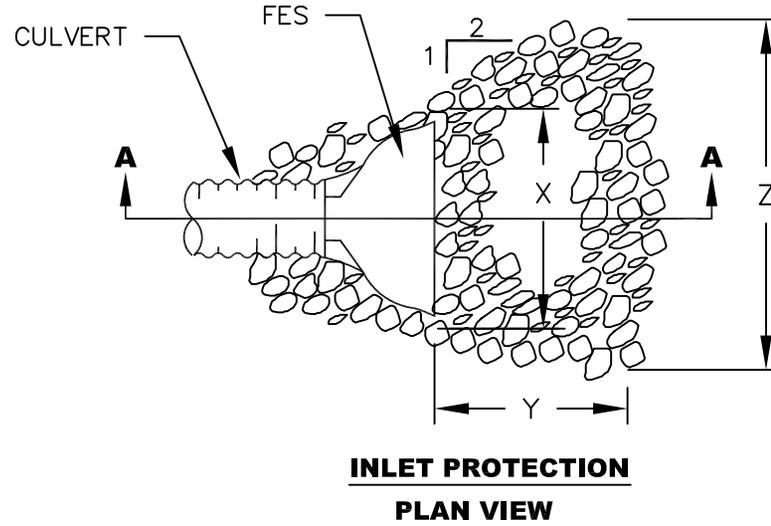
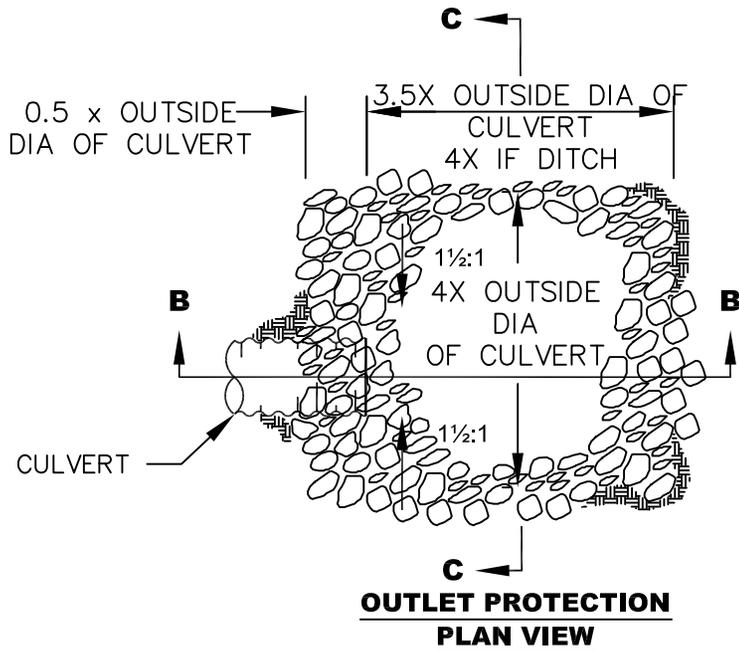




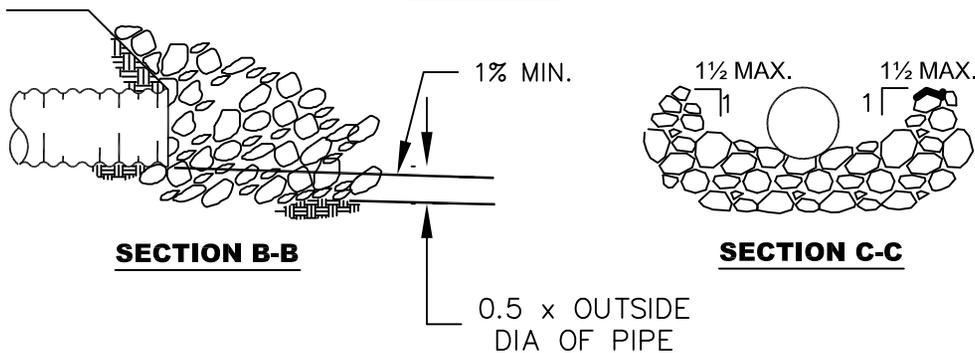
DEPARTMENT OF PUBLIC WORKS & FACILITIES

COUNTY OF PLACER

**STORM DRAIN
ROCK INLET/OUTLET PROTECTION
48" DIAMETER OR SMALLER**

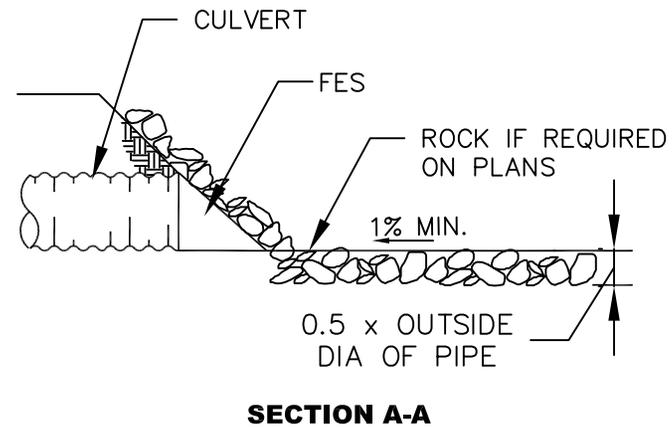


INLET PROTECTION MINIMUM DIMENSIONS				
ROCK CLASS	PIPE Ø IN.	X FEET	Y FEET	Z FEET
NO. 1 BACKING	12	3	4	5
NO. 1 BACKING	15-18	4.5	6	7.5
NO. 1 BACKING	21-24	6	8	10
NO. 1 BACKING	27-30	7.5	10	12.5
NO. 1 BACKING	36	9	12	15
NO. 1 BACKING	42	10.5	14	17.5
NO. 1 BACKING	48	12	16	20



NOTES:

- HAND PLACE ROCKS.
- ALL ROCKS SHALL BE ANGULAR AND HAVE TWO FACES.
- WHERE SLOPE OF OUTLET EXCEEDS 5%, A SEDIMENT BOWL OR ENERGY DISSIPATER SHALL BE REQUIRED.
- FLARED END SECTION AND ROCK SLOPE PROTECTION SHALL BE SLOPED AT A MIN. OF 1% INTO OR OUT OF CULVERT.
- ALL CULVERTS OF 48 IN. OR LESS SHALL BE INSTALLED WITH FLARED END SECTIONS (FES) ON INLETS. REINFORCED CONCRETE HEADWALLS AND END WALLS WITH CUTOFF WALLS SHALL BE CONSTRUCTED FOR ALL PIPES LARGER THAN 48 IN. UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- ON OUTLET APPLICATIONS, 50% OF THE ROCKS SHALL BE LARGER THAN HALF THE DIAMETER OF THE PIPE.
- FOR ADDITIONAL EROSION PROTECTION, ENGINEER MAY REQUIRE FILTER FABRIC BENEATH ROCK.



DATE:
APR. 2016

SCALE:
NOT TO SCALE

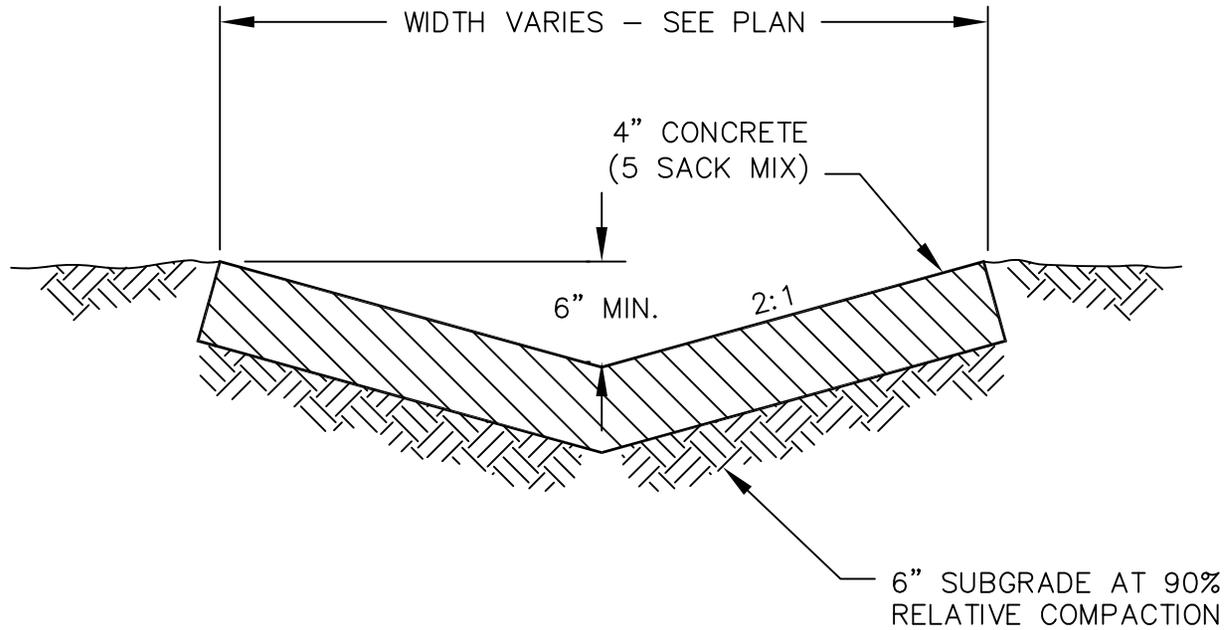


PLATE
401



COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

CONCRETE SWALE



NOTE:

- 1. EXPANSION JOINTS AT 20 FT O.C.

DATE: APR. 2016
SCALE: NOT TO SCALE



PLATE
402



DEPARTMENT OF PUBLIC WORKS & FACILITIES

COUNTY OF PLACER

STORM DRAIN MARKING

DATE:

APR. 2016

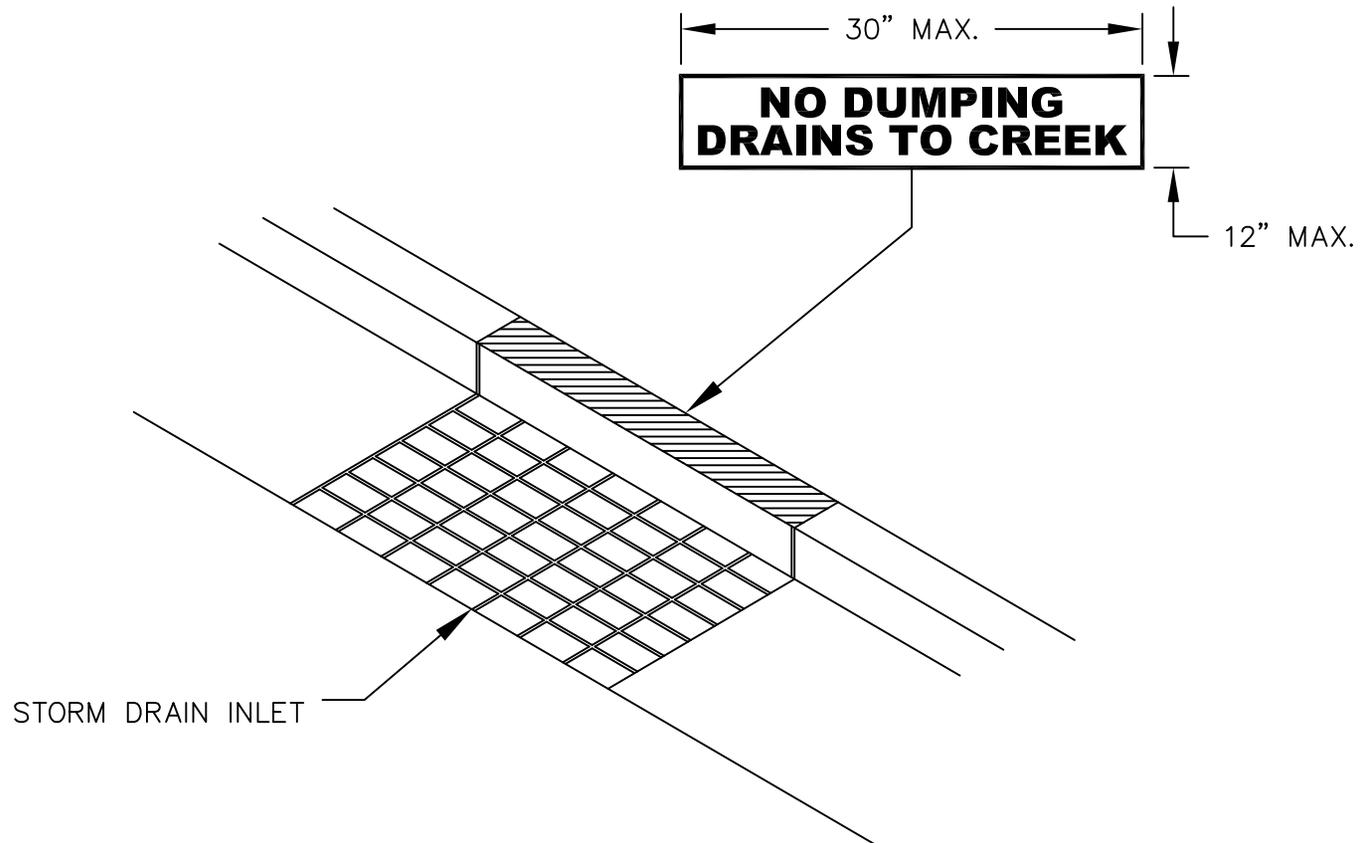
SCALE:

NOT TO SCALE



PLATE

403



ACCEPTABLE MESSAGES:

1. NO DUMPING—DRAINS TO CREEK
2. NO DUMPING—DRAINS TO STREAM
3. NO DUMPING—DRAINS TO LAKE
3. ONLY RAIN DOWN THE DRAIN
4. OTHER MESSAGES MAY BE USED WITH PRIOR APPROVAL BY THE DEPARTMENT OF PUBLIC WORKS.

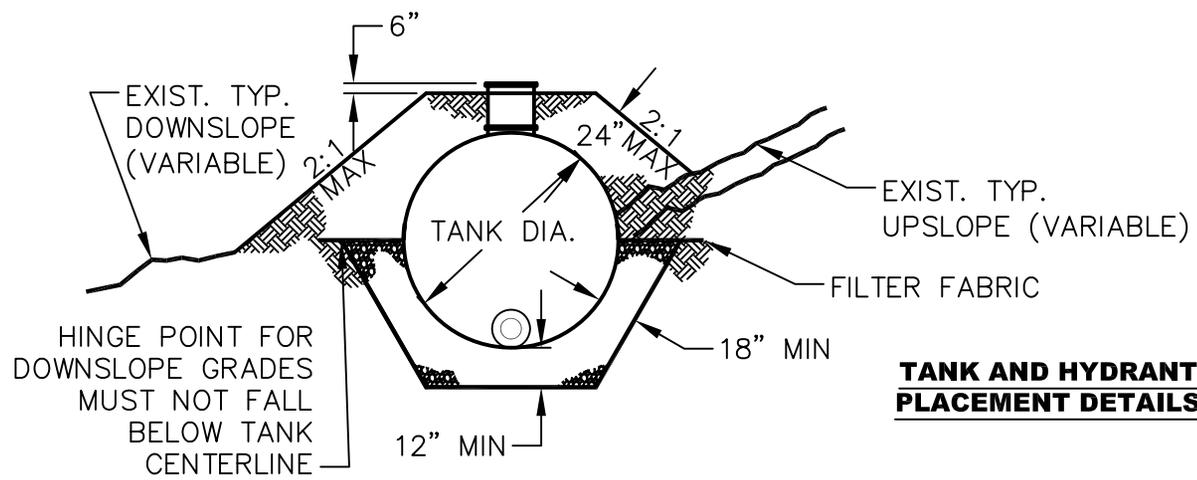
NOTES:

1. THE STORM DRAIN MESSAGE SHALL BE PERMANENTLY STAMPED INTO CONCRETE DURING CONSTRUCTION OF THE SIDEWALK. IF SIDEWALK IS NOT PLACED ADJACENT TO BACK OF CURB, THE ENGINEER WILL DETERMINE MESSAGE PLACEMENT AND METHODOLOGY.
2. LETTERING HEIGHT SHALL BE $1\frac{1}{2}$ " AND STAMPING DEPTH SHALL BE APPROXIMATELY 0.25". THE MESSAGE SHALL BE CLEAR, LEGIBLE AND ACCEPTABLE TO THE ENGINEER.
4. MESSAGE DIMENSIONS SHALL BE 12" X 30" MAXIMUM.
5. MESSAGE SHALL BE PLACED ADJACENT AND PARALLEL TO THE LONG AXIS OF THE DRAIN.

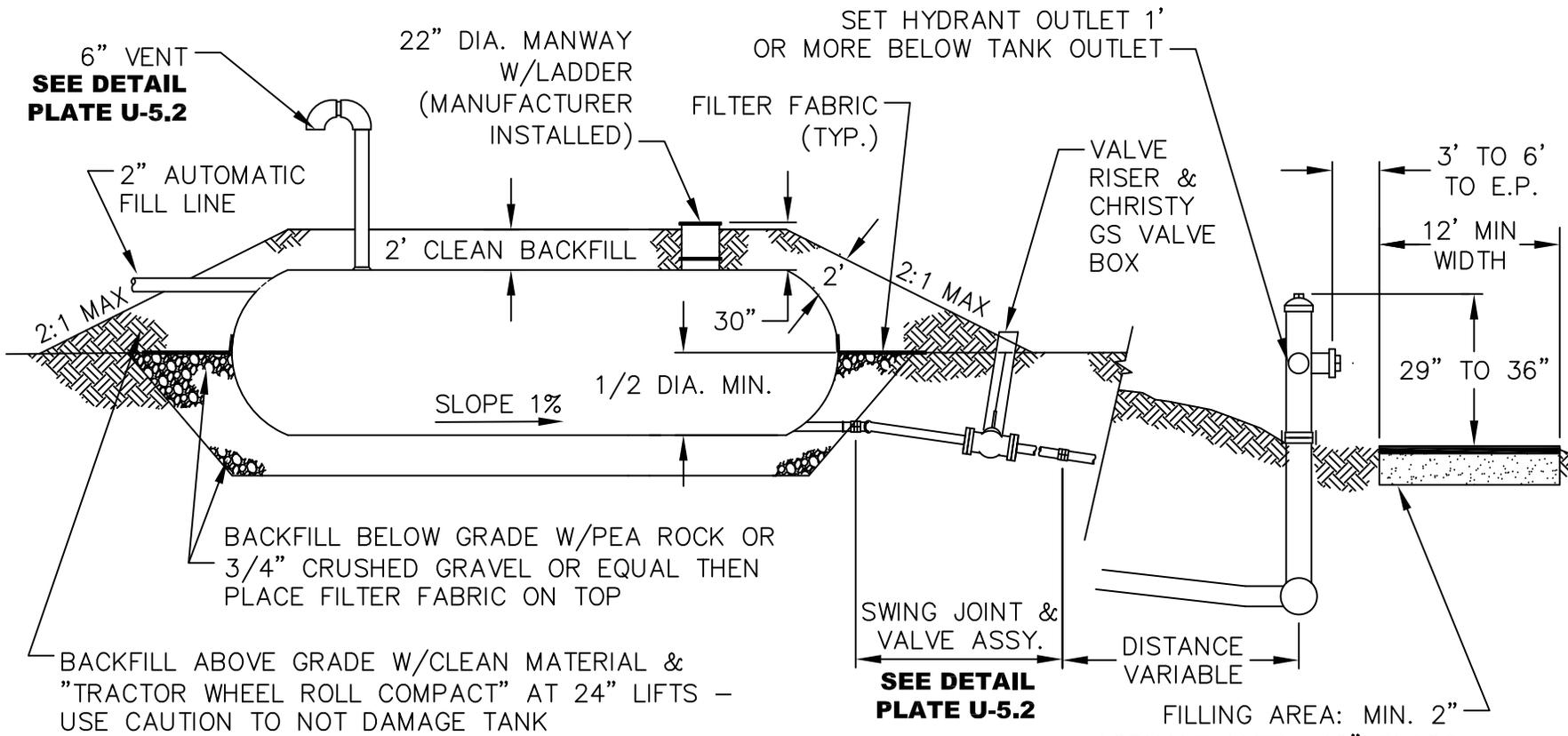


COUNTY OF PLACER
CDRA
ENGINEERING & SURVEYING

FIRE SUPPLY STORAGE TANK PLACEMENT



TANK AND HYDRANT PLACEMENT DETAILS



FILLING AREA: MIN. 2"
ASPHALT OVER 10" CLASS
2 AGGREGATE BASE, 40'
MIN LENGTH W/MIN
TURNAROUND = 40' DIA.

DATE:
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SCALE:
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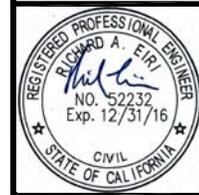
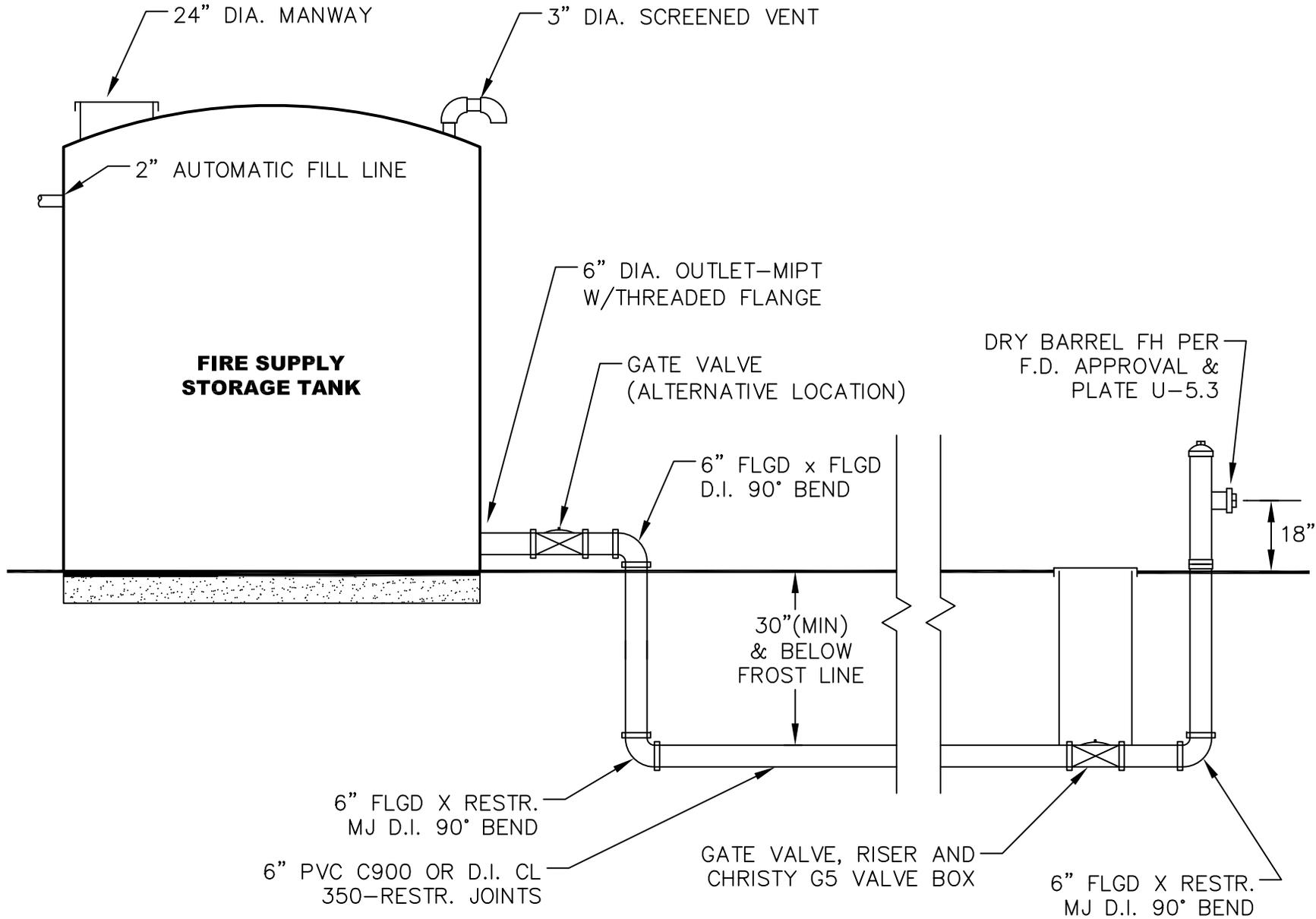


PLATE
404



COUNTY OF PLACER CDRA ENGINEERING & SURVEYING

FIRE SUPPLY ABOVE GROUND STORAGE TANK



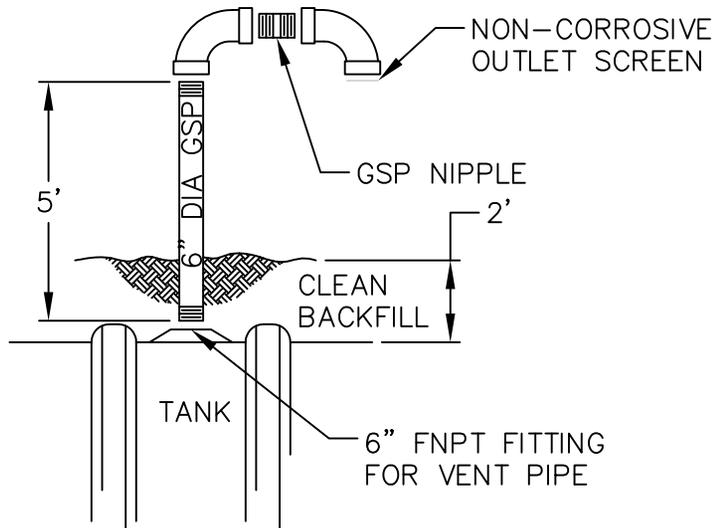
REVISED: APR. 2018
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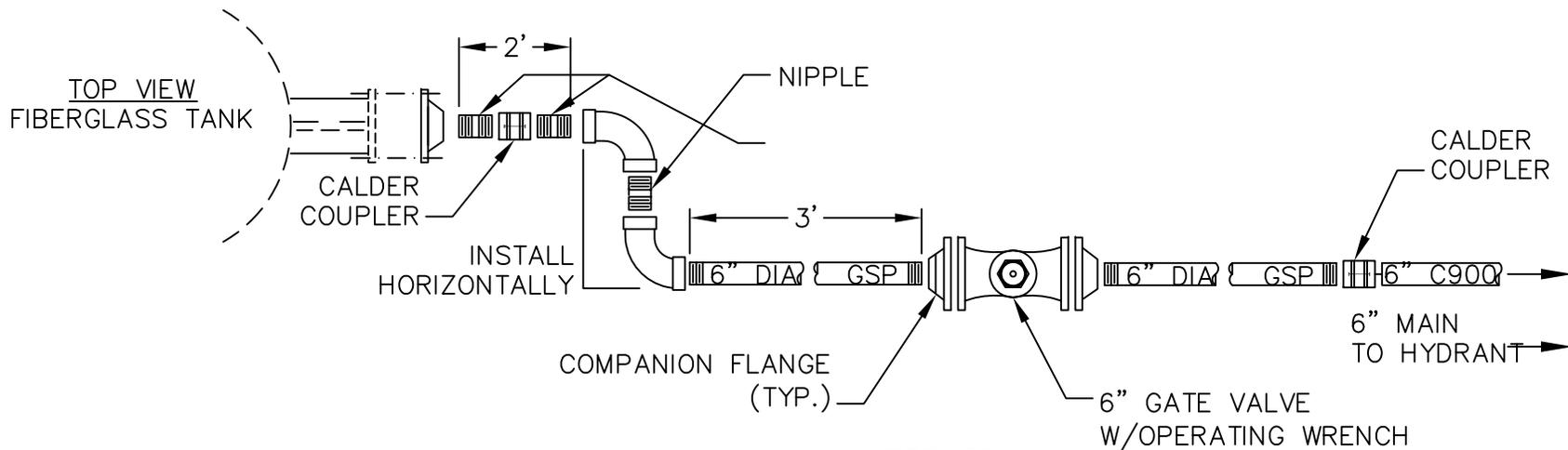


COUNTY OF PLACER CDRA ENGINEERING & SURVEYING

FIRE SUPPLY STORAGE TANK PLUMBING CONNECTIONS



DETAIL - 6" GSP VENT



**TOP VIEW
DETAIL - SWING JOINT**

DATE: APR. 2016
SCALE: NOT TO SCALE



PLATE
406



COUNTY OF PLACER CDRA ENGINEERING & SURVEYING

FIRE SUPPLY STORAGE TANK NOTES

NOTES:

1. TANK SHALL BE WARRANTIED FOR 30 YEARS AGAINST DEFECTS IN WORKMANSHIP AND MATERIALS.
2. TANK VOLUME, LOCATION, MATERIALS, DESIGN, AND HYDRANT PLACEMENT SHALL COMPLY WITH PROJECT APPROVALS AND ARE SUBJECT TO LOCAL FIRE DISTRICT APPROVALS. IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CONDITION SHALL APPLY. ROAD DISTANCES TO HYDRANTS SHALL NOT EXCEED 1000' FOR LOTS UP TO 3 ACRES, AND 2000' FOR LOTS BETWEEN 3 ACRES AND 20 ACRES UNLESS OTHERWISE APPROVED BY THE ENGINEER.
3. TANKS ELEVATED ABOVE GRADE SHALL BE DESIGNED BY A CIVIL OR STRUCTURAL ENGINEER REGISTERED IN CALIFORNIA. PARTIALLY OR COMPLETELY BURIED TANKS ARE EXEMPT UNDER THE UNIFORM BUILDING CODE, AND DO NOT REQUIRE ENGINEERING. TANKS SUPPORTED ON-GRADE, IF UNDER 5000 GAL. CAPACITY AND NOT EXCEEDING A 2:1 HEIGHT-TO-DIAMETER RATIO ARE LIKEWISE EXEMPT, AND DO NOT REQUIRE ENGINEERING. ALL OTHER TANKS REQUIRE AN ENGINEERED DESIGN.
4. TANKS SHALL BE CONSTRUCTED OF NON-CORROSIVE MATERIAL OR TREATED MATERIAL. CORROSIVE MATERIALS SHALL COMPLY WITH THE FOLLOWING:
 - A. PAINTS AND COATINGS SHALL COMPLY WITH THE LATEST PLACER COUNTY WATER AGENCY (PCWA) SPECIFICATIONS.
 - B. TANKS SHALL HAVE A MINIMUM WALL THICKNESS OF 1/2 INCH.
 - C. THE TANK INTERIOR SHALL BE SANDBLASTED AND TREATED PER PCWA SPECIFICATIONS.
 - D. THE TANK EXTERIOR SHALL BE TREATED WITH APPROPRIATE COATINGS PER PCWA SPECIFICATIONS.
 - E. TANK TREATMENT SHALL PROVIDE FOR A MINIMUM USEFUL LIFE OF 50 YEARS.
 - F. CATHODIC PROTECTION, IF REQUIRED, SHALL BE DESIGNED BY A NATIONAL ASSOCIATION OF CORROSION ENGINEERS CERTIFIED OR A CALIFORNIA REGISTERED CORROSION ENGINEER. SPECIAL INSPECTION WILL BE REQUIRED FOR SUCH INSTALLATIONS.
 - G. CERTIFICATES OF COMPLIANCE FOR THE ABOVE SHALL BE PROVIDED TO THE COUNTY'S INSPECTOR PRIOR TO ACCEPTANCE OF THE TANK(S).
5. AUTOMATIC FILL – A SUITABLE MEANS SHALL BE PROVIDED TO AUTOMATICALLY MAINTAIN THE WATER LEVEL IN THE TANK.
6. WHEN REQUIRED, A HYDRAULIC ANALYSIS OF THE SYSTEM SHALL BE PROVIDED BY A CALIFORNIA REGISTERED CIVIL ENGINEER.
7. ALL COMPONENTS OF THE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH COUNTY GENERAL SPECIFICATIONS AND THE LATEST VERSION OF PCWA SPECIFICATIONS.
8. AFTER INSTALLATION, THE TANK SHALL RECEIVE A LOW PRESSURE AIR TEST PER UNDERWRITER'S LABORATORY REQUIREMENTS.
9. 6" PVC PIPE SHALL MEET ALL AWWA C900 STANDRDS. THRUST BLOCKS SHALL BE PROVIDED AT ALL CHANGES IN DIRECTION.
10. STANDARD DRY-BARREL HYDRANT(S) SHALL BE CONFIGURED WITH 4 1/2 INCH AND 2 1/2 INCH FIRE CONNECTIONS AND A 6 INCH UNDERGROUND VALVE. HYDRANT IS TO BE PERMANENTLY LABELED "DRAFT ONLY", AND INSTALLED WITH A STANDARD BURY, CONCRETE KICKER, AND BREAK-OFF BOLT ASSEMBLY, AS APPROVED BY THE LOCAL FIRE DISTRICT. IF APPROVED BY THE DISTRICT, A 4 INCH STAND PIPE WITH A PERMANENTLY ATTACHED 4 1/2 INCH X 2 1/2 INCH FEMALE SWIVEL NATIONAL HOSE THREAD FITTING MAY BE SUBSTITUTED FOR A HYDRANT. THE STAND PIPE SHALL BE BETWEEN 18 INCHES AND 30 INCHES ABOVE GRADE.
11. A REFLECTORIZED BLUE MARKER WITH A MINIMUM DIMENSION OF 3 INCHES SHALL BE MOUNTED ON A FIRE RETARDANT POST PLACED WITHIN 3 FEET OF THE HYDRANT/FIRE VALVE. THE MARKER SHALL BE MOUNTED HORIZONTALLY, BETWEEN 3 AND 5 FEET ABOVE THE GROUND, AND VISIBLE FROM THE ROADWAY, OR AS SPECIFIED IN THE LATEST VERSION OF THE STATE FIRE MARSHAL'S GUIDELINES FOR FIRE HYDRANT MARKINGS ALONG STATE HIGHWAYS AND FREEWAYS.

DATE: APR. 2016
 SCALE: NOT TO SCALE



PLATE
407



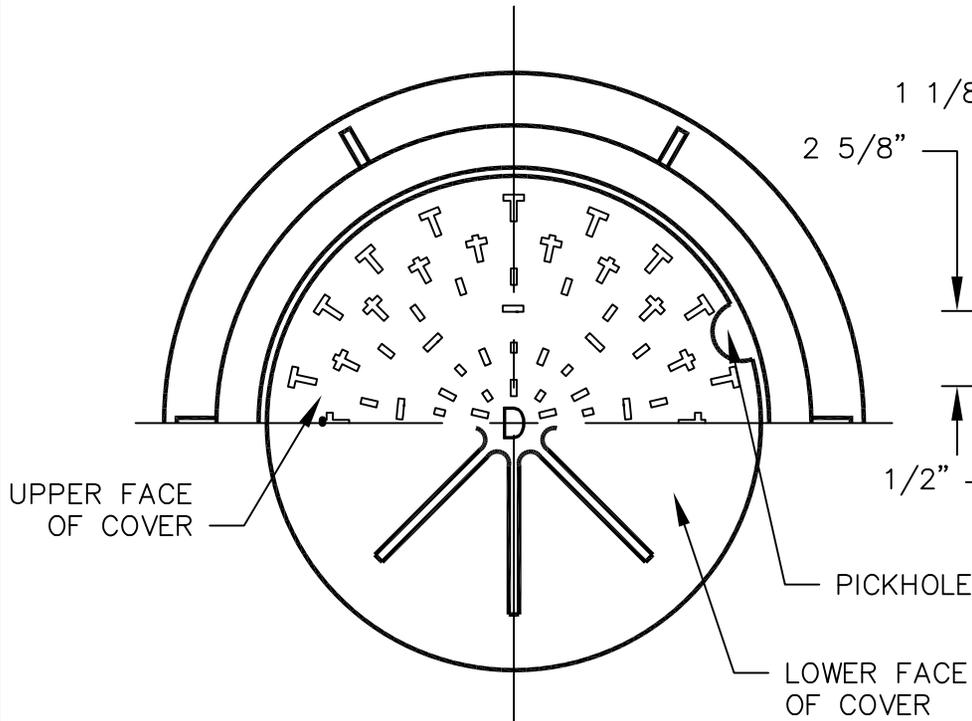
COUNTY OF PLACER
DEPARTMENT OF PUBLIC WORKS & FACILITIES

STANDARD 24" STORM DRAIN MANHOLE

DATE:
APR. 2016
SCALE:
NOT TO SCALE

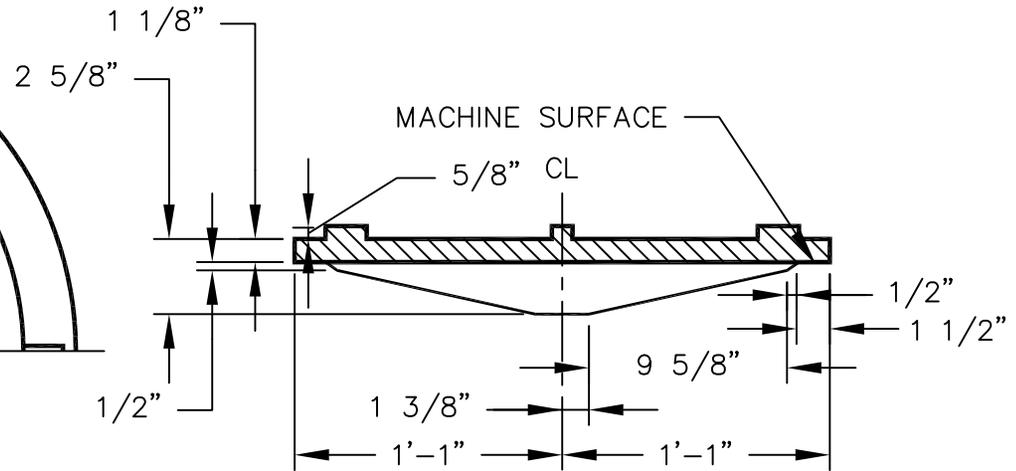


PLATE
408

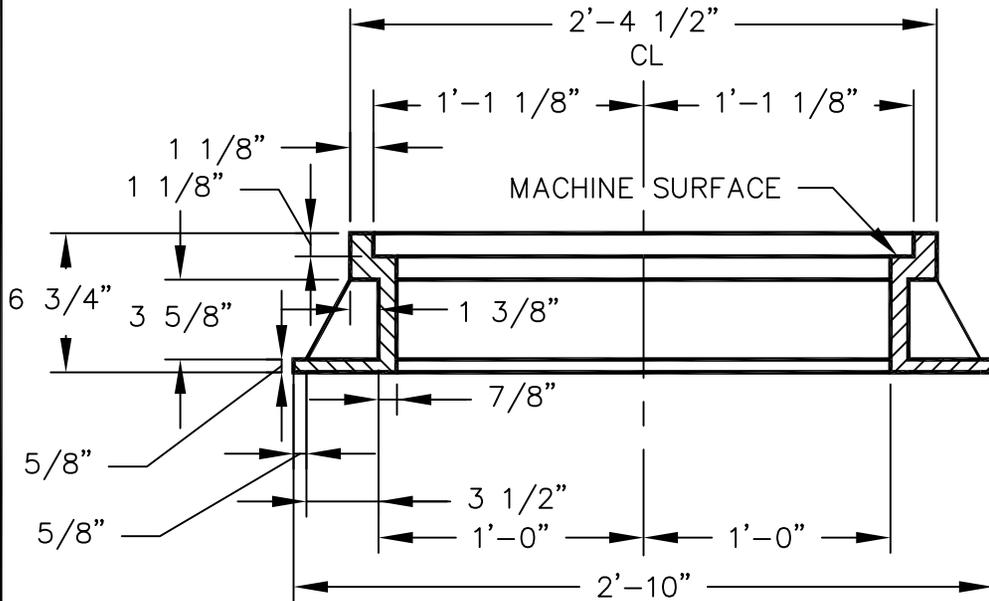


HALF PLAN OF MANHOLE FRAME & COVER

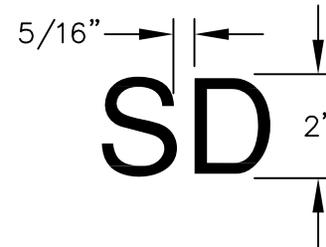
SD or D = STORM DRAIN



SECTION ON CL THROUGH COVER



SECTION ON CL THROUGH FRAME



**LETTER "S" AND/OR "D" AT
CENTER OF COVER**



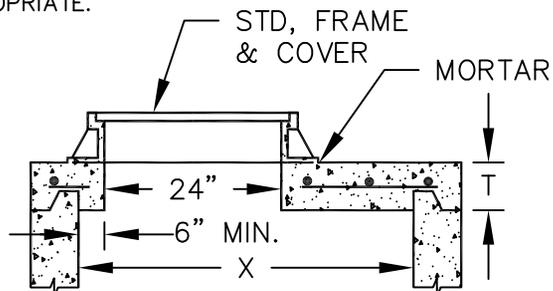
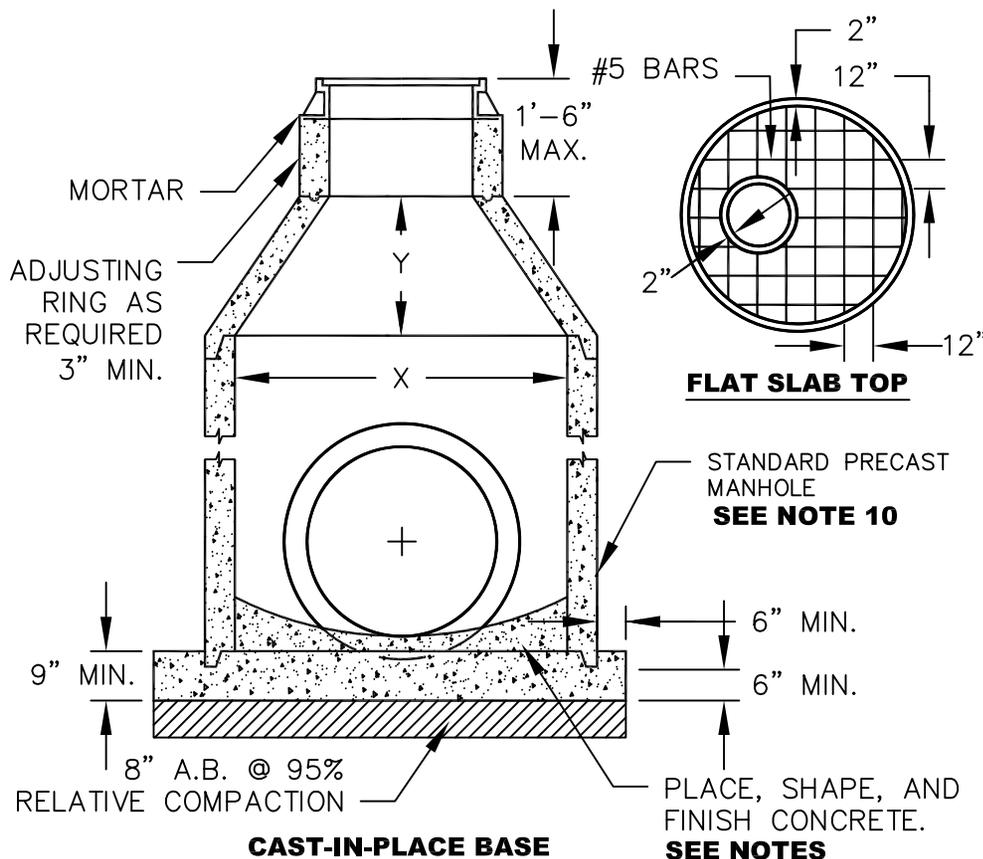
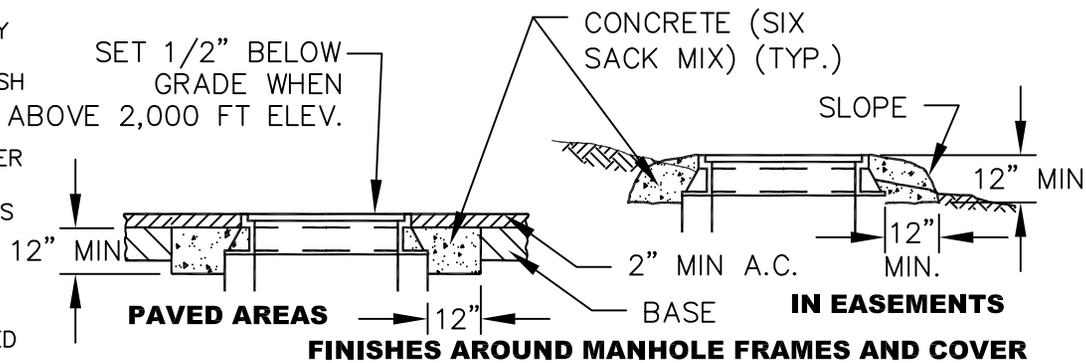
DEPARTMENT OF PUBLIC WORKS & FACILITIES
COUNTY OF PLACER

STANDARD PRECAST STORM DRAIN MANHOLE

NOTES:

1. ECCENTRIC CONES SHALL BE USED WHEN SPECIFIED ON THE PLANS.
2. JOINTS MAY BE EITHER KEYED OR TONGUE AND GROOVE.
3. RISER SECTIONS, CONES, AND ADJUSTING RINGS SHALL CONFORM TO ASTM DESIGNATION C-478.
4. FRAME SHALL BE SECURED TO RISER OR FLAT SLAB TOP WITH CEMENT MORTAR.
5. DIMENSION "Y" IS A MINIMUM DIMENSION AND MAY BE GREATER IF DEPTH PERMITS.
6. MANHOLE FLOORS SHALL HAVE WOOD TROWEL FINISH AND SLOPED FROM ALL DIRECTIONS TOWARD THE ABOVE 2,000 FT ELEV. OUTLET.
7. COVER FOR STORM DRAINS SHALL BEAR THE LETTER "D" OR "SD". SEE PLATES: 408 AND 410.
8. EXTRA DEPTH MANHOLES OR MANHOLES WITH PIPES OVER 54 INCHES IN DIAMETER SHALL REQUIRE SPECIAL DESIGN.
9. THERE SHALL BE AN 8 INCH MINIMUM CLEAR DISTANCE BETWEEN ALL PIPE OUTSIDE DIAMETERS AT THE MANHOLE UNLESS SPECIFICALLY APPROVED BY THE ENGINEER.
10. CAST-IN-PLACE MANHOLE WALLS MAY BE APPROVED BY THE ENGINEER. ALL CAST-IN-PLACE MANHOLES MUST BE FORMED IN A CIRCULAR SHAPE CONSISTENT WITH THE DIAMETER SPECIFIED ON THE PLANS AND REQUIRED TO FIT UPPER PRECAST SECTIONS. MINIMUM WALL THICKNESS SHALL BE 8 INCHES. MAXIMUM HEIGHT OF THE CAST-IN-PLACE SHALL BE 60 INCHES (MEASURED FROM THE TOP OF THE MANHOLE). PRECAST RINGS SHALL BE SET WET OR REQUIRED KEY FORM SHALL BE INCLUDED IN THE FORM WORK TO ACCEPT THE PRECAST KEY. ALL CAST-IN-PLACE CONCRETE SHALL BE CONSOLIDATED BY AN ACCEPTABLE METHOD TO ENSURE ALL VOIDS ARE REMOVED.
11. ANY VARIATIONS FROM THIS PLATE OR SPECIAL MANHOLES AND JUNCTION BOXES WILL REQUIRE REVIEW AND APPROVAL OF THE DESIGN BY THE ENGINEER.
12. M.H. LID TO BE RAISED AFTER FINAL PAVING, WHERE APPROPRIATE.

M.H.	X	Y	T	MIN.	MAX. PIPE INNER DIA
48"	48"	18"	8"		30"
60"	60"	30"	9"		42"
72"	72"	42"	10"		54"



FLAT SLAB SHALL BE USED WHEN DEPTH DOES NOT PERMIT USE OF TAPER UNIT.

DATE: APR. 2016
SCALE: NOT TO SCALE





COUNTY OF PLACER
 DEPARTMENT OF PUBLIC WORKS & FACILITIES

**STANDARD 36" STORM DRAIN MANHOLE
 FRAME AND COVER**

DATE: APR. 2016
 SCALE: NOT TO SCALE

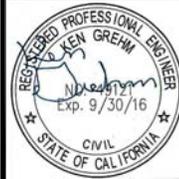
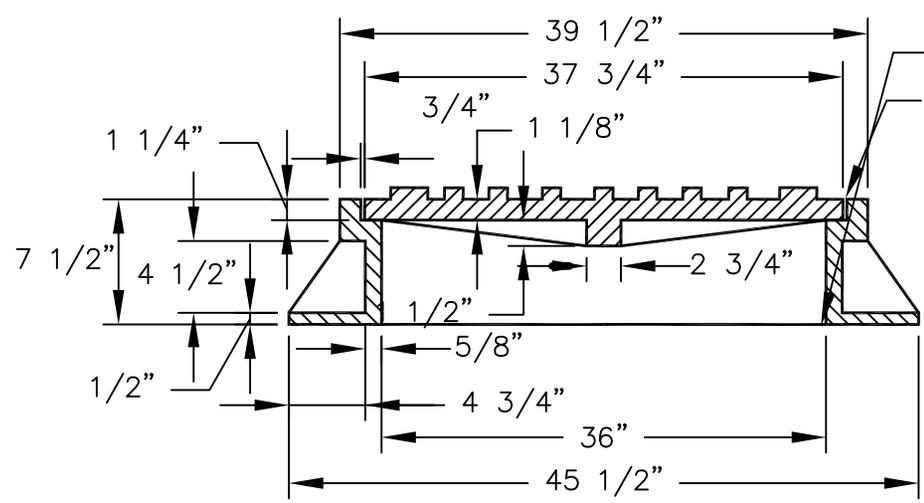
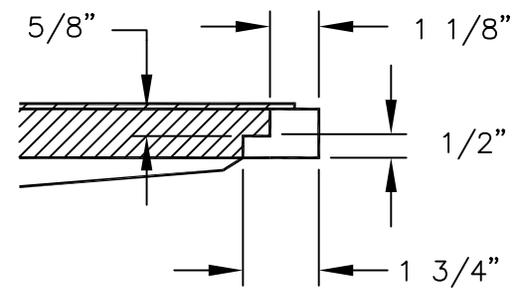


PLATE
410

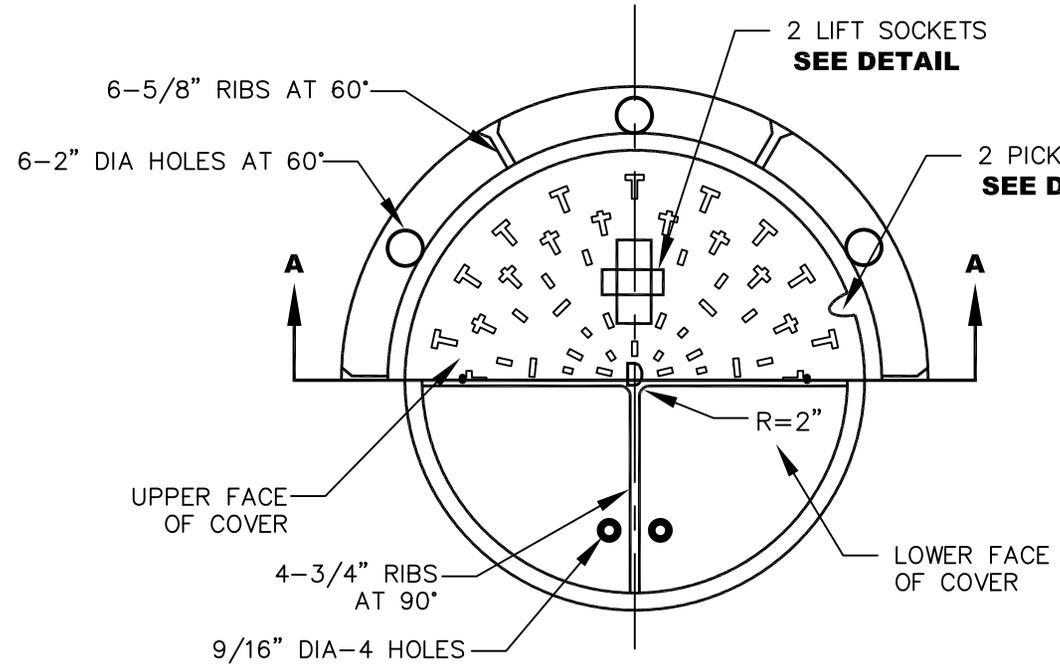


SECTION A-A

SMOOTH ALL JOINTS
 & EDGES WITH MORTAR
 MACHINE
 CONTACT
 SURFACES

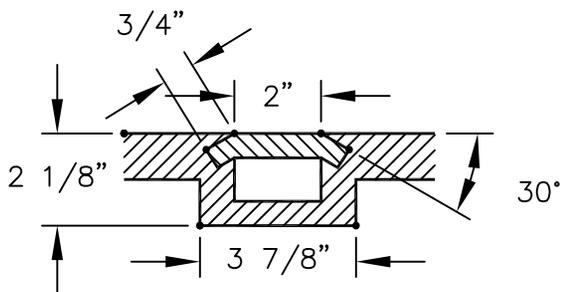
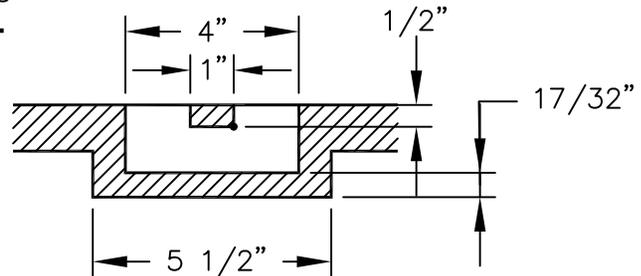


PICK HOLE DETAIL



HALF PLAN OF MANHOLE FRAME & COVER

APPROX. WEIGHTS:
 FRAME - 300 LBS.
 COVER - 375 LBS.



LIFT SOCKET DETAIL



COUNTY OF PLACER
DEPARTMENT OF PUBLIC WORKS & FACILITIES

SADDLE STORM DRAIN MANHOLES

TYPE A & B

COUNTY OF PLACER

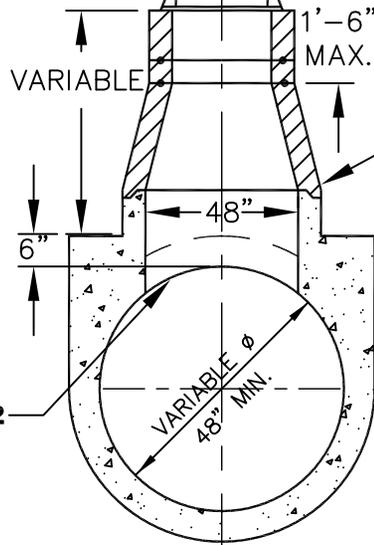
DATE: APR. 2016
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PLATE
411

ADJUST RINGS AS
REQUIRED, 3" MIN.

STANDARD 24" FRAME & COVER
SEE STANDARD PRECAST MANHOLE
PLATE FOR REQUIRED FINISHES
AROUND MANHOLE FRAMES & COVERS

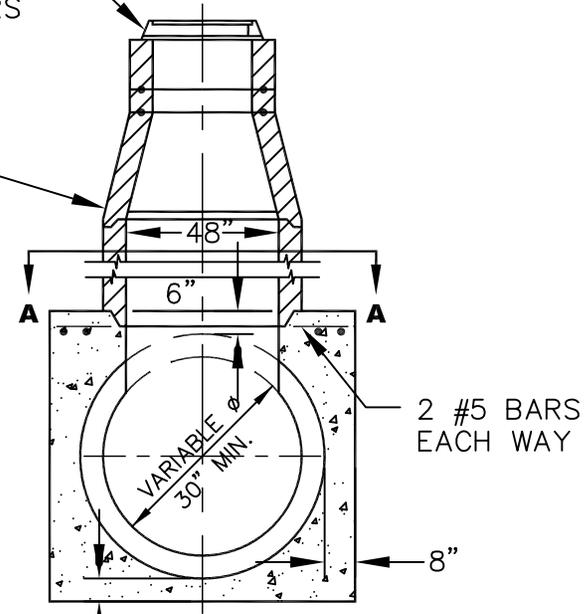


SEE NOTE 2

TYPE A

1. CAST-IN-PLACE PIPE ONLY, 48" MIN. DIAMETER.
2. REMOVE CONCRETE IN MANHOLE OPENING AND CONSTRUCT RISER BASE WHILE CONCRETE IS STILL FRESH.
3. PLACE RISER SECTION AFTER CONCRETE HAS SET.

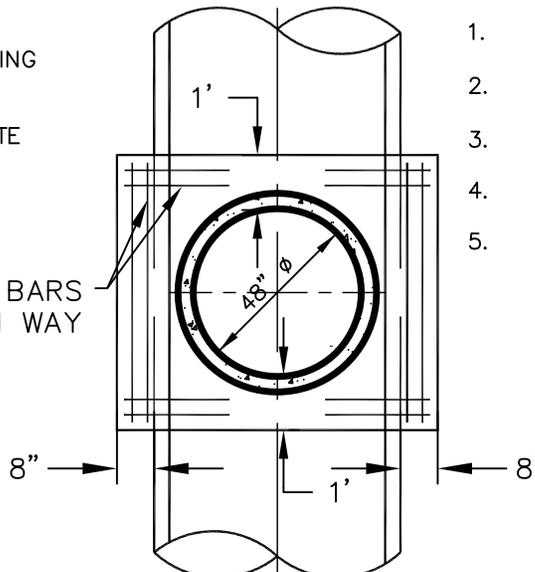
STANDARD MANHOLE
SECTION



TYPE B

1. ALL PIPE OTHER THAN CAST-IN-PLACE PIPE.
2. CAST-IN-PLACE PIPE LESS THAN 48" DIAMETER. (SEE NOTE 2 UNDER TYPE A).
3. WET SET RING FOR FIRST RISER WHILE CONCRETE IS STILL WET.
4. PLACE RISER SECTION AFTER CONCRETE HAS SET.
5. SPECIAL INSPECTION AND STAMPED CERTIFICATION BY THE DESIGN ENGINEER MAY BE REQUIRED AT THE SOLE DISCRETION OF THE COUNTY.

2 #5 BARS
EACH WAY



SECTION A-A

NOTES:

1. TWO FLEX JOINTS REQUIRED FOR VCP OUTSIDE OF SEWER MANHOLES. ONLY ONE FLEX JOINT REQUIRED FOR PVC & DIP OUTSIDE OF SEWER MANHOLES.
2. ON PRE-CAST MANHOLE BASES, THE BUILT IN JOINT CAN BE USED FOR THE FIRST FLEX JOINT.
3. ALL MANHOLES BARRELS AND CONES SHALL BE ASTM C-478.
4. FOR MANHOLES LARGER THAN 48-INCH IN DIAMETER, ADDITIONAL REDUCING CONE SECTIONS ARE REQUIRED.
5. FLAT TOPS ARE NOT ALLOWED WITHOUT PERMISSION FROM THE ENGINEER.
6. NEW CHANNELS IN THE MANHOLE BASES SHALL BE CONSTRUCTED IN THE FIELD USING NON-SHRINK GROUT AND THE FOLLOWING REQUIREMENTS AT A MINIMUM:
 - A. CHANNEL SURFACES SHALL BE FINISHED WITH A SMOOTH FINISH AND BLEND INTO THE EXISTING BASE IN A MANNER ACCEPTABLE TO THE ENGINEER.
 - B. THE EXISTING MANHOLE BASE SHALL BE BUSH-HAMMERED IN THE AREA OF THE NEW CHANNELS PRIOR TO THE CONSTRUCTION OF THE CHANNELS.
 - C. A CONCRETE BONDING AGENT SHALL BE USED IN THE AREA OF THE NEW CHANNELS TO ENSURE PROPER BONDING BETWEEN THE NEW NON-SHRINK GROUT CHANNELS AND THE EXISTING BASE.
 - D. CONTRACTOR SHALL SUBMIT SPECIFICATION SHEETS FOR REVIEW AND APPROVAL BY THE ENGINEER FOR ALL MATERIALS TO BE USED IN THE CONSTRUCTION OF THIS SPECIFIC CHANNEL. ALL SUBMITTALS MUST BE SUBMITTED THROUGH THE PROJECT DESIGN ENGINEER.
 - E. NO DEBRIS FROM CHANNEL CREATION SHALL BE ALLOWED TO FALL IN TO THE ACTIVE FLOW.
7. BACKFILL MATERIAL AROUND SEWER MANHOLES AND OTHER SANITARY SEWER STRUCTURES THAT MUST REMAIN WATERTIGHT SHALL BE COMPACTED WITH RAMMER COMPACTORS ("WHACKER" TYPE). HEAVY EQUIPMENT SHALL NOT BE USED TO COMPACT AROUND THESE STRUCTURE UNLESS SPECIFICALLY APPROVED BY THE ENGINEER IN WRITING. BACKFILL SHALL BE PLACED UNIFORMLY AROUND THE CIRCUMFERENCE OF THE STRUCTURE IN 8-INCH LIFTS.
8. PRIOR TO INSTALLATION OF ANY SANITARY SEWER FACILITIES THE CONTRACTOR SHALL PROVIDE TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL MATERIAL SUBMITTALS FOR THE COMPONENTS VERIFYING THAT THEY MEET PLACER COUNTY REQUIREMENTS AND SPECIFIC PROJECT REQUIREMENTS. THE MATERIAL SUBMITTALS SHALL INCLUDE, BUT NOT LIMITED TO, MANHOLES, PIPING, LIFT STATION COMPONENTS, UNDERGROUND STORAGE TANKS AND APPURTENANCES, ETC. THEY SHALL PROPERLY IDENTIFY WHICH FACILITY THE ITEM PERTAINS TO ON THE PROJECT PLANS (E.G. FROM THE PRECAST MANUFACTURER FOR ALL PRECAST MANHOLE BASES). AFTER DESIGN ENGINEER REVIEW AND APPROVAL OF THE SUBMITTALS A COPY SHALL BE SENT TO THE ENGINEER FOR FINAL REVIEW AND ACCEPTANCE. ONCE ACCEPTED, COPIES SHALL BE RETURNED TO THE CONTRACTOR. THE CONTRACTOR SHALL NOT START INSTALLATION OF THE APPLICABLE SANITARY SEWER FACILITIES UNTIL THE COUNTY INSPECTOR HAS VERIFIED ALL COMPONENTS DELIVERED TO THE PROJECT SITE CONFORM TO THE APPROVED MATERIAL SUBMITTALS.
9. PRECAST MANHOLE BASES REQUIRE THE HORIZONTAL ALIGNMENT OF A SEWER LINE AT THE MANHOLE TO MATCH THE PRECAST BASE WITHIN A TOLERANCE OF ± 4 DEGREES.
10. MANHOLES SHALL BE WATER-TIGHT STRUCTURES CONSTRUCTED BY PLACING PRECAST CONCRETE SECTIONS ON A Poured CONCRETE BASE OR A PRECAST MANHOLE BASE. PRECAST MANHOLE BASES SHALL ONLY BE ALLOWED WHERE PRECAST DIRECTION GEOMETRY MATCHES ALL INCOMING AND OUTGOING LINES BY ± 4 DEGREES AS STATED IN PLACER COUNTY GENERAL SPECIFICATIONS SECTION 71-1.07A.
11. MANHOLES SHALL BE TESTED PER THE REQUIREMENTS OF PLACER COUNTY GENERAL SPECIFICATIONS SECTION 71-1.08 D.
12. FOR ALL FORCE MAIN, LOW PRESSURE AND GRAVITY SEWER PIPING SYSTEMS INSTALL SOLID INSULATED #10 THHN SOFT DRAWN COPPER WIRE. THE WIRE SHALL BE TAPED CONTINUOUSLY TO THE TOP OF THE PIPE AND ACCESSIBLE AT MANHOLES (PLATE 413), VALVE BOXES (PLATE 430), SEWER LATERAL CLEANOUTS (PLATES 421 & 422), FLUSHING BRANCHES (PLATE 423), AND SEWER SERVICE CONNECTIONS (PLATE 420).



DEPARTMENT OF PUBLIC WORKS & FACILITIES

COUNTY OF PLACER

STANDARD SANITARY SEWER MANHOLE NOTES

DATE:

APR. 2016

SCALE:

NOT TO SCALE



PLATE

412



COUNTY OF PLACER
DEPARTMENT OF PUBLIC WORKS & FACILITIES

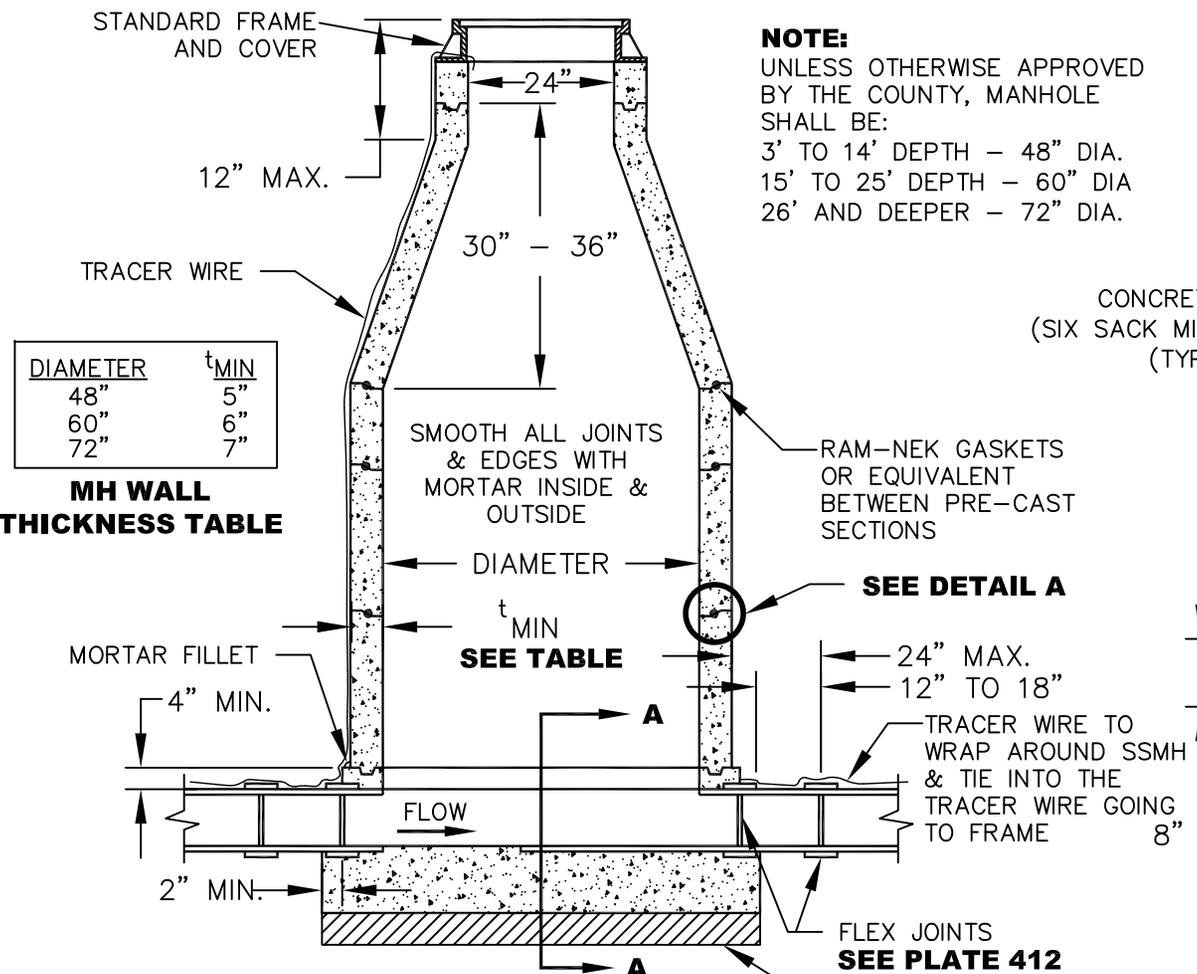
STANDARD SANITARY SEWER MANHOLE

REVISED:
APR. 2018
SCALE:
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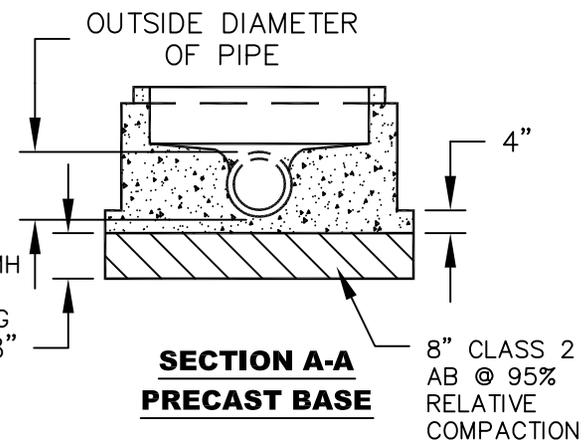
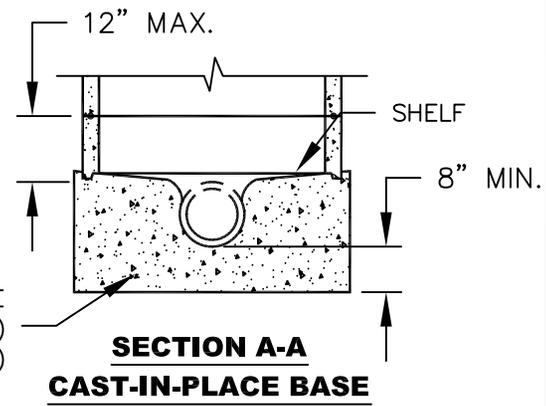
PLATE
413

NOTE:
UNLESS OTHERWISE APPROVED
BY THE COUNTY, MANHOLE
SHALL BE:
3' TO 14' DEPTH - 48" DIA.
15' TO 25' DEPTH - 60" DIA.
26' AND DEEPER - 72" DIA.

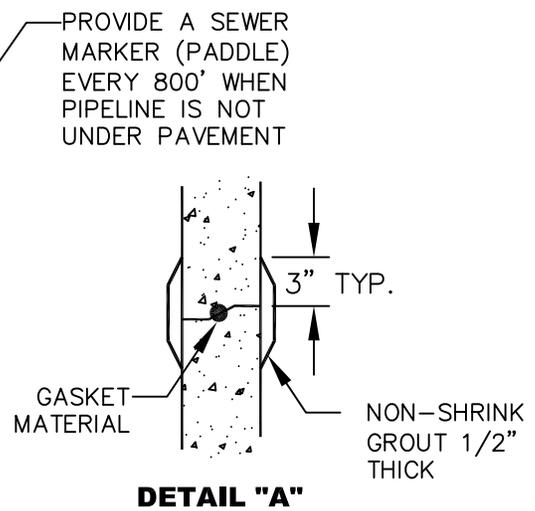
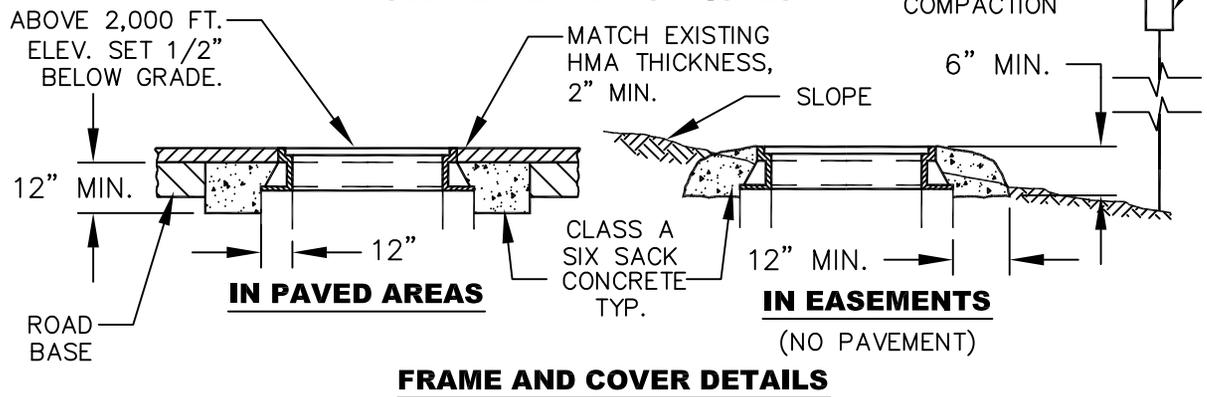


MH WALL THICKNESS TABLE

DIAMETER	t _{MIN}
48"	5"
60"	6"
72"	7"



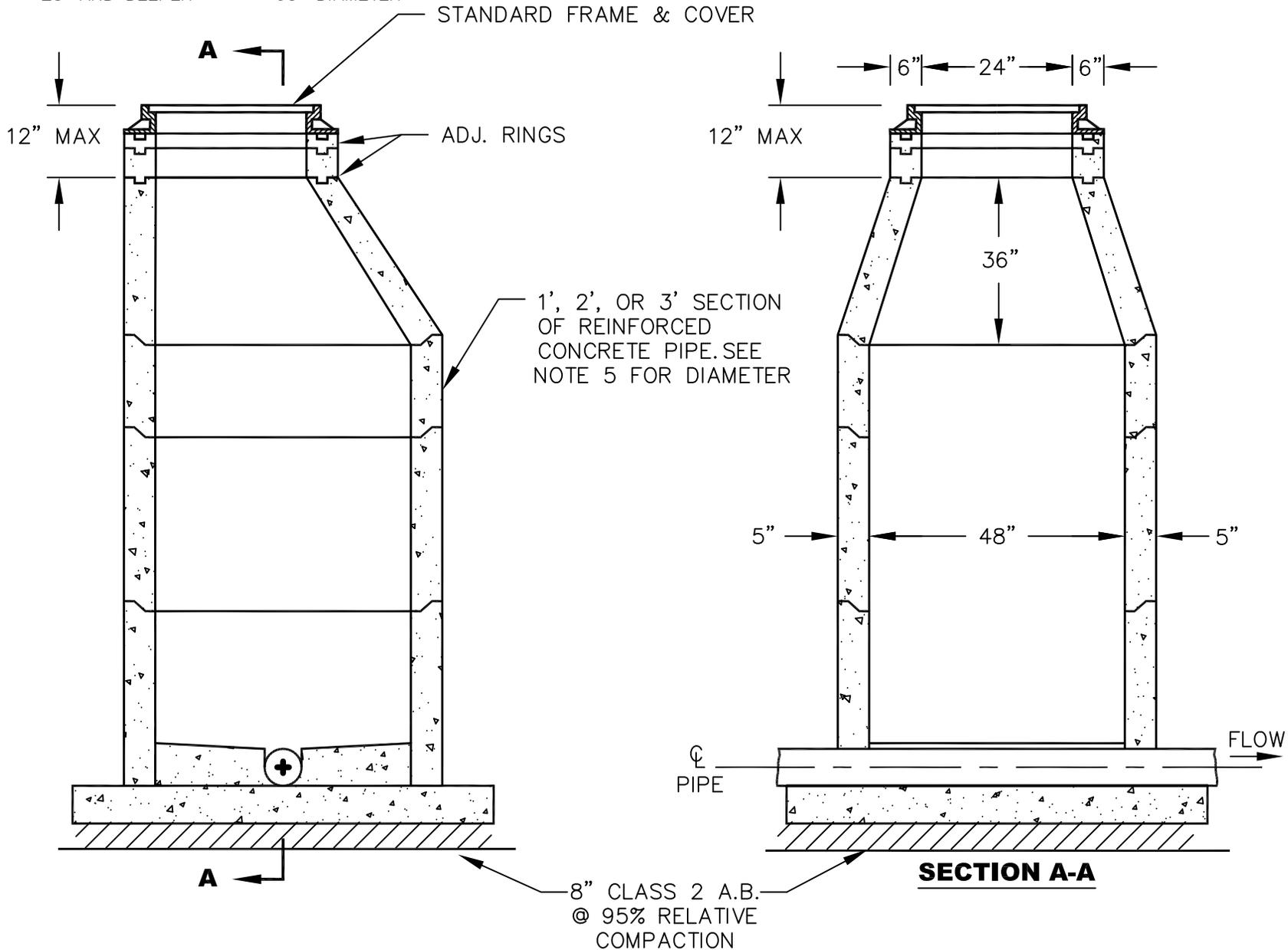
STANDARD MANHOLE DETAIL
SEE PLATE 412 FOR NOTES



DETAIL "A"

NOTES:

1. REFER TO PLATES 413 AND 416 FOR ADDITIONAL DETAILS.
2. INSTALL TRACER WIRE AS SHOWN ON PLATE 413
3. 48 IN. DIAMETER MANHOLE SHOWN.
4. ALL SECTIONS TO BE ASTM C-478.
5. TO BE USED ONLY WITH ENGINEER'S APPROVAL.
6. MANHOLE SIZE DETERMINED BY DEPTH, UNLESS OTHERWISE APPROVED BY THE COUNTY.
 - 3' TO 20' DEPTH - 48" DIAMETER
 - 20' AND DEEPER - 60" DIAMETER



COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

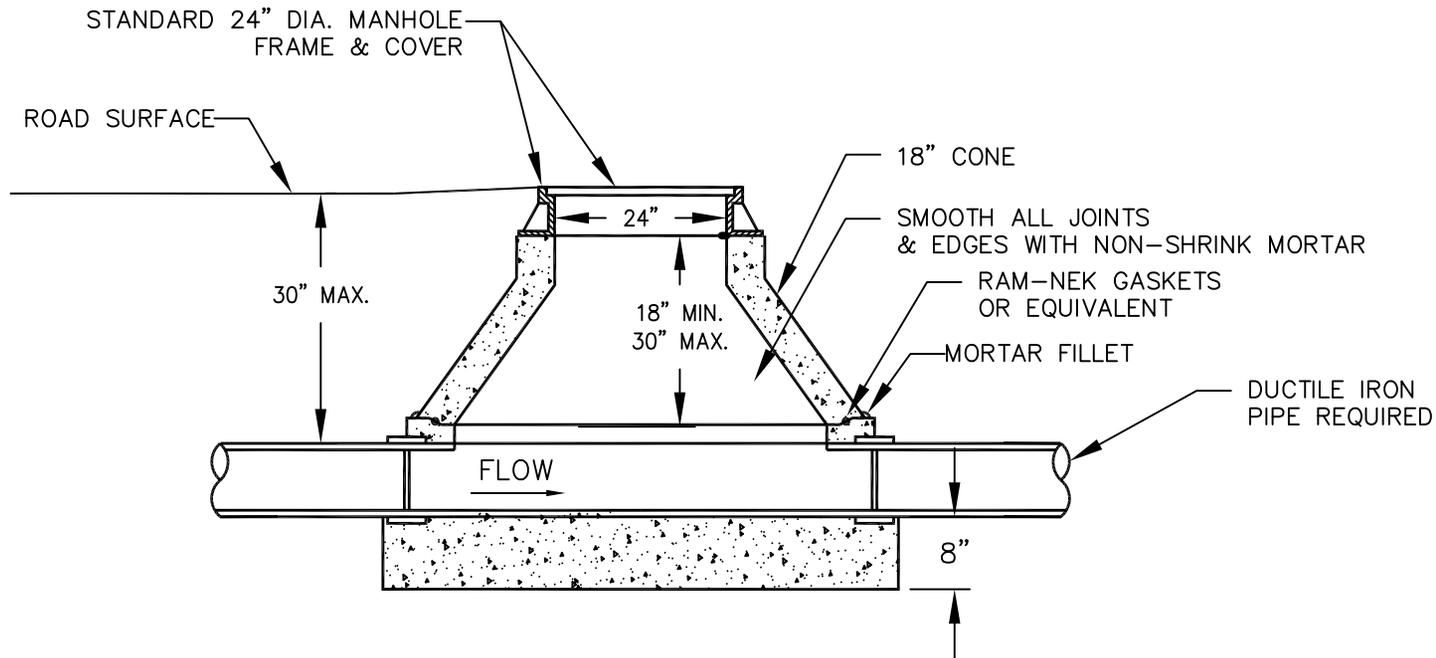
PRECAST SANITARY SEWER MANHOLE WITH ECCENTRIC CONE

DATE: APR. 2016
SCALE: NOT TO SCALE





SHALLOW SANITARY SEWER MANHOLE



THIS MANHOLE IS USED WHERE TOP OF PIPE IS LESS THAN 30 INCHES BELOW SURFACE.

NOTES:

1. FOR MANHOLE FRAME & COVER DETAILS, SEE PLATE 417.
2. FOR CAST-IN-PLACE BASE DETAIL SEE PLATE 413. INSTALL TRACER WIRE AS SHOWN ON PLATE 413.
3. FOR PIPES WITH LESS THAN 22 IN. COVER, NOTCH HOLE IN SIDE OF CONE.
4. SEE PLATE 412 FOR STANDARD NOTES.
5. REQUIRES APPROVAL BY DISTRICT SEWER ENGINEER.
6. MORTAR SUBMITTAL IS REQUIRED PRIOR TO CONSTRUCTION.
7. SEE PLACER COUNTY GENERAL SPECIFICATION 71-1.07D FOR CAST-IN-PLACE MANHOLES.

DATE: APR. 2016

SCALE: NOT TO SCALE





DEPARTMENT OF PUBLIC WORKS & FACILITIES

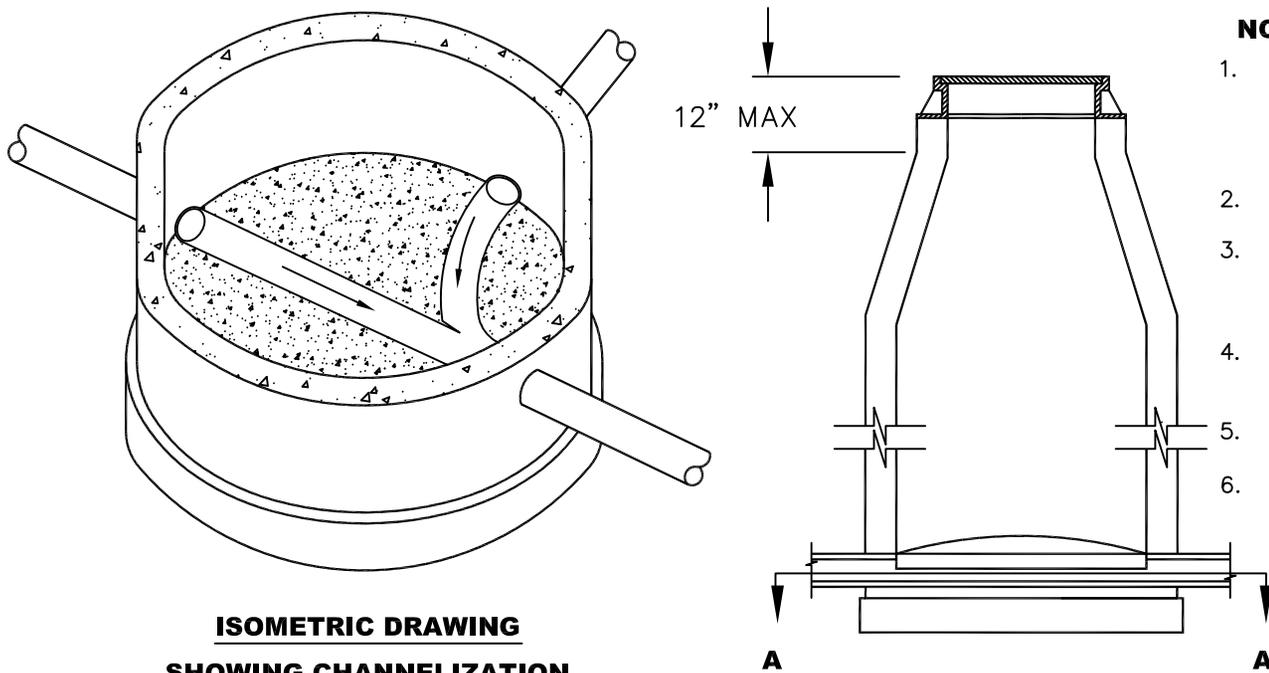
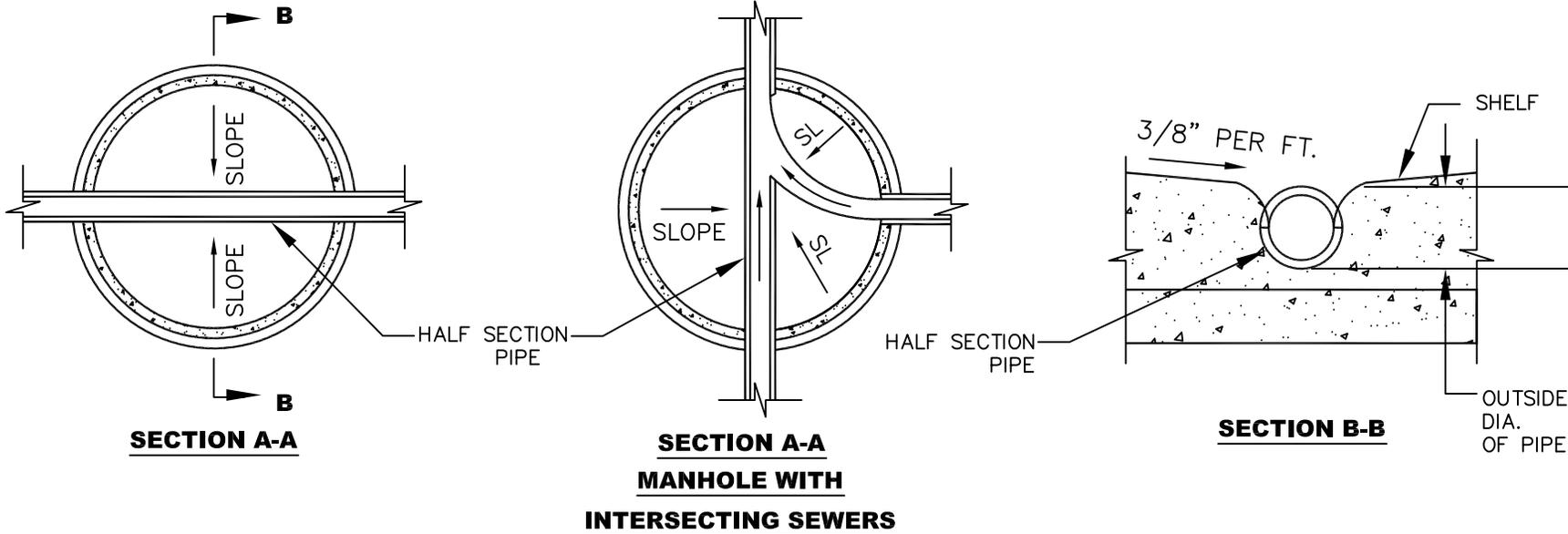
COUNTY OF PLACER

STANDARD SANITARY SEWER MANHOLE CHANNELIZATION DETAIL

DATE: APR. 2016
SCALE: NOT TO SCALE



PLATE
416



NOTES:

1. PIPE MAY STOP AT INSIDE FACE OF MANHOLE, OR BE CONTINUOUS THROUGH MANHOLE. IF PIPE LAID CONTINUOUS, TOP HALF SHALL BE CUT AWAY AFTER BASE IS POURED.
2. MIN 0.1' DROP BETWEEN INLET AND OUTLET PIPES.
3. SEWER SERVICES SHALL BE INSTALLED WITH THE INVERT ELEVATION MATCHING THE CROWN ELEVATION OF THE OUTLET PIPE.
4. FOR SEWER CAMERA ACCESSIBILITY, PROVIDE A STRAIGHT THROUGH CHANNEL SECTION OF 30" OR MORE.
5. SEE SECTION 71-1.07 OF THE GENERAL SPECIFICATIONS.
6. SEE PLATE 412 FOR STANDARD NOTES

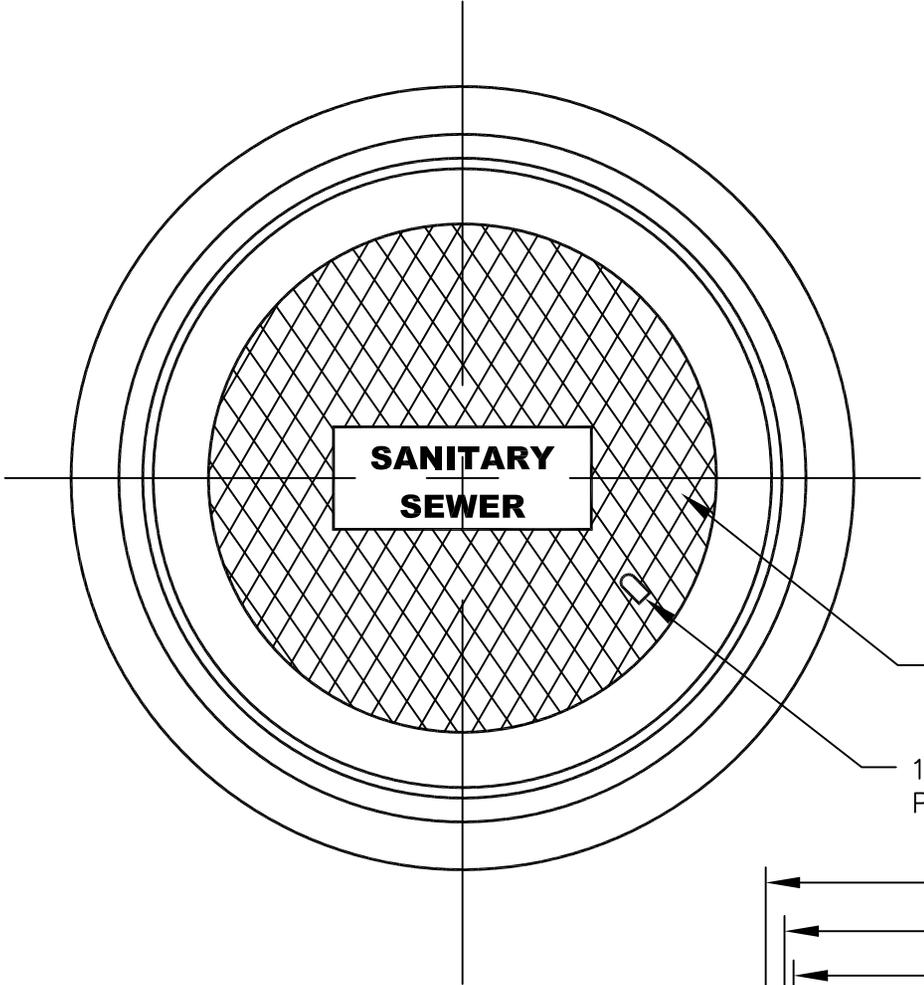


COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

STANDARD 24" SANITARY SEWER MANHOLE - FRAME AND COVER

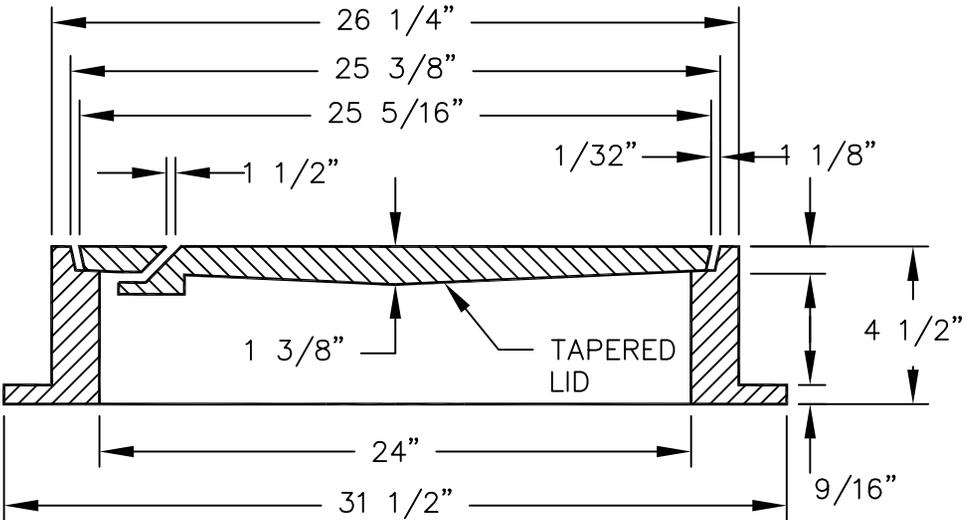
NOTES:

- 1. FRAME AND COVER BEARING SURFACES MACHINED TO ASSURE INTERCHANGEABILITY AND CLOSE, QUIET FIT.
- 2. CASTINGS DIPPED IN BLACK BITUMINOUS PAINT.
- 3. ALL MATERIAL USED IN MANUFACTURING SHALL CONFORM TO ASTM SPECIFICATIONS A159-64T-G3000, 48-30, OR OF UNITED STATES GOVERNMENT SPECIFICATIONS QQ1-653.
- 4. FRAME AND COVER EXCEEDS H-20 WHEEL LOADING.
APPROX. WEIGHTS:
FRAME - 140 LBS.
COVER - 130 LBS. MIN.
- 5. WHEN BOLT DOWN MANHOLE LIDS ARE SPECIFIED, USE D&L SUPPLY, A-1024 BOLT DOWN/WATER TIGHT MANHOLE RING AND COVER OR EQUAL.
- 6. SEE PLATE 412 FOR STANDARD NOTES



ASTM GRID PATTERN

1 1/2" OPEN PICK HOLE



1/32" 1 1/8"

1 3/8" TAPERED LID

4 1/2"

24" 9/16" 31 1/2"

DATE: APR. 2016
SCALE: NOT TO SCALE

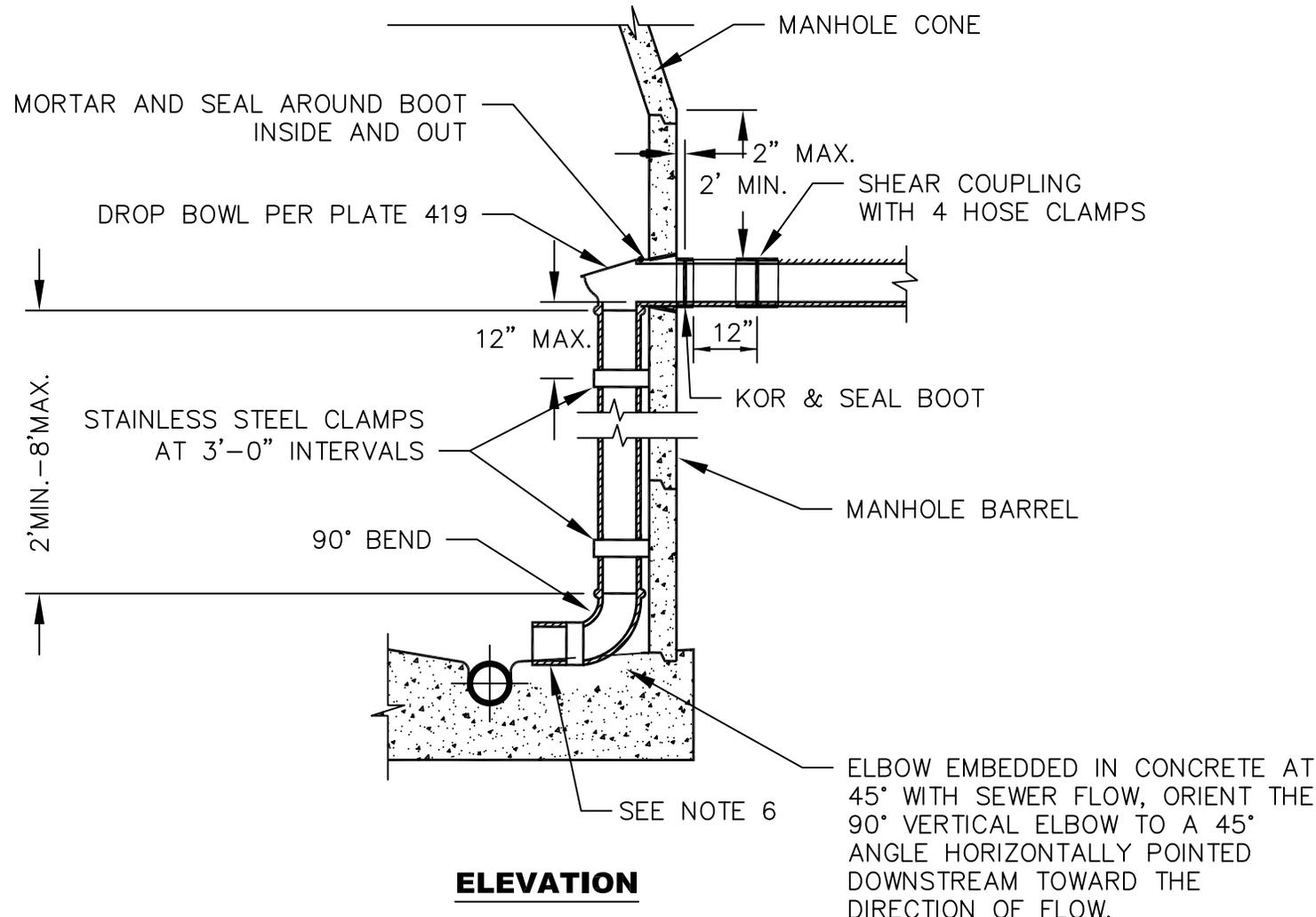


PLATE 417



COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

INSIDE DROP CONNECTION SANITARY SEWER 4", 6" & 8" ONLY



NOTES:

1. ALL INSIDE DROP PIPING SHALL BE P.V.C. PIPE, SCHEDULE 40.
2. INSTALL TRACER WIRE AND DAYLIGHT AT MANHOLE COVER AS SHOWN ON PLATE 413
3. PRIME AND CEMENT ALL JOINTS AS RECOMMENDED BY THE MANUFACTURER.
4. DROP CONNECTION PIPE AND FITTINGS TO BE SAME SIZE AS ENTERING PIPE.
5. CLAMPS SHALL BE 1 1/2 IN. BY 12 GAUGE STAINLESS STEEL, ANCHORED TO MANHOLE WALL WITH 2 1/2 IN. CADMIUM PLATED BOLTS.
6. THE FLOWLINE OF THE DROP PIPE SHALL REST ON TOP OF THE SHELF OF THE MANHOLE BASE.
7. INSIDE DROP CONNECTIONS ARE ALLOWED FOR 4", 6", AND 8" PIPE ONLY.

REVISED: APR. 2018
SCALE: NOT TO SCALE

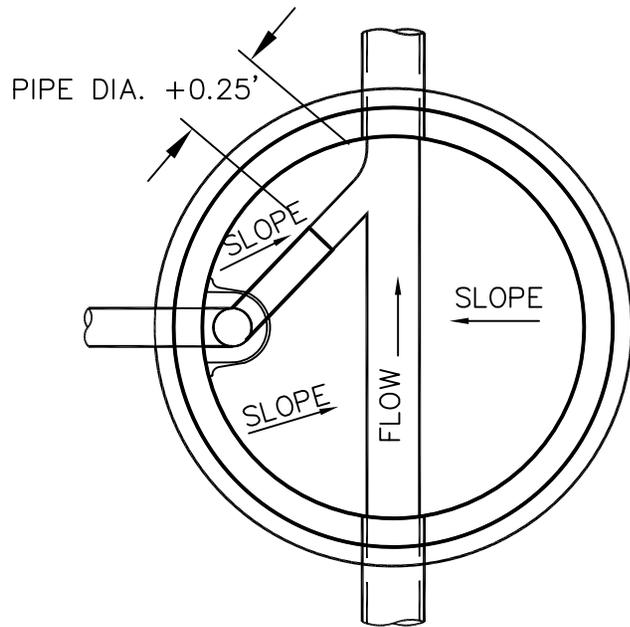


PLATE
418

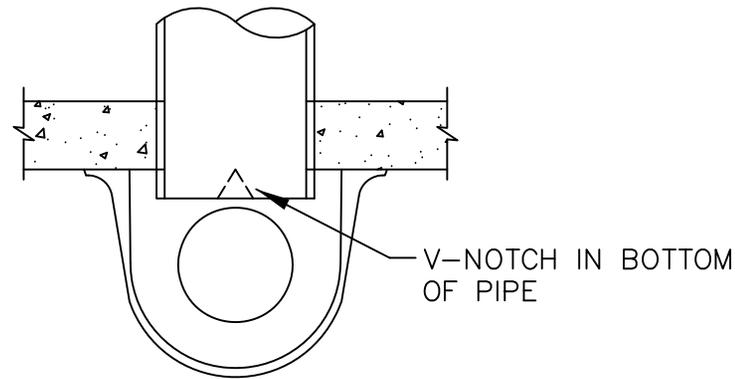


COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

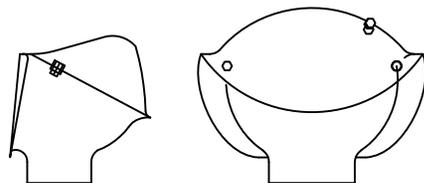
STANDARD SEWER INSIDE DROP CONNECTION DETAILS



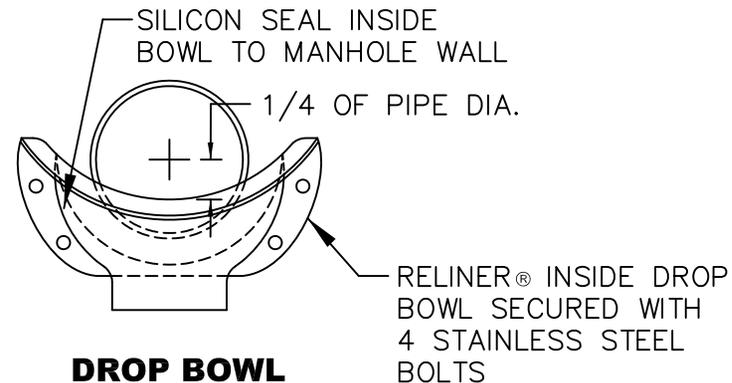
**PLAN
PER PLATE 416**



**DROP BOWL
MOUNTING POSITION
TOP VIEW**



FORCE LINE HOOD
REQUIRED FOR FORCE MAINS
AND LOW PRESSURE PIPES
OR WHEN THE SLOPE EXCEEDS 3%



**DROP BOWL
MOUNTING POSITION
FRONT VIEW**

DATE:
APR. 2016
SCALE:
NOT TO SCALE



PLATE
419



DEPARTMENT OF PUBLIC WORKS & FACILITIES

COUNTY OF PLACER

STANDARD SEWER LATERAL & CLEANOUT

REVISED:

APR. 2018

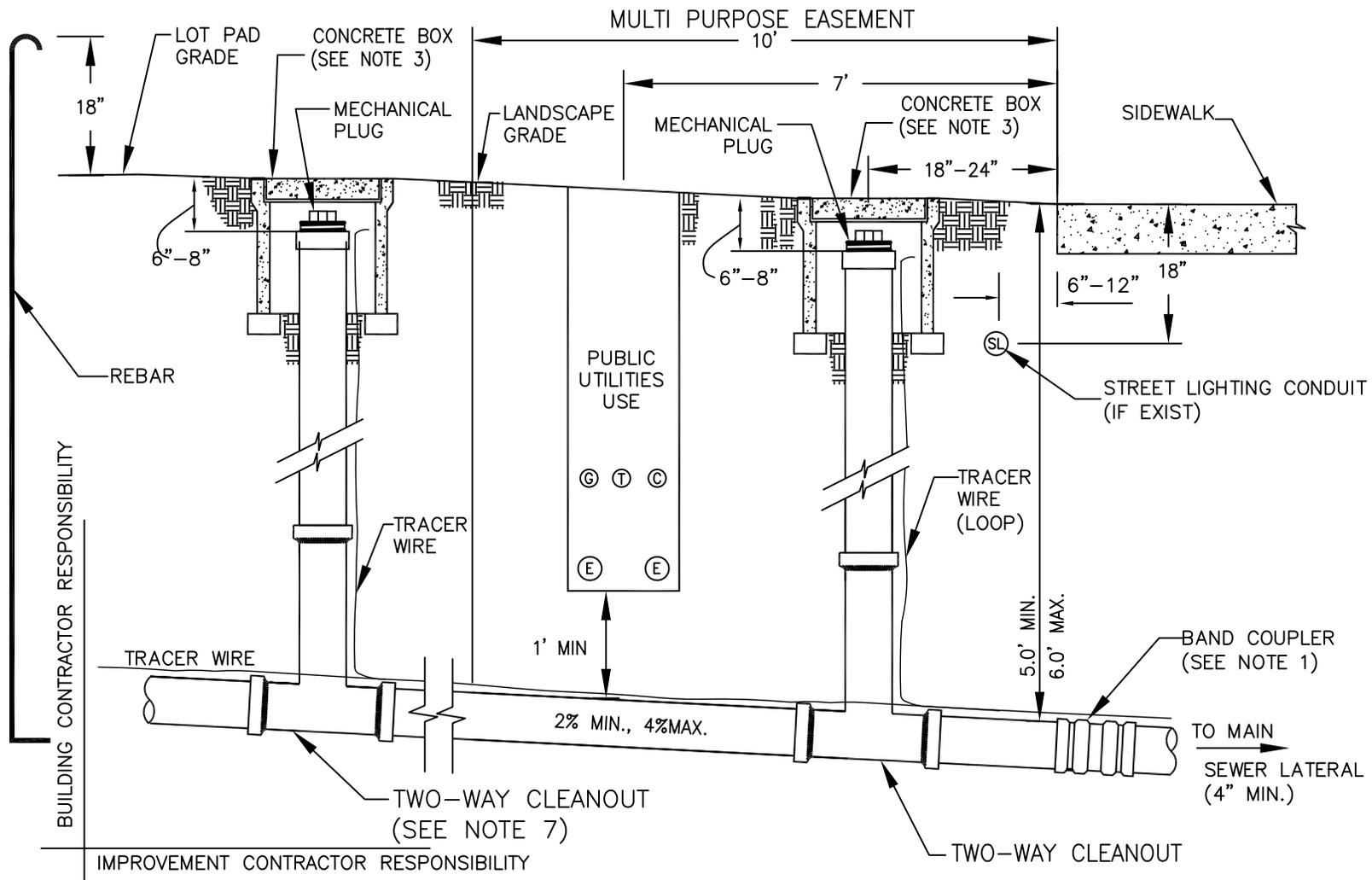
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PLATE

421



NOTES:

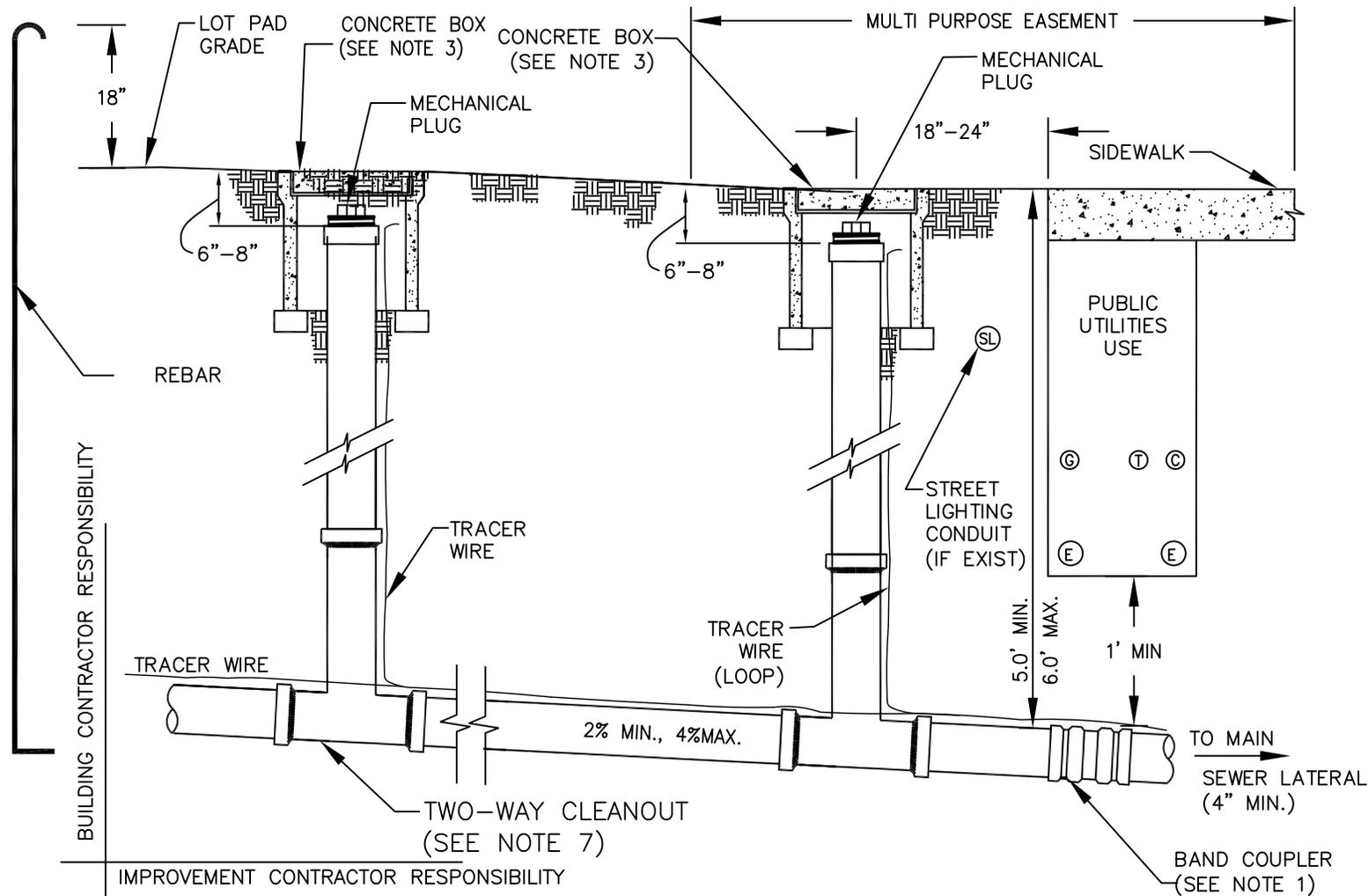
1. BAND COUPLER SHALL BE A FERNCO STAINLESS STEEL SHEAR COUPLER OR APPROVED EQUAL. BAND SHALL HAVE A MINIMUM OF 4 LOCKING BAND STRAPS.
2. CLEANOUT AND SERVICE MATERIALS SHALL BE ALL ABS OR ALL PVC. WYE AT PUBLIC MAIN SHALL BE SAME MATERIAL AS PUBLIC LINE.
3. CONCRETE BOX WITH METAL LID
 - A) IN LANDSCAPED AREAS USE CHRISTY G05 WITH METAL LID MARKED "SEWER", 2" ABOVE LANDSCAPE GRADE
 - B) AVOID PLACING CURB BOX IN DRIVEWAY.
 - C) IF PLACED IN PAVED AREAS, USE CHRISTY G05 TRAFFIC BOX MARKED "SEWER", IF APPROVED BY COUNTY ENGINEER.
 - D) BOXES SHALL BE PROVIDED WITHOUT KNOCK-OUTS.
4. IN AREAS WHERE SIDEWALK IS NOT MONOLITHIC WITH CURB, THE CLEANOUT SHALL BE LOCATED WITHIN 18 IN. TO 24 IN. FROM BACK OF CURB OR BACK OF STORM DRAIN WHEN THERE IS A STORM DRAIN CONFLICT.
5. JOINT TRENCH SHALL BE A MINIMUM OF 1 FOOT ABOVE THE SANITARY SEWER LATERAL.
6. CLEANOUT MATERIALS SHALL BE SAME DIAMETER AS LATERAL.
7. CLEANOUTS SHALL BE EVERY 100 FEET MAX. FROM PROPERTY LINE TO HOUSE.
8. PIPELINE SHALL BE INSPECTED PRIOR TO BACKFILL.
9. 12 GAUGE TRACER WIRE-DIRECT BURIAL-GREEN SHALL BE TAPED TO THE TOP OF THE PIPE FROM THE HOME TO THE STREET CONNECTION AND DAYLIGHT IN ALL CLEANOUT BOXES.



DEPARTMENT OF PUBLIC WORKS & FACILITIES

COUNTY OF PLACER

STANDARD SEWER LATERAL & CLEANOUT FOR JOINT TRENCH UNDER WALK



NOTES:

1. BAND COUPLER SHALL BE A FERNCO STAINLESS STEEL SHEAR COUPLER OR APPROVED EQUAL. BAND SHALL HAVE A MINIMUM OF 4 LOCKING BAND STRAPS.
2. CLEANOUT AND SERVICE MATERIALS SHALL BE ALL ABS OR ALL PVC. WYE AT PUBLIC MAIN SHALL BE SAME MATERIAL AS PUBLIC LINE.
3. CONCRETE BOX WITH METAL LID
 - A) IN LANDSCAPED AREAS USE CHRISTY G05 WITH METAL LID MARKED "SEWER", 2" ABOVE LANDSCAPE GRADE
 - B) AVOID PLACING CURB BOX IN DRIVEWAY.
 - C) IF PLACED IN PAVED AREAS, USE CHRISTY G05 TRAFFIC BOX MARKED "SEWER", IF APPROVED BY COUNTY ENGINEER.
 - D) BOXES SHALL BE PROVIDED WITHOUT KNOCK-OUTS.
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7. CLEANOUTS SHALL BE EVERY 100 FEET MAX. FROM PROPERTY LINE TO HOUSE.
8. PIPELINE SHALL BE INSPECTED PRIOR TO BACKFILL.
9. 12 GAUGE TRACER WIRE-DIRECT BURIAL-GREEN SHALL BE TAPED TO THE TOP OF THE PIPE FROM THE HOME TO THE STREET CONNECTION AND DAYLIGHT IN ALL CLEANOUT BOXES.

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SCALE:
NOT TO SCALE



PLATE
422



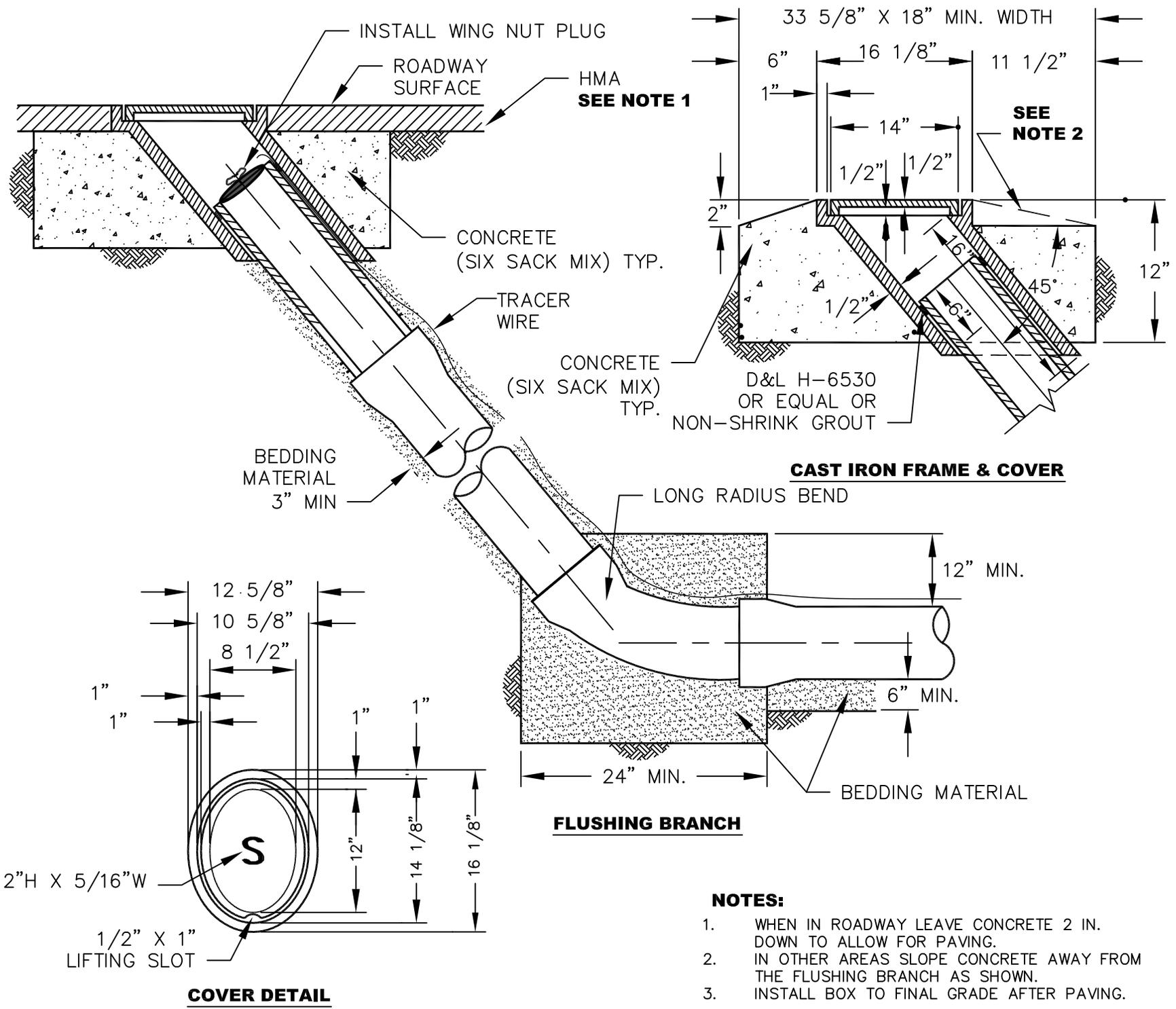
COUNTY OF PLACER
DEPARTMENT OF PUBLIC WORKS & FACILITIES

SEWER FLUSHING BRANCH STANDARD 45°

REVISED:
APR. 2018
SCALE:
NOT TO SCALE



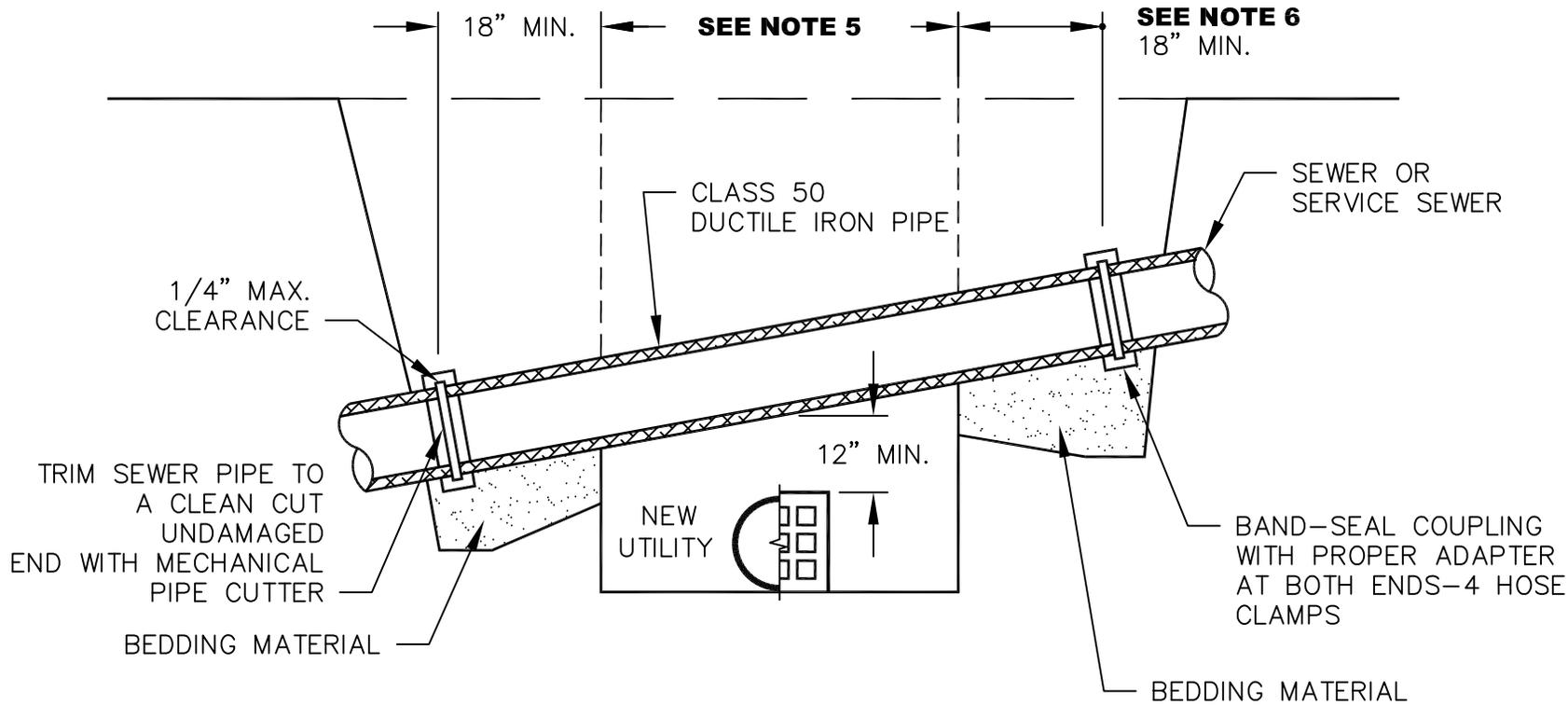
PLATE
423





COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

SEWER UTILITY CROSSING



NOTES:

1. INSIDE DIAMETER OF DUCTILE IRON PIPE TO BE SAME AS THE PIPE TO WHICH IT CONNECTS.
2. REPLACE WITH DUCTILE IRON PIPE, AS PER THIS DETAIL, WHENEVER A NEW UTILITY IS CONSTRUCTED BENEATH THE SEWER PIPE.
3. USE DUCTILE IRON PIPE, AS PER THIS DETAIL WHENEVER A NEW SEWER PIPE IS CONSTRUCTED ABOVE AN EXISTING UTILITY OR WHENEVER CLEARANCE IS LESS THAN 12".
4. ALTERATION OF SEWER GRADES WILL BE PERMITTED ONLY AFTER WRITTEN PERMISSION HAS BEEN RECEIVED FROM THE PLACER COUNTY DEPARTMENT OF PUBLIC WORKS AND FACILITIES, ENVIRONMENTAL ENGINEERING DIVISION.
5. WHENEVER THE SPAN, WHETHER CAUSED BY TRENCH WIDTH OR CROSSING ANGLE, OF THE DUCTILE IRON PIPE EXCEEDS 3 FT.-0 IN. PLACE BEDDING MATERIAL TO 6 IN. ABOVE THE DUCTILE IRON PIPE.
6. FOR CROSSINGS OF DOMESTIC WATER LINES, A MINIMUM OF 20 LF OF DIP SHALL BE USED AND CENTERED OVER CROSSING.
7. THIS DETAIL TO BE USED WHENEVER A SEWER LATERAL OR SEWER SERVICE CROSSES OVER ANY EXISTING OR PROPOSED UTILITY OR CULVERT AND WHEN A NEW UTILITY IS INSTALLED UNDER AN EXISTING SEWER.

REVISED:
APR. 2018

SCALE:
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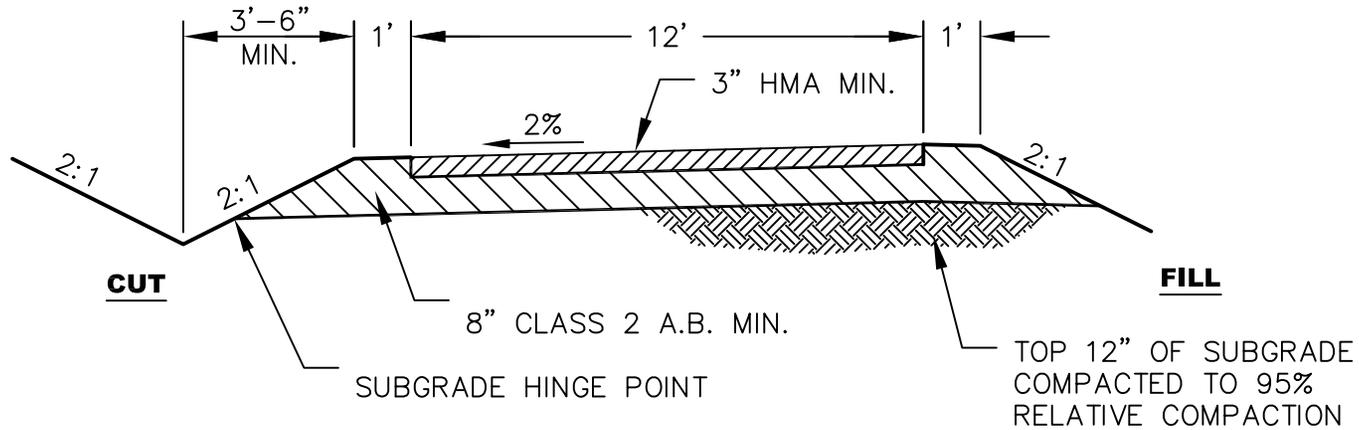


PLATE
424



COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

SEWER ACCESS ROAD



NOTES:

1. MAXIMUM LONGITUDINAL GRADE IS 12%.
2. DITCH FLOWLINE MUST BE A MINIMUM OF ONE FOOT BELOW SUBGRADE HINGE POINT. THE DITCH MAY BE REQUIRED TO BE LARGER DEPENDING ON THE DRAINAGE TO BE CONVEYED.
3. HMA PER ENCROACHMENT PERMIT REQUIREMENTS OR AS DIRECTED BY COUNTY.

DATE: APR. 2016
 SCALE: NOT TO SCALE

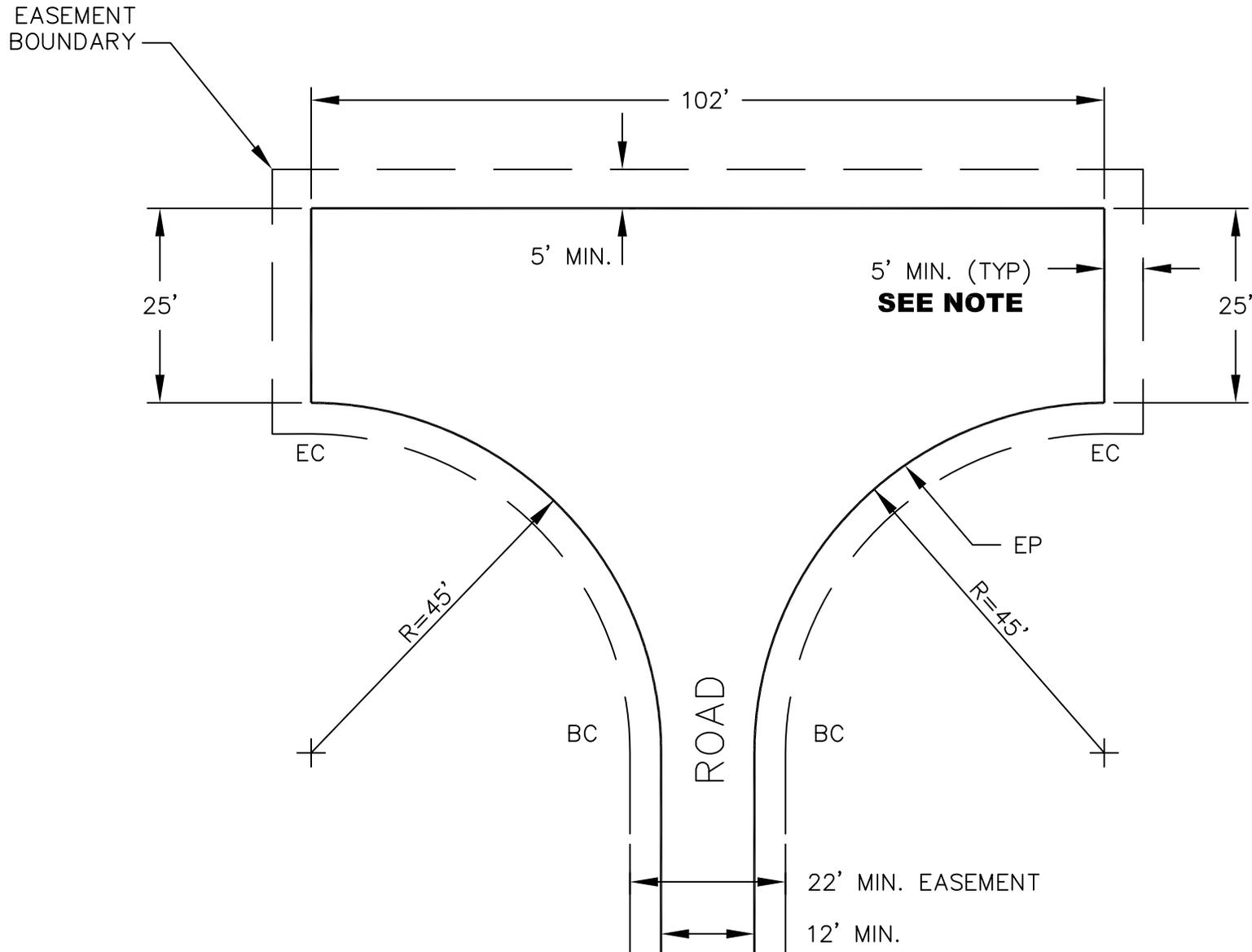


PLATE
425



COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

SEWER ACCESS ROAD HAMMERHEAD FOR TRUCKS (OPTION 1)



NOTE:

1. PROVIDE A 5' MINIMUM OVERHANG EASEMENT AREA

DATE: APR. 2016
 SCALE: NOT TO SCALE



PLATE
426



COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

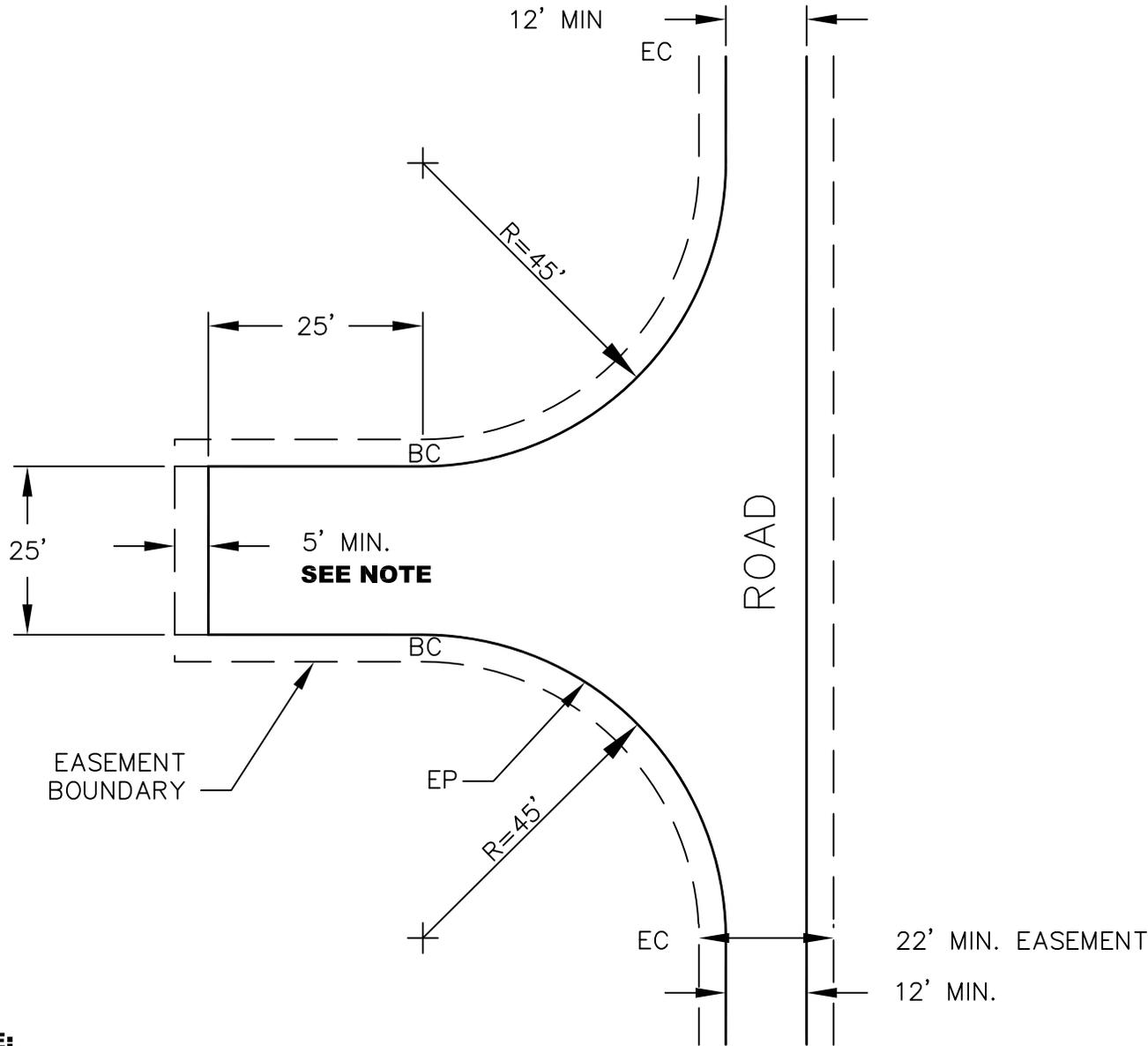
SEWER ACCESS ROAD HAMMERHEAD FOR TRUCKS (OPTION 2)

DATE: APR. 2016

SCALE: NOT TO SCALE



PLATE
427



NOTE:

1. PROVIDE A 5' MINIMUM OVERHANG EASEMENT AREA



DEPARTMENT OF PUBLIC WORKS & FACILITIES

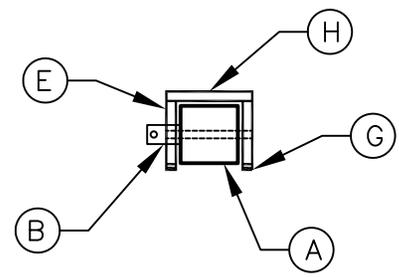
COUNTY OF PLACER

BOLLARD DETAILS

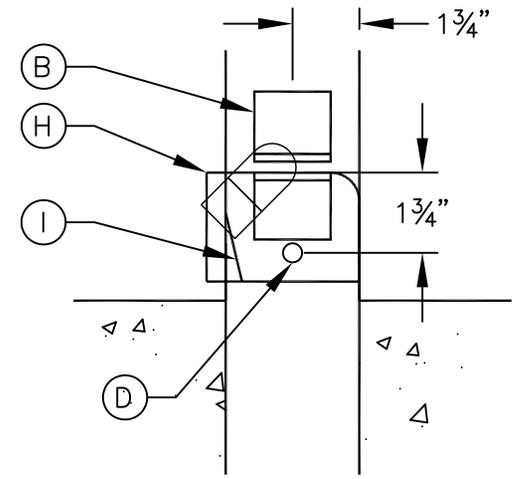
DATE: APR. 2016
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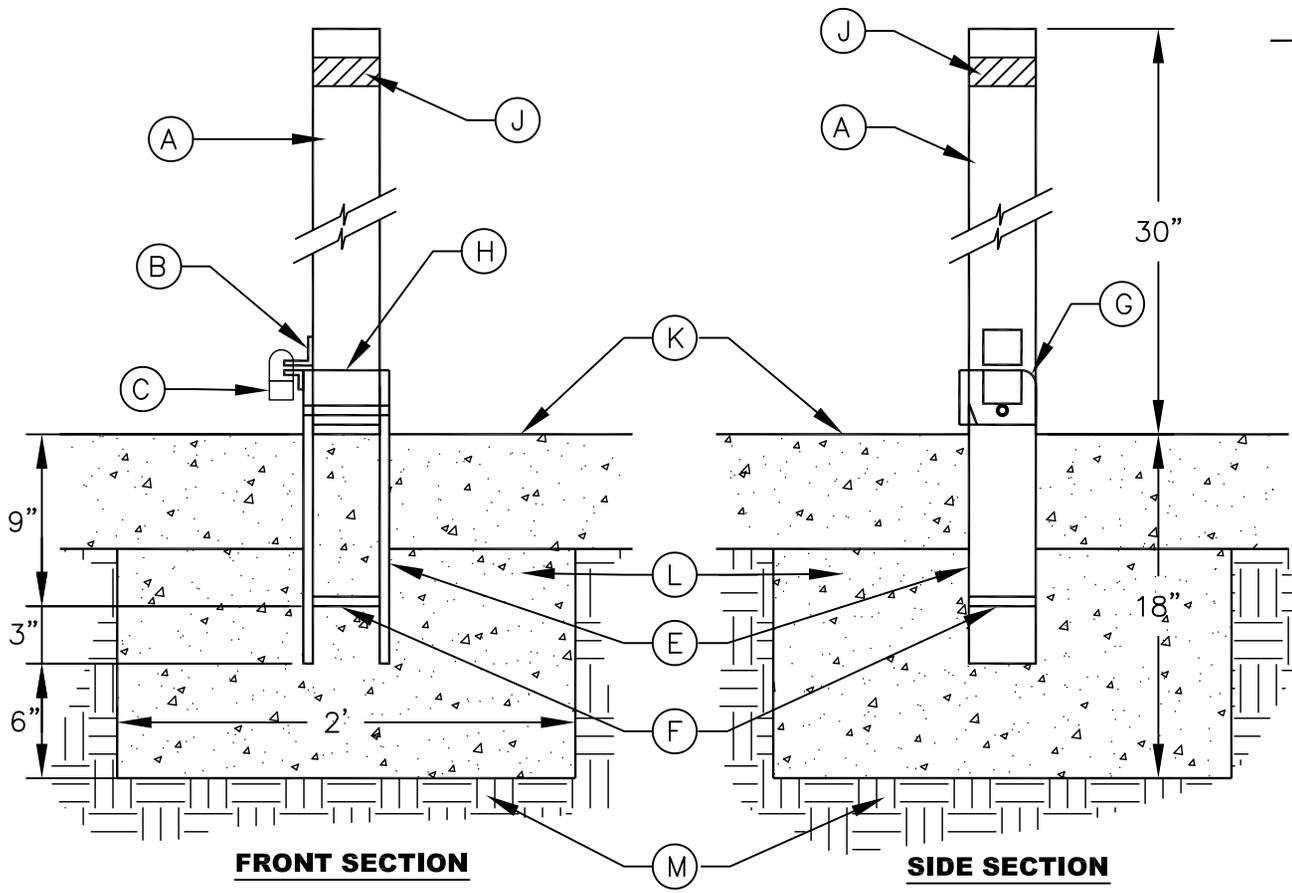
PLATE
428



PLAN VIEW



ENLARGEMENT



FRONT SECTION

SIDE SECTION

LEGEND:

- A. 3 1/2" O.D. 1/4" WALL STEEL TUBE WITH CAP WELDED ON TOP, 3/4" HOLES FOR SWIVEL ROD. EASE ALL EDGES OF STEEL TUBE.
- B. 1 1/2" X 1 1/2" ANGLE IRON (2) WELDED TO TUBE AND BASE. PLACE 1/2" HOLE DRILLED 1/4" FROM END OF ANGLE IRON ON TUBE
- C. PADLOCK TO BE PROVIDED BY FIRE DEPARTMENT AND/OR ENVIRONMENTAL ENGINEERING
- D. 5/8" DIA. STEEL SWIVEL ROD, WELD SWIVEL ROD TO SIDE PLATES.
- E. 3/8" X 16" X 4" STEEL BASE PLATE WITH 1 1/2" RADIUS CORNERS EASE ALL EDGES.
- F. 3/8" STEEL BRACE FILET WELD BOTH SIDES TO BASE PLATES
- G. 1 1/2" RADIUS CORNERS, TYP.
- H. 4" X 4" X 3/8" STEEL BACK PLATE WELDED TO BASE PLATE.
- I. FISH MOUTH GRIND AT BOTTOM BACK CORNER OF TUBE.
- J. PLACE 2" WHITE REFLECTIVE TAPE.
- K. CONCRETE PAVING (OR HMA)
- L. CONCRETE FOOTING
- M. COMPACTED SUBGRADE

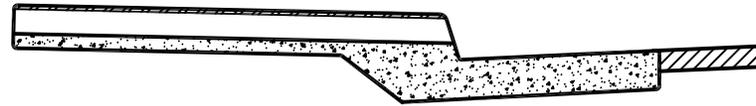
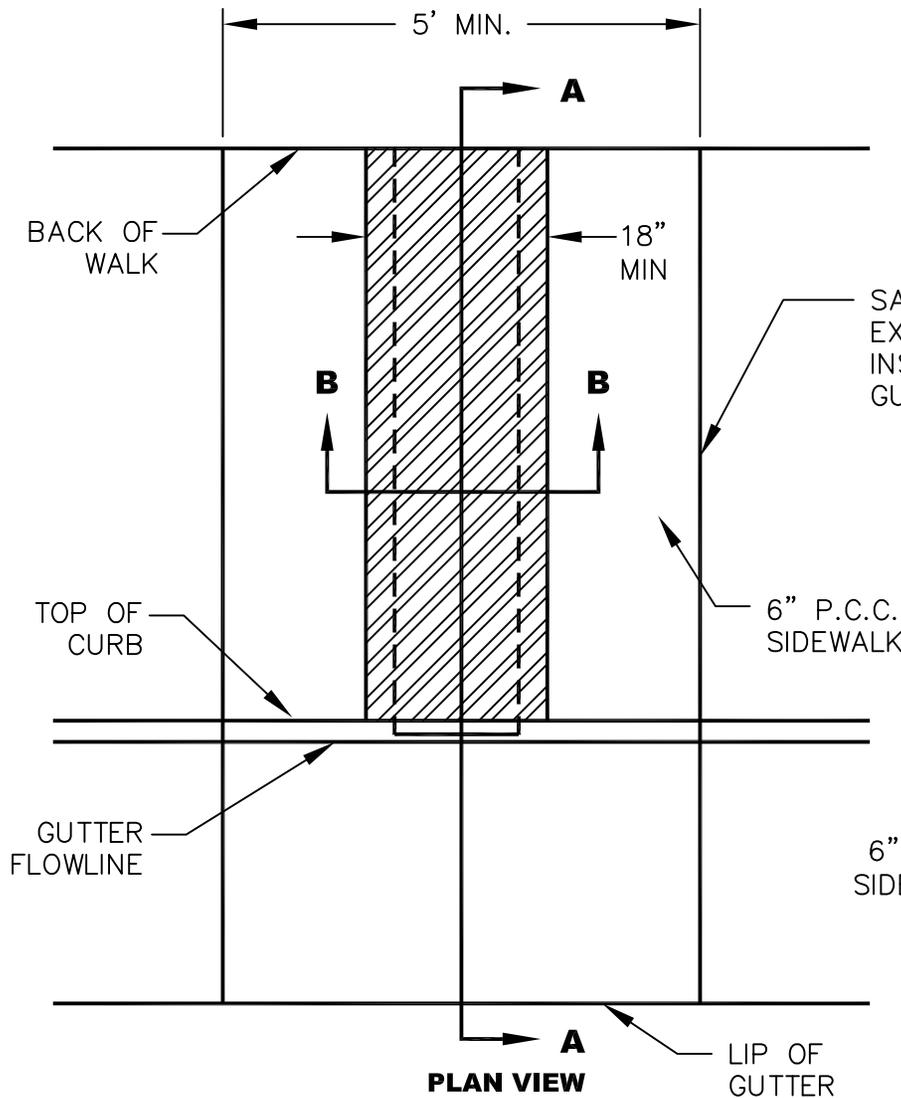
NOTES:

1. ALL TUBING SHALL BE BLACK STEEL PIPE.
2. ALL JOINTS SHALL BE WELDED IN ACCORDANCE WITH CA STATE STANDARD SPECIFICATIONS FOR WELDING STRUCTURAL STEEL AND GROUND SMOOTH.
3. ALL PARTS (EXCEPT PADLOCK) SHALL BE PAINTED WITH TWO COATS ZINC CHROMATE PRIMER AND TWO COATS EXTERIOR ENAMEL. COLOR: YELLOW
4. BOLLARD SHALL BE INSTALLED SUCH THAT IT LAYS FLAT WHEN FOLDED.
5. CONCRETE SHALL BE "MINOR CONCRETE".



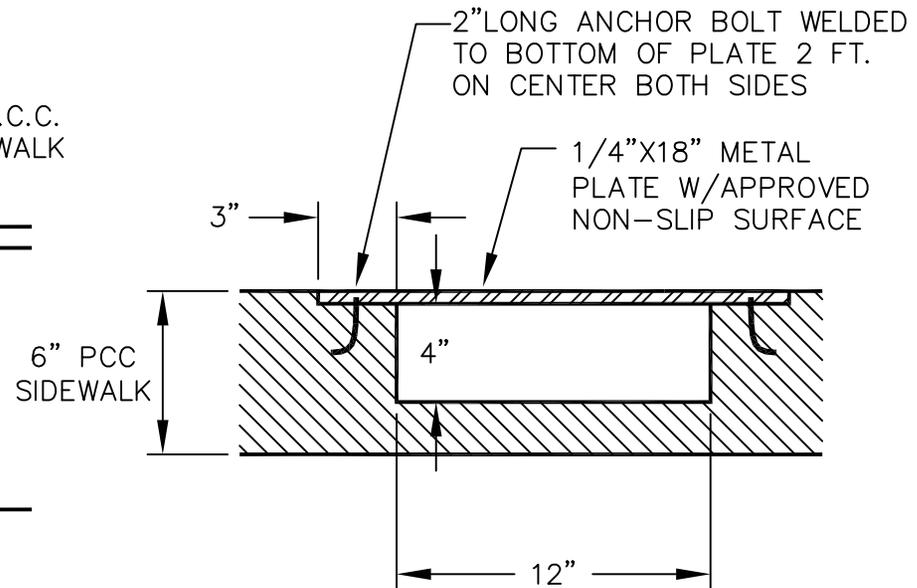
COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

STORM DRAIN UNDER SIDEWALK DRAIN



SECTION A-A

SAWCUT AT EXISTING EXPANSION JOINTS WHEN INSTALLING IN EXISTING CURB, GUTTER & SIDEWALK



SECTION B-B

NOTES:

1. GALVANIZE AFTER FABRICATION AND ASSEMBLY.
2. FOR INSTALLATION IN EXISTING SIDEWALK, SAWCUT AT EXISTING EXPANSION JOINTS AND RECONSTRUCT SIDEWALK.
3. ALLOWABLE ONLY WHEN DRAINAGE HAS BEEN ADEQUATELY TREATED FOR QUALITY ON SITE.
4. ALTERNATIVES MAY BE APPROVED BY THE ENGINEER.

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SCALE: NOT TO SCALE



PLATE
429



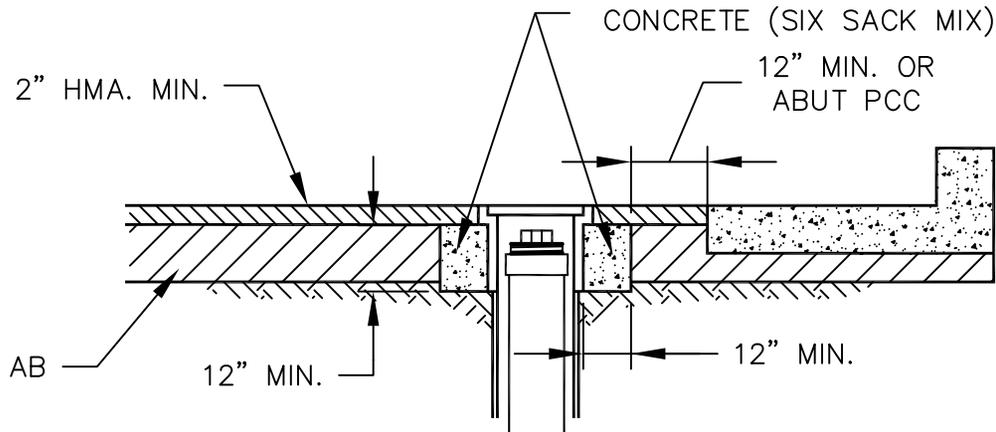
DEPARTMENT OF PUBLIC WORKS & FACILITIES
COUNTY OF PLACER

UTILITY BOXES

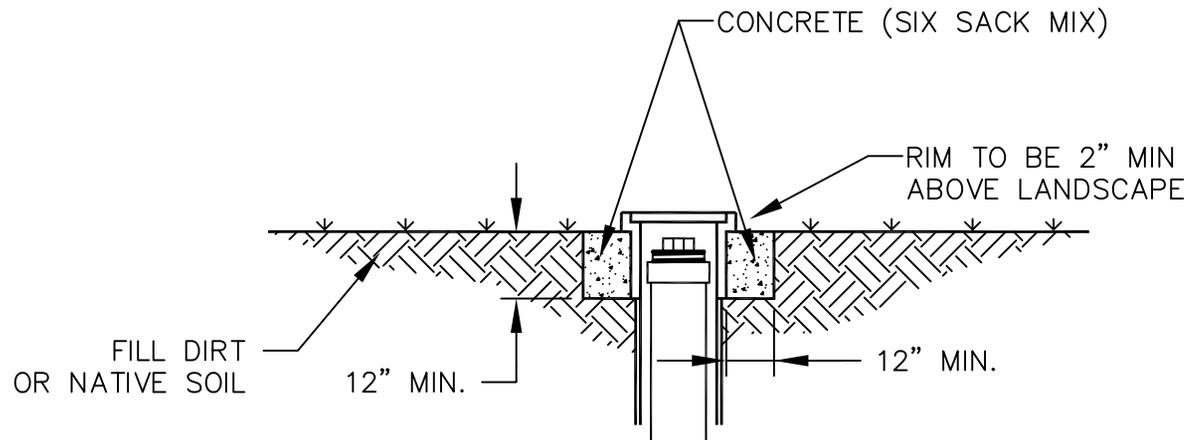
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APR. 2018
SCALE:
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PLATE
430



IN PAVEMENT



OUTSIDE PAVEMENT

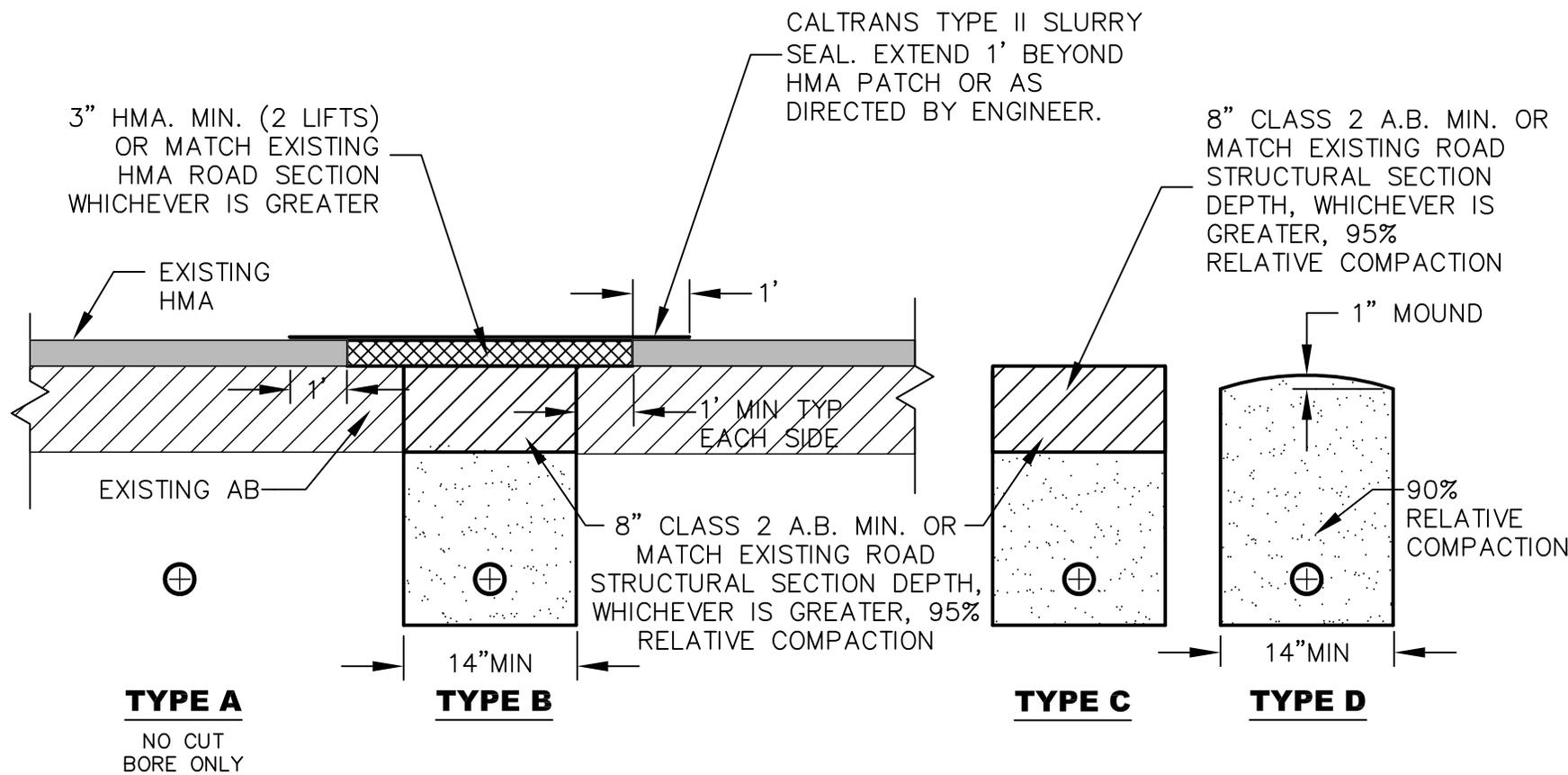
NOTES:

1. TOP OF BOX IN PAVEMENT TO BE RECESSED BY 0.5 IN. WHEN ABOVE 2,000 FT. ELEVATION.
2. BOXES TO BE RAISED AFTER FINAL PAVING.
3. BOX AND LID SHALL BE G05 WITH A METAL LID WITH "SEWER" WELDED ON THE LID.
4. BOXES GREATER THAN 12" OUTER DIAMETER WILL REQUIRE APPROVAL OF THE ENGINEER PRIOR TO INSTALLATION.
5. ALL RECTANGULAR UTILITY BOXES SHALL BE LOCATED OUTSIDE OF THE PAVEMENT AND NOT WITHIN TWO FEET OF A ROAD SIDE DITCH UNLESS APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
6. LOCATE OUTSIDE OF VEHICLE WHEEL PATH.
7. BOXES LOCATED OUTSIDE PAVEMENT SHALL BE 2" MINIMUM ABOVE THE OUTSIDE PAVEMENT MATERIAL.
8. METAL LIDS ARE REQUIRED ON ALL BOXES.



COUNTY OF PLACER
DEPARTMENT OF PUBLIC WORKS & FACILITIES

TRANSVERSE TRENCH RESURFACING SECTIONS



- TYPE A:** PAVEMENT SURFACES LESS THAN 5 YEARS OLD, SURFACE TREATMENTS LESS THAN 3 YEARS OLD, & MAJOR THOROUGHFARES WITH HIGH QUALITY RIDING SURFACES, BORING OR JACKING ONLY. NO PAVEMENT CUTTING PERMITTED.
- TYPE B:** PAVEMENT GREATER THAN 5 YEARS OLD
- TYPE C:** UNSURFACED ROAD SHOULDER OR OTHER AREAS SUBJECT TO TRAFFIC LOADS
- TYPE D:** OUTSIDE ROADWAY, NOT SUBJECT TO TRAFFIC LOADS

- NOTES:**
- SEE PLATES 433, 434, 435 AND PLACER COUNTY GENERAL SPECIFICATIONS SECTION 19 FOR APPLICABLE TRENCH, BACKFILL, AND COMPACTION REQUIREMENTS.
 - WHERE OPEN-GRADE OR OTHER SPECIALIZED HMA/SURFACE TREATMENT IS PRESENT, RESTORATION REQUIREMENTS WILL BE DETERMINED BY ENGINEER.
 - WHERE GEOTEXTILE FABRIC IS PRESENT, RESTORATION REQUIREMENTS WILL BE DETERMINED BY ENGINEER.

REVISED:
APR. 2018
SCALE:
NOT TO SCALE

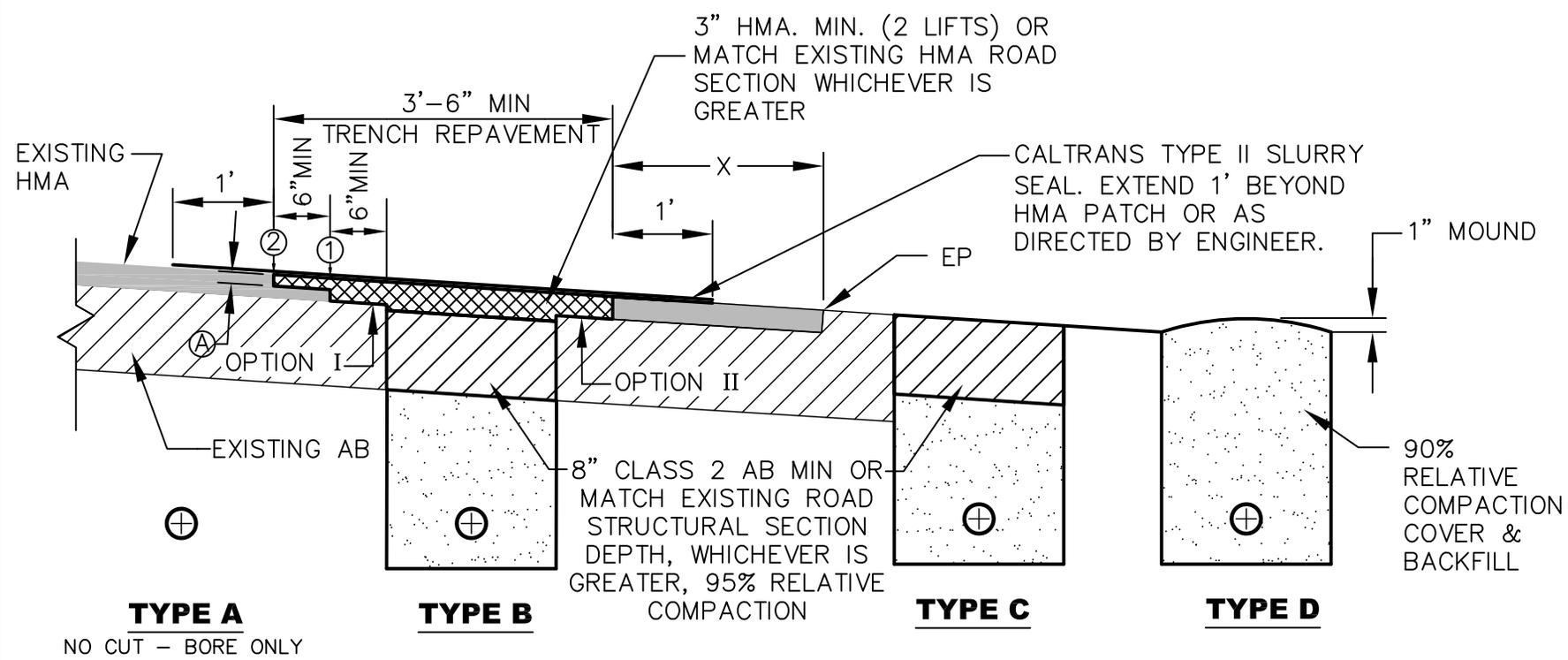


PLATE
431



COUNTY OF PLACER
 DEPARTMENT OF PUBLIC WORKS & FACILITIES

LONGITUDINAL TRENCH RESURFACING SECTIONS



TYPE A: PAVEMENT LESS THAN 5 YRS OLD, SURFACE TREATMENT LESS THAN 3 YRS OLD, AND MAJOR THOROUGHFARES WITH HIGH QUALITY RIDING SURFACES

1. BORING AND JACKING ONLY—NO PAVEMENT CUTTING UNLESS REQUESTED IN WRITING AND APPROVED IN WRITING BY THE DIRECTOR OF DPW.
2. RESTORATION SHALL BE AS DIRECTED BY THE ENGINEER AND MAY INCLUDE:
 - A. COMPLETE ROAD OVERLAY AFTER TRENCHING 0.2 FT. MIN. THICKNESS OR AS SPECIFIED ON THE PERMIT.
 - B. COMPLETE ROAD RECONSTRUCTION TO MATCH EXISTING.
3. ANY OTHER RESTORATION MUST BE REQUESTED IN WRITING AND APPROVED IN WRITING BY THE DIRECTOR OF PUBLIC WORKS.

TYPE B: PAVEMENT OLDER THAN 5 YEARS; OR SURFACE TREATMENT OLDER THAN 3 YRS

1. THE ENGINEER SHALL DETERMINE WHICH OPTION (I OR II) APPLIES.
2. IF USING OPTION I: TRENCH RESTORATION TO INCLUDE PLACEMENT OF NEW HMA USING OFFSET JOINT WITH MIN. 6" + 6" LAP EACH SIDE. GRIND DEPTH (A) TO BE 0.2' AT DISCRETION OF COUNTY WHERE EXISTING AC SECTION IS LESS THAN 3". NEW HMA SHALL BE PLACED IN TWO LIFTS. THE FIRST LIFT SHALL BE TO TOP OF OFFSET JOINT AT SAWCUT LINE (1) SECOND LIFT SHALL BE FULL WIDTH OF NEW AC TO GRIND LINE (2). COUNTY MAY REQUIRE PLACEMENT OF GEOTEXTILE FABRIC BETWEEN TWO AC LIFTS WHERE EXTENSIVE SURFACE CRACKS ARE PRESENT OR IF POOR SOIL CONDITIONS EXIST.
3. IF X<3 FT. FOR ALL TRENCHES REPAVE TO E.P.
4. SLURRY SEAL OR OTHER ASPHALT MATERIAL AS DIRECTED BY THE ENGINEER, MINIMUM OF 2 FT. EITHER SIDE OF TRENCH LIMITS, IF X< 5 FT. SEAL TO E.P. A MINIMUM OF ONE FOOT BEYOND THE SAWCUT/GRIND LIMITS AND/OR LIMITS OF DISTURBANCE.
5. DAMAGE TO THE STRUCTURAL SECTION OR THE PAVEMENT SURFACE RESULTING FROM WORK UNDER THIS PERMIT SHALL BE RESTORED BY THE PERMITTEE TO EQUAL OR BETTER CONDITIONS AS DIRECTED BY THE COUNTY. EXTENSIVE DAMAGE MAY REQUIRE RESTORATION VIA CREATION OF A NEW STRUCTURAL SECTION.
6. IF OPEN GRADE OR OTHER SPECIALIZED HMA/SURFACE TREATMENT IS PRESENT, RESTORATION REQUIREMENTS WILL BE DETERMINED BY ENGINEER.
7. PAVEMENT REPAIR JOINTS SHALL BE LOCATED OUTSIDE OF VEHICLE WHEEL PATH.
8. WHERE GEOTEXTILE FABRIC IS PRESENT, RESTORATION REQUIREMENTS WILL BE DETERMINED BY ENGINEER.
9. SEE PLATES 433-435 AND PLACER COUNTY GENERAL SPECS SECTION 19 FOR TRENCH, BACKFILL, AND COMPACTION REQUIREMENTS.

TYPE C: UNSURFACED ROAD SHOULDER OR OTHER AREAS SUBJECT TO TRAFFIC LOADS

TYPE D: OUTSIDE ROADWAY PRISM, NOT SUBJECT TO TRAFFIC

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 APR. 2018
 SCALE:
 NOT TO SCALE



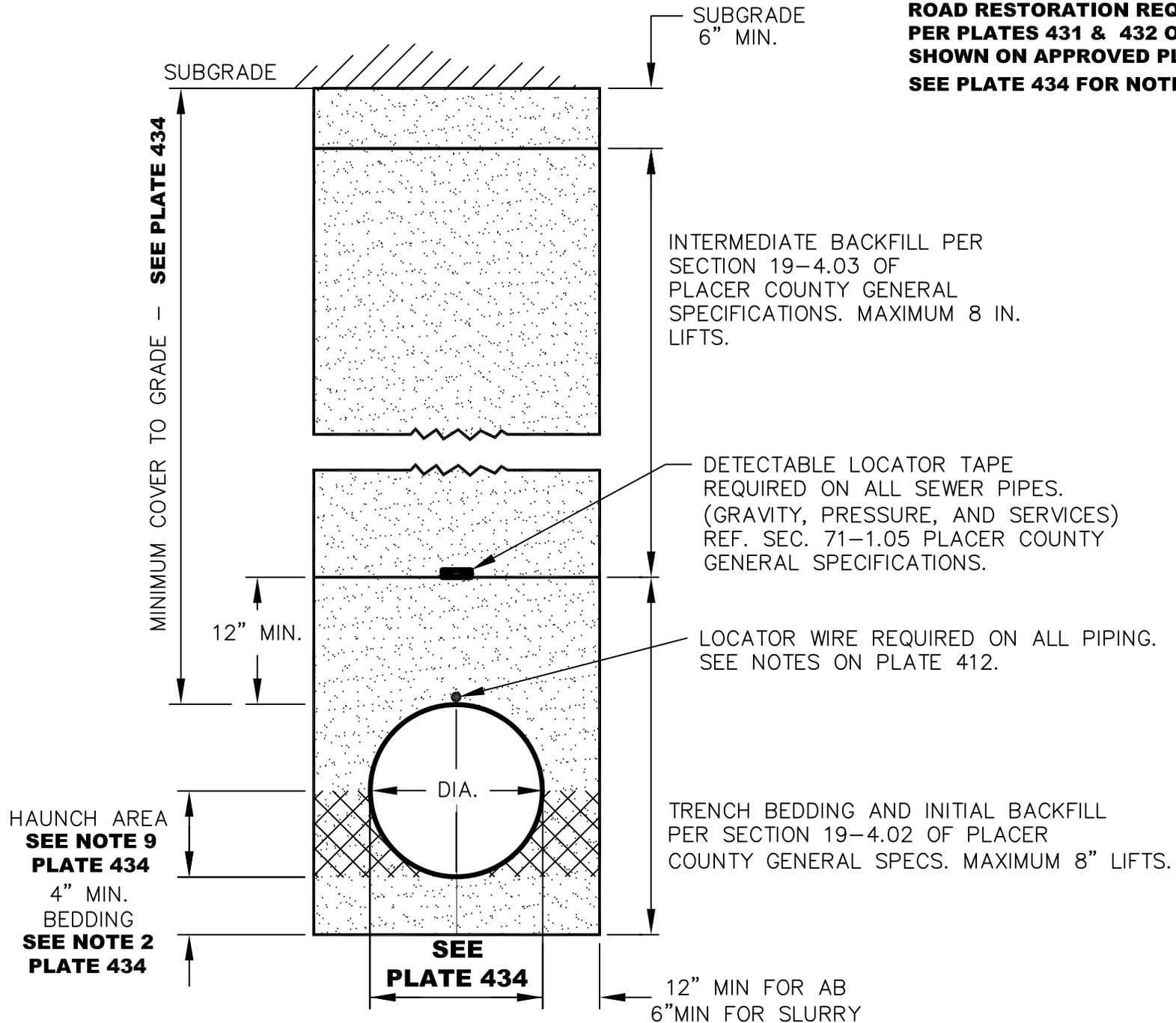
PLATE
432



COUNTY OF PLACER
DEPARTMENT OF PUBLIC WORKS & FACILITIES

TRENCH EXCAVATION AND BACKFILL

**ROAD RESTORATION REQUIREMENTS
PER PLATES 431 & 432 OR AS
SHOWN ON APPROVED PLANS.
SEE PLATE 434 FOR NOTES.**



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PLATE
433



COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

TRENCH EXCAVATION AND BACKFILL - NOTES

NOTES:

1. UNLESS OTHERWISE APPROVED, MINIMUM COVERAGE FROM TOP OF PIPE TO FINISH GRADE SHALL BE AS FOLLOWS:

SEWER	36 IN.
WATER	30 IN.
CULVERTS	18 IN.
STORM DRAINS	18 IN.
OTHER UTILITIES	30 IN.

2. IN WET OR ROCKY MATERIAL, THE DEPTH OF TRENCH BEDDING SHALL BE INCREASED TO THE LARGER OF EITHER 6 IN. OR 1/4 DIA.

3. FOR CULVERTS/STORM DRAINS, THE MINIMUM DISTANCE BETWEEN THE SIDE OF THE TRENCH AND THE SIDE OF THE PIPE SHALL BE 12 IN.

4. MINIMUM COMPACTION REQUIREMENTS (SEE SECTION 19-4.04 OF THE PLACER COUNTY GENERAL SPECIFICATIONS).
 - A. WITHIN ROADWAY PRISM-

BEDDING/INITIAL BACKFILL	
SUBGRADE	95%
INTERMEDIATE BACKFILL	92%

 - B. OUTSIDE ROADWAY PRISM-

BEDDING/INITIAL BACKFILL	90%
INTERMEDIATE BACKFILL	90%

5. IN AREAS WITH MINIMUM COVER, INTERMEDIATE BACKFILL SHALL BE CLASS 2 AGGREGATE BASE.

6. IN AREAS OF NATURAL VEGETATION OR LANDSCAPING, REMOVE TOP 12 IN. OF MATERIAL, STOCKPILE & REPLACE IN A MOUND PER PLATE 431, TYPE D AND PLATE 432, TYPE D.

7. ALL LANDSCAPING CONDUITS WITHIN THE ROADWAY PRISM AND/OR TRAFFIC AREAS MUST HAVE MINIMUM OF 30 INCHES COVER. MINIMUM COVER WITHIN COUNTY R/W BUT OUTSIDE THE ROADWAY AND TRAFFIC AREAS SHALL BE AS FOLLOWS:

LOW VOLTAGE ELECTRICAL CONDUITS	24 IN. MIN
PRESSURIZED WATERLINES	24 IN. MIN
NONPRESSURIZED (DISCHARGED) LATERALS	12 IN. MIN

8. COMPACTION TESTING WITHIN THE PIPE ZONE (BOTTOM OF TRENCH TO 12 IN. ABOVE CONDUIT(S)) SHALL BE PERFORMED BY TESTING LAB AS APPROVED BY THE COUNTY OR DONE BY THE COUNTY AND REIMBURSED BY THE APPLICABLE DEVELOPER OR UTILITY COMPANY.

9. SHOVEL SLICE BEDDING MATERIAL UNIFORMLY UNDER PIPE IN HAUNCH AREA. SHOVEL SLICING SHALL BE COMPLETED BEFORE THE BEDDING IS BROUGHT UP TO THE PIPE SPRINGLINE AND PREFERABLY WHEN IT IS NO HIGHER THAN THE QUARTER POINT OF THE PIPE.

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PLATE
434



COVER REQUIREMENTS

CLASS	CONCRETE PIPE					CMP UNSTRUTTED					VCP EXTRA STRENGTH		
	C-14		REINFORCED					16 GA	14 GA	12 GA		10 GA	8 GA
DIA	SS	ES	I	II	III	IV	V						
10	13	30	NOT PERMITTED									30	
12	12	26		8	12	30			60	80			26
15	12	26		10	15	35			50	70			26
18	12	29		11	16	38			40	60	100		29
21	12	29		12	17	39			35	50	80	100	29
24	12	24		12	18	39			17	47	72	82	24
27				13	19	39							19
30				14	19	38			17*	32	47	72	19
33				14	20	38							20
36				13	17	27	64		13*	18	33	48	
42			14	18	29	62			18*	28	38	100	
48			15	19	30	60			16*	24	29	39	
54			16	20	31	58			14*	20	25	35	
60			14	16	21	31	57		12*	17*	20	30	
66			15	17	22	32	56			14*	20	25	
72			15	18	23	33	56			7*	16	21	

MAXIMUM ALLOWABLE COVER - DRAINAGE PIPES

MEASURED FINISH GRADE TO BOTTOM OF TRENCH IN FEET
* ONLY ON MINOR STREETS AND UNTRAVELED AREAS

LEGEND:
SS = SINGLE STRENGTH
ES = EXTRA STRENGTH

- NOTES:
1. CONCRETE PIPE SHALL CONFORM TO ASTM C-76 57-T OR C-14.
 2. VITRIFIED CLAY PIPE SHALL BE EXTRA STRENGTH AND CONFORM TO ASTM C-278, CL 2.
 3. ALL DEPTHS SHOWN FOR FLEXIBLE PAVEMENT ONLY
 4. MIN. COVER ON VCP EXTRA STRENGTH SHALL CONFORM TO THAT OF CONCRETE PIPE CLASS 3.
 5. 12 IN. MIN. COVER ON CONCRETE PIPE OUTSIDE STREET AREAS.
 6. PIPES SHALL NOT EXTEND INTO ROAD STRUCTURAL SECTIONS UNLESS SPECIFICALLY APPROVED BY THE ENGINEER.

THICKNESS	GAGE NO.					
	22	20	18	16	14	12
UNCOATED (in)	0.0299	0.0359	0.0478	0.0598	0.0747	0.1046
GALVANIZED(in)	0.034	0.040	0.052	0.064	0.079	0.109
GALVANIZED(mm)	0.762	1.02	0.32	1.63	2.01	2.77
	10	8	7	5	3	1
UNCOATED (in)	0.1345	0.1644	0.1838	0.2145	0.2451	0.2758
GALVANIZED(in)	0.138	0.168	0.188	0.218	0.249	0.280
GALVANIZED(mm)	3.51	4.27	4.78	5.54	6.32	7.11

CLASS	CONCRETE PIPE							CORRUGATED METAL PIPE ALL SIZES H-20 LOADING	CORRUGATED HIGH DENSITY POLYETHYLENE DUAL WALL SMOOTH INTERIOR ONLY
	C-14		REINFORCED						
DIA	SS	ES	I	II	III	IV	V		
ALL SIZES	27"	24"	27"	24"	18"	12"	12"	18"	18"

MINIMUM ALLOWABLE COVER - DRAINAGE PIPES

MEASURED SURFACE TO TOP OF PIPE IN INCHES

CORRUGATED HIGH DENSITY POLYETHYLENE PIPE DUAL WALL SMOOTH INTERIOR ONLY

DIA (INCHES)	MIN. COVER (INCHES)	MAX. FILL (HEIGHT - FEET)
12	18	23
15	18	22
18	18	22
24	18	24
30	18	23
36	18	26

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DEPARTMENT OF PUBLIC WORKS & FACILITIES

COUNTY OF PLACER

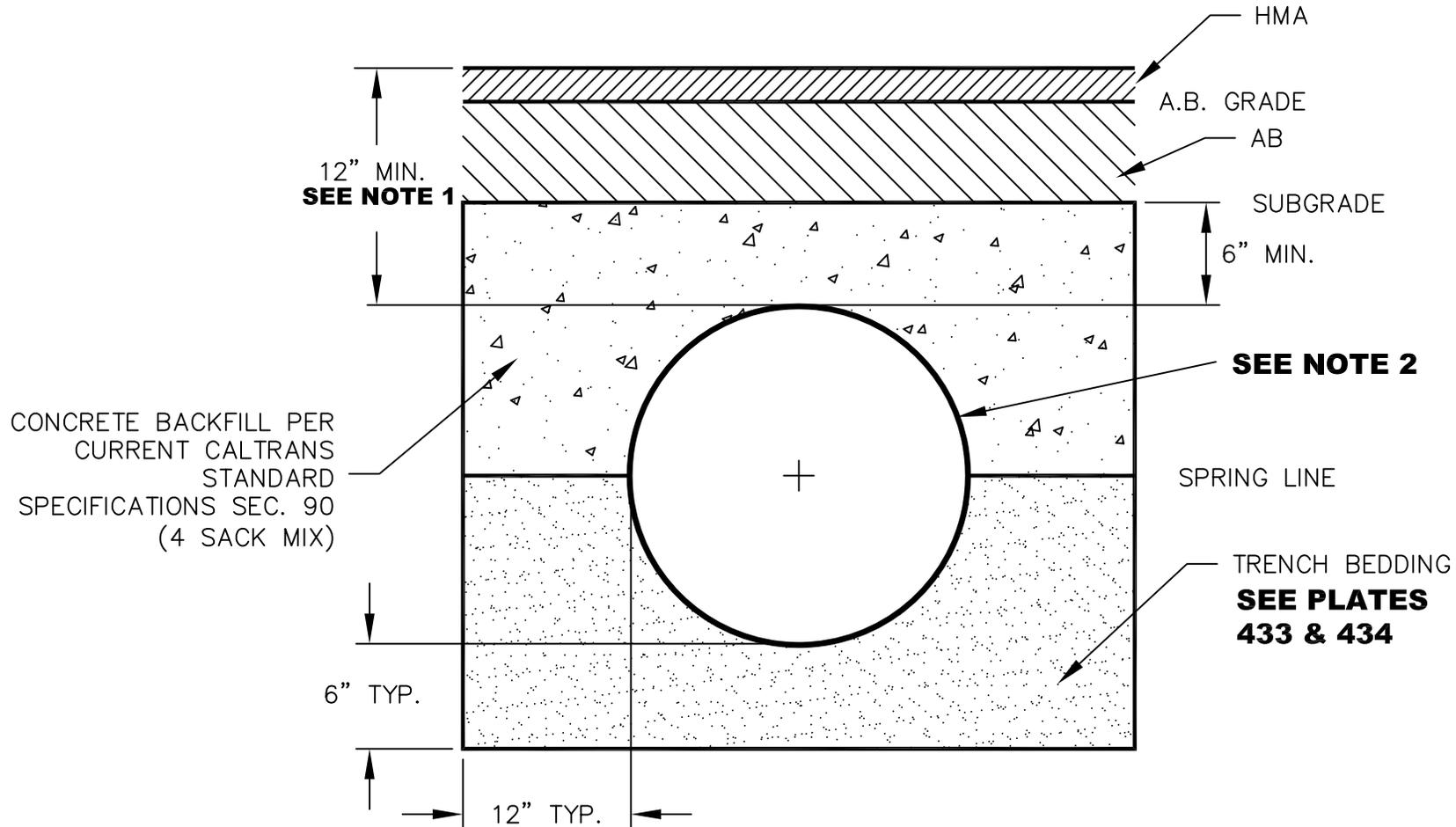
CONCRETE CAP FOR PIPES HAVING LESS THAN MINIMUM COVER

DATE:
APR. 2016

SCALE:
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PLATE
436



NOTES:

1. PROVIDE MINIMUM COVER TO ACCOMMODATE STRUCTURAL SECTION REQUIRED PER THE COUNTY.
2. IF CONCRETE BONDING TO PIPE IS A CONCERN, WRAP ENTIRE PIPE WITH MINIMUM 10 MIL POLYETHYLENE SHEETING TO PREVENT BONDING.
3. CONCRETE CAP SHALL NOT BE ALLOWED WITHIN 5' OF A FLEX JOINT IN A SEWER PIPELINE.



DEPARTMENT OF PUBLIC WORKS & FACILITIES

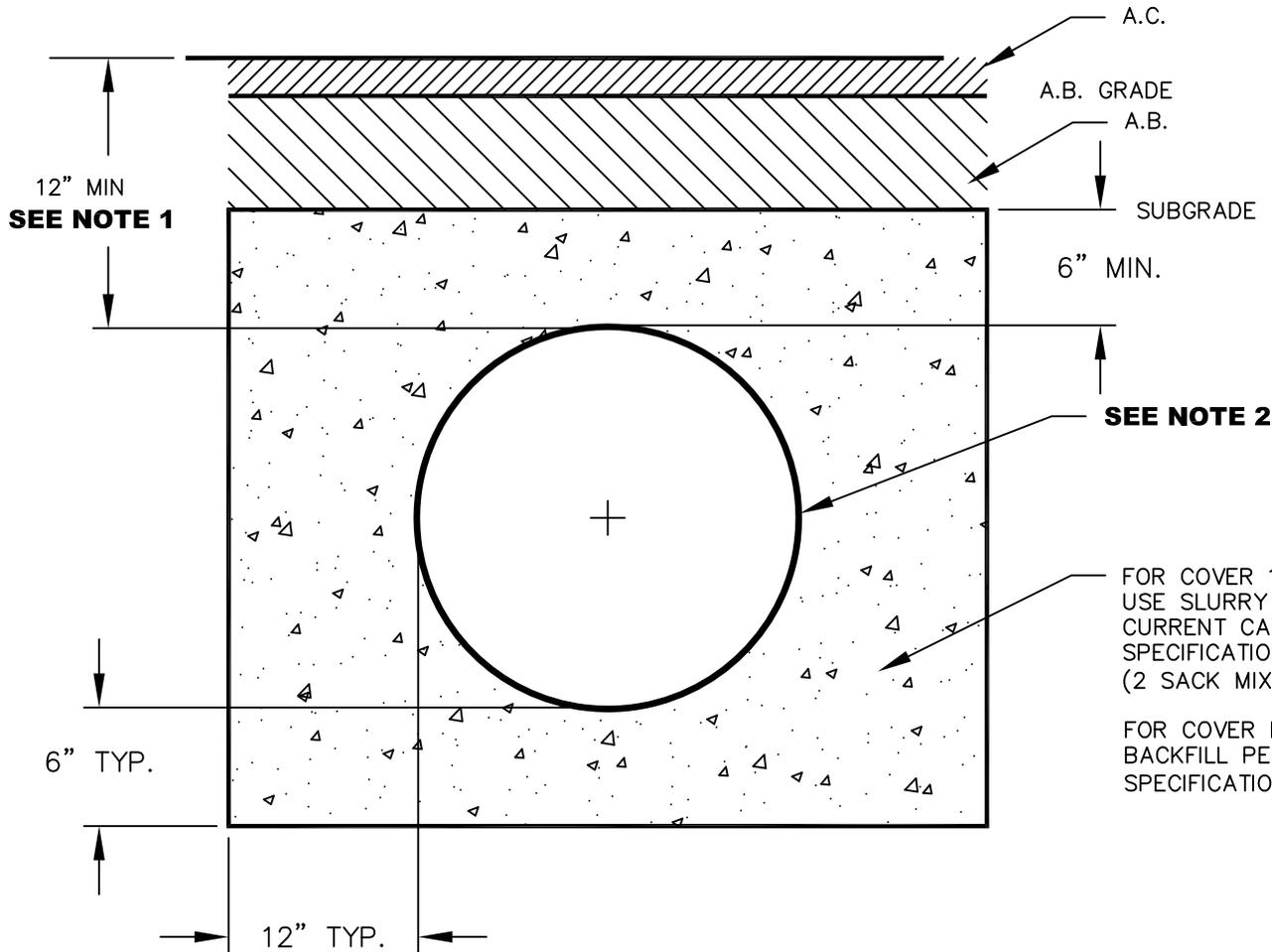
COUNTY OF PLACER

CONCRETE ENCASEMENT FOR PIPES

DATE:
APR. 2016
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PLATE
437



FOR COVER 12" OR GREATER,
USE SLURRY CEMENT BACKFILL PER
CURRENT CALTRANS STANDARD
SPECIFICATIONS SEC. 19-3.02D
(2 SACK MIX) OR COMPACTABLE CONCRETE.

FOR COVER LESS THAN 12", USE CONCRETE
BACKFILL PER CURRENT CALTRANS STANDARD
SPECIFICATIONS SEC. 90 (4 SACK MIX).

NOTES:

1. PROVIDE MINIMUM COVER SUCH THAT FULL DESIGN A.C. LAYER PROVIDED AND AT LEAST 0.20 FT. OF A.B. TO ALLOW FOR GROUNDWATER FLOW OVER PIPE (i.e. TO PREVENT HYDROSTATIC PRESSURE BUILD-UP UNDER PAVEMENT).
2. IF CONCRETE BONDING TO PIPE IS A CONCERN, WRAP ENTIRE PIPE WITH MINIMUM 10 MIL PLASTIC TO PREVENT BONDING.
3. CONCRETE ENCASEMENT SHALL NOT BE ALLOWED WITHIN 5' OF A FLEX JOINT IN A SEWER PIPELINE.



COUNTY OF PLACER DEPARTMENT OF PUBLIC WORKS & FACILITIES

TRASH RACK 48" PIPE & SMALLER

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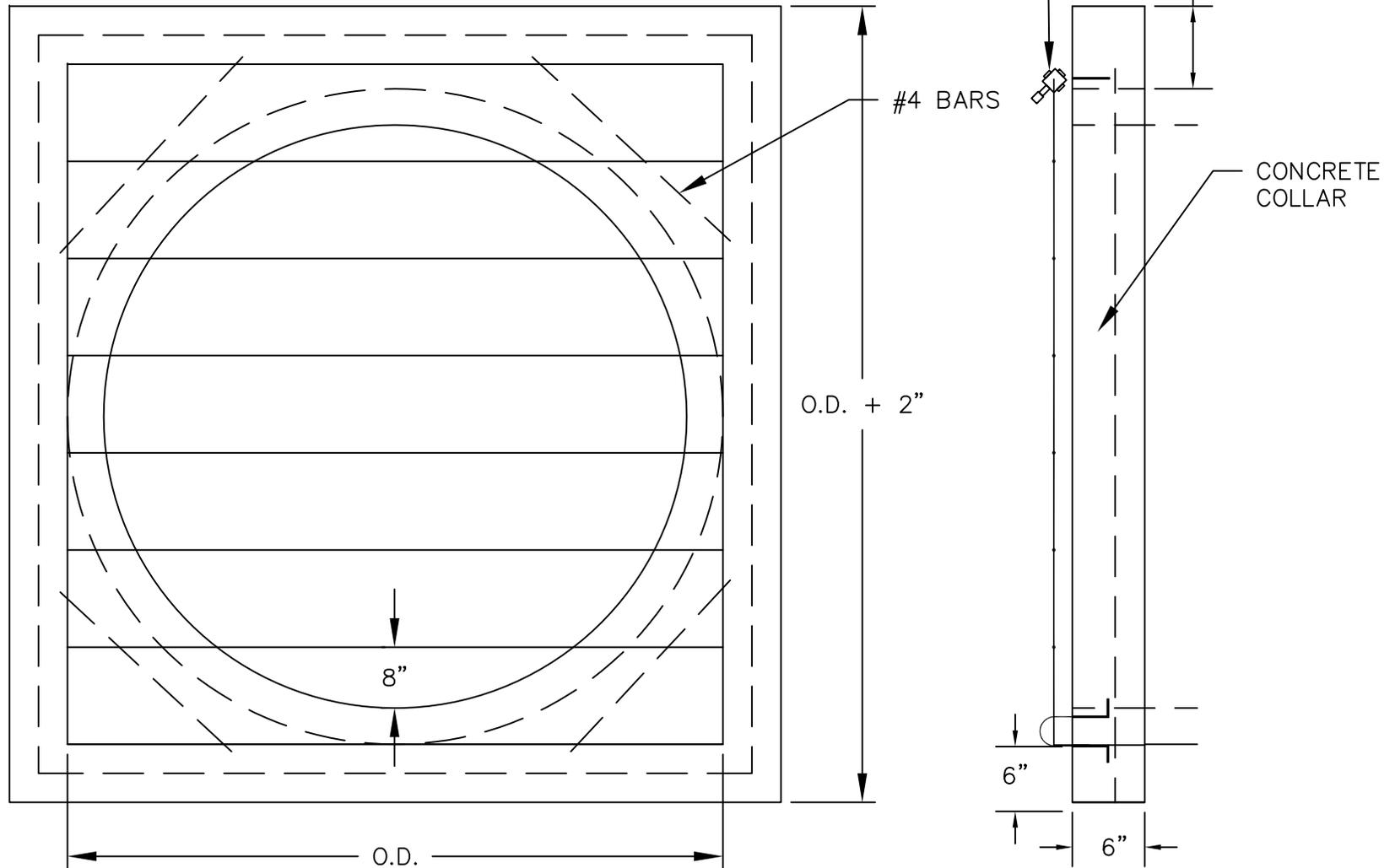


PLATE
438

NOTES:

1. ENTIRE RACK TO BE WELDED REINFORCING STEEL OR ROUND BARS OF EQUAL DIAMETER WITH HORIZONTAL BARS BEING 8" CENTER TO CENTER.
2. USE 5 SACK MIX CONCRETE.
3. ROOM SHALL BE PROVIDED DOWNSTREAM TO LAY RACK FLAT.
4. REFER TO SECTION 5.09(1)(g) IN THE LAND DEVELOPMENT MANUAL.

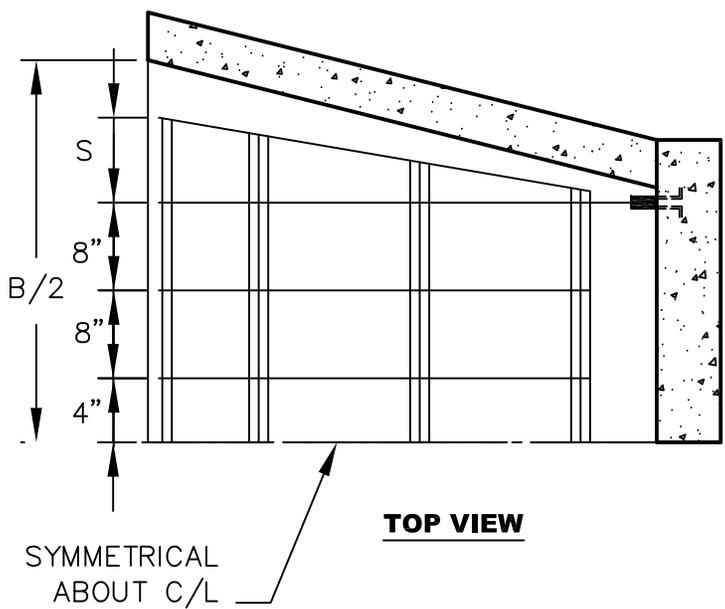
PIPE SIZE	24"	27"	30"	33"	36"	42"	48"
BAR SIZE	#4	#5	#5	#6	#6	#7	#7



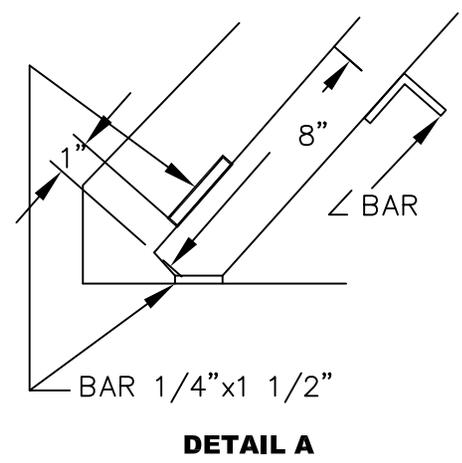
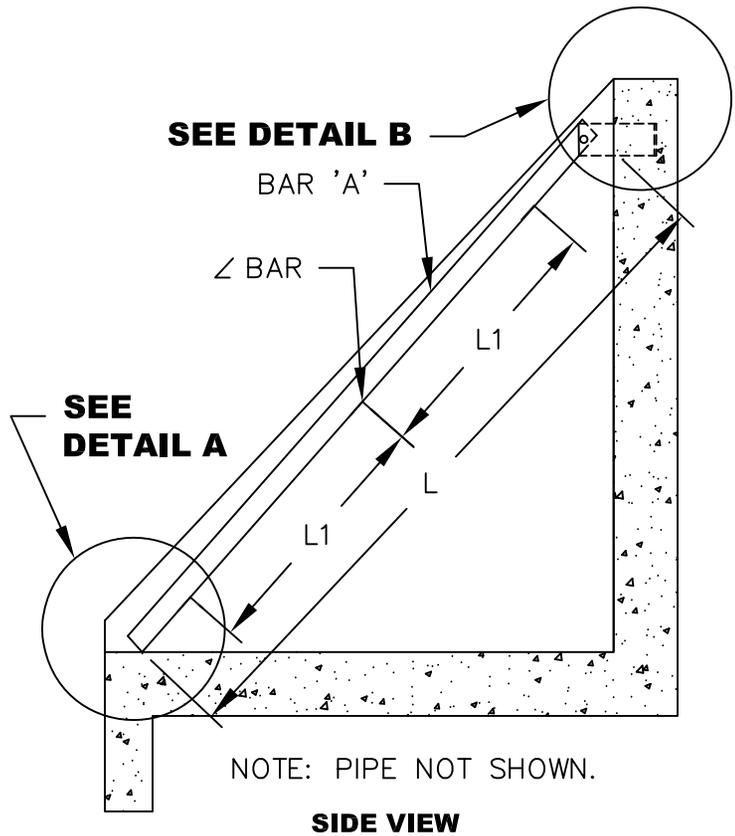
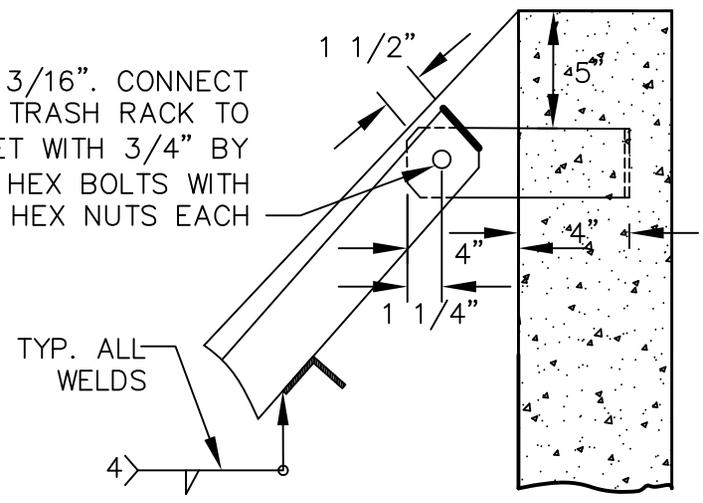


COUNTY OF PLACER
 DEPARTMENT OF PUBLIC WORKS & FACILITIES

TRASH RACK 54" PIPE & LARGER



DRILL 13/16". CONNECT
 TRASH RACK TO
 BRACKET WITH 3/4" BY
 2-3/4" HEX BOLTS WITH
 TWO HEX NUTS EACH



NOTES:

1. THIS TRASH RACK MAY BE USED WITH PIPE INLET STRUCTURES MATERIAL TO CONFORM TO ASTM DESIGNATION A-36.
2. 'S' MAY VARY WITH 'B'. SEE PLATE U-35.
3. ALL FILLET WELDS TO BE 3/16".
4. 3 HINGES REQUIRED.

TRASH RACK DIMENSIONS

DIA.	NUMBER & SIZE		L	L1	S	H
	BAR A	∠ BAR				
54"	10- $\frac{3}{8}$ X3	4-3X3X $\frac{1}{4}$	7'-9"	2'-1 $\frac{1}{2}$ "	10 $\frac{1}{2}$ "	5'-8"
60"	11- $\frac{3}{8}$ X3 $\frac{1}{2}$	4-3X3X $\frac{1}{4}$	8'-5"	2'-4"	11"	6'-2"

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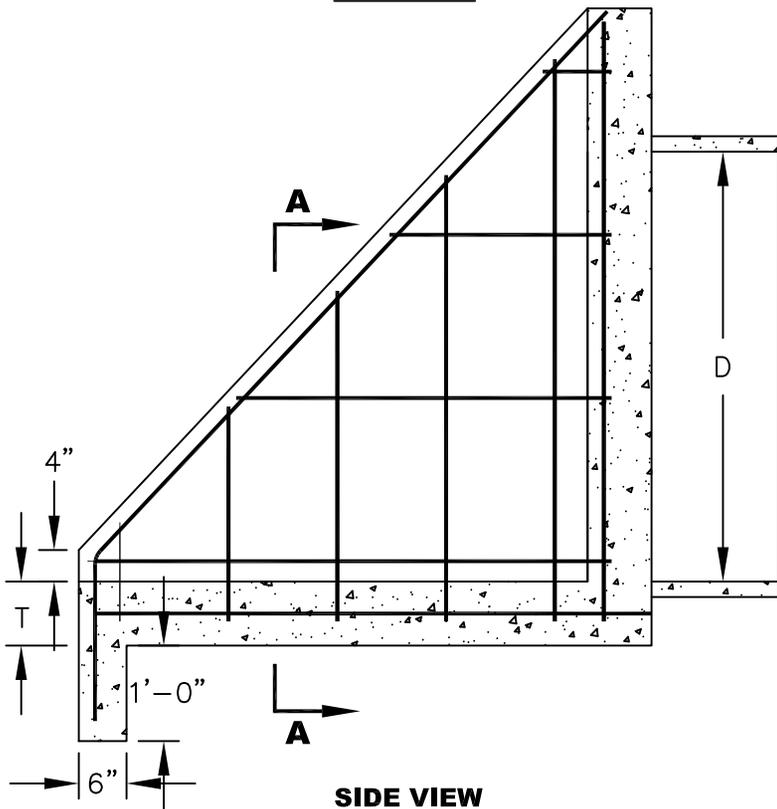
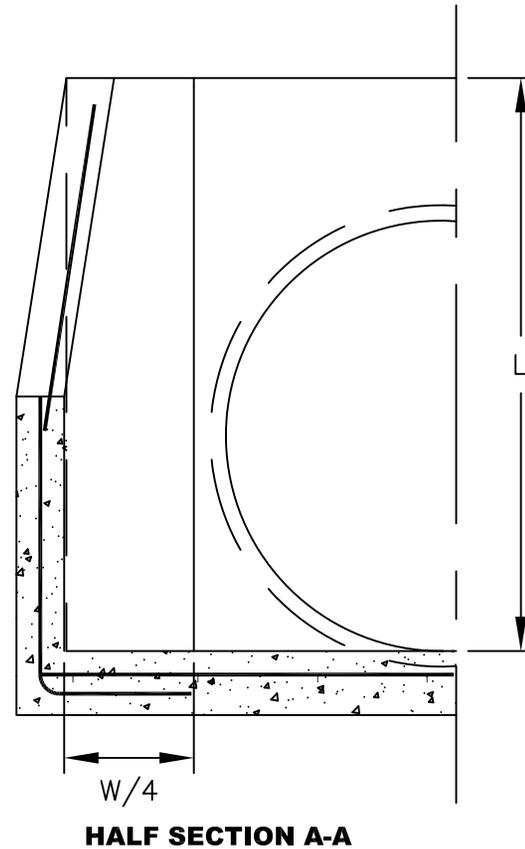
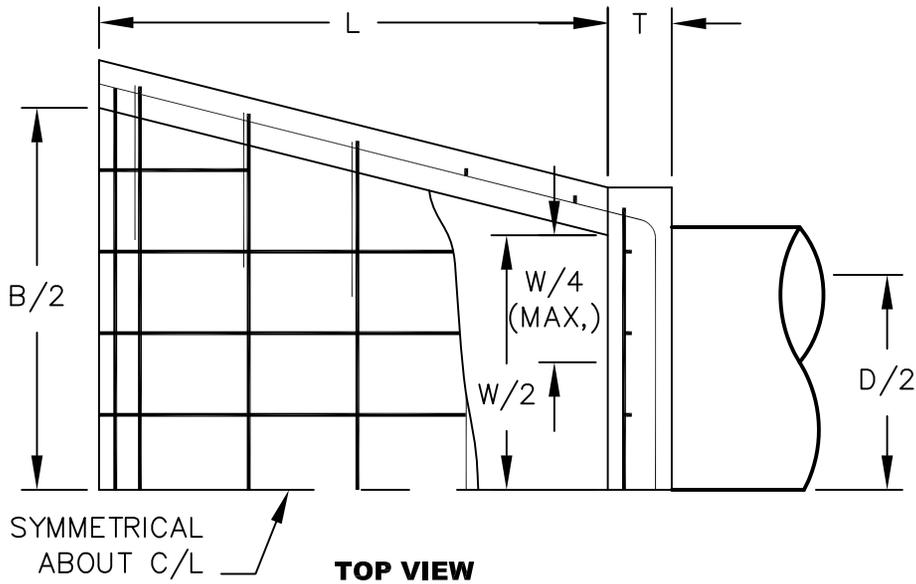
PLATE
439



DEPARTMENT OF PUBLIC WORKS & FACILITIES

COUNTY OF PLACER

54" - 60" PIPE STORM DRAIN INLET STRUCTURE



DIMENSIONS AND REINFORCING

D	W	B	L	T	ALL REINFORCING
54"	5'-4"	8'-0"	6'-0"	8"	#6 @ 12"
60"	6'-0"	8'-10"	6'-6"	8"	#6 @ 12"

NOTES:

1. "B" MAY BE REDUCED IF REQUIRED BY CHANNEL DIMENSIONS.
2. REINFORCING BAR SPACING SHOWN IS MAXIMUM SPACING.
3. USE 5 SACK MIX CONCRETE.
4. REFER TO SECTION 5.09(1)(h) IN THE LAND DEVELOPMENT MANUAL.

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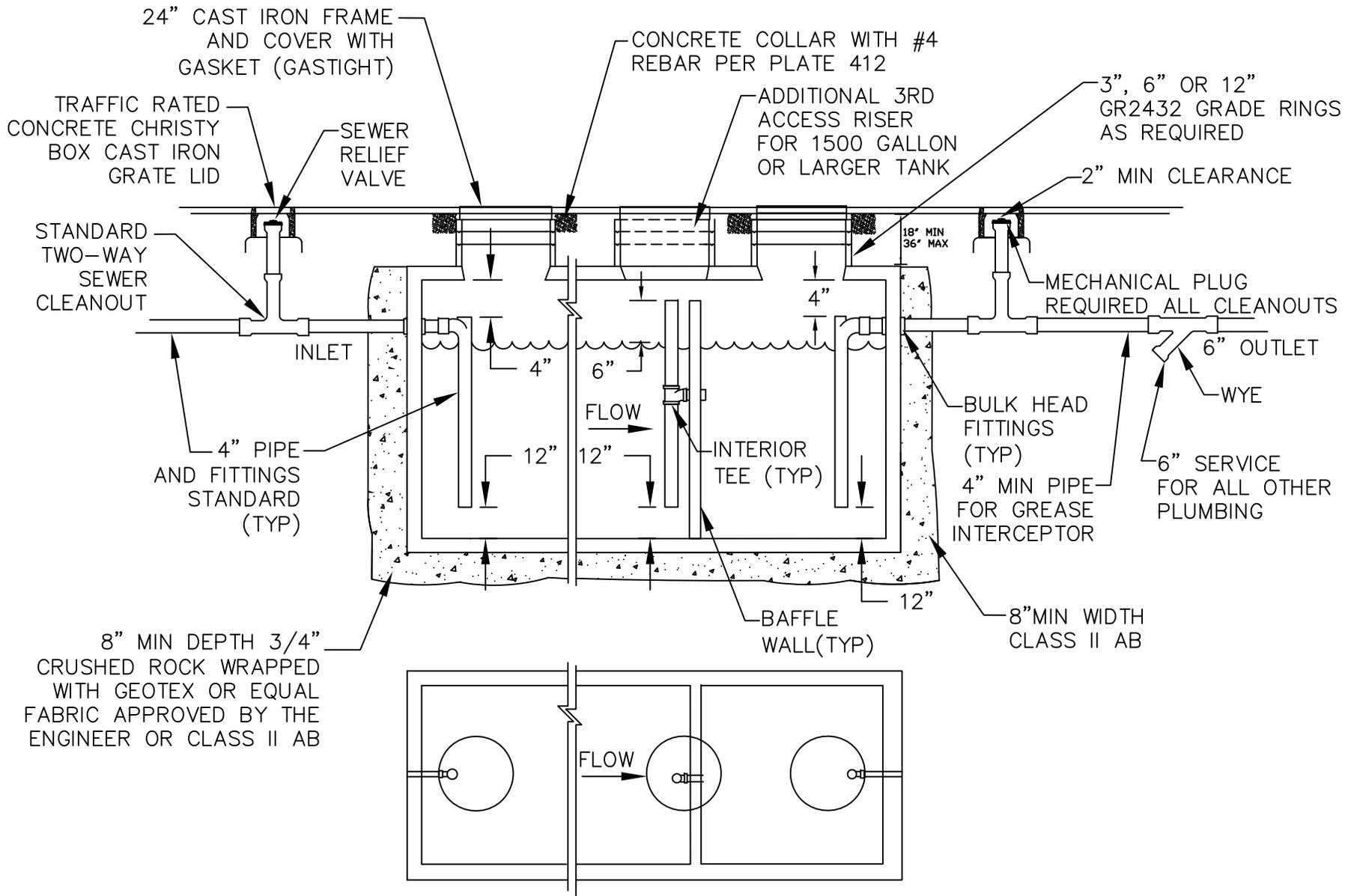
DEPARTMENT OF PUBLIC WORKS & FACILITIES
COUNTY OF PLACER

GREASE INTERCEPTOR

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PLATE
441



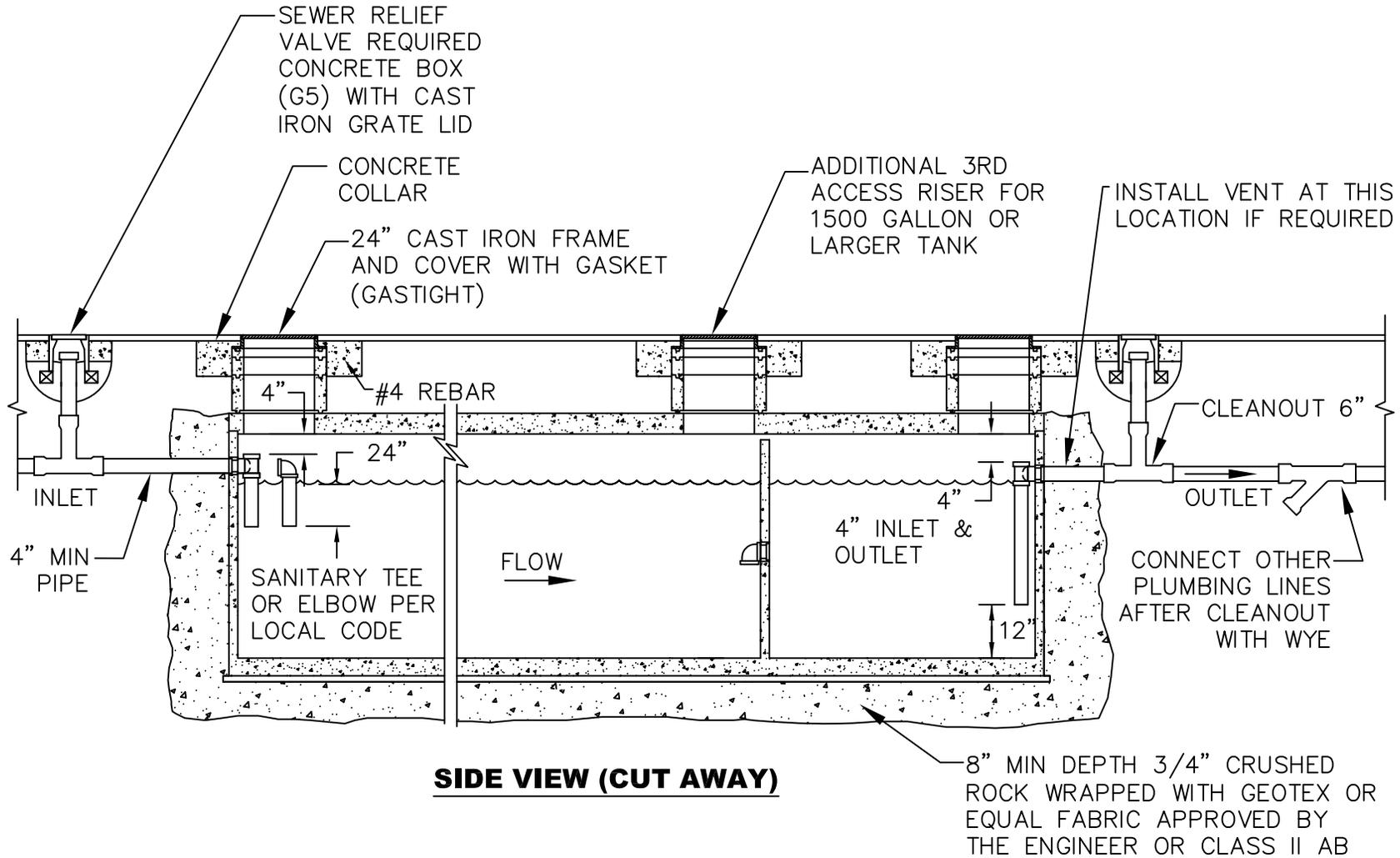
SEE PLATE 443 FOR SPECIAL NOTES



DEPARTMENT OF PUBLIC WORKS & FACILITIES

COUNTY OF PLACER

SAND/OIL SEPARATOR



SIDE VIEW (CUT AWAY)

SEE PLATE 443 FOR SPECIAL NOTES

DATE:
APR. 2016

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PLATE
442



DEPARTMENT OF PUBLIC WORKS & FACILITIES

COUNTY OF PLACER

NOTES - GREASE INTERCEPTOR OR SAND/OIL SEPARATOR

NOTES:

1. TWO RISERS ARE REQUIRED FOR ALL TANKS. ADDITIONAL RISER(S) REQUIRE CONCRETE COLLARS.
2. MANHOLE LIDS SHALL SAY "INTERCEPTOR" OR "GREASE INTERCEPTOR".
3. UTILITY BOXES LOCATED IN TRAFFIC AREAS SHALL CONFORM TO THE "IN PAVEMENT" DETAIL ON PLACER COUNTY PLATE 430.
4. TRENCH EXCAVATION AND BACKFILL SHALL CONFORM TO PLACER COUNTY PLATES 433 AND 434.
5. PLACER COUNTY ENVIRONMENTAL ENGINEERING SHALL REVIEW AND APPROVE ALL GREASE INTERCEPTORS PRIOR TO PERMIT ISSUANCE AND INSTALLATION.
6. RISER DEPTH SHALL NOT EXCEED 36 INCHES.
7. REFER TO THE GREASE INTERCEPTOR SPECIFICATIONS HANDOUT FOR INSTALLATION AND INSPECTION OF INTERCEPTOR FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
8. TANKS SHALL BE PRE-CAST CONCRETE WITH WALLS AND THE BOTTOM SLAB MONOLITHICALLY POURED.
9. REINFORCING STEEL SHALL BE ASTM A615 GRADE 60, FY=60,000 PSI. DETAILS AND PLACEMENT SHALL BE IN ACCORDANCE WITH ACI 315 AND ACI 318.
10. TANKS SHALL BE VACUUM TESTED PRIOR TO BACKFILL AND INSPECTED BY ENVIRONMENTAL ENGINEERING.
11. NO WASTEWATER FROM TOILETS, BATHROOM FIXTURES, WASHING MACHINES OR MOP SINKS OUTSIDE THE KITCHEN AREA SHALL FLOW THROUGH GREASE INTERCEPTOR OR SAND/OIL SEPARATOR.
12. TANKS SHALL BE A MINIMUM OF 1500 GALLONS.
13. NO TANK SHALL BE LOCATED IN A DRIVE THRU, PARKING SPACE, FOOD DINING AREA, OR INSIDE A BUILDING..
14. WHEN TANKS ARE LOCATED IN LANDSCAPING THE LIDS SHALL HAVE A MINIMUM 6 FOOT DIAMETER CLEARANCE WITH ONLY BARK, 3/8 INCH OR LESS GRAVEL OR GRASS.
15. TANKS IN LANDSCAPING SHALL USE AN ORENCO FIBERGLASS RISER WITH A 4 BOLT FIBERGLASS LID OR EQUAL.

REVISED:
APR. 2018

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NOT TO SCALE



PLATE
443