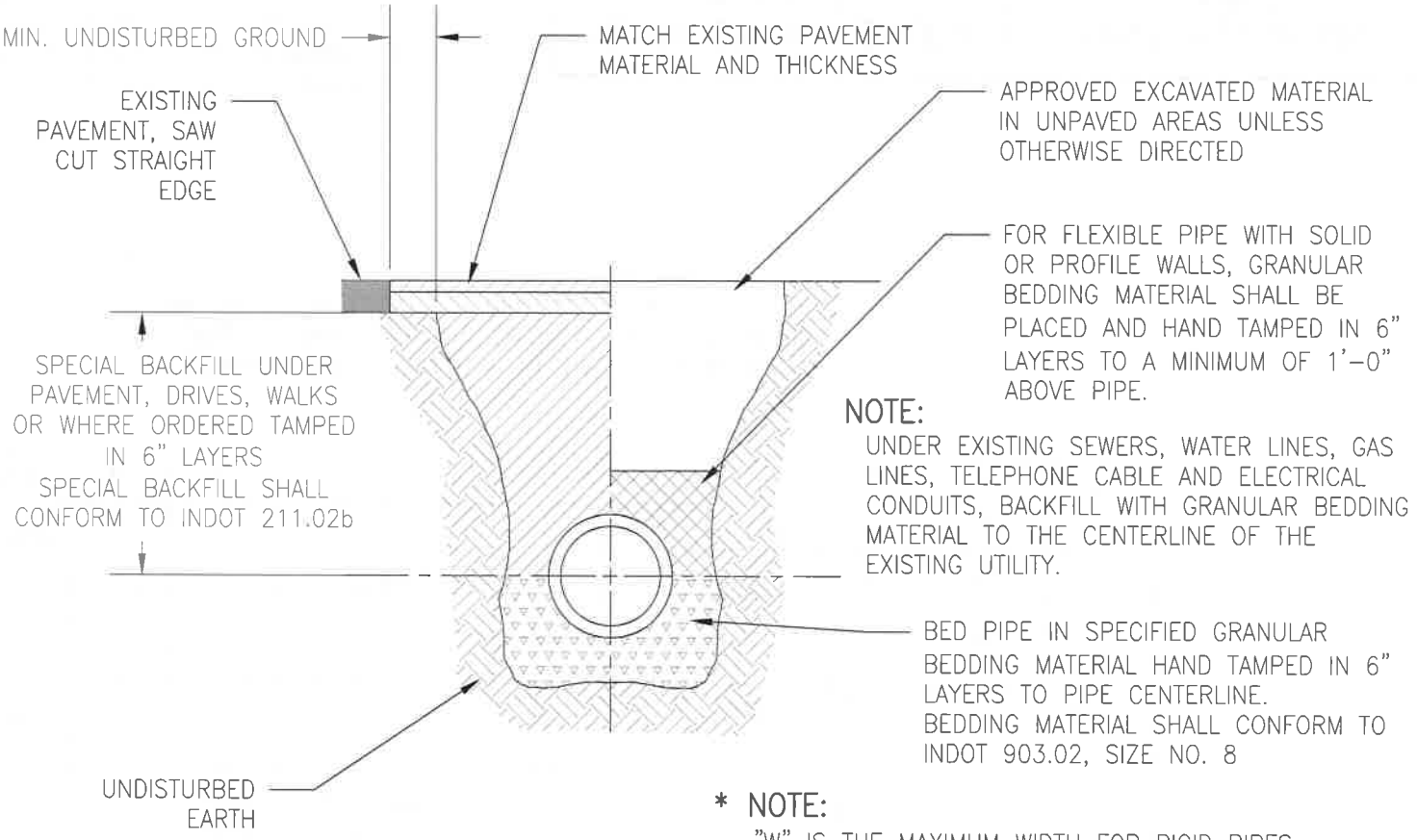
NOTE:

THE ABOVE RESTRAINED JOINT LENGTHS ARE MINIMUM LENGTHS. THE DESIGN ENGINEER SHALL DETERMINE IF LONGER LENGTHS ARE REQUIRED BASED ON SPECIFIC SOIL AND SITE CONDITIONS.

TOWN OF WATERLOO INDIANA		JOINT RESTRAINT TABLE
APRIL 2016 Drawing: 04	Scale: Not To Scale	www.jheng.com

SIZE	"W"	"U"**	"T"
6"	2'-6"	2'-0"	4"
8"	2'-6"	2'-1"	4"
10"	2'-6"	2'-3"	4"
12"	2'-9"	2'-5"	4"
15"	3'-0"	2'-8"	5"
18"	3'-6"	3'-0"	5"
21"	3'-11"	3'-4"	6"
24"	4'-3"	3'-8"	6"
27"	5'-6"	3'-11"	6"
30"	5'-9"	4'-4"	6"
36"	6'-3"	5'-2"	6"
42"	6'-11"		8"
48"	7'-4"		9"
54"	8'-0"		9"
60"	8'-6"		9"
66"	9'-1"		9"
72"	9'-8"		10"
78"	10'-3"		10"

TRENCH SCHEDULE

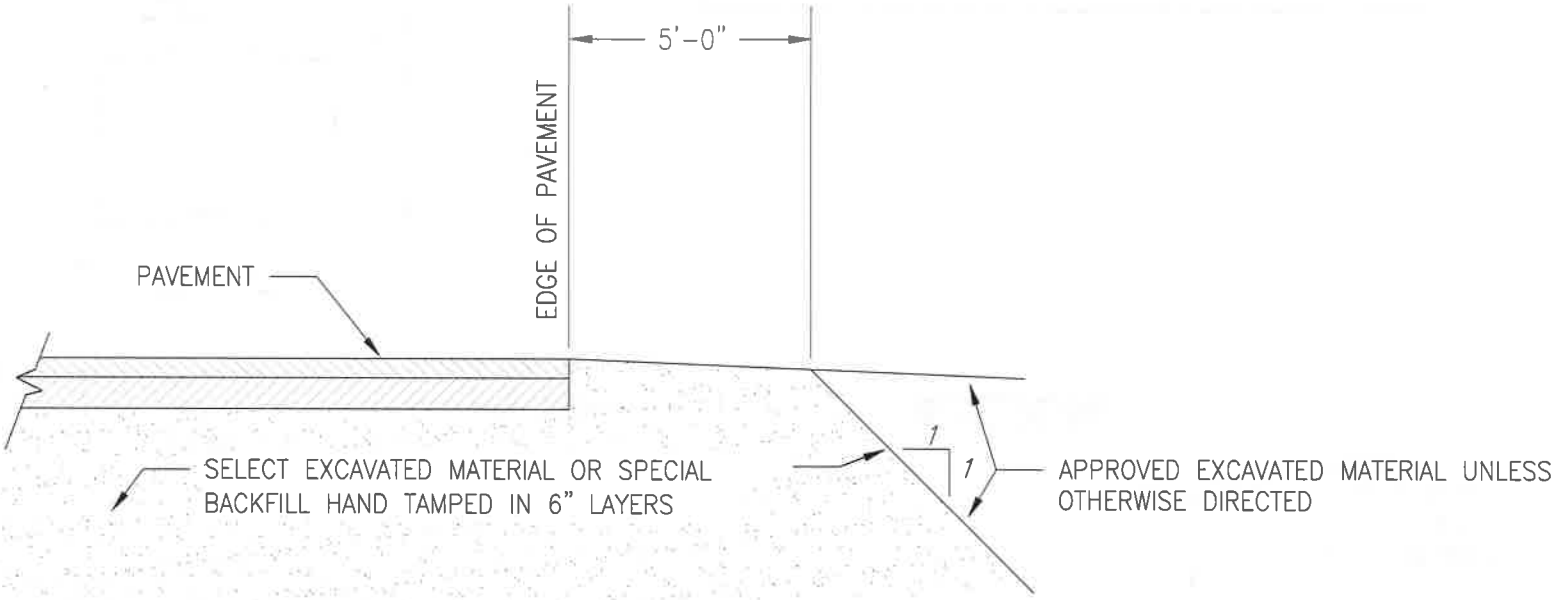


* NOTE:
"W" IS THE MAXIMUM WIDTH FOR RIGID PIPES.
"U" IS THE MINIMUM WIDTH FOR FLEXIBLE PIPES IN ACCORDANCE WITH ASTM D-2321.

TRENCH DETAIL FOR SEWER AND WATER MAINS

** TABLE IS FOR ASTM D-3034, WALL THICKNESS CLASS SDR 35 FOR 6"-15" AND ASTM F-679 WALL THICKNESS CLASS T-1 FOR 18"-36". FOR OTHER FLEXIBLE PIPES, MINIMUM TRENCH WIDTH "U" SHALL MEET MANUFACTURER'S REQUIREMENTS.

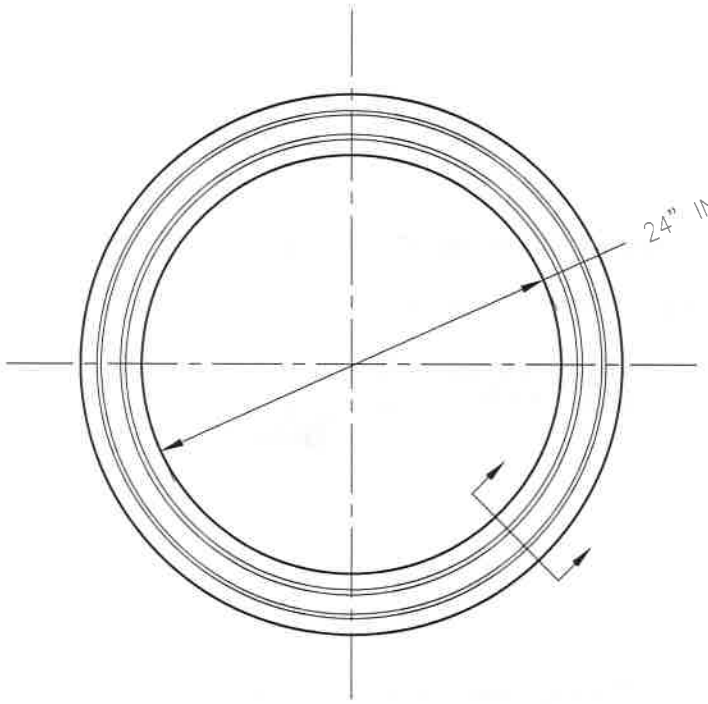
TOWN OF WATERLOO INDIANA		TRENCH DETAIL & TRENCH SCHEDULE
APRIL 2016 Drawing: 05	Scale: Not To Scale	www.jheng.com



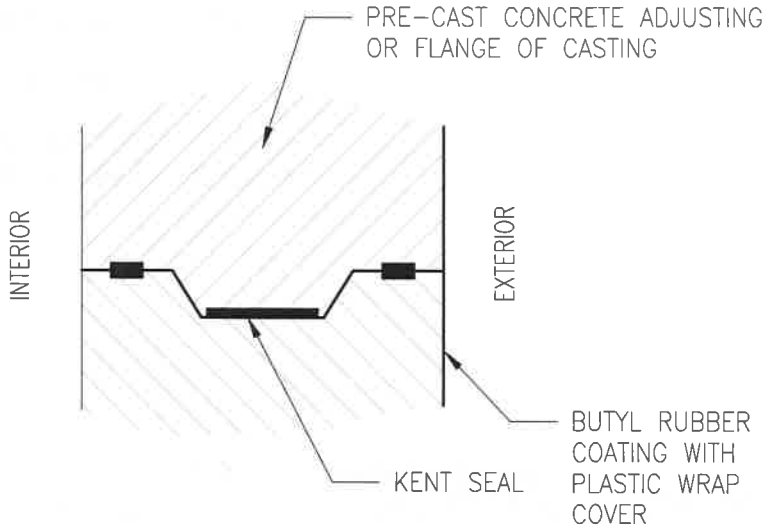
NOTE:

1. SELECT EXCAVATED MATERIAL OR SPECIAL BACKFILL SHALL BE PLACED UNDER ALL PAVEMENTS AND WITHIN THE LIMITS SHOWN ABOVE.
2. SPECIAL BACKFILL SHALL CONFORM TO INDOT 211.02b.
3. SELECT EXCAVATED MATERIAL SHALL BE APPROVED BY ENGINEER.

TOWN OF WATERLOO INDIANA		LIMITS OF SPECIAL BACKFILL
APRIL 2016 Drawing: 06	Scale: Not To Scale	www.jheng.com



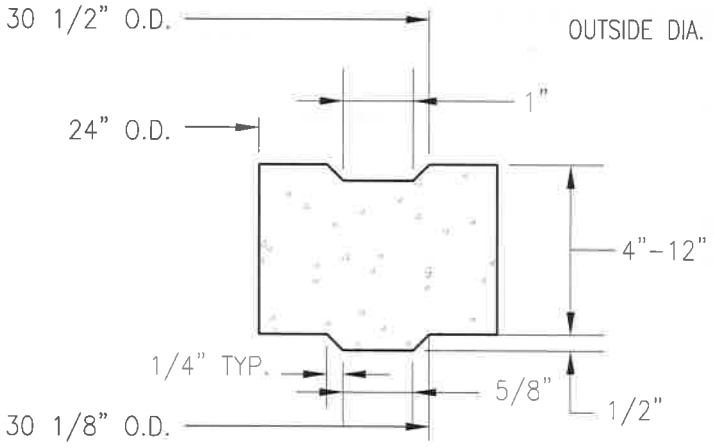
PLAN



JOINT DETAIL

RISER RING THICKNESS 4" – 12"

OUTSIDE DIA. 34" OR 36"



SECTION

TOWN OF WATERLOO INDIANA	ADJUSTING RING DETAIL
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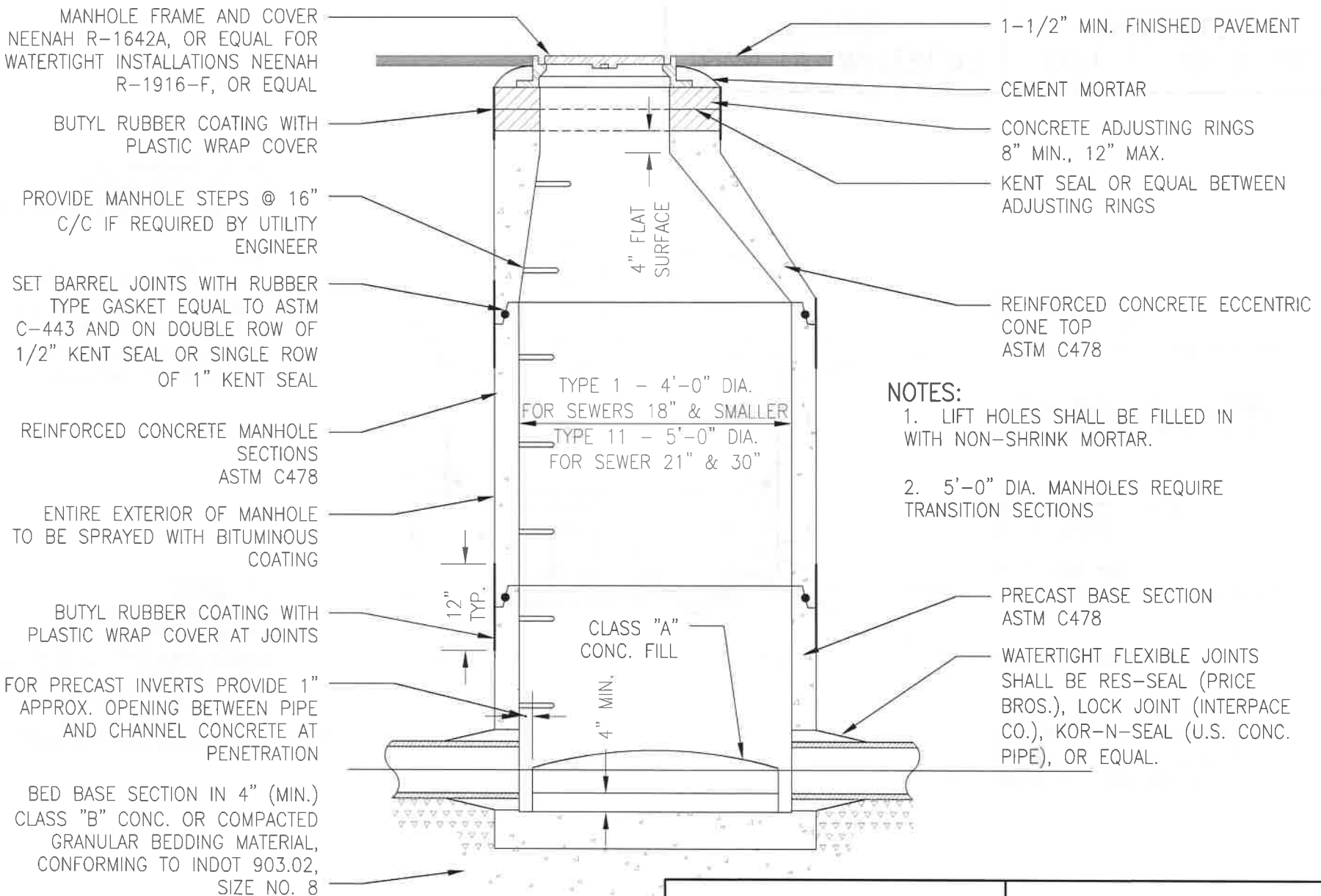
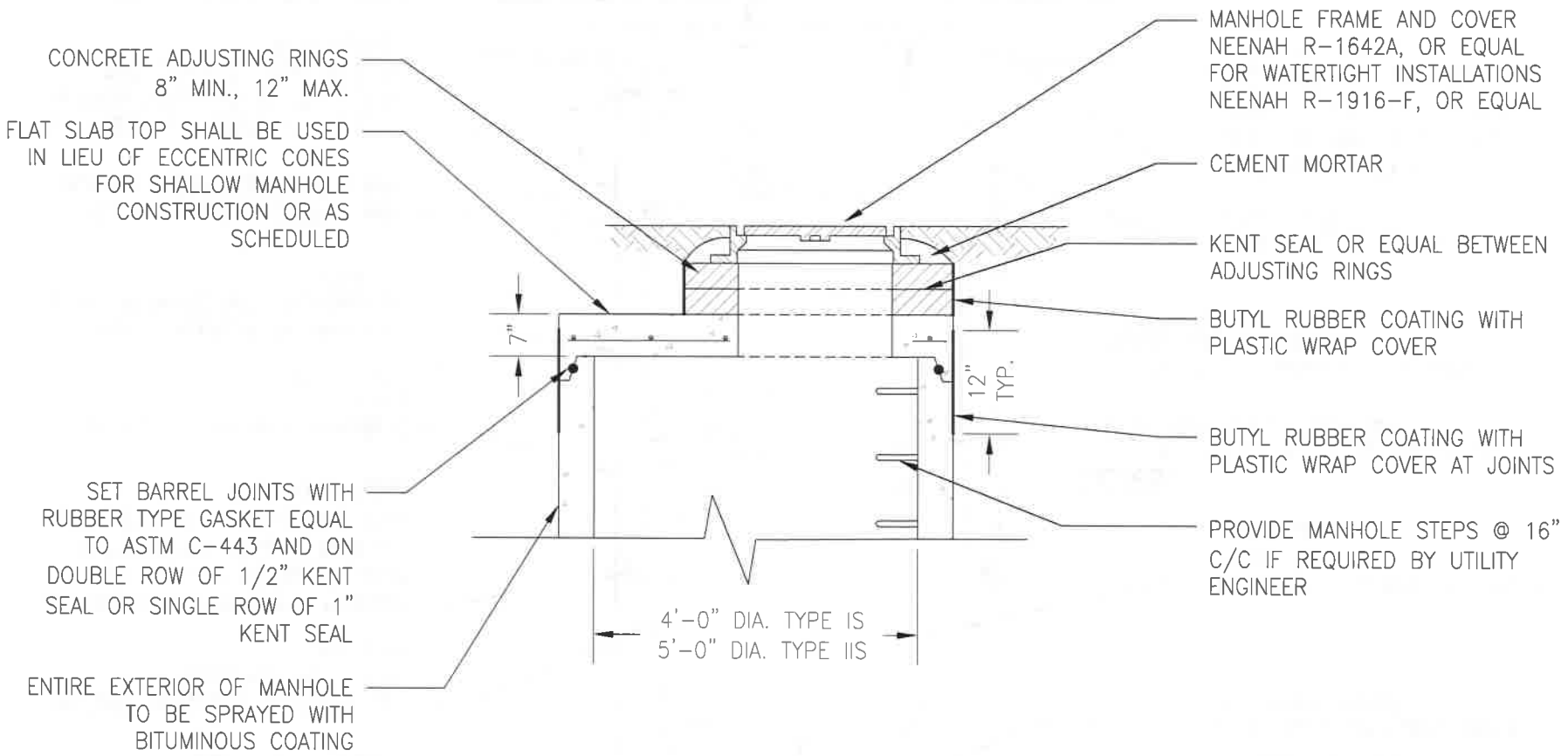
	www.jheng.com



NOTES:

1. LIFT HOLES SHALL BE FILLED IN WITH NON-SHRINK MORTAR.
2. 5'-0" DIA. MANHOLES REQUIRE TRANSITION SECTIONS

TOWN OF WATERLOO INDIANA	TYPE I & II MANHOLES
APRIL 2016 Drawing: 08	Scale: Not To Scale
	www.jheng.com



TOWN OF WATERLOO INDIANA		TYPE IS, IIS & IIIS MANHOLES
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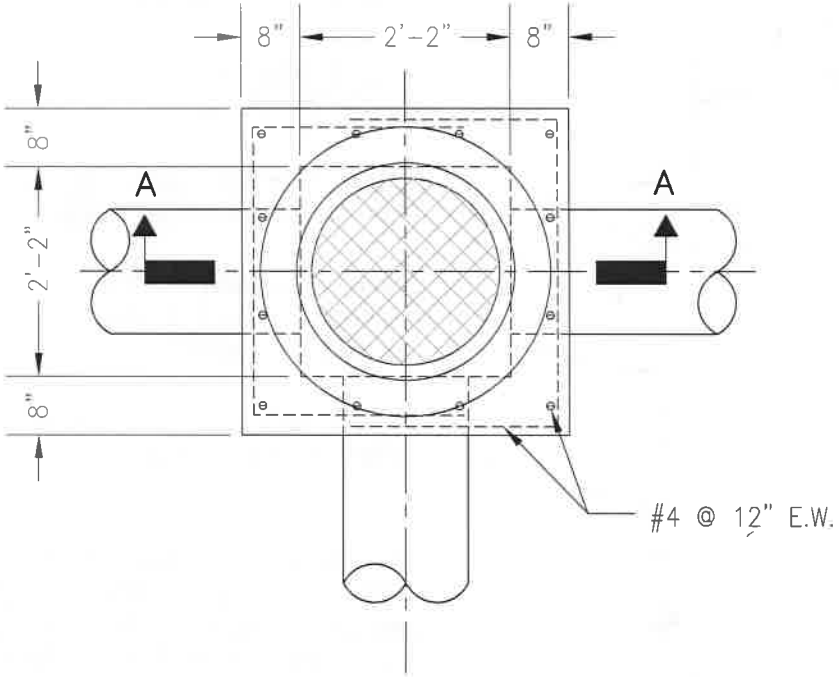
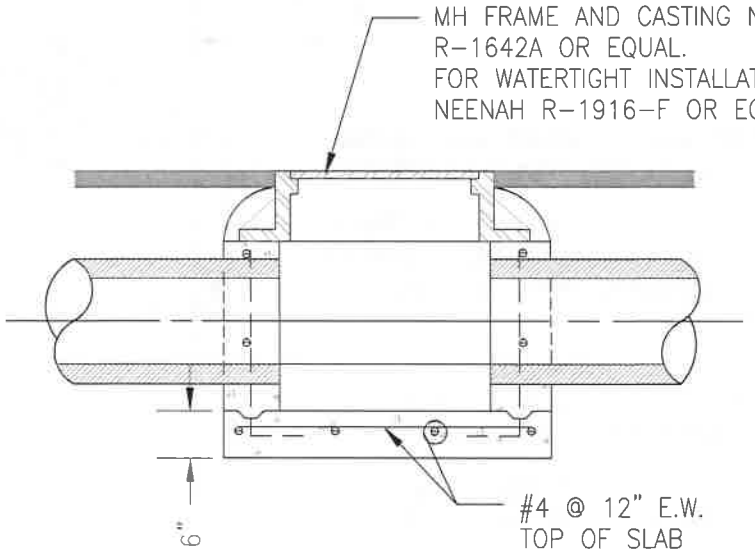
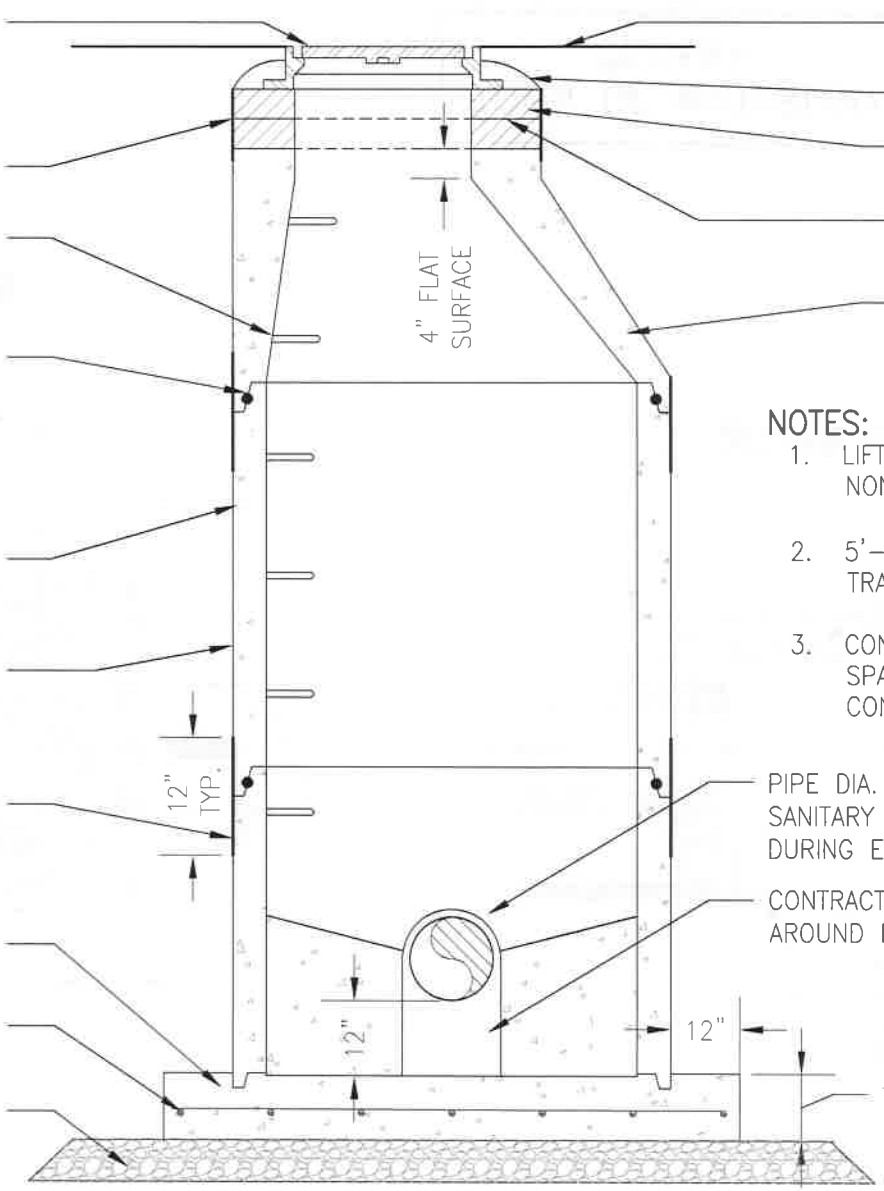


PLAN



SECTION A-A

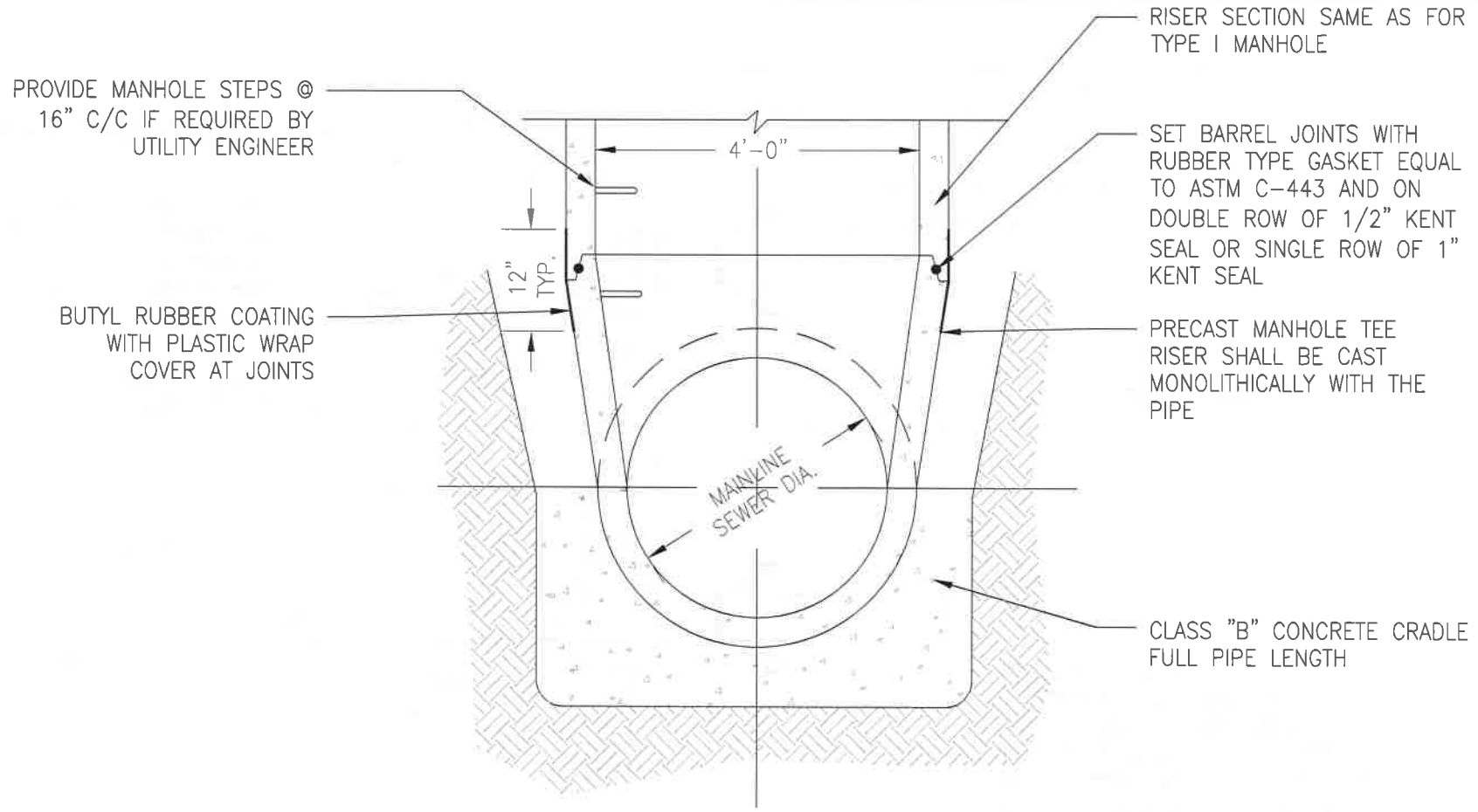
TOWN OF WATERLOO INDIANA		TYPE IV MANHOLE
APRIL 2016 Drawing: 10	Scale: Not To Scale	www.jheng.com



NOTES:

1. LIFT HOLES SHALL BE FILLED IN WITH NON-SHRINK MORTAR.
2. 5'-0" DIA. MANHOLES REQUIRE TRANSITION SECTIONS.
3. CONTRACTOR TO EXCAVATE TO PROVIDE SPACE FOR POURED IN PLACE CONCRETE BASE.

TOWN OF WATERLOO INDIANA		DOGHOUSE MANHOLE
APRIL 2016 Drawing: 11	Scale: Not To Scale	www.jheng.com



TOWN OF WATERLOO INDIANA		TEE MANHOLE
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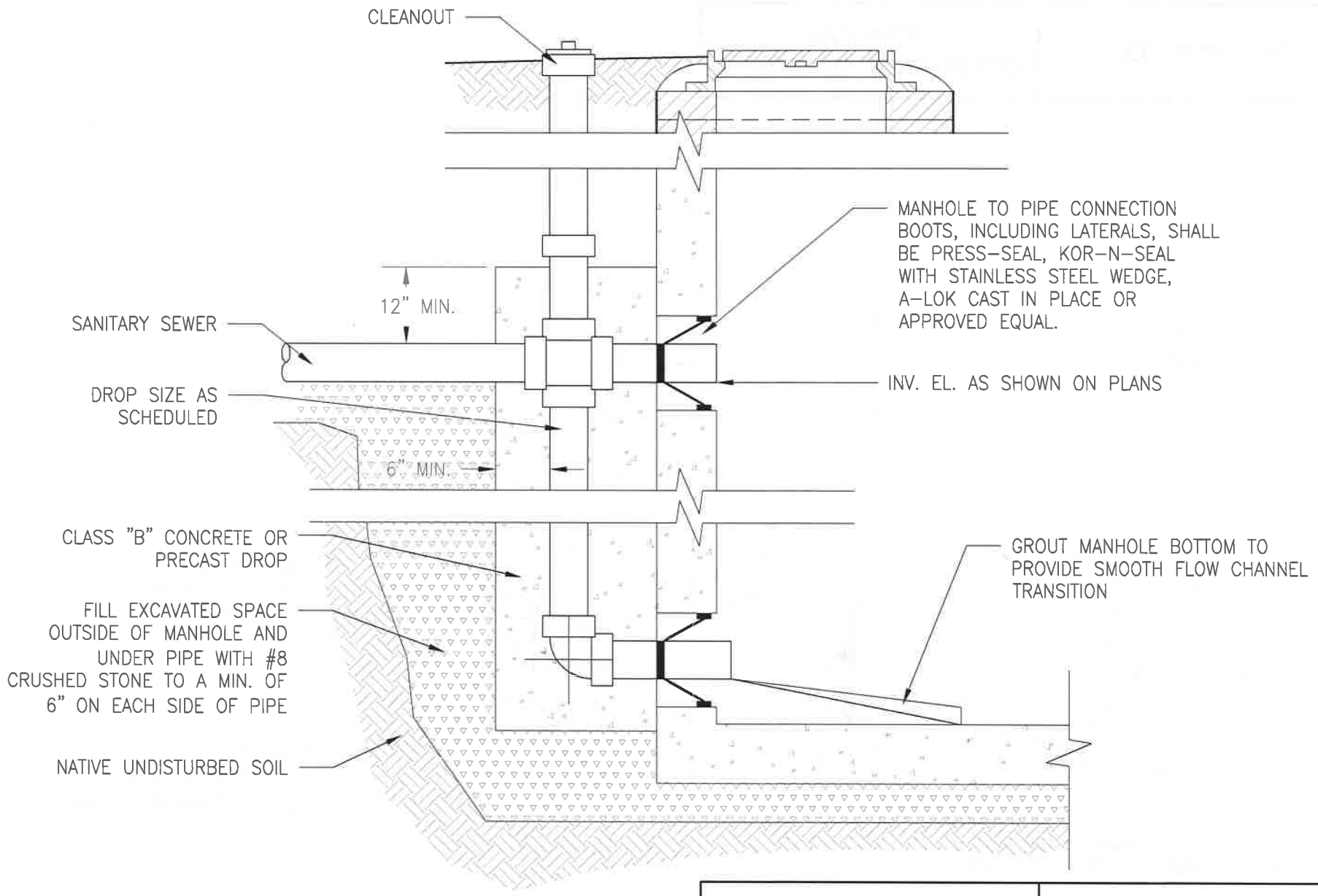
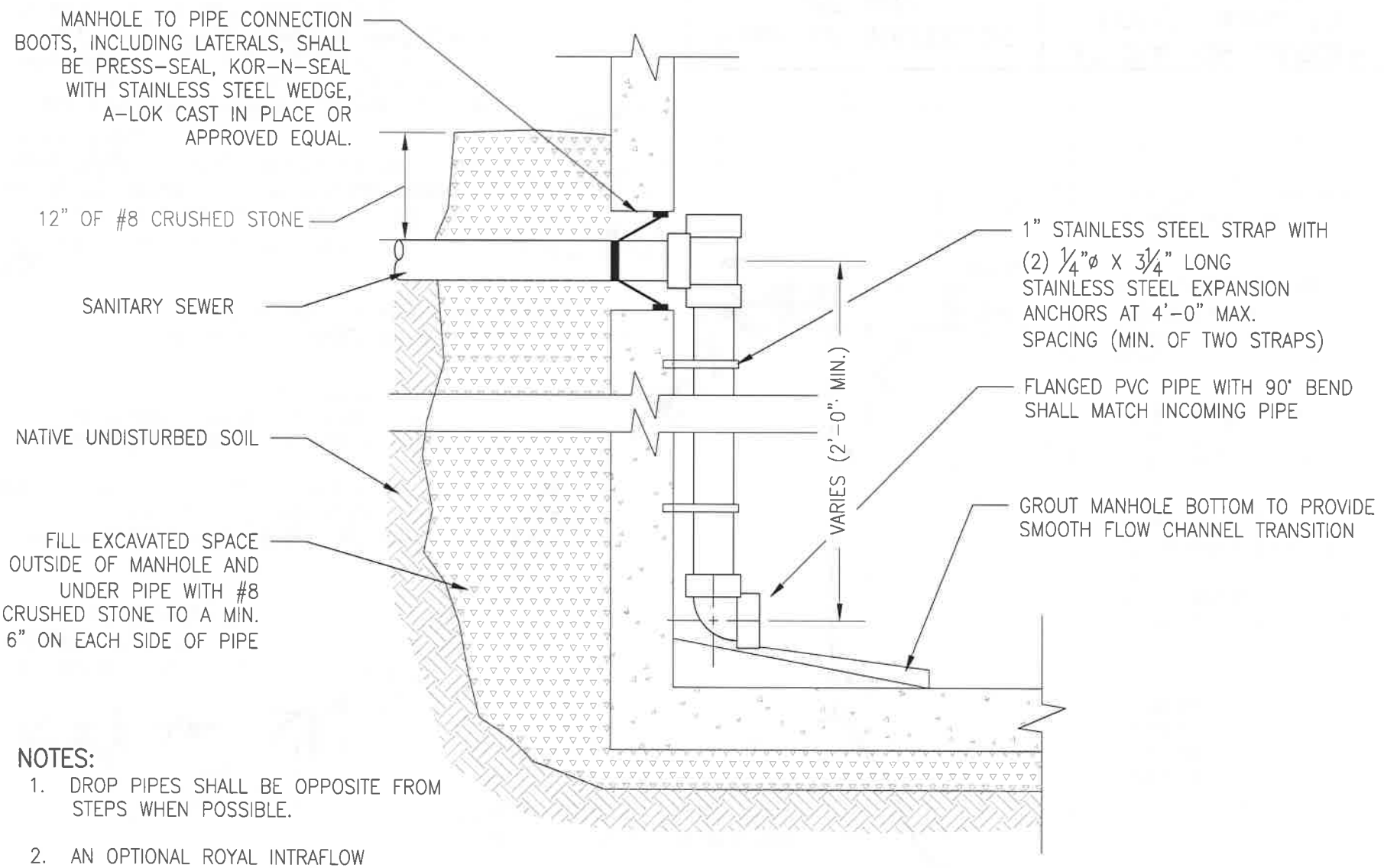


NOTE:

1. DROP PIPES SHALL BE OPPOSITE FROM STEPS WHEN POSSIBLE.

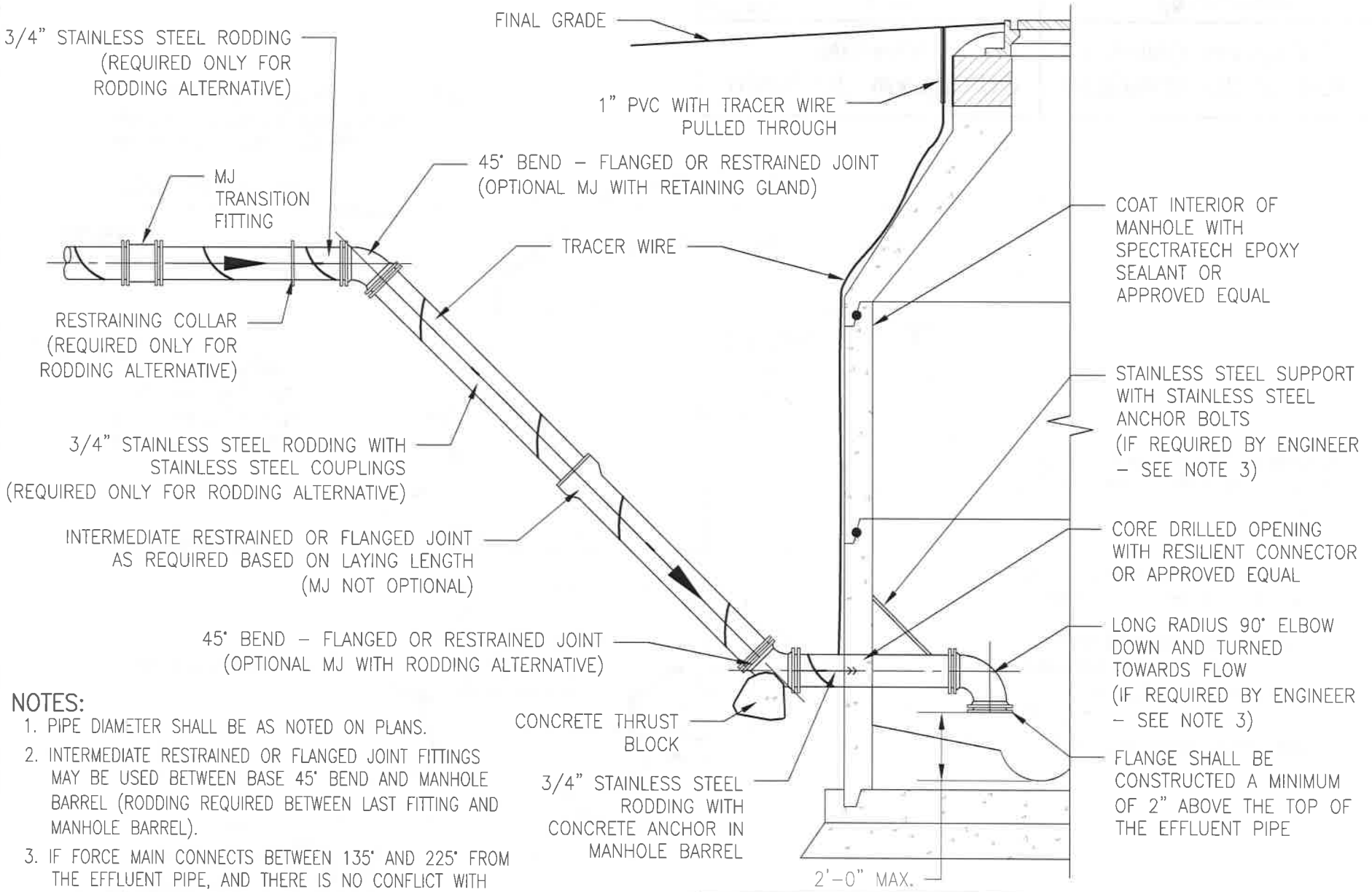
TOWN OF WATERLOO INDIANA		MANHOLE WITH DROP
APRIL 2016 Drawing: 13	Scale: Not To Scale	www.jheng.com



NOTES:

1. DROP PIPES SHALL BE OPPOSITE FROM STEPS WHEN POSSIBLE.
2. AN OPTIONAL ROYAL INTRAFLOW INTERNAL DROP SYSTEM CAN BE UTILIZED WHEN APPROVED BY THE CITY.

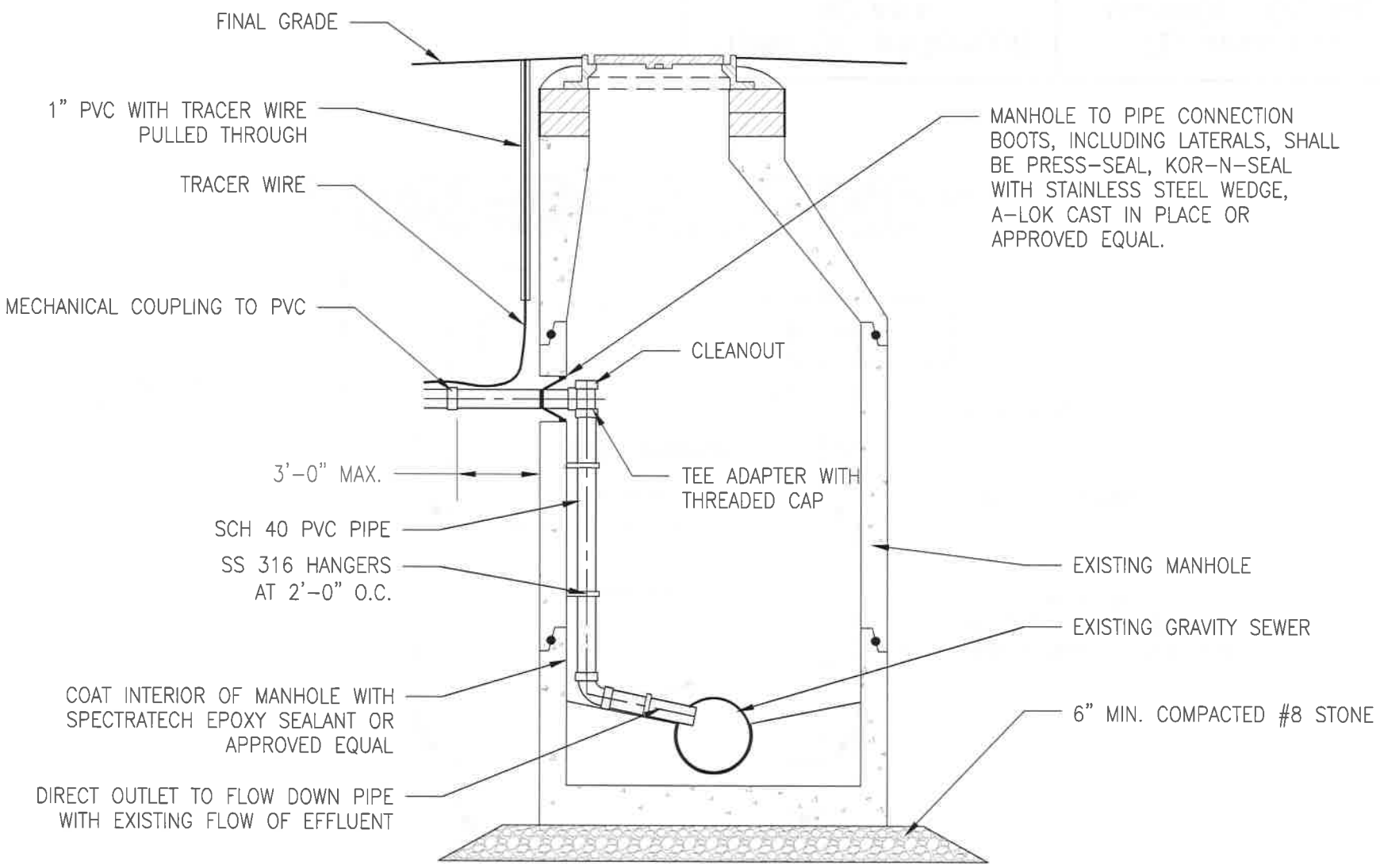
TOWN OF WATERLOO INDIANA		INTERIOR DROP FOR EXISTING MANHOLES
APRIL 2016 Drawing: 14	Scale: Not To Scale	www.jheng.com



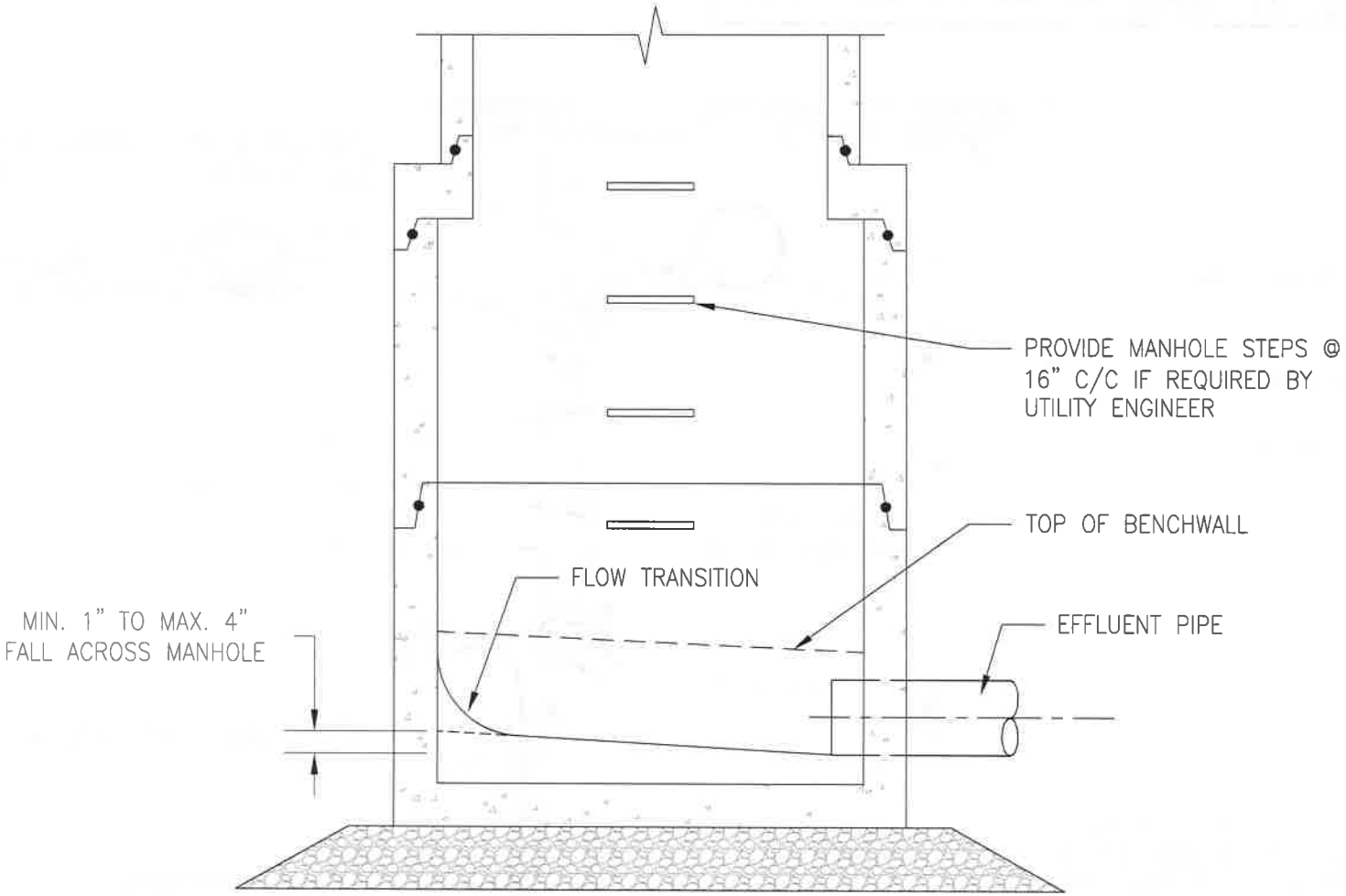
NOTES:

1. PIPE DIAMETER SHALL BE AS NOTED ON PLANS.
2. INTERMEDIATE RESTRAINED OR FLANGED JOINT FITTINGS MAY BE USED BETWEEN BASE 45° BEND AND MANHOLE BARREL (RODDING REQUIRED BETWEEN LAST FITTING AND MANHOLE BARREL).
3. IF FORCE MAIN CONNECTS BETWEEN 135° AND 225° FROM THE EFFLUENT PIPE, AND THERE IS NO CONFLICT WITH OTHER ENTERING PIPES, THEN CORE MANHOLE AND BENCHWALL SUCH THAT THE FORCE MAIN CONNECTS INTO THE MANHOLE AT THE INVERT ELEVATION OF THE EFFLUENT PIPE, OTHERWISE INSTALL 90° ELBOW DOWN AND TOWARDS FLOW AND SUPPORT AS DETAILED.

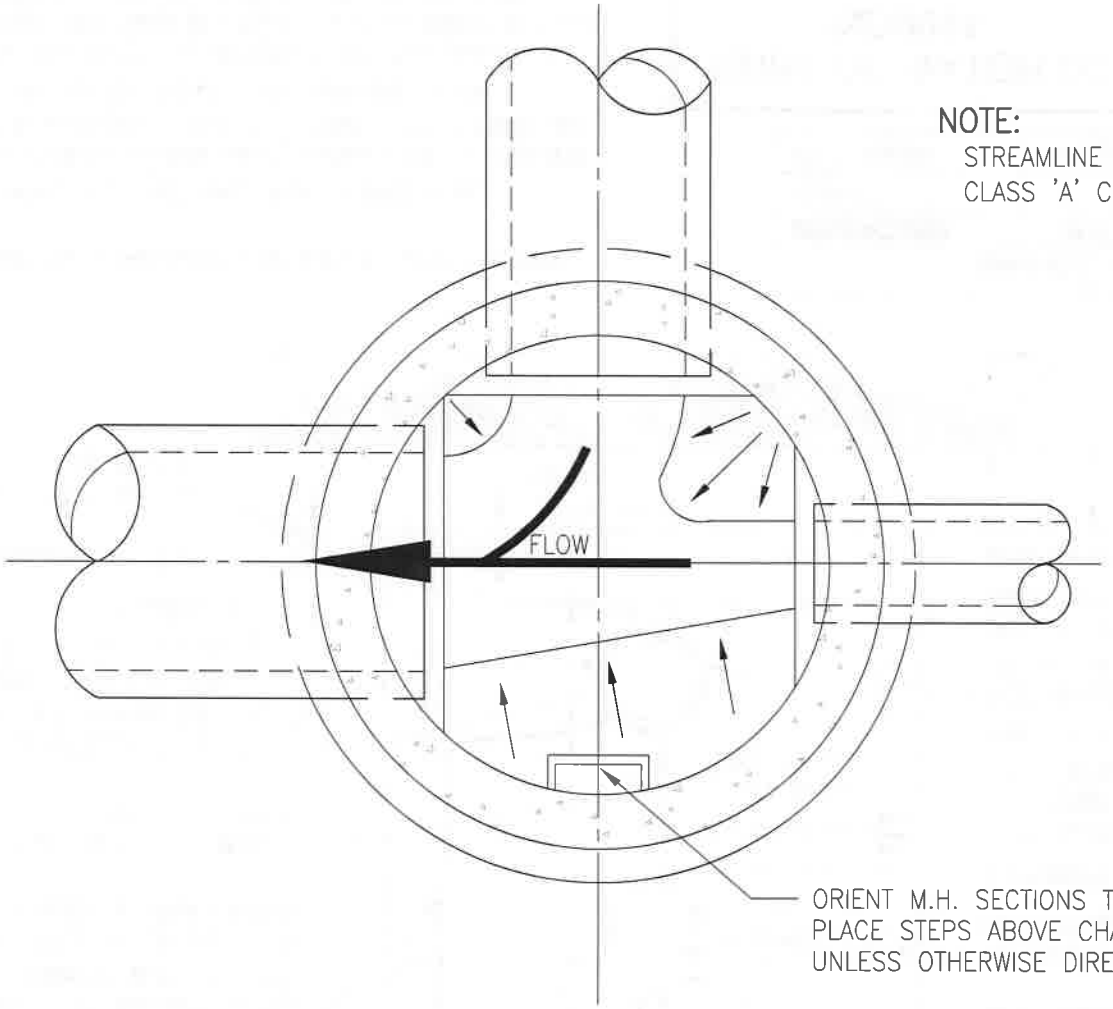
TOWN OF WATERLOO INDIANA		4" DIA. OR LARGER FORCE MAIN TO MANHOLE DETAIL
APRIL 2016 Drawing: 15	Scale: Not To Scale	www.jheng.com



TOWN OF WATERLOO INDIANA		SMALLER THAN 4" DIA. FORCE MAIN TO MANHOLE DETAIL
APRIL 2016 Drawing: 16	Scale: Not To Scale	www.jheng.com

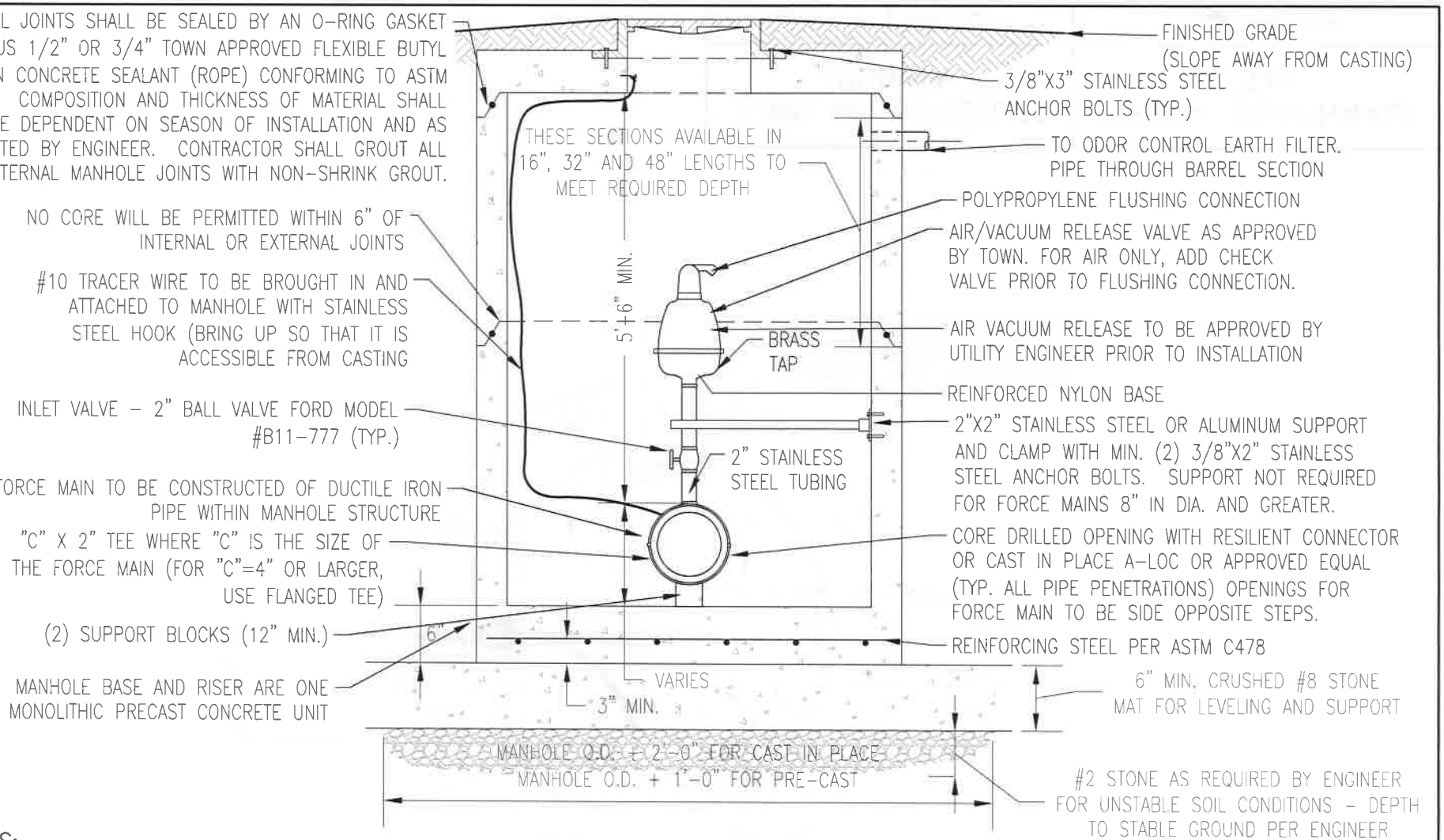


TOWN OF WATERLOO INDIANA		TERMINATION MANHOLE DETAIL
APRIL 2016 Drawing: 17	Scale: Not To Scale	www.jheng.com



NOTE:
STREAMLINE ALL CHANNELS USING
CLASS 'A' CONCRETE

TOWN OF WATERLOO INDIANA		TYPICAL BENCHWALL DETAIL
APRIL 2016 Drawing: 18	Scale: Not To Scale	www.jheng.com



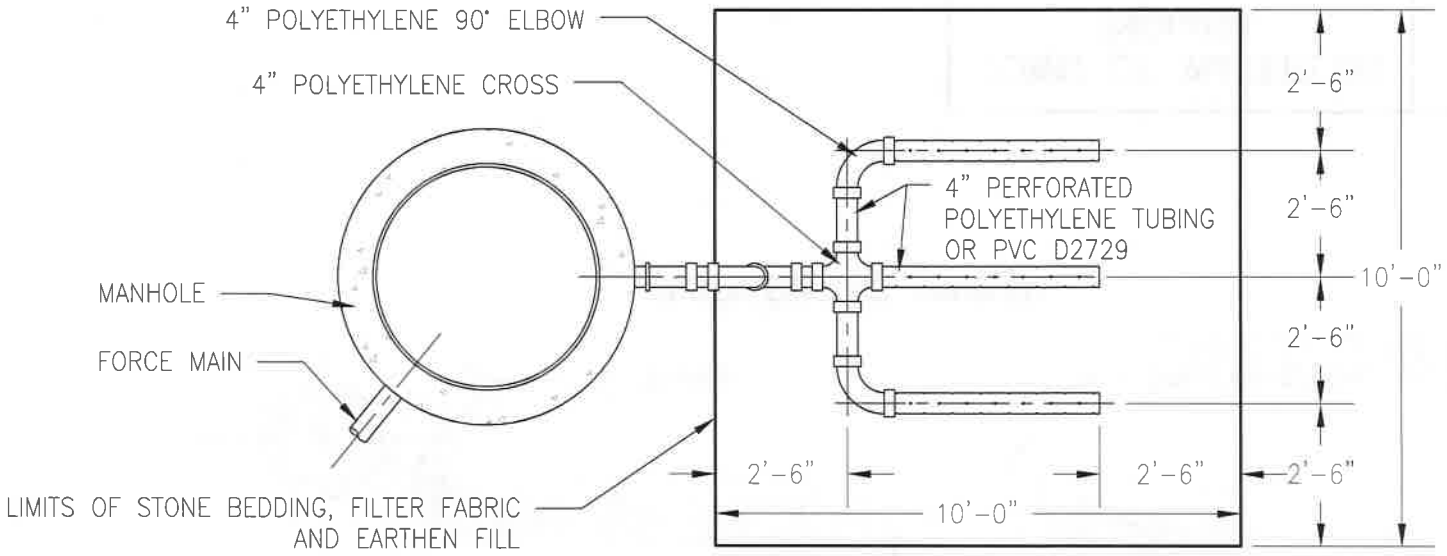
NOTES:

1. FORCE MAIN TO BE LOCATED SUCH THAT AIR/VACUUM DOES NOT INTERFERE WITH ACCESS OPENING.
2. TOP OF CASTING SHALL EXTEND 0.20 FEET (MIN.) ABOVE FINISHED GRADE.
3. MANHOLE SECTIONS SHALL CONFORM TO ASTM C478 UTILIZING 4,000 PSI CONCRETE. JOINTS SHALL CONFORM TO ASTM C443. 4'-0" DIA. MANHOLE FOR 6" FORCE MAIN AND SMALLER OR 5'-0" DIA. MANHOLE FOR 8" FORCE MAIN AND LARGER.
4. CASTING SHALL BE EITHER SELF-SEALING OR WATERTIGHT (SEE PLAN AND PROFILE SHEETS FOR CASTING TYPE). LIDS SHALL BE STAMPED "SANITARY SEWER" AND HAVE CLOSED PICKHOLES. FRAME SHALL BE SET ON DOUBLE ROW OF 1/2" KENT SEAL, OR SINGLE ROW OF 1" KENT SEAL (SEE MANHOLE CASTING SCHEDULE).

MANHOLE CASTING SCHEDULE

MANUFACTURER	SELF SEALING	WATERTIGHT
NEENAH	R-1772	
EAST JORDAN	1022Z1GS	1022Z1PT

TOWN OF WATERLOO INDIANA	AIR/VACUUM RELEASE MANHOLE DETAIL
APRIL 2016 Drawing: 19	Scale: Not To Scale
	www.jheng.com

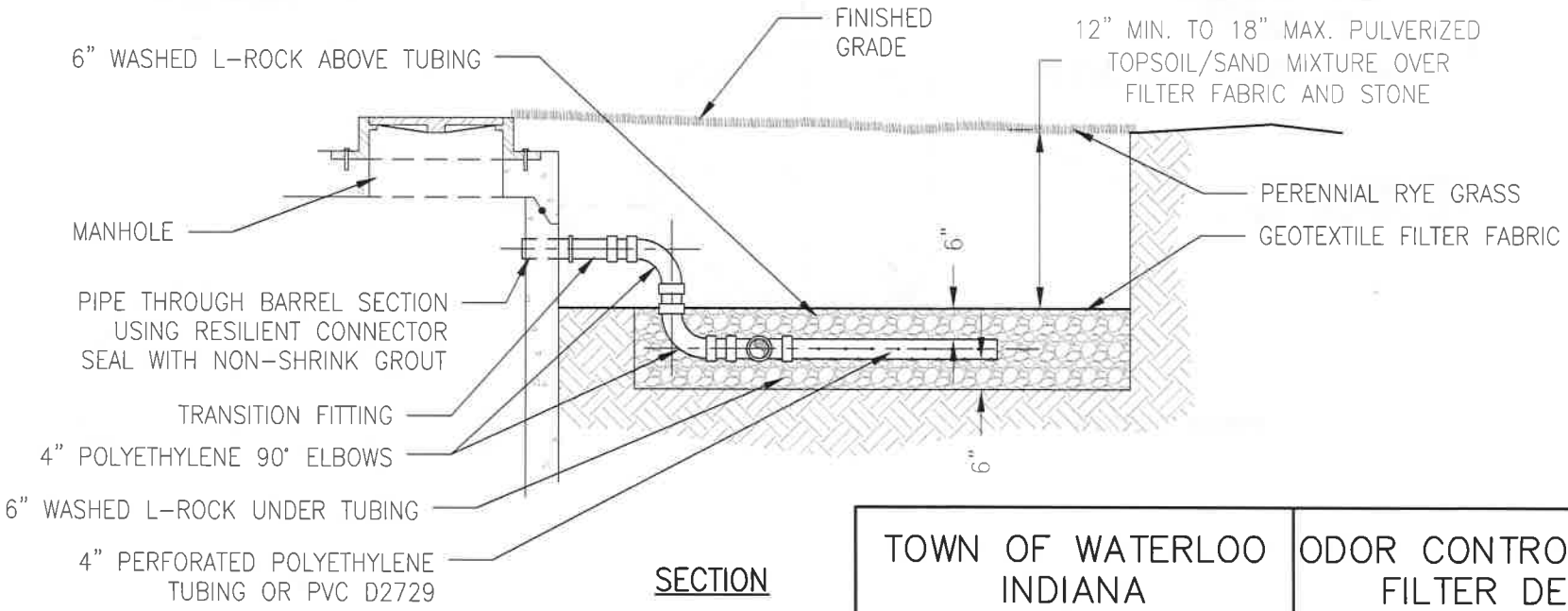


PLAN VIEW

NOTES:

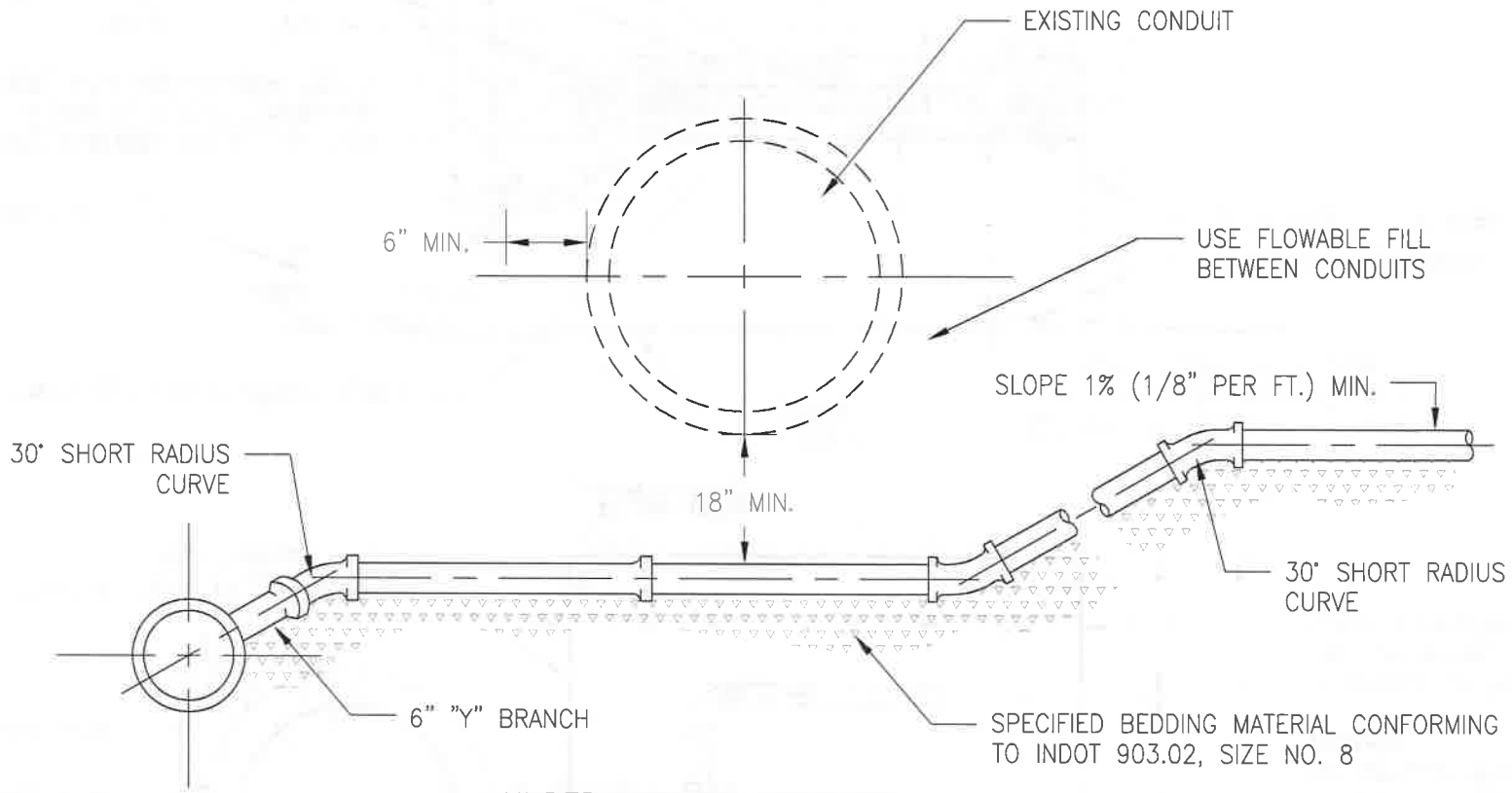
1. TO BE USED FOR FORCE MAINS WITH A DISCHARGE PIPE OF 4" OR SMALLER OR ATTACHED TO CLOSED BOTTOM AIR/VACUUM RELEASE MANHOLES.

2. ORIENT SO THAT FILTER IS LOCATED WITHIN SANITARY SEWER EASEMENT.



SECTION

TOWN OF WATERLOO INDIANA	ODOR CONTROL EARTH FILTER DETAIL
APRIL 2016 Drawing: 20 — Scale: Not To Scale	www.jheng.com



UNDER EXISTING CONDUITS

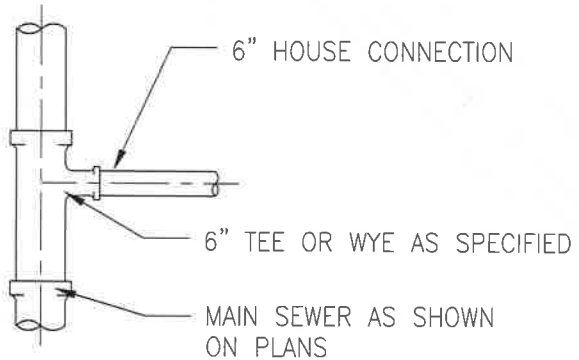
TOWN OF WATERLOO INDIANA		HOUSE CONNECTION DETAIL
APRIL 2016 Drawing: 21	Scale: Not To Scale	www.jheng.com

SERVICE CONNECTION NOTES

A. CONTRACTOR SHALL NOT BACKFILL SERVICE CONNECTION UNTIL THE TOWN HAS INSPECTED AND TAKEN MEASUREMENTS, ELEVATIONS & OTHER INFORMATION REQUIRED FOR PURPOSES OF RECORD.

B. ALL TEE AND WYE BRANCHES IN THE MAIN SEWER LINE ROTATED MORE THAN 30° FROM HORIZONTAL SHALL BE ENCASED IN 6" MIN. CLASS "B" CONCRETE.

C. TEE BRANCHES MAY BE USED IN LIEU OF WYE BRANCHES FOR CONNECTIONS TO MAIN SEWERS 18" AND LARGER.



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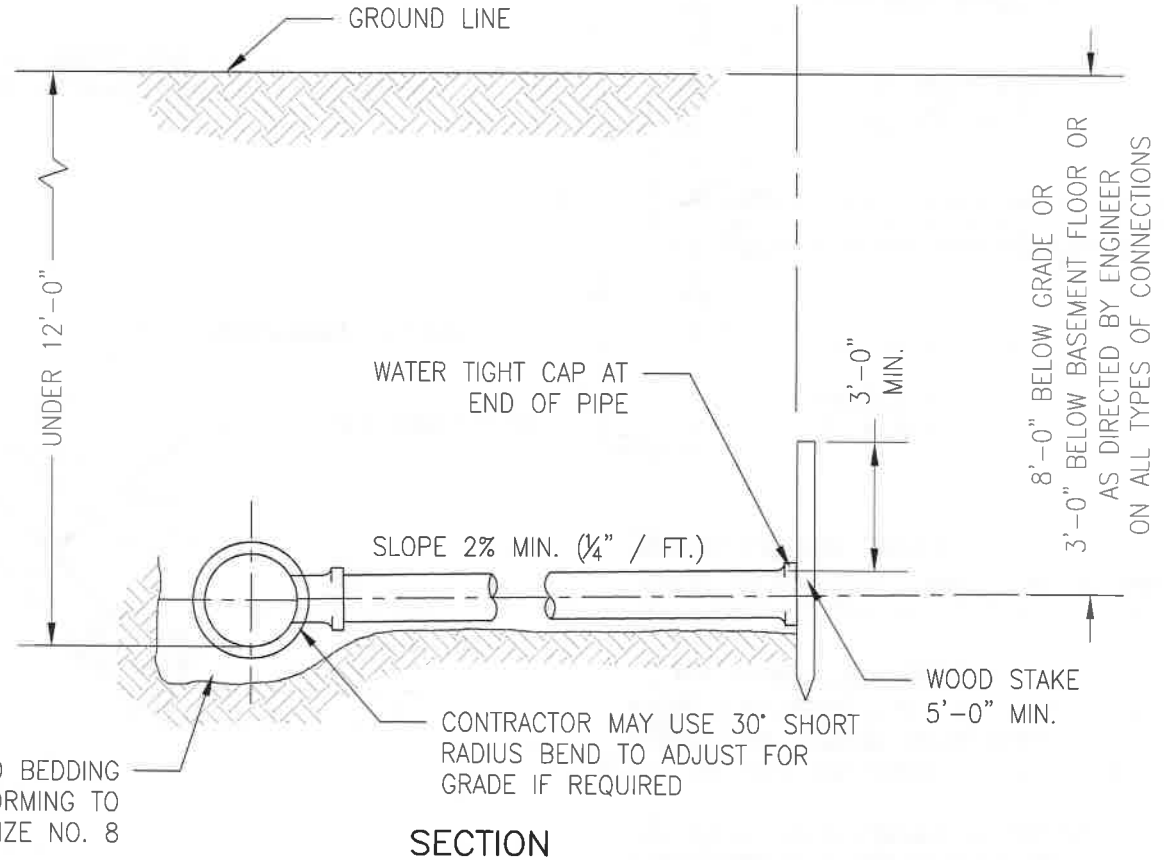

SECTION

TO BE USED WHERE MAIN SEWER IS LESS THAN 12' IN DEPTH

TOWN OF WATERLOO INDIANA	HOUSE CONNECTION TYPE I
APRIL 2016 Drawing: 22	Scale: Not To Scale
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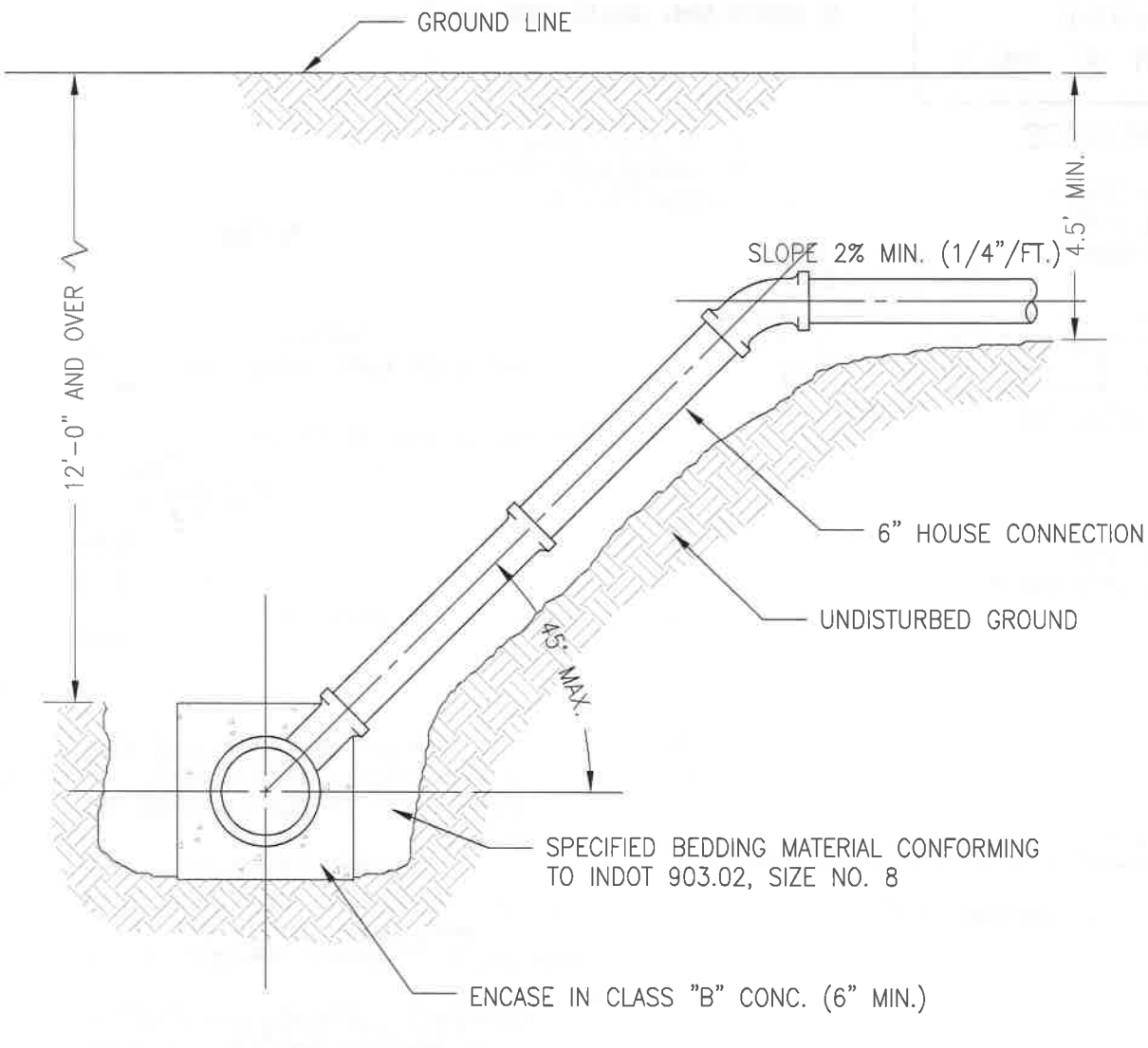


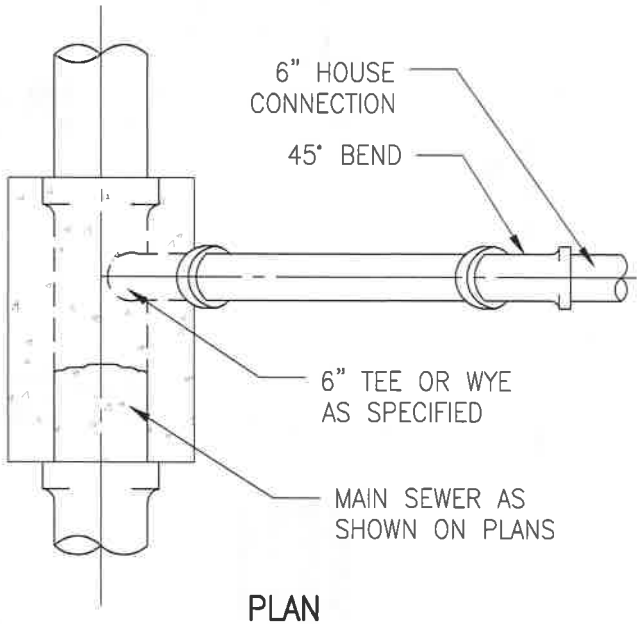
SECTION

SERVICE CONNECTION NOTES

A. CONTRACTOR SHALL NOT BACKFILL SERVICE CONNECTION UNTIL THE TOWN HAS INSPECTED AND TAKEN MEASUREMENTS, ELEVATIONS & OTHER INFORMATION REQUIRED FOR PURPOSES OF RECORD.

B. ALL TEE AND WYE BRANCHES IN THE MAIN SEWER LINE ROTATED MORE THAN 30° FROM HORIZONTAL SHALL BE ENCASED IN 6" MIN. CLASS "B" CONCRETE.

C. TEE BRANCHES MAY BE USED IN LIEU OF WYE BRANCHES FOR CONNECTIONS TO MAIN SEWERS 18" AND LARGER.



PLAN

TO BE USED WHERE MAIN SEWER IS MORE THAN 12' IN DEPTH

TOWN OF WATERLOO INDIANA		HOUSE CONNECTION TYPE II
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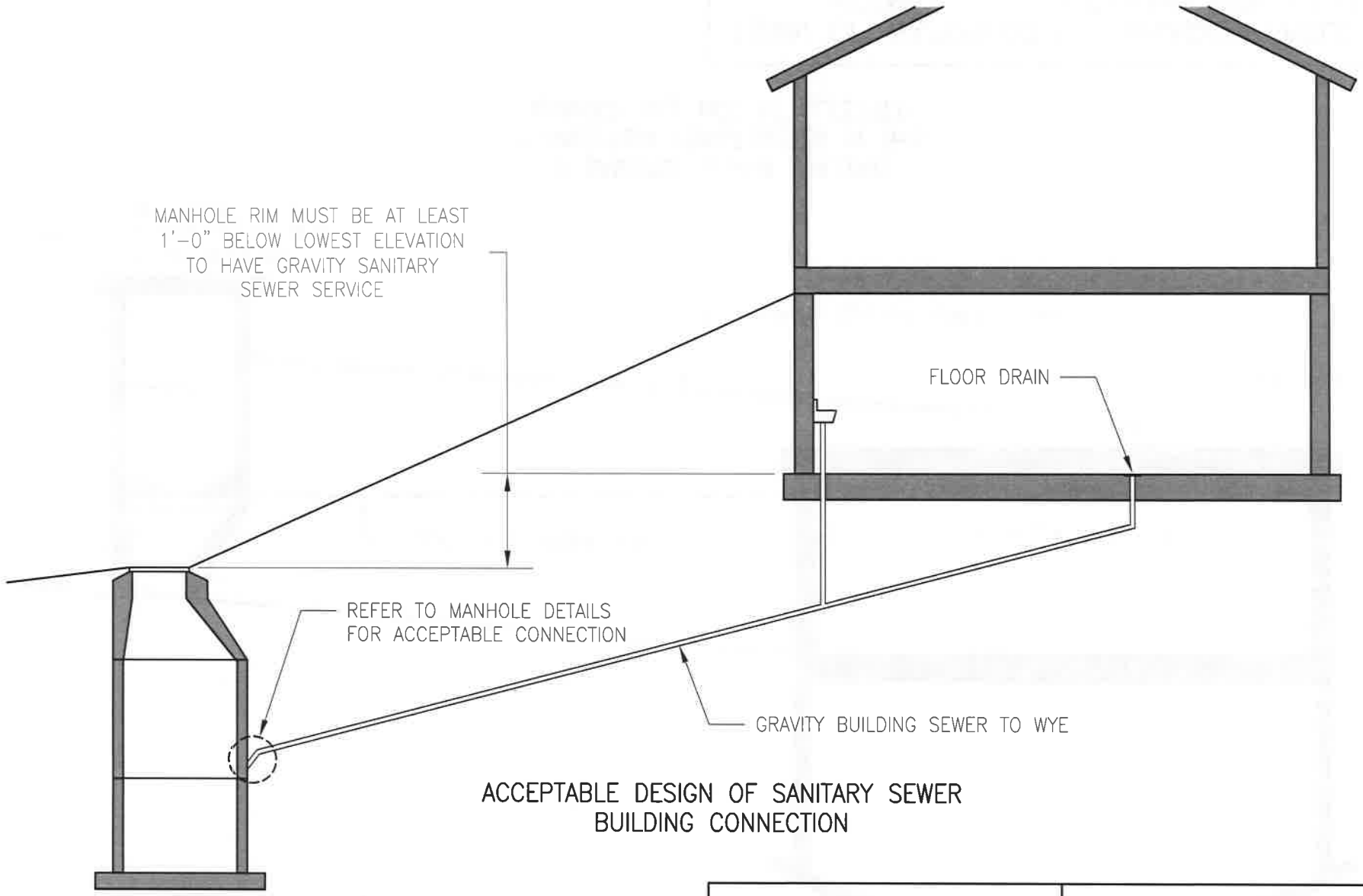
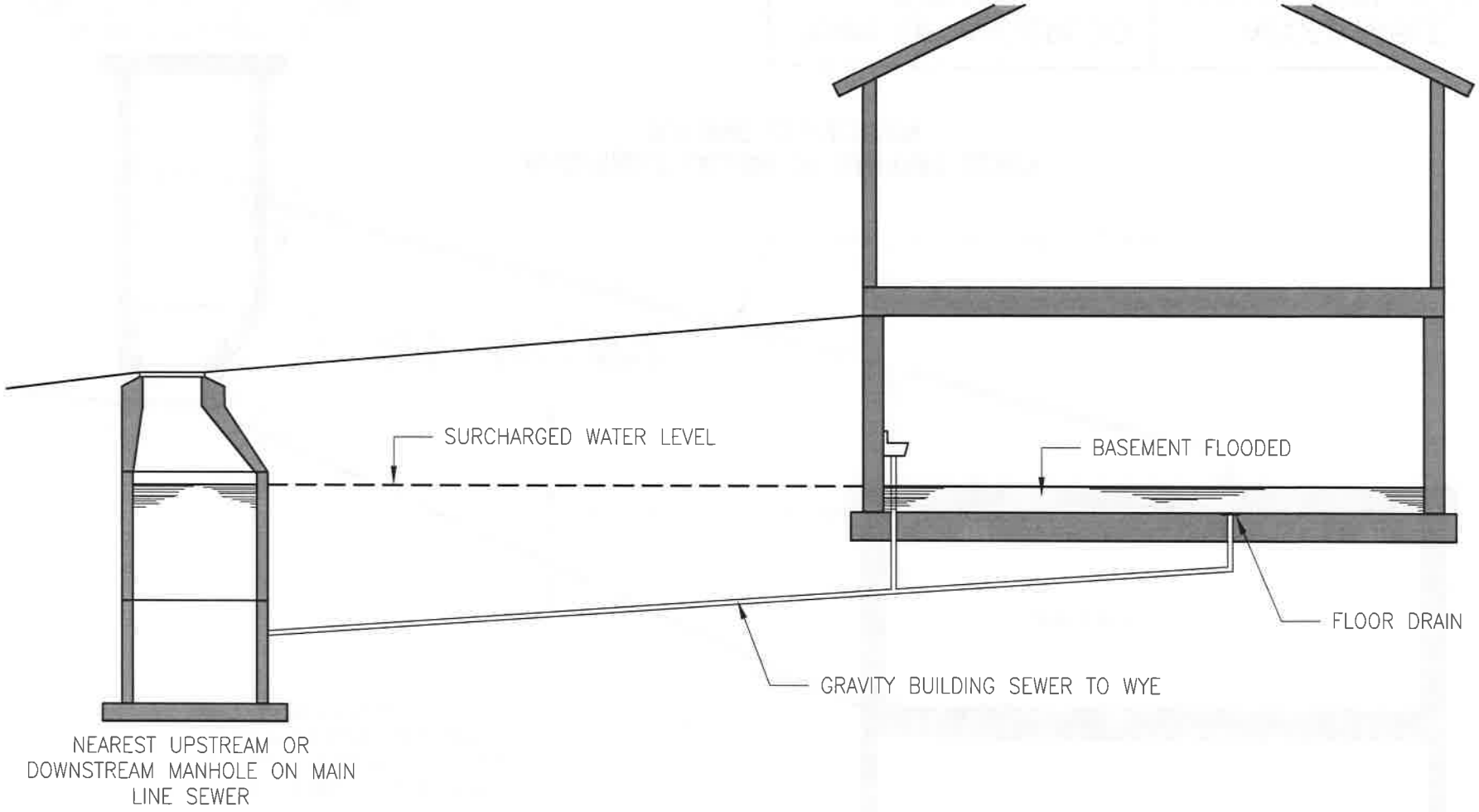


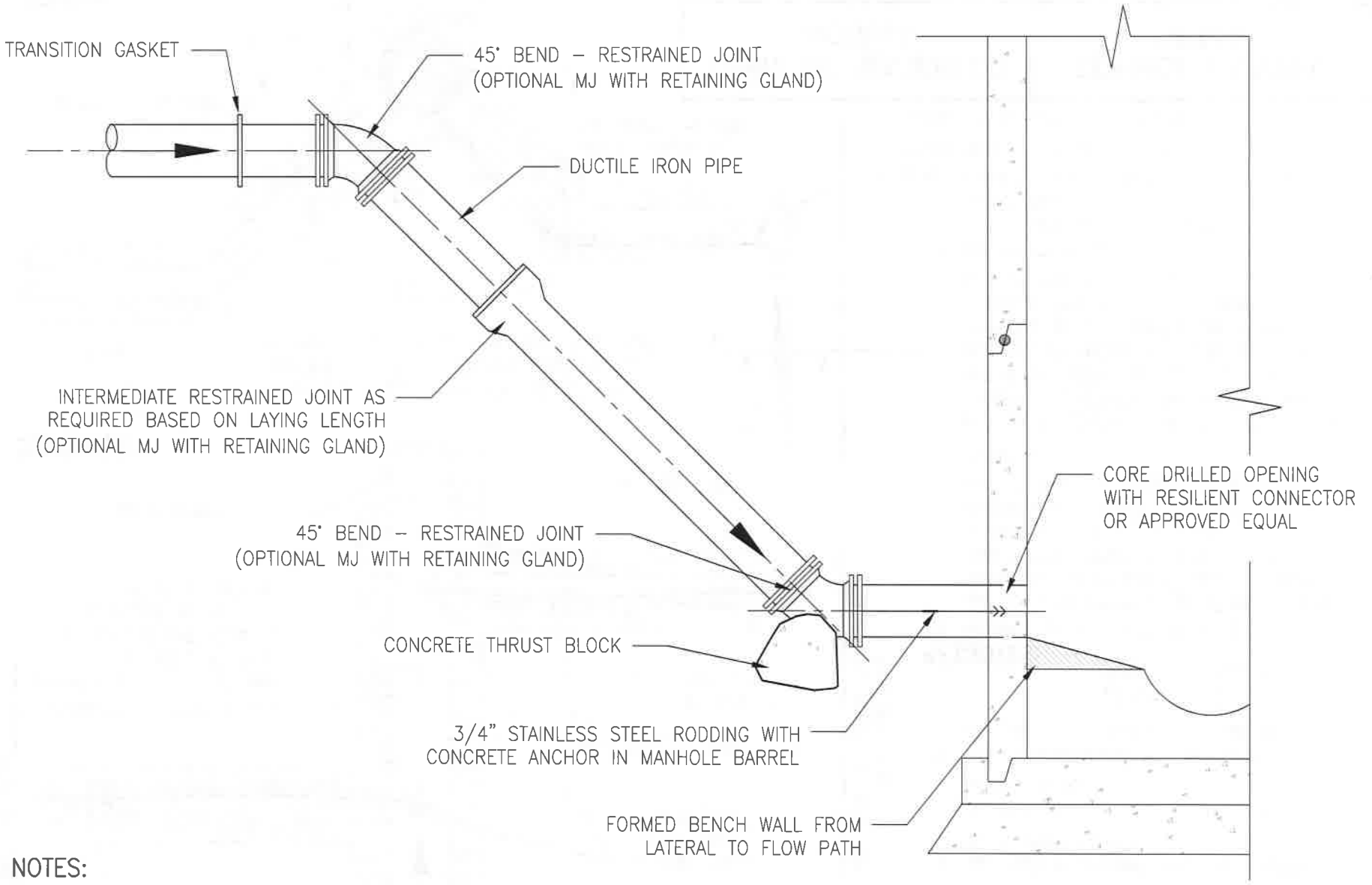
ACCEPTABLE DESIGN OF SANITARY SEWER BUILDING CONNECTION

TOWN OF WATERLOO INDIANA		ACCEPTABLE CONNECTION DETAIL
APRIL 2016 Drawing: 24	Scale: Not To Scale	www.jheng.com



A SANITARY SEWER BUILDING CONNECTION CONSTRUCTED IN THIS MANNER WILL NOT BE ACCEPTED

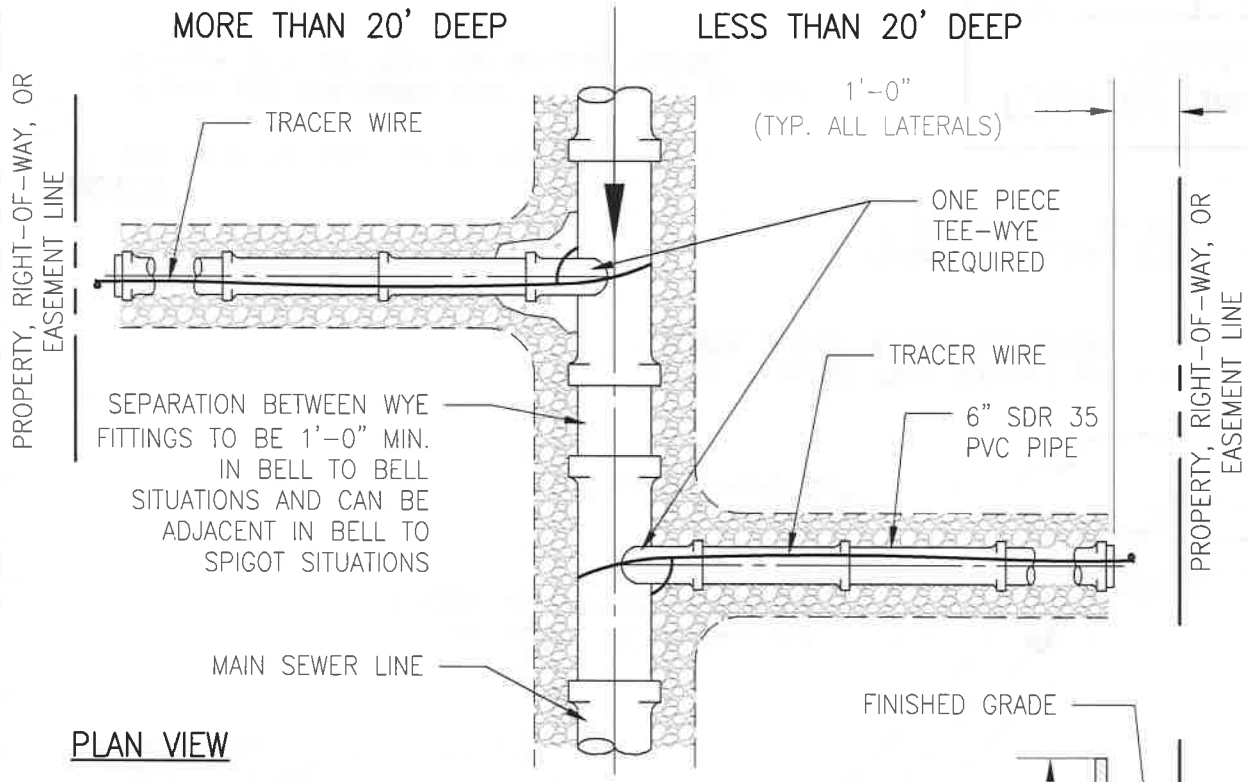
TOWN OF WATERLOO INDIANA		UNACCEPTABLE CONNECTION DETAIL
APRIL 2016 Drawing: 25	Scale: Not To Scale	www.jheng.com



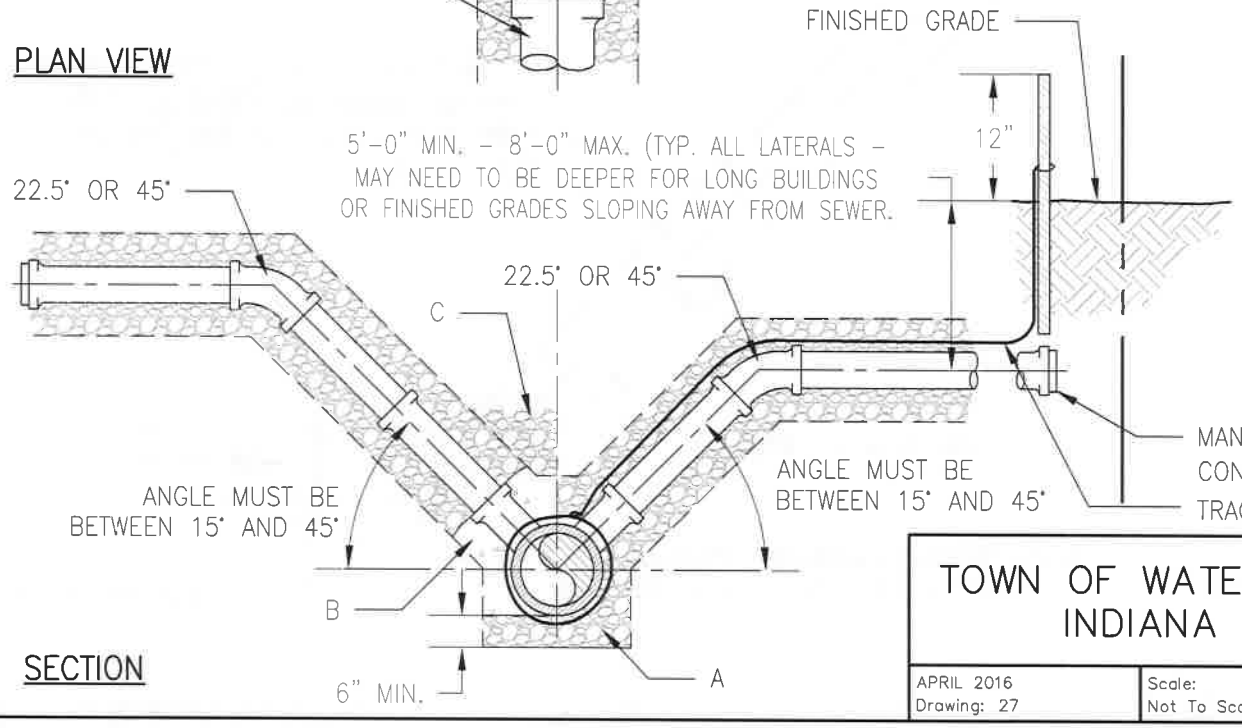
NOTES:

1. PIPE DIAMETER SHALL BE AS NOTED ON PLANS.
2. INTERMEDIATE RESTRAINED JOINT FITTINGS MAY BE USED BETWEEN BASE 45° BEND AND MANHOLE BARREL.

TOWN OF WATERLOO INDIANA		DEEP LATERAL CONNECTION DETAIL
APRIL 2016 Drawing: 26	Scale: Not To Scale	www.jheng.com



PLAN VIEW



SECTION

NOTES:

1. ALL FITTINGS SHALL BE SDR 26.
2. DEPTH OF SERVICE LATERAL SHALL BE MEASURED FROM FINISHED GRADE TO THE TOP OF MAIN SEWER LINE.
3. ALL LATERAL BEDDING SHALL BE AGAINST UNDISTURBED TRENCH.
4. MINIMUM FALL IS 1/8" PER FOOT, TYPICAL OF ALL LATERALS.
5. PIPE REQUIREMENTS PER DEPTH ARE AS FOLLOWS:

3'-19'	SDR-35
20'-25'	SDR-26
OVER 25'	SDR-23.5

KEYNOTES:

A. BEDDING TO BE PLACED ON UNDISTURBED EARTH. COMPACTION OF #8 STONE IS CRITICAL UNDER ALL JOINTS AND FITTINGS. IF PROPER COMPACTION CANNOT BE ACHEIVED, THEN PLACE A MINIMUM OF 6" OF 3500 PSI, 28 DAY COMPRESSIVE STRENGTH CONCRETE AROUND THE PIPE TO BEAR ON STABLE GROUND (PER ENGINEER).

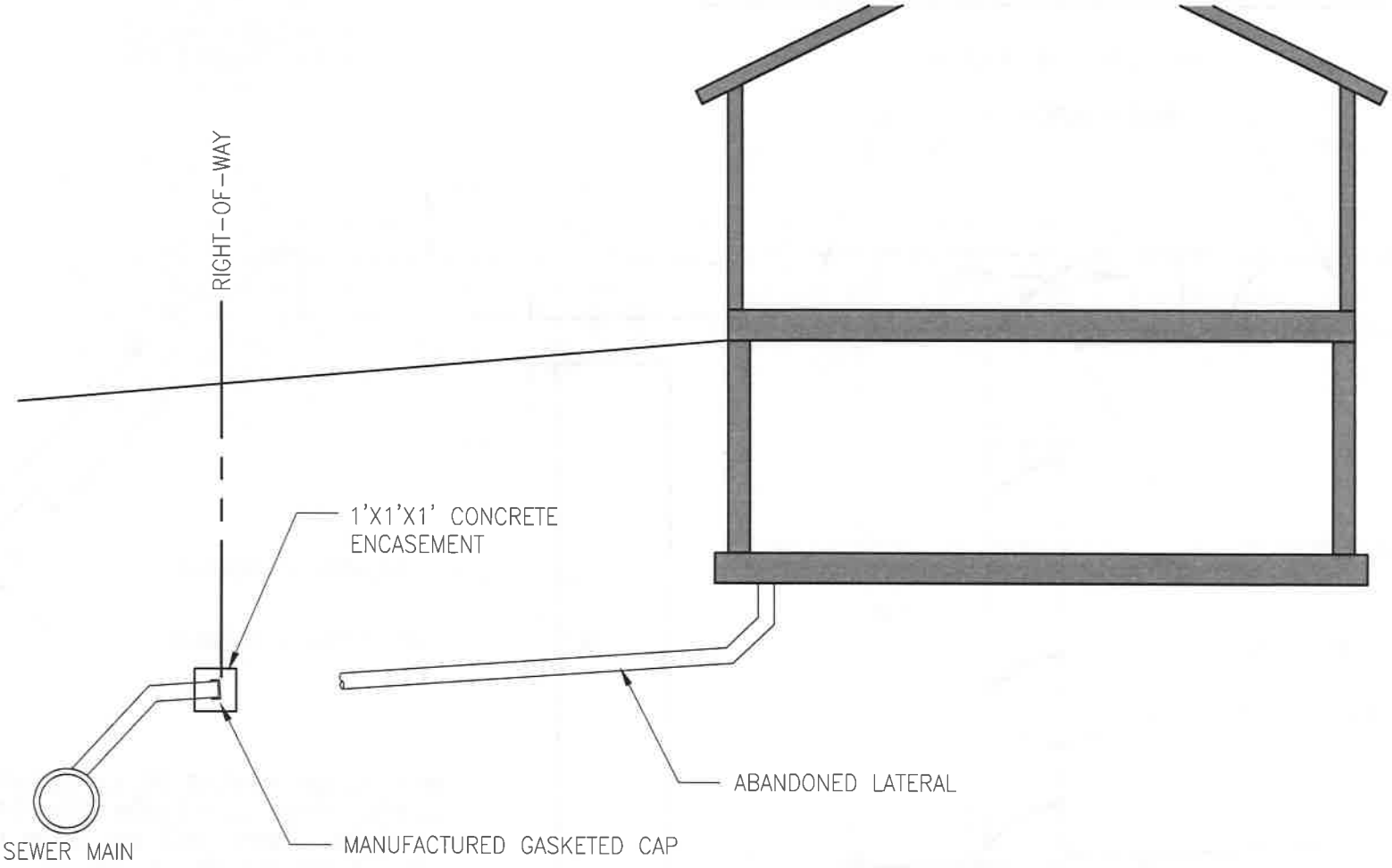
B. MINIMUM 4" CONCRETE CAP REQUIRED, NOT TO EXCEED BEYOND FIRST PIPE JOINT OF WYE. IF WYE IS 20' DEEP, THEN CONCRETE CAP IS REQUIRED AT ENGINEERS DISCRETION. MIN. 3500 PSI, 28 DAY COMPRESSIVE STRENGTH CONCRETE REQUIRED. NOT REQUIRED FOR DUCTILE IRON TEE.

C. MIN. OF 8" OF #8 STONE OVER THE CONCRETE CAPPED WYE SHALL BE PLACED PRIOR TO BACKFILLING.

MANUFACTURED, WATERTIGHT CAP FOR FUTURE CONNECTION (TYP. ALL LATERALS)

TRACER WIRE (TYP. ALL LATERALS)

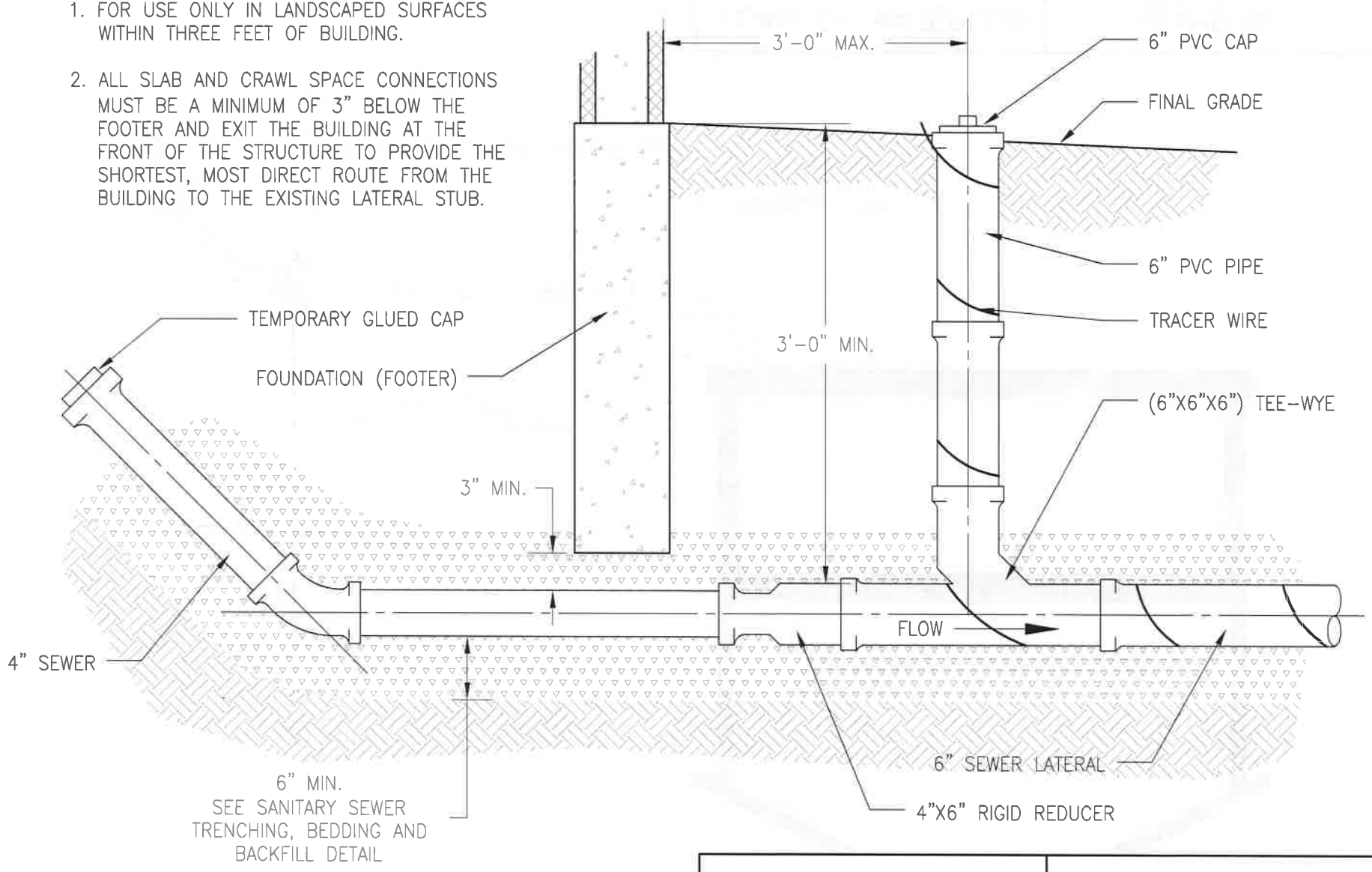
TOWN OF WATERLOO INDIANA	SERVICE LATERAL DETAIL
APRIL 2016 Drawing: 27	Scale: Not To Scale
	www.jheng.com



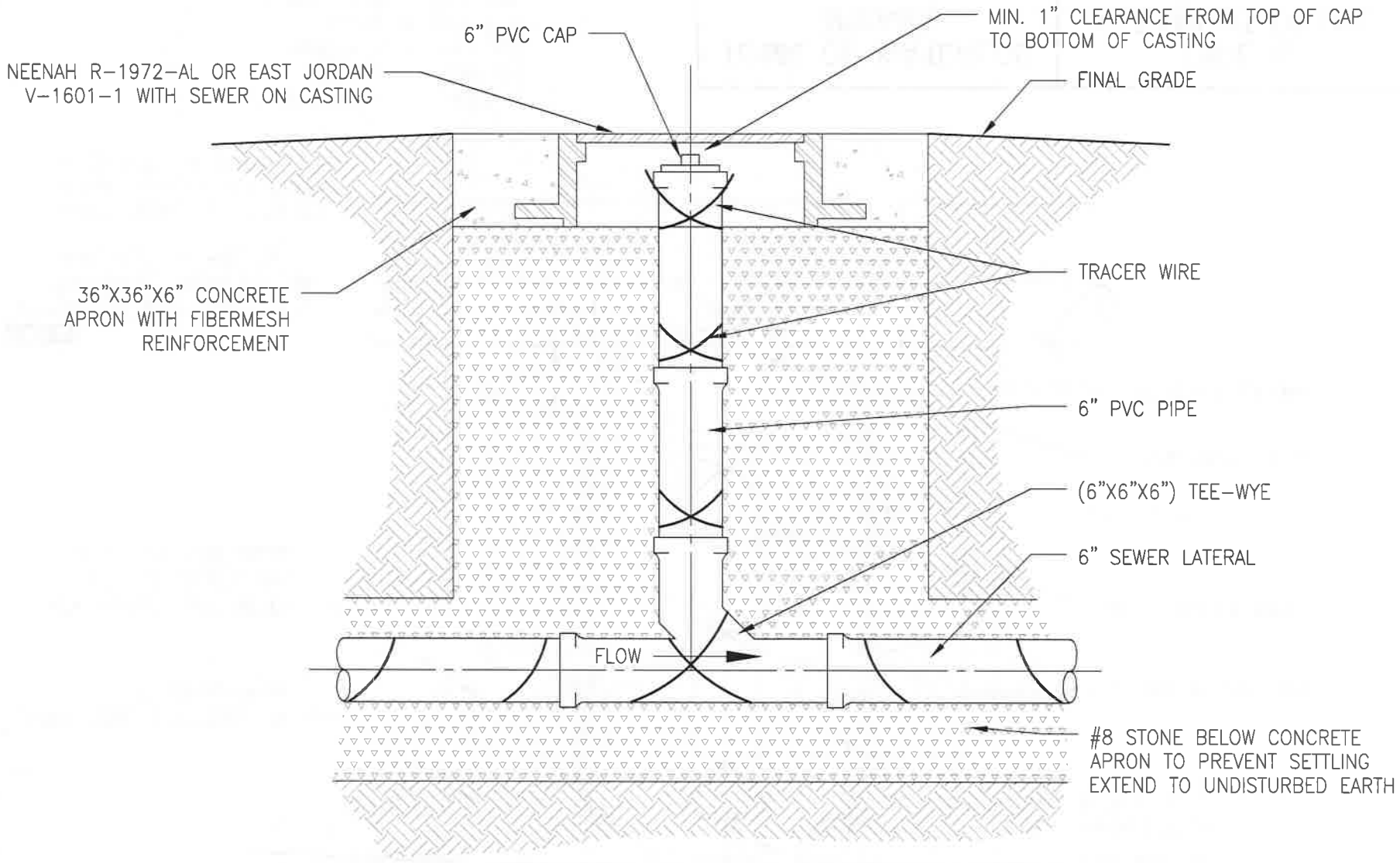
TOWN OF WATERLOO INDIANA		ABANDONED LATERAL DETAIL
APRIL 2016 Drawing: 28	Scale: Not To Scale	www.jheng.com

NOTES:

1. FOR USE ONLY IN LANDSCAPED SURFACES WITHIN THREE FEET OF BUILDING.
2. ALL SLAB AND CRAWL SPACE CONNECTIONS MUST BE A MINIMUM OF 3" BELOW THE FOOTER AND EXIT THE BUILDING AT THE FRONT OF THE STRUCTURE TO PROVIDE THE SHORTEST, MOST DIRECT ROUTE FROM THE BUILDING TO THE EXISTING LATERAL STUB.



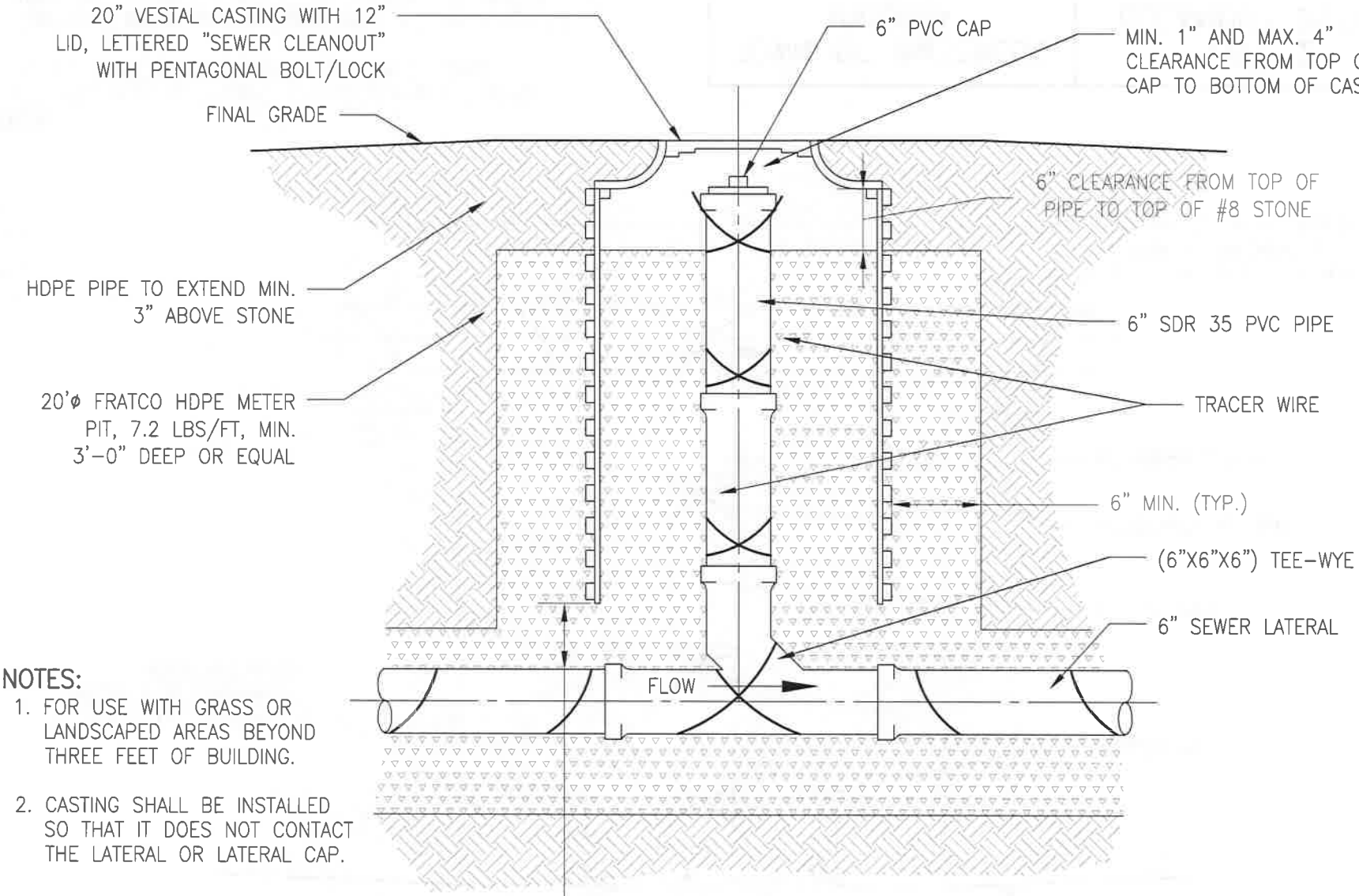
TOWN OF WATERLOO INDIANA		TYPE I CLEANOUT DETAIL
APRIL 2016 Drawing: 29	Scale: Not To Scale	www.jheng.com



NOTES:

1. FOR USE WITH HARDSCAPE SURFACES AND ALL OTHER INSTALLATIONS BEYOND THREE FEET OF BUILDING.
2. CONCRETE APRON AND CASTING SHALL BE INSTALLED SO THAT THEY DO NOT CONTACT THE LATERAL OR LATERAL CAP.

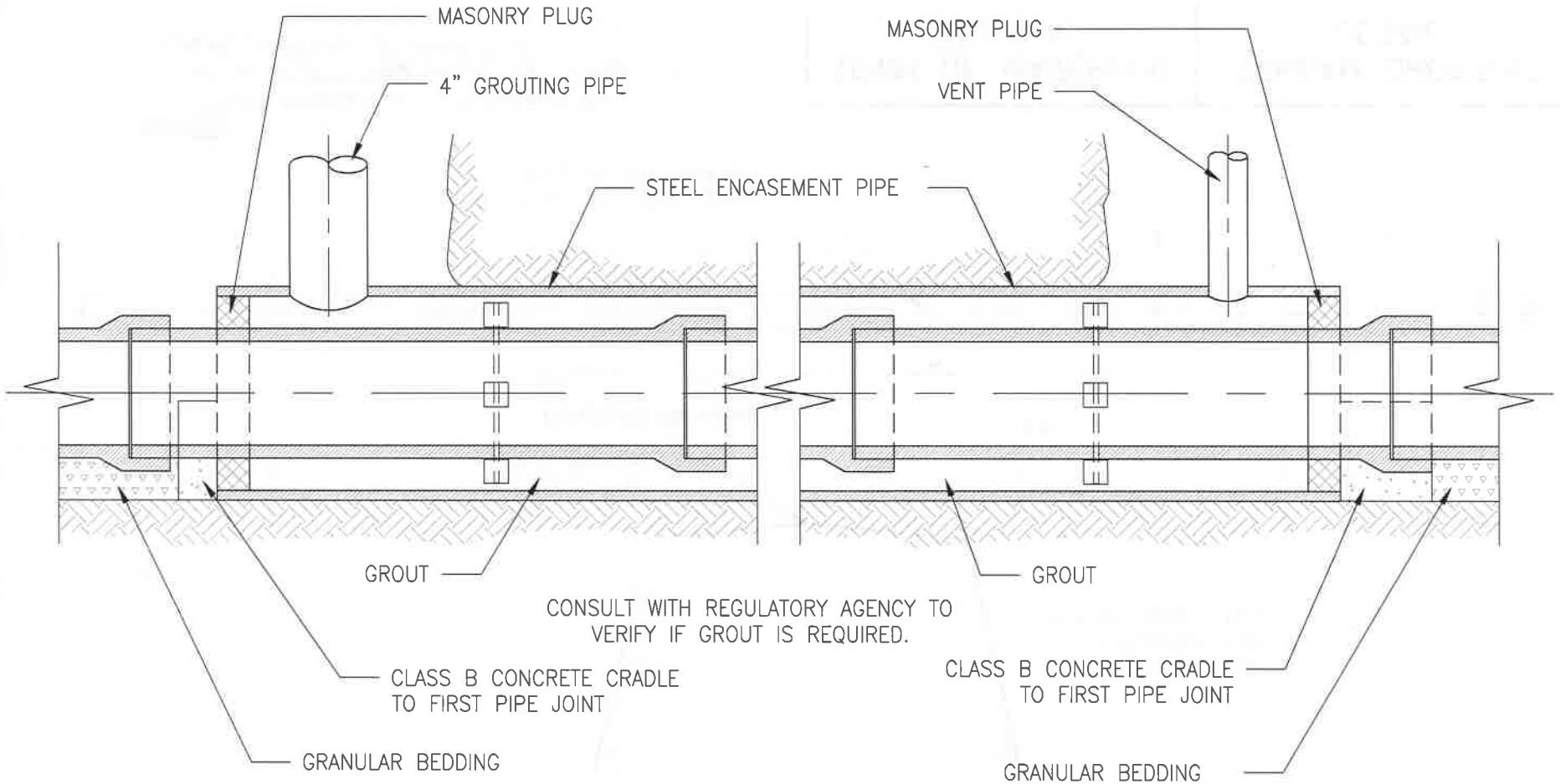
TOWN OF WATERLOO INDIANA		TYPE 2 CLEANOUT DETAIL
APRIL 2016 Drawing: 30	Scale: Not To Scale	www.jheng.com

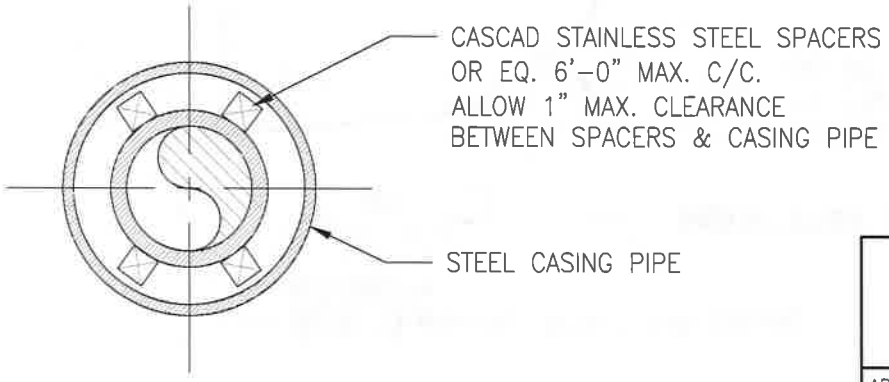


NOTES:

1. FOR USE WITH GRASS OR LANDSCAPED AREAS BEYOND THREE FEET OF BUILDING.
2. CASTING SHALL BE INSTALLED SO THAT IT DOES NOT CONTACT THE LATERAL OR LATERAL CAP.

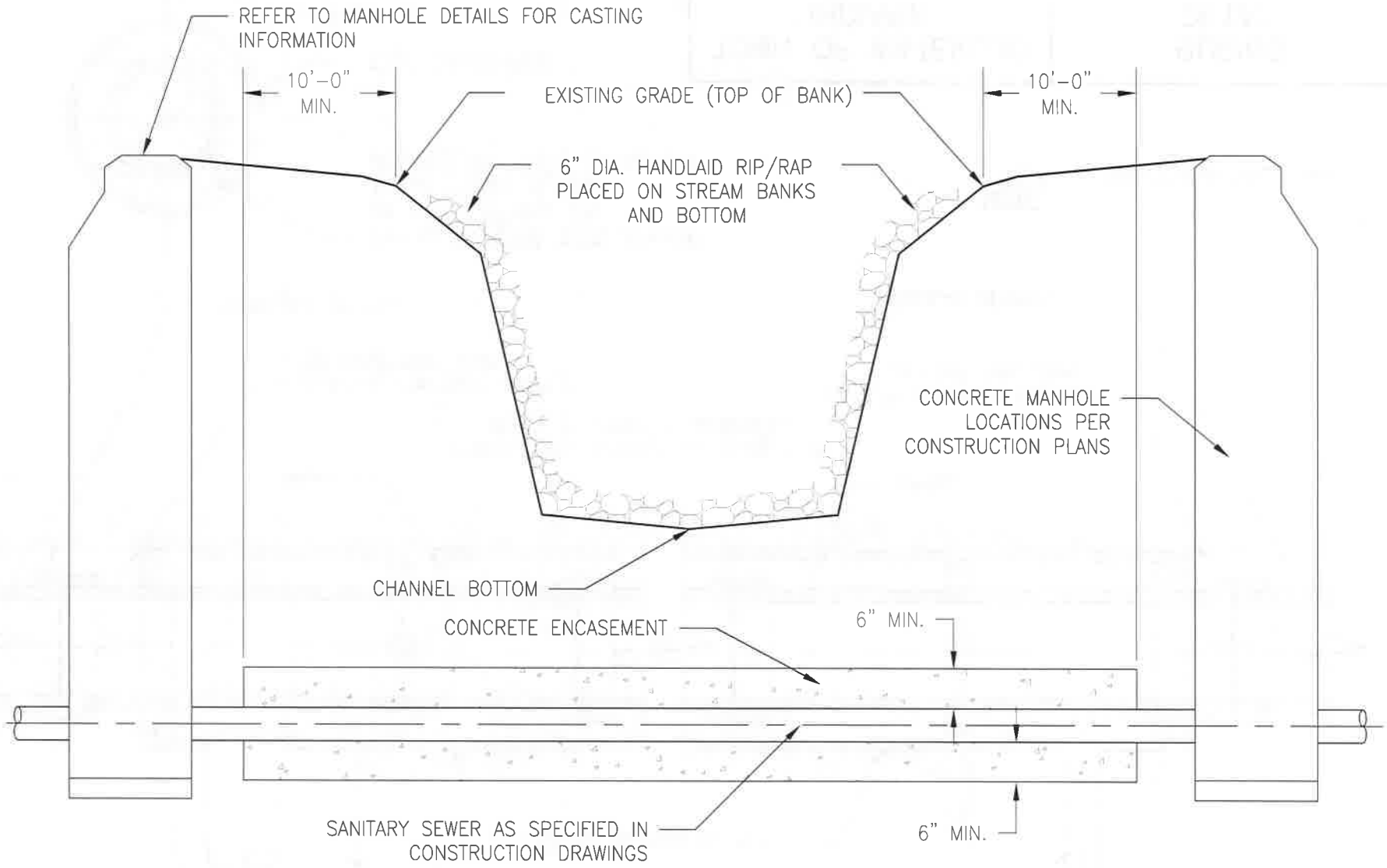
TOWN OF WATERLOO INDIANA		TYPE III CLEANOUT DETAIL
APRIL 2016 Drawing: 31	Scale: Not To Scale	www.jheng.com





NOTE:
WELD ALL ENCASEMENT PIPE JOINTS.

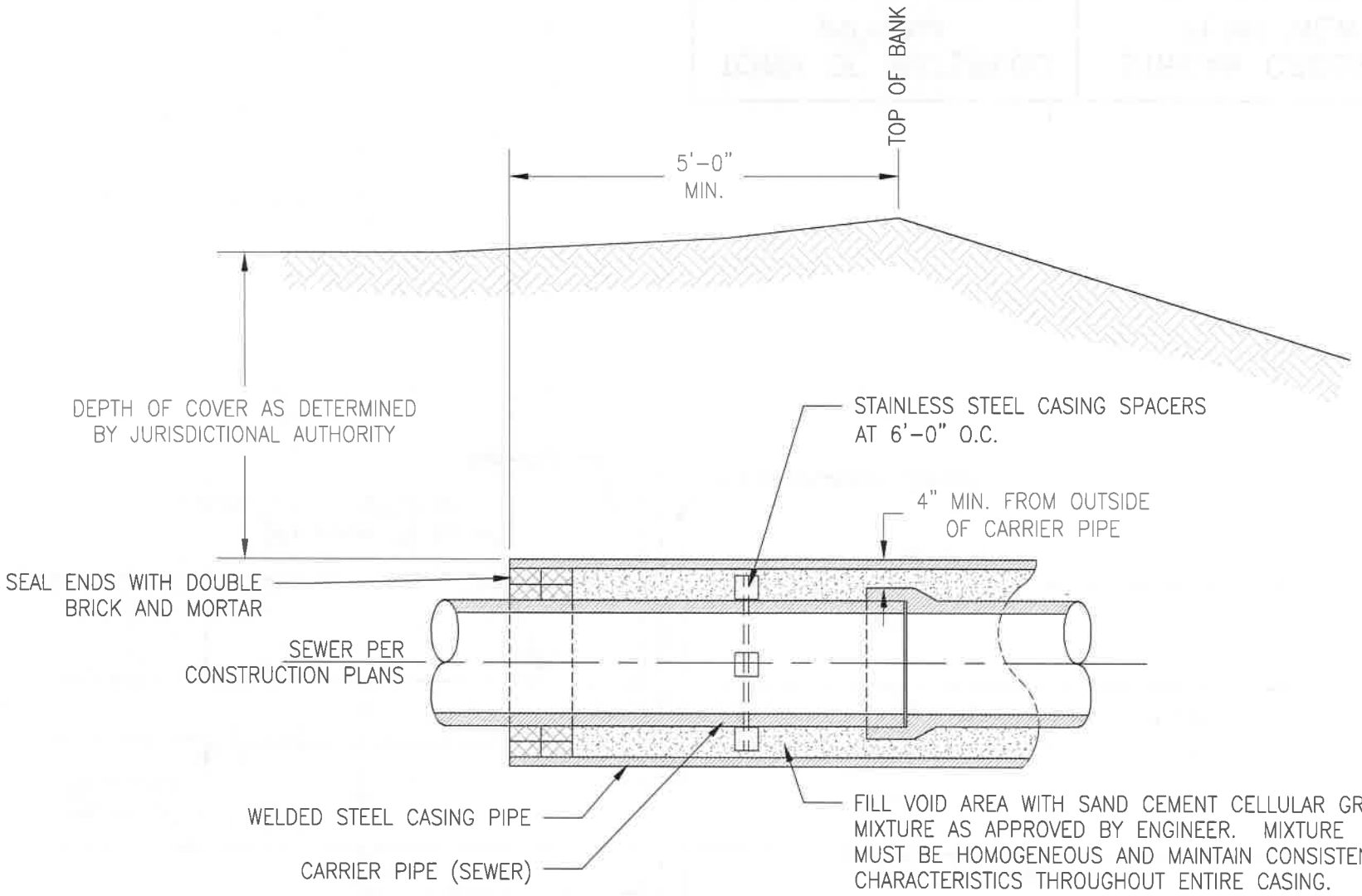
TOWN OF WATERLOO INDIANA		BORING DETAIL
APRIL 2016 Drawing: 32	Scale: Not To Scale	www.jheng.com



NOTES:

ALL STREAM CROSSINGS TO BE REVIEWED BY THE COUNTY SURVEYOR'S OFFICE AND ADHERE TO THEIR CONSTRUCTION DETAIL RECOMMENDATIONS.

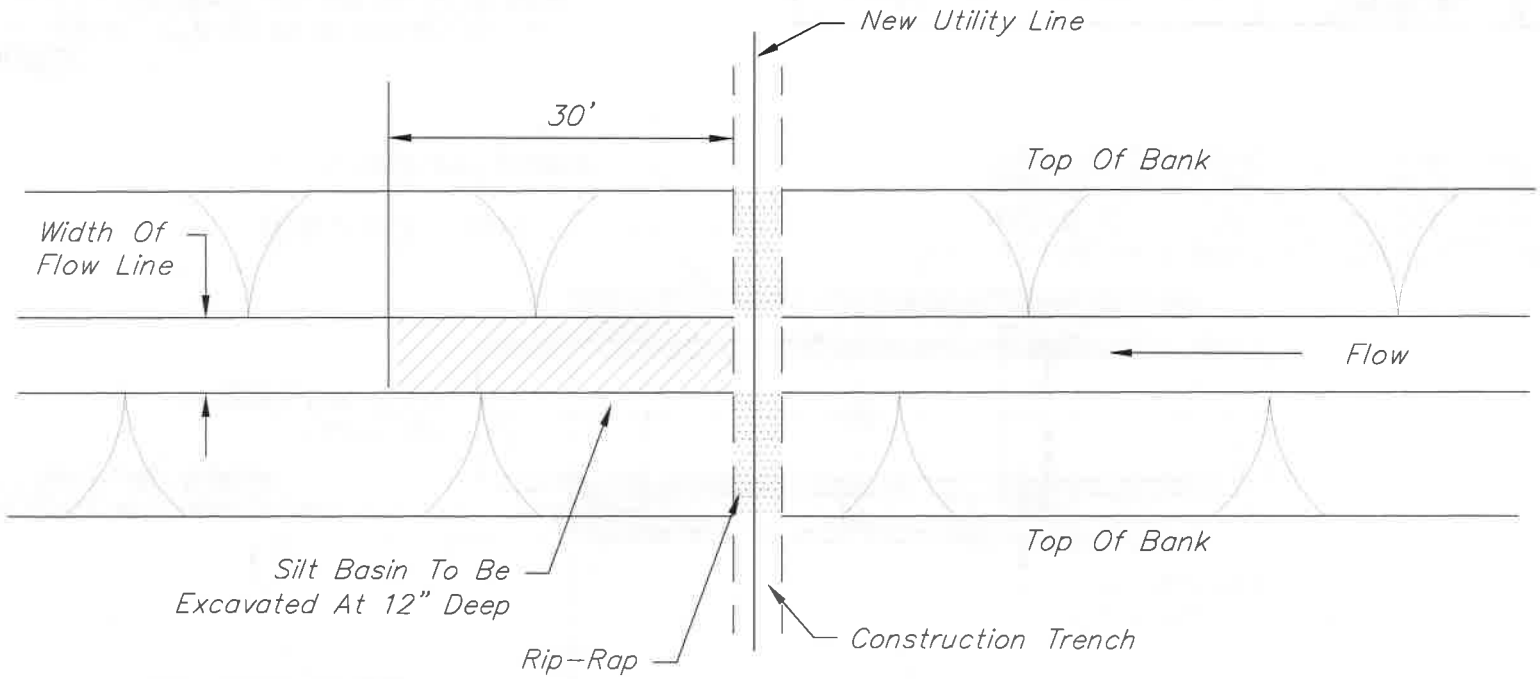
TOWN OF WATERLOO INDIANA		STREAM CROSSING DETAIL
APRIL 2016 Drawing: 33	Scale: Not To Scale	www.jheng.com



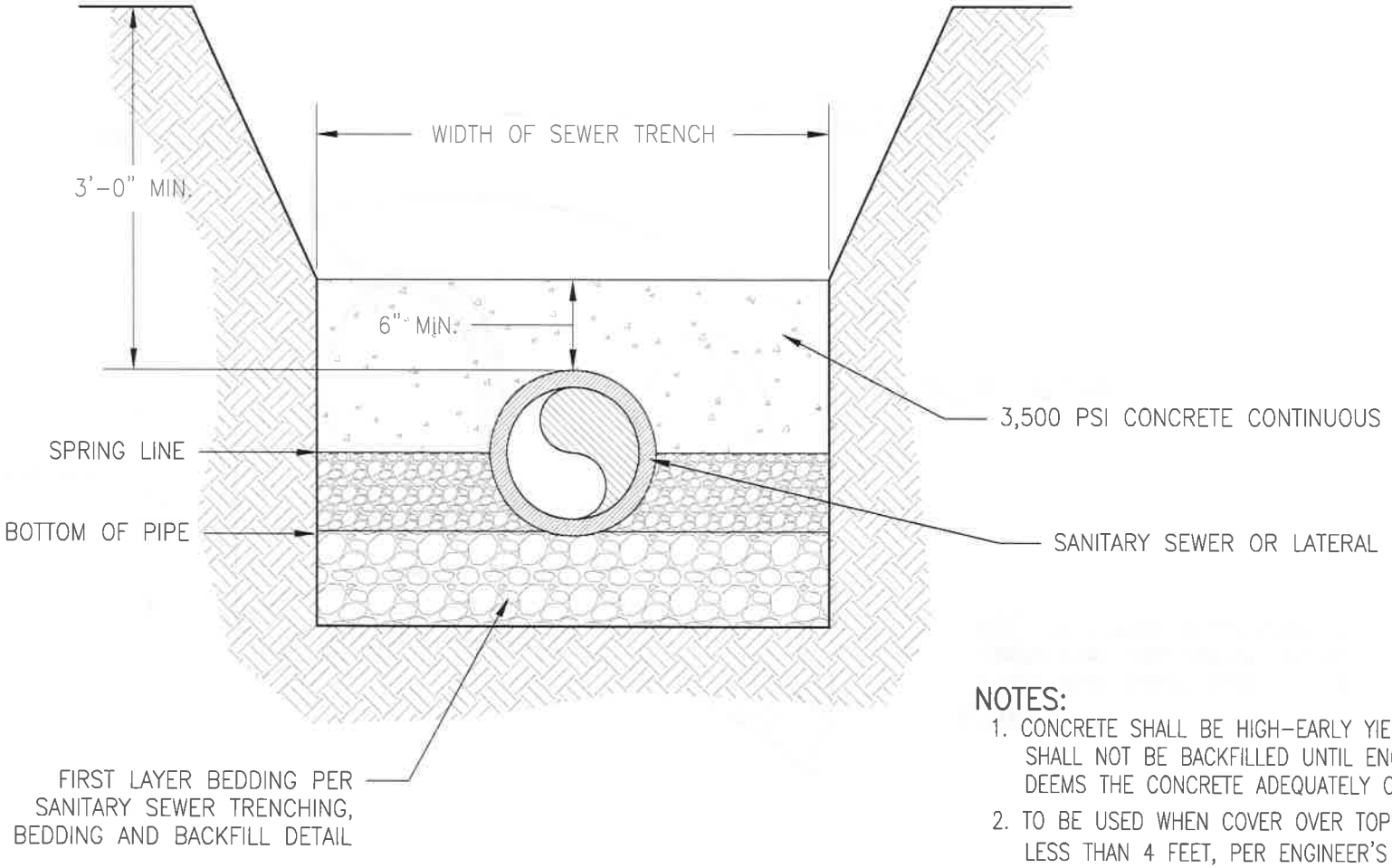
NOTES:

ALL STREAM CROSSINGS TO BE REVIEWED BY THE COUNTY SURVEYOR'S OFFICE AND ADHERE TO THEIR CONSTRUCTION DETAIL RECOMMENDATIONS.

TOWN OF WATERLOO INDIANA		TYPICAL STREAM CROSSING ENCASEMENT
APRIL 2016 Drawing: 34	Scale: Not To Scale	www.jheng.com



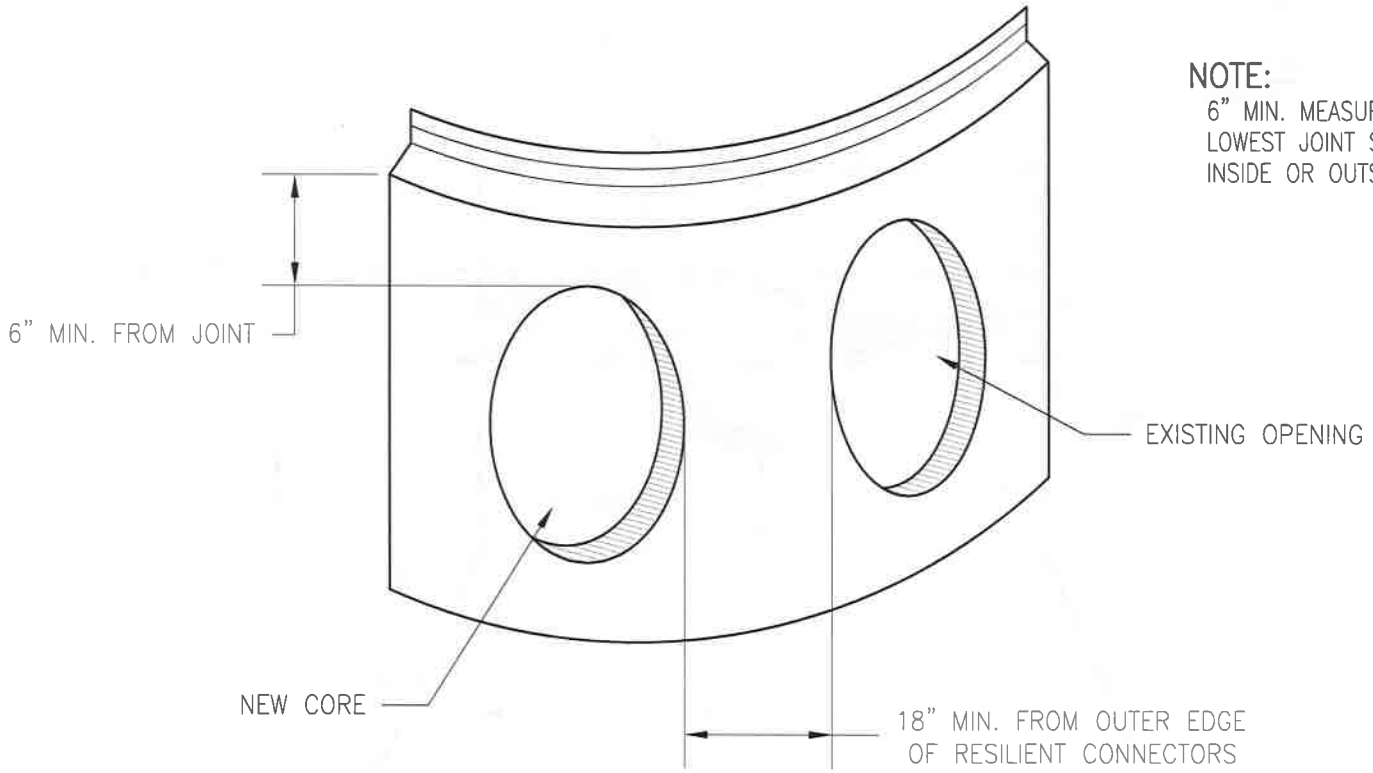
TOWN OF WATERLOO INDIANA		STREAM CROSSING PLAN VIEW
APRIL 2016 Drawing: 35	Scale: Not To Scale	www.jheng.com



NOTES:

1. CONCRETE SHALL BE HIGH-EARLY YIELD AND SHALL NOT BE BACKFILLED UNTIL ENGINEER DEEMS THE CONCRETE ADEQUATELY CURED.
2. TO BE USED WHEN COVER OVER TOP OF PIPE IS LESS THAN 4 FEET, PER ENGINEER'S DIRECTION OR WHERE NOTED ON THE CONSTRUCTION PLANS.

TOWN OF WATERLOO INDIANA		CONCRETE CAP DETAIL
APRIL 2016 Drawing: 36	Scale: Not To Scale	www.jheng.com

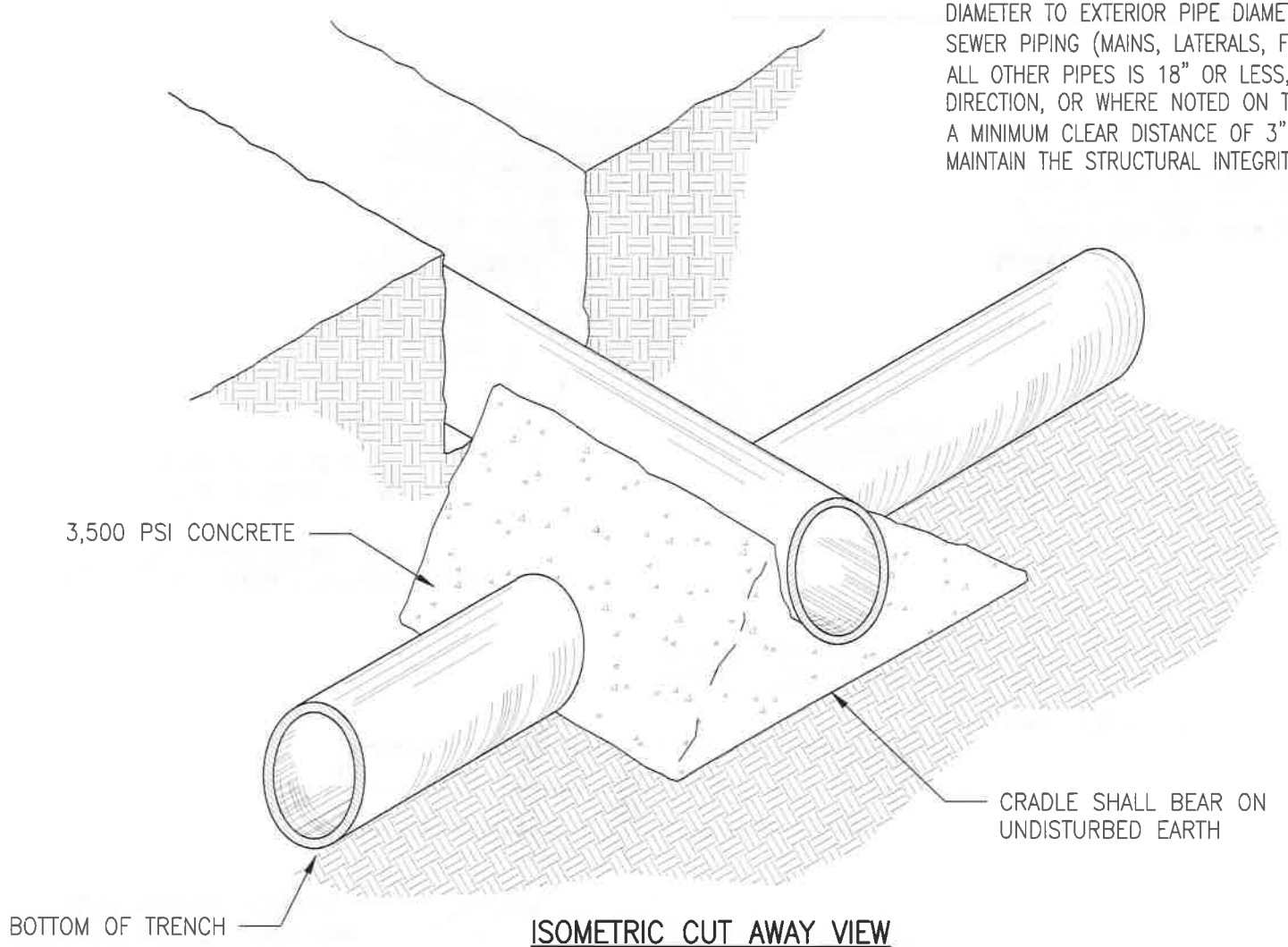


NOTE:
6" MIN. MEASUREMENT MUST BE FROM LOWEST JOINT SEAM WHETHER ON THE INSIDE OR OUTSIDE OF THE STRUCTURE.

TOWN OF WATERLOO INDIANA		NEW CORE DETAIL
APRIL 2016 Drawing: 37	Scale: Not To Scale	www.jheng.com

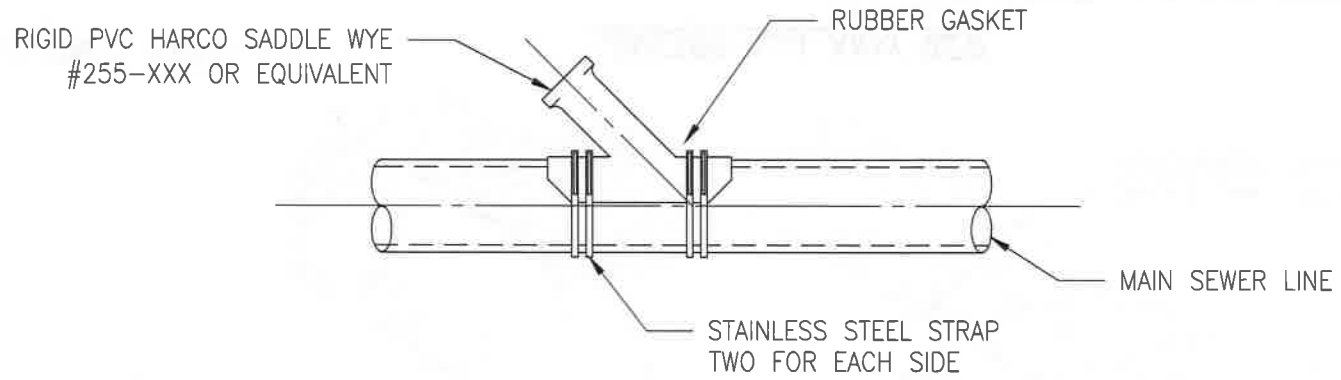
NOTES:

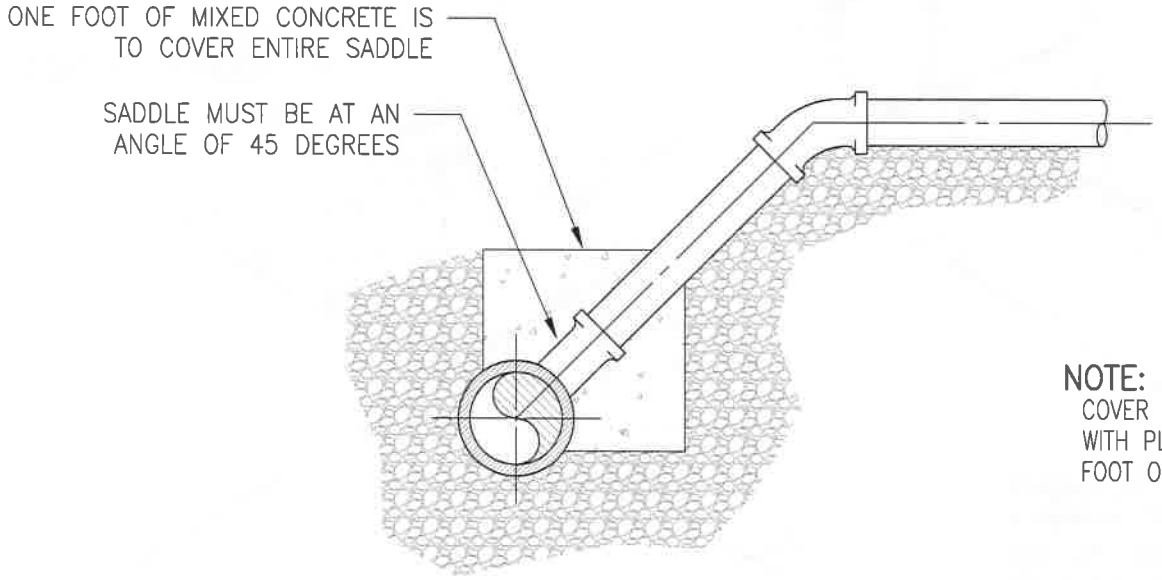
TO BE USED WHEN CLEAR DISTANCE (FROM EXTERIOR PIPE DIAMETER TO EXTERIOR PIPE DIAMETER) BETWEEN SANITARY SEWER PIPING (MAINS, LATERALS, FORCE MAINS, ETC.) AND ALL OTHER PIPES IS 18" OR LESS, PER ENGINEER'S DIRECTION, OR WHERE NOTED ON THE CONSTRUCTION PLANS. A MINIMUM CLEAR DISTANCE OF 3" MUST BE PROVIDED TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE CONCRETE.



ISOMETRIC CUT AWAY VIEW

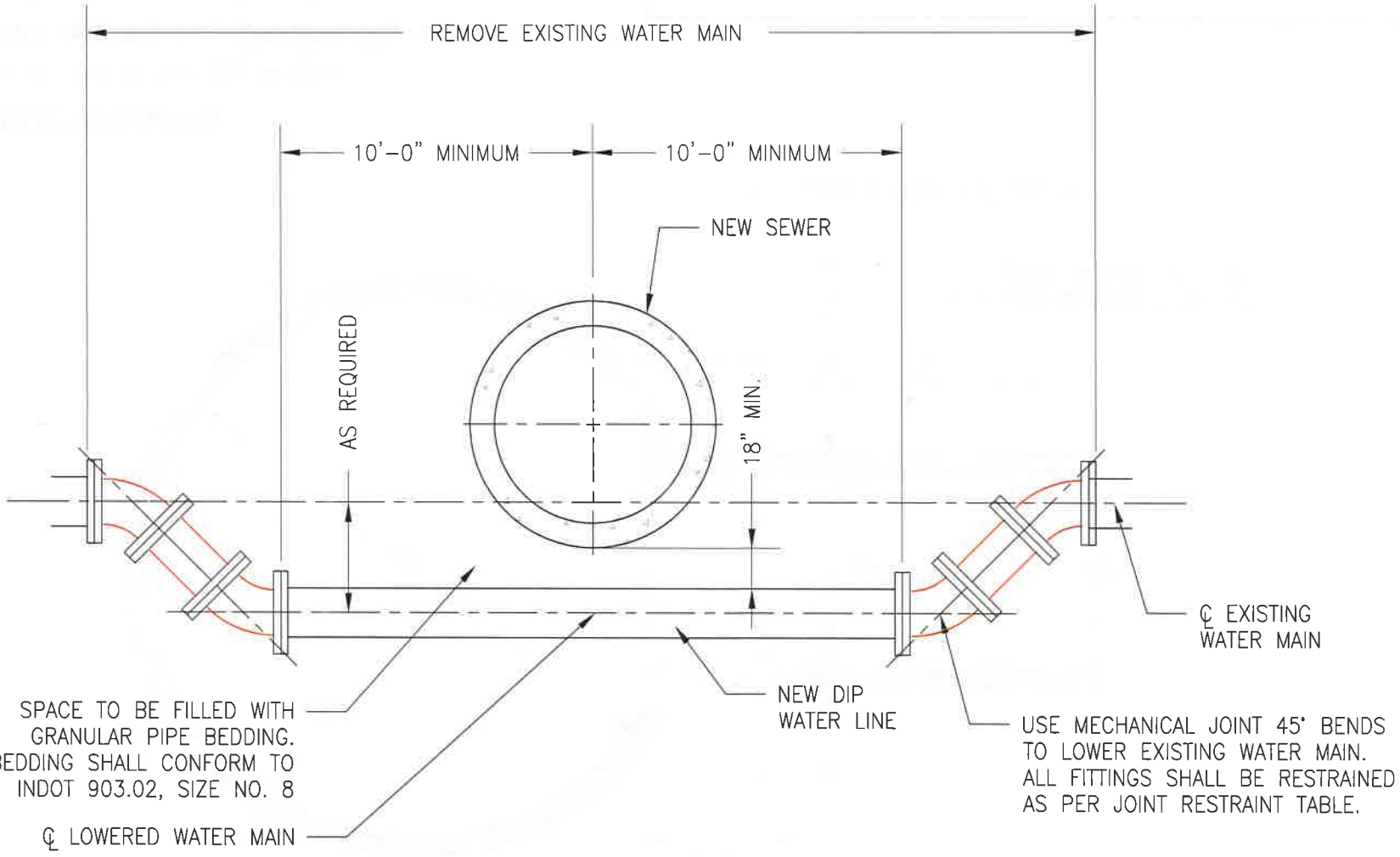
TOWN OF WATERLOO INDIANA		CONCRETE CRADLE DETAIL
APRIL 2016 Drawing: 40	Scale: Not To Scale	www.jheng.com





NOTE:
COVER FITTING AND STAINLESS STEEL STRAPS WITH PLASTIC WRAP AND ENCASE WITH ONE FOOT OF MIXED CONCRETE IN ALL DIRECTIONS.

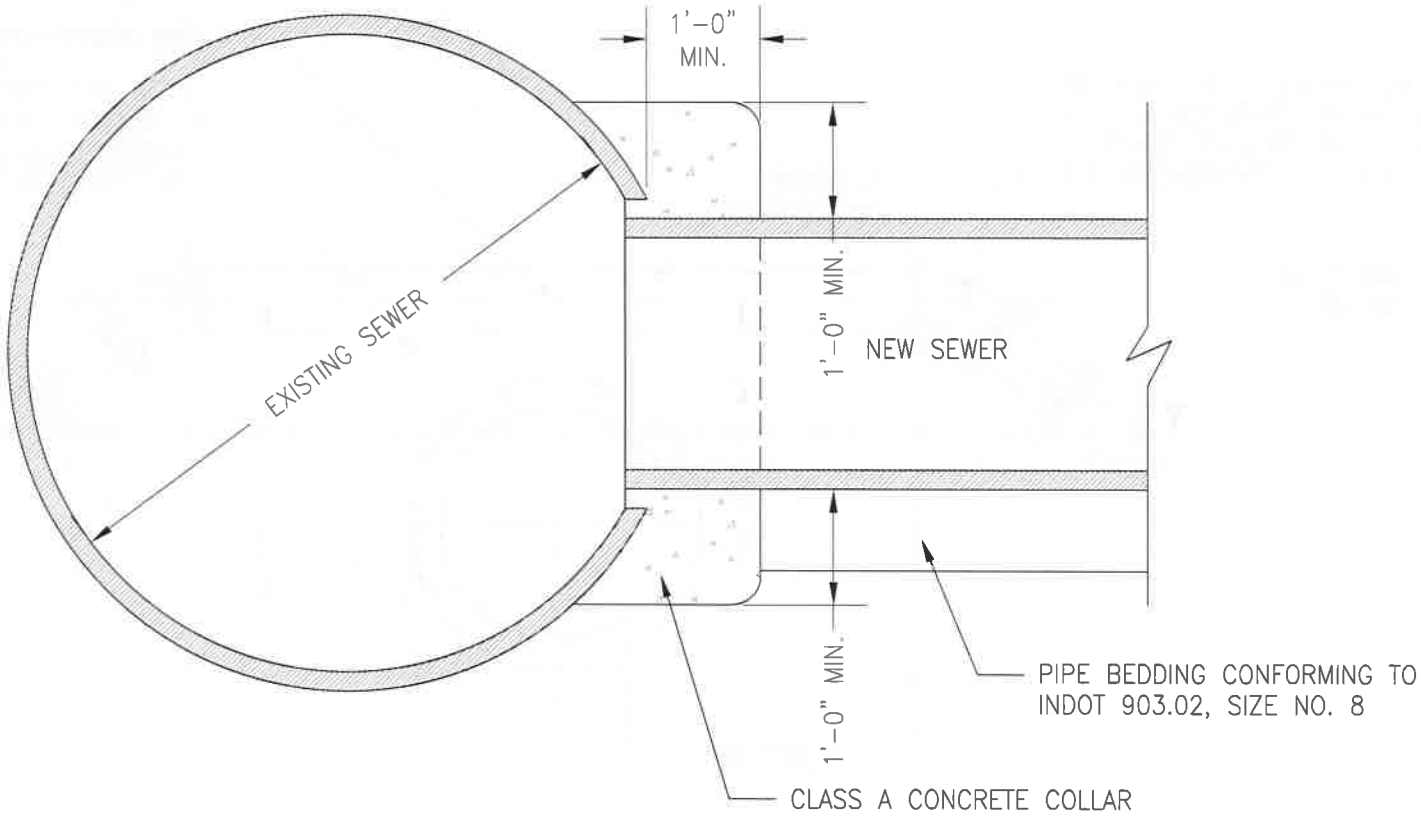
TOWN OF WATERLOO INDIANA		SADDLE TEE DETAIL
APRIL 2016 Drawing: 39	Scale: Not To Scale	www.jheng.com



NOTE:

CONTRACTOR SHALL FIELD VERIFY ELEVATION OF EXISTING WATER MAIN TO DETERMINE EXACT OFFSET DIMENSION REQUIRED.

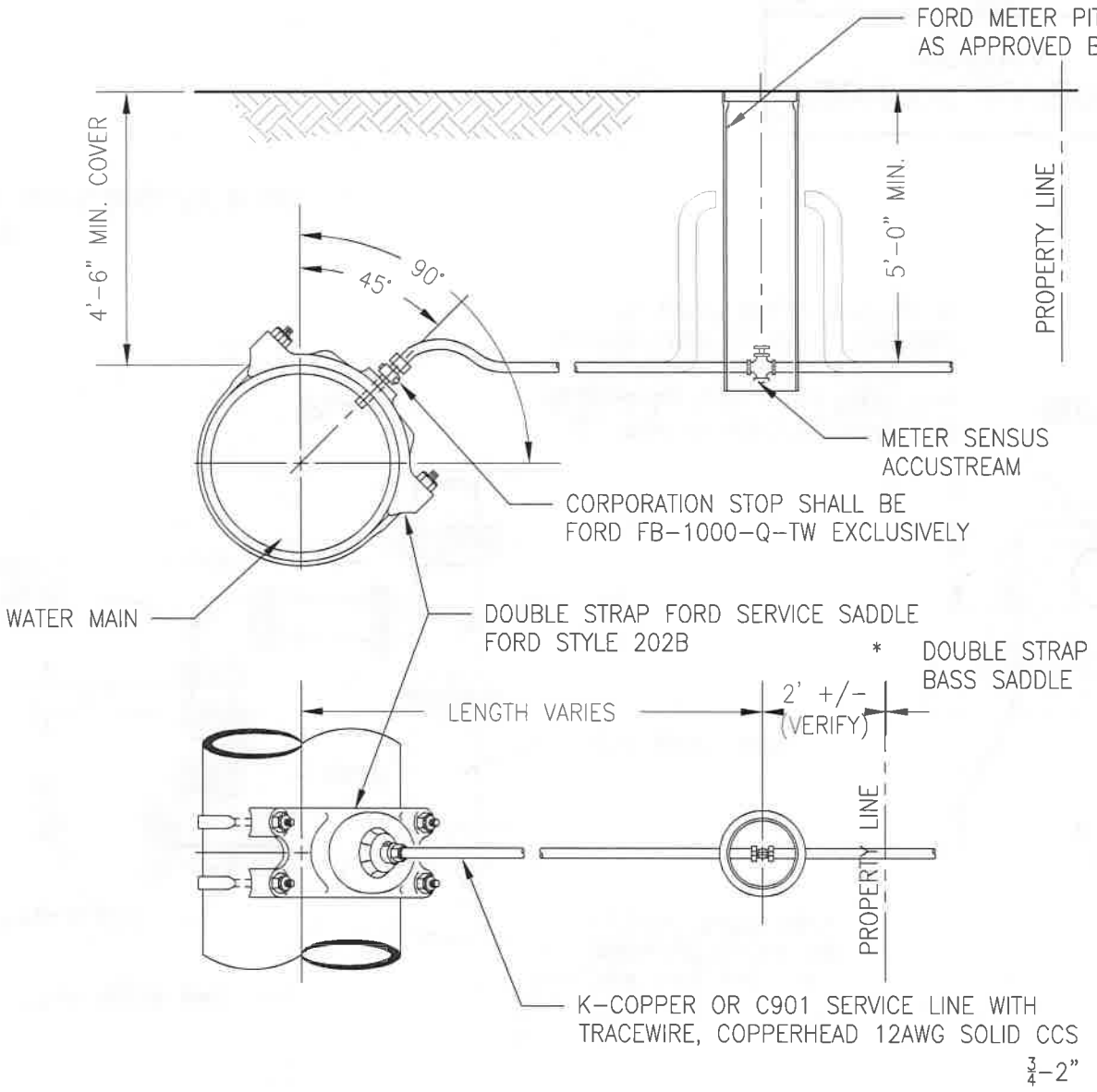
TOWN OF WATERLOO INDIANA		LOWERING EXISTING WATER MAIN
APRIL 2016 Drawing: 41	Scale: Not To Scale	www.jheng.com



CONNECTION NOTES

1. SAWCUT HOLE IN EXISTING SEWER.
2. INSTALL NEW PIPE NOT PROTRUDING INTO EXISTING SEWER.
3. ENCASE CONNECTION IN CONCRETE COLLAR AS SHOWN.
4. BACKFILL CAREFULLY.

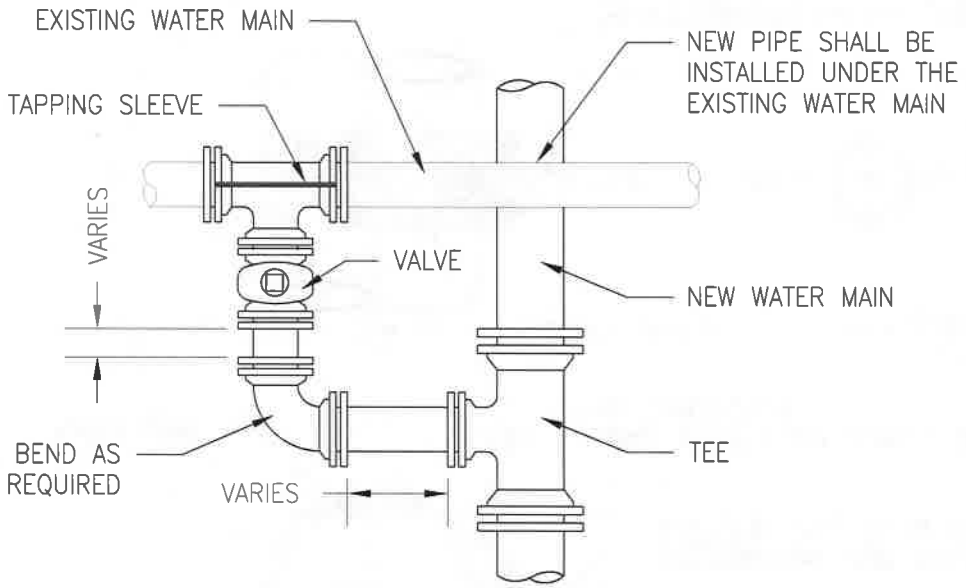
TOWN OF WATERLOO INDIANA		STORM SEWER CONNECTION
APRIL 2016 Drawing: 42	Scale: Not To Scale	www.jheng.com



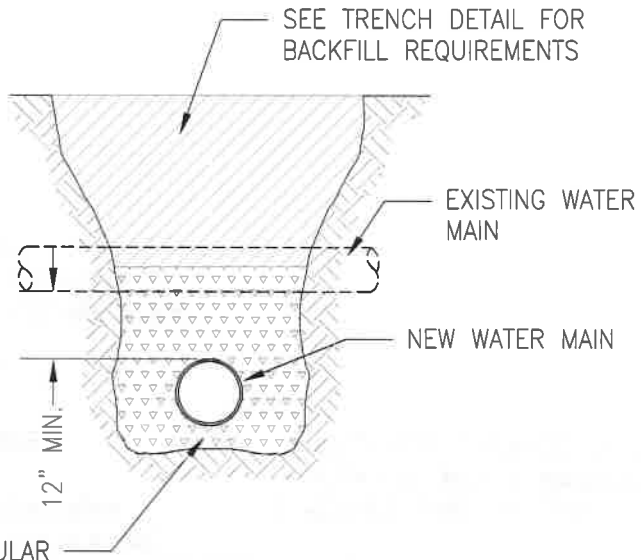
NOTES:

1. SADDLE TAPS SHALL BE USED FOR ALL SERVICE TAPS.
2. CORPORATION STOP SHALL BE BRAND AND MODEL APPROVED BY WATER UTILITIES.
3. SERVICE LINE TAP SHALL BE INSTALLED WITH A MINIMUM HORIZONTAL DISTANCE OF 24".

TOWN OF WATERLOO INDIANA		WATER SERVICE DETAIL
APRIL 2016 Drawing: 43	Scale: Not To Scale	www.jheng.com



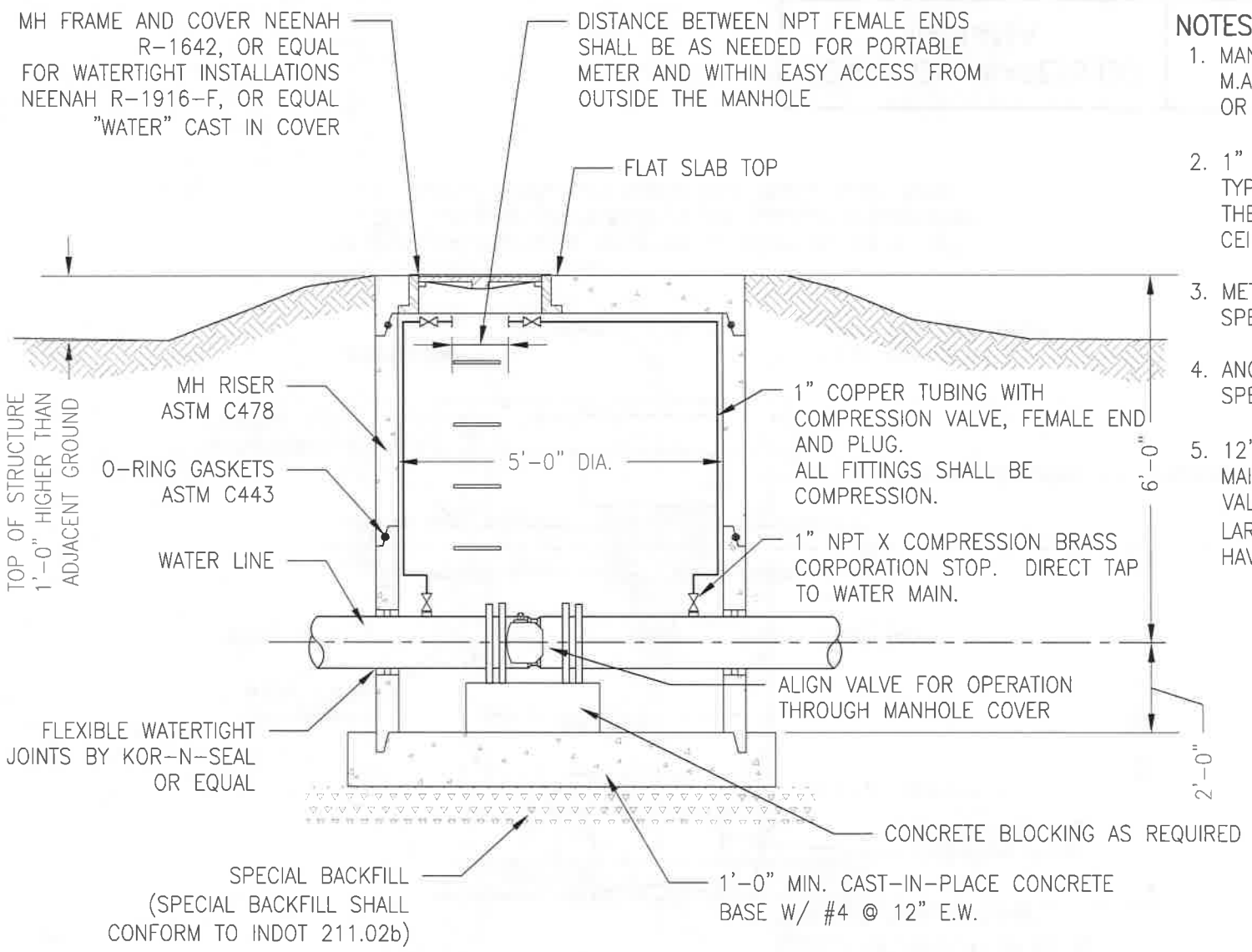
PLAN



SECTION

NOTE:
ALL JOINTS SHALL BE RESTRAINED.

TOWN OF WATERLOO INDIANA		WATER MAIN CONNECTION DETAIL
APRIL 2016 Drawing: 44	Scale: Not To Scale	www.jheng.com

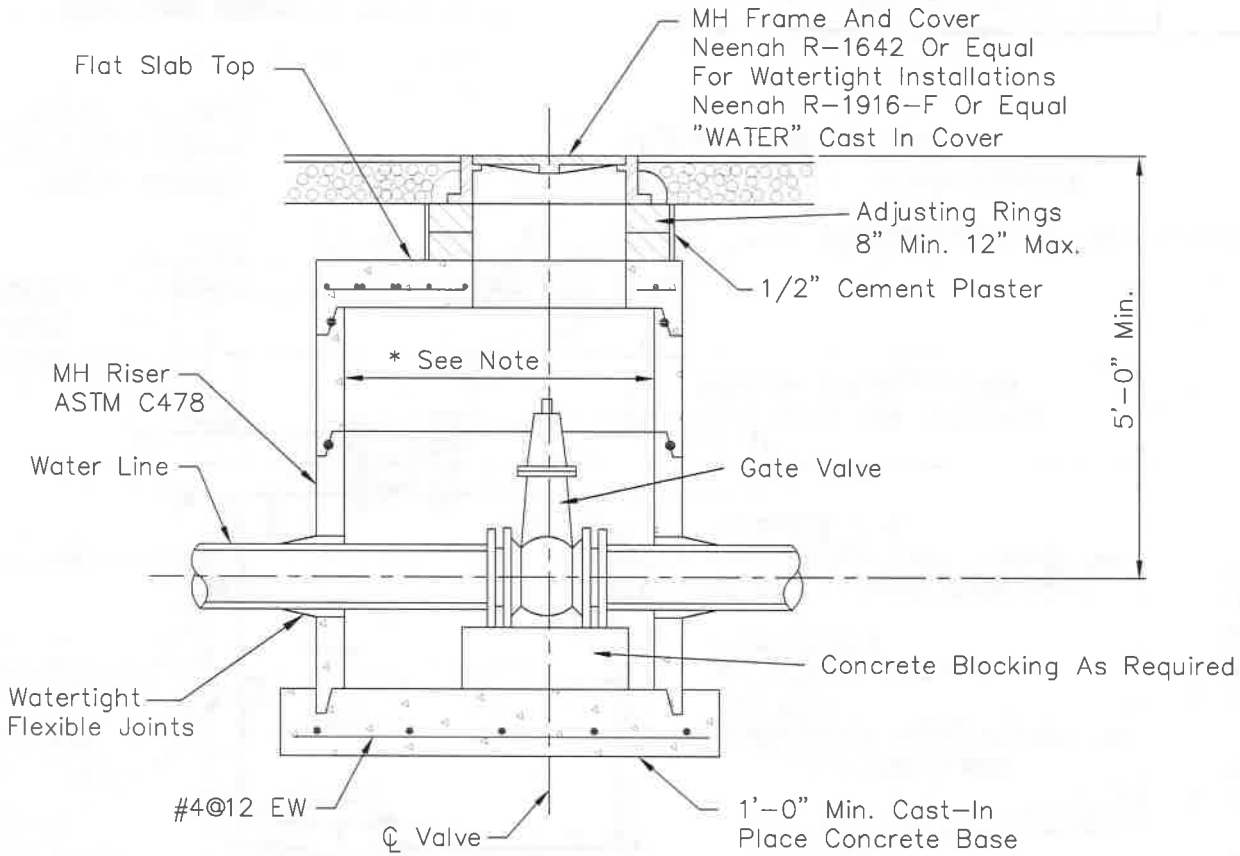


NOTES:

1. MANHOLE STEPS SHALL BE M.A. INDUSTRIES MODEL PS-1 OR EQUAL.
2. 1" COPPER TUBING SHALL BE TYPE K FIRMLY ANCHORED TO THE MANHOLE WALLS AND CEILING.
3. METER YOKE SHALL BE SPECIFIED BY UTILITY.
4. ANGLE VALVES SHALL BE SPECIFIED BY UTILITY.
5. 12" AND SMALLER WATER MAINS SHALL HAVE GATE VALVES. WATER MAINS LARGER THAN 12" SHALL HAVE BUTTERFLY VALVES.

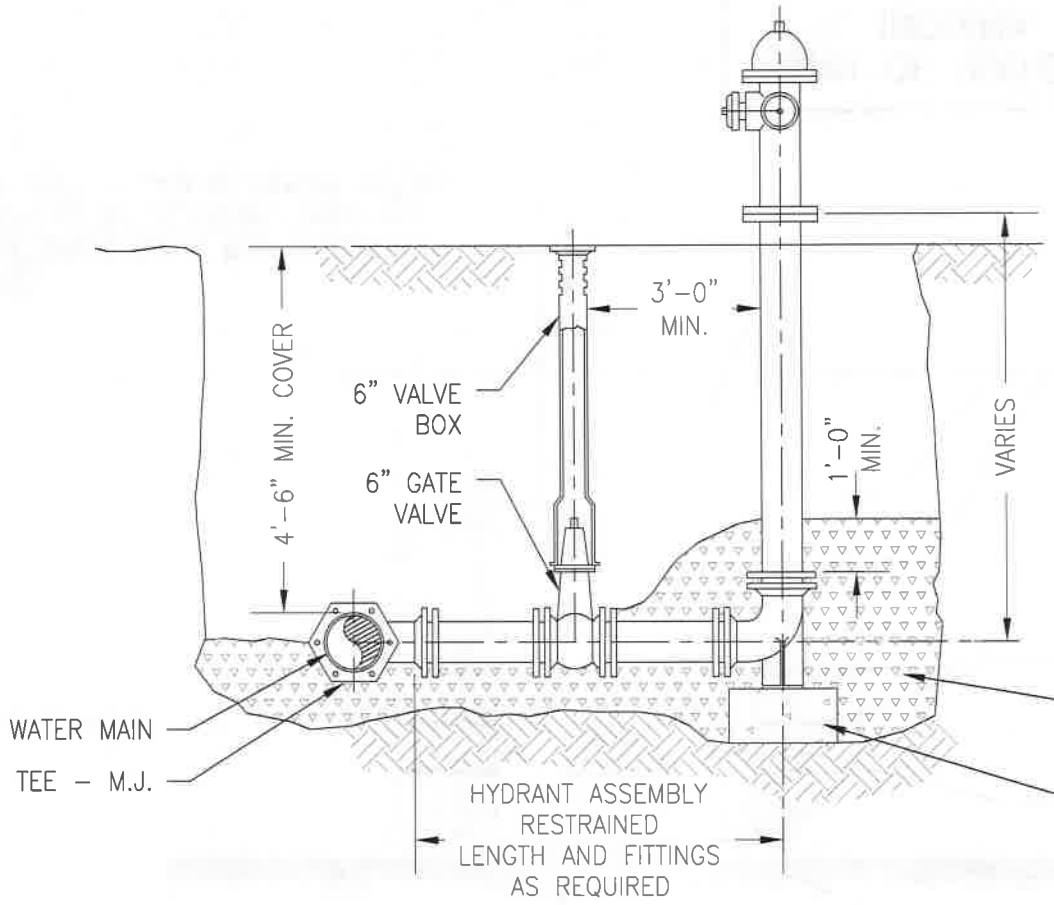
MONITORING MANHOLES SHALL BE INSTALLED AT EACH STREAM CROSSING

TOWN OF WATERLOO INDIANA		MONITORING MANHOLE
APRIL 2016 Drawing: 45	Scale: Not To Scale	www.jheng.com



* Manhole Diameter Shall Be A Minimum Of 4'-0".
The Designer Shall Specify An Adequate Diameter
To Accomodate The Valve And Water Main Size.

TOWN OF WATERLOO INDIANA		WATER VALVE MANHOLE
APRIL 2016 Drawing: 46	Scale: Not To Scale	www.jheng.com



HYDRANT TO BE:

"WATEROUS 5–1/4" PACER" W/5"x2–1/2" CONNECTIONS HYDRANT SHALL INCLUDE HARRINGTON STORCH FITTINGS INSTALLED ON THE 5" STORZ CONNECTION

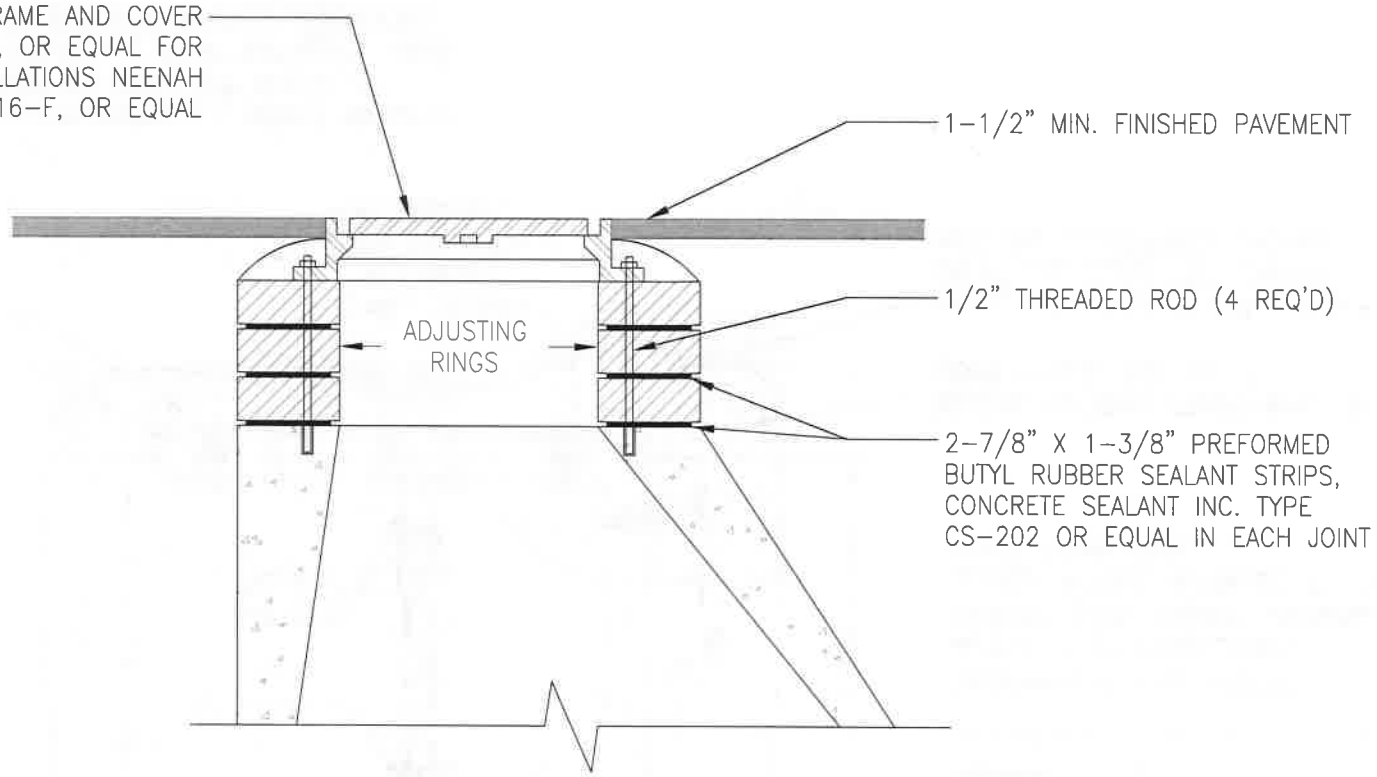
BEDDING MATERIAL CONFORMING TO INDOT 903.02, SIZE NO. 8

ONE 8"x8"x16" SOLID CONC. BLOCK OR 6" MIN. CLASS "B" CONCRETE BASE ON UNDISTURBED GROUND.

NOTES:

1. AT HIGH POINTS ALONG MAIN WATER LINE WHERE INDICATED ON DRAWINGS, ANCHORING TEE SHALL BE SET AT 45° ANGLE UPWARDS AND CONNECTED TO 6" 45° BEND. MAIN WATER LINE SHALL BE LOWERED TO PROVIDE SUFFICIENT COVER AS SPECIFIED.
2. ALL JOINTS SHALL BE RESTRAINED.
3. HYDRANTS SHALL BE SET AT 500' MAX. HORIZONTAL DISTANCE, OR LESS AS SPECIFIED BY FIRE DEPARTMENT.

TOWN OF WATERLOO INDIANA		FIRE HYDRANT ASSEMBLY
APRIL 2016 Drawing: 47	Scale: Not To Scale	www.jheng.com

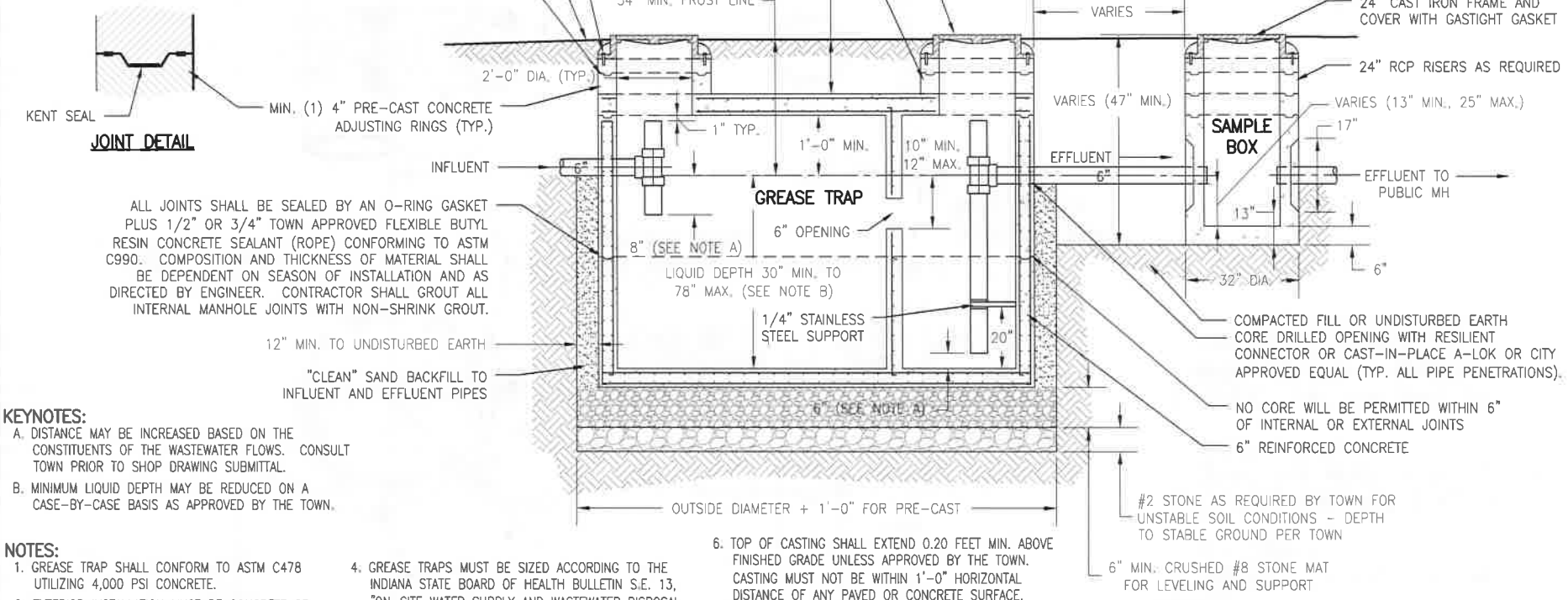


NOTE:
PREFORMED BUTYL RUBBER SEALANT BETWEEN MH ADJUSTING RINGS MAY BE USED IN LIEU OF CEMENT MORTAR

TOWN OF WATERLOO INDIANA		BUTYL RUBBER SEALANT DETAIL
APRIL 2016 Drawing: 48	Scale: Not To Scale	www.jheng.com

MANHOLE CASTING TABLE		
LOCATION	**MODEL**	**COVER**
18" OR MORE ABOVE THE 100-YEAR FLOOD ELEVATION OF ALL WATERWAYS	EAST JORDAN 1022Z1GS OR NEENAH R-1772	HEAVY DUTY SOLID
LESS THAN 18" ABOVE THE 100-YEAR FLOOD ELEVATION OF ALL WATERWAYS	EAST JORDAN 1022Z1PT	HEAVY DUTY SOLID

LID	
OWNERSHIP	**LETTERING**
PRIVATE	"SANITARY SEWER"



JOINT DETAIL

KEYNOTES:

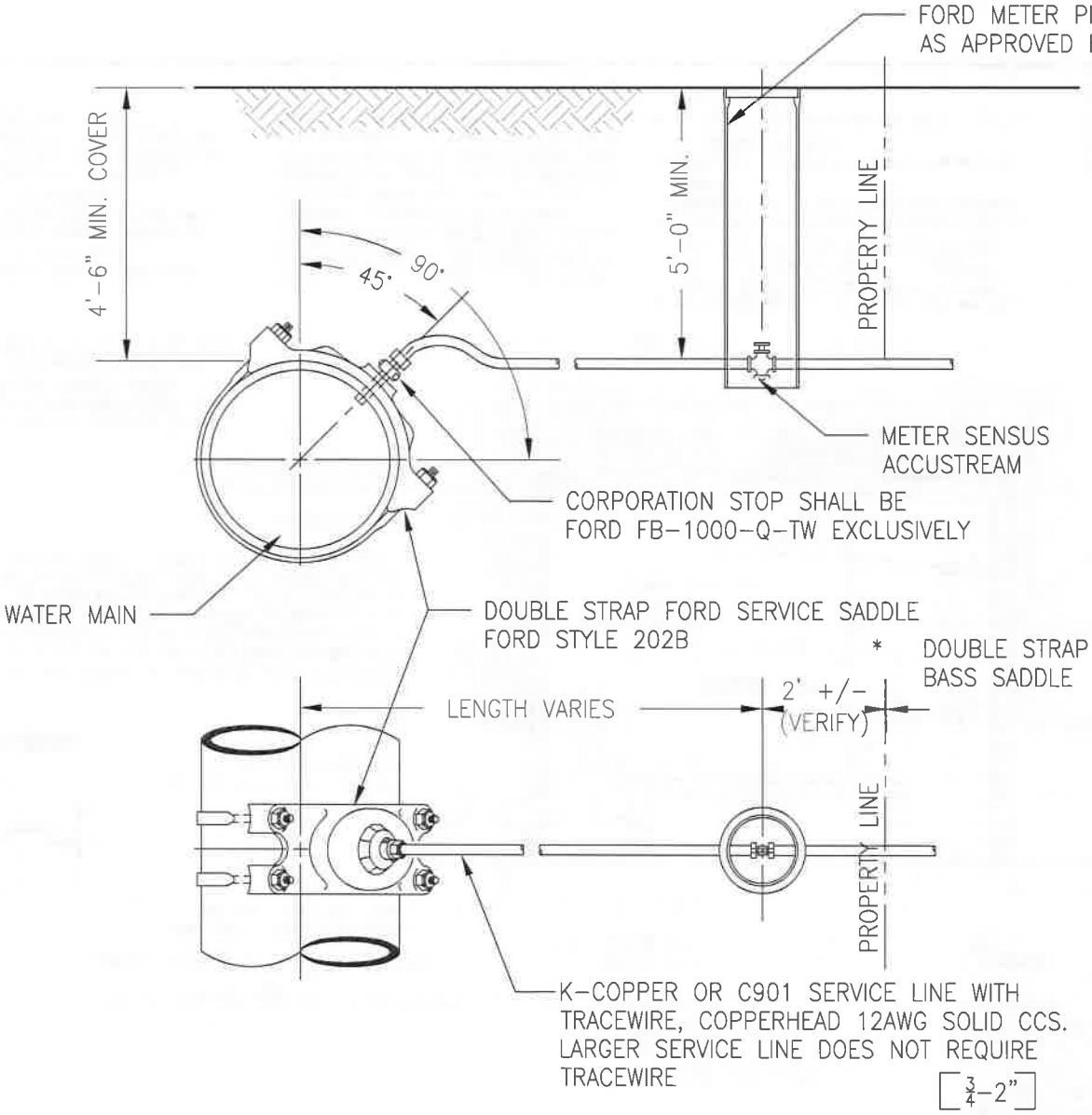
A. DISTANCE MAY BE INCREASED BASED ON THE CONSTITUENTS OF THE WASTEWATER FLOWS. CONSULT TOWN PRIOR TO SHOP DRAWING SUBMITTAL.

B. MINIMUM LIQUID DEPTH MAY BE REDUCED ON A CASE-BY-CASE BASIS AS APPROVED BY THE TOWN.

NOTES:

1. GREASE TRAP SHALL CONFORM TO ASTM C478 UTILIZING 4,000 PSI CONCRETE.
2. EXTERIOR INSTALLATION MUST BE CONCRETE OR CAST IRON. STEEL GREASE TRAPS SHALL ONLY BE INSTALLED INSIDE A BUILDING.
3. CONTRACTOR MAY SUPPLY GREASE TRAP AS MANUFACTURED BY ZURN SERIES Z-1170 OR JAY R. SMITH MANUFACTURING COMPANY SERIES 8000 IF INTERIOR INSTALLATION UTILIZED.
4. GREASE TRAPS MUST BE SIZED ACCORDING TO THE INDIANA STATE BOARD OF HEALTH BULLETIN S.E. 13, "ON-SITE WATER SUPPLY AND WASTEWATER DISPOSAL FOR PUBLIC AND COMMERCIAL ESTABLISHMENT" SECTION 501 "GREASE TRAPS" AND PER LOCAL REQUIREMENTS OR CODES. THE SIZING METHOD FOR ALL STRUCTURES MUST BE APPROVED BY THE TOWN.
5. SHOP DRAWINGS MUST BE SUBMITTED TO THE UTILITY ENGINEER FOR REVIEW AND APPROVAL.
6. TOP OF CASTING SHALL EXTEND 0.20 FEET MIN. ABOVE FINISHED GRADE UNLESS APPROVED BY THE TOWN. CASTING MUST NOT BE WITHIN 1'-0" HORIZONTAL DISTANCE OF ANY PAVED OR CONCRETE SURFACE.
7. SAMPLE BOX MUST BE PLACED ON SUITABLE BASE OF COMPACTED SOIL OR UNDISTURBED EARTH IN TRAFFIC CONDITION.
8. SAMPLE BOX IS PROPERTY OF OWNER AND WILL NOT BE MAINTAINED BY UTILITY.
9. THE BAFFLE ORIENTATION SHALL BE DEPENDENT UPON THE APPLICATION.

TOWN OF WATERLOO INDIANA	GREASE TRAP AND SAMPLE BOX DETAIL
APRIL 2016 Drawing: 49	Scale: Not To Scale
	www.jheng.com



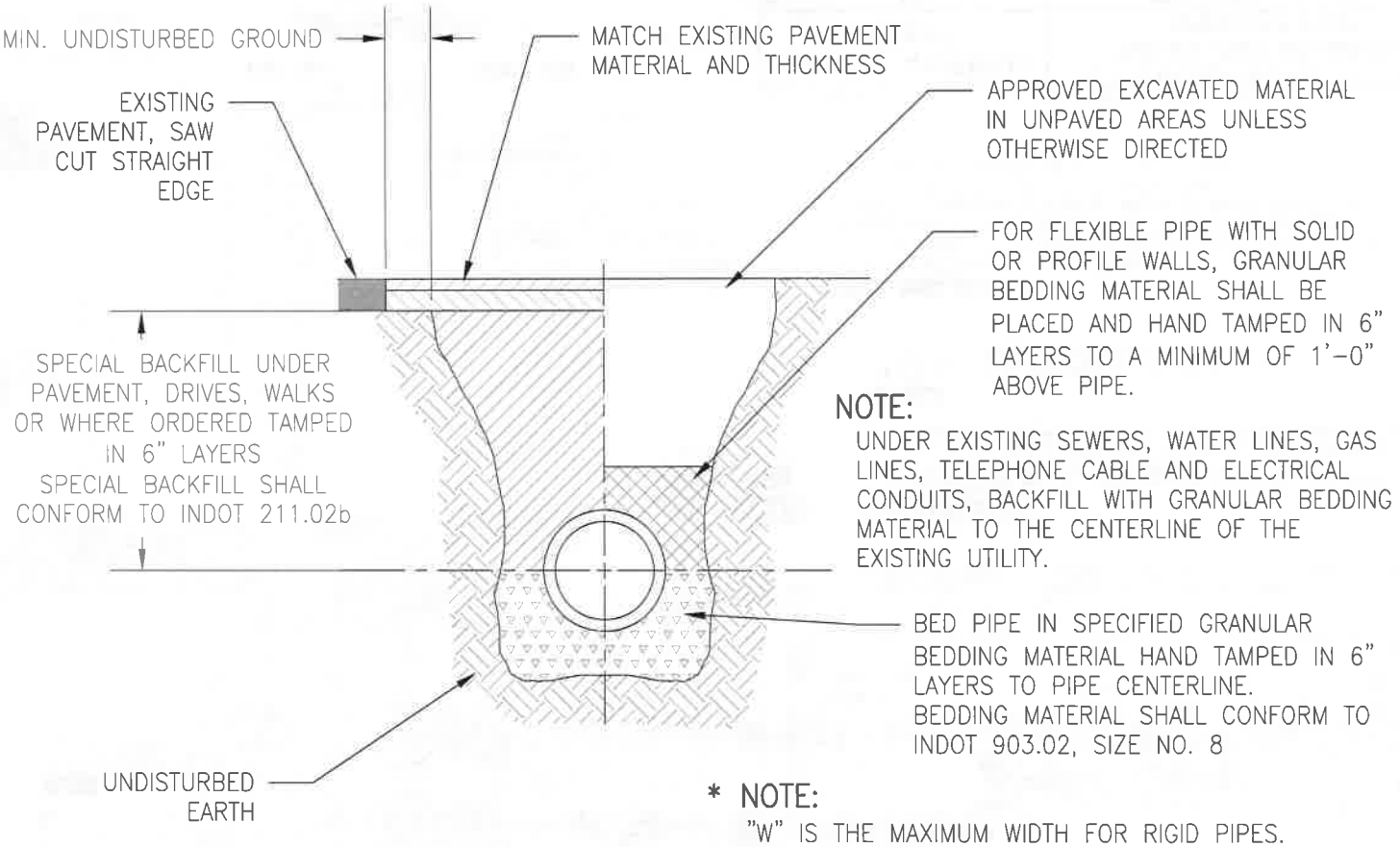
NOTES:

1. SADDLE TAPS SHALL BE USED FOR ALL SERVICE TAPS.
2. CORPORATION STOP SHALL BE BRAND AND MODEL APPROVED BY WATER UTILITIES.
3. SERVICE LINE TAP SHALL BE INSTALLED WITH A MINIMUM HORIZONTAL DISTANCE OF 24".

TOWN OF WATERLOO INDIANA		FIRE TAP DETAIL
APRIL 2016 Drawing: 50A	Scale: Not To Scale	www.jheng.com

SIZE	"W"	"U"**	"T"
6"	2'-6"	2'-0"	4"
8"	2'-6"	2'-1"	4"
10"	2'-6"	2'-3"	4"
12"	2'-9"	2'-5"	4"
15"	3'-0"	2'-8"	5"
18"	3'-6"	3'-0"	5"
21"	3'-11"	3'-4"	6"
24"	4'-3"	3'-8"	6"
27"	5'-6"	3'-11"	6"
30"	5'-9"	4'-4"	6"
36"	6'-3"	5'-2"	6"
42"	6'-11"		8"
48"	7'-4"		9"
54"	8'-0"		9"
60"	8'-6"		9"
66"	9'-1"		9"
72"	9'-8"		10"
78"	10'-3"		10"

TRENCH SCHEDULE

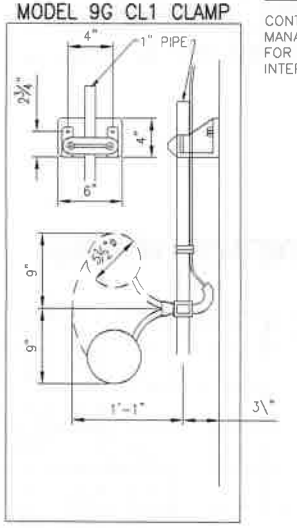


TRENCH DETAIL FOR SEWER AND WATER MAINS

** TABLE IS FOR ASTM D-3034, WALL THICKNESS CLASS SDR 35 FOR 6"-15" AND ASTM F-679 WALL THICKNESS CLASS T-1 FOR 18"-36". FOR OTHER FLEXIBLE PIPES, MINIMUM TRENCH WIDTH "U" SHALL MEET MANUFACTURER'S REQUIREMENTS.

TOWN OF WATERLOO INDIANA		FIRE TAP BACKFILL REQUIREMENTS
APRIL 2016 Drawing: 50B	Scale: Not To Scale	www.jheng.com

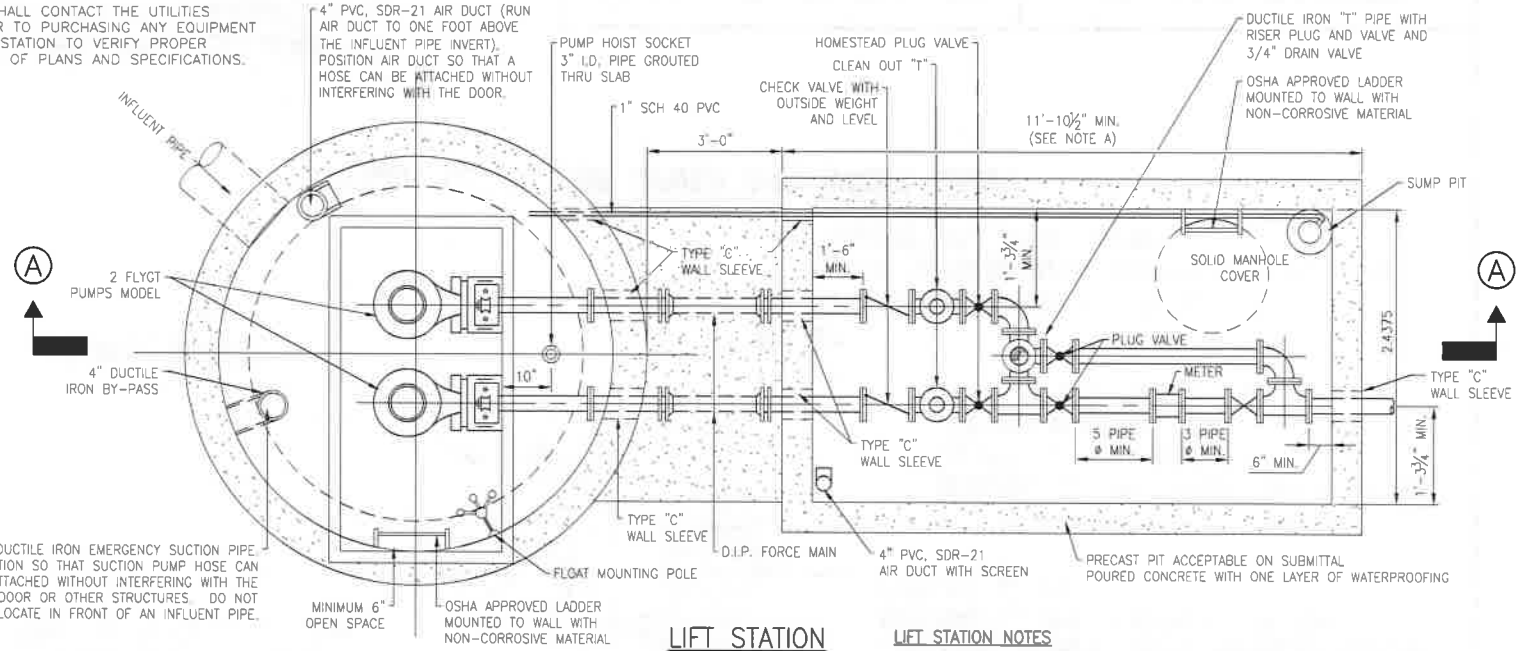
MODEL 9G CL1 CLAMP



CONSOLIDATED BULLETIN B-100
MODEL L.S.C.-2 OR 4
(N.O. & N.C.) FLOAT SWITCH

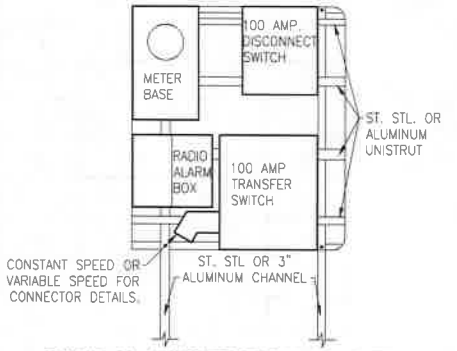
CLAMP NOTE

CONTRACTOR SHALL CONTACT THE UTILITIES MANAGER PRIOR TO PURCHASING ANY EQUIPMENT FOR THIS LIFT STATION TO VERIFY PROPER INTERPRETATION OF PLANS AND SPECIFICATIONS.



LIFT STATION PLAN VIEW

3/4" = 1'-0"

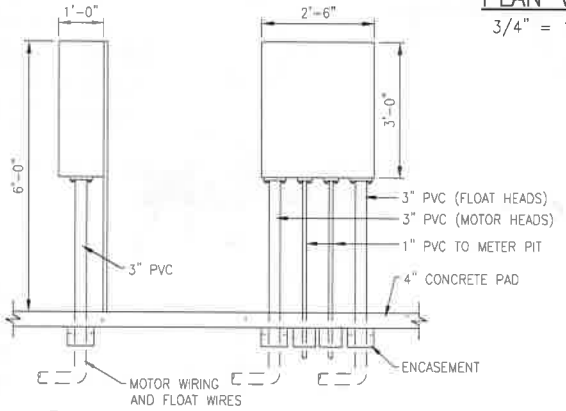


TYPICAL UNDERGROUND SERVICE ON THE BACK OF PANEL

N.T.S.

PANEL NOTES

1. ALL ELECTRICAL CONNECTIONS FROM BACK TO THE PANEL SHALL BE MADE INTO THE BOTTOM OF THE PANEL.
2. SEE CONSTANT SPEED OR VARIABLE SPEED ELECTRICAL SCHEMATIC SHEETS FOR ADDITIONAL INFORMATION.



END VIEW FRONT VIEW

CONTROL PANEL

3/4" = 1'-0"

LIFT STATION NOTES

1. A 10'-0" WIDE ASPHALT DRIVE SHALL BE FURNISHED FROM NEAREST STREET SURFACE TO CONCRETE PAD AND VAULT.
2. SIZE OF LID OPENING DETERMINED BY SIZE OF PUMPS AND SHALL BE OFFSET TO BE OVER LADDER AND LID TO OPEN AWAY FROM CONTROL BOX.

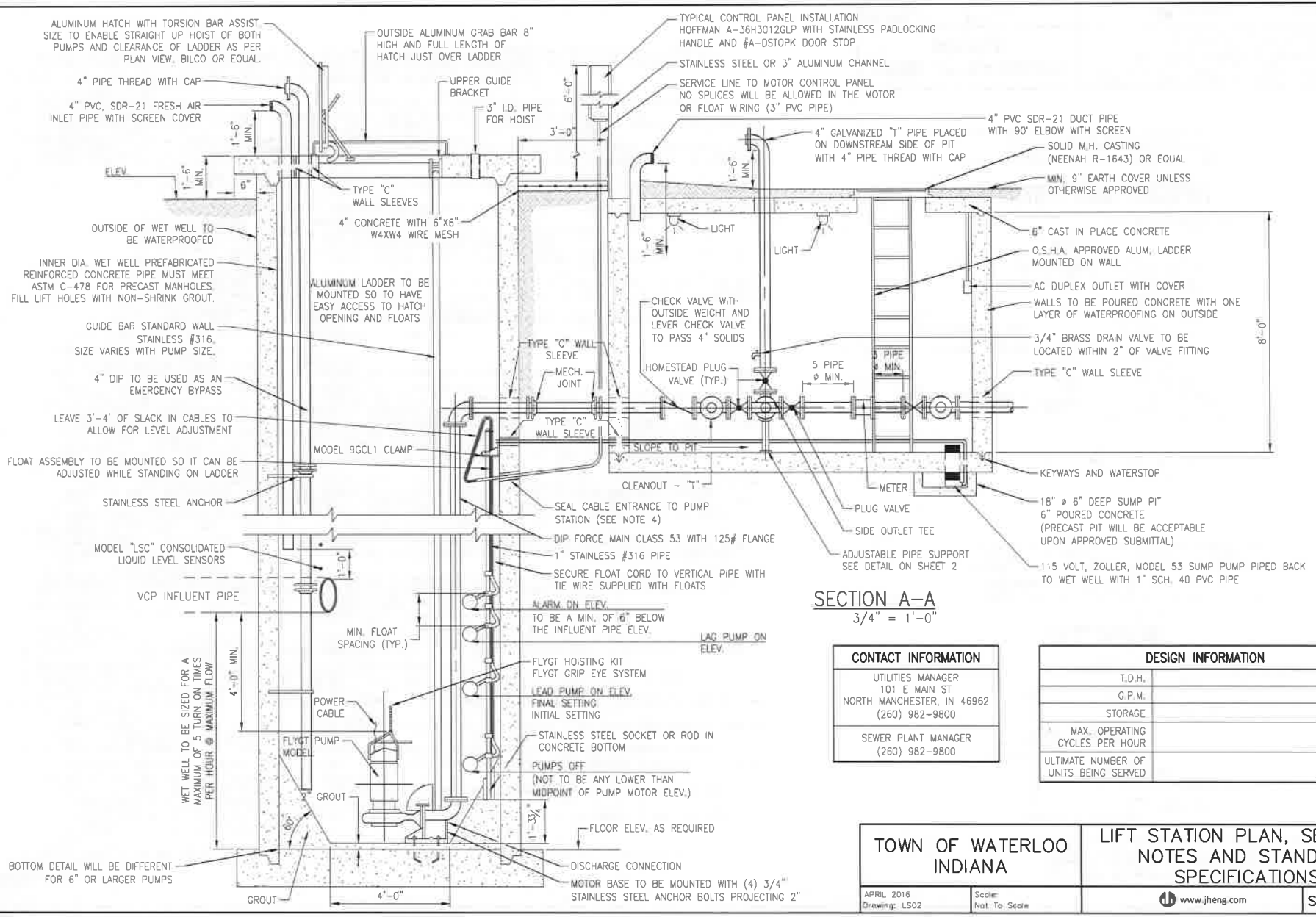
KEYNOTES

VALVE PIT SIZE TO BE DETERMINED BY THE AREA NEEDED TO PUT IN THE REQUIRED COMPONENTS AS SPECIFIED.

CONTROL PANEL NOTES

1. THE CONTROL PANEL IS TO FACE (OPEN TO) THE LIFT STATION HATCH.
2. SIZE OF CABINET TO BE LARGER FOR STATIONS WITH PUMPS LARGER THAN 20 HP.
3. ALARM WORKING LIGHTS TO USE 60 TO 100 WATT, 110 VAC BULBS. FIXTURES AND THE CONNECTION TO CONTROL BOX TO BE TOTALLY WATERPROOF. FIXTURES TO HAVE INTEGRAL GUARD OR SHIELD FOR PROTECTION.
4. A SQUARE "D" TRANSFER SWITCH HALL BE PROVIDED.

TOWN OF WATERLOO INDIANA		LIFT STATION PLAN, SECTIONS, NOTES AND STANDARD SPECIFICATIONS
APRIL 2016 Drawing: LS01	Scale: Not To Scale	www.jheng.com SHEET 1 OF 3



SECTION A-A
3/4" = 1'-0"

CONTACT INFORMATION
UTILITIES MANAGER 101 E MAIN ST NORTH MANCHESTER, IN 46962 (260) 982-9800
SEWER PLANT MANAGER (260) 982-9800

DESIGN INFORMATION	
T.D.H.	
G.P.M.	
STORAGE	
MAX. OPERATING CYCLES PER HOUR	
ULTIMATE NUMBER OF UNITS BEING SERVED	

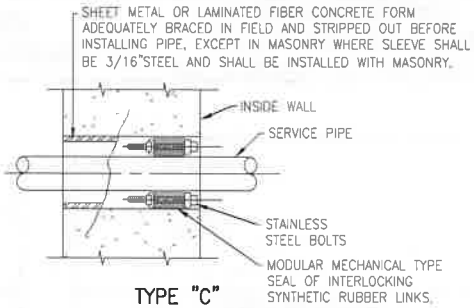
TOWN OF WATERLOO INDIANA		LIFT STATION PLAN, SECTIONS, NOTES AND STANDARD SPECIFICATIONS	
APRIL 2016 Drawing: LS02	Scale: Not To Scale	www.jheng.com	SHEET 2 OF 3

NOTES

1. PUMPS TO BE 240 OR 480 VOLTS, 3 PHASE. PUMP CHAIN AND ALL CHAIN FITTINGS SHALL BE #316 STAINLESS. PUMP BRAND TO BE FLYGT.
2. POWER:
   a) SHALL BE 3 PHASE, 60 CYCLE UNDERGROUND SERVICE.
   b) VOLTAGE SHALL BE 240/120, 3 PHASE, 4 WIRE, OR 460 VOLT, 3 PHASE, 3 WIRE FOR PUMPS 20 HP OR LARGER. A 460 VOLT SYSTEM SHALL REQUIRE A STEP DOWN TRANSFORMER FOR 110 VAC CONTROL.
3. ALL WIRES FROM CONTROL BOX TO THE INSIDE OF THE LIFT STATION SHALL BE RUN IN NON-CORROSIVE CONDUIT (PVC SCH 80). ENTRANCE THROUGH THE WALL NOT TO BE MORE THAN 18" FROM TOP OF LID.
4. THE HOLE IN THE SIDE OF THE LIFT STATION THAT THE CONDUIT COMES THROUGH SHALL BE GROUTED WITH WATERPROOF (EXPANDING) EMICO GROUT.
5. 400 WATT MERCURY VAPOR YARD LIGHT, SPAULDING MODEL PT-400-DX SHALL BE FURNISHED AND MOUNTED ON A 3" ALUMINUM POLE 8' HIGH. LOCATION TO BE DESIGNATED BY THE SEWER PLANT MANAGER.
6. ALL DOORS, HATCHES, AND ELECTRICAL ENCLOSURES TO BE FURNISHED WITH PROVISIONS FOR PADLOCKING. THE FITTINGS AND FASTENERS SHALL BE OF STAINLESS STEEL.
7. A BILL WILL BE SENT TO THE STATION CONTRACTOR FOR THE CURRENT COST OF (4) PADLOCKS FROM "BEST LOCK". THE PADLOCKS WILL BE KEYED TO OUR MASTER SYSTEM BY A LOCKSMITH. THIS WILL BE ORDERED AND SPECIFIED BY THE UTILITIES MANAGER.
8. GRAB BARS AND LADDERS SHALL BE ALUMINUM AND MEET OSHA SPECS. ANY AND ALL SHIELDING OF MOVING PARTS, GUARD RAILS, STEPS, ELECTRICAL EQUIPMENT AND INSTALLATION OF THE SAME, SHALL MEET OSHA STANDARDS.
9. FLOATS - ARE TO BE CONSOLIDATED ELECTRIC COMPANY MODEL LSC-2 OR 4 (20' OR 40') SWITCH ARRANGEMENT 1-N.O./1-N.C. FLOATS ARE TO BE MOUNTED ON A #316 STAINLESS POLE. THE POLE IS TO BE MOUNTED TO THE WALL WITH CONSOLIDATED ELECTRIC MODEL 90 GLI PIPE MOUNTING CLAMP.
10. THE CONTRACTOR SHALL PROVIDE A "START TEST" AND INSPECTION IN THE PRESENCE OF TOWN EMPLOYEES.
11. THE CONTRACTOR SHALL SUBMIT AN EQUIPMENT LIST FOR APPROVAL BEFORE INSTALLATION.
12. THREE COPIES OF AN OPERATIONS AND MAINTENANCE MANUAL COVERING ALL EQUIPMENT SHALL BE SUPPLIED TO THE UTILITIES MANAGER. THIS MANUAL SHALL INCLUDE THE BASIC ENGINEERING CALCULATIONS WHICH DETERMINED PUMP SIZING, FLOAT SWITCH ELEVATIONS AND INVERT ELEVATIONS OF LIFT STATION AND INFLUENT PIPES.
13. "MASTER CONTROL PANEL": ALL CONTROLS, MOTOR STARTERS, ALARMS, CONVENIENCE OUTLETS, ETC. SHALL BE HOUSED IN ONE CONTROL BOX. CONTROL BOX SHALL BE A WATERPROOF NEMA TYPE 4X FIBERGLASS. ALL BOLTS AND FITTINGS SHALL BE ALUMINUM OR STAINLESS STEEL #316.
14. THE "MASTER CONTROL PANEL" SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
   a) A SINGLE UNIT "MINI-POWER" CENTER CONSISTING OF MAIN PRIMARY BREAKERS, SEVEN (7) - 15 AMPERES SECONDARY BRANCH CIRCUIT BREAKERS. ONE OF THE SECONDARY BREAKERS SHALL BE OF THE GROUND FAULT INTERRUPTION TYPE (GFI) TO BE USED FOR THE CIRCUIT PROTECTION FOR A DUPLEX-CONVENIENCE OUTLET. PRIMARY AND SECONDARY BREAKERS SHALL BE SUPPLIED WITH PROVISIONS FOR PADLOCKING. THE DUPLEX CONVENIENCE OUTLET SHALL BE 20 AMPS, 120 VOLT, GROUNDING TYPE, ALL TO BE FURNISHED AND INSTALLED BY CONTRACTOR IN THE MAIN CONTROL BOX.
   b) ONE (1) A.C. MAGNETIC FULL VOLTAGE NON-REVERSING COMBINATION MOTOR STARTER WITH CIRCUIT DISCONNECT FOR EACH PUMP MOTOR. THE STARTERS SHALL BE SQUARE "D" AND SHALL BE EQUIPPED WITH OVERLOAD RELAYS WHICH HAVE "NORMALLY OPEN AND NORMALLY CLOSED" CONTACTS, AND INCLUDE RESET BUTTON, GREEN PILOT LIGHT AND HAND-OFF-AUTO SELECTOR SWITCH. ALL THREE OVERLOAD RELAY "NORMALLY OPEN" CONTACTS AND THE ALARM CONTACTS OF THE "TIME-MARK" PHASE MONITOR SHALL BE WIRED IN PARALLEL INTO THE ALARM SYSTEM. ALL CONTROL EQUIPMENT SHALL BE PROVIDED FOR OPERATION ON 115 VOLTS 60 HZ.
   c) THE PUMP CONTROLLER SHALL BE BY CONSOLIDATED ELECTRIC CO., INC., MODEL CB2D. SAID CONTROLLER SHALL CONTAIN ALL CONTROL RELAYS, TERMINAL BOARDS, ETC., NECESSARY FOR OPERATION OF THE PUMPING SYSTEM.
   d) DIVERSIFIED ELECTRONICS PHASE MONITOR, MODEL 0289 FOR 240 VOLT SYSTEMS, OR MODEL 0290 FOR 480 VOLTS. THE PHASE MONITOR IS TO BE WIRED INTO THE CONTROL SYSTEM AS SHOWN ON THE
   e) THE ALARM SYSTEM SHALL INCLUDE THE FOLLOWING:
      (1) "HIGH WATER ALARM LIGHT LOCATED ON THE BOTTOM OF CONTROL BOX.
      (2) THE ALARM SYSTEM SHALL BE INSTALLED AND TELEMETERED TO THE WASTEWATER TREATMENT PLANT. SAID ALARM SYSTEM SHALL BE IN ACCORDANCE WITH TOWNS SPECIFICATIONS AND INCLUDE THE FOLLOWING:
         A. 1 - MOTOROLA UHF INTRAC SYSTEM. EQUIPMENT SHALL BE OF CURRENT DESIGN, AND BE COMPATIBLE WITH EXISTING EQUIPMENT.
         B. 1 - ANTENNA, YAGI TYPE (450-470 MHZ) MOT. #TDE-630 WITH ENOUGH COAXIAL CABLE FOR MOUNTING HIGH ENOUGH TO REACH THE WASTEWATER TREATMENT PLANT.
         C. "DUCK SEAL" SHALL BE PLACED IN ALL CONDUIT ENTERING THE CONTROL BOX TO PREVENT INFILTRATION OF SEWER GAS FROM THE LIFT STATION. "DUCK SEAL" ALSO REQUIRED IN CONDUIT WHERE WIRES EXIT PUMP PIT.
         D. THE RUNNING HOUR METERS SHALL BE MOUNTED INSIDE THE DOOR OF THE MAIN CONTROL BOX. THE METER SHALL BE A CRAMMER NON-RESETABLE ELAPSED TIME METER MODEL #635E.

         ALL THE ABOVE COMPONENTS, DRAWINGS AND PROPOSED STRUCTURAL ASSEMBLY SHALL BE VERIFIED BY THE UTILITIES MANAGER OR TOWN ENGINEER.

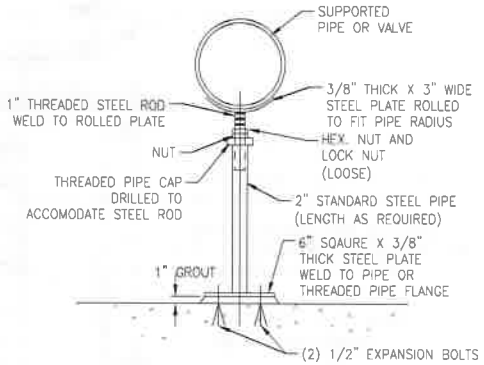
         THE CONTRACTOR SHALL FURNISH AND INSTALL AS PER CARMEL SPECIFICATIONS AND DRAWINGS EVERY TIME REQUIRED FOR AN OPERATIONAL, PROPERLY DESIGNED LIFT STATION.
15. ALL POWER CABLES AND FLOAT CONTROL CABLES HALL BE RUN DIRECTLY TO THE CONTROL BOX WITH NO SPLICES OR INTERVENING JUNCTION BOXES. THE PUMP CABLE SEALS ON THE PUMP MOTOR SHALL NOT BE DISTURBED BY THE CONTRACTOR FOR ANY REASON. FAILURE TO OBSERVE THESE PRECAUTIONS MAY RESULT IN VOIDING ALL WARRANTIES AND FAILURE OF THE LIFT STATION.
16. ANTENNA SHALL BE MOUNTED ON AN ALUMINUM OR STAINLESS STEEL POLE SUPPORTED BY THE CONTROL BOX MOUNTING LEGS. ANTENNA SHALL BE BEAMED TOWARD AND MOUNTED HIGH ENOUGH SO AS FOR THE RADIO SIGNAL TO REACH THE WASTEWATER TREATMENT PLANT.
17. THE RADIO AND ANTENNA INSTALLATION SHALL BE PUT INTO SERVICE UNDER THE SUPERVISION OF THE RADIO MANUFACTURER'S REPRESENTATIVE OR BY A LICENSED TECHNICIAN.
18. SEE CONSTANT SPEED OR VARIABLE DRIVE ELECTRICAL SCHEMATIC SHEETS FOR ADDITIONAL INFORMATION.
19. FLOW METER SHALL BE FOXBORO MODEL 2800 FLOW TUBE WITH A 8965 D.C. TRANSMITTER, ADJUSTABLE OUT TO 10 HZ., 24 VOLT D.C. PULSE OUTPUT WITH COUNTER AND METER, TRANSMITTER TO BE MOUNTED IN CONTROL BOX, OR IN A NEMA04 BOX IN THE BACK OF CONTROL BOX.



PIPE SLEEVE

N.T.S.

1. WALLS SHALL BE CORE DRILLED WHERE SHOWN AND ELSEWHERE IF APPROVED BY THE ENGINEER.
2. CONCRETE SHALL BE WORKED IN AND VIBRATED TO ELIMINATE ALL VOIDS IN CONCRETE - IF VOIDS DO REMAIN, FILL WITH GROUT BEFORE INSTALLING PIPE AND RUBBER SEALS.



ADJUSTABLE PIPE SUPPORT

N.T.S.

PIPE SUPPORTS SHALL BE SPACED NOT MORE THAN 12'-0" ON CENTER. SUPPORT PIPING NEAR EACH SIDE OF VALVES AND COUPLINGS.

TOWN OF WATERLOO INDIANA		LIFT STATION PLAN, SECTIONS, NOTES AND STANDARD SPECIFICATIONS	
APRIL 2016 Drawing: LS03	Scale: Not To Scale	www.jheng.com	SHEET 3 OF 3