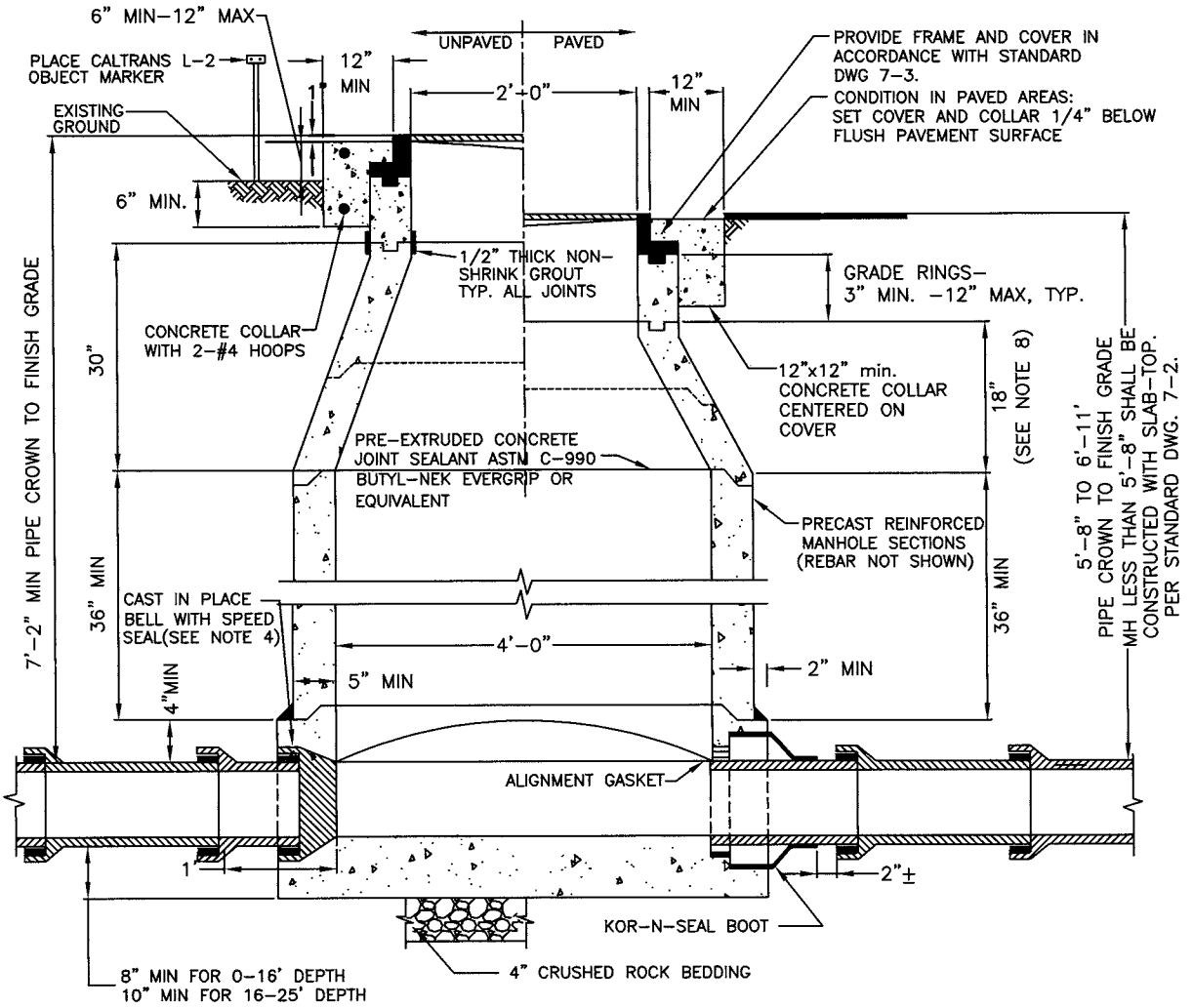
Standard Drawings Section 7 – Sanitary Sewer Design		
Drawing	**Sheets**	**Description**
7-1	1 of 3	Standard 48” Sewer Manhole
7-1	2 of 3	Manhole Base, Camera Channel Detail
7-1	3 of 3	Manhole Base, Camera Channel Detail
7-2	1 of 2	Standard 60” Sewer Manhole (Type A)
7-2	2 of 2	Standard 60” Sewer Manhole (Type B)
7-3	1	Grey Iron Standard 24” Manhole Frame and Cover
7-4	1	Sewer Pipe Bedding and Initial Backfill
7-5	1 of 3	Sewer Services
7-5	2 of 3	Service Cleanout to Grade
7-5	3 of 3	Service Cleanout to Grade Backfill Requirements
7-6	1 of 2	Flushing Branch
7-6	2 of 2	Flushing Branch Frame and Cover
7-7	1 of 2	Utility Crossing
7-7	2 of 2	Utility Crossing

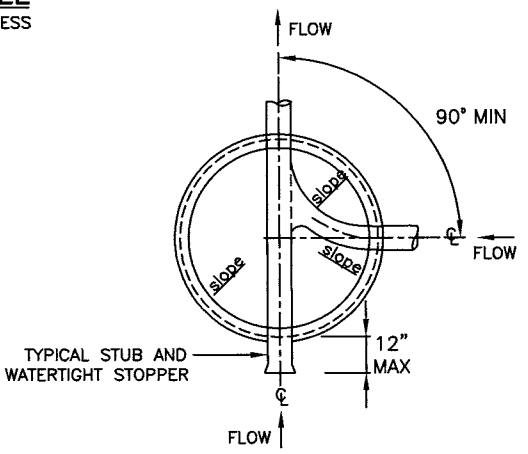


STANDARD 48" MANHOLE

FOR SANITARY SEWER 12" DIAMETER OR LESS
SEE SHEET 2 FOR REBAR

NOTES:

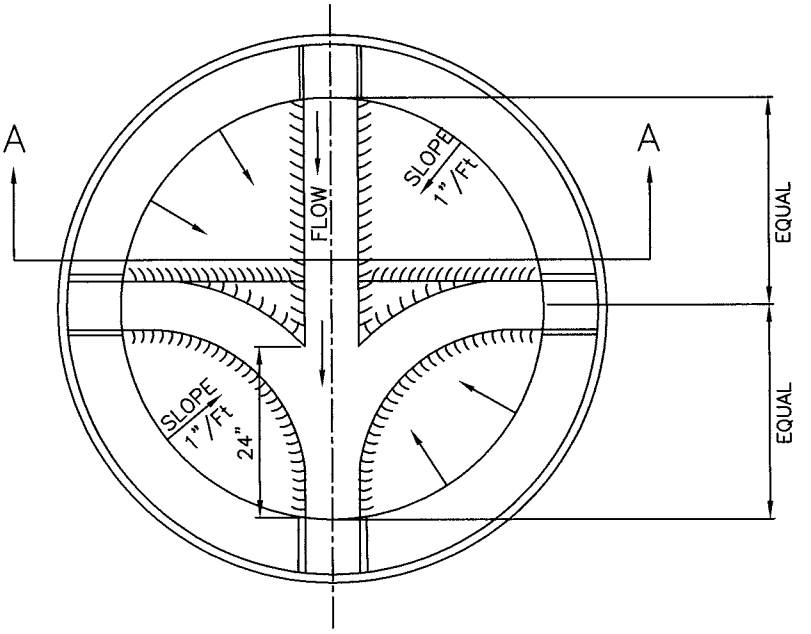
1. CLASS A CONCRETE, 6–SACK MIX SHALL BE USED FOR MANHOLE BASES.
2. PIPE SHALL STOP AT INSIDE FACE OF MANHOLE.
3. JOINTS FOR THE BARREL SECTION SHALL BE TONGUE AND GROOVE, ALL LIFTING HOLES SHALL BE SEALED WITH NON METALLIC NON SHRINK GROUT.
4. ALL MANHOLE BASES SHALL BE PRECAST BASES AND SHALL BE PLACED ON 4" MIN OF CRUSHED ROCK PLACED OVER UNDISTURBED MATERIAL. CONNECTION OF THE PIPE TO THE MANHOLE SHALL USE A RESILIENT CONNECTOR CONFORMING TO ASTM STANDARD C923 SUCH AS KOR–N–SEAL, A–LOK, OR APPROVED EQUIVALENT. ALL MANHOLE BASES TO INCLUDE AN ANTI–FLOATATION RING PER DRAWING 7–1 SHEET 2.
5. ANY SERVICE SEWER ENTERING A MANHOLE SHALL BE INSTALLED WITH THE INVERT ELEVATION OF THE SERVICE PIPE MATCHING THE CROWN ELEVATION OF THE EXIT SEWER EXCEPT WHEN AN INTERNAL DROP CONNECTION IS USED. IF THE MANHOLE AT THE END OF A CUL–DE–SAC IS CONSTRUCTED WITH A PRE CAST BASE. THE INVERT OF ANY SERVICE STUBS SHALL BE A MINIMUM OF ONE INCH ABOVE THE INVERT OF THE EXIT PIPE.
6. BEDDING FOR PRE CAST MANHOLE SHALL BE SELECT IMPORTED MATERIAL 1/2" OR 3/4" CRUSHED ROCK (4" MIN).
7. THE STANDARD CONE MAY BE PROVIDED AS TWO PRE CAST SECTIONS.
8. CUL–DE–SAC MANHOLES OR END OF LINE MANHOLES WITH A DEPTH OF 6'–11" OR LESS SHALL USE 18" CONES.

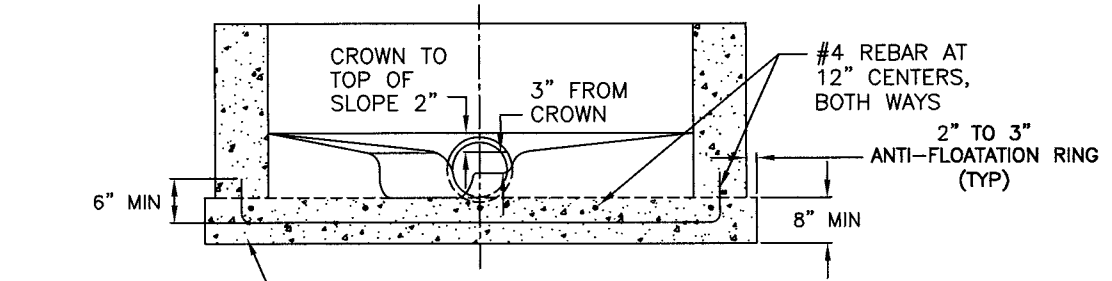


PLAN VIEW OF 48" MANHOLE SHOWING INTERSECTING SEWERS

COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
STANDARD 48" SEWER MANHOLE	SHEET # 1 OF 3
Paros Kokkas 28AUG-08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7–1 NOT TO SCALE

CAMERA CHANNEL
REQUIRED FOR ALL LINES

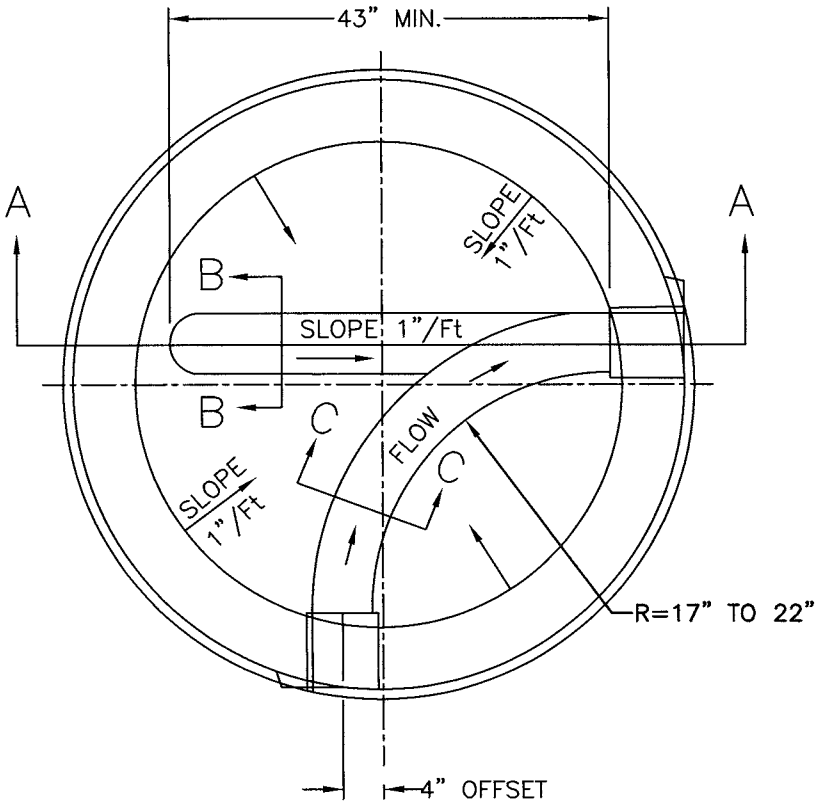




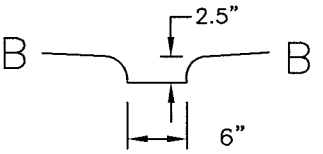
SECTION A-A

COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
MANHOLE BASE CAMERA CHANNEL DETAIL	SHEET # 2 OF 3
Patrick Kuhlman 28 Aug. 08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7-1 NOT TO SCALE

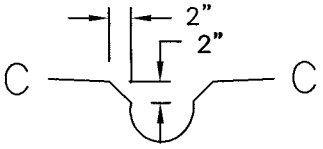
CAMERA CHANNEL REQUIRED FOR ALL 8" AND 10" LINES

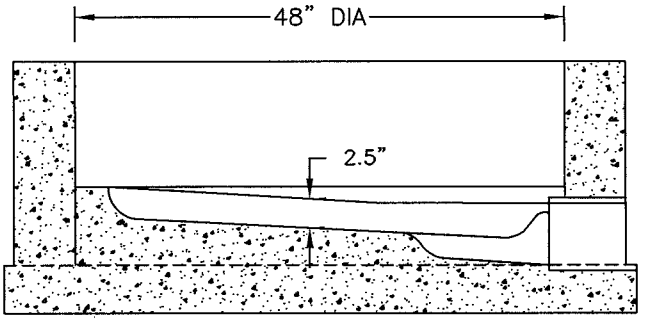


FOR 8" LINE ONLY



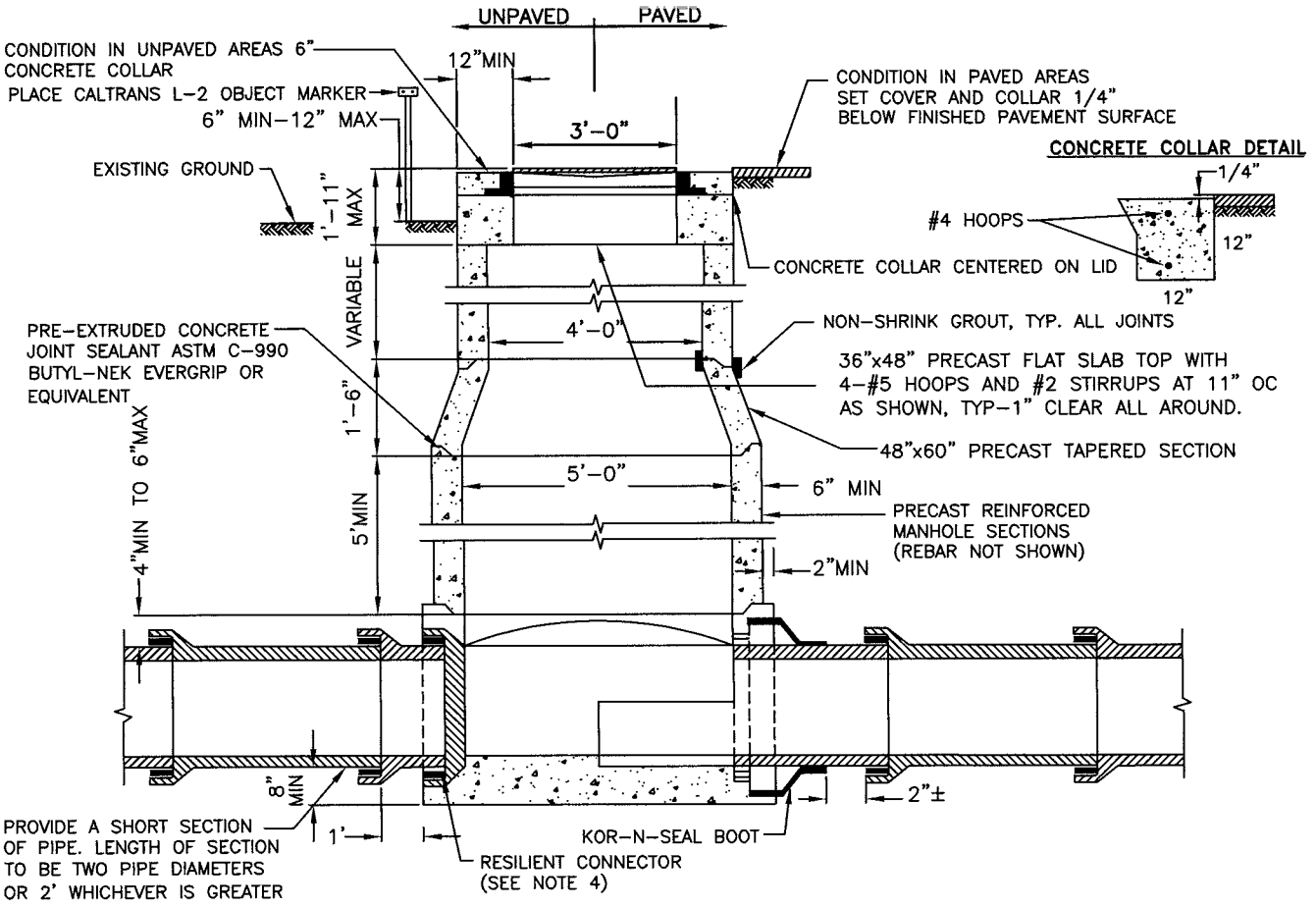
OR



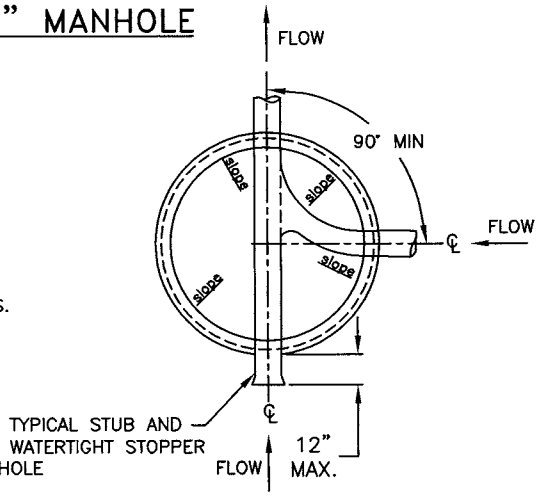


SECTION A–A

COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
MANHOLE BASE CAMERA CHANNEL DETAIL	SHEET # 3 OF 3
Carlos Rokkas 28 AUG. 08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7–1 NOT TO SCALE



STANDARD TYPE A 60" MANHOLE



PLAN VIEW OF 60" MANHOLE SHOWING INTERSECTING SEWERS

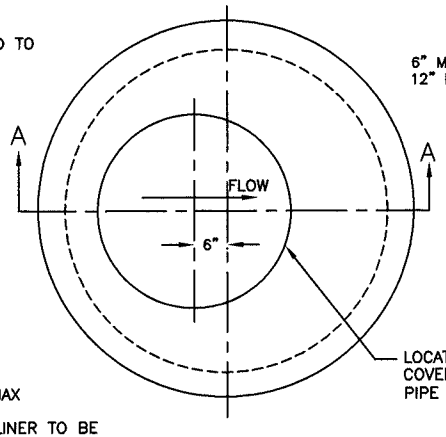
NOTES:

1. CLASS A CONCRETE, 6-SACK MIX SHALL BE USED FOR MANHOLE BASES.
2. PIPE SHALL STOP AT INSIDE FACE OF MANHOLE OR SHALL BE CONTINUOUS THROUGH MANHOLE. IF PIPE LAID CONTINUOUS, TOP HALF SHALL BE REMOVED AFTER BASE IS POURED.
3. JOINTS FOR THE BARREL SECTION SHALL BE TONGUE AND GROOVE, ALL JOINTS MUST BE SEALED WITH GULF STATES PRE-EXTRUDED CONCRETE JOINT SEALANT.
4. FOR PRECAST MANHOLE BASES, CONNECTION OF THE PIPE TO THE MANHOLE SHALL USE A RESILIENT CONNECTOR CONFORMING TO ASTM STANDARD C923 SUCH AS KOR-N-SEAL, A-LOK. OR EQUIVALENT.
5. ANY SERVICE SEWER ENTERING A MANHOLE SHALL BE INSTALLED WITH THE INVERT ELEVATION OF THE SERVICE PIPE MATCHING THE CROWN ELEVATION OF THE EXIT SEWER EXCEPT WHEN AN INTERNAL DROP CONNECTION IS USED.
6. BEDDING FOR PRE-CAST MANHOLE SHALL BE SELECT IMPORTED MATERIAL 1/2" OR 3/4" CRUSHED ROCK.
7. ALL MANHOLE SECTIONS TO BE FITTED WITH EXTERNAL LIFTING PINS, NO THROUGH PENETRATION HOLES ALLOWED.

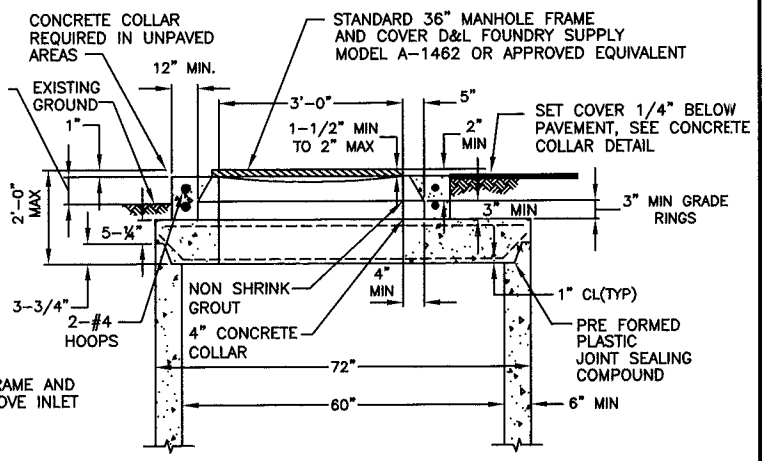
COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
STANDARD 60" SEWER MANHOLE (TYPE A)	SHEET # 1 OF 2
Patrick Kahlkat 28 AUG. 08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7-2 NOT TO SCALE

NOTES:

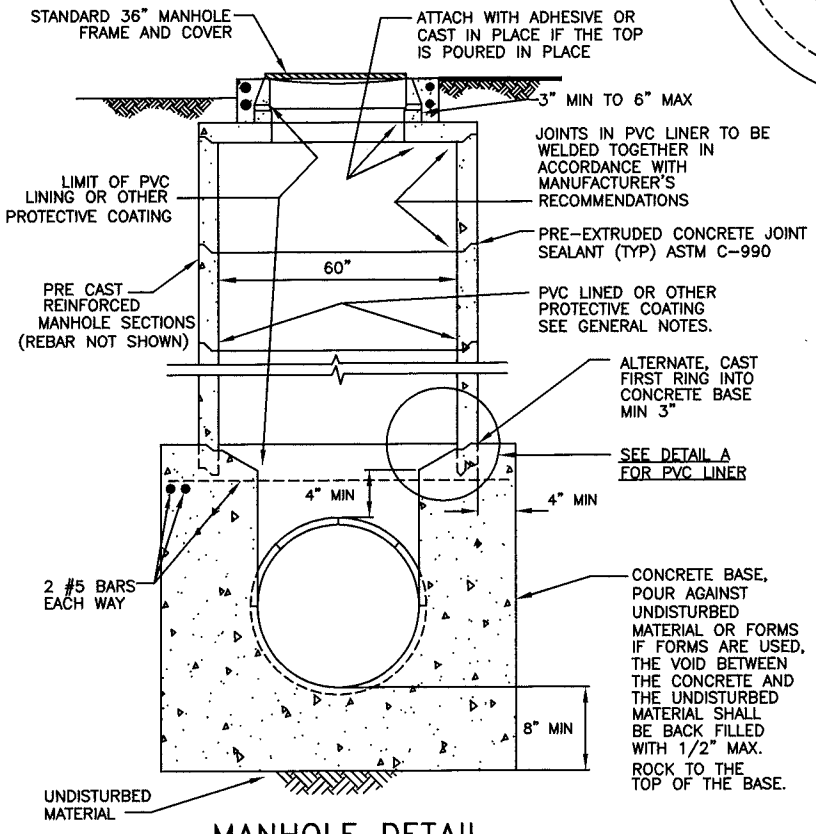
1. PROTECTIVE COATING SHALL BE (a) T-LOCK PVC LINER, AMERON PROTECTIVE COATING, 40 MIL. (b) CCS COATING, HIGH CHEMICAL RESISTANCE EPOXY COATING BY CHEMCO SYSTEMS OF REDWOOD CITY, CA. MULTIPLE LAYER SPRAY APPLIED TO A MINIMUM FINISHED THICKNESS OF NOT LESS THAN 40 MILS. (c) RAVEN 405 EPOXY MORTAR MULTI LAYERED SPRAY APPLIED TO A MINIMUM THICKNESS OF NOT LESS THAN 60 MILS. (d) OR APPROVED EQUIVALENT.
2. BOTH PVC LINING AND PROTECTIVE COATINGS SHALL BE SPARK TESTED FOR INTEGRITY AFTER INSTALLATION.
3. PROTECTIVE COATING SHALL BE APPLIED TO MANHOLE SHELVES, UNDERSIDE OF COVER SLAB, INSIDE OF GRADE RINGS AND ALL OTHER PLACES WHERE PVC IS SHOWN ON DETAIL BELOW.
4. PVC LINER SHALL BE WHITE IN COLOR.
5. SLAB TOP TO MEET H-20 LOAD SPECIFICATIONS. WEIGHT AND LOAD SPECIFICATIONS TO BE SUBMITTED BY MANUFACTURER.



PLAN



SECTION A-A

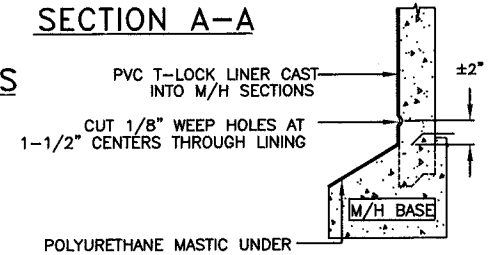


MANHOLE DETAIL

STANDARD SLAB TOP DETAILS

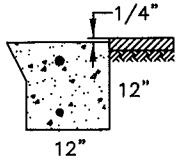
INSTALLATION REQUIREMENTS FOR PVC SHELF LINER

1. 30 MIL PVC SHELF LINER SHALL BE PRECUT AND PREPARED ABOVE GROUND PRIOR TO INSTALLATION WITH SAND EMBEDDED NONSKID SURFACE 1" PLUS IN FROM EDGE, ACCORDING TO PVC SHEETING MANUFACTURERS RECOMMENDATION.
2. COAT CLEAN AND DRY CONCRETE SURFACE OF M/H SHELVES W/LINABOND PRIMER EP30 AND LINABOND POLYURETHANE MASTIC TO A MIN. THICKNESS OF 125 MIL. ALSO COAT CONTACT SIDE OF THE PRECUT PVC SHEETING WITH LINABOND CLA-1 ACTIVATOR ALL AS MANUFACTURED BY ALLIED COATINGS CO. OF HOLLYWOOD, CA OR EQUIVALENT (SUBMITTAL WILL BE REQUIRED).
3. ALL MATERIALS SHALL BE APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

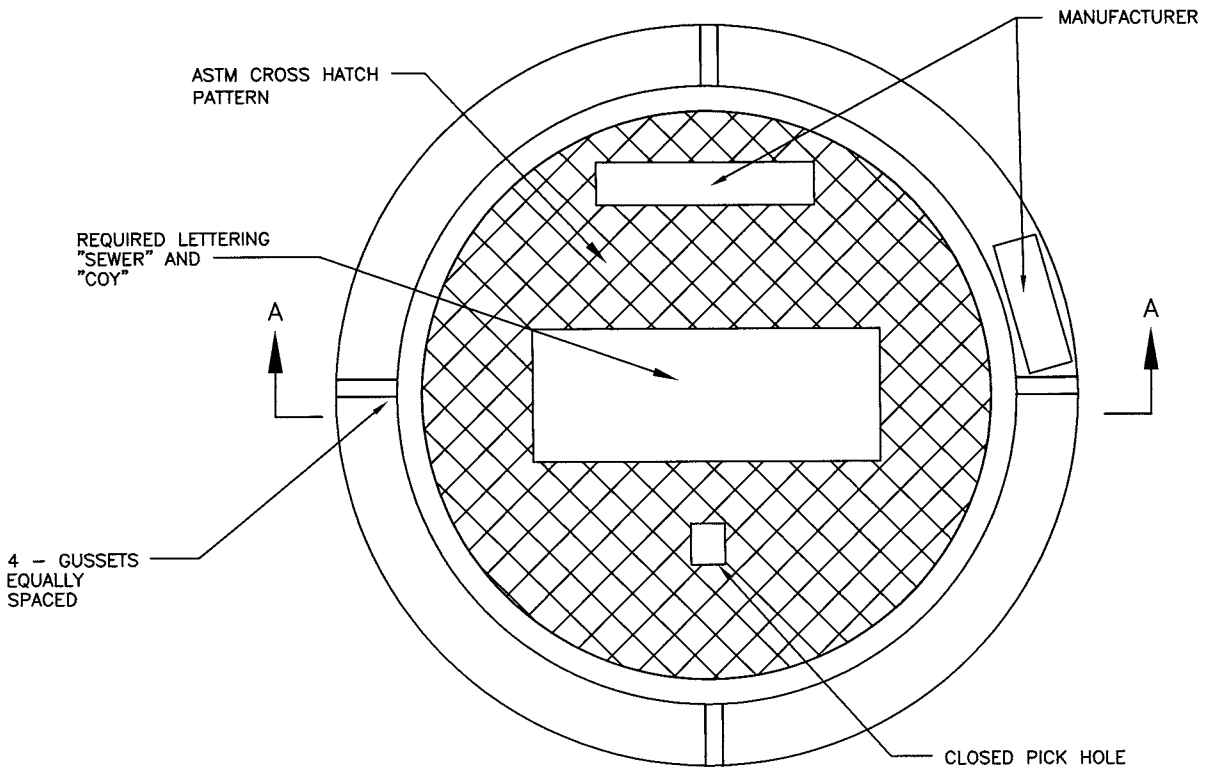


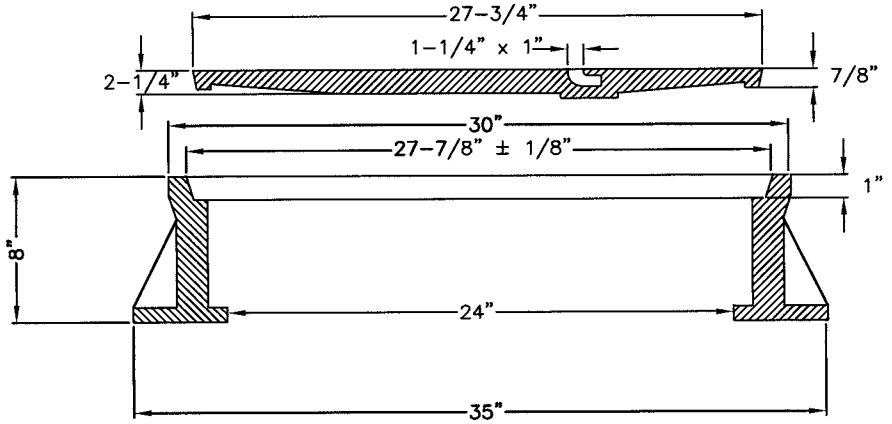
DETAIL A

CONCRETE COLLAR DETAIL



COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT STANDARD 60" MANHOLE (TYPE B)	DATE: 08/05/08 SHEET # 2 OF 2
Pamela Kallas COUNTY ENGINEER No. C42401	28 AUG 08 APPROVAL DATE
	DRAWING #: 7-2 NOT TO SCALE



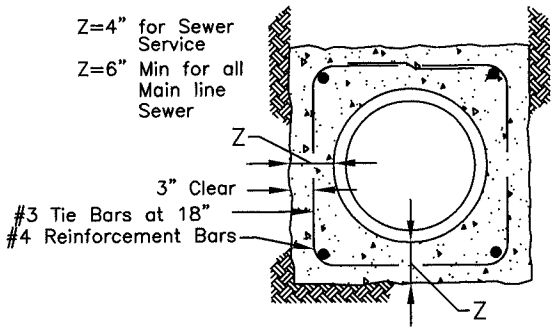


SECTION A–A

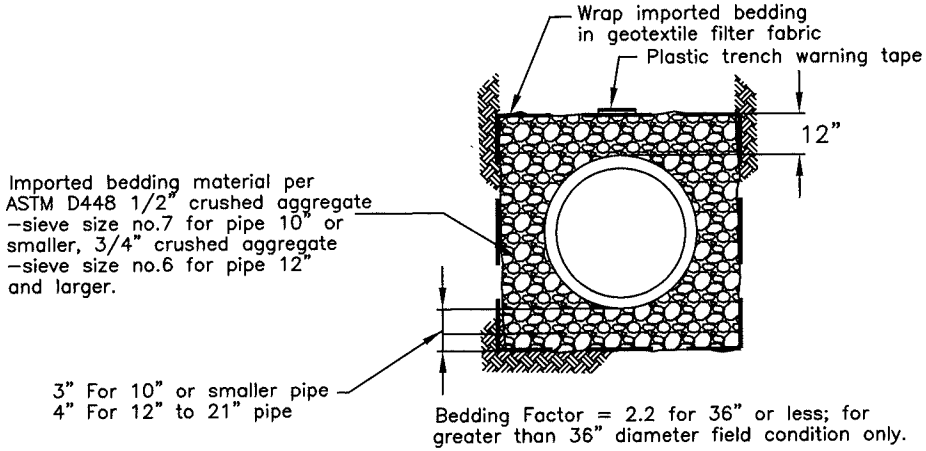
NOTES:

1. ALL CASTINGS TO CONFORM TO ASTM A48, CLASS 35B. D&L FOUNDRY A–1018, OR EQUIVALENT
2. FRAME AND COVER TO MEET H–20 LOAD SPECIFICATIONS.
3. MACHINED HORIZONTAL AND VERTICAL BEARING SURFACES NOT TO EXCEED 1/64" TOLERANCE.
4. FRAME AND COVER SHALL HAVE A COATING OF BITUMINOUS MATERIAL.
5. LOCKING COVER TYPE FRAME AND COVERS SHALL BE USED IN EASEMENT AREAS UNLESS OTHERWISE APPROVED.
6. COVER SHALL BE LABELED AS REQUIRED BY SERVICE DISTRICT. COUNTY COVERS SHALL BE DENOTED "COY".

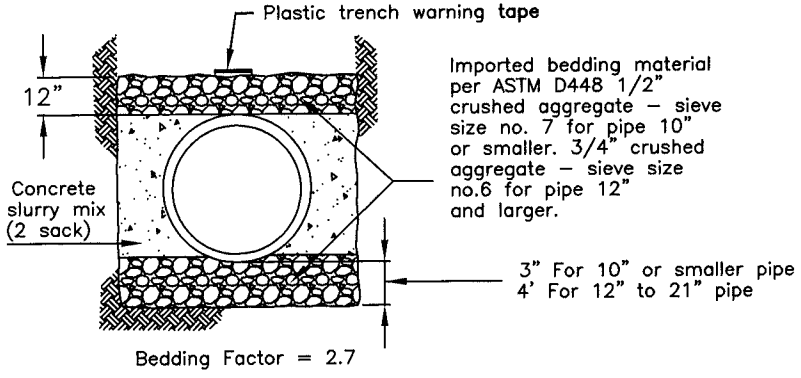
COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
GRAY IRON STANDARD 24" MANHOLE FRAME AND COVER	SHEET # 1 OF 1
Panos Kokkas 28 AUG 08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7–3 NOT TO SCALE



CONCRETE ENCASEMENT



TYPE II



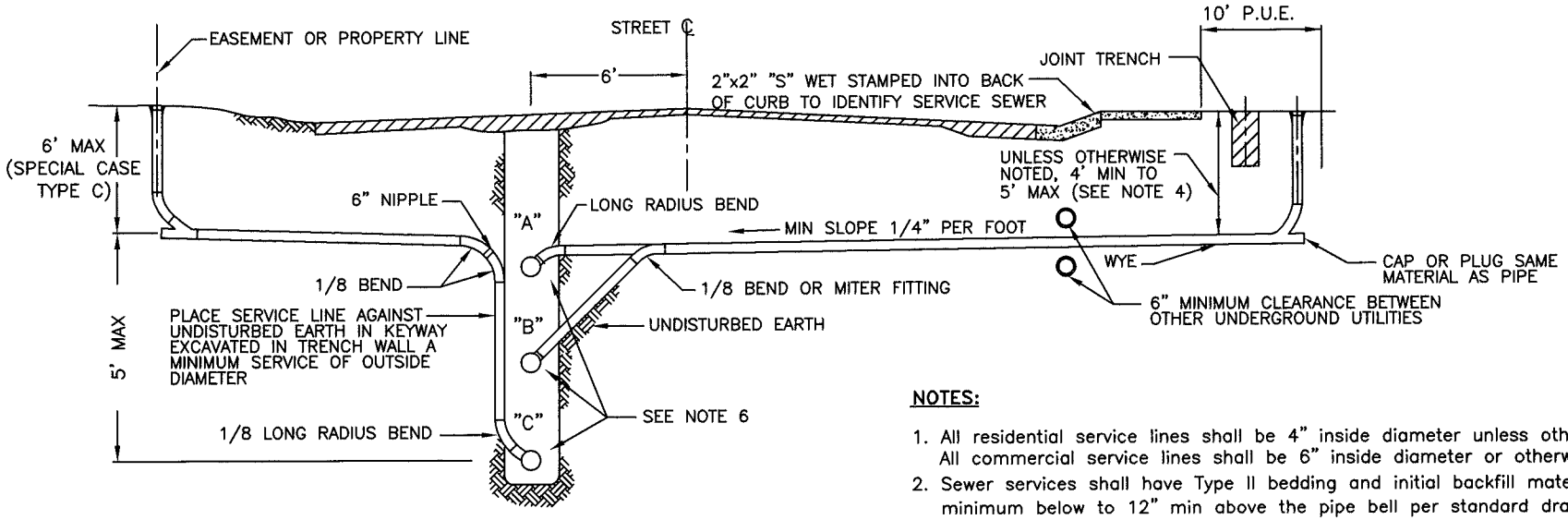
TYPE III
(See Note 3)

(Concrete must extend from pipe to the trench walls. TYPE III not allowed where soils are expansive)

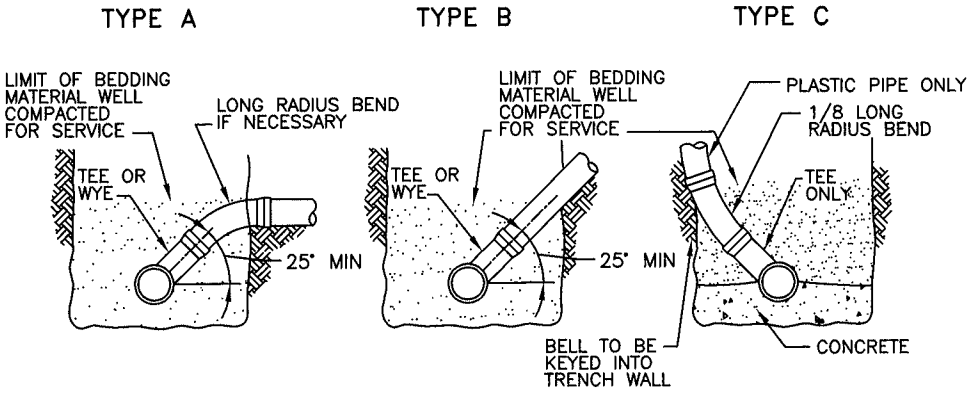
NOTES:

1. Unless otherwise noted on plans bedding and initial backfill for all pipes shall be Type II.
2. Minimum depth of bedding and material under pipe bells shall be 1 1/2 inches.
3. Type III may be used only when construction conditions encountered in the field have resulted in the allowable trench width for Type II being exceeded. Written approval of the Director is necessary.
4. For all flexible (non–rigid) pipe, imported material must be used for bedding and initial backfill to 12 inches over pipe bell.
5. See Drawing 7–4 Sheet 2 for concrete dam to be installed where required due to groundwater conditions.
6. Trench backfill above initial bedding zone shall be compacted to 95% relative compaction, unless higher density is required due to site specific conditions.

COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
SEWER PIPE BEDDING AND INITIAL BACKFILL	SHEET # 1 OF 1
Patrick Kahler 28 JUL 08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7–4 NOT TO SCALE



ELEVATIONS

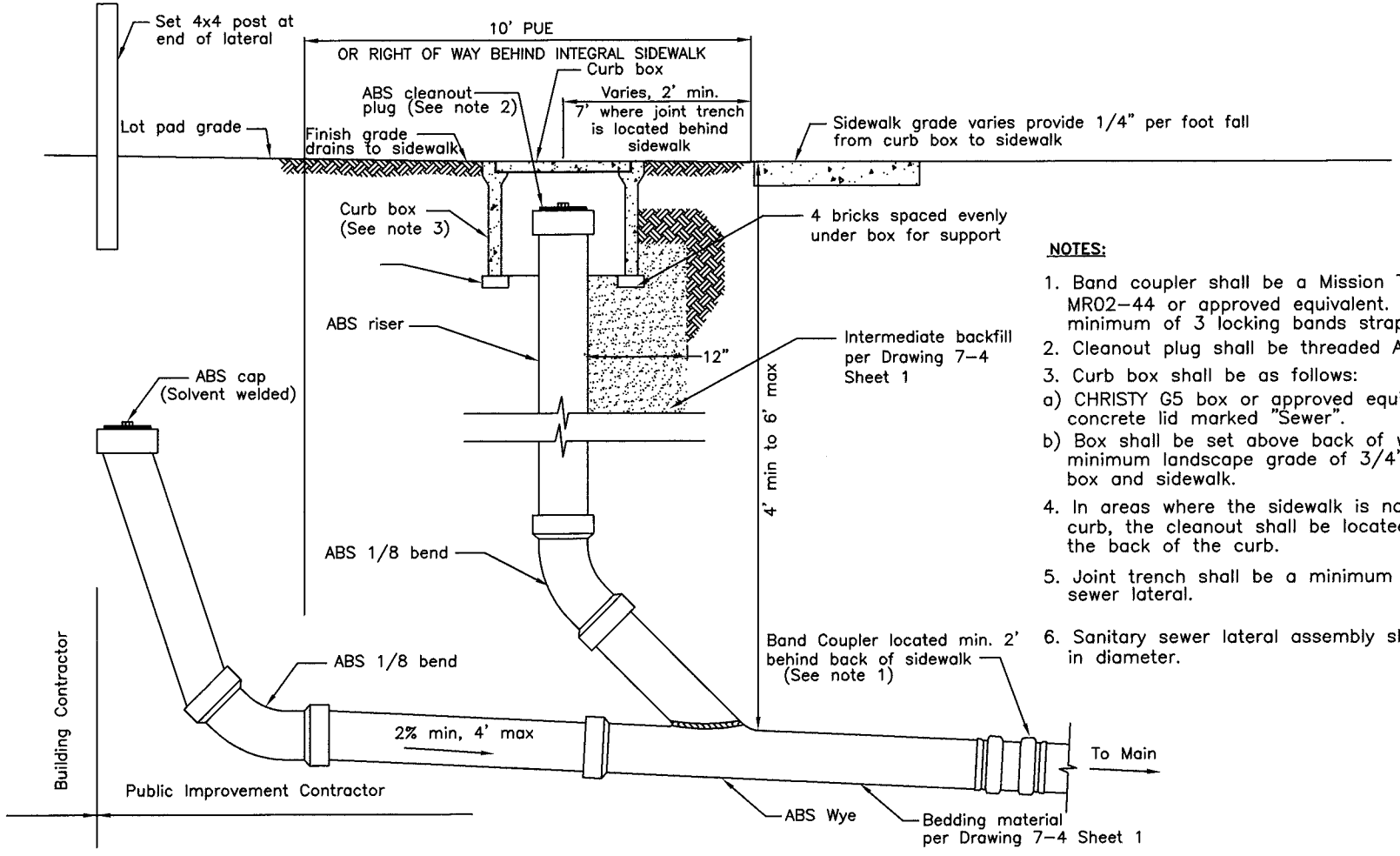


CONNECTION DETAILS

NOTES:

1. All residential service lines shall be 4" inside diameter unless otherwise noted. All commercial service lines shall be 6" inside diameter or otherwise noted.
2. Sewer services shall have Type II bedding and initial backfill material from 3" minimum below to 12" min above the pipe bell per standard drawing 7–4, Sheet 1.
3. Contractor shall use the most appropriate type connection (A, B or C) for the particular situation.
4. The standard sewer service has 4' to 5' of cover at back of sidewalk or 6' maximum for Type C. The standard cover may need to be deeper should other utilities be located in adjacent areas.
5. Minimum depth of cover to be 5' and maximum 6' where joint trench (PG&E, phone, CATV) is to be installed at back of sidewalk as part of sub–division improvements.
6. Place concrete 12" wide or well compacted bedding material 18" wide under the tee or wye, the fitting, and unsupported pipe. When bedding material is used, place additional bedding material to top of bend, the full width of the trench.
7. Minimum specified cover at the property line shall be measured from existing ground surface or edge of adjacent roadway, whichever is lower.
8. A specific elevation at the property line, when shown on the plans or designated by the engineer, shall govern.
9. Miter fittings shall be maximum 45°.
10. Only long radius bends shall be used.

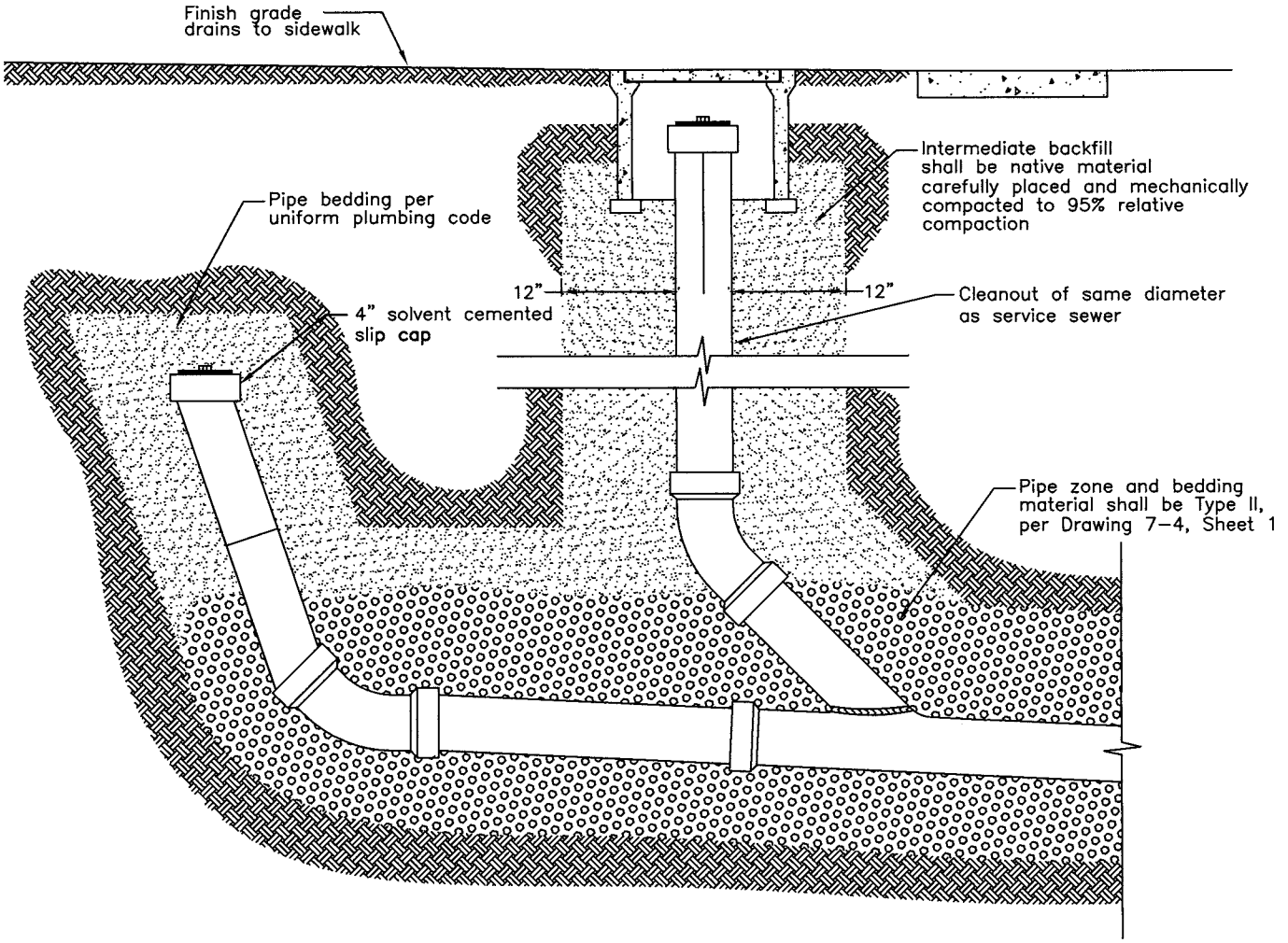
COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
SEWER SERVICES	SHEET # 1 OF 3
Patrick Kahlas 28 AUG. 08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7–5 NOT TO SCALE



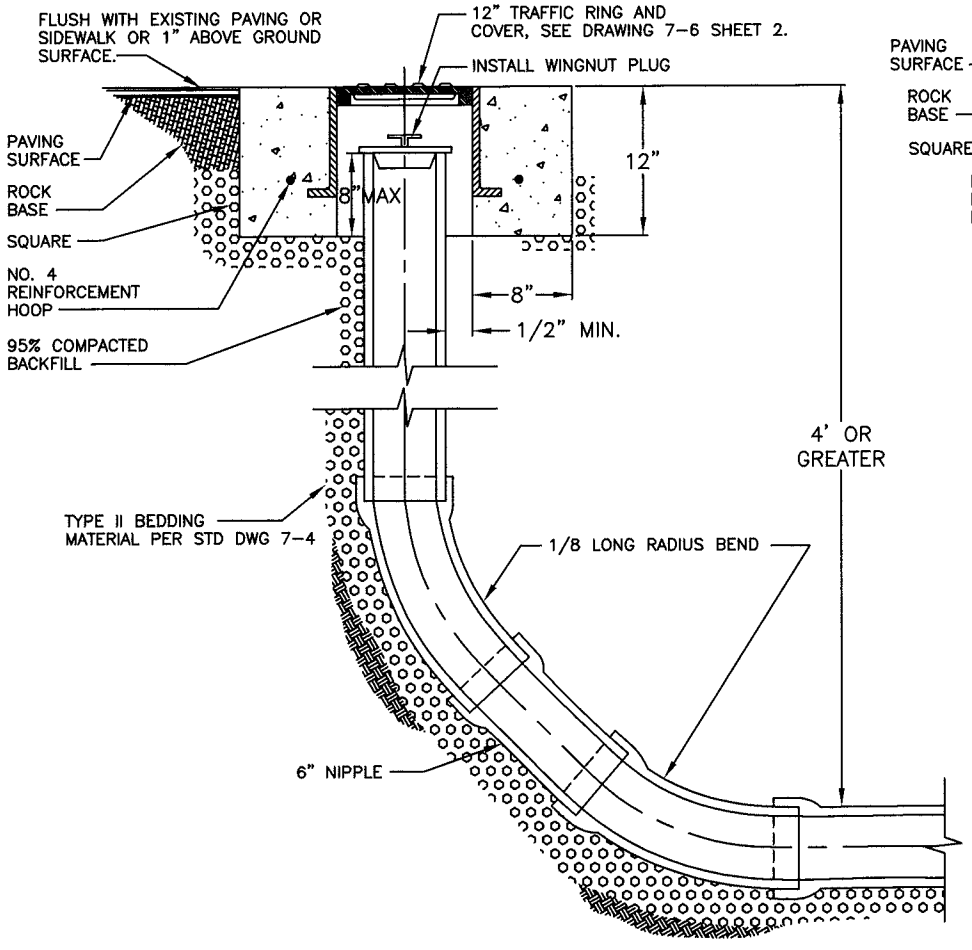
NOTES:

1. Band coupler shall be a Mission Transition Coupler, Model MR02-44 or approved equivalent. Band shall have a minimum of 3 locking bands straps.
2. Cleanout plug shall be threaded ABS.
3. Curb box shall be as follows:
   a) CHRISTY G5 box or approved equivalent, with a custom concrete lid marked "Sewer".
   b) Box shall be set above back of walk to provide minimum landscape grade of 3/4" per foot between box and sidewalk.
4. In areas where the sidewalk is not monolithic with the curb, the cleanout shall be located within 18" to 24" from the back of the curb.
5. Joint trench shall be a minimum of 6" above the sanitary sewer lateral.
6. Sanitary sewer lateral assembly shall not be less than 4" in diameter.

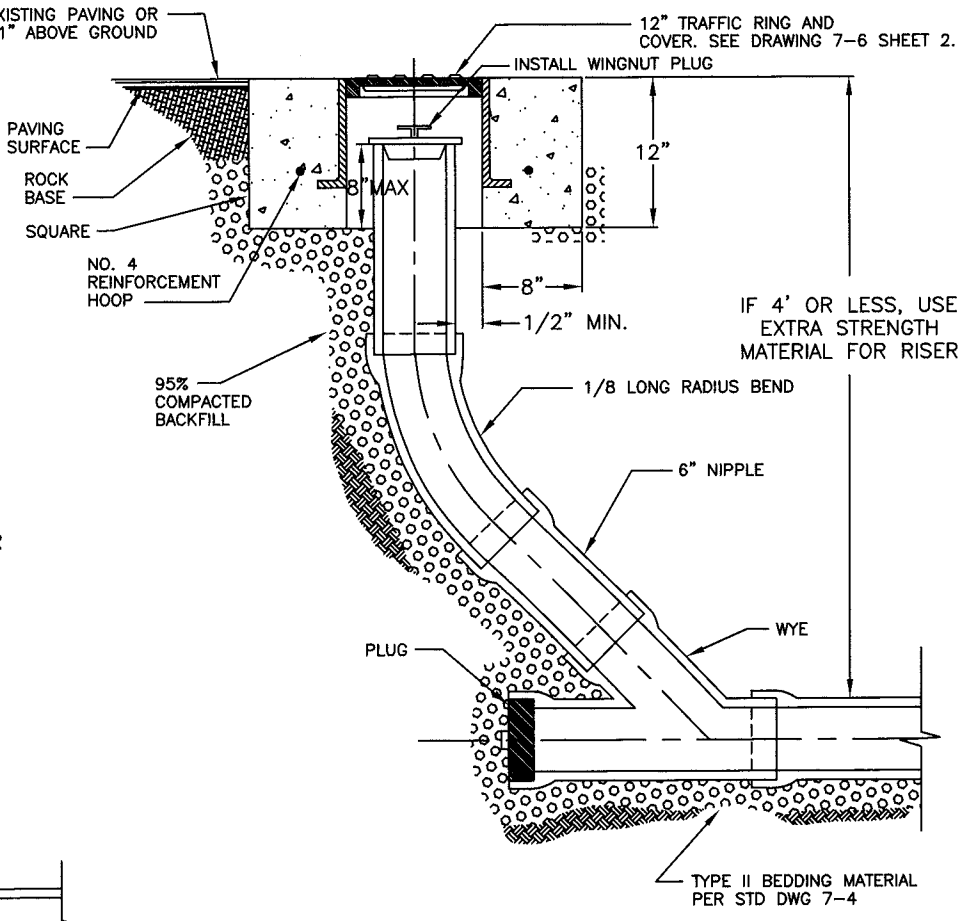
COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
SERVICE CLEANOUT TO GRADE	SHEET # 2 OF 3
Ramon Kolkas 28 AUG. 08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7-5 NOT TO SCALE



COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
SERVICE CLEANOUT TO GRADE BACKFILL REQUIREMENTS	SHEET # 3 OF 3
Ramos Kokkas COUNTY ENGINEER No. C42401 28 AUG. 08 APPROVAL DATE	DRAWING #: 7-5 NOT TO SCALE



TYPICAL FLUSHING BRANCH

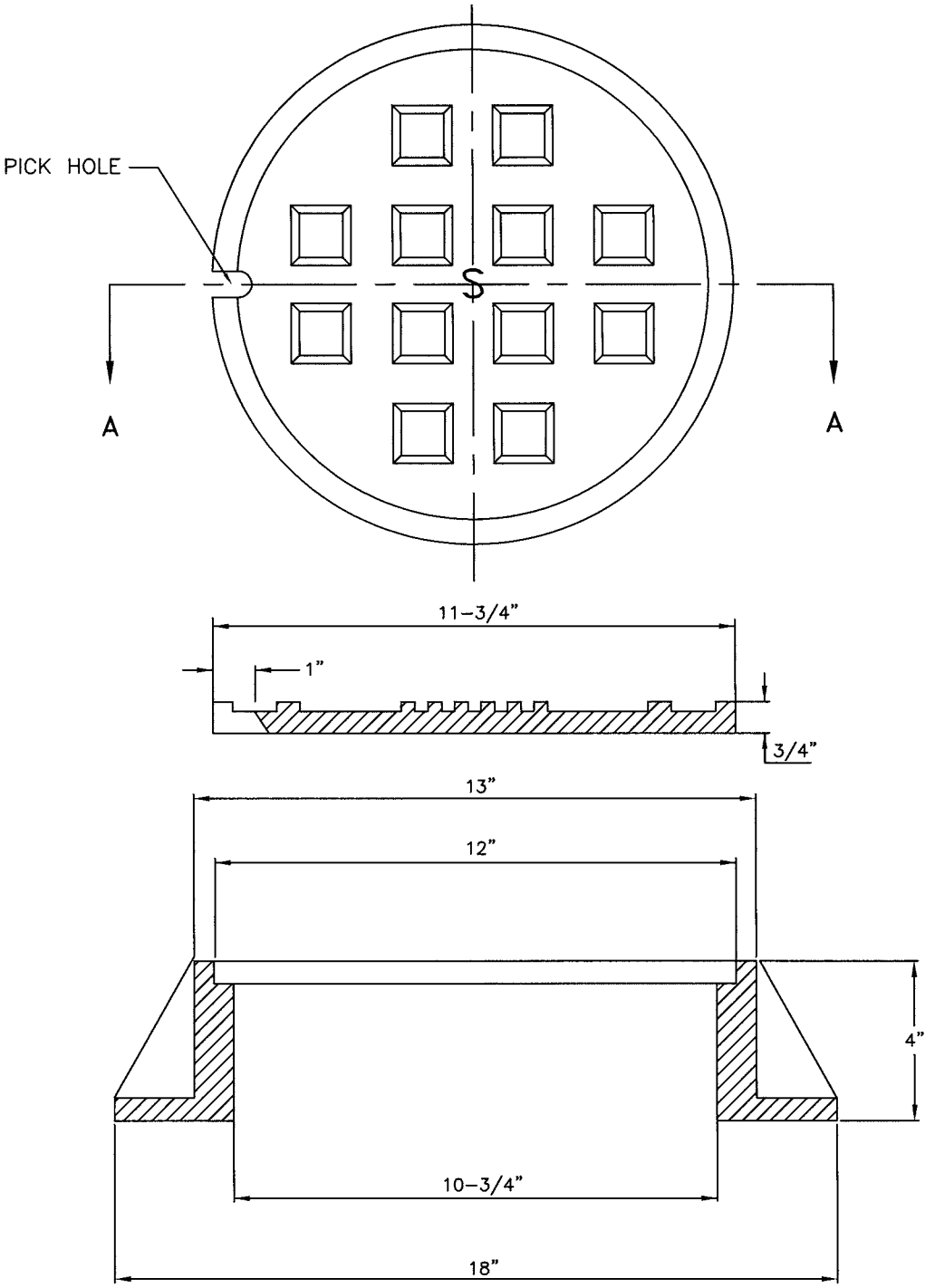


ALTERNATIVE FLUSHING BRANCH

NOTES:

1. ALL PIPE FITTINGS SHALL BE THE SAME SIZE AND MATERIAL AS THE HORIZONTAL PIPE TO WHICH THEY CONNECT.
2. JOINT SHALL BE AS SPECIFIED FOR THE TYPE OF PIPE USED.

COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
FLUSHING BRANCH	SHEET # 1 OF 2
Panos Kokkas COUNTY ENGINEER No. C42401	28 AUG 08 APPROVAL DATE
	DRAWING #: 7-6 NOT TO SCALE

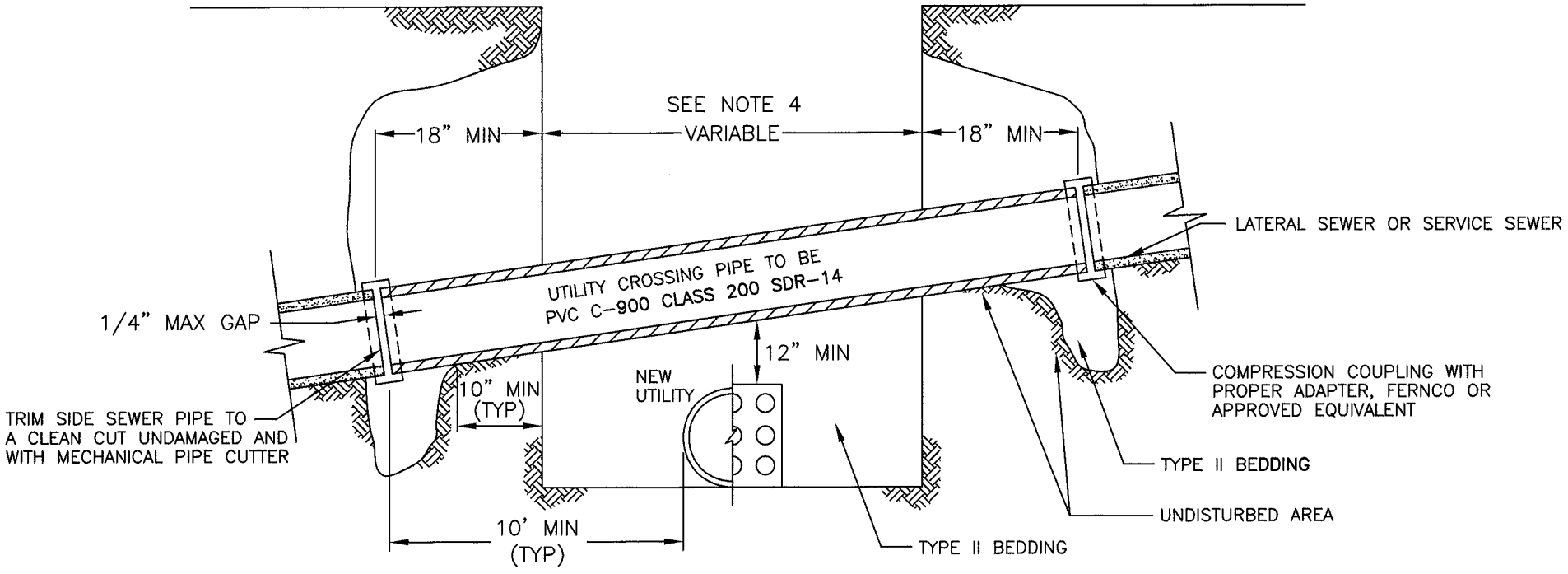


SECTION A–A

NOTES:

1. All materials used in manufacturing shall conform to ASTM 48, Class 35B. D&L Supply Model H–8024 or equivalent.
2. Frame and cover meets H–20 wheel loading.

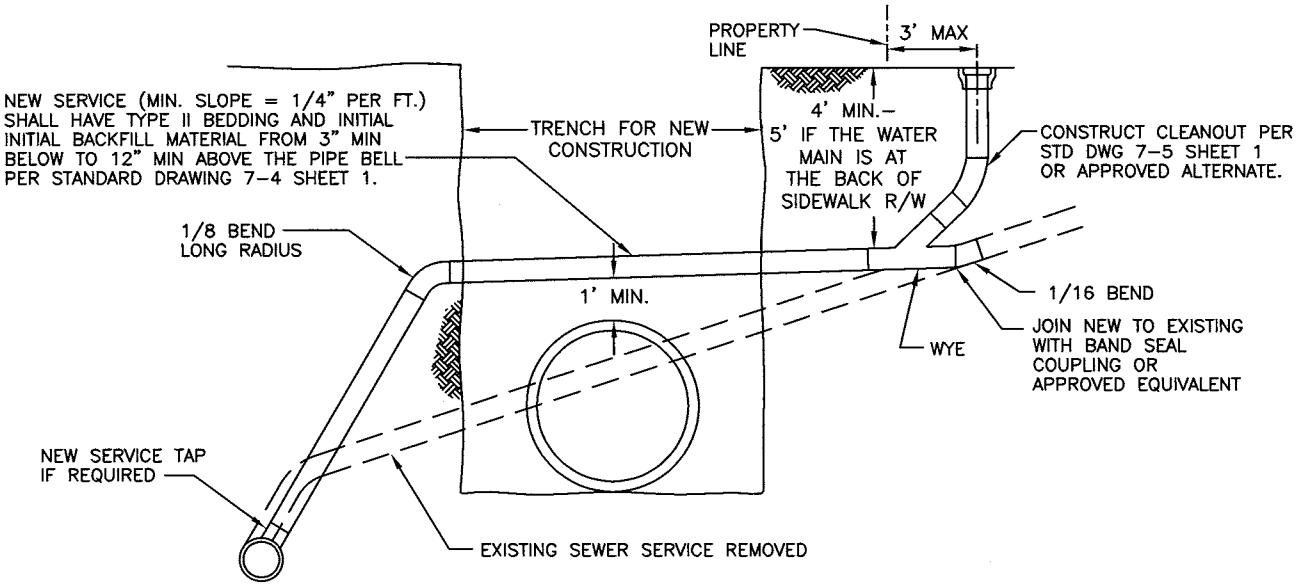
COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
FLUSHING BRANCH FRAME AND COVER	SHEET # 2 OF 2
Ramos Kolkas 28 Aug 08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7–6 NOT TO SCALE



NOTES:

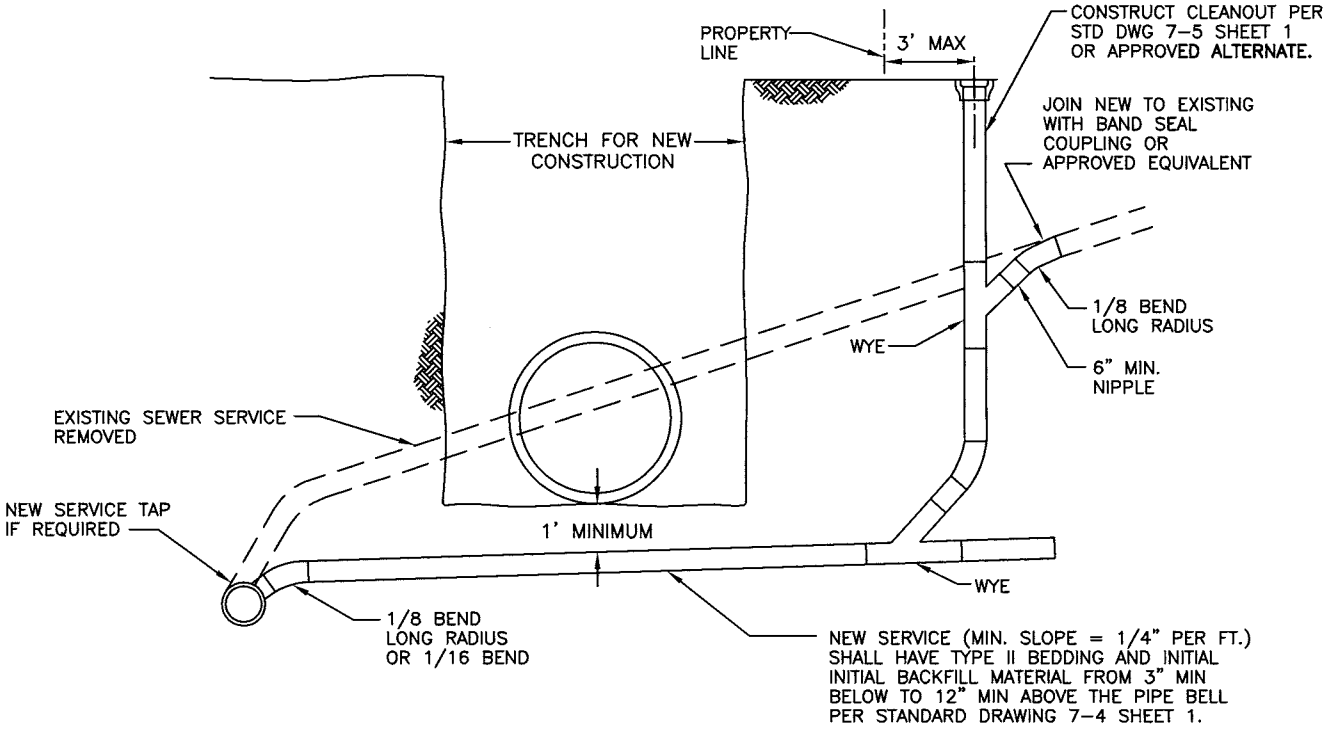
1. All lines are to be protected in place. This detail shall apply whenever the main collector or lateral sewer service is cut or damaged when new construction posses beneath these lines, and may only be used when directed to do so by the County Engineer. Detail does not apply to new water lines.
2. Inside diameter of utility crossing pipe to be the same as the pipe to which it connects.
3. Alteration of sewer grades will be permitted only after written permission has been received from the County engineer.
4. 10 feet minimum from the new utility to the newly created joint of the utility crossing pipe. Place Type II bedding to 12" above the new utility and 18" minimum each side of its center line.
5. Any new utility with 12" clearance may be required to place a compressible material (styrofoam or equivalent) between the lines.

COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
UTILITY CROSSING	SHEET # 1 OF 2
Pamela Kekkas 28Aug.08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7-7 NOT TO SCALE



A. SEWER SERVICE RELOCATION OPTION OVER NEW CONSTRUCTION

(WATER MAIN UNDER NOT ALLOWED)



B. SEWER SERVICE RELOCATION OPTION UNDER NEW CONSTRUCTION

(WATER MAIN OVER SEWER SERVICE)

NOTE:

IF NEITHER OF THESE OPTIONS IS AVAILABLE, THE ELEVATION OF THE NEW FACILITY WILL NEED TO BE ADJUSTED TO ACCOMMODATE ONE OF THESE OPTIONS.

COUNTY OF YOLO PLANNING AND PUBLIC WORKS DEPARTMENT	DATE: 08/05/08
UTILITY CROSSING	SHEET # 2 OF 2
Panos Kokkas 28 AUG 08 COUNTY ENGINEER No. C42401 APPROVAL DATE	DRAWING #: 7-7 NOT TO SCALE