

PART 4

SANITARY SEWER

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Trenching

See Trenching requirements under Section 3

Abbreviations and symbols for sewer

1. LETTERING SIZE: 100 Leroy minimum except for line type and other background information. Use 120 Leroy for new work installation.
2. LETTERING STYLE: Capital letters preferred.
3. EXISTING IMPROVEMENTS: Shown in light shaded dashed line.
4. NEW IMPROVEMENTS: Shown in solid continuous line.

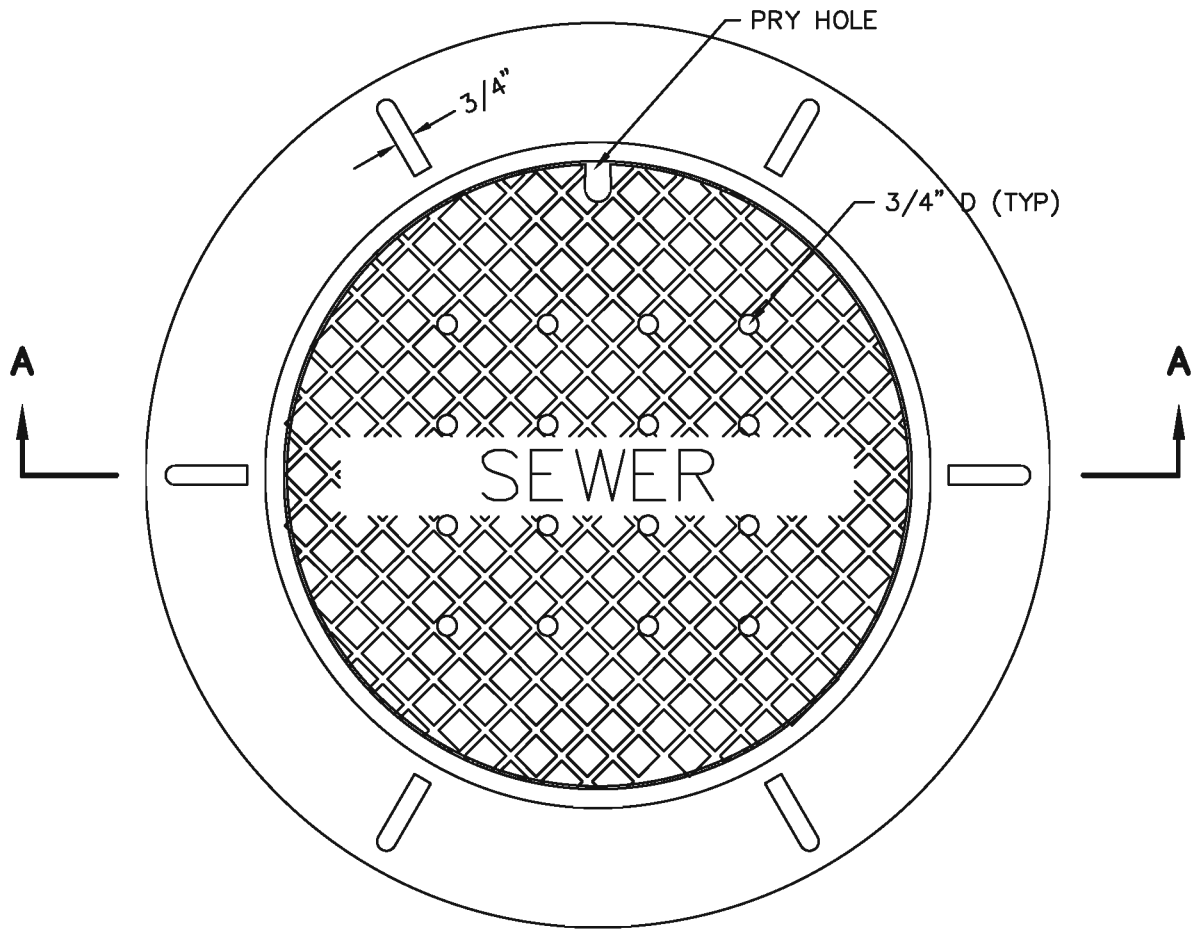
SYMBOLS	DEFINITIONS
	CENTER LINE
	CONSTRUCTION CENTER LINE
	PROPERTY OR R/W LINE
	EASEMENT LINE
	MONUMENT LINE
	FENCE
	CONTOUR LINE CONTOUR ELEVATION
	BANK SLOPES
	STORM DRAIN LINE
	WATER LINE
	GAS LINE
	TELEPHONE CABLE
	ELECTRIC CABLE
	SANITARY SEWER LINE
	ASPHALT PAVING
	FIRE HYDRANT
	WATER VALVE
	WATER METER
	MANHOLE
	CATCH BASIN
	CLEAN OUT BOX
	POLE & ANCHOR
	STREET LIGHT
	UNDISTURBED EARTH
	STRUCTURE

SYMBOLS	DEFINITIONS
	CURB & GUTTER
	SIDEWALK
	RAILROAD TRACKS
	GUARD RAIL
	OPEN DITCH, CANAL
	CULVERT
	SECTION CORNER
	SOIL BORING
	MONUMENT
	BENCH MARK
	SIGN
	POWER POLE
	TELEPHONE POLE
	DECIDUOUS TREE
	CONIFEROUS TREE
	P.I.
	P.C. OR P.T.
	<u>PROFILE</u>
	GROUND PROFILE
	CULVERT
	P.V.I.
	P.V.C. OR P.V.T.
	GROUNDWATER ELEVATION

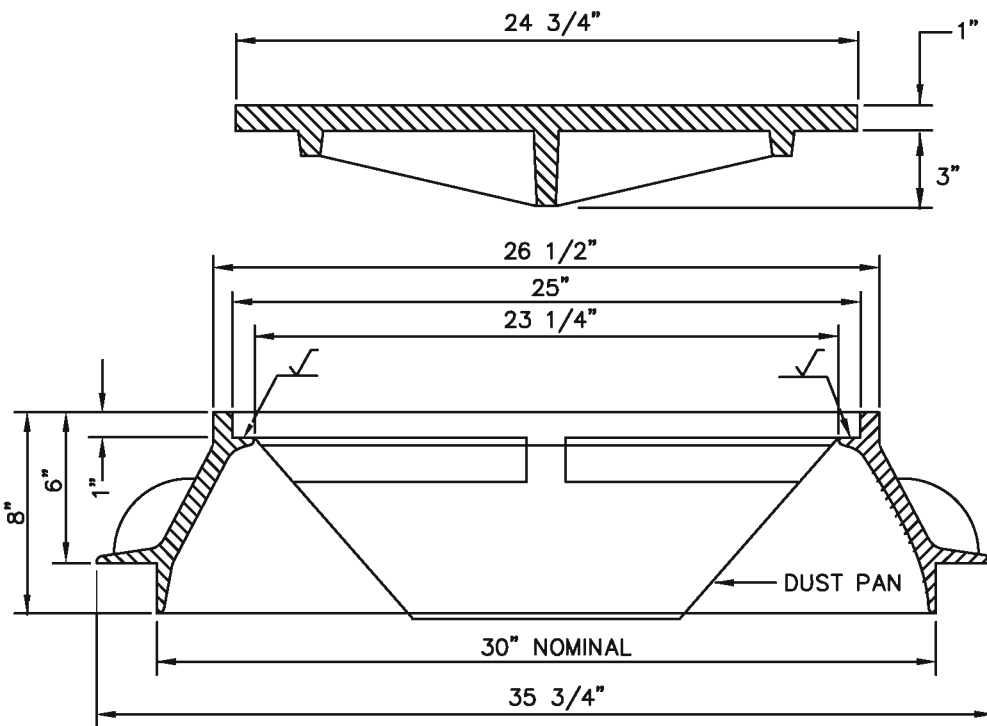
Abbreviations and symbols for sewer

30" Frame and cover

1. CASTINGS: Grey iron class 35 minimum per ASTM A 48.
2. COATINGS: Except machined surfaces, coat all metal parts with asphaltum paint.
3. INSCRIPTIONS: Cast the words "SEWER" on the cover flush with the surface finish.
4. HEAT NUMBER: Place foundry and heat number on the inside of the frame and on the bottom of the cover.
5. FIT: \surd designates machined surface. Give the frame and cover a machine finish so the cover will not rock.
6. LOCKING: Provide covers for manholes located in easements, rights-of-way, alleys, parking lots, and all other places except paved streets, with allen socket set screw locking devices. Drill and tap two holes to a depth of 1 inch at 90 degrees to pry hole and install 3/4 x 3/4 inch allen socket set screws.
7. MANHOLE STRUCTURE: See Plan No. 411.



PLAN



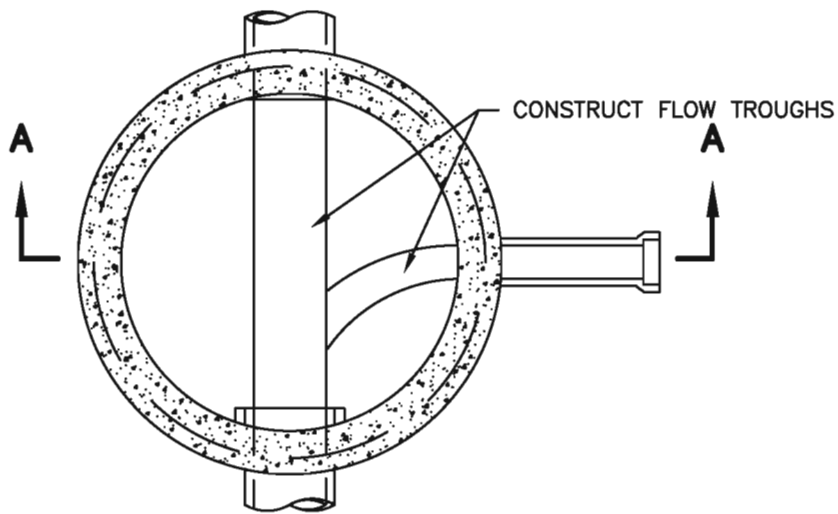
SECTION A-A

30" Frame and cover

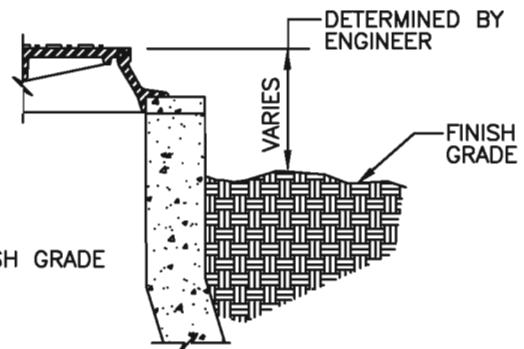
Plan No.
402

Sanitary sewer manhole

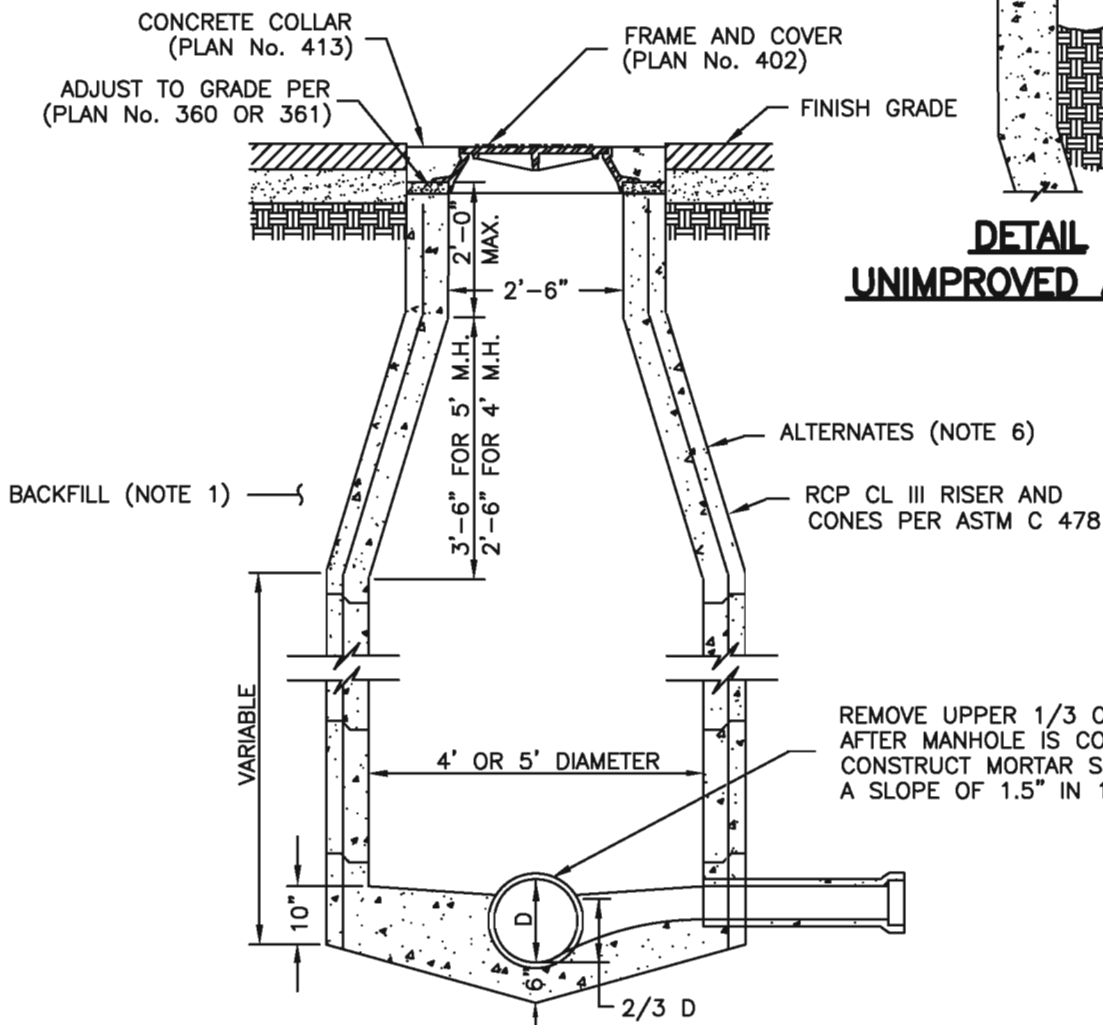
1. **BACKFILL:** Provide and place per APWA Section 31 23 23. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness is 8 inches before compaction.
2. **CONCRETE:** Class 4000 per APWA Section 03 30 04. Place concrete per APWA Section 03 30 10. Cure per APWA Section 03 39 00.
3. **MANHOLE SIZE:** For sewers under 12" diameter, build a 4 feet diameter manhole. For sewers 12" and larger, and when 3 or more pipes intersect in the manhole, build a 5 feet diameter manhole.
4. **GROUT:** Grout around all pipe openings with 2:1 sand/cement mortar.
5. **JOINTS:** Place flexible gasket-type sealant in all manhole joints.
6. **ALTERNATES:**
 - A. Precast reinforced concrete walls 5 inches thick (to be acceptable to the ENGINEER.
 - B. Cast in-place concrete to be 8 inches thick minimum.
7. **INVERT COVERS:** Place invert covers over the top of pipe in all manholes during construction. See Plan No. 412.
8. **WATER STOPS:** Install rubber water-stop on all plastic pipes when connecting plastic pipes to manholes. Hold water-stop in place with stainless steel bands.



PLAN



DETAIL UNIMPROVED AREAS



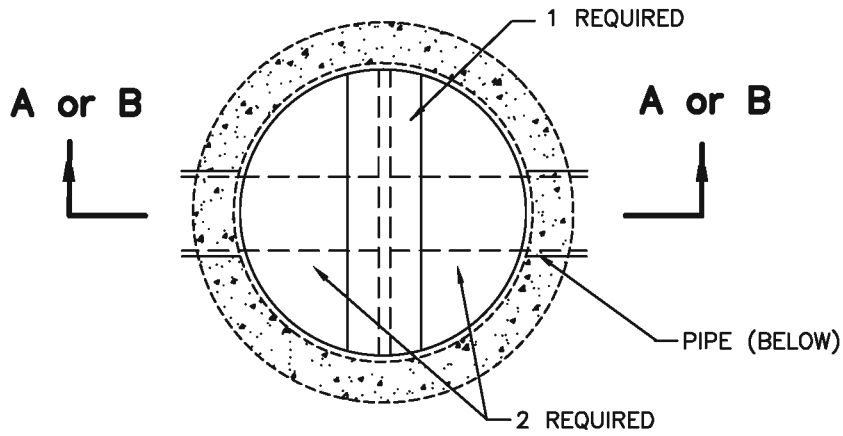
SECTION A-A

Sanitary sewer manhole

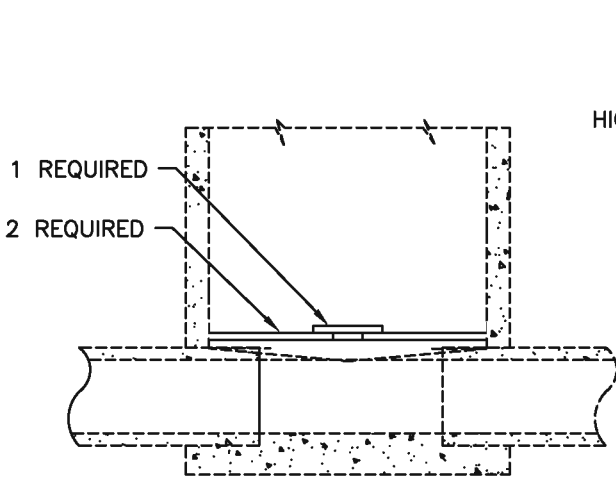
Plan No.
411

Invert cover

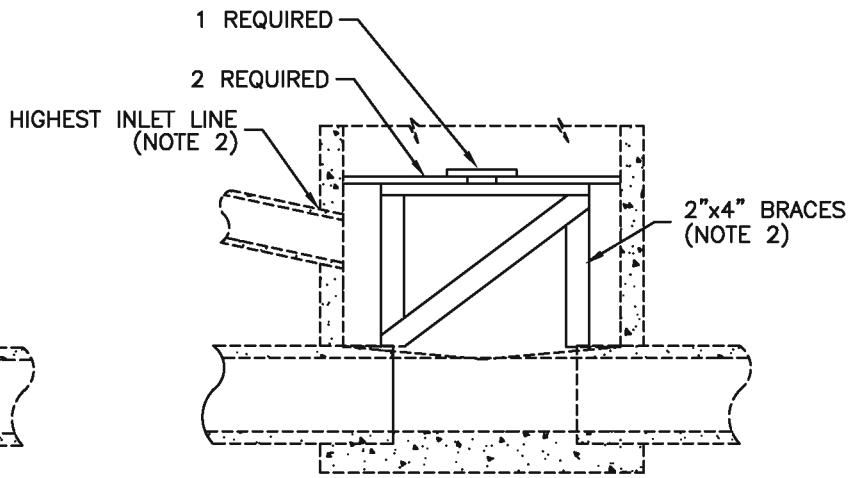
1. MATERIAL: 5/8" thick exterior grade plywood.
2. INSTALLATION:
 - A. Install invert cover over manhole shelf. With pipe entering above the mainline pipe, install 2' x 4" bracing to raise invert cover above top of the highest pipe inlet. If necessary, install solid bracing attached to wall.
 - B. If manhole is not round, cut invert cover to match shape.
 - C. Install so no debris can enter the pipe.
 - D. Do not interfere with flow in pipeline.
 - E. Nail all three pieces of each invert cover securely together.



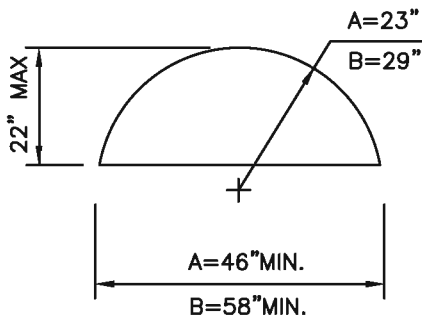
PLAN
(INVERT COVER IN PLACE)



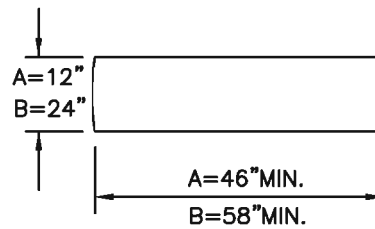
SECTION A-A
OPTION 1



SECTION B-B
OPTION 2



2 REQUIRED



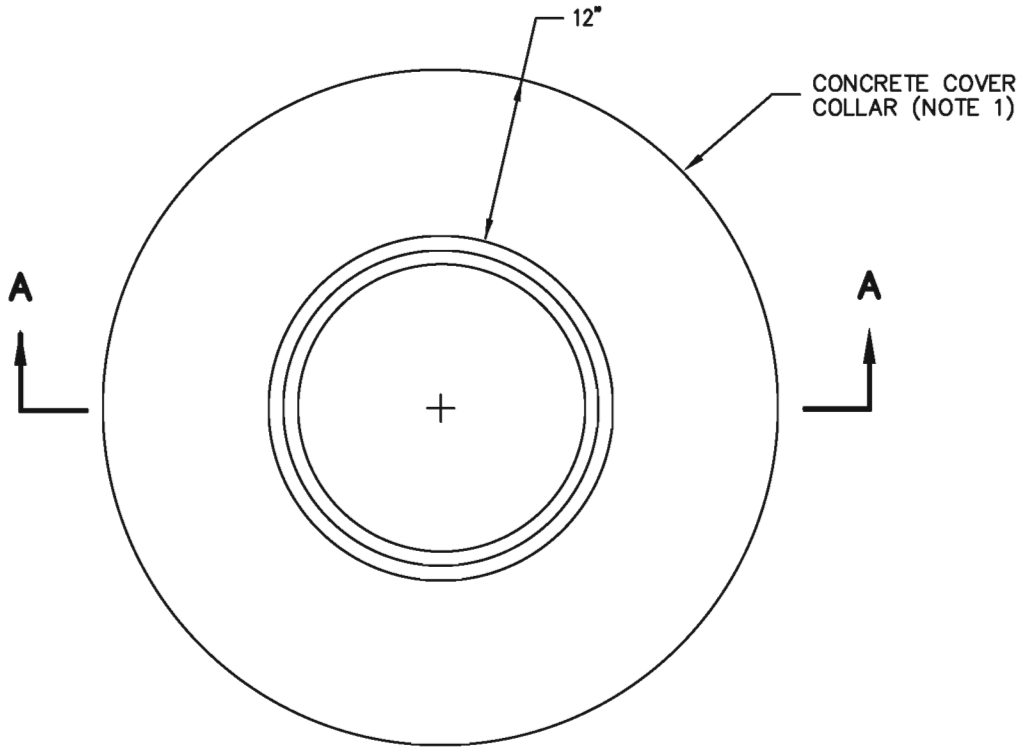
1 REQUIRED

USE DIMENSION A FOR 48" MANHOLES
USE DIMENSION B FOR 60" MANHOLES

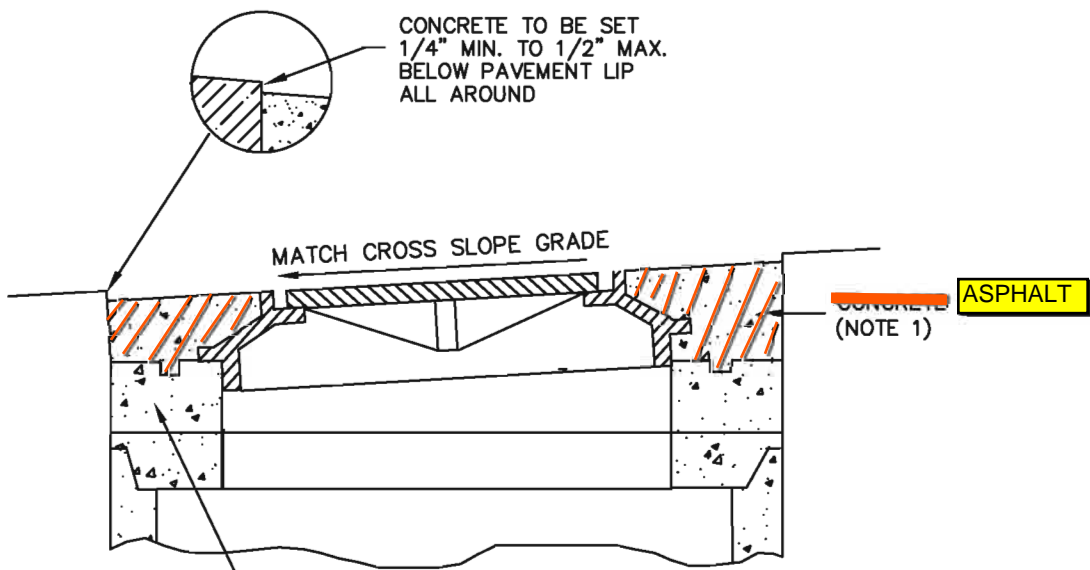
Invert cover

Cover collar for sanitary sewer manhole

1. CONCRETE: ~~Class 4000 per APWA Section 03 30 04. Place concrete per APWA Section 03 30 10. Cure per APWA Section 03 30 00.~~ **CONCRETE COLLARS NOT ALLOWED**
2. JOINTS: Provide a neat straight joint between existing and new asphalt concrete surfaces. Provide concentric circle cut. Clean edges of all dirt, oil and loose debris.



PLAN



GRADE RINGS ARE SHOWN
 PLASTIC FORMS ARE ACCEPTABLE
 (PLAN No. 360 or 361)

SECTION A-A

Cover collar for sanitary sewer manhole

Plan No.
413

Sewer lateral connection

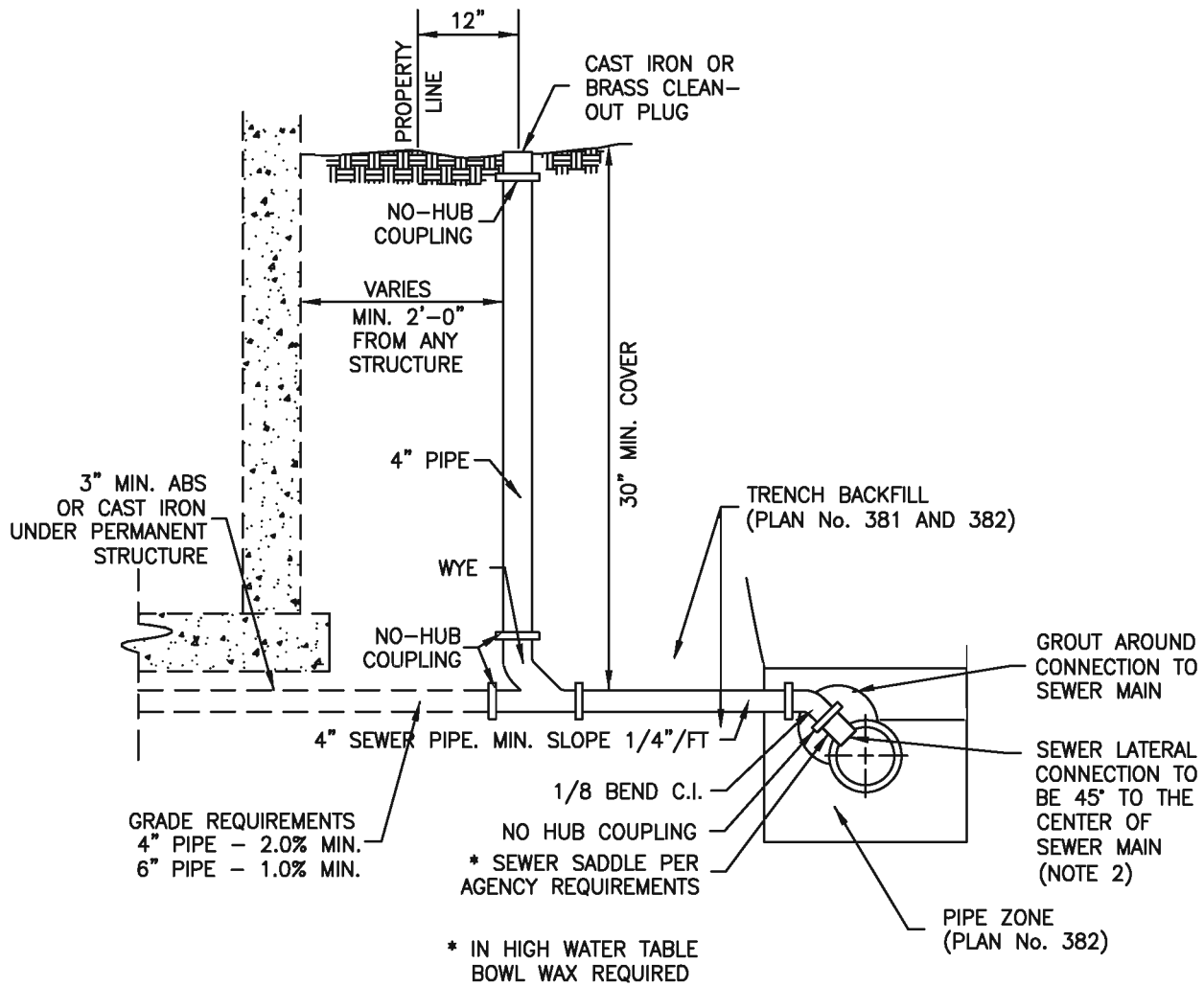
1. INSPECTION:
 - A. Prior to installation, secure acceptance by ENGINEER for all pipe, fittings, and couplings to be used.
 - B. Prior to backfilling, secure inspection of installation by ENGINEER. Give at least 24 hours notice.

2. INSTALLATION:

ROMAC STAINLESS STEEL SEWER TAPPING SADDLE

 - A. Provide agency approved ~~wye or tee with appropriate donut. Verify whether CONTRACTOR or agency is to install the wye.~~
 - B. Tape wrap pipe as required by soil conditions.
 - C. Remove core plug from sewer main. Do not break into sewer main to make connection.
 - D. Stainless steel straps required.

3. BACKFILL: Provide and place per APWA Section 33 05 20. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness is 8 inches before compaction.



SECTION

Sewer lateral connection

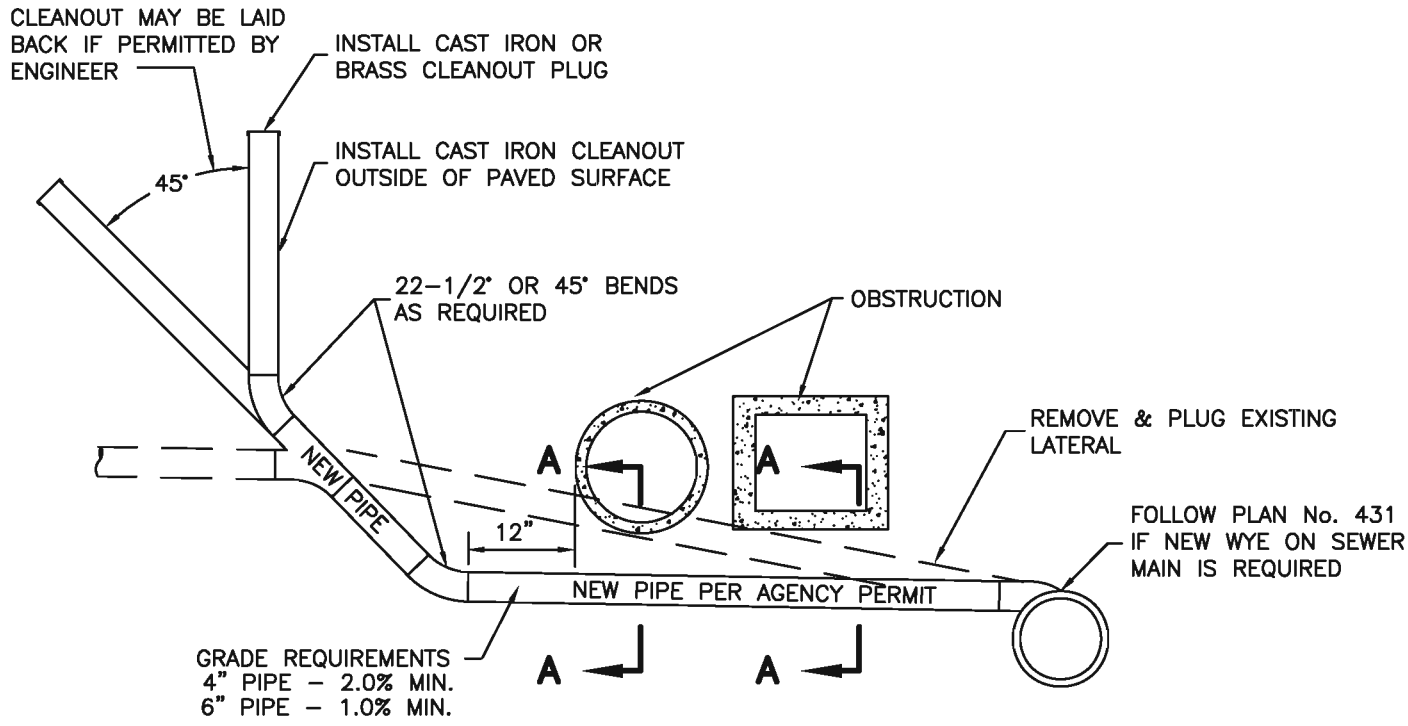
Plan No.
431

Sewer lateral relocation

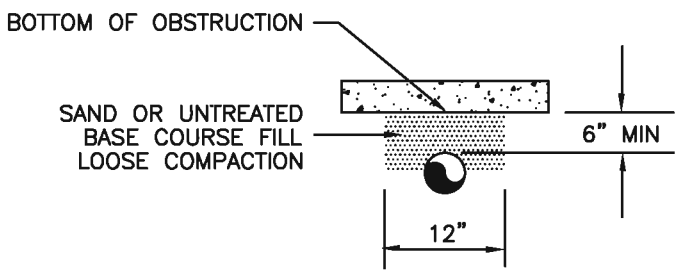
1. INSPECTION:
 - A. Prior to installation, secure acceptance by ENGINEER for all pipe, fittings, and couplings to be used.
 - B. Prior to backfilling, secure inspection of installation by ENGINEER. Give at least 24 hours notice.

2. INSTALLATION:
 - A. Provide agency approved wye or tee with appropriate donut. Verify whether CONTRACTOR or agency is to install the wye.
 - B. Tape wrap pipe as required by soil conditions.
 - C. Do not install couplings under the obstruction.
 - D. Under the obstruction, loosely compact granular material or sand. Flowable fill not allowed.

3. BACKFILL: Provide and place per APWA Section 33 05 20. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness is 8 inches before compaction.



SECTION



REPLACE EXISTING LATERAL
 PER AGENCY PERMIT

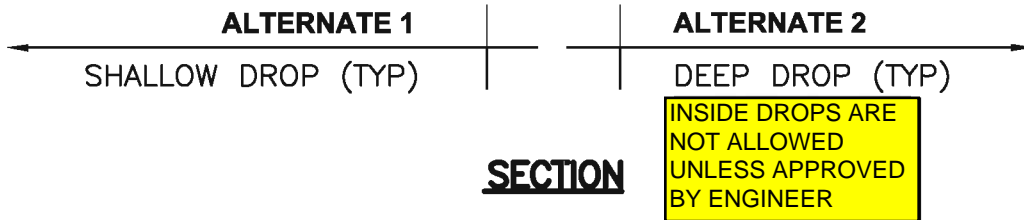
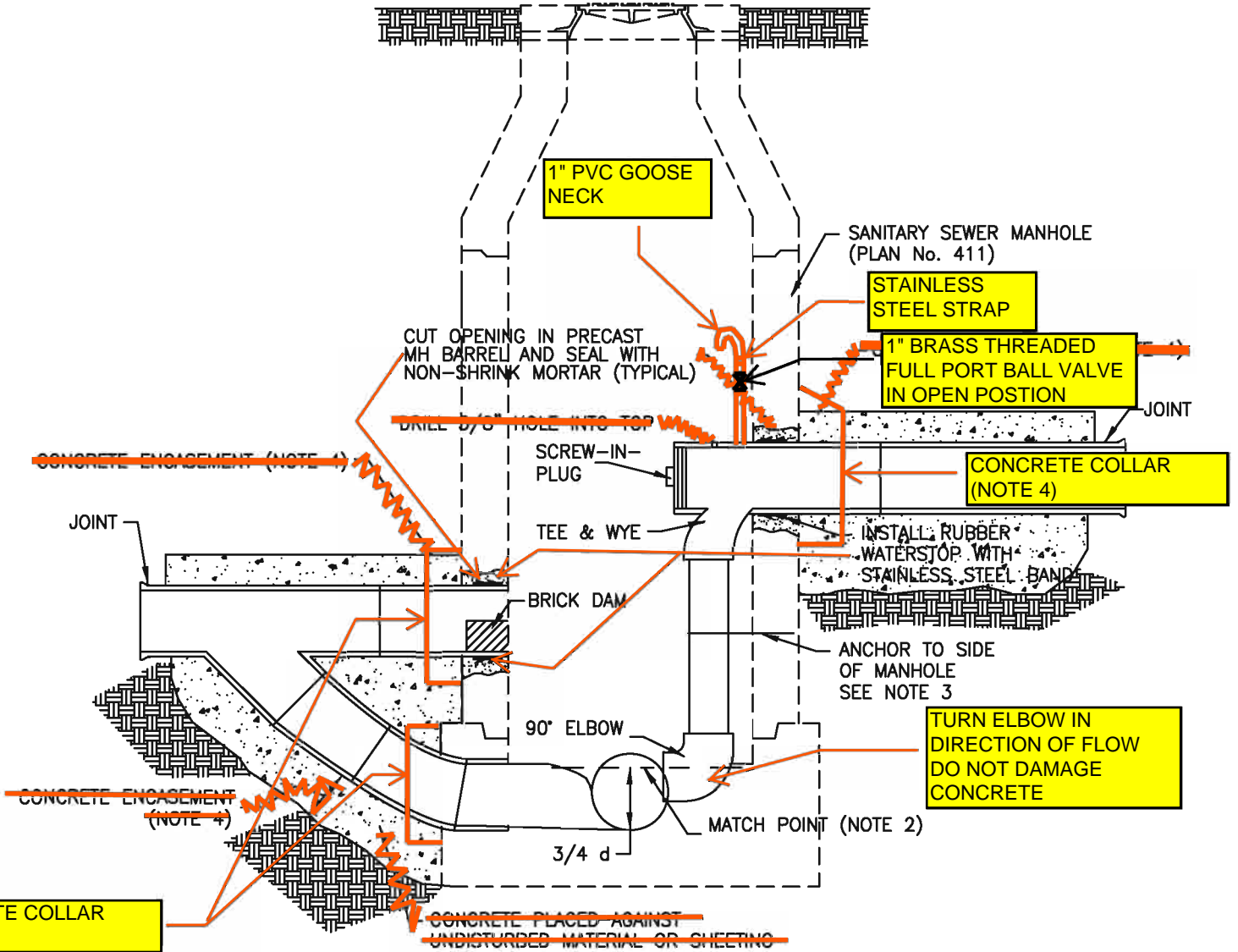
SECTION A-A

Sewer lateral relocation

Pipe drop

1. PIPE DROPS: Only one drop pipe is allowed inside the manhole. Size the drop pipe to be same diameter as sewer pipe discharging into manhole.
2. MATCH POINT: Match the 3/4 diameter points of the pipes.
3. ANCHOR: If the drop is more than 18 inches, anchor the riser to the wall every 12 inches. Use stainless steel anchors which are acceptable to ENGINEER.
4. CONCRETE: Class 4000 per APWA Section 03 30 04. ~~Extend encasement to first joint beyond excavation for drop connection.~~

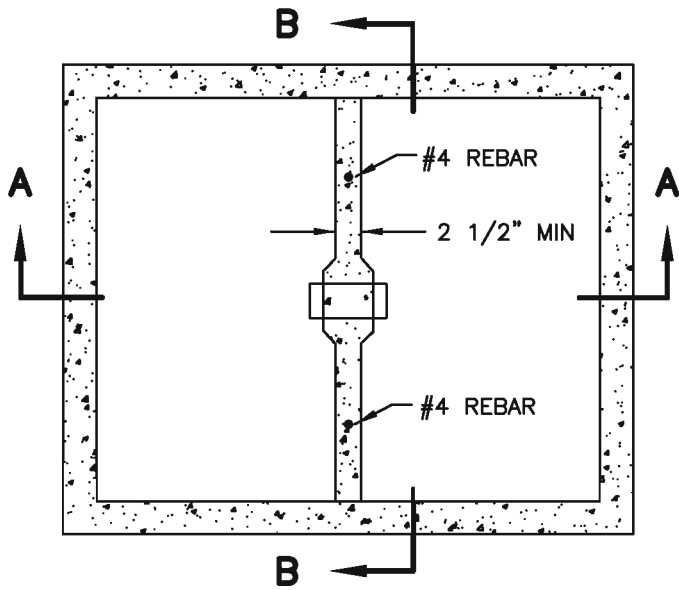
5. DEEP DROP ALTERNATE 2 REQUIRES FITTINGS TO BE TAPPABLE.



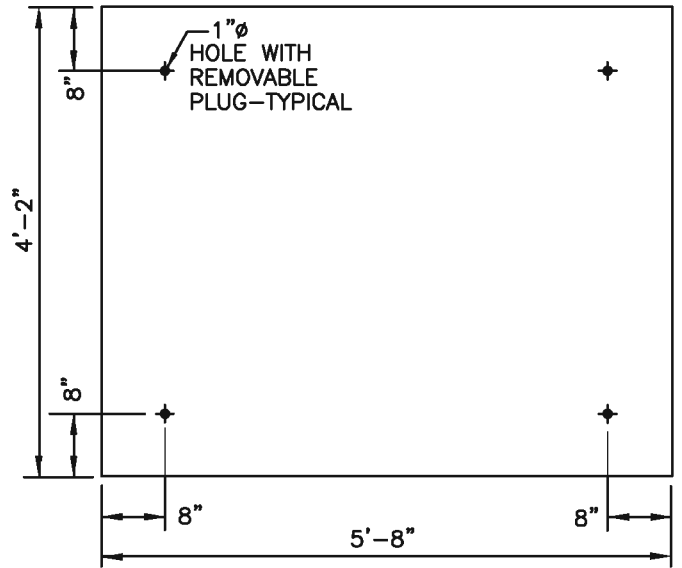
Pipe drop

Grease trap

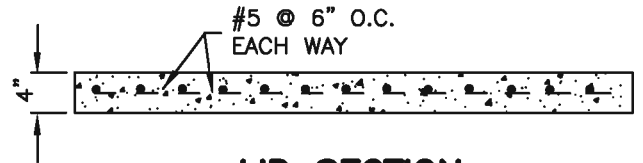
1. INSPECTION: Prior to backfilling around concrete box, secure inspection of installation by ENGINEER.
2. BACKFILL: Provide and place per APWA Section 31 23 23. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness is 8 inches before compaction.
3. REINFORCEMENT: ASTM A 615, grade 60, deformed steel. See APWA Section 03 20 00 requirements.
4. CONCRETE: Class 4000 per APWA Section 03 30 04. Place concrete per APWA Section 03 30 10. Cure per APWA Section 03 39 00.
5. WALL PENETRATIONS: Fill annular space around piping with waterproof sealer.



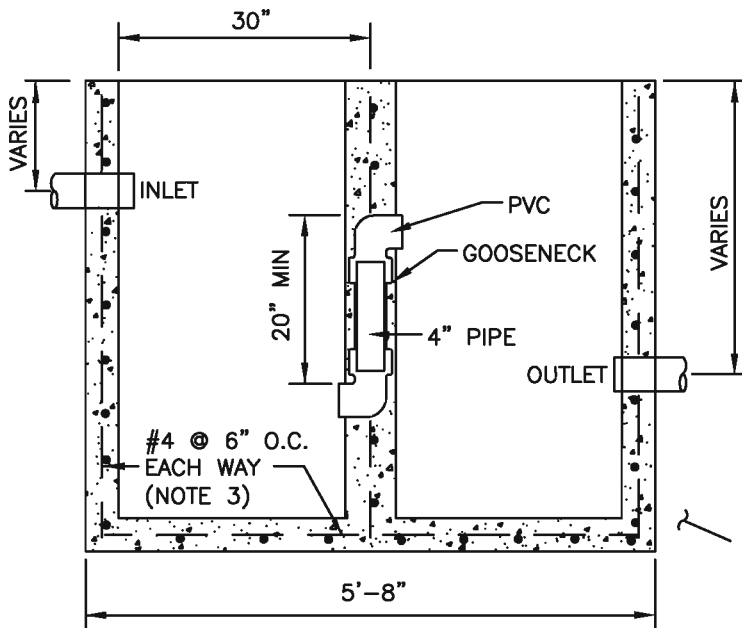
BOX PLAN



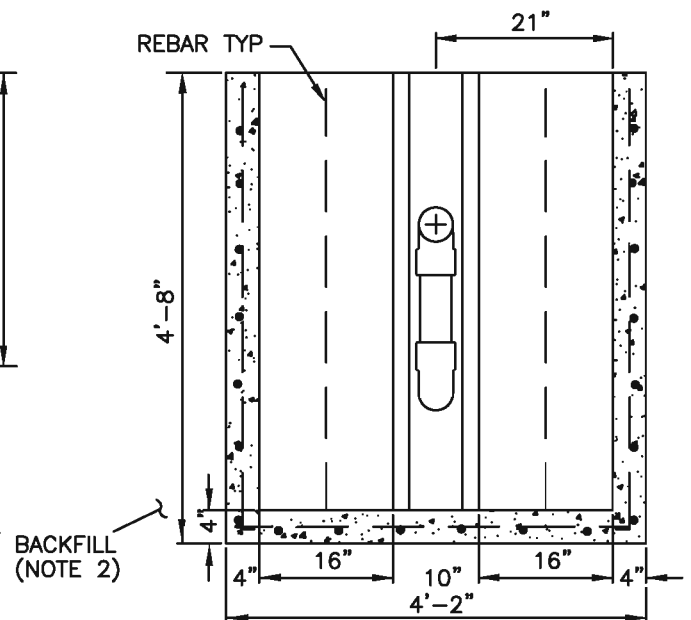
LID PLAN



LID SECTION



SECTION A-A



SECTION B-B

Grease trap

Plan No.

441

