APPROVED MATERIALS FOR PIPES

SANITARY SEWER LINES

1) Vitrified Clay Pipe (Extra Strength)
2) Ductile Iron Cement Lined, Class 50
3) Polyvinyl Chloride Gravity Pipe (P.V.C.), SDR-35
4) Acrylonitrile-Butadiene-Styrene Pipe (A.B.S.), SDR-23.5

WATER LINES

1) Asbestos-Cement Pipe, Class 150
2) Ductile Iron Pipe (D.I.P.), Class 150, Cement lined inside
3) Polyvinyl Chloride Pressure Pipe (P.V.C.), Class 150 DR 18, AWWA (C-900)
4) Polyvinyl Chloride Pipe (P.V.C.), Schedule 40 (for irrigation treewells only)

STORM DRAIN LINES

1) Reinforced Concrete Pipe, Class III (minimum)
2) Asbestos-Cement Pipe, Class III (minimum)
3) Polyvinyl Chloride Gravity Pipe (P.V.C.), SDR-35

NOTES:

1. REFER TO THE APPROPRIATE SECTION OF THE STANDARD SPECIFICATIONS FOR APPROVED PIPE CLASSIFICATIONS.

2. ALL MATERIALS TO BE APPROVED BY THE PUBLIC WORKS DEPARTMENT.

NO.	REVISED	BY

DRAWN BY: J. KOESTER
CHECKED BY: J. PODESTA
SCALE: NONE

PIPE MATERIALS

CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: M. Burton
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-1
DATE: JAN. 1988

PRINTED ON DIEPO NO 1000H CLEARPRINT

INSTALLATION SPECIFICATIONS FOR LARGE DIAMETER SEWER AND STORM DRAIN PIPE

GENERAL

The requirements of this specification apply to the following:

1. All "Large Diameter" sanitary sewer pipe 18" in diameter or greater;
2. All "Large Diameter" storm drain pipe, 18" in diameter or greater.

The requirements of this section do not apply to High Density Polyethylene "HDPE" storm drain pipe. (Refer to Standard U-2B)

MATERIALS

"Large Diameter" pipe materials shall comply with City of Manteca Standard Plans and Specifications.

TESTING AND INSPECTION

Testing and inspection shall be in accordance with City of Manteca Standard Plans and Specifications.

All "Large Diameter" sewer and storm drain pipe, except Reinforced Concrete Pipe, installed in the City of Manteca, shall be inspected by means of a closed-circuit color television camera at the expense of the Contractor. The City shall be provided with one reproducible (VHS) format copy of the video inspection. The quality of the picture shall be acceptable to the City, if unacceptable, the pipe shall be retelevised. The City shall also be provided with a copy of the television inspection log.

SPECIAL INSPECTOR

A Special Inspector shall be present during the installation of all "Large Diameter" sewer and storm drain pipe, except Reinforced Concrete Pipe.

The Public Works Department shall approve the resume of the Special Inspector. The Special Inspector shall submit a signed daily report to the Public Works Department at the end of each workday. The Contractor shall be responsible for paying the cost of providing a Special Inspector.

MINIMUM COVER REQUIREMENTS

All sewer and storm drain pipe, regardless of size, installed in the traveled way shall have a minimum of thirty inches (30") of cover measured from the top of the pipe to finished grade. If the cover is less than thirty inches (30"), to an absolute minimum cover of eighteen inches (18"), cement lined Ductile Iron Pipe shall be used.

Any sewer or storm drain pipe installed in the traveled way with less than eighteen inches (18") of cover shall be rejected.

NO.	REVISED	BY
2	9/30/02	JP

DRAWN BY: S. FOX
CHECKED BY: J. PODESTA
SCALE: NONE

LARGE DIAMETER SEWER AND STORM DRAIN PIPE

CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: Michael F. Brinton
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-2A
DATE: JAN. 1988

INSTALLATION SPECIFICATIONS FOR HIGH DENSITY POLYETHYLENE STORM DRAIN PIPE TEN INCHES (10") TO TWENTY-FOUR INCHES (24") IN DIAMETER

GENERAL

The requirements of this specification apply to ten inch (10") to twenty-four inch (24") corrugated, smooth interior, High Density Polyethylene "HDPE" storm drain pipe with water tight joints.

MATERIALS

Pipe shall conform to the latest edition of AASHTO M294 "Type S". Joints shall be watertight attained by using rubber gasketed bell and spigot joints or sanitary fittings with O-ring seals. All fittings, end caps and repair materials shall be supplied or recommended by the manufacturer.

INSTALLATION

Installation shall be in conformance with the latest edition of ASTM D 2321.

SUBMITTALS

Contractor shall submit the following for review and approval by the Public Works Department (Allow 2-weeks for review):

1. Manufacturer's literature on pipe and fittings. Include manufacturer's installation recommendations.

2. Engineer's Report, stamped and signed by a registered Civil Engineer. The report, which shall reference and be in accordance with ASTM D 2321 (Latest Edition), shall provide the following information:
   a. Soil boring logs, for borings to a depth of five feet (5') below the trench foundation or to groundwater (whichever is deeper), showing depth to groundwater, soil classification and description. The location of the borings shall be along the pipe alignment and shall be sufficient in number to ensure sub surface conditions have been adequately identified the entire length of pipe to be installed.
   b. A map showing the location of the borings with respect to the pipe alignment.
   c. Buoyancy calculations showing minimum depth of cover required to prevent the pipe from floating.
   d. A trench cross section showing trench width and depth, and recommended foundation, embedment and backfill materials. Include embedment compaction requirements.

TESTING AND INSPECTION

Testing and inspection shall be in accordance with City of Manteca Standard Plans and Specifications.

NO.	REVISED	BY

DRAWN BY: S. FOX
CHECKED BY: J. PODESTA
SCALE: NONE

HIGH DENSITY POLYETHYLENE (HDPE) STORM DRAIN PIPE

CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: Michael A. Brinton
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-2B
DATE: OCT. 2002

"HDPE" storm drain pipe, installed in the City of Manteca, shall be inspected by means of a closed-circuit color television camera at the expense of the Contractor. The City shall be provided with one reproducible (VHS) format copy of the video inspection. The quality of the picture shall be acceptable to the City, if unacceptable, the pipe shall be retelevised. The City shall also be provided with a copy of the television inspection log.

"HDPE" storm drain pipe shall be mandrel tested prior to acceptance. The maximum allowable deflection shall be 7 ½ % of the base diameter.

At the end of one-year, prior to the exoneration of the warranty bond for construction of public improvements, "HDPE" storm drain pipe shall be mandrel tested a second time. The maximum allowable deflection shall be 7 ½% of the base diameter.

Mandrel testing shall be done at the expense of the Contractor.

SPECIAL INSPECTOR

A Special Inspector shall be present during the installation of "HDPE" storm drain pipe. The Public Works Department shall approve the resume of the Special Inspector. The Special Inspector shall submit a signed daily report to the Public Works Department at the end of each workday. The Contractor shall be responsible for paying the cost of providing a Special Inspector.

MINIMUM COVER REQUIREMENTS

"HDPE" storm drain pipe shall have a minimum of thirty-six inches (36") of cover measured from the top of the pipe to finished grade. If the cover is less than thirty-six inches (36"), to an absolute minimum cover of eighteen inches (18"), cement lined Ductile Iron Pipe shall be used.

Any "HDPE" pipe installed in the traveled way with less than eighteen inches (18") of cover shall be rejected.

NO.	REVISED	BY

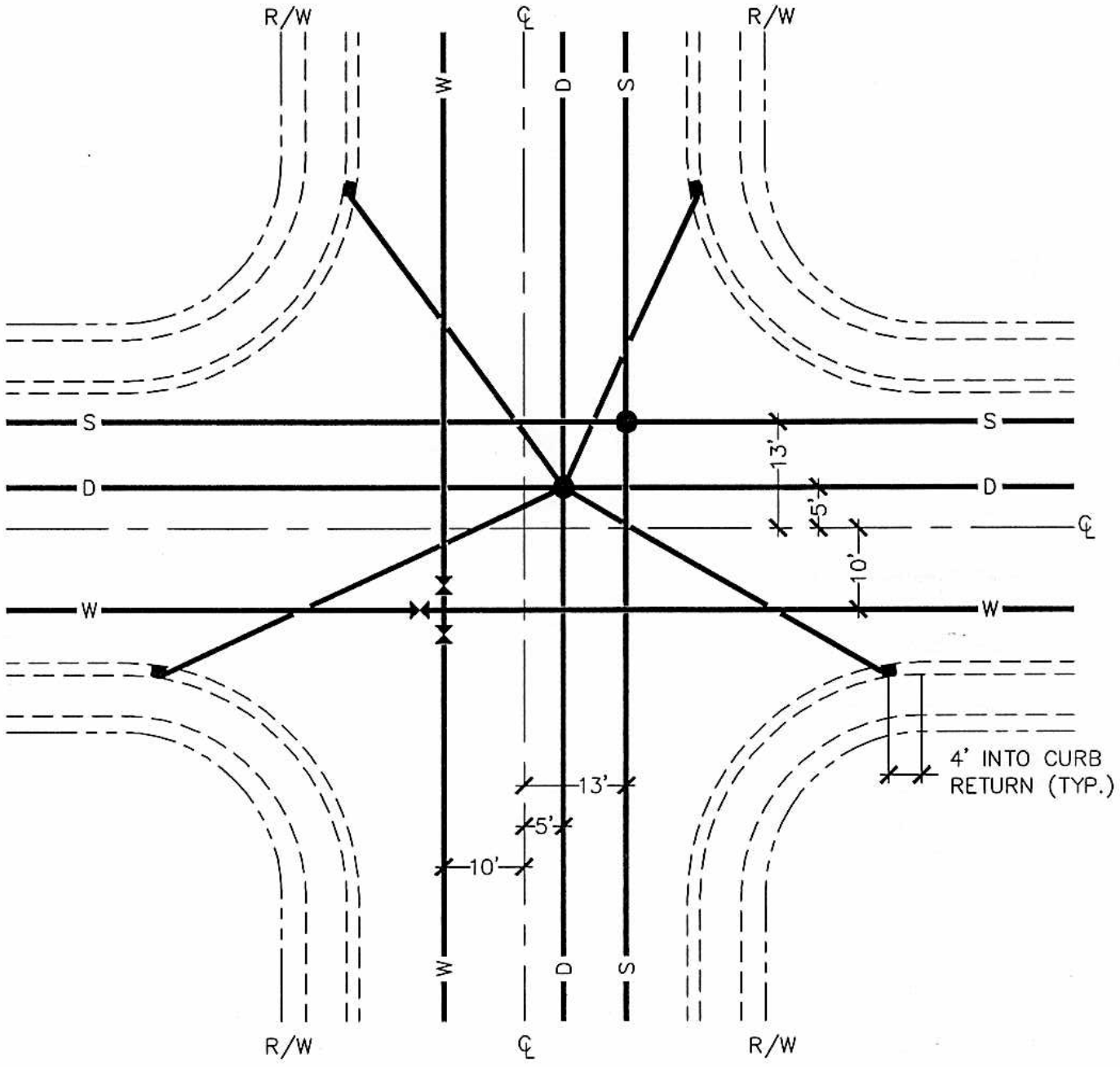
DRAWN BY: S. FOX
CHECKED BY: J. PODESTA
SCALE: NONE

HIGH DENSITY POLYETHYLENE (HDPE) STORM DRAIN PIPE

CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: Michael F. Brandon
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-2B
DATE: OCT. 2002



LEGEND:

D — STORM DRAIN	WATER VALVE
S — SANITARY SEWER	CURB INLET
W — WATER LINE	CENTERLINE
MANHOLE	RIGHT-OF-WAY LINE

NO.	REVISED	BY
1	JUN. 1999	JH
DRAWN BY:	J. HULSEY	
CHECKED BY:	J. PODESTA	
SCALE:	NONE	

LOCATION OF CITY UTILITIES

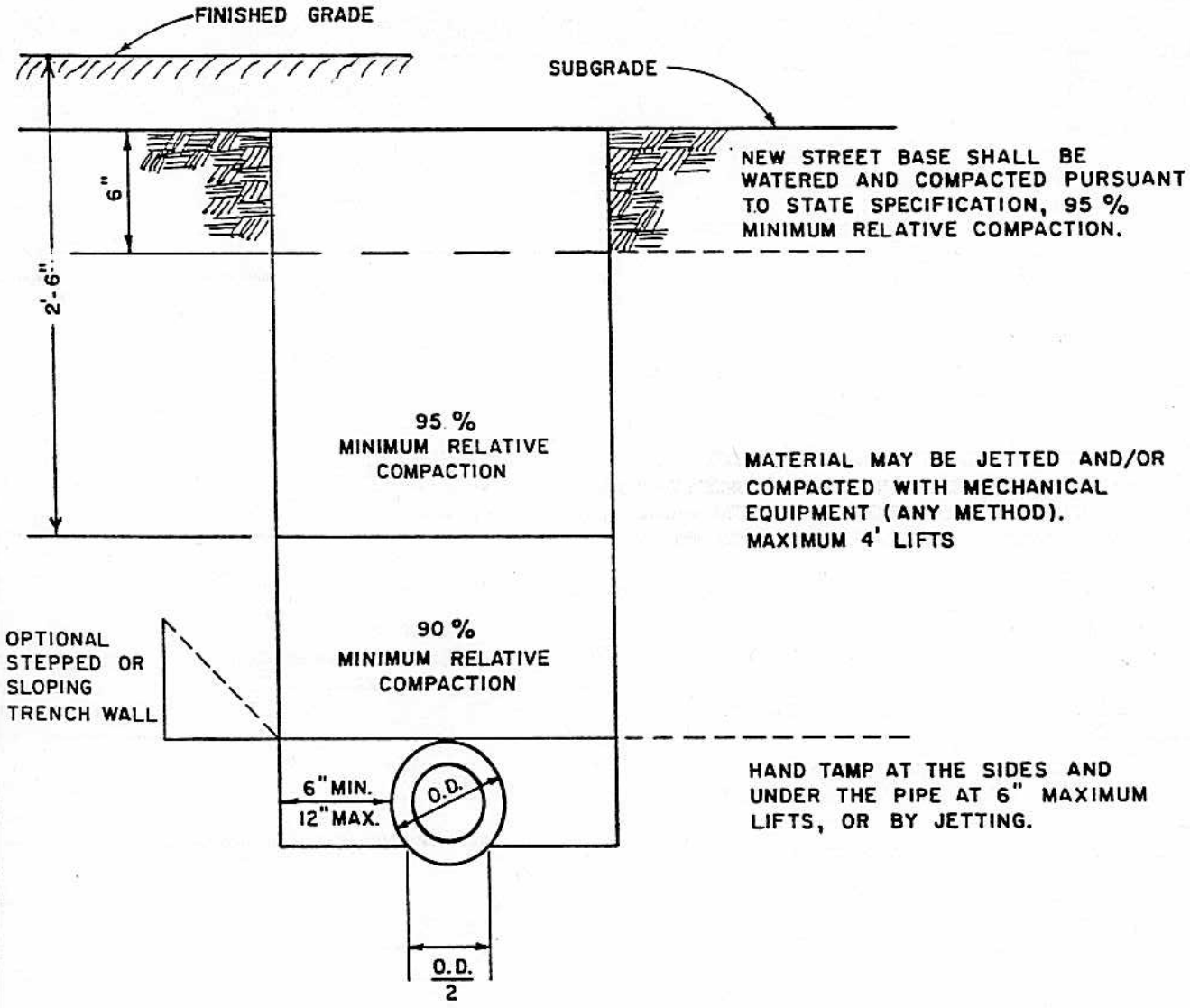
CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-3

DATE: JAN. 1988



NOTES:

1. ANY AREA AT THE BOTTOM OF THE TRENCH DETERMINED TO BE UNSUITABLE BY THE ENGINEER SHALL BE REMOVED AND REPLACED WITH DRAIN ROCK (1-1/2" X 3/4" OR 2-1/2" X 1-1/2").
2. SELECTED NATIVE MATERIAL MAY BE USED IN ALL TRENCH BACKFILL ZONES AND SHALL BE FREE OF ORGANIC MATERIAL, STONES, OR LUMPS EXCEEDING 3" IN GREATEST DIMENSION.
3. COMPACTION TESTING SHALL BE REQUIRED AS DIRECTED BY THE CITY ENGINEER.

NO.	REVISED	BY

DRAWN BY: J. KOESTER
CHECKED BY: J. PODESTA
SCALE: NONE

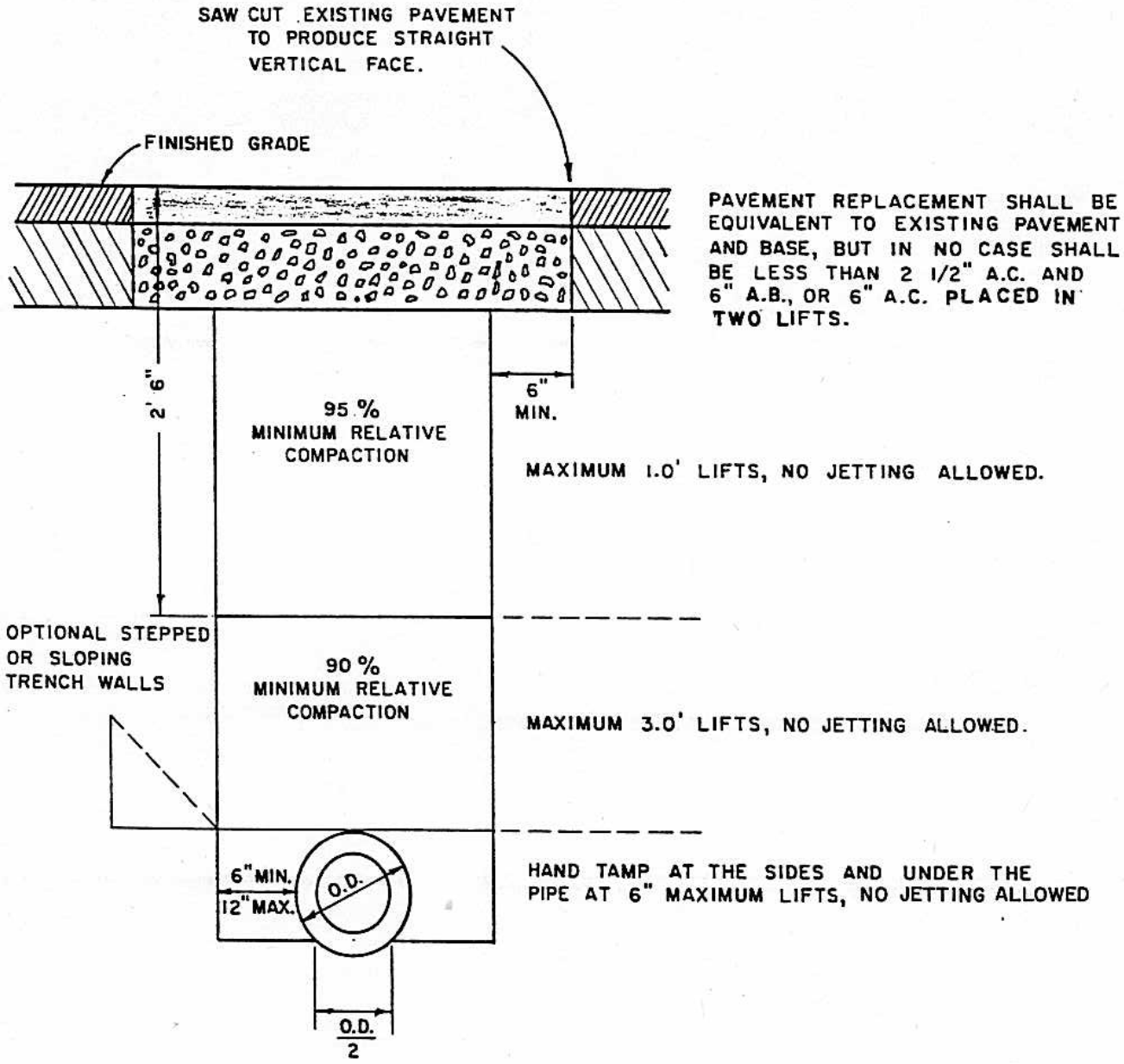
TRENCH BACKFILL FOR NEW SUBDIVISION STREET

CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: M. Brinton
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-4
DATE: JAN. 1988

PRINTED ON DIEPO NO. 1000H CLEARPRINT



NOTES:

1. ANY AREA AT THE BOTTOM OF THE TRENCH DETERMINED TO BE UNSUITABLE BY THE ENGINEER SHALL BE REMOVED AND REPLACED WITH DRAIN ROCK (1-1/2" X 3/4" OR 2-1/2" X 1-1/2").
2. SELECTED NATIVE MATERIAL MAY BE USED IN ALL TRENCH BACKFILL ZONES AND SHALL BE FREE OF ORGANIC MATERIAL, STONES, OR LUMPS EXCEEDING 3" IN GREATEST DIMENSION.
3. COMPACTION TESTING SHALL BE REQUIRED AS DIRECTED BY THE CITY ENGINEER.

NO.	REVISED	BY

DRAWN BY: A. MENOR

CHECKED BY: J. PODESTA

SCALE: NONE

TRENCH BACKFILL IN EXISTING STREETS

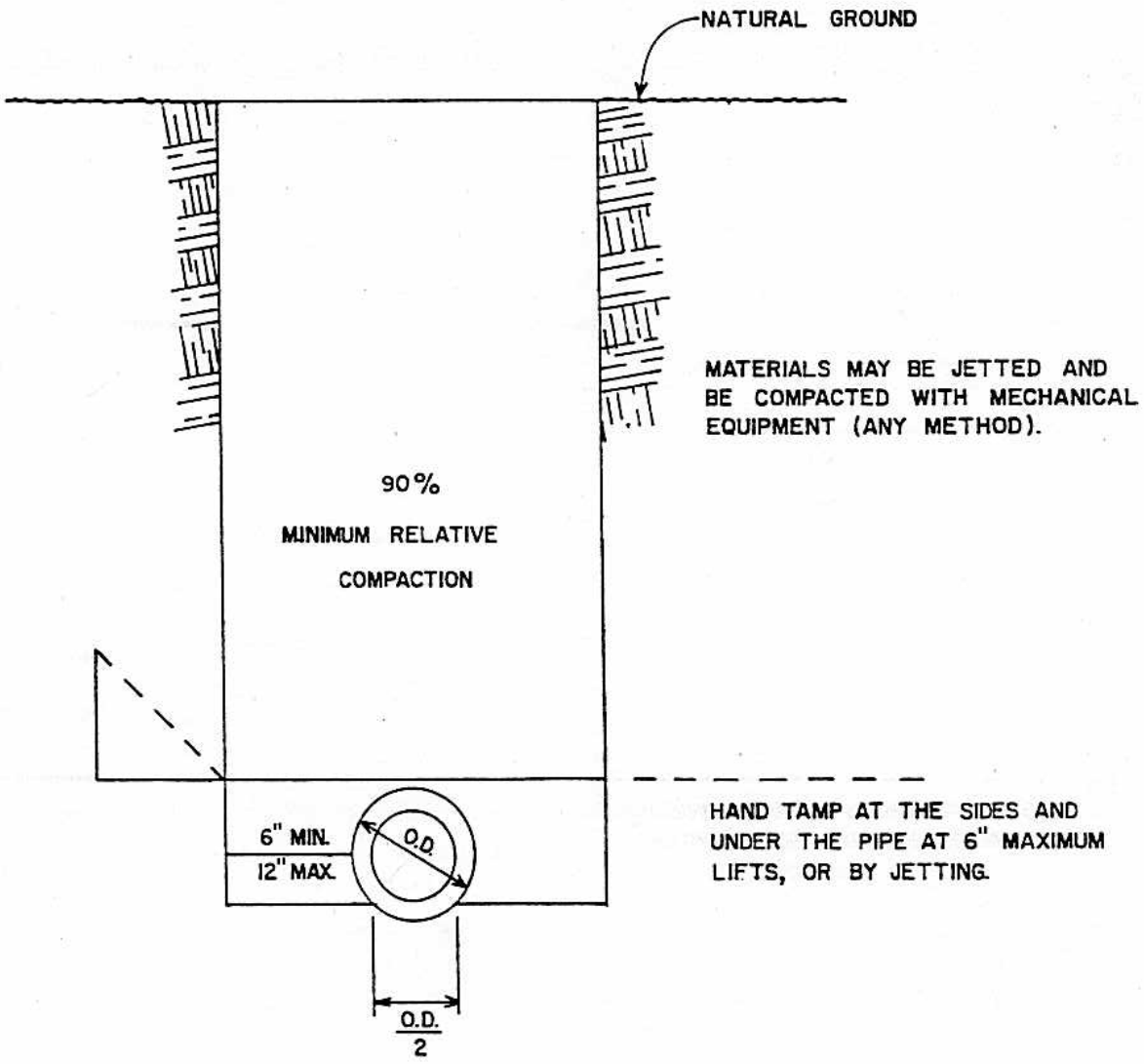
CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: M. Brinton
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-5

DATE: JAN. 1988

PRINTED ON DIEPO NO. 1000H CLEARPRINT



NO.	REVISED	BY

DRAWN BY: A. MENOR

CHECKED BY: J. PODESTA

SCALE: NONE

TRENCH BACKFILL OUTSIDE STREET AREAS (P.U.E.)

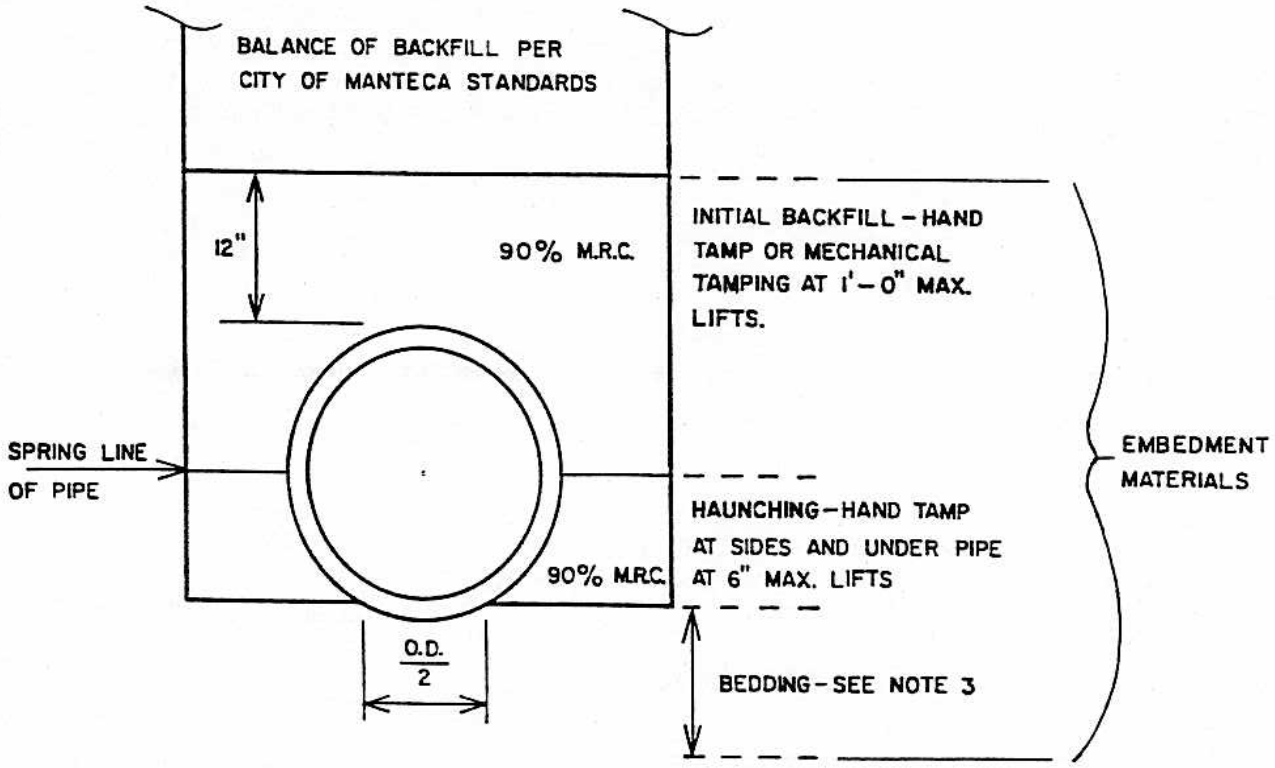
CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-6

DATE: JAN. 1988

PRINTED ON DIEPO NO. 1000H CLEARPRINT



NOTES:

1. ALL EMBEDMENT MATERIALS SHALL CONFORM TO CLASS I, II, OR III SOIL CLASSIFICATIONS AS DESIGNATED IN ASTM D-2321.

2. SELECTED NATIVE MATERIALS CONFORMING TO CLASS I, II, OR III MAY BE USED IN ALL EMBEDMENT MATERIAL ZONES. NATIVE MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES OR LUMPS EXCEEDING 3" IN GREATEST DIMENSION.

3. ANY AREA AT THE BOTTOM OF THE TRENCH DETERMINED TO BE UNSUITABLE BY THE ENGINEER SHALL BE REMOVED AND REPLACED WITH 6" OF CLASS I, II, OR III MATERIALS AT 95% MINIMUM RELATIVE COMPACTION. IN A CASE WHERE THE TRENCH BOTTOM IS UNSTABLE, THE BOTTOM AREA SHALL BE REMOVED AND REPLACED WITH CLASS I OR CLASS II MATERIALS TO A DEPTH DETERMINED BY THE ENGINEER.

4. JETTING WILL NOT BE ALLOWED IN THE EMBEDMENT ZONES. COMPACTION OF EMBEDMENT MATERIALS SHALL CONSIST OF HAND TAMPING AND/OR MECHANICAL TAMPING.

NO.	REVISED	BY

DRAWN BY: C. SABERTON
CHECKED BY: J. PODESTA
SCALE: NONE

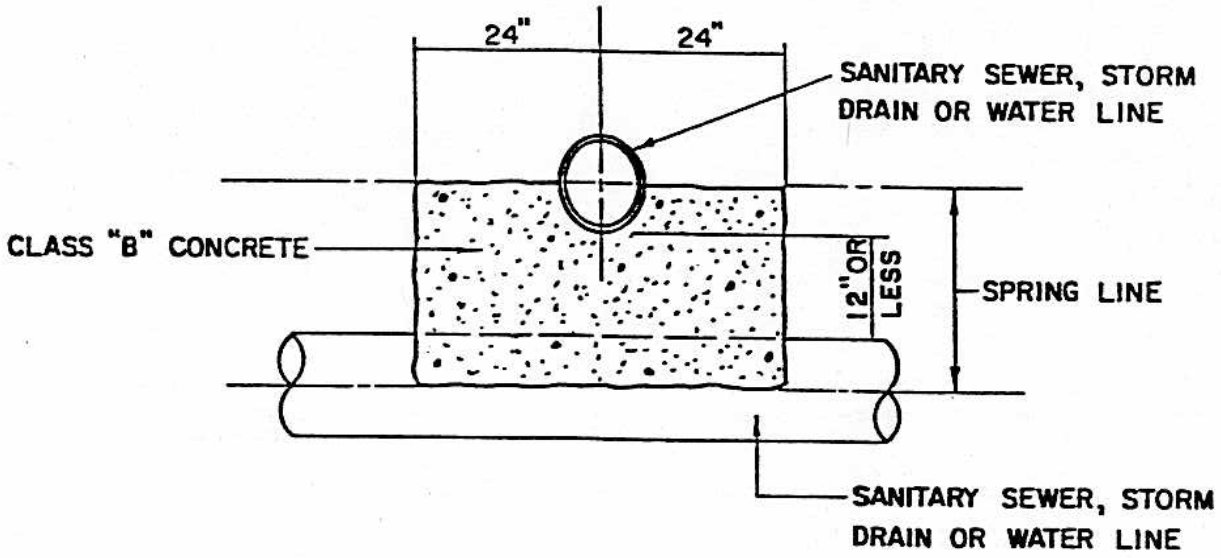
TRENCH BACKFILL FOR P.V.C. PIPE

CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

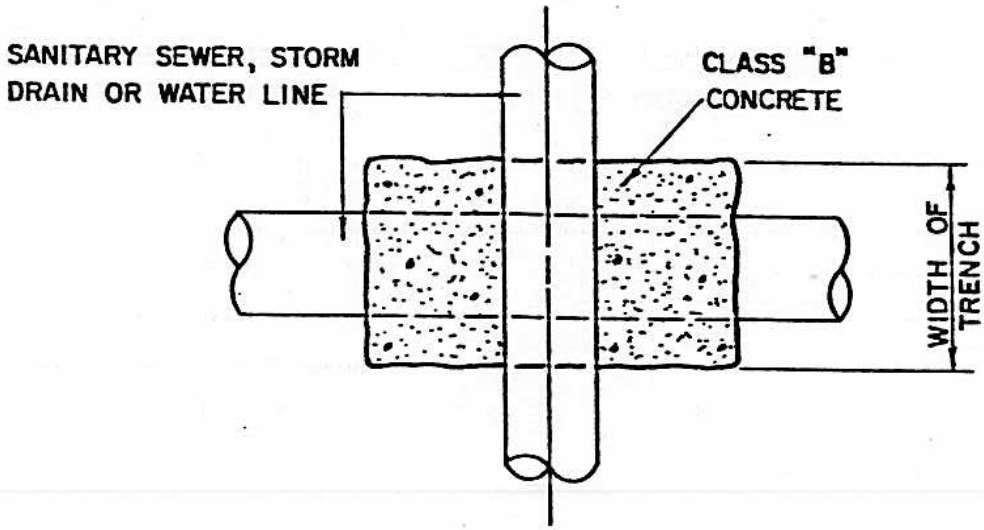
APPROVED BY: M. Brinton
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-7
DATE: JAN. 1988

PRINTED ON DIEPO NO. 1000H CLEARPRINT



SIDE VIEW



PLAN VIEW

NOTES:

1. APPLICABLE IN CASES WHERE CLEARANCE IS 12 INCHES OR LESS.

NO.	REVISED	BY

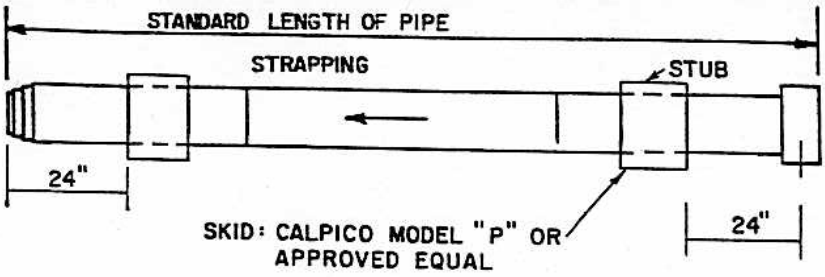
DRAWN BY: J. KOESTER
CHECKED BY: J. PODESTA
SCALE: NONE

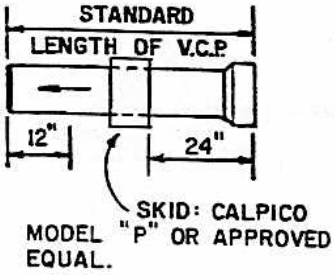
UNDERGROUND UTILITY CROSSING

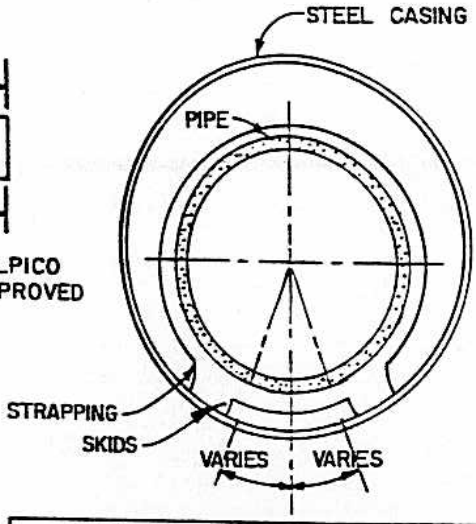
CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

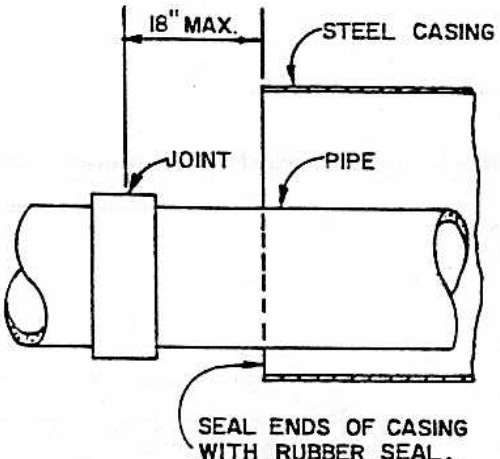
APPROVED BY: M. A. Burton
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-8
DATE: JAN 1988

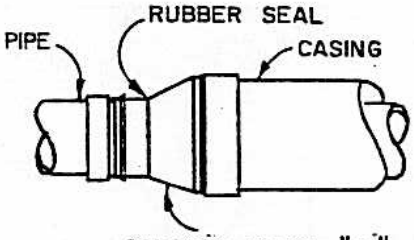








STEEL CASING SCHEDULE		
PIPE SIZE	CASING	THICK.
6" ASBESTOS CEMENT	12" I.D.	3/16"
8" ASBESTOS CEMENT	16" I.D.	1/4"
10" ASBESTOS CEMENT	18" I.D.	1/4"
12" ASBESTOS CEMENT	20" I.D.	1/4"
16" ASBESTOS CEMENT	30" I.D.	11/32"
6" VITRIFIED CLAY	14" I.D.	3/16"
8" VITRIFIED CLAY	16" I.D.	1/4"
10" VITRIFIED CLAY	20" I.D.	1/4"
12" VITRIFIED CLAY	22" I.D.	1/4"
15" VITRIFIED CLAY	30" I.D.	11/32"
18" VITRIFIED CLAY	30" I.D.	11/32"



NOTES:

1. CASING SHALL BE INSTALLED BY THE JACKING OR BORING METHOD.
2. CASING JOINTS SHALL BE WELDED OR RIVETED TYPE.
3. SKIDS SHALL BE PROVIDED AS PER DETAIL ABOVE.
4. SIZE AND THICKNESS OF CASING WALL SHALL BE AS SHOWN IN SCHEDULE.
5. ENDS OF BORE HOLE SHALL BE SEALED TO PREVENT ENTRANCE OF FILL MATERIAL AS REQUIRED.
6. A JOINT SHALL BE INSTALLED AT END OF CASING PIPE (SEE DETAIL).
7. CASING OF A LARGER SIZE THAN SHOWN IN THE ABOVE SCHEDULE OR CASING FOR PIPE LARGER THAN 18" SHALL BE APPROVED BY THE CITY ENGINEER.

NO.	REVISED	BY

DRAWN BY: J. KOESTER
CHECKED BY: J. PODESTA
SCALE: NONE

CASING REQUIREMENTS FOR JACKING OR BORING

CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: W. Bruton
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-9
DATE: JAN. 1988

PRINTED ON DIEPO NO. 1000H CLEARPRINT

At locations shown on the plans, or as specified by the Engineer, all utility crossings shall be bored and jacked into place. Jetting will not be allowed, and areas caving in adjacent to the boring tunnel shall be backfilled with sand or mortar.

The diameter of the bored hole shall not be more than 0.1 foot larger than the outside diameter of the pipe.

MORATORIUM

Trenching of City streets will not be permitted for a period of four (4) years after the placement of a new asphalt-concrete surface. For those streets with newly placed slurry seal coatings, the moratorium shall be two (2) years from the date of resurfacing. Exceptions to the above conditions are as follows:

1. Emergency which endangers life or property.
2. Work that is mandated by City, State, or Federal legislation.
3. Other situations deemed by the City Engineer to be in the best interest of the general public.

Should one or more of the above conditions exist such that trenching of the street is authorized, the following mitigation measures will apply:

ARTERIAL AND COLLECTOR STREETS

A) Longitudinal Trenches Within Traveled Lane:
Over the City's standard trench restoration requirements, the entire traveled lane (limits to be determined by the Engineer) shall be edge planed and overlayed with one and one-half inches (1½") of asphalt-concrete or overlayed and tapered to conform with existing cross slope.

B) Transverse Trenches Across Traveled Lanes:
Over the City's standard trench restoration requirements, an area no less than ten feet (10') wide on each side of the trench shall be planed and overlayed with one and one-half inches (1½") of asphalt-concrete or overlayed and tapered to conform with existing cross slope.

LOCAL SERVICE STREETS

A) Resurfacing Age Under Four (4) Years Old:
Over the City's standard trench restoration requirements, the entire traveled lane (limits to be determined by the Engineer) for longitudinal trenches and ten feet (10') each side of transverse trenches shall be slurry sealed.

B) Resurfacing Age Over Four (4) Years Old:
No additional resurfacing is required over the City's standard trench restoration requirements.

NO.	REVISED	BY
1	2/91	JB

DRAWN BY: J. KOESTER
CHECKED BY: J. BOND
SCALE: NONE

BORING AND TRENCHING OF CITY STREETS

CITY OF MANTECA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
DIRECTOR OF PUBLIC WORKS

DRAWING NO. U-10
DATE: OCT. 1990

PRINTED ON DIEPO NO 1000H CLEARPRINT