

MANHOLE FRAME & COVER:
ASTM A-48, LATEST EDITION, CLASS 35
WITH 24" DIAMETER FRAME.
IN TRAFFIC AREAS:
7" MIN. HGT., EQUAL TO EAST JORDAN 1022
OR EQUAL WITH HEAVY DUTY COVER,
MACHINED BEARING SURFACE & CONCEALED
LIFT HOLES.
(SET LID FLUSH WITH FINISHED STREET
SURFACE).
IN NON-TRAFFIC AREAS:
7" HGT., EQUAL TO EAST JORDAN 1022
WITH MEDIUM DUTY COVER, MACHINED
BEARING SURFACE & CONCEALED LIFT
HOLES. SET TOP 2" ABOVE GRADE
(AFTER EARTH SETTLEMENT).

Moved existing detail notes to
WW-06

BUTYL FILLER STRIP

GRADING RINGS:
SEE SHEET WW-06 FOR GRADING RING NOTES

PRECAST CONE AND RISER SECTIONS:
ASTM C-478, 4000 P.S.I. CONCRETE.

JOINTS:
JOINTS SHALL BE SEALED WITH 1-1/4" PREFORMED BUTYL MASTIC
MEETING ASTM C-990.
PRIME EXTERIOR OF JOINTS WITH BITUMINOUS PRIMER PRIOR TO
WRAPPING. ALL JOINTS SHALL HAVE EXTERIOR JOINT WRAP
MEETING THE REQUIREMENTS OF ASTM C-877, MINIMUM 6" WRAP.
IN INSTANCES WHERE JOINT IS BELOW WATER TABLE, JOINT SHALL
BE SEALED WITH A CONTROLLED EXPANSION WATER SEAL EQUAL
TO CONSEAL CS-231.

PRECAST BASE SECTION:
BASE SECTION WITH RESILIENT PIPE TO MANHOLE CONNECTOR
MEETING ASTM C-923.
SMOOTH INVERT CHANNELS SHALL BE SHAPED TO A DEPTH OF A FULL
INSIDE PIPE DIAMETER.
THE MANHOLE BENCH SHALL SLOPE TOWARD THE CHANNEL AT A 12:1
SLOPE.
THE MANHOLE BASE SECTION SHALL BE PLACED ON A #5 OR #8 STONE
BASE WITH A MINIMUM COMPACTED DEPTH OF 6". THE STONE BASE
SHALL OVERHANG THE BASE SECTION BY A MINIMUM OF 6".

Minimum Pipe Deflection Angle 48"Ø Structure

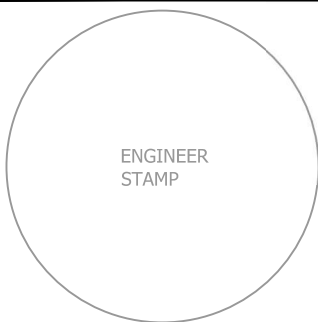
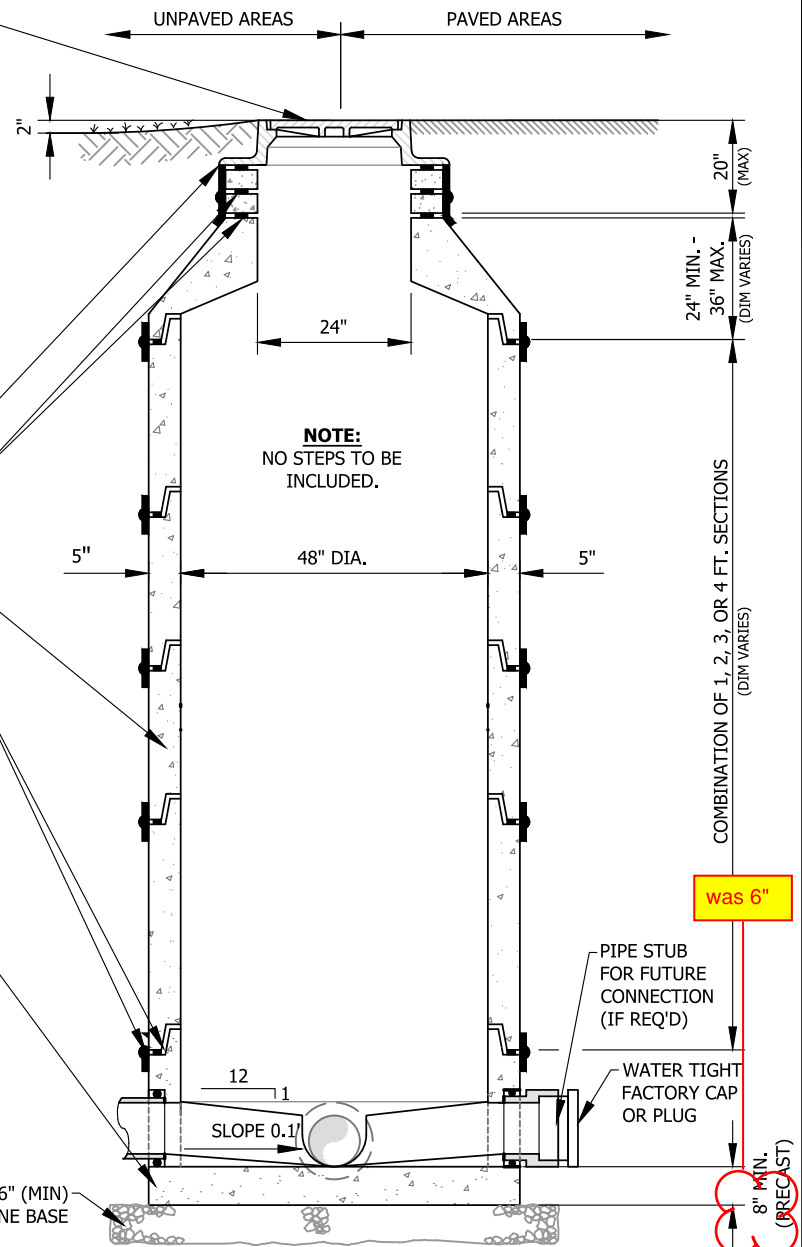
Pipe Size	15"	18"	24"	30"	36"
12"	65°	67°	73°	82°	96°
15"		69°	75°	84°	98°
18"			81°	90°	104°
24"				99°	113°
30"					127°

NOTE:

- ANGLE SHOWN IS FOR MIN. DEGREES BETWEEN CENTERLINES OF PIPES. THE DEGREES ARE BASED ON THE HOLE SIZE FOR EACH PIPE INCLUDING 6" MIN CONCRETE BETWEEN HOLES.

NOTE:

- ALL MANHOLE LIDS SHALL BEAR "SANITARY SEWER" MOLDED INTO THE EXTERIOR SURFACE.
- WATERTIGHT CASTINGS EQUAL TO EJ 1022-WT WITH GASKET AND BOLT DOWN LIDS REQUIRED AS NOTED.
- ALL PRECAST CONCRETE SHALL CONTAIN WATERPROOFING ADDITIVE, XYPEX OR EQUIVALENT.
- ALL PRECAST CONCRETE FOR FORCE MAIN RECEIVING MANHOLES AND ALL NEW MANHOLES WITHIN 500 FEET UPSTREAM OR DOWNSTREAM OF THE RECEIVING MANHOLE SHALL CONTAIN ANTI-CORROSION ADDITIVE, CONSHIELD OR EQUIVALENT.
- IT IS UP TO THE EWSU REVIEWER TO DETERMINE IF ECCENTRIC OR CONCENTRIC IS ALLOWED.
- REMOTE AREAS REQUIRE FRAME/CASTING TO BE MINIMUM 12" ABOVE GROUND WITH MARKER POLE.
- REFER TO WW-20 FOR BENCH DETAIL.
- ALL OPENINGS TO HAVE WATERTIGHT RESILIENT SEAL BOOT OR GASKET.
- IF VENT REQUIRED, ADD PER DETAIL ON WW-11.



STANDARD PRECAST CONCRETE 48" MANHOLE

Approved: / /

Approved By:

Adopted: / /

Scale: N.T.S.

Figure

WW-01

MANHOLE FRAME & COVER:
ASTM A-48, LATEST EDITION, CLASS 35 WITH 24" DIAMETER FRAME.

IN TRAFFIC AREAS:
7" MIN. HGT., EQUAL TO EAST JORDAN 1022 OR EQUAL WITH HEAVY DUTY COVER, MACHINED BEARING SURFACE & CONCEALED LIFT HOLES. (SET LID FLUSH WITH FINISHED STREET SURFACE).

IN NON-TRAFFIC AREAS:
7" HGT., EQUAL TO EAST JORDAN 1022 WITH MEDIUM DUTY COVER, MACHINED BEARING SURFACE & LIFT HOLES. SET TOP 2" ABOVE GRADE (AFTER EARTH SETTLEMENT).

Moved existing detail notes to WW-06

BUTYL FILLER STRIP

GRADING RINGS:
SEE SHEET WW-06 FOR GRADING RING NOTES

PRECAST CONE AND RISER SECTIONS:
ASTM C-478, 4000 P.S.I. CONCRETE.

PRECAST 60" TO 48" TRANSITION SECTION:
ASTM C-478, 4000 P.S.I. CONCRETE.
ALTERNATE TRANSITIONS NEED TO BE APPROVED BY EWSU

JOINTS:
PRIME EXTERIOR OF JOINTS WITH BITUMINOUS PRIMER PRIOR TO WRAPPING. JOINTS SHALL BE SEALED WITH 1-1/4" PREFORMED BUTYL MASTIC MEETING ASTM C-990. ALL JOINTS SHALL HAVE EXTERIOR JOINT WRAP MEETING THE REQUIREMENTS OF ASTM C-877, MINIMUM 6" WRAP. IN INSTANCES WHERE JOINT IS BELOW WATER TABLE, JOINT SHALL BE A CONTROLLED EXPANSION WATER SEAL EQUAL TO CONSEAL CS-231.

PRECAST BASE SECTION:
BASE SECTION WITH RESILIENT PIPE TO MANHOLE CONNECTOR MEETING ASTM C-923. SMOOTH INVERT CHANNELS SHALL BE SHAPED TO A DEPTH OF A FULL INSIDE PIPE DIAMETER. THE MANHOLE BENCH SHALL SLOPE TOWARD THE CHANNEL AT A 12:1 SLOPE. THE MANHOLE BASE SECTION SHALL BE PLACED ON A #5 OR #8 STONE BASE WITH A MINIMUM COMPACTED DEPTH OF 6". THE STONE BASE SHALL OVERHANG THE BASE SECTION BY A MINIMUM OF 6".

Minimum Pipe Deflection Angle 60"Ø Structure

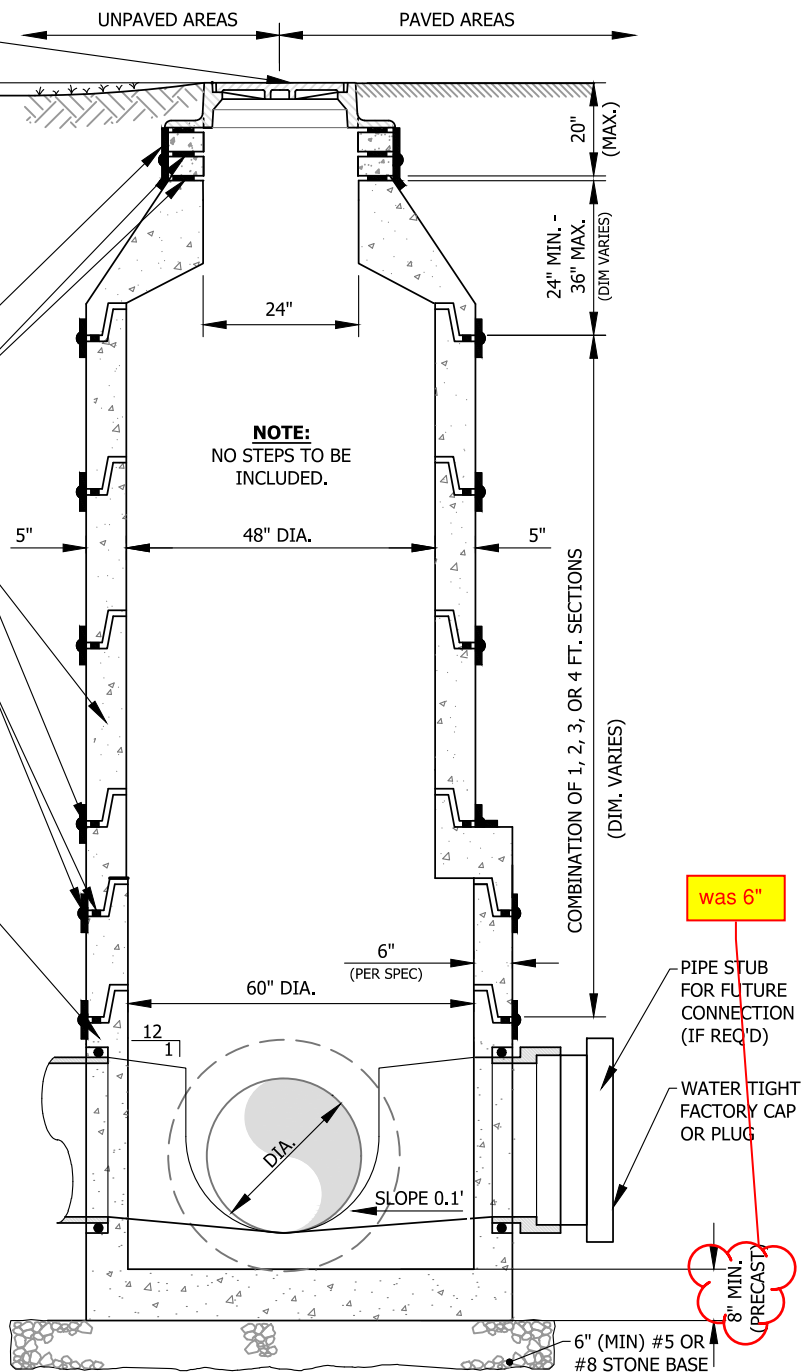
Pipe Size	12"	15"	18"	24"	30"	36"
12"	50°	53°	57°	63°	73°	81°
15"		56°	60°	66°	76°	84°
18"			64°	70°	80°	88°
24"				76°	86°	94°
30"					96°	104°
36"						112°

NOTE:

- ANGLE SHOWN IS FOR MIN. DEGREES BETWEEN CENTERLINES OF PIPES. THE DEGREES ARE BASED ON THE HOLE SIZE FOR EACH PIPE INCLUDING 6" MIN CONCRETE BETWEEN HOLES.

NOTE:

- ALL MANHOLE LIDS SHALL BEAR "SANITARY SEWER" MOLDED INTO THE EXTERIOR SURFACE.
- WATERTIGHT CASTINGS EQUAL TO EJ 1022-WT WITH GASKET AND BOLT DOWN LIDS REQUIRED AS NOTED.
- ALL PRECAST CONCRETE SHALL CONTAIN WATERPROOFING ADDITIVE, XYPEX OR EQUIVALENT.
- ALL PRECAST CONCRETE FOR FORCE MAIN RECEIVING MANHOLES AND ALL NEW MANHOLES WITHIN 500 FEET UPSTREAM OR DOWNSTREAM OF THE RECEIVING MANHOLE SHALL CONTAIN ANTI-CORROSION ADDITIVE, CONSHIELD OR EQUIVALENT.
- IT IS UP TO THE EWSU REVIEWER TO DETERMINE IF ECCENTRIC OR CONCENTRIC IS ALLOWED.
- REMOTE AREAS REQUIRE FRAME/CASTING TO BE MINIMUM. 12" ABOVE GROUND WITH MARKER POLE.
- REFER TO WW-20 FOR BENCH DETAIL.
- ALL OPENINGS TO HAVE WATERTIGHT RESILIENT SEAL BOOT OR GASKET.
- IF VENT REQUIRED, ADD PER DETAIL ON WW-11.



was 6"

8" MIN. (PRECAST)



STANDARD PRECAST CONCRETE 60" MANHOLE

Approved: / /

Approved By:

Adopted: / /

Scale: N.T.S.

Figure

WW-02

ENGINEER
STAMP

MANHOLE FRAME & COVER:
ASTM A-48, LATEST EDITION, CLASS 35 WITH 24" DIAMETER FRAME.
IN TRAFFIC AREAS:
7" MIN. HGT., EQUAL TO EAST JORDAN 1022 OR EQUAL WITH HEAVY DUTY COVER, MACHINED BEARING SURFACE & CONCEALED LIFT HOLES. (SET LID FLUSH WITH FINISHED STREET SURFACE).
IN NON-TRAFFIC AREAS:
7" HGT., EQUAL TO EAST JORDAN 1022 WITH MEDIUM DUTY COVER, MACHINED BEARING SURFACE & CONCEALED LIFT HOLES. SET TOP 2" ABOVE GRADE (AFTER EARTH SETTLEMENT).

Moved existing detail notes to WW-06

BUTYL FILLER STRIP

GRADING RINGS:
SEE SHEET WW-06 FOR GRADING RING NOTES

PRECAST CONE AND RISER SECTIONS:
ASTM C-478, 4000 P.S.I. CONCRETE.

PRECAST 72" TO 48" TRANSITION SECTION:
ASTM C-478, 4000 P.S.I. CONCRETE.

JOINTS:
PRIME EXTERIOR OF JOINTS WITH BITUMINOUS PRIMER PRIOR TO WRAPPING. JOINTS SHALL BE SEALED WITH 1-1/4" PREFORMED BUTYL MASTIC MEETING ASTM C-990. ALL JOINTS SHALL HAVE EXTERIOR JOINT WRAP MEETING THE REQUIREMENTS OF ASTM C-877, MINIMUM 6" WRAP. IN INSTANCES WHERE JOINT IS BELOW WATER TABLE, JOINT SHALL BE A CONTROLLED EXPANSION WATER SEAL EQUAL TO CONSEAL CS-231.

PRECAST BASE SECTION:
BASE SECTION WITH RESILIENT PIPE TO MANHOLE CONNECTOR MEETING ASTM C-923. SMOOTH INVERT CHANNELS SHALL BE SHAPED TO A DEPTH OF A FULL INSIDE PIPE DIAMETER. THE MANHOLE BENCH SHALL SLOPE TOWARD THE CHANNEL AT A 12:1 SLOPE. THE MANHOLE BASE SECTION SHALL BE PLACED ON A #5 OR #8 STONE BASE WITH A MINIMUM COMPACTED DEPTH OF 6". THE STONE BASE SHALL OVERHANG THE BASE SECTION BY A MINIMUM OF 6".

**Minimum Pipe Deflection Angle
72" Ø Structure**

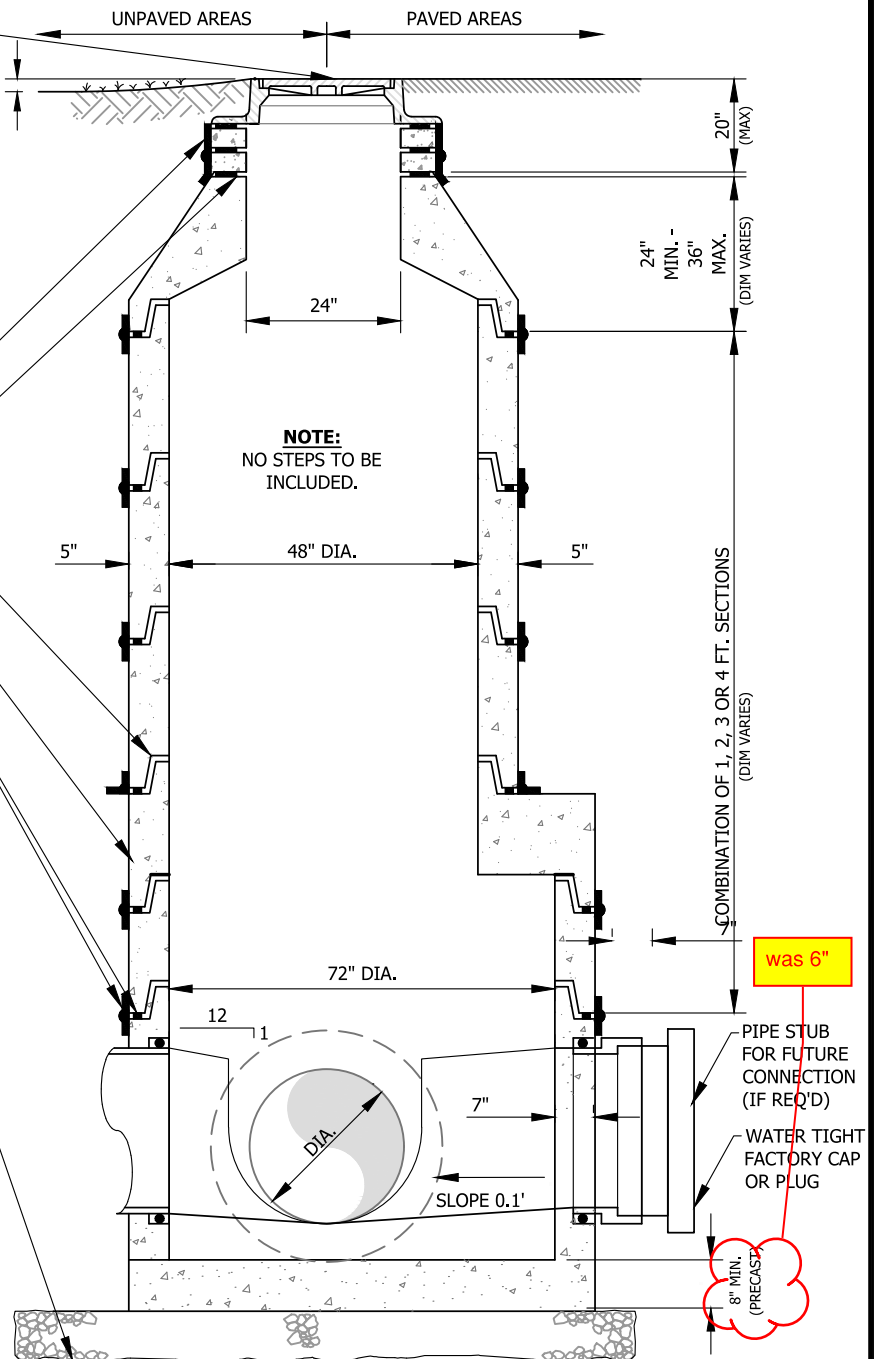
Pipe Size	12"	15"	18"	24"	30"	36"	42"	48"
12"	42°	44°	49°	52°	60°	68°	78°	88°
15"		46°	51°	54°	62°	70°	78°	87°
18"			56°	59°	67°	75°	83°	92°
24"				62°	70°	78°	86°	95°
30"					78°	86°	94°	103°
36"						94°	102°	111°
42"							110°	119°
48"								128°

NOTE:

- ANGLE SHOWN IS FOR MIN. DEGREES BETWEEN CENTERLINES OF PIPES. THE DEGREES ARE BASED ON THE HOLE SIZE FOR EACH PIPE INCLUDING 6" MIN CONCRETE BETWEEN HOLES.

NOTE:

- ALL MANHOLE LIDS SHALL BEAR "SANITARY SEWER" MOLDED INTO THE EXTERIOR SURFACE.
- WATERTIGHT CASTINGS EQUAL TO EJ 1022-WT WITH GASKET AND BOLT DOWN LIDS REQUIRED AS NOTED.
- ALL PRECAST CONCRETE SHALL CONTAIN WATERPROOFING ADDITIVE, XYPEX OR EQUIVALENT.
- ALL PRECAST CONCRETE FOR FORCE MAIN RECEIVING MANHOLES AND ALL NEW MANHOLES WITHIN 500 FEET UPSTREAM OR DOWNSTREAM OF THE RECEIVING MANHOLE SHALL CONTAIN ANTI-CORROSION ADDITIVE, CONSHIELD OR EQUIVALENT.
- IT IS UP TO THE EWSU REVIEWER TO DETERMINE IF ECCENTRIC OR CONCENTRIC IS ALLOWED.
- REMOTE AREAS REQUIRE FRAME/CASTING TO BE MINIMUM 12" ABOVE GROUND WITH MARKER POLE.
- REFER TO WW-20 FOR BENCH DETAIL.
- ALL OPENINGS TO HAVE WATERTIGHT RESILIENT SEAL BOOT OR GASKET.
- IF VENT REQUIRED, ADD PER DETAIL WW-11.



was 6"

8" MIN.
(PRECAST)



STANDARD PRECAST CONCRETE 72" MANHOLE

Approved: ___/___/___

Approved By:

Adopted: ___/___/___

Scale: N.T.S.

Figure

WW-03

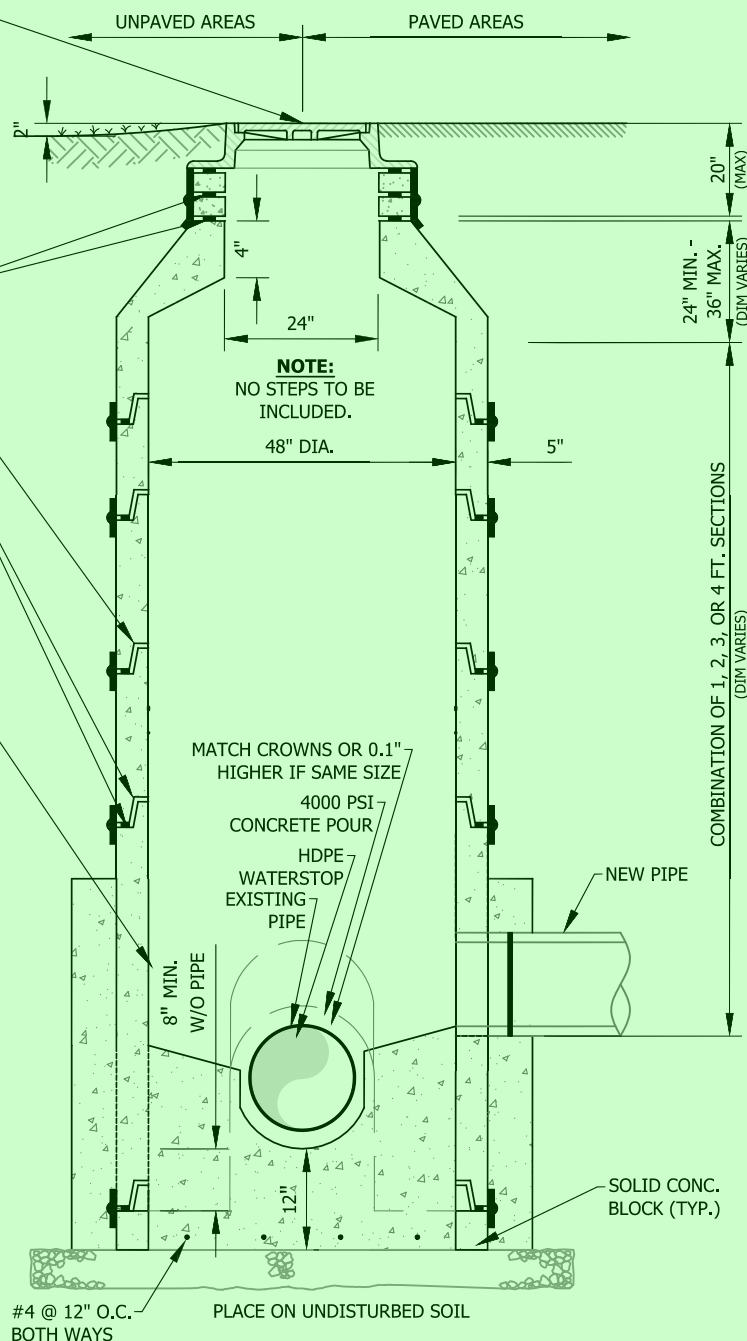
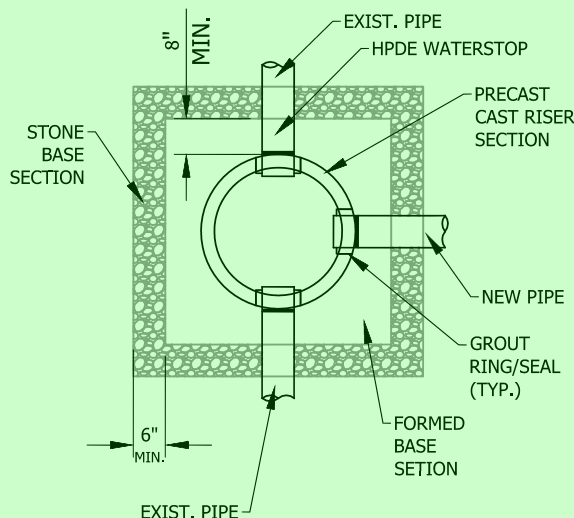
MANHOLE FRAME & COVER:
 ASTM A-48, LATEST EDITION, CLASS 35 WITH 24" DIAMETER FRAME.
IN TRAFFIC AREAS:
 7" MIN. HGT., EQUAL TO EAST JORDAN 1022 OR EQUAL WITH
 HEAVY DUTY COVER, MACHINED BEARING SURFACE & CONCEALED
 LIFT HOLES.
 (SET LID FLUSH WITH FINISHED STREET SURFACE).
IN NON-TRAFFIC AREAS:
 7" HGT., EQUAL TO EAST JORDAN 1022 WITH MEDIUM DUTY COVER,
 MACHINED BEARING SURFACE & CONCEALED LIFT HOLES, SET TOP
 2" ABOVE GRADE (AFTER EARTH SETTLEMENT).

GRADING RINGS:
 SEE SHEET WW-06 FOR GRADING RING NOTES

PRECAST CONE AND RISER SECTIONS:
 ASTM C-478, 4000 P.S.I. CONCRETE.

JOINTS:
 JOINTS SHALL BE SEALED WITH 1-1/4" PREFORMED BUTYL MASTIC
 MEETING ASTM C-990.
 PRIME EXTERIOR OF JOINTS WITH BITUMINOUS PRIMER PRIOR TO
 WRAPPING. ALL JOINTS SHALL HAVE EXTERIOR JOINT WRAP
 MEETING THE REQUIREMENTS OF ASTM C-877, MINIMUM 6" WRAP.
 IN INSTANCES WHERE JOINT IS BELOW WATER TABLE, JOINT
 SHALL BE SEALED WITH A CONTROLLED EXPANSION WATER SEAL
 EQUAL TO CONSEAL CS-231

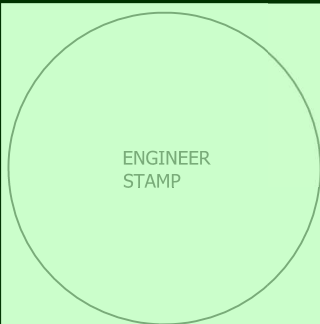
CAST IN PLACE BASE SECTION:
 THE MANHOLE BENCH SHALL SLOPE TOWARD THE CHANNEL
 AT A 12:1 SLOPE.
 THE MANHOLE BASE SECTION SHALL BE PLACED ON A #5 OR
 #8 STONE BASE WITH A MINIMUM COMPACTED DEPTH OF 6".
 THE STONE BASE SHALL OVERHANG THE BASE SECTION BY A
 MINIMUM OF 6".



NOTE:

1. ALL MANHOLE LIDS SHALL BEAR "SANITARY SEWER" MOLDED INTO THE EXTERIOR SURFACE.
2. WATERTIGHT CASTINGS EQUAL TO EJ 1022-WT WITH GASKET AND BOLT DOWN LIDS REQUIRED AS NOTED.
3. ALL PRECAST CONCRETE SHALL CONTAIN WATERPROOFING ADDITIVE, XYPEX OR EQUIVALENT.
4. ALL PRECAST CONCRETE FOR FORCE MAIN RECEIVING MANHOLES AND ALL NEW MANHOLES WITHIN 500 FEET UPSTREAM OR DOWNSTREAM OF THE RECEIVING MANHOLE SHALL CONTAIN ANTI-CORROSION ADDITIVE, CONSHIELD OR EQUIVALENT.
5. UP TO REVIEWER TO DETERMINE IF ECCENTRIC OR CONCENTRIC IS ALLOWED.
6. IF COVER IS ALIGNED WITH PIPE, ECCENTRIC CONE IS ALLOWED.
7. BONDING AGENT TO BE USED ON ALL SURFACES OF PRECAST.

Date: Nov 19, 2020, 4:32pm User Name: trutheford
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-04 Standard Doghouse Detail.dwg



STANDARD DOGHOUSE 48" MANHOLE

Approved: / /

Approved By:

Adopted: / /

Scale: N.T.S.

Figure

WW-04

MANHOLE FRAME & COVER:
 ASTM A-48, LATEST EDITION, CLASS 35 WITH 24" DIAMETER FRAME.
 IN TRAFFIC AREAS:
 7" MIN. HGT., EQUAL TO EAST JORDAN 1022 OR EQUAL WITH HEAVY DUTY COVER, MACHINED BEARING SURFACE & CONCEALED LIFT HOLES. (SET LID FLUSH WITH FINISHED STREET SURFACE).
 IN NON-TRAFFIC AREAS:
 7" HGT., EQUAL TO EAST JORDAN 1022 WITH MEDIUM DUTY COVER, MACHINED BEARING SURFACE & CONCEALED LIFT HOLES. SET TOP 2" ABOVE GRADE (AFTER EARTH SETTLEMENT).

CONCRETE GRADING RINGS:
 SEE SHEET WW-06 FOR GRADING RING NOTES

PRECAST FLAT TOP AND RISER SECTIONS:
 ASTM C-478, 4000 P.S.I. CONCRETE.

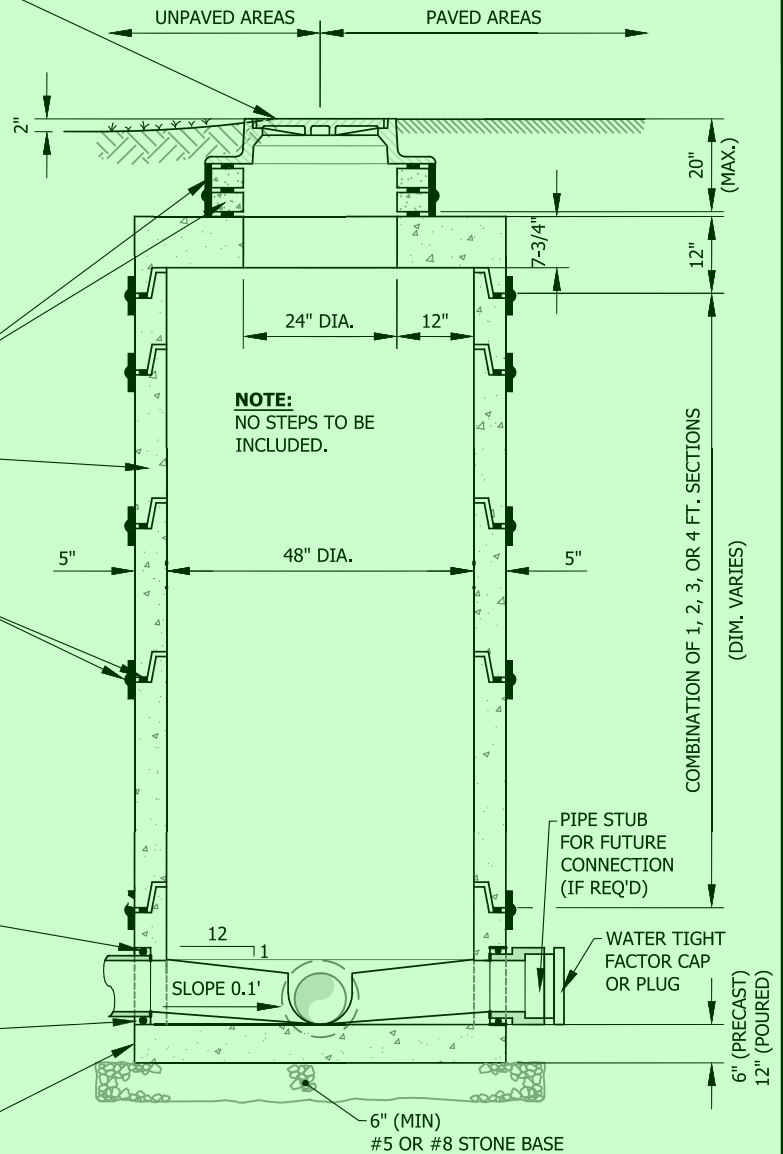
JOINTS:
 JOINTS SHALL BE SEALED WITH 1 1/4" PREFORMED BUTYL MASTIC MEETING ASTM C-990.
 PRIME EXTERIOR OF JOINTS WITH BITUMINOUS PRIMER PRIOR TO WRAPPING. ALL JOINTS SHALL HAVE EXTERIOR JOINT WRAP MEETING THE REQUIREMENTS OF ASTM C-877, MINIMUM 6" WRAP.
 IN INSTANCES WHERE JOINT IS BELOW WATER TABLE, JOINT SHALL BE A CONTROLLED EXPANSION WATER SEAL EQUAL TO CONSEAL CS-231.

GROUT SEAL (TYP.)
 WATER STOP RING OR BOOT (TYP.)

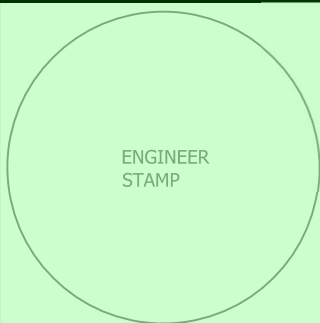
PRECAST BASE SECTION:
 BASE SECTION WITH RESILIENT PIPE TO MANHOLE CONNECTOR MEETING ASTM C-923.
 SMOOTH INVERT CHANNELS SHALL BE SHAPED TO A DEPTH OF A FULL INSIDE PIPE DIAMETER.
 THE MANHOLE SHELF SHALL SLOPE TOWARD THE CHANNEL AT A 12:1 SLOPE.
 THE MANHOLE BASE SECTION SHALL BE PLACED ON A #5 OR #8 STONE BASE WITH A MINIMUM COMPACTED DEPTH OF 6". THE STONE BASE SHALL OVERHANG THE BASE SECTION BY A MINIMUM OF 6".

NOTE:

1. ALL MANHOLE LIDS SHALL BEAR "SANITARY SEWER" MOLDED INTO THE EXTERIOR SURFACE.
2. WATERTIGHT CASTINGS EQUAL TO EJ 1022-WT CASKETED AND BOLT DOWN LIDS REQUIRED AS NOTED.
3. ALL PRECAST CONCRETE SHALL CONTAIN WATERPROOFING ADDITIVE, XYPEX OR EQUIVALENT.
4. ALL PRECAST CONCRETE FOR FORCE MAIN RECEIVING MANHOLES AND ALL NEW MANHOLES WITHIN 500 FEET UPSTREAM OR DOWNSTREAM OF THE RECEIVING MANHOLE SHALL CONTAIN ANTI-CORROSION ADDITIVE, CONSHIELD OR EQUIVALENT.
5. IT IS UP TO THE EWSU REVIEWER TO DETERMINE WHEN THE FLAT TOP MANHOLE CAN BE USED IN PLACE OF A STANDARD MANHOLE.
6. BONDING AGENT ON PRECAST SECTION WHERE CAST-IN-PLACE TO BE IN CONTACT.
7. LARGER OPENINGS MAY BE REQUIRED FOR LARGER DIAMETER BARREL MANHOLE SECTIONS.



File: S:\113-0170\WRS\CAD\Plans\Details Proposed by LG\Sanitary Sewer\Flat Top Manhole.dwg



STANDARD PRECAST FLAT TOP MANHOLE

Approved:

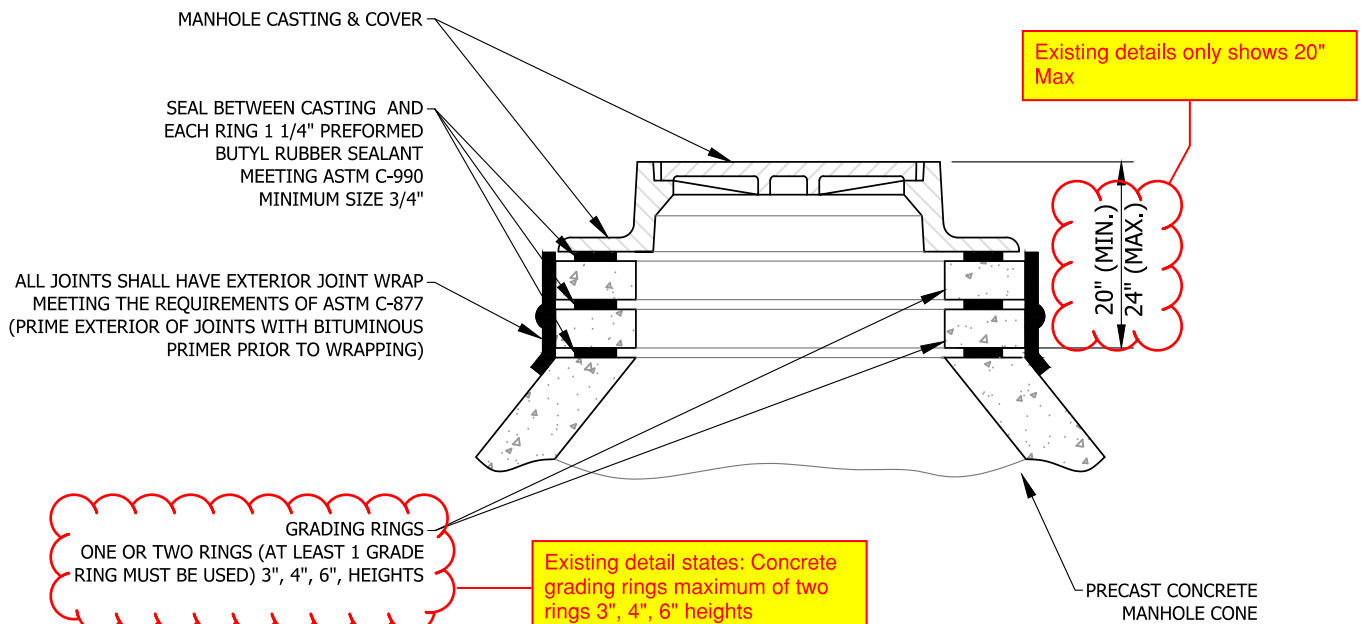
Approved By: -

Adopted: -

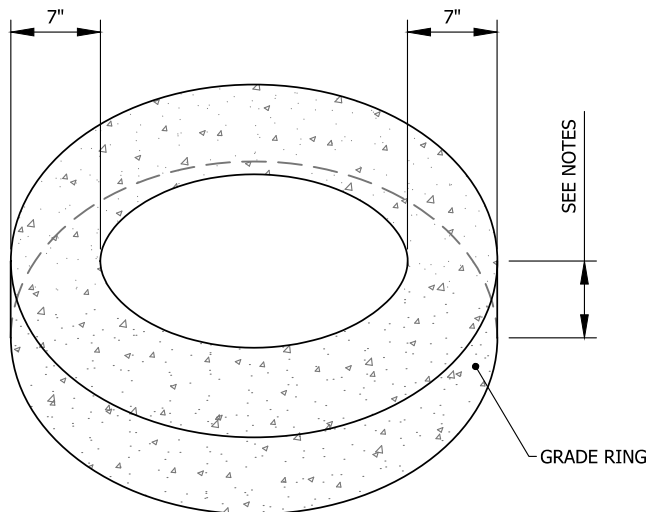
Scale: N.T.S.

Figure

WW-05



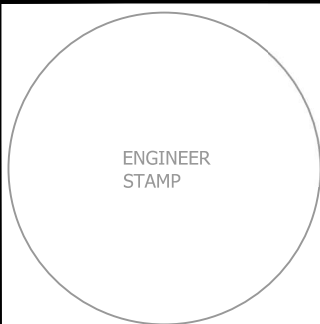
CASTING ADJUSTMENT



NOTE:

1. SYNTHETIC OR CONCRETE GRADE RINGS ALLOWED.
2. SYNTHETIC RINGS SHALL BE CRETEX PRO RINGS OR APPROVED EQUAL.
3. SYNTHETIC RINGS SHALL BE 2" MAXIMUM. 3" AND GREATER USE CONCRETE.
4. CONCRETE GRADE RINGS SHALL HAVE A MINIMUM STRENGTH: 4,500 PSI AT 28 DAYS.
5. CONCRETE RINGS SHALL BE 3", 4", OR 6".
6. PRECAST GRADE RINGS SHALL CONTAIN WATER PROOFING ADDITIVE, XYPEX OR EQUIVALENT.
7. RINGS SHALL BE ALIGNED VERTICALLY AND CORRECTED IF OFFSET BEYOND 1/2".
8. RISER RINGS SHALL BE FREE OF DEFECTS AT INSTALLATION AND WARRANTY INSPECTION.
9. ALL PRECAST CONCRETE FOR FORCE MAIN RECEIVING MANHOLES AND ALL NEW MANHOLES WITHIN 500 FEET UPSTREAM OR DOWNSTREAM OF THE RECEIVING MANHOLE SHALL CONTAIN ANTI-CORROSION ADDITIVE, CONSHIELD OR EQUIVALENT.
10. SEE SEWER SPEC AS NEEDED.

GRADE RINGS



STANDARD CASTING ADJUSTMENT AND GRADE RINGS

Approved: ___/___/___

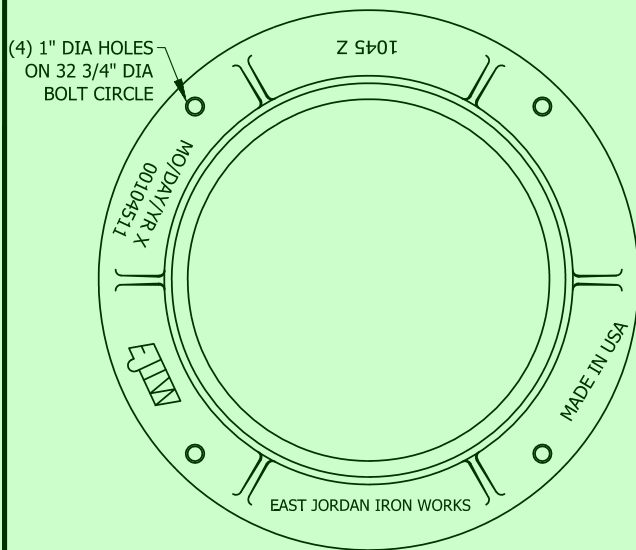
Approved By:

Adopted: ___/___/___

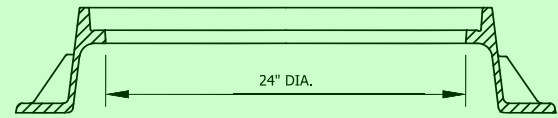
Scale: N.T.S.

Figure

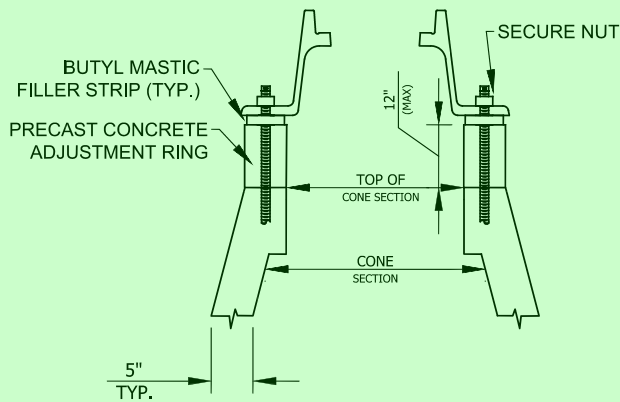
WW-06



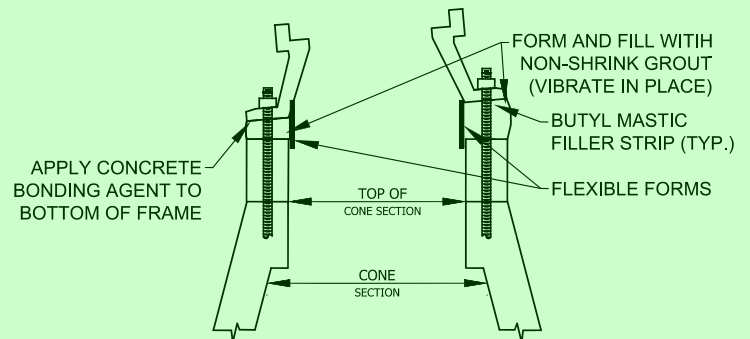
MANHOLE COVER



FRAME SECTION



**INSTALLATION DETAIL
FOR FRAMES AND COVERS**

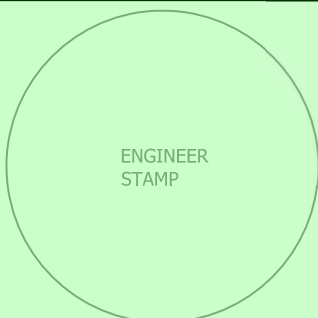


**INSTALLATION DETAIL
FOR SLOPE ADJUSTMENT**

NOTE:

1. MANHOLE FRAME & COVER TO BE ASTM A-48, LATEST EDITION, CLASS 35 WITH 24" DIAMETER FRAME.
2. IN TRAFFIC AREAS, 7" MINIMUM HEIGHT., EQUAL TO EAST JORDAN 1022 OR EQUAL WITH HEAVY DUTY COVER, MACHINED BEARING SURFACE & CONCEALED LIFTHOLES. (SET LID FLUSH WITH FINISHED STREET SURFACE).
3. IN NON-TRAFFIC AREAS, 7" HEIGHT, EQUAL TO EAST JORDAN 1022 WITH MEDIUM DUTY COVER, MACHINED BEARING SURFACE & CONCEALED LIFT HOLES. SET TOP 2" ABOVE GRADE (AFTER EARTH SETTLEMENT).
4. APPROVED WATER SEALANT REQUIRED AT ALL JOINTS.
5. STAINLESS STEEL REQUIRED FOR ALL HARDWARE AND FASTENERS.
6. BOLT DOWN MANHOLE FRAME AND COVER SHALL BE IN FLOODPLAIN AREAS OR AT DISCRETION OF EWSU REVIEWER.

Date: Nov 19, 2020, 4:33pm User Name: trutheford
File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-06 Manhole Frame and Cover.dwg



BOLT DOWN CASTING

Approved: / /

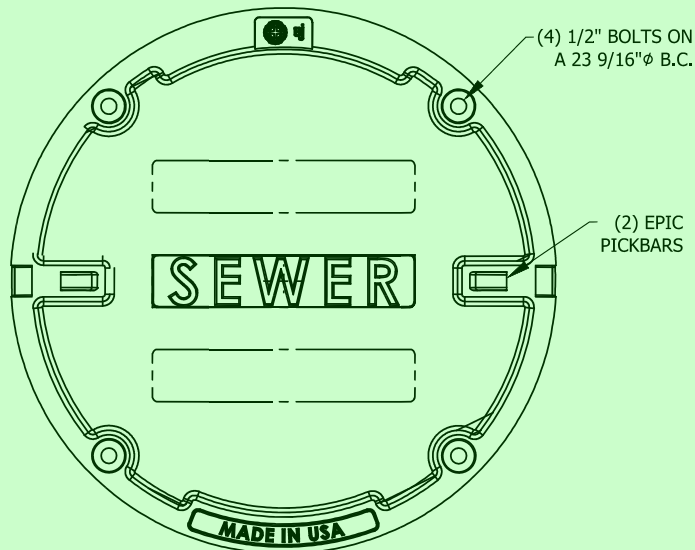
Approved By:

Adopted: / /

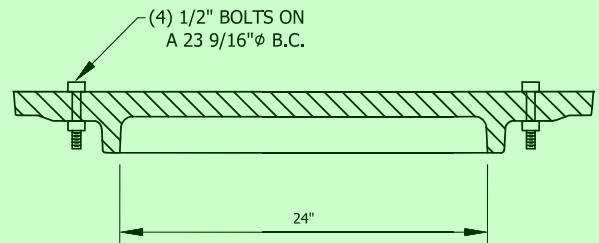
Scale: N.T.S.

Figure

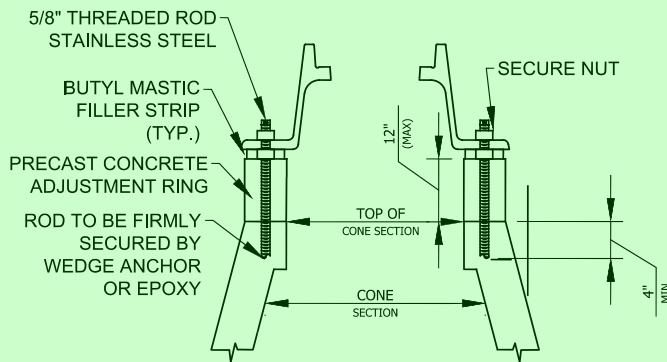
WW-07



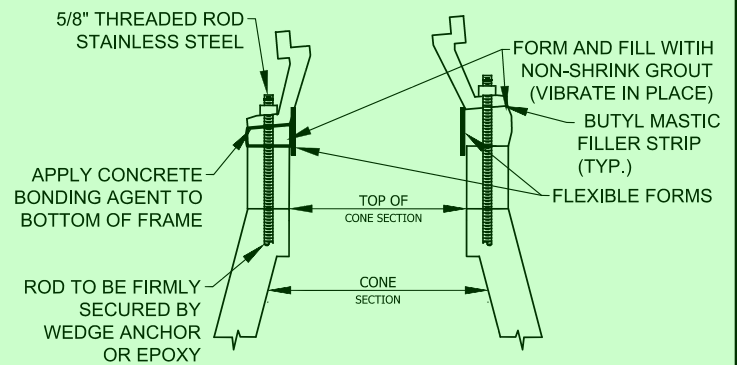
BOLTED MANHOLE COVER



FRAME SECTION



**INSTALLATION DETAIL
FOR FRAMES AND COVERS**

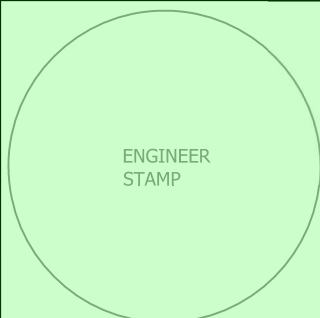


**INSTALLATION DETAIL
FOR SLOPE ADJUSTMENT**

NOTE:

1. APPROVED WATER SEALANT REQUIRED AT ALL JOINTS.
2. WATERTIGHT MANHOLE FRAME MODE #1045Z BY EAST JORDAN IRON WORKS, INC OR EQUIVALENT.
3. STAINLESS STEEL REQUIRED FOR ALL HARDWARE AND FASTENERS.
4. BOLT DOWN MANHOLE FRAME AND COVER SHALL BE IN FLOODPLAIN AREAS OR AT DIRECTION OF EWSU REVIEWER.

Date: Nov 19, 2020, 4:33pm User Name: trutheford
File: S:\113-0170\WR\CAO\Plans\Details Proposed by LG\Sanitary Sewer\WW-07 Floodplain Manhole Frame and Cover.dwg



BOLT DOWN MANHOLE FRAME AND COVER

Approved: / /

Approved By:

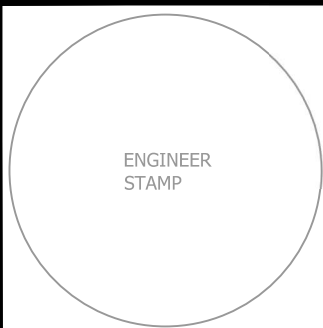
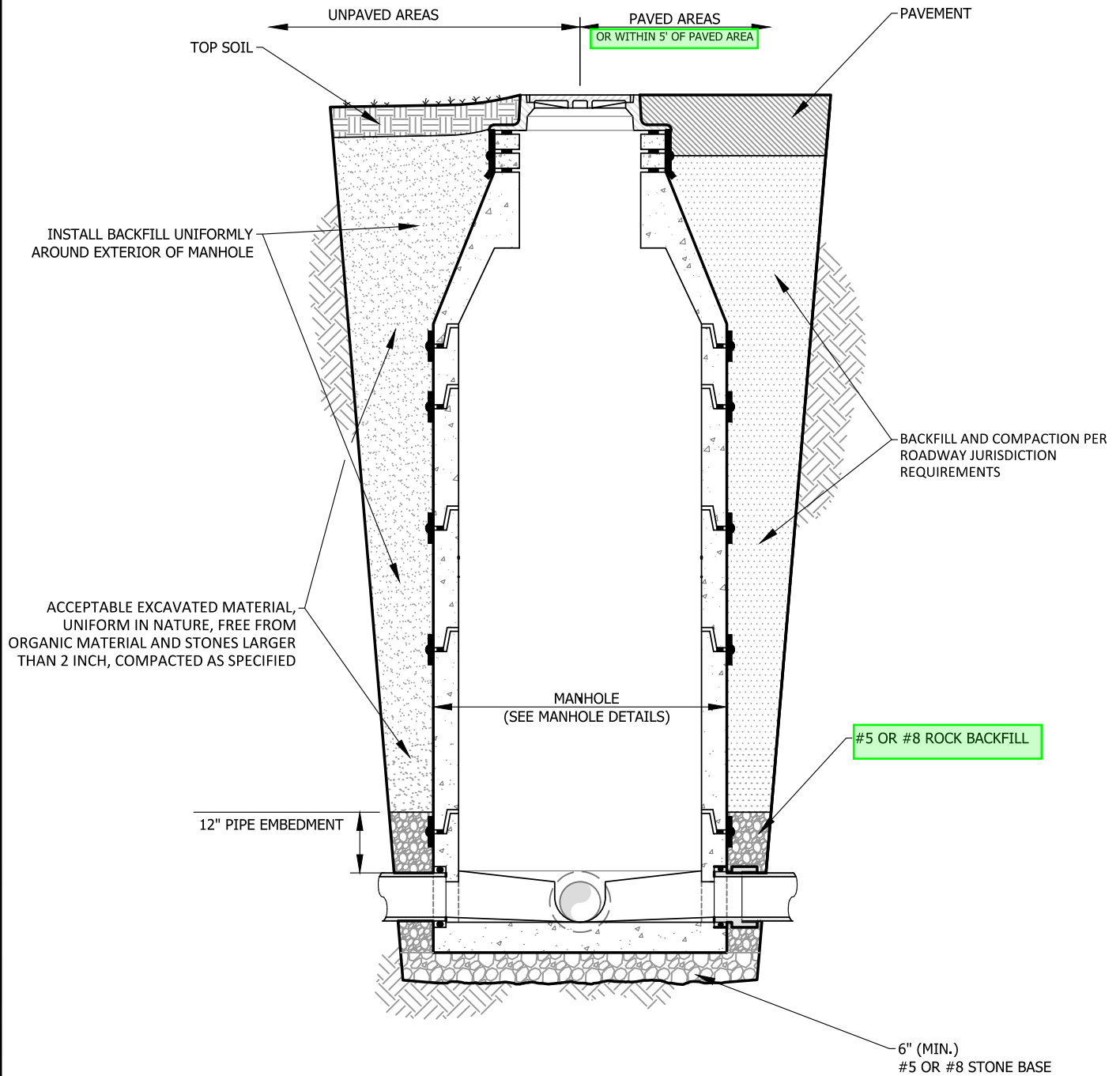
Adopted: / /

Scale: N.T.S.

Figure

WW-08

Date: Nov 19, 2020, 4:33pm User Name: trutheford
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-08 Standard Manhole Backfill.dwg



STANDARD MANHOLE BACKFILL

Approved: ___/___/___

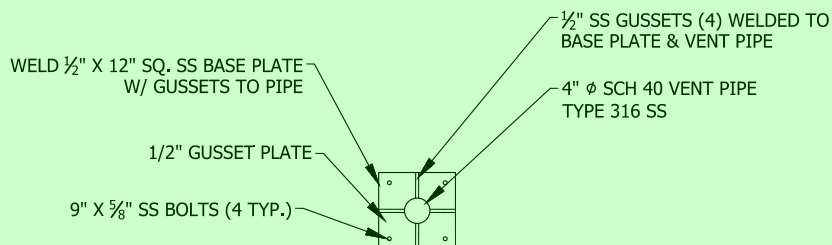
Approved By:

Adopted: ___/___/___

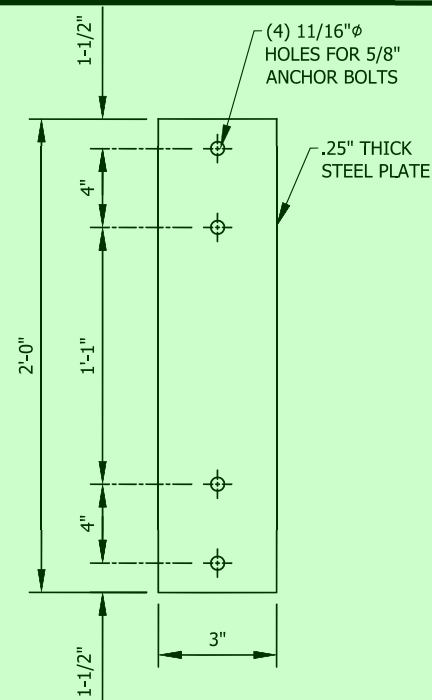
Scale: N.T.S.

Figure

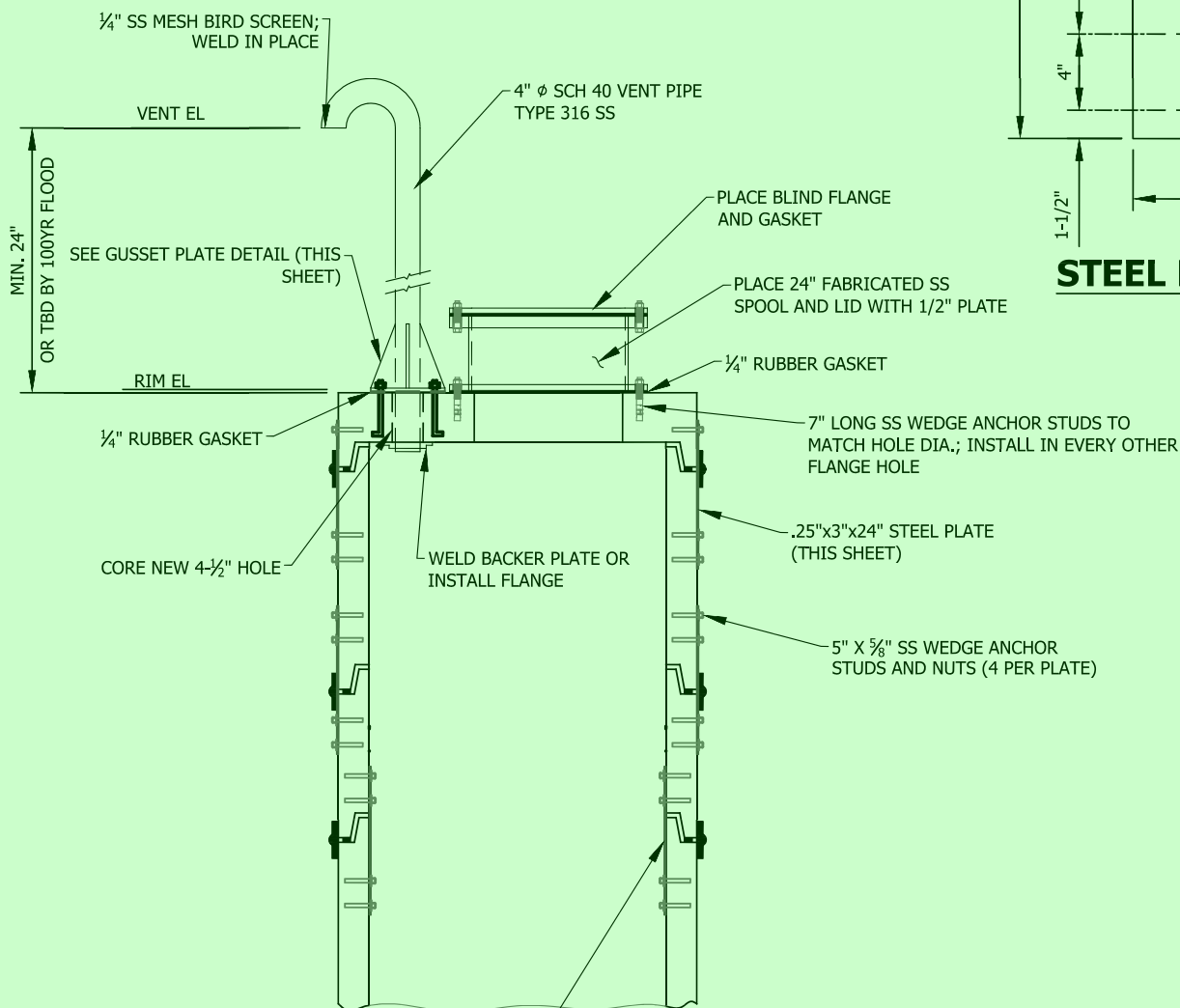
WW-09



GUSSET PLATE



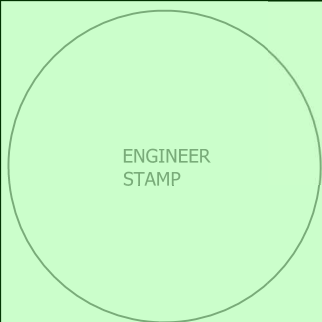
STEEL PLATE



STEEL PLATES (3 TYP. PER JOINT) SHALL BE INSTALLED EXTERNALLY FOR JOINTS ABOVE GRADE AND INTERNALLY FOR ALL BELOW GRADE

NOTE:

1. GUSSET PLATE TO BE USED IF VENT PIPE EXCEEDS 24".



FLAT VENTED FLOODPLAIN PRECAST 48" MANHOLE

Approved: / /

Approved By:

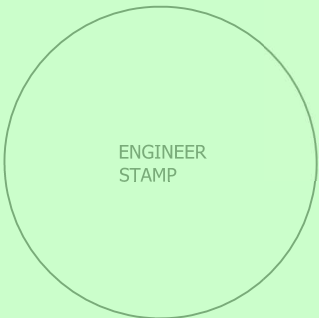
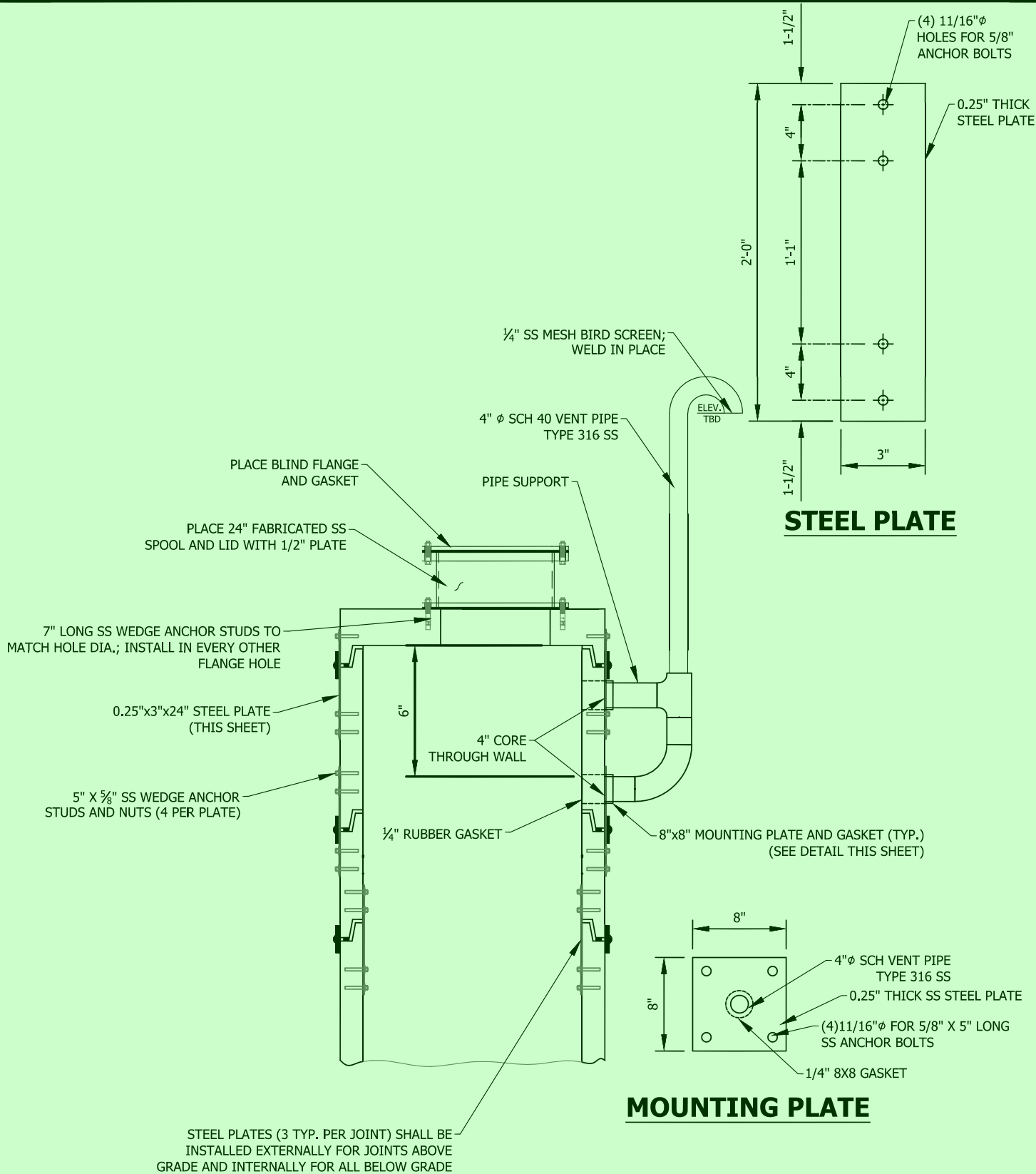
Adopted: / /

Scale: N.T.S.

Figure

WW-11

Detail: Nov-19-2020 4:32pm - User: Alanna.Lanthorn
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-09 Flat Top Vented Floodplain Manhole Over Side Vent.dwg



FLAT VENTED FLOODPLAIN PRECAST 48" MANHOLE WITH SIDE VENT

Approved: / /

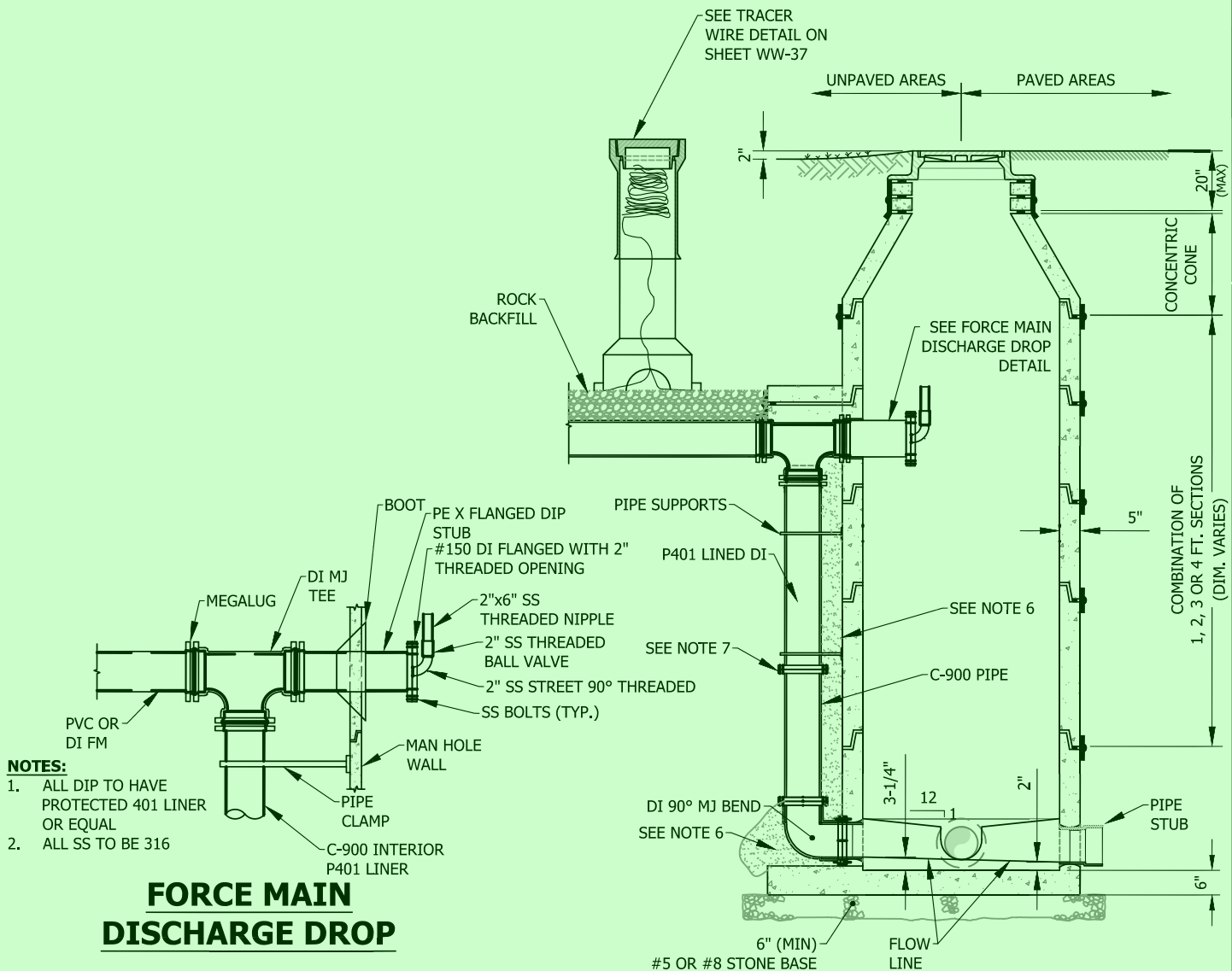
Approved By:

Adopted: / /

Scale: N.T.S.

Figure

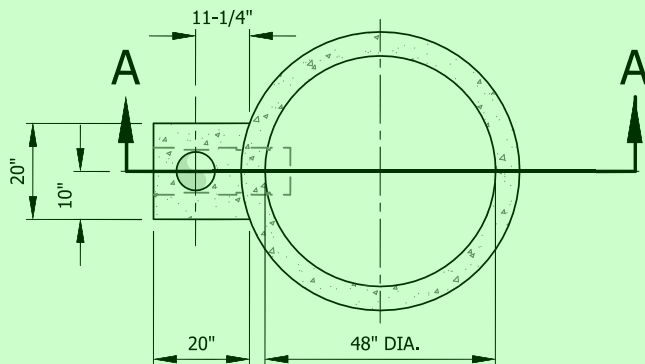
WW-12



FORCE MAIN DISCHARGE DROP

NOTES:

1. ALL DIP TO HAVE PROTECTED 401 LINER OR EQUAL
2. ALL SS TO BE 316



MANHOLE BASE/RISER PLAN

SECTION "A-A"

NOTE:

1. ALL MATERIAL, DESIGN, MANUFACTURE, PHYSICAL TEST REQUIREMENTS, FINISH MARKING, INSPECTION, REJECTION AND REPAIRS TO MEET / OR EXCEED "SPECIFICATIONS FOR PRECAST-REINFORCED CONCRETE MANHOLE SECTIONS". PER ASTM C-478 (LATEST REVISION).
2. RESILIENT CONNECTORS MEET "SPECIFICATIONS FOR RESILIENT CONNECTORS BETWEEN REINFORCED CONCRETE MANHOLE STRUCTURES, PIPES AND LATERALS". PER ASTM C-923 (LATEST REVISION). RESILIENT CONNECTORS SHALL MEET AND/OR EXCEED ASTM C-478 GASKET REQUIREMENTS. 1" MASTIC BUTYL WILL BE ADDED BETWEEN THE JOINTS OF THE PRECAST DROP AND SHALL BE TIED INTO THE BARREL SECTION SEALANT. ALL ANGLES AND FALL SHALL BE ACCORDING TO PLANS.
3. SPECIFIC DROP TO ELEVATION TO BE DESIGNED BY ENGINEER.
4. ALL PRECAST CONCRETE FOR FORCE MAIN RECEIVING MANHOLES AND ALL NEW MANHOLES WITHIN 500 FEET UPSTREAM OR DOWNSTREAM OF THE RECEIVING MANHOLE SHALL CONTAIN ANTI-CORROSION ADDITIVE, CONSHIELD OR EQUIVALENT
5. SPECIFIC DROP TO ELEVATION TO BE DESIGNED BY ENGINEER.
6. ACCEPTABLE EXCAVATED MATERIAL, UNIFORM IN NATURE, FREE FROM ORGANIC MATERIAL AND STONES LARGER THAN 2", COMPACTED AS SPECIFIED.
7. MEGALUG RESTRAINTS ON ALL JOINTS.



PRECAST EXTERNAL DROP MANHOLE (REQUIRED ON ALL DROPS GREATER THAN 24") (FORCE MAIN)

ENGINEER
STAMP

Approved: / /

Approved By:

Adopted: / /

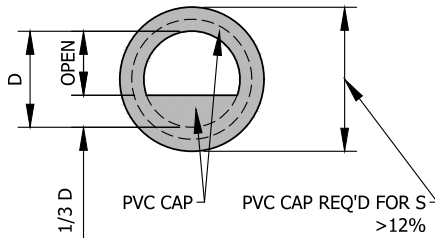
Scale: N.T.S.

Figure

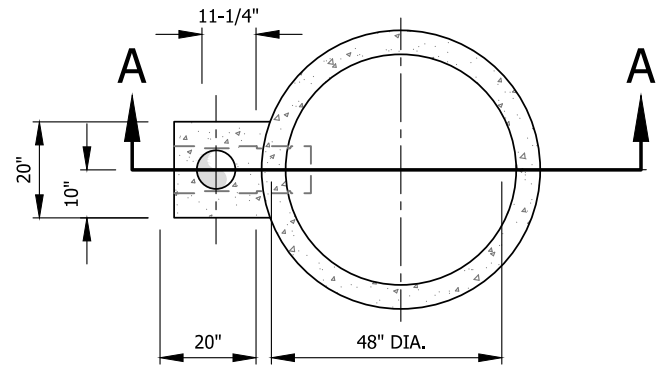
WW-13



Removed Coupling Detail

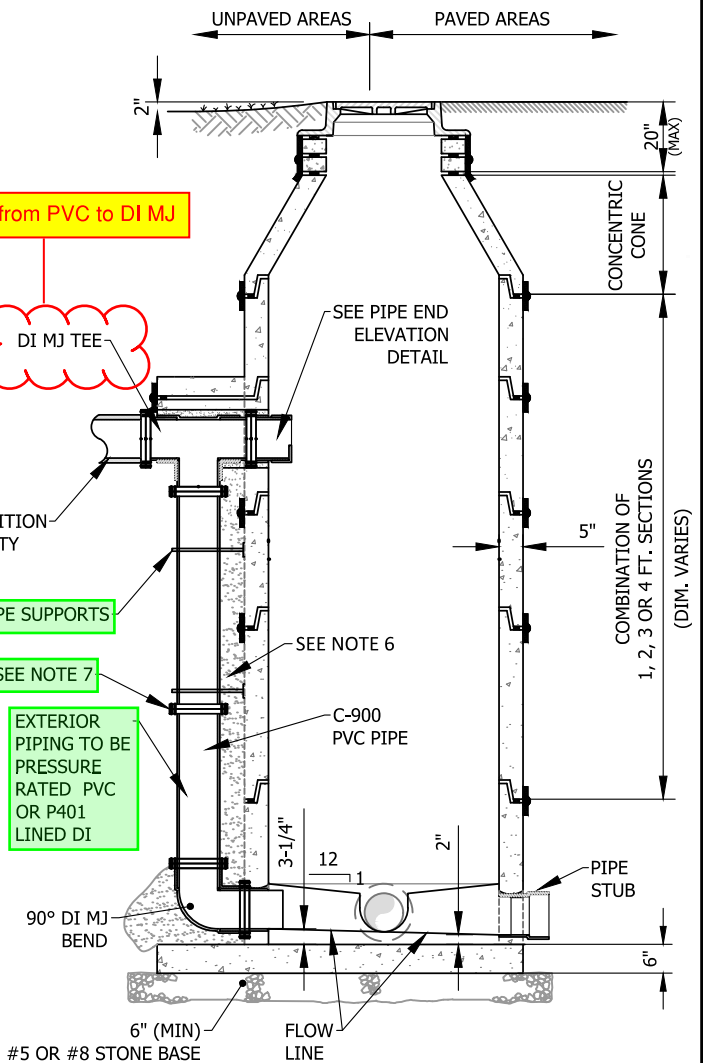


PIPE END ELEVATION



MANHOLE BASE/RISER PLAN

changed from PVC to DI MJ

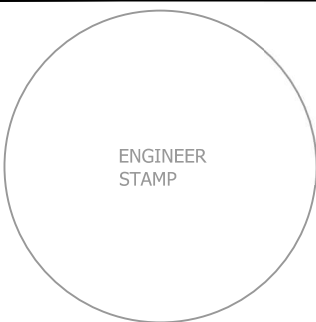


SECTION "A-A"

NOTE:

1. ALL MATERIAL, DESIGN, MANUFACTURE, PHYSICAL TEST REQUIREMENTS, FINISH MARKING, INSPECTION, REJECTION AND REPAIRS TO MEET / OR EXCEED "SPECIFICATIONS FOR PRECAST-REINFORCED CONCRETE MANHOLE SECTIONS". PER ASTM C-478 (LATEST REVISION).
2. RESILIENT CONNECTORS MEET "SPECIFICATIONS FOR RESILIENT CONNECTORS BETWEEN REINFORCED CONCRETE MANHOLE STRUCTURES, PIPES AND LATERALS". PER ASTM C-923 (LATEST REVISION). RESILIENT CONNECTORS SHALL MEET AND/OR EXCEED ASTM C-478 GASKET REQUIREMENTS. 1" MASTIC BUTYL WILL BE ADDED BETWEEN THE JOINTS OF THE PRECAST DROP AND SHALL BE TIED INTO THE BARREL SECTION SEALANT. ALL ANGLES AND FALL SHALL BE ACCORDING TO PLANS.
3. 33" DROP MINIMUM REQUIRED. DROP IS 8" PIPE ONLY. IF DROP REQUIRES GREATER THAN 8" PIPE, A SPECIAL DETAIL WILL BE REQUIRED FOR APPROVAL.
4. ALL PRECAST CONCRETE FOR FORCE MAIN RECEIVING MANHOLES AND ALL NEW MANHOLES WITHIN 500 FEET UPSTREAM OR DOWNSTREAM OF THE RECEIVING MANHOLE SHALL CONTAIN ANTI-CORROSION ADDITIVE, CONSHIELD OR EQUIVALENT.
5. SPECIFIC DROP ELEVATION TO BE DESIGNED BY ENGINEER.
6. ACCEPTABLE EXCAVATED MATERIAL, UNIFORM IN NATURE, FREE FROM ORGANIC MATERIAL AND STONES LARGER THAN 2", COMPACTED AS SPECIFIED.
7. MEGALUG RESTRAINTS ON ALL JOINTS.

Date: Nov 19, 2020, 4:33pm User Name: trutheford
File: S:\113-0170\WR\CAO\Plans\Details Proposed by LG\Sanitary Sewer\WW-10 External Drop Manhole(Gravity).dwg



PRECAST EXTERNAL DROP MANHOLE
(REQUIRED ON ALL DROPS GREATER THAN 24")
(GRAVITY)

Approved: / /

Approved By:

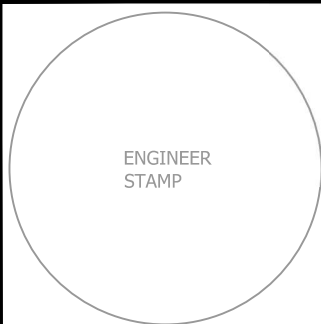
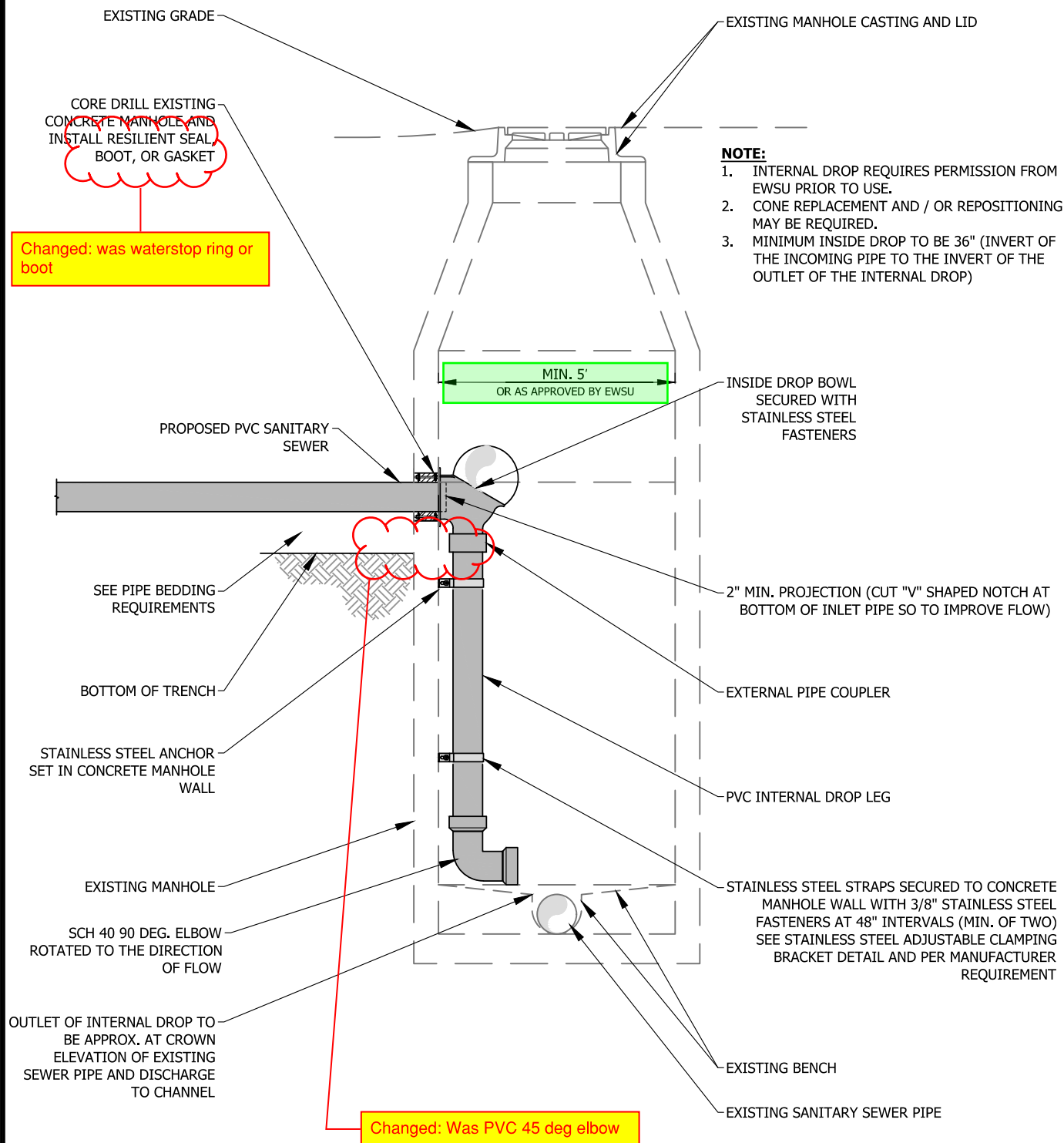
Adopted: / /

Scale: N.T.S.

Figure

WW-14

Date: Nov 19, 2020, 4:33pm User Name: trutheford
File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-11 Internal Drop Connection to Existing MH.dwg



INTERNAL DROP CONNECTION TO EXISTING MANHOLE (GRAVITY)

Approved: ___/___/___

Approved By:

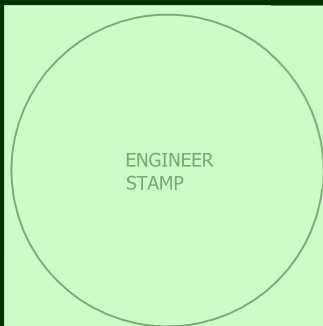
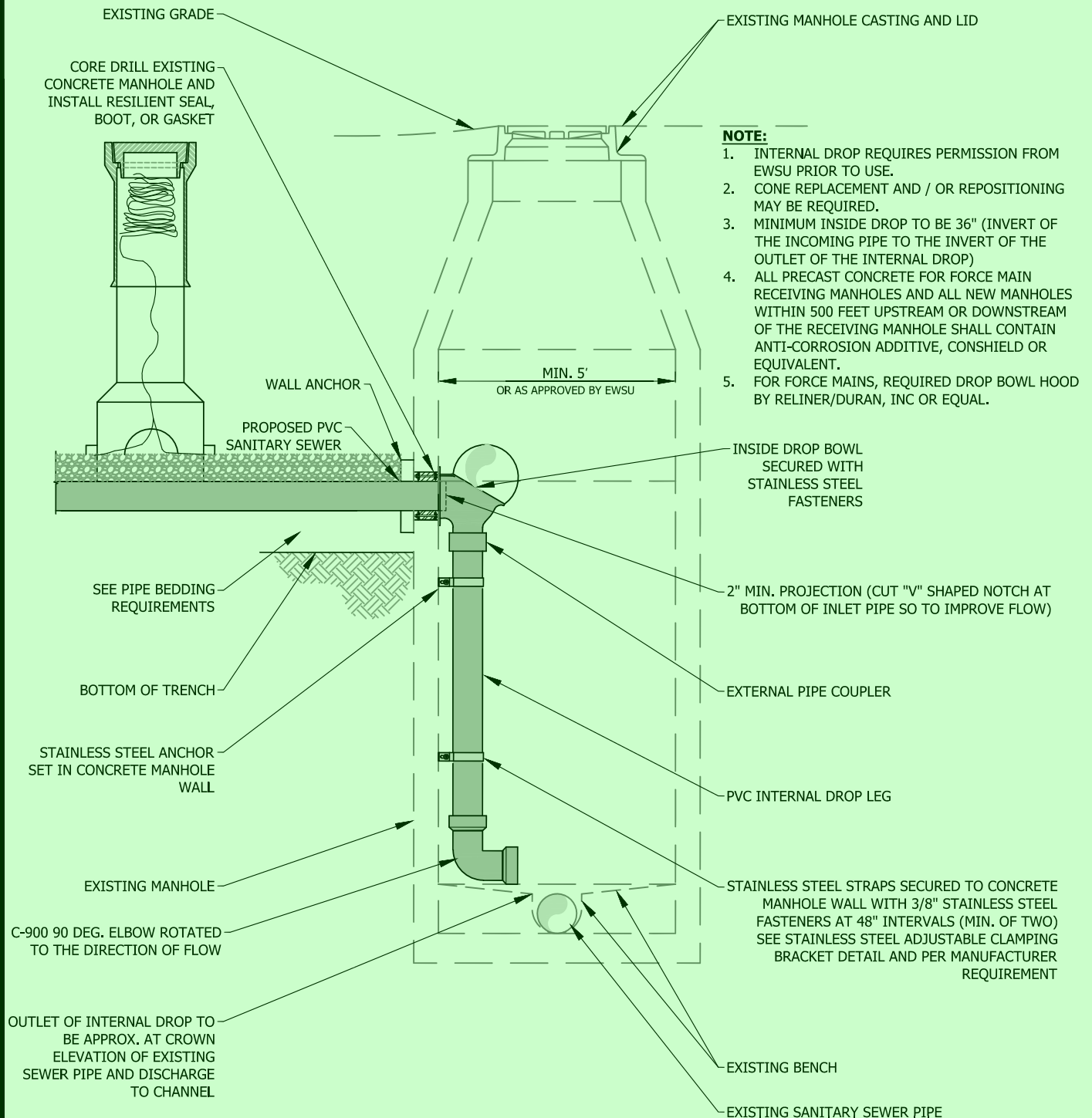
Adopted: ___/___/___

Scale: N.T.S.

Figure

WW-15

DATE: NOV 19, 2020, 4:23PM USER: JST/STW
FILE: S:\113-0170\WCAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-11 Internal Drop Connection to Existing MH\ForceMain.dwg



INTERNAL DROP CONNECTION TO EXISTING MANHOLE (FORCE MAIN)

Approved: __/__/__

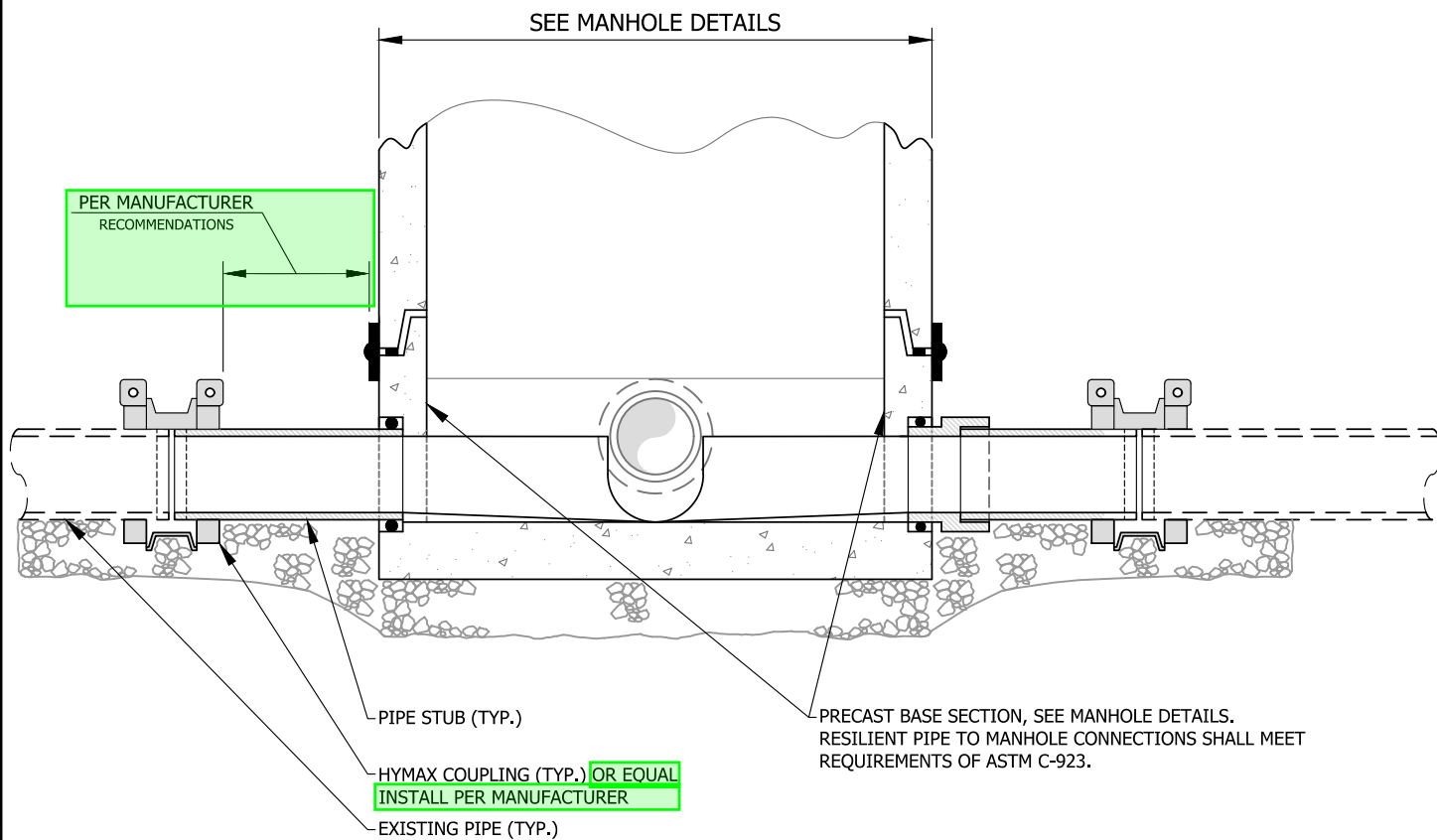
Approved By:

Adopted: __/__/__

Scale: N.T.S.

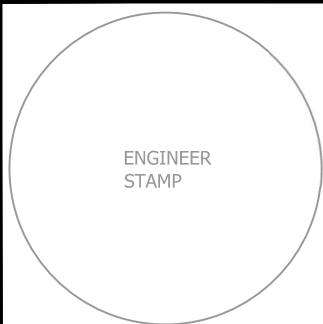
Figure

WW-16



NOTE:

1. CUT OUT SECTION OF EXISTING PIPE, INSTALL NEW MANHOLE WITH STUBS, CONNECT WITH HYMAX COUPLERS AS SHOWN.
2. MANHOLE TO MEET STANDARD DETAILS WW-01 THROUGH WW-03



NEW MANHOLE ON EXISTING PIPE

Approved: ___/___/___

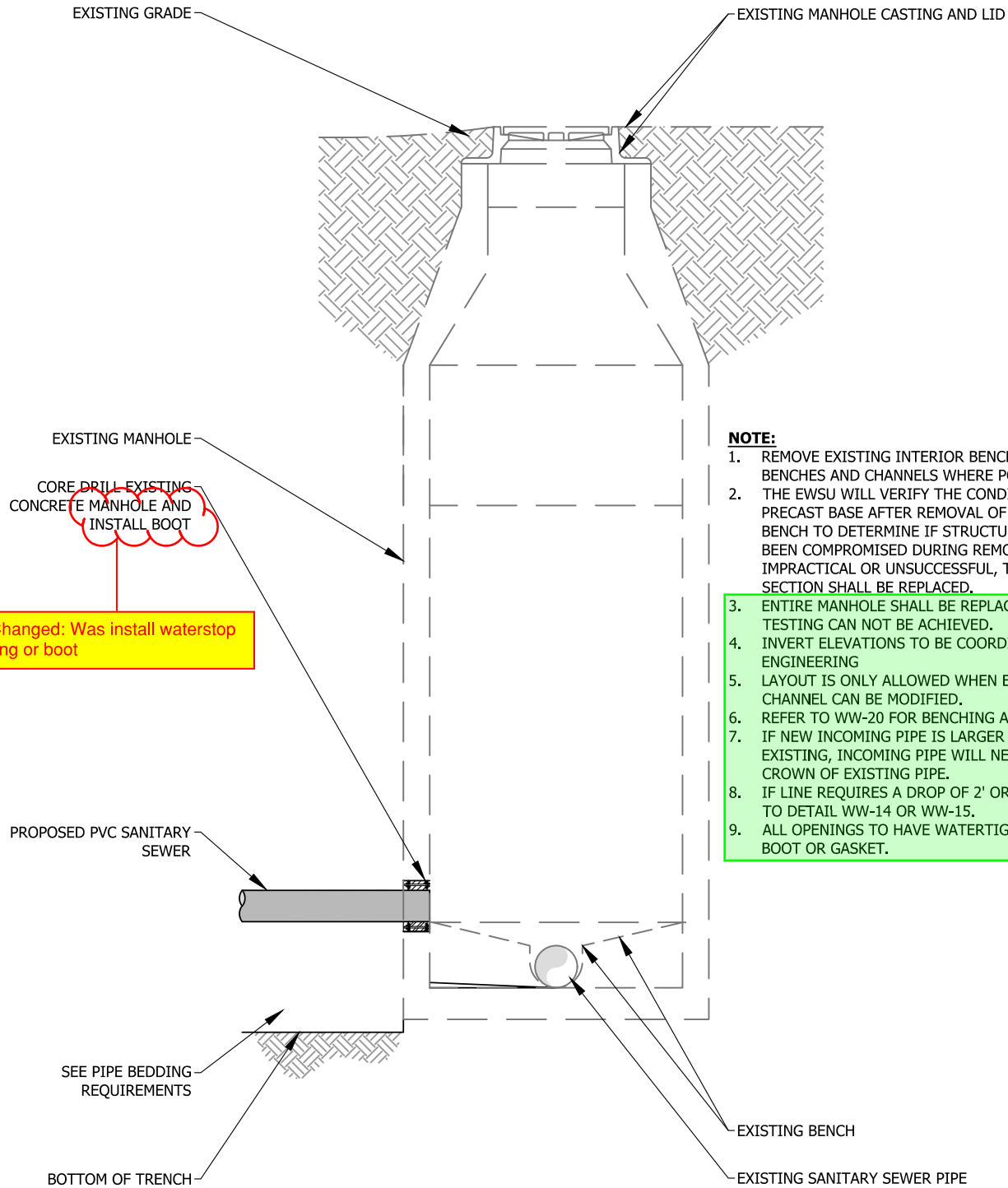
Approved By:

Adopted: ___/___/___

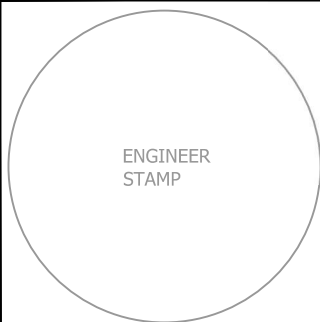
Scale: N.T.S.

Figure

WW-17



Date: Nov 19, 2020, 4:34pm User Name: trutthierford
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-13 New Pipe Connection to Existing MH.dwg



NEW PIPE CONNECTION TO EXISTING MANHOLE

Approved: / /

Approved By:

Adopted: / /

Scale: N.T.S.

Figure

WW-18

Changed: existing detail states
"Rubber gasket water stop"

CORE DRILL EXISTING CONCRETE
MANHOLE AND INSTALL RESILIENT
BOOT OR GASKET PER SUBMITTAL

PRECAST CONCRETE MANHOLE
(SEE PRECAST CONCRETE MANHOLES FOR
ADDITIONAL INFORMATION)

BENCH (SEE BENCHES AND CHANNELS
FOR ADDITIONAL INFORMATION)

NEW SEWER PIPE

GROUT INVERT WITH
NON-SHRINK GROUT

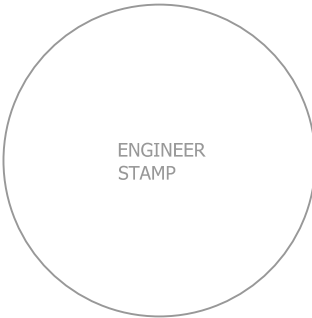
CHANNEL (SEE BENCHES AND CHANNELS
FOR ADDITIONAL INFORMATION)

8"
(MIN.)

8"
(MIN.)

PRECAST CONCRETE MANHOLE BASE
(SEE PRECAST CONCRETE MANHOLES
FOR ADDITIONAL INFORMATION)

Date: Nov 19, 2020, 4:34pm User Name: trutheford
File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-14 Stub-out at Manhole.dwg



Changed name. Was called
Stub-out manhole

CORE EXISTING MANHOLE
FOR NEW TAP

Approved: ___/___/___

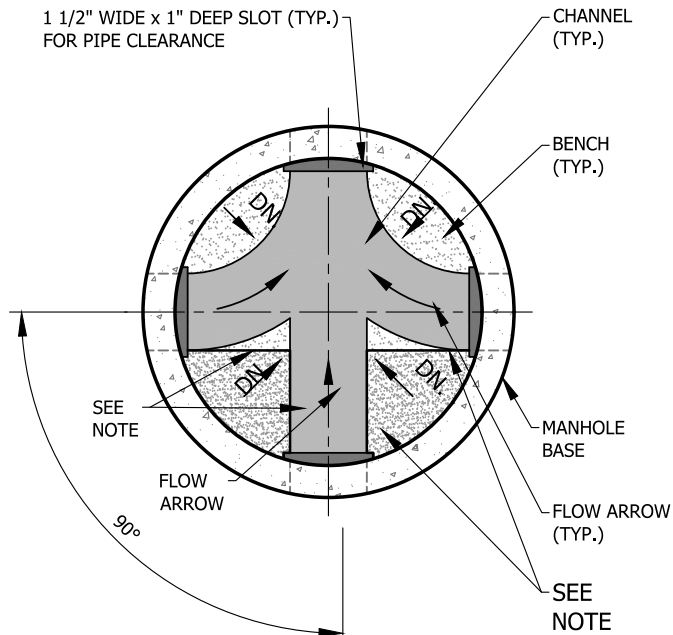
Adopted: ___/___/___

Figure

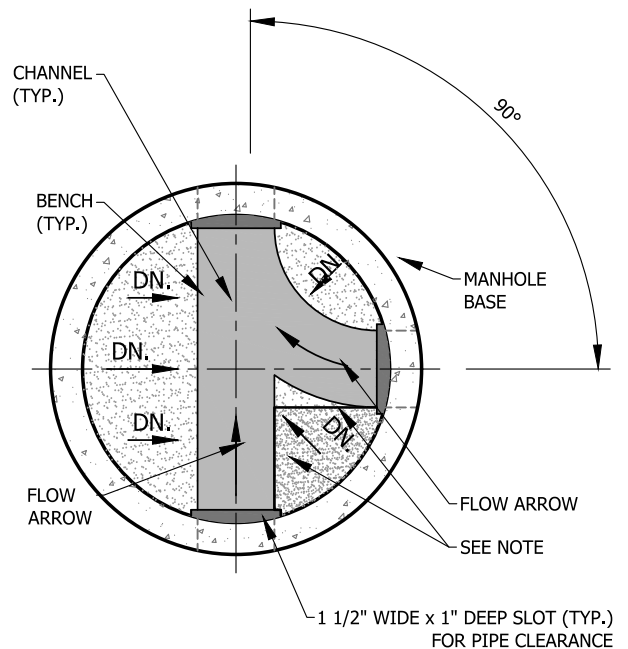
Approved By:

Scale: N.T.S.

WW-19



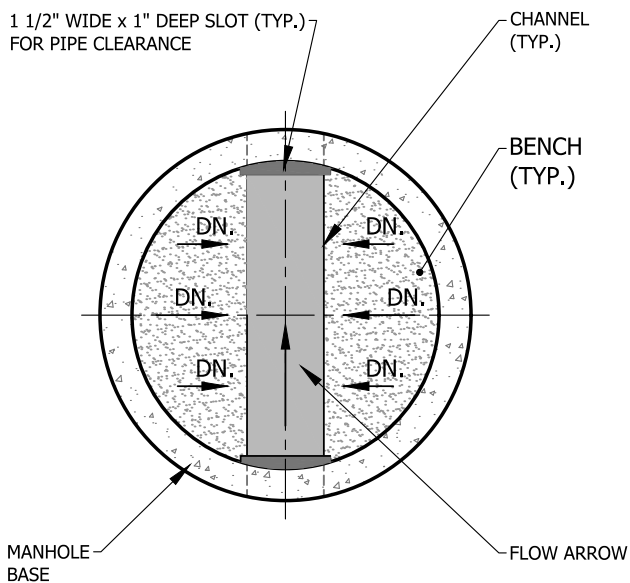
TYPICAL 4-WAY FLOW



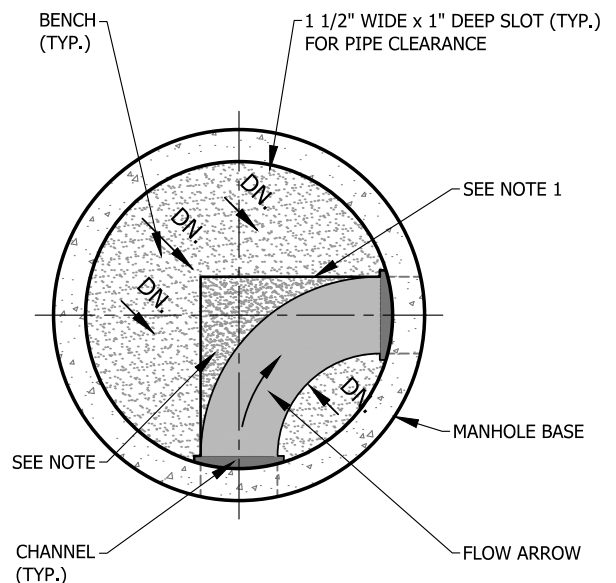
TYPICAL 3-WAY FLOW

NOTE:

1. WALLS SHALL BE FLARED OUT AS REQUIRED SO THAT TESTING AND INSPECTION EQUIPMENT CAN BE SAFELY REMOVED.
2. ALL NON-TYPICAL BENCHES AND CHANNELS WILL REQUIRE A SPECIAL DETAIL ON THE PLANS.
3. DEPTH OF CHANNEL SHALL EQUAL DIAMETER OF PIPE
4. THREE WAY TEE SHALL BE BUILT AS A TYPICAL FOUR WAY FLOW.

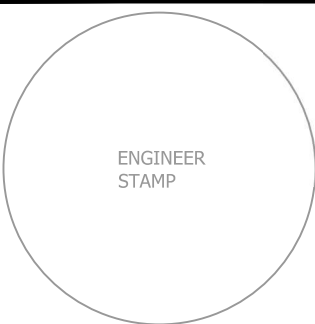


TYPICAL STRAIGHT FLOW



TYPICAL CURVE FLOW

Date: Nov 19, 2020, 4:34pm User Name: trutheford
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-15 Standard Manhole Benches & Channels.dwg



STANDARD MANHOLE BENCHES AND CHANNELS

Approved: / /

Approved By:

Adopted: / /

Scale: N.T.S.

Figure

WW-20

RESIDENCE
TO BE CONNECTED TO PUBLIC SEWER
(IN-LINE LAYOUT)

SANITARY LATERAL

CONCRETE COLLAR
(ONLY REQUIRED IN PAVED AREAS)

7' (MAX.)

CLEANOUT

(PER STANDARD DETAIL)

100' (MAX. BETWEEN CLEANOUTS)

SANITARY LATERAL

4" DIA. (MIN.) OR 6" DIA.

@ MIN. 1/8" PER FOOT OR 1.0% SLOPE

INSTALL PER PLUMBING CODE

CLEANOUT

REQUIRED AT ALL BENDS AND
EVERY 100' ON STRAIGHT RUNS
(PER STANDARD DETAIL)

CONCRETE COLLAR
(ONLY REQUIRED IN PAVED AREAS)

CLEANOUT

REQUIRED AT EASEMENT OR
PROPERTY LINES
(PER STANDARD DETAIL)

CONCRETE COLLAR
(ONLY REQUIRED IN PAVED AREAS)

Changed: Was 45 deg. bend

BENDS AS REQ'D

PUBLIC UTILITY EASEMENT OR
PROPERTY LINE

EXISTING SANITARY SEWER

FLOW DIRECTION

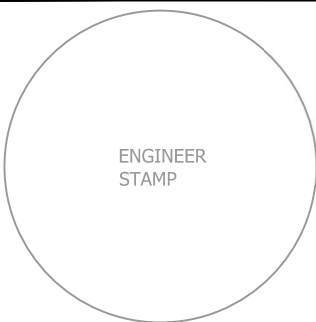
NOTE:

1. SEE STANDARD SANITARY CLEANOUT DETAILS.
2. INSTALL TRACER WIRE PER WW-37.

EXIST.
MANHOLE

WYE CONNECTION

Date: Nov 19, 2020, 4:34pm User Name: trutheford
File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-16 Lateral Sewer Connection Layout (Residential).dwg



ENGINEER
STAMP



LATERAL SEWER CONNECTION LAYOUT (RESIDENTIAL)

Approved: ___/___/___

Adopted: ___/___/___

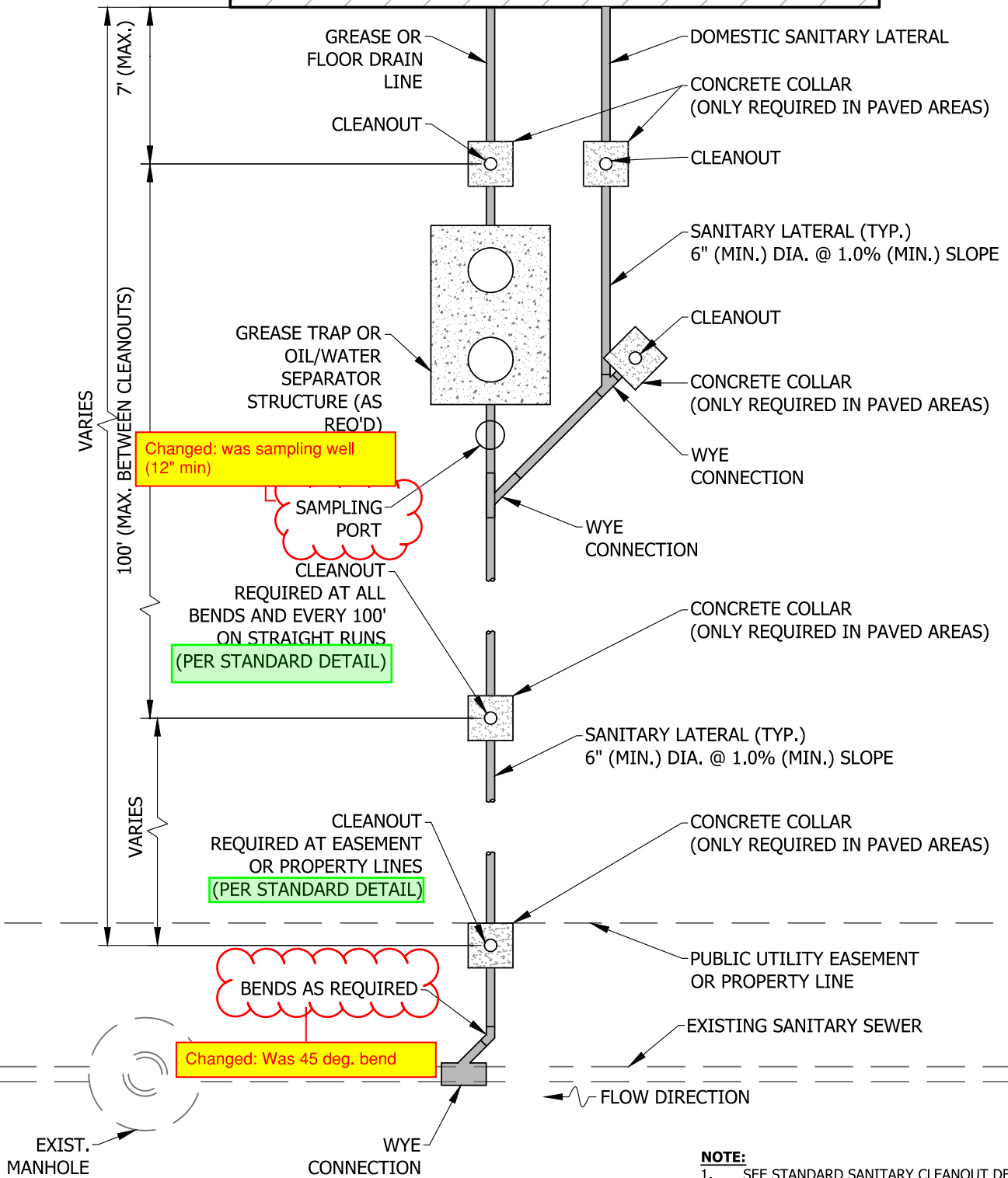
Figure

Approved By: _____

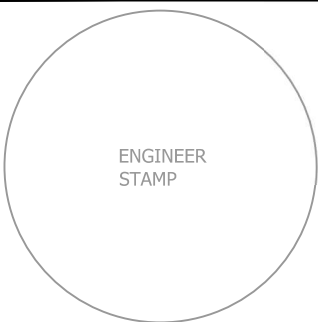
Scale: N.T.S.

WW-21

COMMERCIAL OR INDUSTRIAL
TO BE CONNECTED TO PUBLIC SEWER
(IN-LINE LAYOUT)



Date: Nov 19, 2020, 4:34pm User Name: trutheford
File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-17 Lateral Sewer Connection Layout (Commercial).dwg



LATERAL SEWER CONNECTION LAYOUT (COMMERCIAL)

Approved: ___/___/___

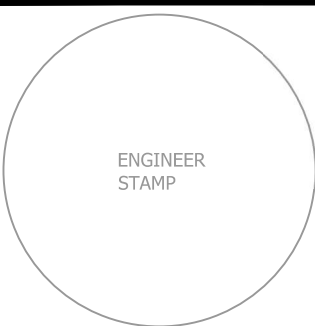
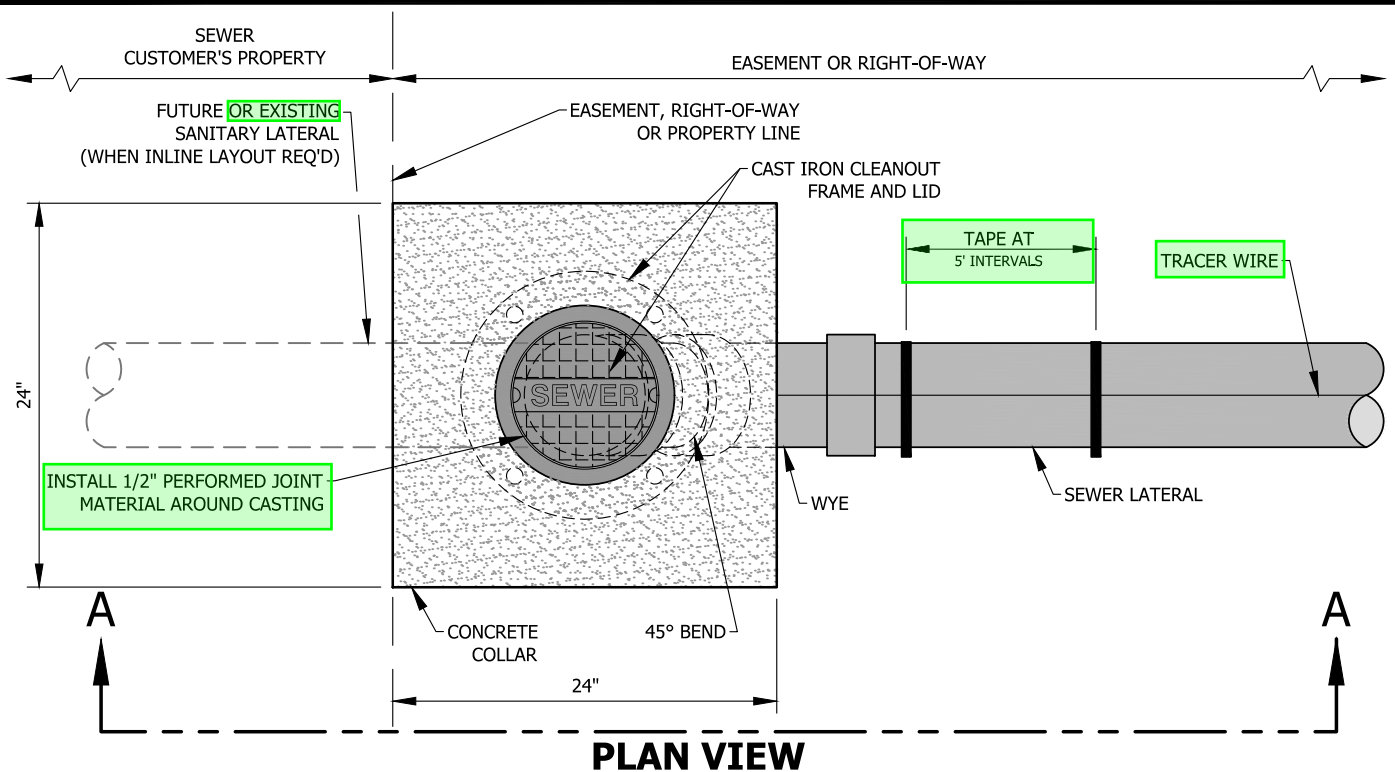
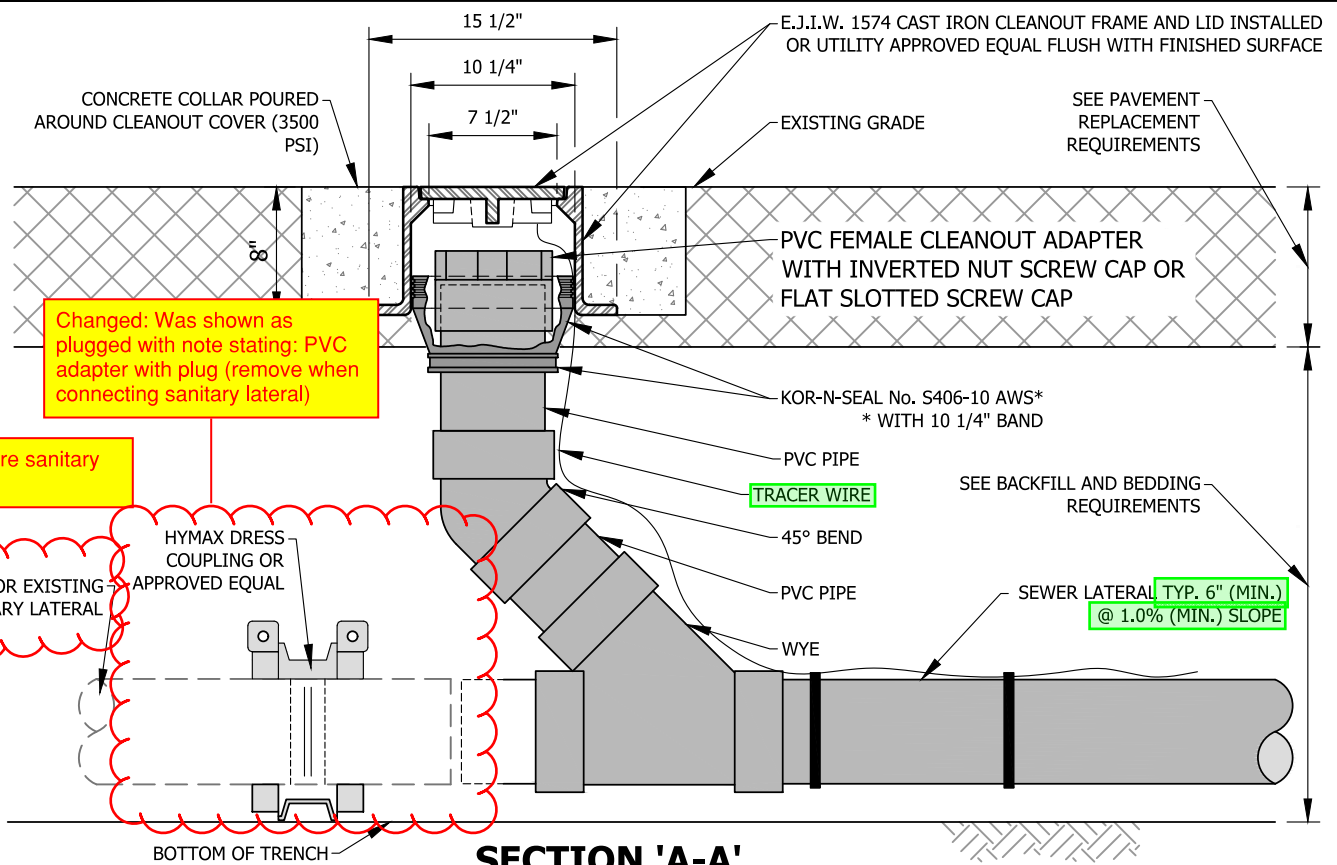
Approved By:

Adopted: ___/___/___

Scale: N.T.S.

Figure

WW-22



STANDARD SANITARY CLEANOUT IN PAVED AREAS

Approved: ___/___/___

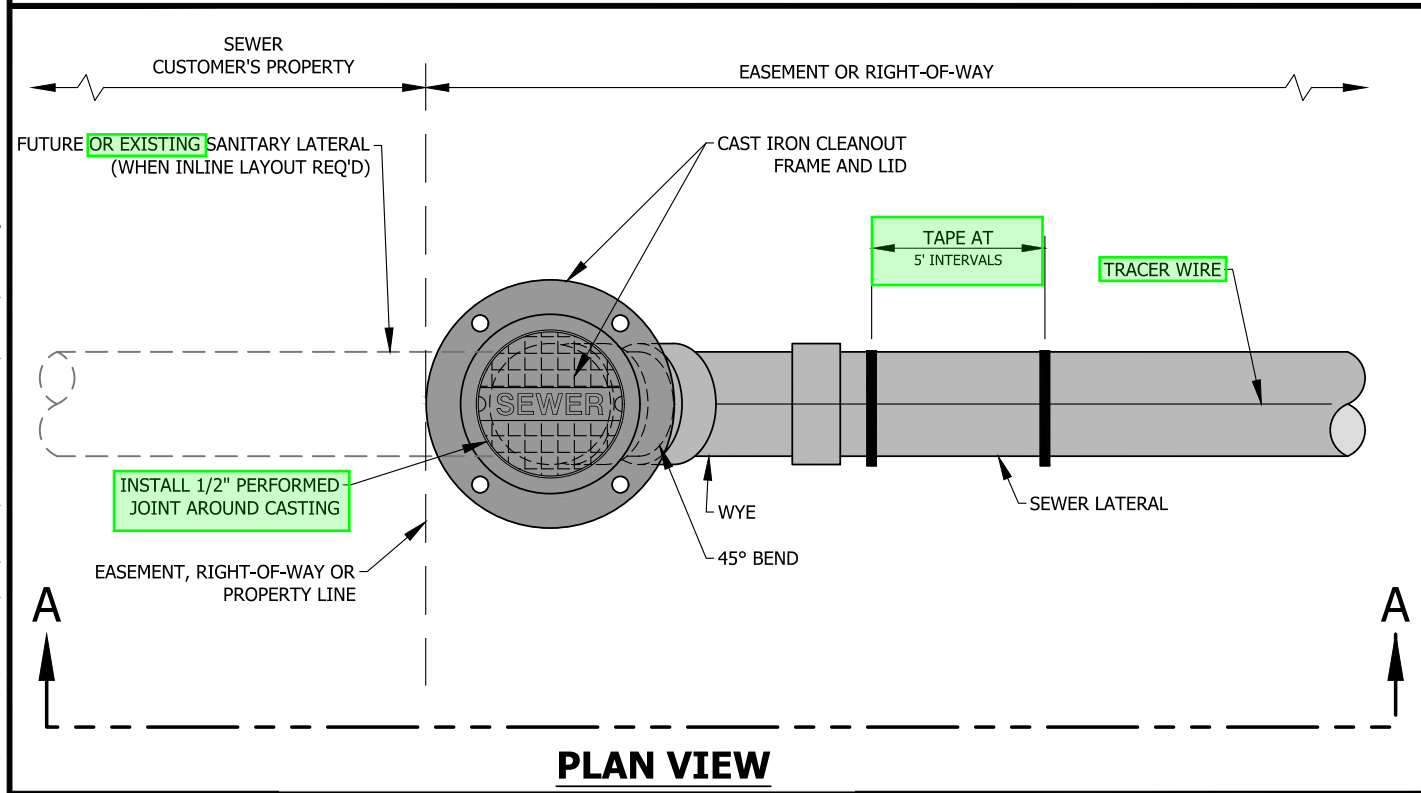
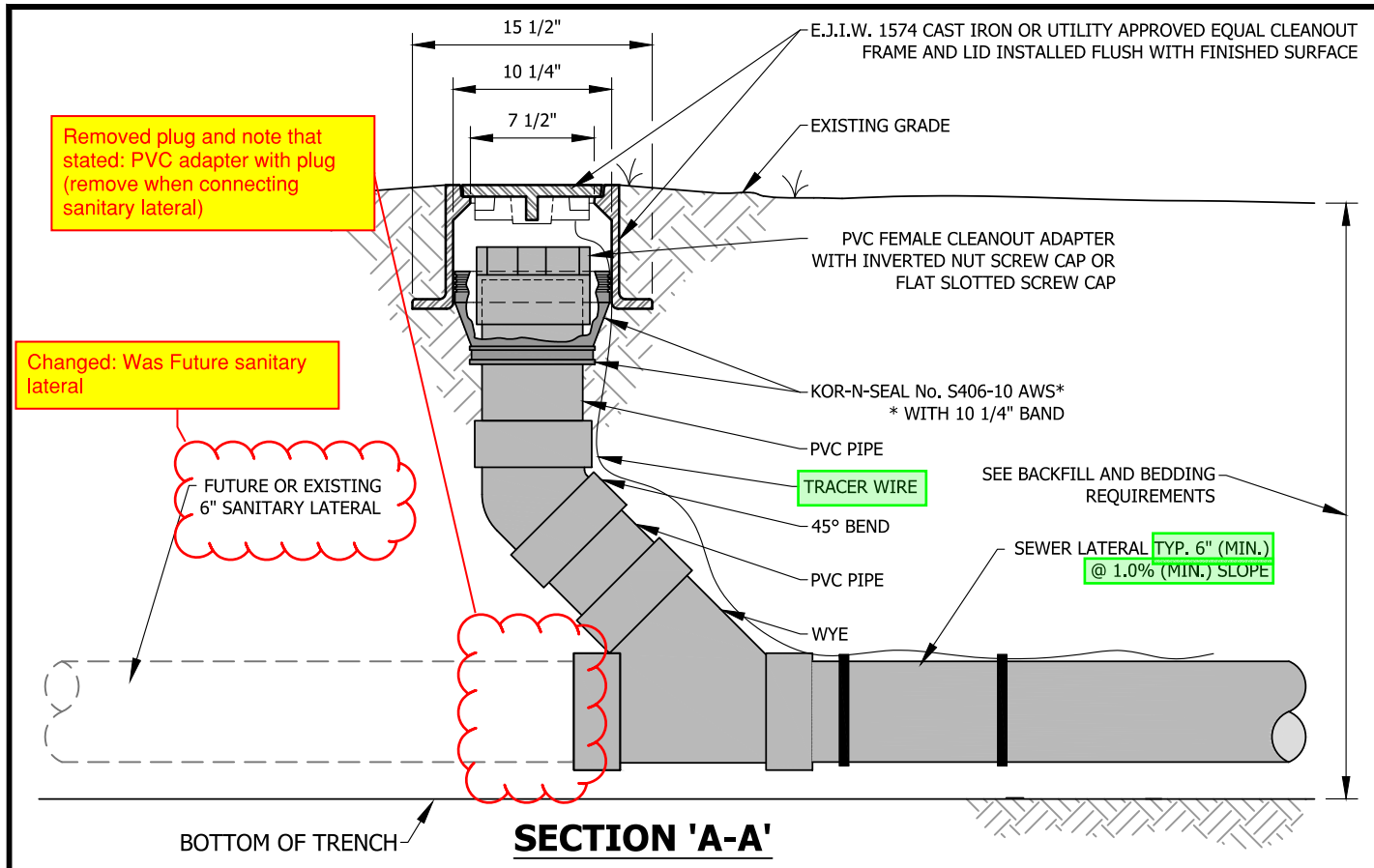
Approved By:

Adopted: ___/___/___

Scale: N.T.S.

Figure

WW-23



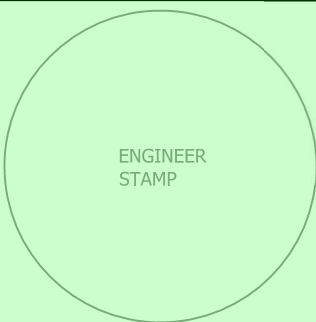
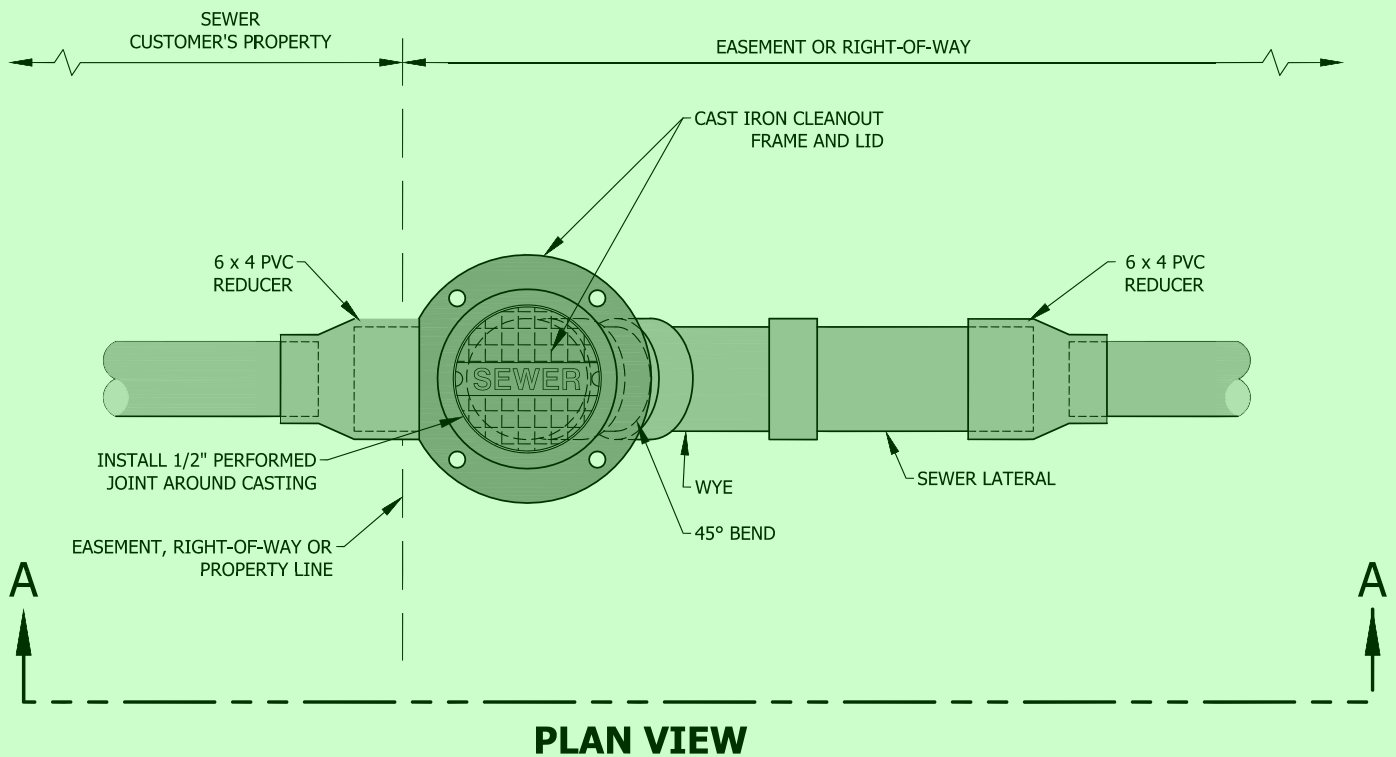
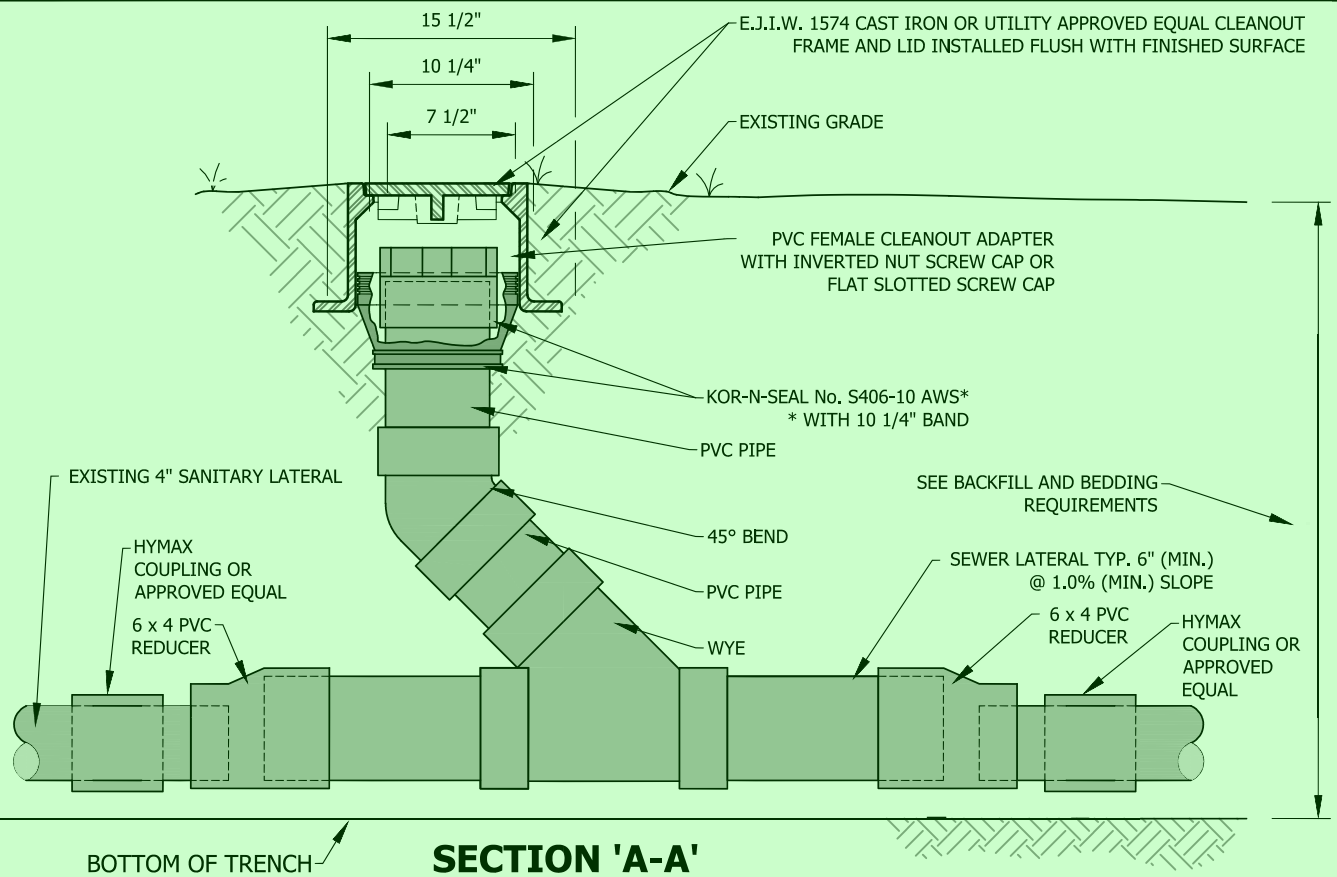
Date: Nov 19, 2020, 4:34pm User Name: truthriferd
File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-19 Standard Sanitary Cleanout Unpaved Areas.dwg

ENGINEER
STAMP



STANDARD SANITARY CLEANOUT IN UN-PAVED AREAS

Approved: ___/___/___	Adopted: ___/___/___	Figure <h3 style="margin: 0;">WW-24</h3>
Approved By: _____	Scale: N.T.S.	



NEW CLEANOUT ON EXISTING 4" PIPE

Approved: / /

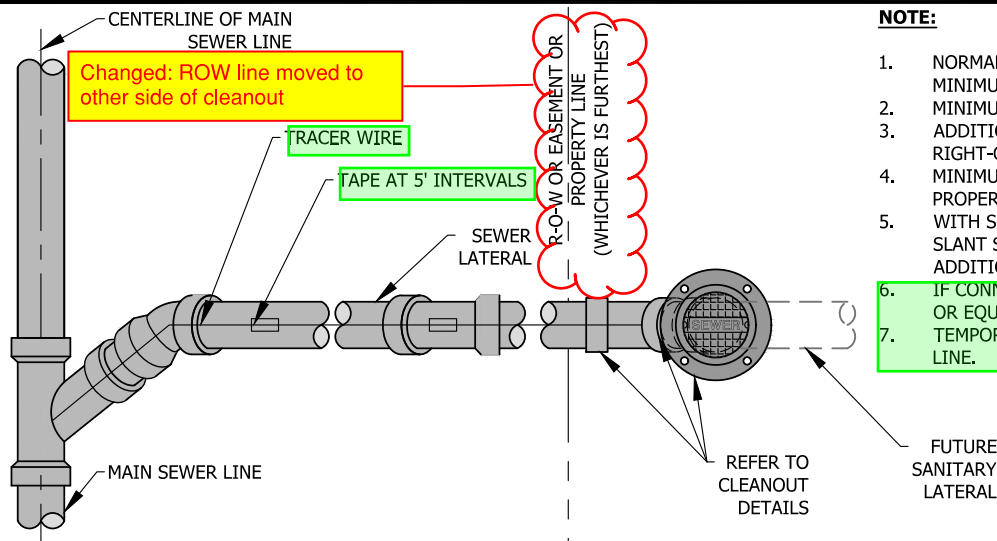
Approved By:

Adopted: / /

Scale: N.T.S.

Figure

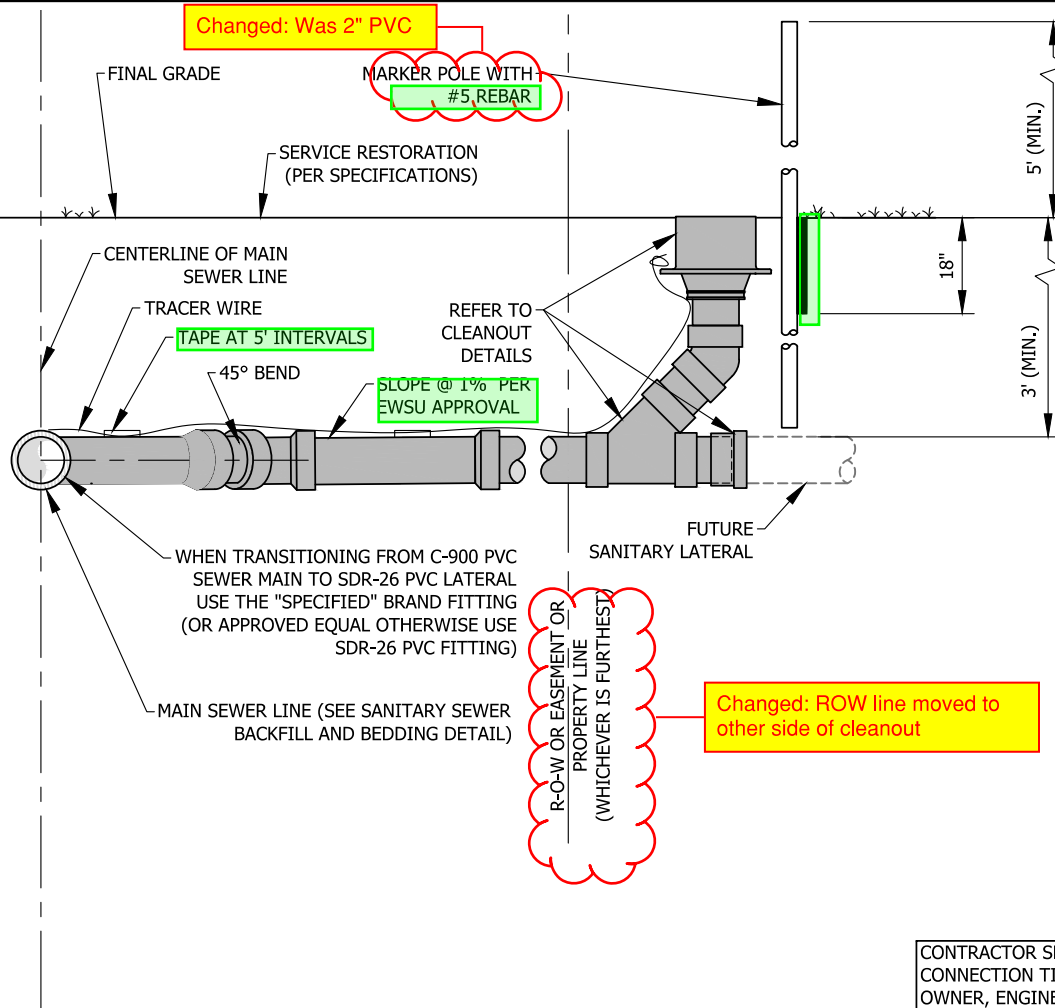
WW-25



PIPING PLAN VIEW

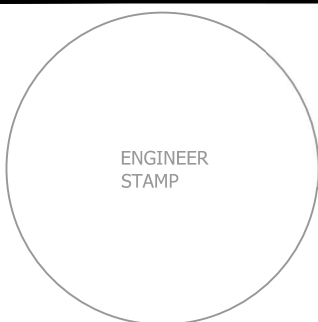
NOTE:

1. NORMAL LATERAL SLOPE IS 4" @ 1/4" PER FOOT, MINIMUM LATERAL SLOPE IS 6" @ 1/8" PER FOOT.
2. MINIMUM COVER IS 3 FEET OVER PIPE.
3. ADDITIONAL CLEANOUT REQUIRED AT RIGHT-OF-WAY WHERE LATERAL CROSSES ROADWAY.
4. MINIMUM LATERAL SIZE FROM SEWER MAIN TO PROPERTY LINE CLEANOUT IS 6".
5. WITH SEWER UTILITY APPROVAL, DEEP SEWER SLANT STACK MAY BE INSTALLED; MAY REQUIRE ADDITIONAL EASEMENT.
6. IF CONNECTING TO EXISTING LINE, HYMAX COUPLING OR EQUAL REQUIRED.
7. TEMPORARY FACTORY CAP REQUIRED AT PROPERTY LINE.



PIPING ELEVATION VIEW

CONTRACTOR SHALL PROVIDE "AS-BUILT" SERVICE CONNECTION TIE DOWN MEASUREMENTS TO THE OWNER, ENGINEER, AND PROPERTY OWNER.



SHALLOW SANITARY SERVICE CONNECTION (LESS THAN 5' DEPTH)

Approved: ___/___/___

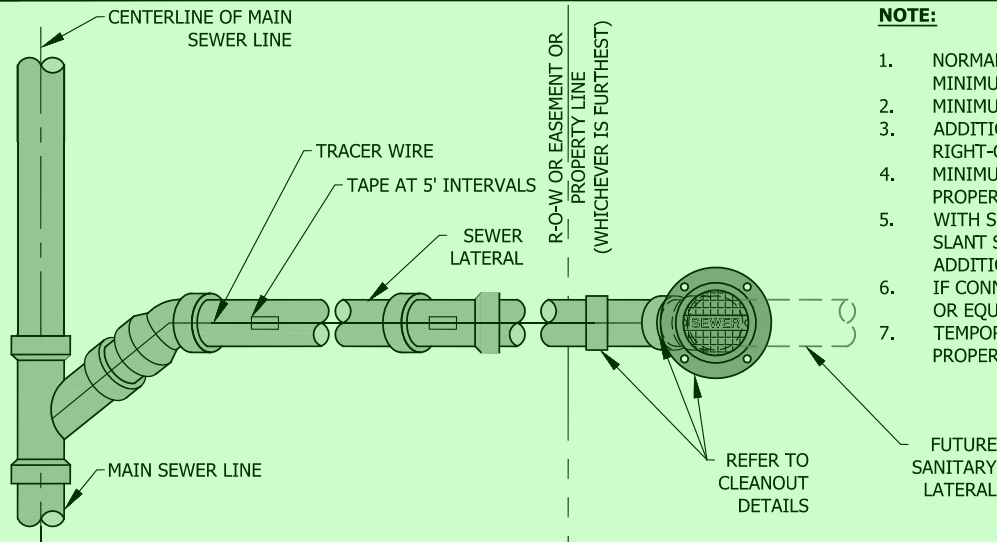
Approved By:

Adopted: ___/___/___

Scale: N.T.S.

Figure

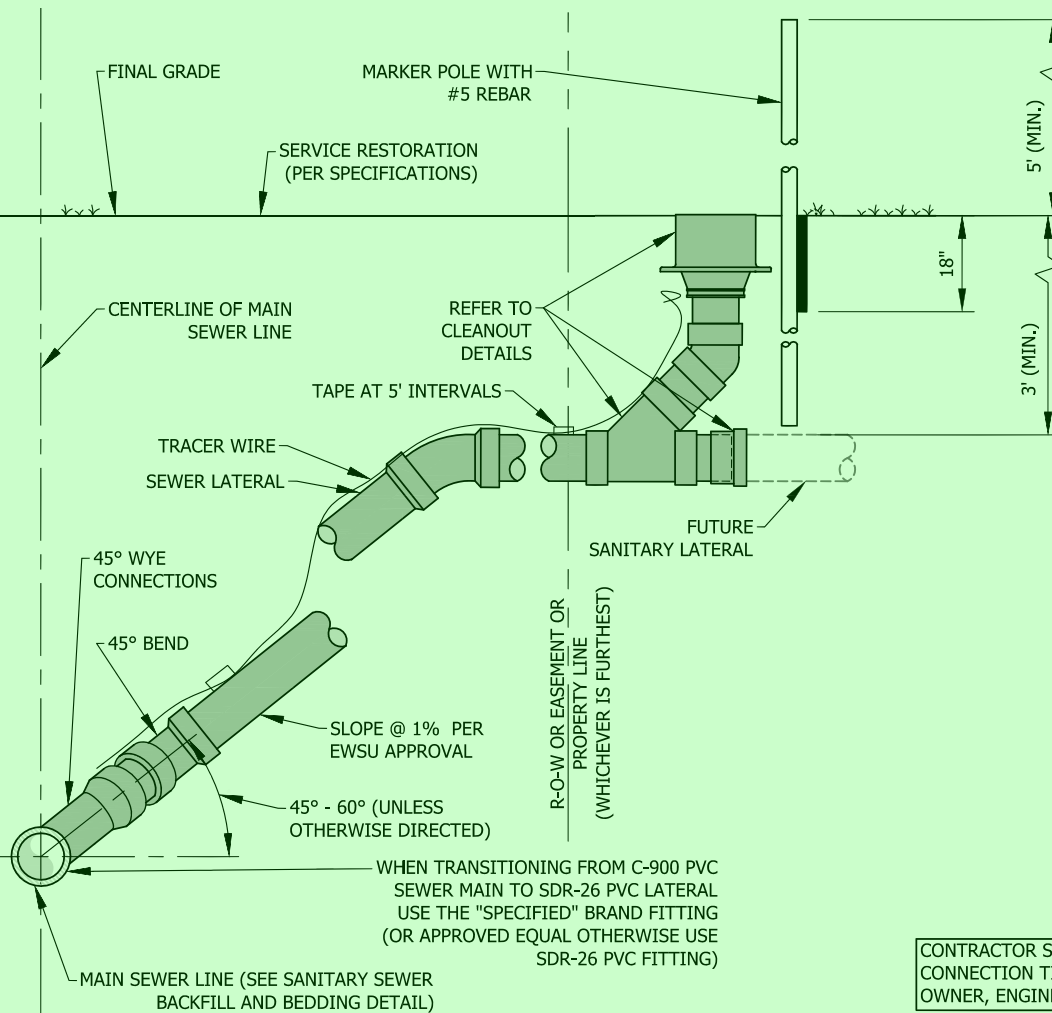
WW-26



PIPING PLAN VIEW

NOTE:

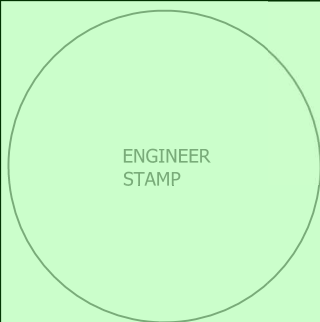
1. NORMAL LATERAL SLOPE IS 4" @ 1/4" PER FOOT, MINIMUM LATERAL SLOPE IS 6" @ 1/8" PER FOOT.
2. MINIMUM COVER IS 3 FEET OVER PIPE.
3. ADDITIONAL CLEANOUT REQUIRED AT RIGHT-OF-WAY WHERE LATERAL CROSSES ROADWAY.
4. MINIMUM LATERAL SIZE FROM SEWER MAIN TO PROPERTY LINE CLEANOUT IS 6".
5. WITH SEWER UTILITY APPROVAL, DEEP SEWER SLANT STACK MAY BE INSTALLED; MAY REQUIRE ADDITIONAL EASEMENT.
6. IF CONNECTING TO EXISTING LINE, HYMAX COUPLING OR EQUAL REQUIRED.
7. TEMPORARY FACTORY CAP REQUIRED AT PROPERTY LINE.



PIPING ELEVATION VIEW

CONTRACTOR SHALL PROVIDE "AS-BUILT" SERVICE CONNECTION TIE DOWN MEASUREMENTS TO THE OWNER, ENGINEER, AND PROPERTY OWNER.

Date: Nov 19, 2020, 9:26am User Name: trutheford
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-20 Shallow Sanitary Service Connection.dwg



MEDIUM SANITARY SERVICE CONNECTION (5-12' DEPTH)

Approved: / /

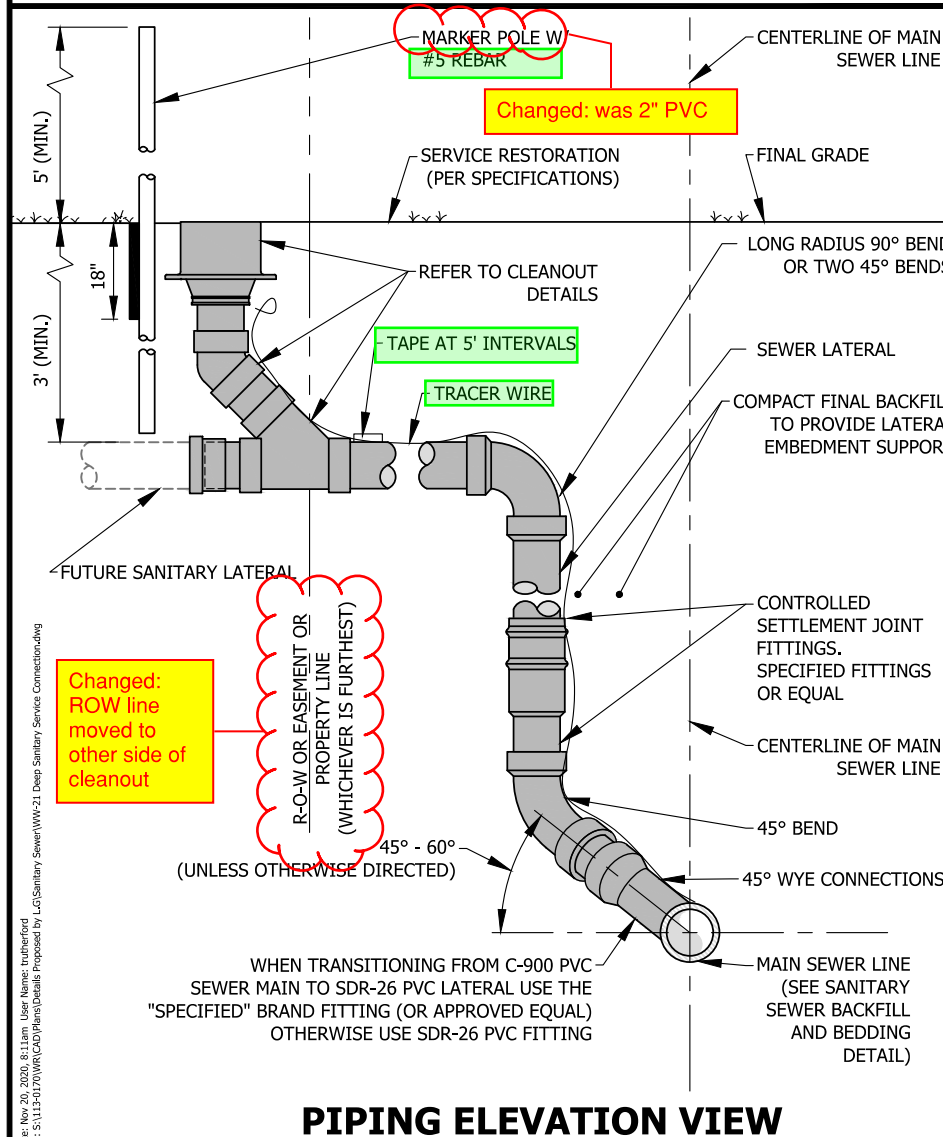
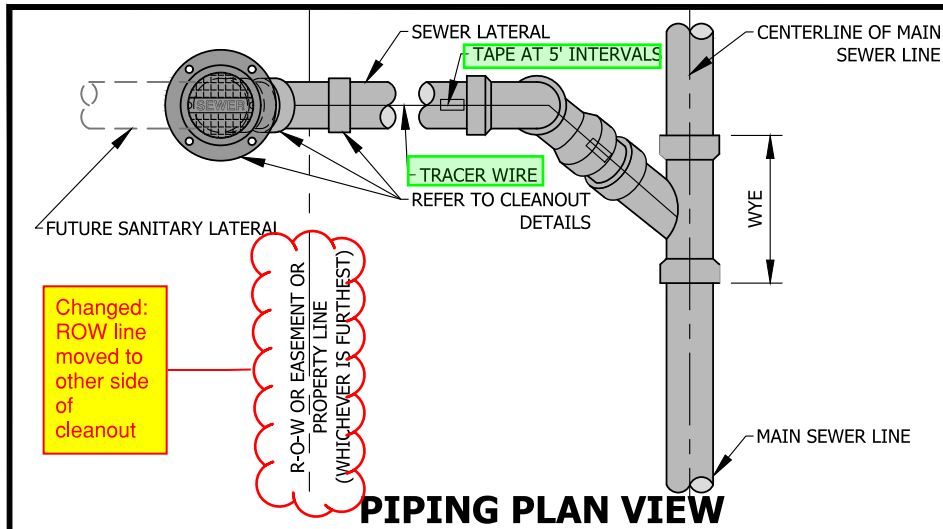
Approved By:

Adopted: / /

Scale: N.T.S.

Figure

WW-27

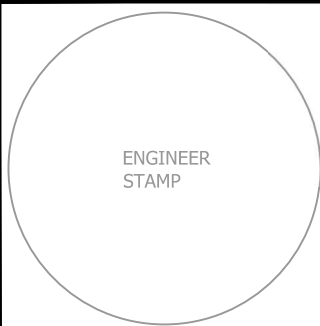


NOTE:

1. NORMAL LATERAL SLOPE IS 4" @ 1/4" PER FOOT, MINIMUM LATERAL SLOPE IS 6" @ 1/8" PER FOOT.
2. MINIMUM COVER IS 3 FEET OVER PIPE.
3. ADDITIONAL CLEANOUT REQUIRED AT RIGHT-OF-WAY WHERE LATERAL CROSSES ROADWAY
4. MINIMUM LATERAL SIZE FROM SEWER MAIN TO PROPERTY LINE CLEANOUT IS 6".
5. WITH SEWER UTILITY APPROVAL, DEEP SEWER SLANT STACK MAY BE INSTALLED; MAY REQUIRE ADDITIONAL EASEMENT.
6. TEMPORARY FACTORY CAP REQUIRED AT PROPERTY LINE.

CONTRACTOR SHALL PROVIDE "AS-BUILT" SERVICE CONNECTION TIE DOWN MEASUREMENTS TO THE OWNER, ENGINEER, AND PROPERTY OWNER.

Notes: New 2018, 2020, 8/1/18, User: Nantz, Title: Standard, File: S:\113-20170\WWS-CAD\plans\Details Proposed by: LG\Sanitary Sewer\WW-21 Deep Sanitary Service Connection.dwg



DEEP SANITARY SERVICE CONNECTION (DEPTH GREATER THAN 12')

Approved: / /

Approved By:

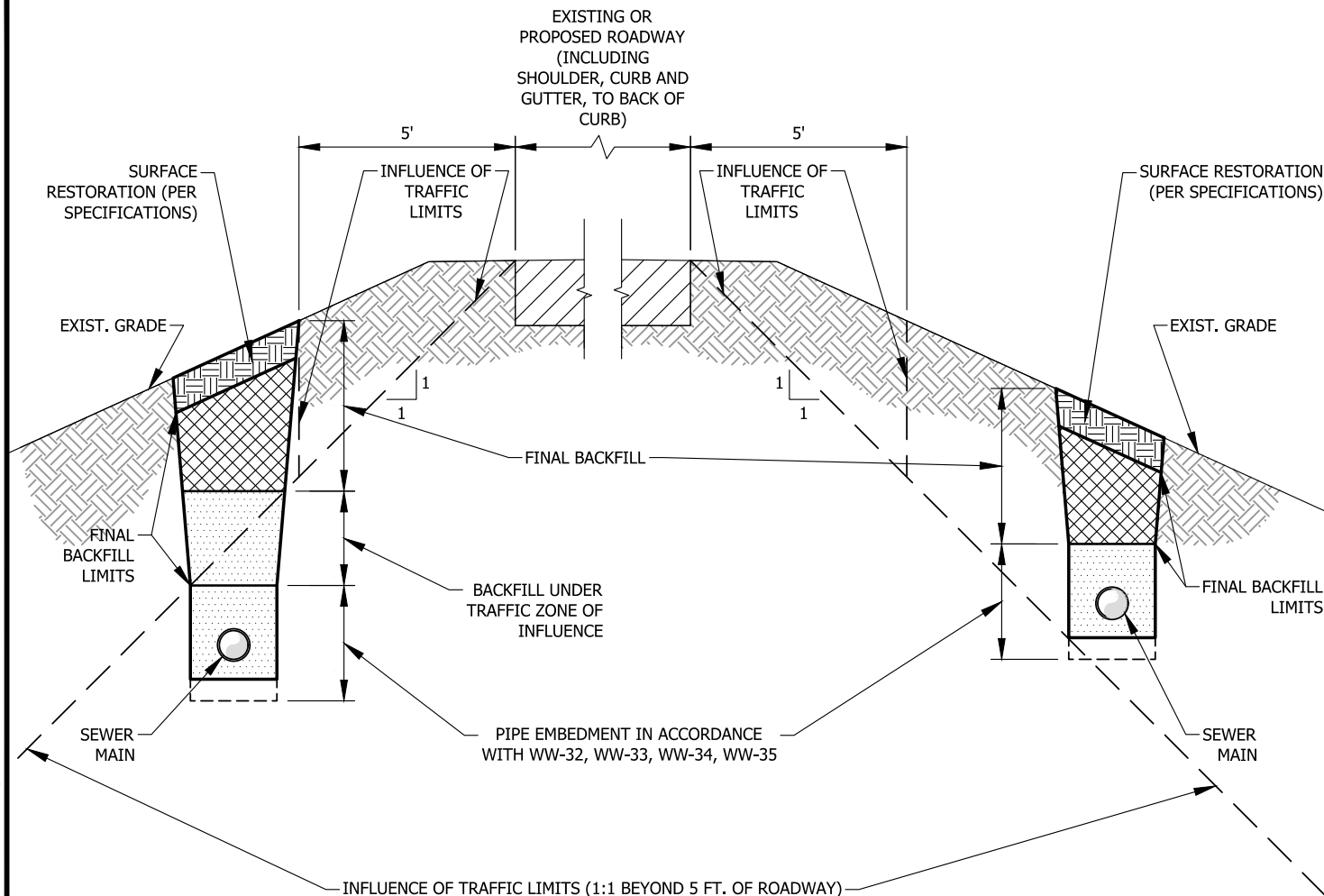
Adopted: / /

Scale: N.T.S.

Figure

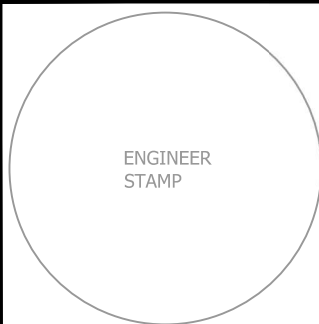
WW-28

Date: Nov 19, 2020, 4:34pm User Name: trutheford
 File: S:\113-0170\WR CAD\Plans\Details Proposed by L\Sanitary Sewer\WW-22-Final Backfill and Traffic Influence Detail.dwg



NOTE:

1. BEDDING AND BACKFILL SHALL CONFORM TO DETAILS WW-32, WW-33, WW-34, WW-35
2. FOR SEWERS GREATER THAN FIVE FEET FROM THE EDGE OF EXISTING OR PROPOSED ROADWAY, ANY PORTION OF THE TRENCH BELOW THE ZONE OF TRAFFIC INFLUENCE SHALL BE BACKFILLED IN ACCORDANCE WITH THE STREET JURISDICTION REQUIREMENTS.



FINAL BACKFILL AND TRAFFIC INFLUENCE DETAIL

Approved: / /

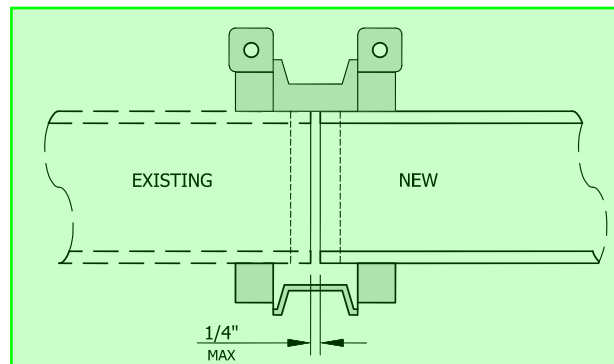
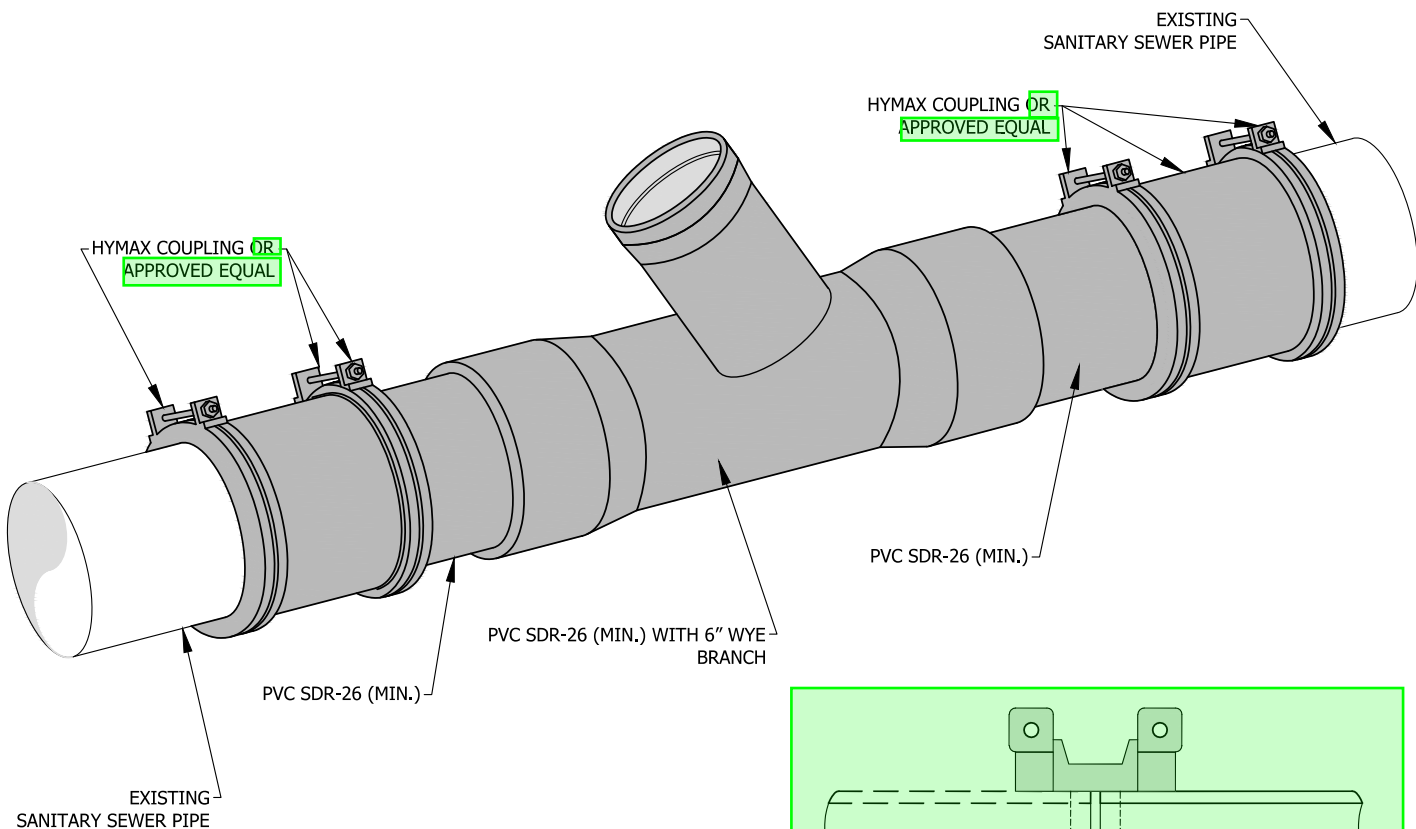
Approved By:

Adopted: / /

Scale: N.T.S.

Figure

WW-29



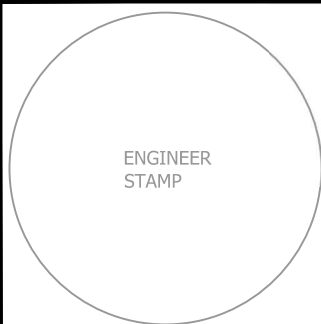
NOTE:

1. FOR COUPLINGS OF 12" AND LESS IN DIAMETER, THE PIPES MUST BE INSERTED A MINIMUM OF 2.25" INTO THE COUPLING. FOR COUPLINGS OF 15", THE PIPES MUST BE INSERTED A MINIMUM OF 4" INTO THE COUPLING.
2. FOR PIPES LARGER THAN 15" DIAMETER, COORDINATE WITH EWSU.
3. ROMAC, GENECO, OR STAINLESS TAPPING SADDLE TO BE ALLOWED UNDER SPECIAL CIRCUMSTANCES AS APPROVED BY EWSU.
4. TABLE TO BE POPULATED AS DETERMINED BY THE EWSU.

MATERIAL & DIAMETER vs. PREFERRED PRODUCT MANUFACTURER AND /OR PROCESS

	6"	8"	10"	12"	15"
RCP	TBD	TBD	TBD	TBD	TBD
HDPE	TBD	TBD	TBD	TBD	TBD
PVC 26	TBD	TBD	TBD	TBD	TBD
TRUSS	TBD	TBD	TBD	TBD	TBD
C-900	TBD	TBD	TBD	TBD	TBD
D.I.	TBD	TBD	TBD	TBD	TBD

Date: Nov 19, 2020, 4:35pm User Name: trutheford
 File: S:\113-0170\WR\CAO\Plans\Details Proposed by LG\Sanitary Sewer\WW-23 Sanitary Service Connection to Exst Piping.dwg



SANITARY SERVICE CONNECTION TO EXISTING PIPE

Approved: / /

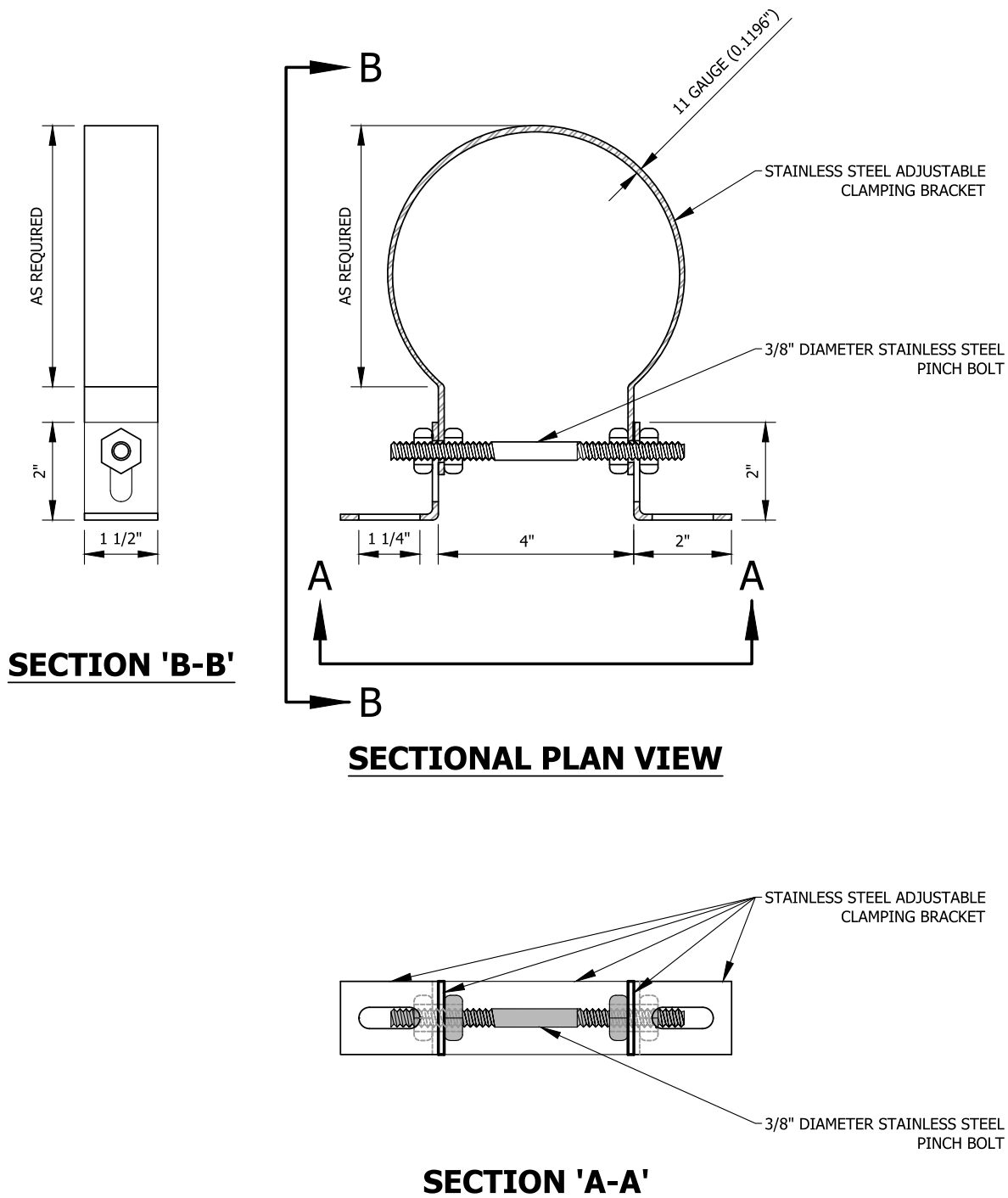
Approved By:

Adopted: / /

Scale: N.T.S.

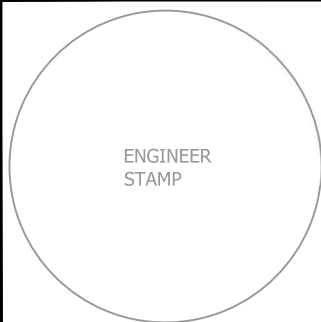
Figure

WW-30



NOTE:

- 1) CLAMP AND BRACKETS IS TYPE 304 STAINLESS STEEL, 11 GAUGE (0.1196").
- 2) 3/8" DIA. PINCH BOLT AND NUTS IS TYPE 18-8 STAINLESS STEEL.
- 3) NUMBER OF BRACKETS & SPACING PER MANUFACTURER.



INSIDE DROP STAINLESS STEEL ADJUSTABLE CLAMPING BRACKET

Approved: / /

Approved By:

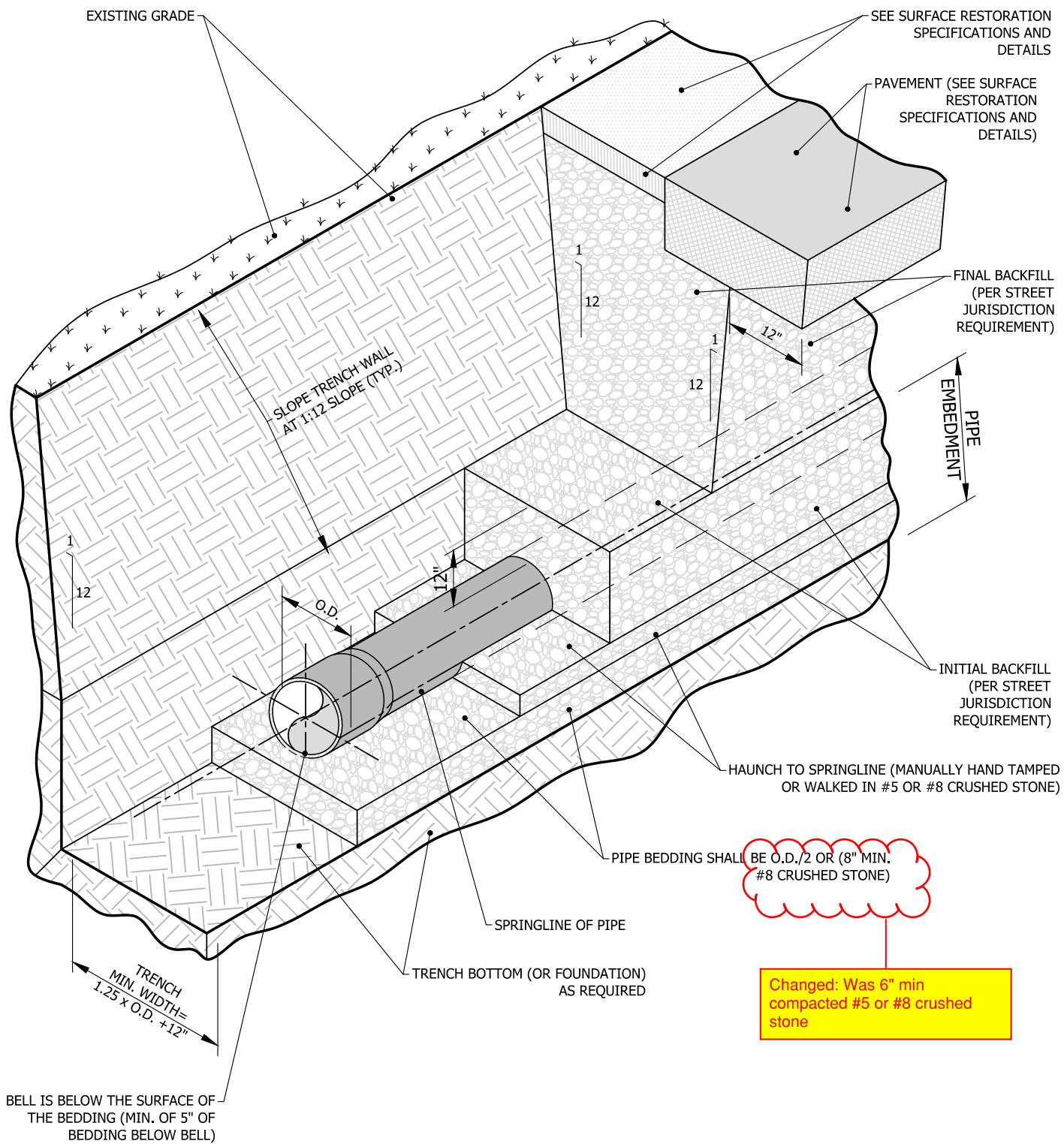
Adopted: / /

Scale: N.T.S.

Figure

WW-31

Date: Nov 19, 2020, 4:35pm User Name: trutheford
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-25 Rigid San Sewer Pipe Bedding within 5' of Pavement.dwg

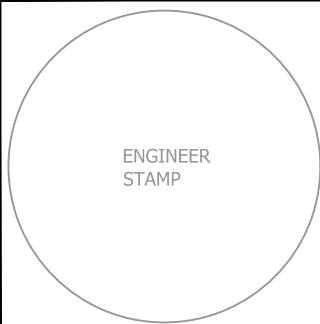


BE O.D./2 OR (8" MIN. #8 CRUSHED STONE)

Changed: Was 6" min compacted #5 or #8 crushed stone

NOTE:

1. OSHA TRENCH SAFETY REQUIREMENTS SHALL BE FOLLOWED WITH ALL TRENCH EXCAVATION.



ENGINEER
STAMP



RIGID SANITARY SEWER PIPE BEDDING AND BACKFILL WITHIN 5' OF, OR UNDER PAVEMENT

Approved: / /

Approved By:

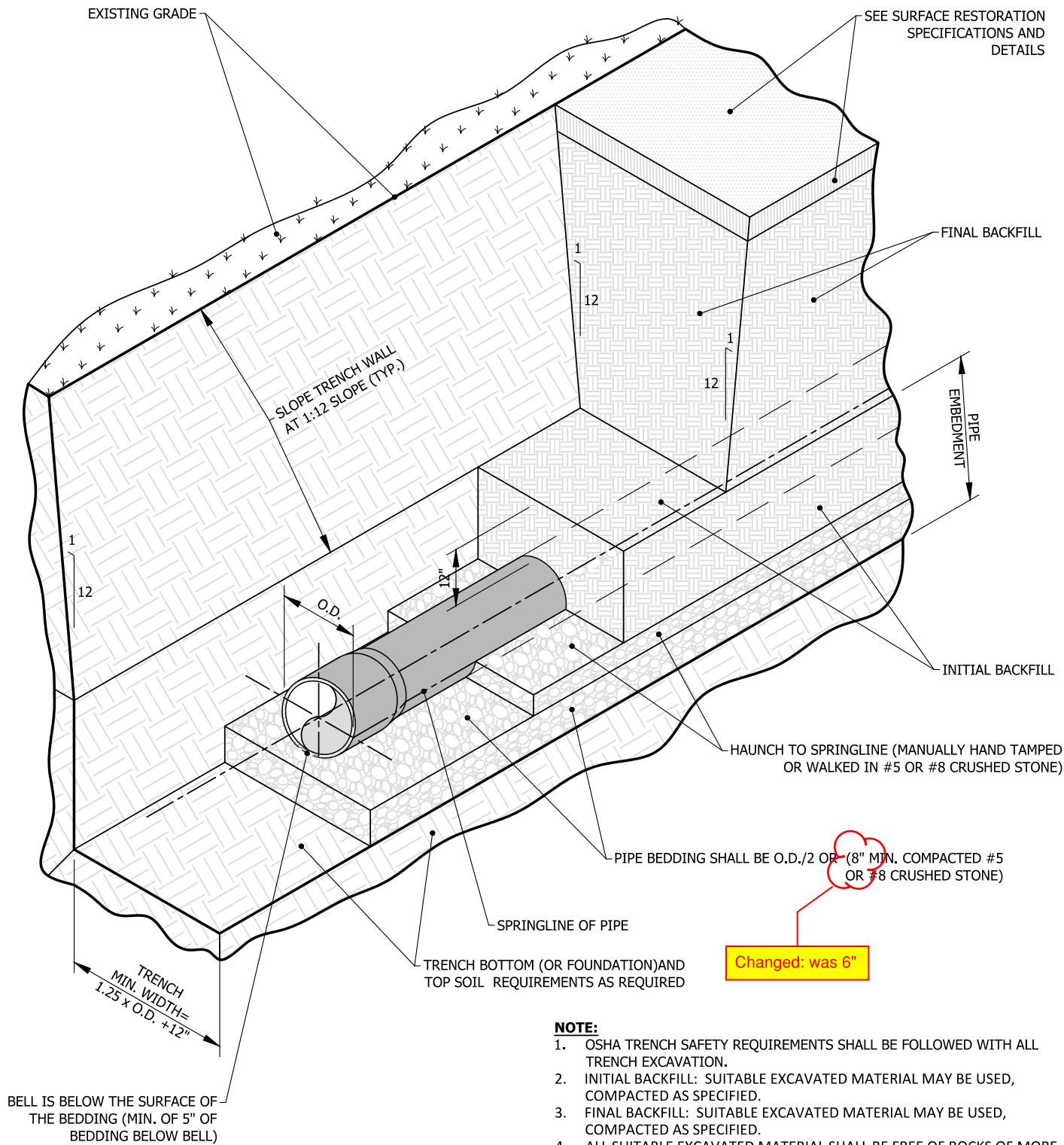
Adopted: / /

Scale: N.T.S.

Figure

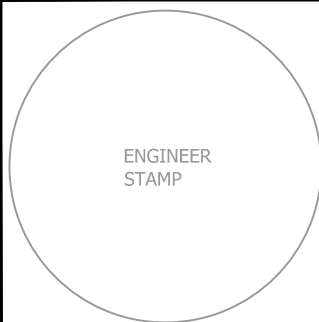
WW-32

Date: Nov 19, 2020, 4:35pm User Name: trutheford
 File: S:\113-0170\WR\CAO\Plans\Details Proposed by LG\Sanitary Sewer\WW-26 Rigid San Sewer Pipe Bedding Beyond 5' of Pavement.dwg



NOTE:

1. OSHA TRENCH SAFETY REQUIREMENTS SHALL BE FOLLOWED WITH ALL TRENCH EXCAVATION.
2. INITIAL BACKFILL: SUITABLE EXCAVATED MATERIAL MAY BE USED, COMPACTED AS SPECIFIED.
3. FINAL BACKFILL: SUITABLE EXCAVATED MATERIAL MAY BE USED, COMPACTED AS SPECIFIED.
4. ALL SUITABLE EXCAVATED MATERIAL SHALL BE FREE OF ROCKS OF MORE THAN TWO INCHES IN DIAMETER, CONCRETE, ROOTS, STUMPS, TRASH, FROZEN MATERIALS, OR OTHER SIMILAR MATERIAL.



RIGID SANITARY SEWER PIPE BEDDING AND BACKFILL MORE THAN 5' FROM PAVEMENT

Approved: / /

Approved By:

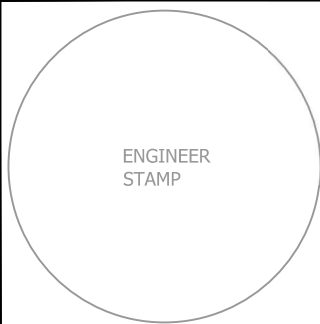
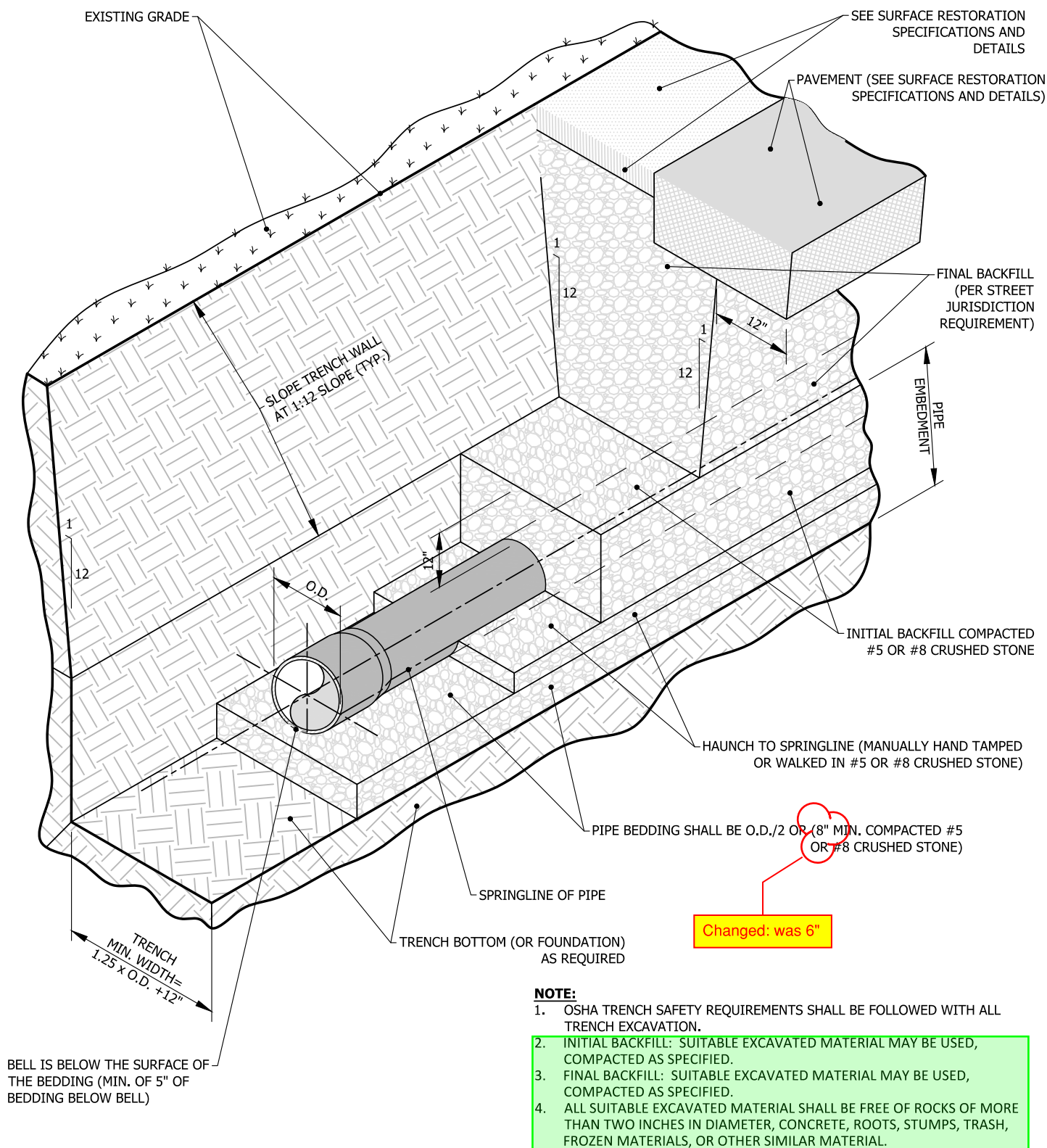
Adopted: / /

Scale: N.T.S.

Figure

WW-33

Date: Nov 19, 2020, 4:35pm User Name: trutheford
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\WW-27 Non-Rigid San Sewer Pipe Bedding within 5' of Pavement.dwg



NON-RIGID SANITARY SEWER PIPE BEDDING AND BACKFILL WITHIN 5', OR UNDER PAVEMENT

Approved: / /

Approved By:

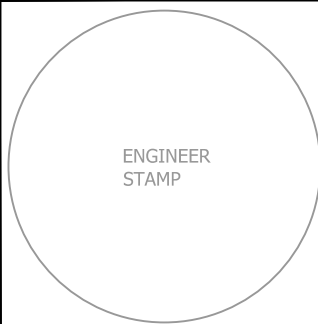
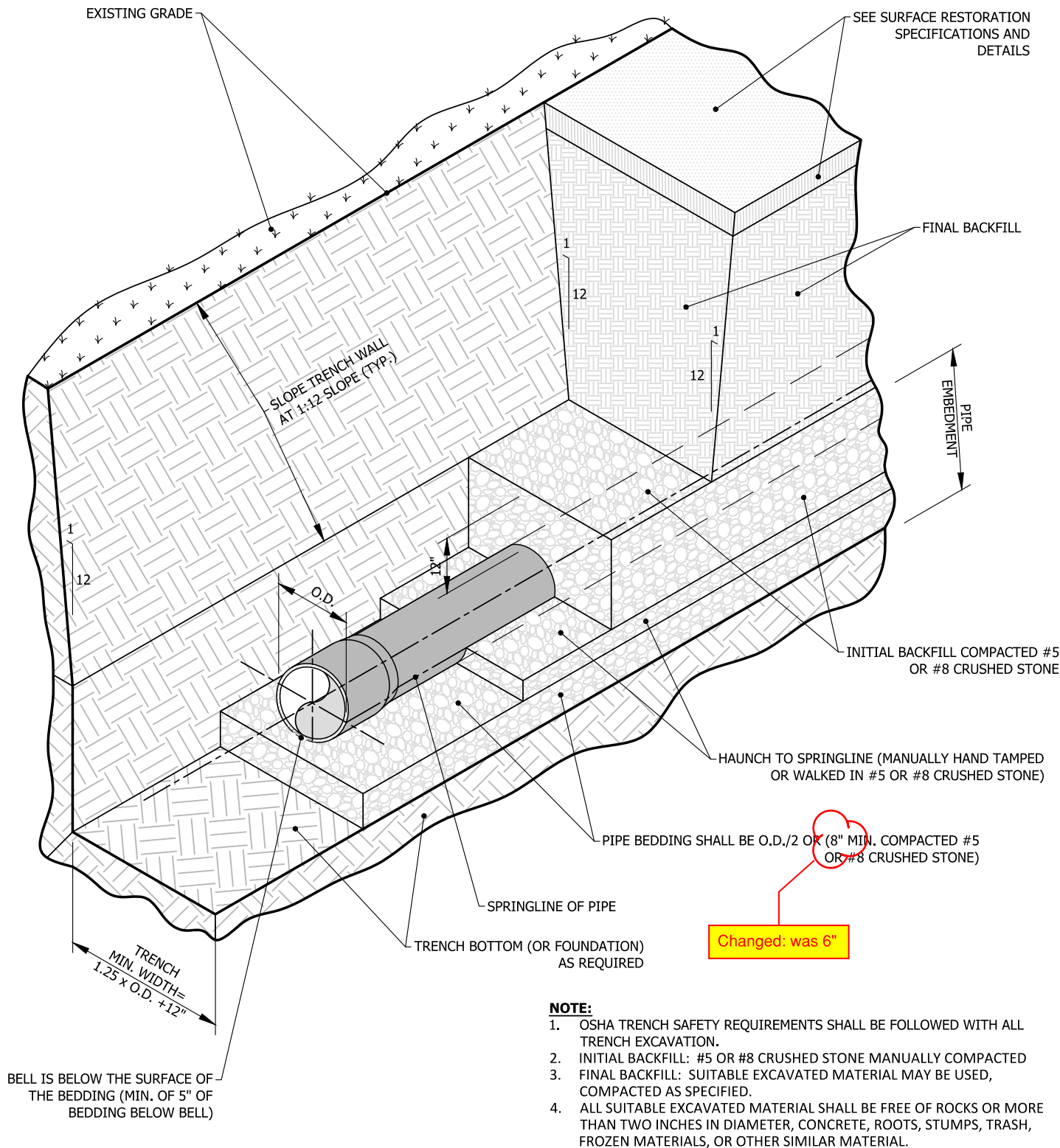
Adopted: / /

Scale: N.T.S.

Figure

WW-34

Date: Nov 19, 2020, 4:35pm User Name: trutheford
 File: S:\113-0170\WR\CAO\Plans\Details Proposed by LG\Sanitary Sewer\WW-28 Non-Rigid San Sewer Pipe Bedding Beyond 5' of Pavement.dwg



NON-RIGID SANITARY SEWER PIPE BEDDING AND BACKFILL MORE THAN 5' FROM PAVEMENT

Approved: / /

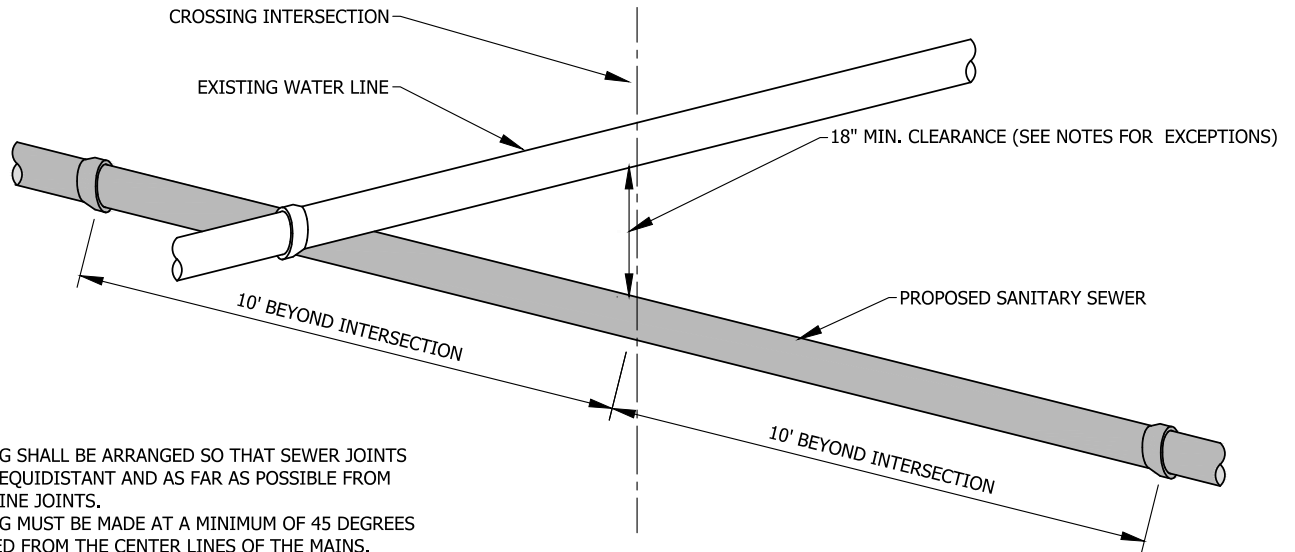
Approved By:

Adopted: / /

Scale: N.T.S.

Figure

WW-35

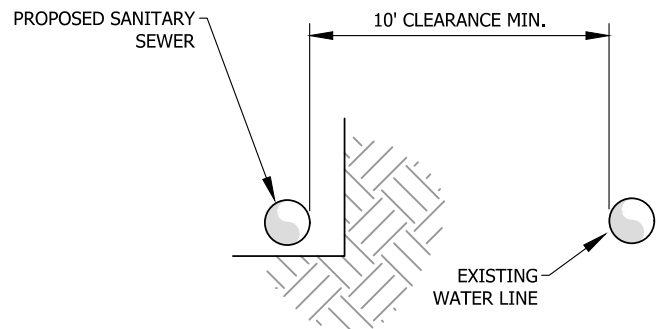


NOTE:

1. CROSSING SHALL BE ARRANGED SO THAT SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM WATER LINE JOINTS.
2. CROSSING MUST BE MADE AT A MINIMUM OF 45 DEGREES MEASURED FROM THE CENTER LINES OF THE MAINS.



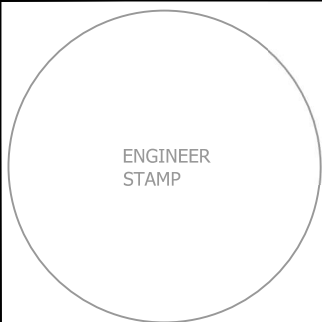
Removed Water and Sewer in same trench detail



NOTE:

ALL OF THE FOLLOWING MUST BE MET

1. THE SANITARY SEWER AND WATER MAIN ARE NOT IN CONTACT.
2. THE SANITARY SEWER MATERIAL IS PVC SDR-21 OR PVC C900 FOR ALL INSTANCES WHERE HORIZONTAL OR VERTICAL CLEARANCE REQUIREMENTS ARE NOT MET.
3. THE SANITARY SEWER MEETS ALL PRESSURE TESTING REQUIREMENTS OF WATER MAIN.
4. THE SANITARY SEWER AND WATER MAIN ARE LAID ON SEPARATE TRENCH SHELVES.
5. ANY SANITARY SEWER JOINTS ARE A COMPRESSION TYPE JOINT THAT ARE PLACED EQUIDISTANTLY FROM THE WATER MAIN.
6. IF BOTH PRESSURE PIPES, EXCEPTION TO 18" CROSSING.



PROPOSED SANITARY SEWER AND EXISTING WATER LINE CROSSING

Approved: ___/___/___

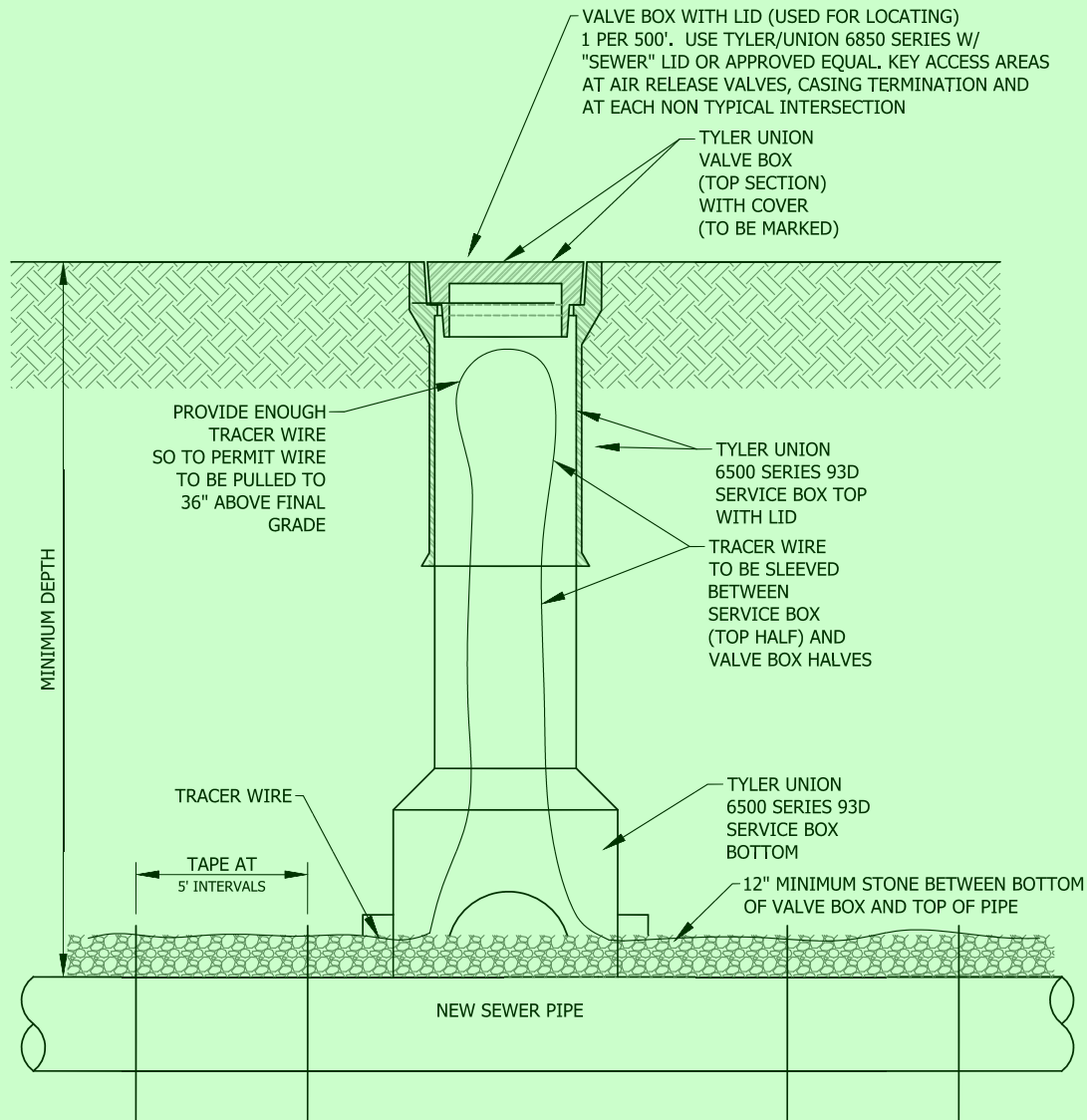
Approved By:

Adopted: ___/___/___

Scale: N.T.S.

Figure

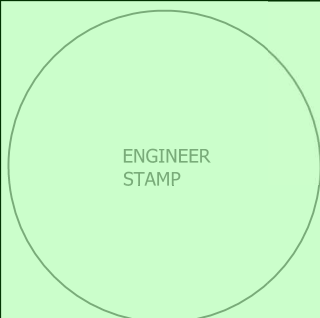
WW-36



NOTE:

1. THE TRACER WIRE SHALL BE CAPABLE OF, AND DEMONSTRATED TO HAVE, CONTINUOUS TRANSMISSION OF TRACING SIGNAL ALONG THE FULL LENGTH OF THE INSTALLED PIPE.
2. CONTINUOUS INSULATED #12 AWG SOLID COPPER CLAD STEEL CONDUCTOR. THE WIRE SHALL BE INSTALLED ALONG THE PIPE, FASTENED SECURELY TO THE PIPE AT FIVE FOOT INTERVALS, AND TERMINATED ABOVE GROUND WITH THE LEAD TAPED AROUND EACH STRUCTURE.
3. FOR OPEN CUT INSTALLATION USE COPPERHEAD® 1230G-HS OR APPROVED EQUAL.
4. FOR DIRECTIONAL DRILL INSTALLATION USE COPPERHEAD® SOLOSHOT™ 1245G-EHS OR APPROVED EQUAL.
5. IF DIRECTIONALLY DRILLED, DOUBLE WIRE REQUIRED.
6. ALL WIRES SUBJECT TO CONTINUITY TEST.
7. TAPE WIRE TO PIPE AT 5' INTERVALS.

Date: Nov 19, 2020, 4:35pm User Name: trutheford
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\Tracer Wire Bounding



TRACER WIRE AND BOX

Approved: / /

Approved By:

Adopted: / /

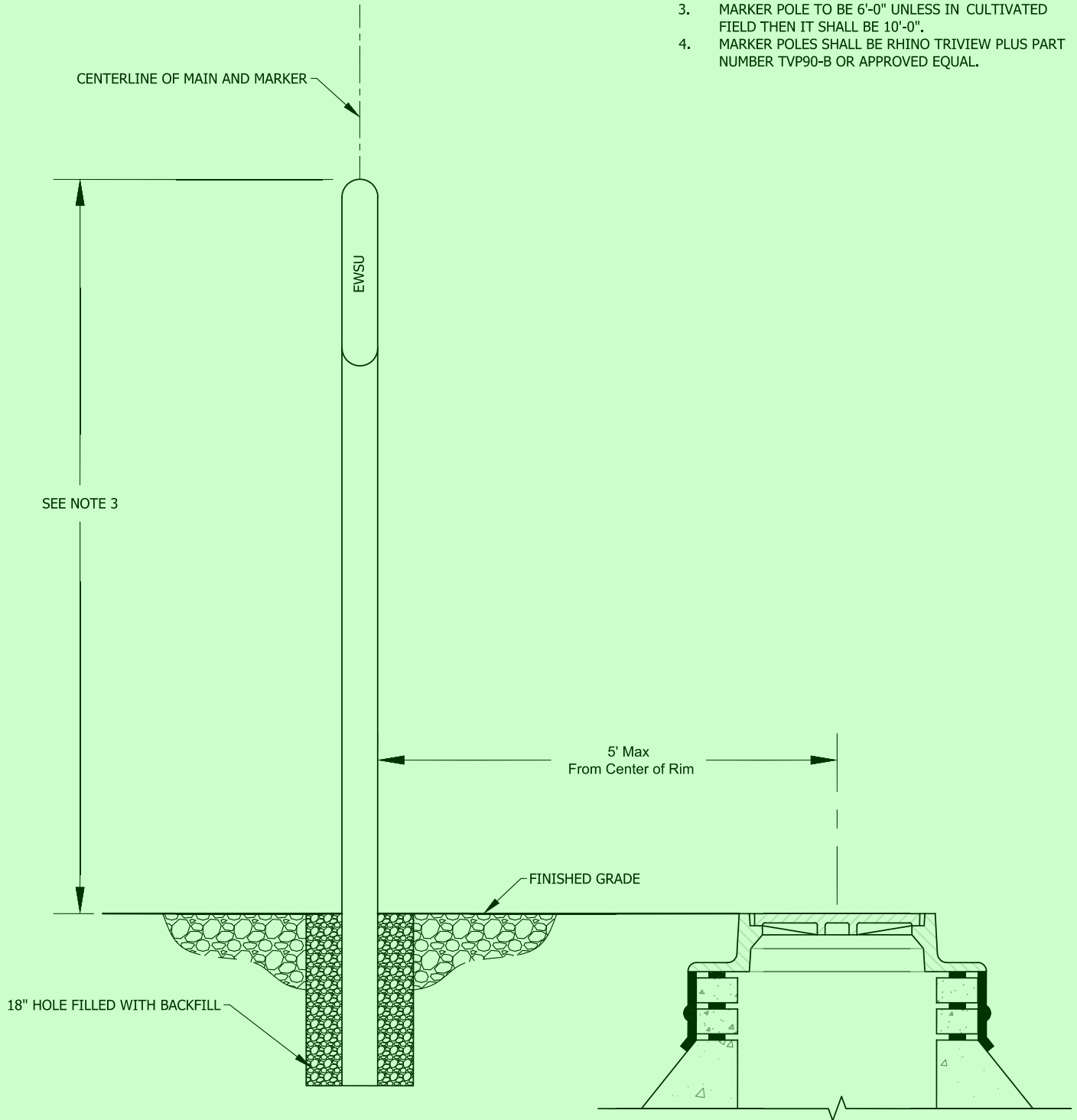
Scale: N.T.S.

Figure

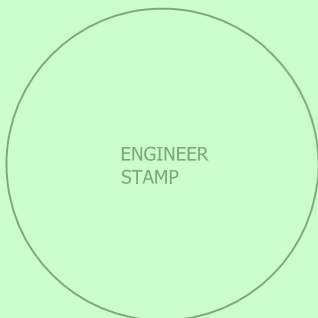
WW-37

NOTE:

1. PLASTER MARKER SHALL HAVE REFLECTIVE STICKER LABELED "EWSU".
2. POLE SHALL STATE "IN CASE OF EMERGENCY CALL EWSU (812) 421-2130)."
3. MARKER POLE TO BE 6'-0" UNLESS IN CULTIVATED FIELD THEN IT SHALL BE 10'-0".
4. MARKER POLES SHALL BE RHINO TRIVIEW PLUS PART NUMBER TVP90-B OR APPROVED EQUAL.



Date: Nov 19, 2020, 4:35pm User Name: trutheford
File: S:\113-0170\WR\CAO\Plans\Details Proposed by LG\Sanitary Sewer\Marker Pole Detail.dwg



MARKER POLE

Approved: / /

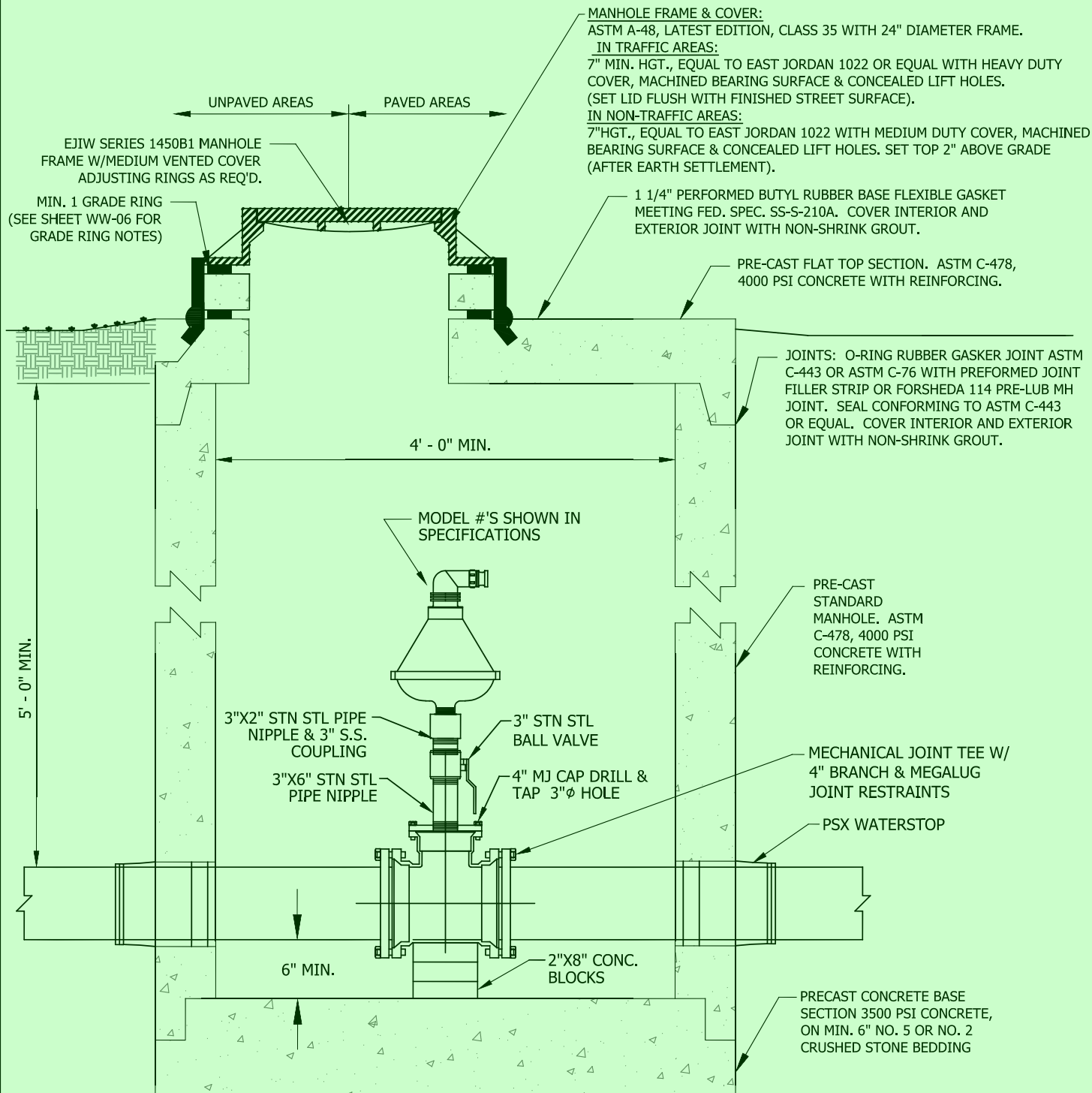
Approved By:

Adopted: / /

Scale: N.T.S.

Figure

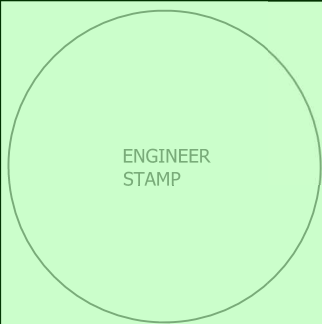
WW-38



NOTE:

1. USE STAINLESS STEEL AT LIFT STATION.
2. NYLON ELSEWHERE UNLESS SPECIFIED BY ENGINEER.
3. TRACER WIRE BOXES SHALL BE PRESENT ON ONE SIDE OF THE AIR RELEASE VALVE.

Date: Nov 19, 2020, 4:35pm User Name: trutheford
File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\Air Release Valve.dwg



AIR RELEASE VALVE

Approved: / /

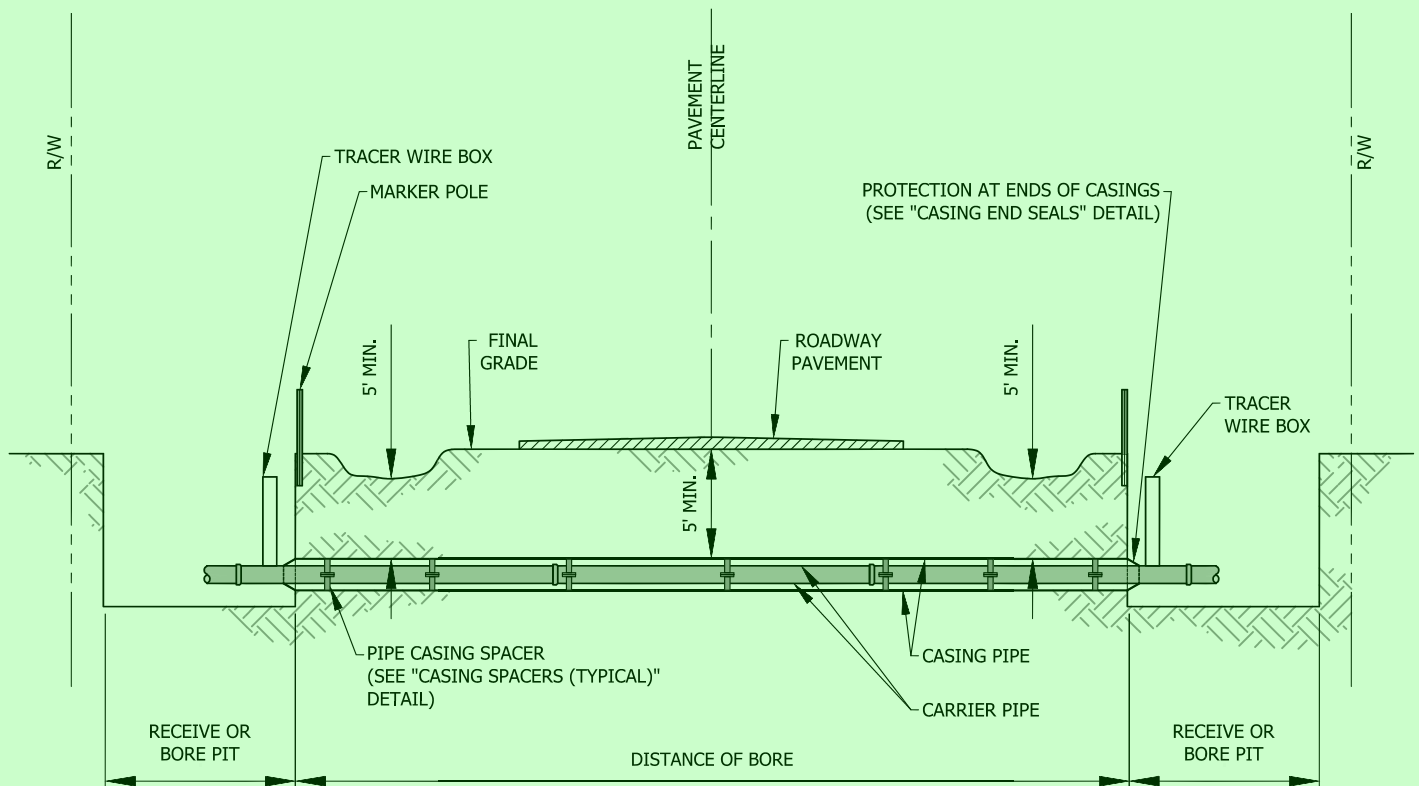
Approved By:

Adopted: / /

Scale: N.T.S.

Figure

WW-39



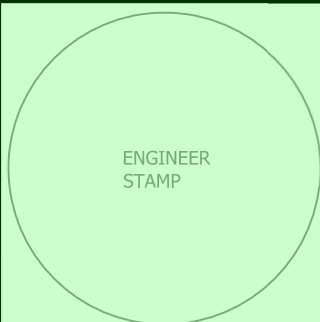
WELDING:

STEEL CASING SECTIONS SHALL BE CONNECTED BY WELDING. ACCORDANCE WITH ASTM A 139, GRADE B, OR ELECTRIC-RESISTANCE WELDED PIPE IN ACCORDANCE WITH ASTM A 53.

NOTE:

1. ALL PIPE JOINTS WITHIN THE CASING ARE TO BE RESTRAINED.
2. TRACING WIRE TO BE INSTALLED THROUGH ALL CASED BORINGS AND CONNECTED TO MARKING POSTS. IF BORED, TRACER WIRE SHALL BE DOUBLED WIRED.
3. THE TRACER WIRE SHALL BE CAPABLE OF, AND DEMONSTRATED TO HAVE, CONTINUOUS TRANSMISSION OF TRACING SIGNAL ALONG THE FULL LENGTH OF THE INSTALLED PIPE.
4. CONTINUOUS INSULATED #12 AWG SOLID COPPER CLAD STEEL CONDUCTOR. THE WIRE SHALL BE INSTALLED ALONG THE PIPE, FASTENED SECURELY TO THE PIPE AT FIVE FOOT INTERVALS, AND TERMINATED ABOVE GROUND WITH THE LEAD TAPED AROUND EACH STRUCTURE.
5. FOR OPEN CUT INSTALLATION USE COPPERHEAD® 1230G-HS OR APPROVED EQUAL.
6. FOR DIRECTIONAL DRILL INSTALLATION USE COPPERHEAD® SOLOSHOT™ 1245G-EHS OR APPROVED EQUAL.
7. IF DIRECTIONALLY DRILLED, DOUBLE WIRE REQUIRED.
8. ALL WIRES SUBJECT TO CONTINUITY TEST.
9. TAPE WIRE TO PIPE AT 5' INTERVALS.
10. STEEL PIPE USED AS CARRIER PIPE TO HAVE MINIMUM WALL THICKNESS LISTED ON WW-41.
11. STEEL PIPE USED AS CASING PIPE, BUT NOT USED AS CARRIER PIPE, SHALL BE SELECTED BY THE CONTRACTOR TO HAVE MINIMUM WALL THICKNESS SUFFICIENT TO RESIST JACKING FORCES. FOR INSTALLATIONS WHERE THE CASING IS NOT USED AS CARRIER BUT ONLY AS CASING FOR A CARRIER PIPE, THE THICKNESS OF THE CASING SHALL BE DETERMINED BY THE CONTRACTOR.
12. MATERIAL FURNISHED UNDER THIS SPECIFICATION SHALL BE COVERED BY TYPE C CERTIFICATION IN ACCORDANCE WITH 916.

Date: Nov 19, 2020, 4:35pm User Name: trutheford
 File: S:\113-0170\WR\CAO\Plans\Details Proposed by LG\Sanitary Sewer\WW45-Typical Jack and Bore Casing Piping.dwg



TYPICAL JACK AND BORE CASING PIPE

Approved: / /

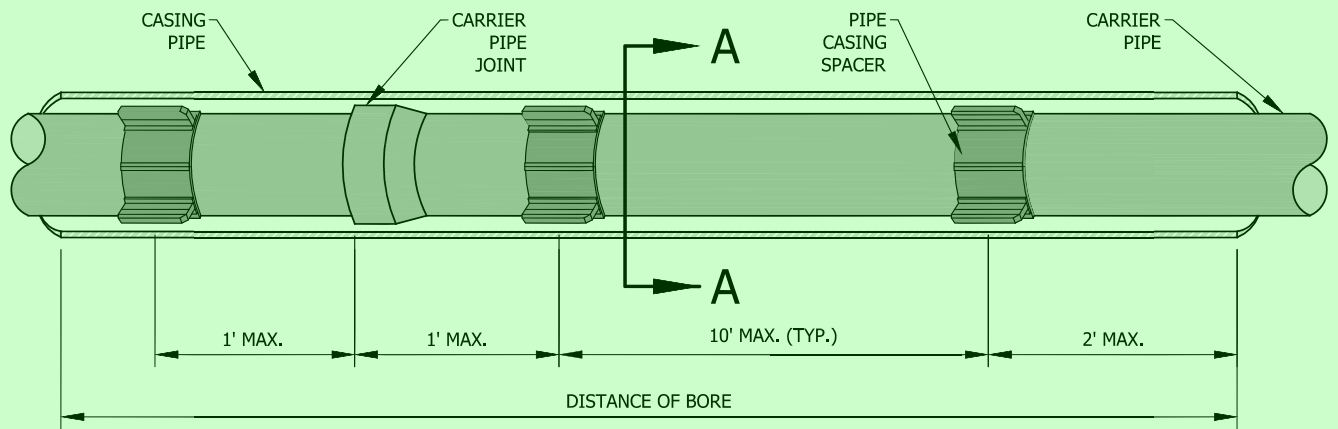
Approved By:

Adopted: / /

Scale: N.T.S.

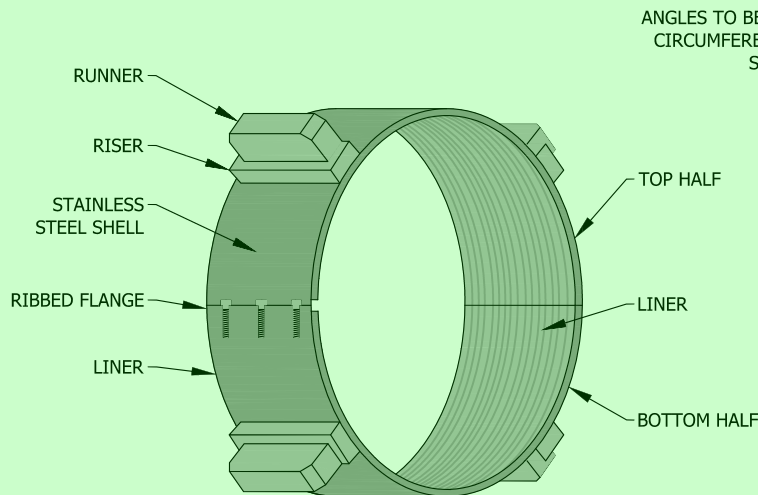
Figure

WW-40

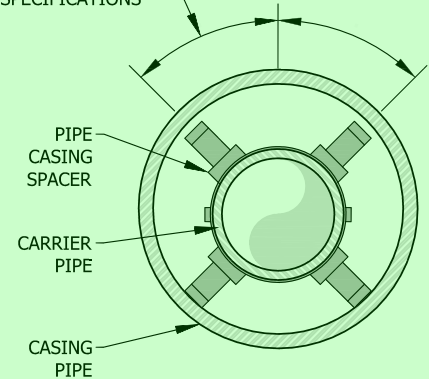


CARRIER PIPE		
PIPE SIZE	CASING O.D.	THICKNESS *
6"	16"	1/4"
8"	18"	1/4"
10"	20"	5/16"
12"	24"	3/8"
16"	30"	1/2"
20"	36"	1/2"
24"	42"	9/16"

* UNLESS OTHERWISE REQUIRED BY IN.D.O.T., RAILROAD OR OTHER SUCH GOVERNING AUTHORITY.



ANGLES TO BE CONSTANT AROUND ENTIRE CIRCUMFERENCE OF THE PIPE. NUMBER OF SPACERS PER MANUFACTURER'S SPECIFICATIONS

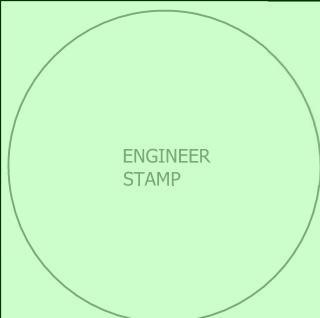


SECTION "A-A"

NOTE:

1. CASING SPACERS SHALL BE CCS SERIES BY CASCADE WATERWORKS MFG. OR APPROVED EQUAL ALTERNATE CASING SPACERS MAY BE USED WITH PRIOR APPROVAL FROM CITY UTILITIES PROJECT ENGINEER.
2. CITY UTILITIES APPROVED CASING SPACERS AND END SEALS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. USE A "CENTERED" CONFIGURATION AND PROVIDE THE MANUFACTURER WITH THE FOLLOWING INFORMATION: CARRIER PIPE O.D., CASING PIPE I.D., AND CASING LENGTH.

Date: Nov 19, 2020, 4:35pm User Name: trutheford
File: S:\113-01\00\WCAD\Plans\Details Proposed by LG\Sanitary Sewer\WW96-Typical Casing Spacers.dwg



TYPICAL CASING SPACERS

Approved: ___/___/___

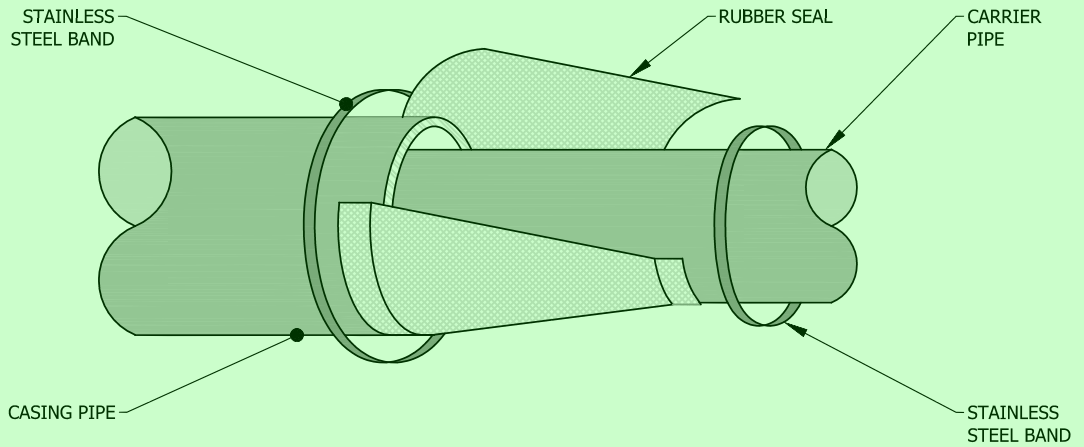
Approved By:

Adopted: ___/___/___

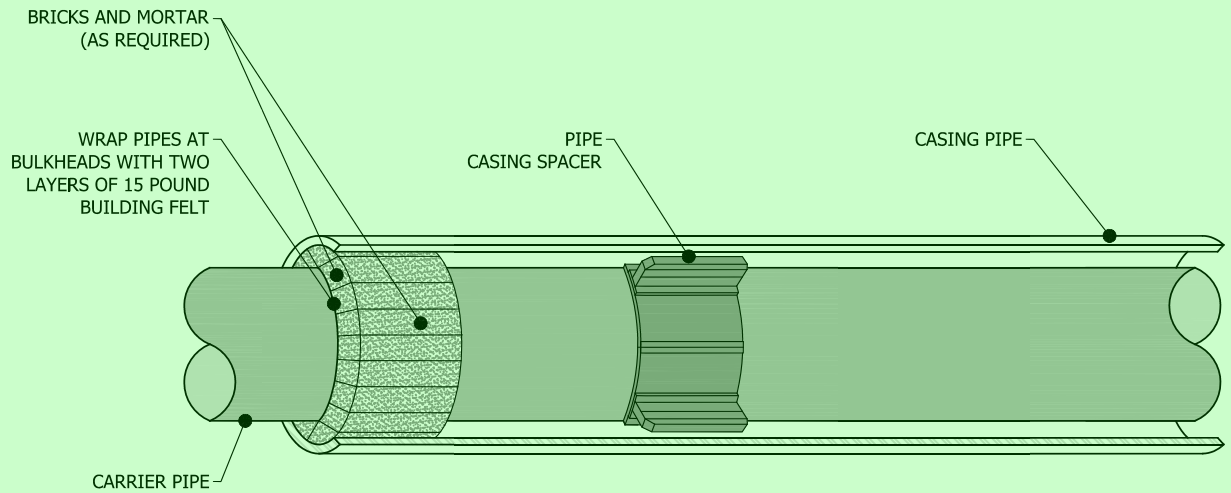
Scale: N.T.S.

Figure

WW-41



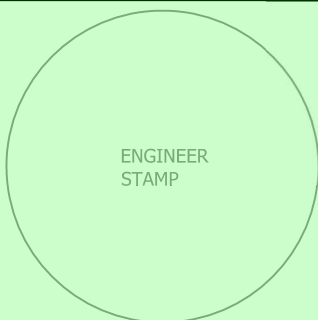
METHOD 'A'



NOTE:

1. THIS STANDARD IS APPLICABLE FOR 4" DIAMETER AND LARGER CARRIER PIPE.

METHOD 'B'



ENGINEER
STAMP



TYPICAL CASING END SEALS

Approved: ___/___/___

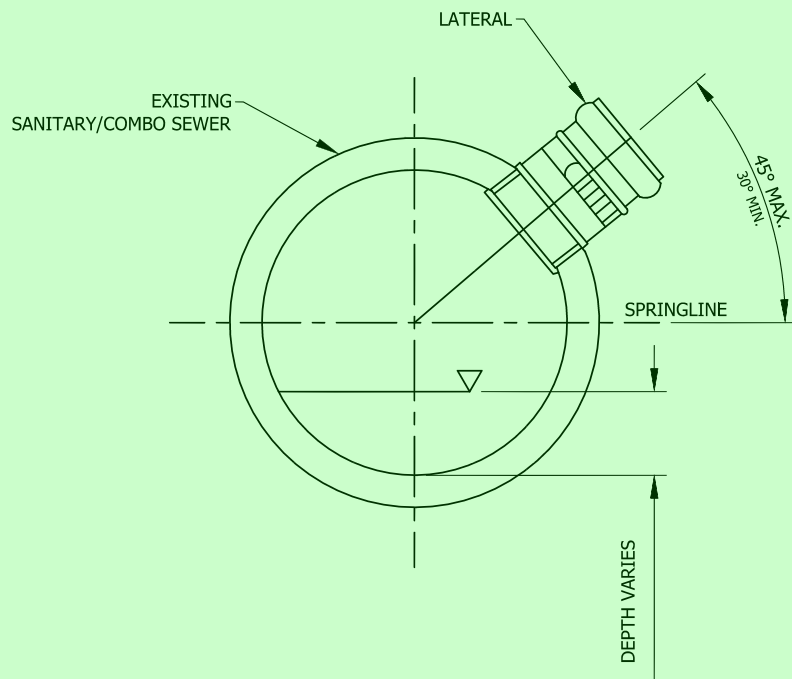
Approved By:

Adopted: ___/___/___

Scale: N.T.S.

Figure

WW-42

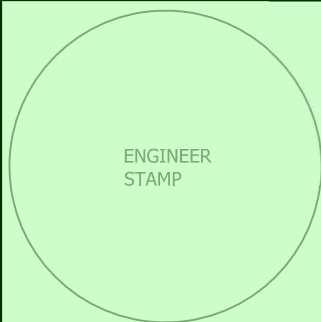


NOTE:

1. TO BE USED ON 15"Ø PIPE OR LARGER.
2. SADDLE TAP SHALL BE KOR-N-TEE OR APPROVED EQUAL.
3. LATERAL CONNECTIONS SHALL BE 6"-10".
4. CORE BIT PER MANUFACTURER SPECIFICATION.
5. HDPE AND PVC PRODUCT SHALL BE DETERMINED BY THE EWSU REVIEWER.

MATERIAL & DIAMETER vs. PREFERRED PRODUCT MANUFACTURER AND /OR PROCESS			
	15"	18"	24"+
RCP	INSERTA -TEE	INSERTA -TEE	INSERTA -TEE
HDPE	TBD	TBD	TBD
PVC	TBD	TBD	TBD
BRICK GUNITE	TBD	TBD	KOR-N-TEE

Date: Nov 19, 2020, 4:36pm User Name: trutheford
 File: S:\113-0170\WR\CAD\Plans\Details Proposed by LG\Sanitary Sewer\Large Core Tapping



MEDIUM/LARGE DIAMETER SEWER TAP

Approved: / /

Adopted: / /

Approved By:

Scale: N.T.S.

Figure

WW-43