

City of Santa Paula
Public Works Department
Standard Plans



February 2009

BY WAY OF EXPLANATION

The City Engineer reserves the right to approve qualified businesses and personnel to construct and install City owned water mains, services, facilities, and appurtenances. Only General Engineering Contractors with a State of California Class A License are qualified for the construction and installation of City owned water mains, services, facilities and appurtenances. Any person or business that does not meet this requirement, or that has ever had their license revoked will not qualify for this work.

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PRESSURE TESTING AND DISINFECTION OF WATER LINES

ALL CHLORINATION, SAMPLING AND TESTING SHALL BE APPROVED BY AND PERFORMED IN THE PRESENCE OF A CITY REPRESENTATIVE. THE CITY REPRESENTATIVE MAY REQUIRE A STATE CERTIFIED TESTER.

HYDROSTATIC TEST.

AFTER COMPLETION OF PIPELINE INSTALLATION, ALL WATER MAINLINE AND ANY PIPING SHALL BE FILLED WITH WATER AND ALL TRAPPED AIR BLED OFF. THE PIPELINE SHALL BE TESTED UNDER A HYDROSTATIC PRESSURE TEST OF 50 PSI ABOVE RATING OF PIPE OR A MAXIMUM OF 200 PSI FOR A PERIOD OF NOT LESS THAN 4 HOURS. THE PRESSURE SHALL BE MAINTAINED AT THE CONCLUSION OF THE 4 HOURS. THE TEST PRESSURE SHALL BE RESTORED AND ALL WATER USED SHALL BE ACCURATELY MEASURED TO DETERMINE THE ACTUAL LEAKAGE.

SUITABLE CALIBRATION TANKS FOR MEASUREMENT OF LEAKAGE AND THE NECESSARY BULKHEADS, PIPING, CALIBRATED GAUGES, WATER METER, PUMPS, POWER AND LABOR SHALL BE PROVIDED BY THE CONTRACTOR.

ALL LEAKS OR OTHER DEFECTS THAT MAY DEVELOP DURING THE TEST SHALL BE REPAIRED. FOLLOWING ANY REPAIRS, THE TEST SHALL BE REPEATED UNTIL THE PIPE IS FOUND SATISFACTORY.

THE MAXIMUM ALLOWABLE LEAKAGE RATE FOR PVC PIPE WITH CAST IRON FITTINGS IS 10 GALLONS PER DAY PER INCH DIAMETER PER MILE.

DISINFECTION OF POTABLE WATER LINES.

AFTER PRESSURE TESTING AND PRIOR TO ACCEPTANCE OF THE WORK, THE ENTIRE PIPELINE, INCLUDING ALL VALVES, FITTINGS, HYDRANTS AND OTHER ACCESSORIES SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C651 AND AS FOLLOWS. ALL CHLORINATION, SAMPLING AND TESTING SHALL BE PERFORMED BY A CERTIFIED OPERATOR IN THE PRESENCE OF A CITY REPRESENTATIVE.

CHLORINE RESIDUAL SHALL BE DETERMINED AND RECORDED IN ACCORDANCE WITH THE METHOD SPECIFIED IN APPENDIX TO AWWA C651; WITH AMOUNTS OF APPLIED CHLORINE TO PRODUCE A 40-50 PPM AND A RESIDUAL OF NOT LESS THAN 25 PPM IN ALL PARTS OF THE LINE AFTER A 24 HOUR PERIOD HAS ELAPSED. THE CONTRACTOR SHALL PROVIDE A PLAN AND FACILITIES FOR DISINFECTION. THE CONTRACTOR SHALL ALSO PROVIDE AND KEEP CHLORINE RESIDUAL TESTING AND INDICATING APPARATUS AVAILABLE ON THE SITE DURING DISINFECTION PERIOD.

DURING CHLORINATION PROCESS, ALL VALVES AND ACCESSORIES SHALL BE OPERATED. AFTER A 24 HOUR CHLORINATION, THE WATER SHALL BE FLUSHED AT A RATE OF 2.5 FEET PER SECOND FROM THE LINE AT ITS EXTREMITIES UNTIL THE REPLACEMENT WATER TEST ARE EQUAL CHEMICALLY AND BACTERIOLOGICALLY, TO THOSE OF THE PERMANENT SUPPLY. THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL DISCHARGE REQUIREMENTS IN ACCORDANCE WITH THE REQUIREMENTS OF VENTURA COUNTYWIDE STORM WATER QUALITY MANAGEMENT PROGRAM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. CAS0963339.

FOLLOWING THE FLUSHING OF THE LINE, THE CONTRACTOR SHALL REFILL THE WATERLINE WITH SYSTEM WATER AND THE CONTRACTOR SHALL PERFORM THE WATER SAMPLING FOR BACTERIOLOGICAL TEST AFTER A 24 HOUR LAPSE TIME. THE BACTERIOLOGICAL TESTING SHALL BE PERFORMED BY A STATE CERTIFIED LAB AND SHALL BE APPROVED BY THE CITY OF SANTA PAULA PRIOR TO CONDUCTING THE TESTING. SUCH TESTING SHALL MEET THE STATE DEPARTMENT OF HEALTH SERVICES REQUIREMENTS FOR DOMESTIC PURPOSES PRIOR TO ACCEPTANCE OF THE LINE FOR INTEGRATION AND USE IN THE SYSTEM. THE COST OF TESTING SHALL BE BORNE BY THE CONTRACTOR.

ALL VALVES CONNECTED TO THE CITY SYSTEM SHALL BE IN THE OFF POSITION UNTIL THE TEST RESULTS ARE RECEIVED AND CHECKED BY THE CITY OF SANTA PAULA.

CONTRACTOR SHALL PROVIDE A CERTIFIED FLOW TEST FOR EACH HYDRANT INSTALLED MEASURING MAXIMUM FLOW RATE, STATIC PRESSURE AND DYNAMIC PRESSURE. WRITTEN FLOW RESULTS SHALL BE PROVIDED TO THE CITY WATER DIVISION PRIOR TO ACCEPTANCE OF THE WATER SYSTEM. A HYDRANT FLOW TEST PERMIT WILL BE REQUIRED AND OBTAINED FROM THE PUBLIC WORKS DEPARTMENT. \$100 FEE FOR A FIRE FLOW TEST. \$50 WILL BE RETURNED WITH RESULTS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

DISINFECTION AND PRESSURE TESTING NOTES

101

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE

SHEET 1 OF 3

CITY OF SANTA PAULA
CHLORINATION OF NEW WATER LINES

1. A CHLORINE RESIDUAL WILL BE TAKEN AND RECORDED, WHEN THE NEW WATER MAINLINE HAS BEEN CHLORINATED TO 40-50 PPM MINIMUM.
2. THE CHLORINATED WATER WILL SIT UNDISTURBED FOR 24 HOURS BEFORE BEING FLUSHED.
3. NO CHLORINATED WATER WILL SIT IN THE NEW WATER LINE OVER THE WEEKEND; THE CHLORINATED LINE MUST BE FLUSHED AT THE END OF 24-HOUR PERIOD.
4. A RESIDUAL WILL BE TAKEN AND RECORDED AT THE END OF THE 24-HOUR PERIOD BEFORE ANY FLUSHING IS STARTED. LESS THAN 25 PPM IS A "FAIL".
5. AFTER THE FLUSHING HAS BEEN COMPLETED, RESIDUAL WILL BE TAKEN AND RECORDED, THE MAIN VALVE WILL BE TURNED OFF AGAIN.
6. AFTER THE BAC-T SAMPLES ARE TAKEN THE MAIN VALVE WILL BE TURNED OFF AGAIN AND IT WILL REMAIN OFF UNTIL A HARD COPY OF THE TEST RESULTS AND A COPY OF "THE CHAIN OF CUSTODY" IS DELIVERED TO THE WATER DIVISION REP.
7. THE MAIN VALVE WILL ONLY BE OPENED FOR SERVICE BY WATER DIVISION REP.
8. ALL CHLORINE RESIDUALS READINGS SHALL BE RECORDED.
9. ALL CHLORINE RESIDUALS AND BAC-T SAMPLES SHALL BE WITNESSED BY A WATER DIVISION REP, OR THEY WILL NOT BE ACCEPTED.

CONSTRUCTION NOTES

1. ALL FITTINGS SHALL BE DUCTILE IRON.
2. PUSH ON OR MECHANICAL JOINTS SHALL BE USED FOR ALL DUCTILE IRON PIPE AND FITTINGS WITH MECHANICAL RESTRAINED GLANDS (MEGALUGS)
3. INSTALL ___INCH AWWA C-900 CL 150/200, PVC PIPE AND ___INCH D.I.P. AWWA C110 PER CITY STANDARD 103.
4. REPAIR DAMAGED SIDEWALK, CURB AND GUTTER IN KIND. SAWCUTS SHALL BE MADE ALONG EXISTING SCORE LINES.
5. ALL UTILITIES AND OTHER STRUCTURES ALONG THE WATER LINE MUST BE LOCATED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ONCE THESE UTILITIES AND STRUCTURES HAVE BEEN EXPOSED BY THE CONTRACTOR, HE SHALL TAKE MEASUREMENTS AND VERIFY THEIR LOCATION WITH THE CITY'S REPRESENTATIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT ALL EXISTING FACILITIES, FROM DAMAGE DURING CONSTRUCTION WHETHER OR NOT THEIR EXISTENCE OR APPROXIMATE LOCATIONS ARE SHOWN ON THESE PLANS.
6. CONTRACTOR SHALL NOTIFY CITY'S REPRESENTATIVES 72 HOURS AND WATER CUSTOMERS AFFECTED 48 HOURS PRIOR TO INTERRUPTION OF WATER SERVICE. NO EXEMPTIONS WILL BE MADE.
7. CONTRACTOR SHALL DEMONSTRATE PROPER OPERATION OF ALL VALVES ON FINAL WALK THROUGH BROUGHT TO FINISH GRADE AND VALVE CANS SHALL BE LEFT FREE RECORDED ON THE AS-BUILT PLANS. ALL VALVE CANS SHALL BE AND CLEAR OF ALL DEBRIS. OPERATOR NUTS SHALL BE CENTERED IN THE VALVE STACK.

CONT'D ON SHT. 3

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	APPROVED BY:  PUBLIC WORKS DIRECTOR / CITY ENGINEER	1-28-09 DATE

CONSTRUCTION NOTES

8. ALL DAMAGED STREET MARKINGS SHALL BE REPAINTED BY CONTRACTOR. THE COST IS TO BE INCLUDED IN THE BID PRICE, FOR THE PROJECT.
9. OVERHEAD ELECTRIC AND CABLE TV LINES ARE NOT NECESSARILY INDICATED ON THE DRAWING, BUT MAY EXIST ON THE JOB SITE. THE CONTRACTOR SHALL EXERCISE CAUTION WHILE WORKING NEAR, OR UNDER, ALL ELECTRIC AND CABLE TV LINES.
10. THE CONTRACTOR SHALL ANTICIPATE ENCOUNTERING ROCKY SOIL CONDITIONS DURING EXCAVATION. NO ADDITIONAL ALLOWANCE WILL BE MADE FOR EXTRA WORK PERTAINING TO TRENCHING CONDITIONS.
11. CONTRACTOR SHALL FIELD VERIFY EXISTING WATER SERVICE LOCATIONS PRIOR TO EXCAVATING SERVICE LATERAL TRENCHES.
12. TRENCH EXCAVATION SHALL INCLUDE AC/CONCRETE REMOVAL. THE COST SHALL BE INCLUDED IN THE BID PRICE PER LINEAR FOOT OF PIPE INSTALLED.
13. ALL OPEN EXCAVATION SHALL BE BACKFILLED OR COVERED WITH PLATES AT THE END OF EACH WORKING DAY. PLATING SHALL BE RAMPED WITH 1' MIN. TEMPORARY AC PAVEMENT. THE EXCAVATION SHALL NOT BE LEFT OPEN WHEN WORKERS ARE NOT PRESENT.
14. ALL NECESSARY AND PROPER LIGHTED BARRICADES SHALL BE POSITION AROUND THE CONSTRUCTION SITE AND ANY EQUIPMENT.
15. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH WATCH MANUAL A. TRAFFIC CONTROL PLAN SHALL BE SUBMITTED FOR APPROVAL TO THE CITY ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
16. COAT ALL BURIED FITTINGS, VALVES, PLASTIC AND APPURTENANCES WITH RUBBERIZED UNDERCOATING AND COVER WITH 10 MIL POLYETHYLENE OR APPROVED EQUAL.
17. ABANDONMENT OF EXISTING WATER MAINS SHALL BE DONE IN ACCORDANCE WITH SEC. 5-3 OF THE STANDARD SPECIFICATIONS. ABANDONED PIPE SHALL BE PLUGGED WITH CONCRETE AT ALL ENDS. ABANDONMENT OF EXISTING FIRE HYDRANTS SHALL BE DONE BY THE CONTRACTOR AND SURPLUS MATERIAL DELIVERED TO THE CITY WATER YARD, 180 S. PALM AVE. VALVE STACKS ON ABANDONED LINES SHALL BE FULLY REMOVED, BACKFILLED AND AN ASPHALT PATCH CONSTRUCTED.
18. LOCATION WIRE SHALL BE INSTALLED ON ALL NON-METALLIC WATERLINES, THE CONNECTION TO THE PVC SHALL BE STRIPPED BACK AT THE SERVICE SADDLES AND CONNECTED TO THE SADDLE BOLT ON ALL SERVICE LATERALS, FLANGE/VALVE BOLT ON ALL FIRE HYDRANT LATERALS AND TO ALL VALVE STACKS. THE IDENTIFICATION WIRE SHALL BE A PLASTIC COATED 10 GAUGE COPPER WIRE AND SHALL BE PROPERLY SECURED TO THE PIPE EVERY 10 FT. AND EXTENDED ALONG THE EXTERIOR OF VALVE STACKS.
19. WHEN IMPROVEMENTS ARE DONE TO THE EXISTING WATER SYSTEM, ALL SERVICES ARE TO BE BROUGHT UP TO CURRENT CITY STANDARDS. THESE IMPROVEMENTS INCLUDE BOTH THE CITY AND CUSTOMER SIDE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

DISINFECTION AND PRESSURE TESTING NOTES

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

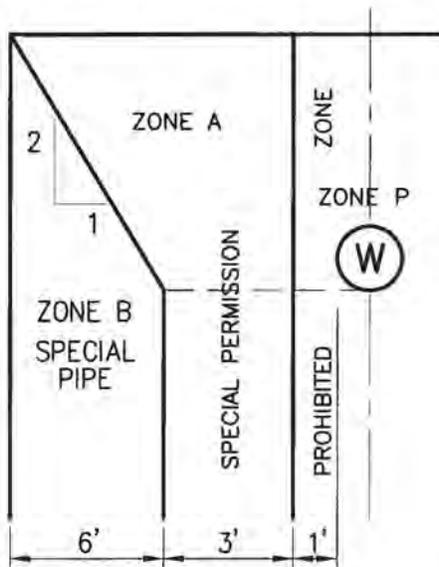
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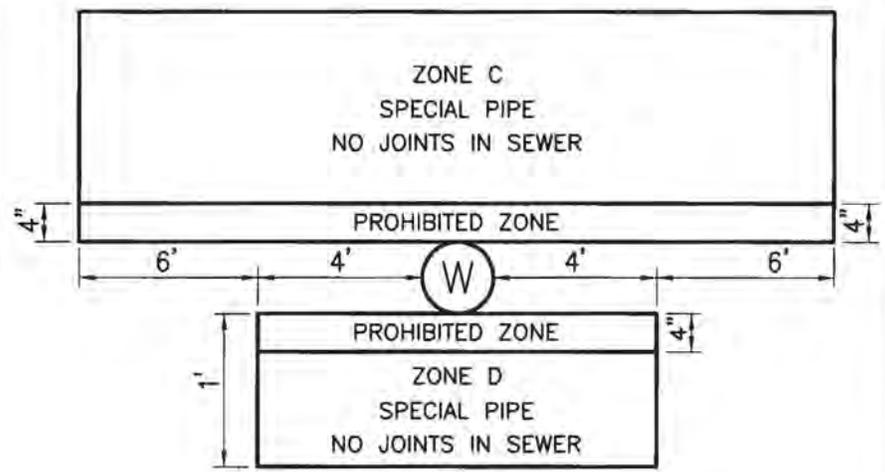
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PARALLEL CONSTRUCTION



CONSTRUCTION AT CROSSINGS



NOTES:

1. ZONES IDENTICAL ON EITHER SIDE OF CENTERLINE.
2. ZONE P IS A PROHIBITED ZONE, SEC. 64630 (e)(2) CALIFORNIA CODE OF REGULATIONS, TITLE 22.

ZONE SPECIAL CONSTRUCTION REQUIRED FOR SANITARY SEWER LINE

- A. SANITARY SEWER LINES PARALLEL TO WATER MAINS SHALL NOT BE PERMITTED IN THIS ZONE WITHOUT APPROVAL FROM THE RESPONSIBLE HEALTH AGENCY AND WATER SUPPLIER.
- B. A SANITARY SEWER LINE PLACED PARALLEL TO A WATER MAIN SHALL BE CONSTRUCTED OF:
 1. EXTRA STRENGTH VITRIFIED CLAY PIPE WITH COMPRESSION JOINTS.
 2. CLASS 4000, TYPE II, ASBESTOS-CEMENT PIPE WITH RUBBER GASKET JOINTS.
 3. PLASTIC SANITARY SEWER PIPE WITH RUBBER RING JOINTS (PER ASTM D3034) OR EQUIVALENT.
 4. CAST OR DUCTILE IRON PIPE WITH COMPRESSION JOINTS.
 5. REINFORCED CONCRETE PRESSURE PIPE WITH COMPRESSION JOINTS (PER AWWA C302-74).
- C. A SANITARY SEWER LINE CROSSING A WATER MAIN SHALL BE CONSTRUCTED OF:
 1. DUCTILE IRON PIPE WITH HOT DIPPED BITUMINOUS COATING AND MECHANICAL JOINTS.
 2. A CONTINUOUS SECTION OF CLASS 200 (DR14 PER AWWA C900) PLASTIC PIPE OR EQUIVALENT CENTERED OVER THE PIPE BEING CROSSED.
 3. A CONTINUOUS SECTION OF REINFORCED CONCRETE PRESSURE PIPE (PER AWWA C302-74) CENTERED OVER THE PIPE BEING CROSSED.
 4. ANY SANITARY SEWER PIPE WITHIN A CONTINUOUS SLEEVE.
- D. A SANITARY SEWER LINE CROSSING A WATER MAIN SHALL BE CONSTRUCTED OF:
 1. A CONTINUOUS SECTION OF DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING.
 2. A CONTINUOUS SECTION OF CLASS 200 (DR14 PER AWWA C900) PLASTIC PIPE OR EQUIVALENT CENTERED OVER THE PIPE BEING CROSSED.
 3. A CONTINUOUS SECTION OF REINFORCED CONCRETE PRESSURE PIPE (PER AWWA C302-74) CENTERED OVER THE PIPE BEING CROSSED.
 4. ANY SANITARY SEWER PIPE WITHIN A CONTINUOUS SLEEVE.
 5. ANY SANITARY SEWER PIPE SEPARATED BY A TEN-FOOT, FOUR INCH THICK REINFORCED CONCRETE SLAB.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

SEPARATION REQUIREMENTS FOR WATER & SANITARY SEWER PIPELINES

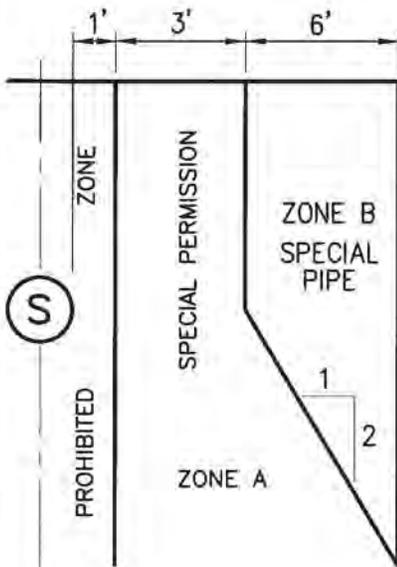
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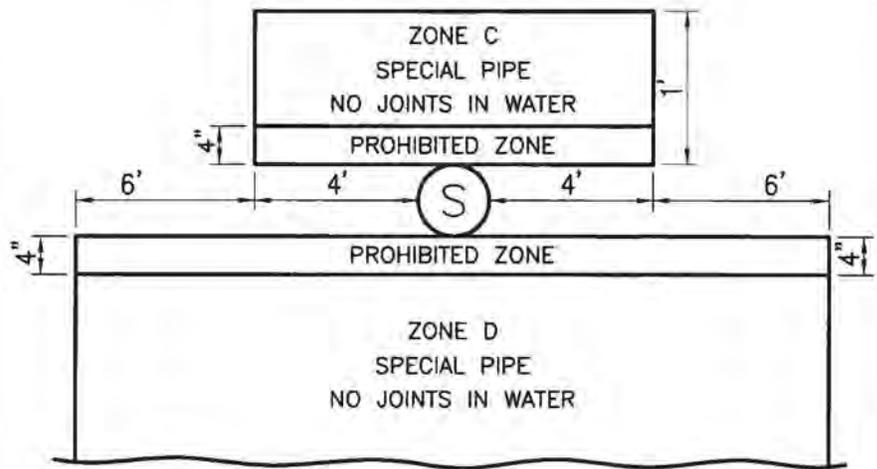
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SHEET 1 OF 2

PARALLEL CONSTRUCTION



CONSTRUCTION AT CROSSINGS



NOTES:

1. ZONES IDENTICAL ON EITHER SIDE OF CENTERLINE.
2. ZONE P IS A PROHIBITED ZONE, SEC. 64630 (e)(2) CALIFORNIA CODE OF REGULATIONS, TITLE 22.

ZONE SPECIAL CONSTRUCTION FOR REQUIRED FOR NEW WATER MAIN

- A. NO WATER MAINS PARALLEL TO SANITARY SEWER LINES SHALL BE PERMITTED IN THIS ZONE WITHOUT APPROVAL FROM THE RESPONSIBLE HEALTH AGENCY AND WATER SUPPLIER.
- B. IF THE SANITARY SEWER LINE PARALLEL TO THE WATER MAIN DOES NOT MEET THE CASE 1, ZONE B REQUIREMENTS, THE WATER MAIN SHALL BE CONSTRUCTED OF:
 1. DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING.
 2. DIPPED AND WRAPPED ONE-FOURTH-INCH THICK WELDED STEEL PIPE.
 3. CLASS 200 PRESSURE RATED PLASTIC WATER PIPE (DR14 PER AWWA C900) OR EQUIVALENT.
 4. REINFORCED CONCRETE PRESSURE PIPE, STEEL CYLINDER TYPE, PER AWWA C300-74, C301-79 OR C303-70.
- C. IF THE SANITARY SEWER LINE CROSSING THE WATER MAIN DOES NOT MEET THE CASE 1, ZONE C REQUIREMENTS, THE WATER MAIN SHALL HAVE NO JOINTS WITHIN FOUR FEET FROM EITHER SIDE OF THE SANITARY SEWER LINE AND SHALL BE CONSTRUCTED OF:
 1. DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING.
 2. DIPPED AND WRAPPED ONE-FOURTH-INCH THICK WELDED STEEL PIPE.
 3. CLASS 200 PRESSURE RATED PLASTIC WATER PIPE (DR14 PER AWWA C900) OR EQUIVALENT.
 4. REINFORCED CONCRETE PRESSURE PIPE, STEEL CYLINDER TYPE, PER AWWA C300-74, C301-79 OR C303-70.
- D. IF THE SANITARY SEWER LINE CROSSING THE WATER MAIN DOES NOT MEET THE CASE 1, ZONE D REQUIREMENTS, THE WATER MAIN SHALL HAVE NO JOINTS WITHIN FOUR FEET FROM EITHER SIDE OF THE SANITARY SEWER LINE AND SHALL BE CONSTRUCTED OF:
 1. DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING.
 2. DIPPED AND WRAPPED ONE-FOURTH-INCH THICK WELDED STEEL PIPE.
 3. CLASS 200 PRESSURE RATED PLASTIC WATER PIPE (DR14 PER AWWA C900) OR EQUIVALENT.
 4. REINFORCED CONCRETE PRESSURE PIPE, STEEL CYLINDER TYPE, PER AWWA C300-74, C301-79 OR C303-70.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SEPARATION REQUIREMENTS FOR WATER & SANITARY SEWER PIPELINES

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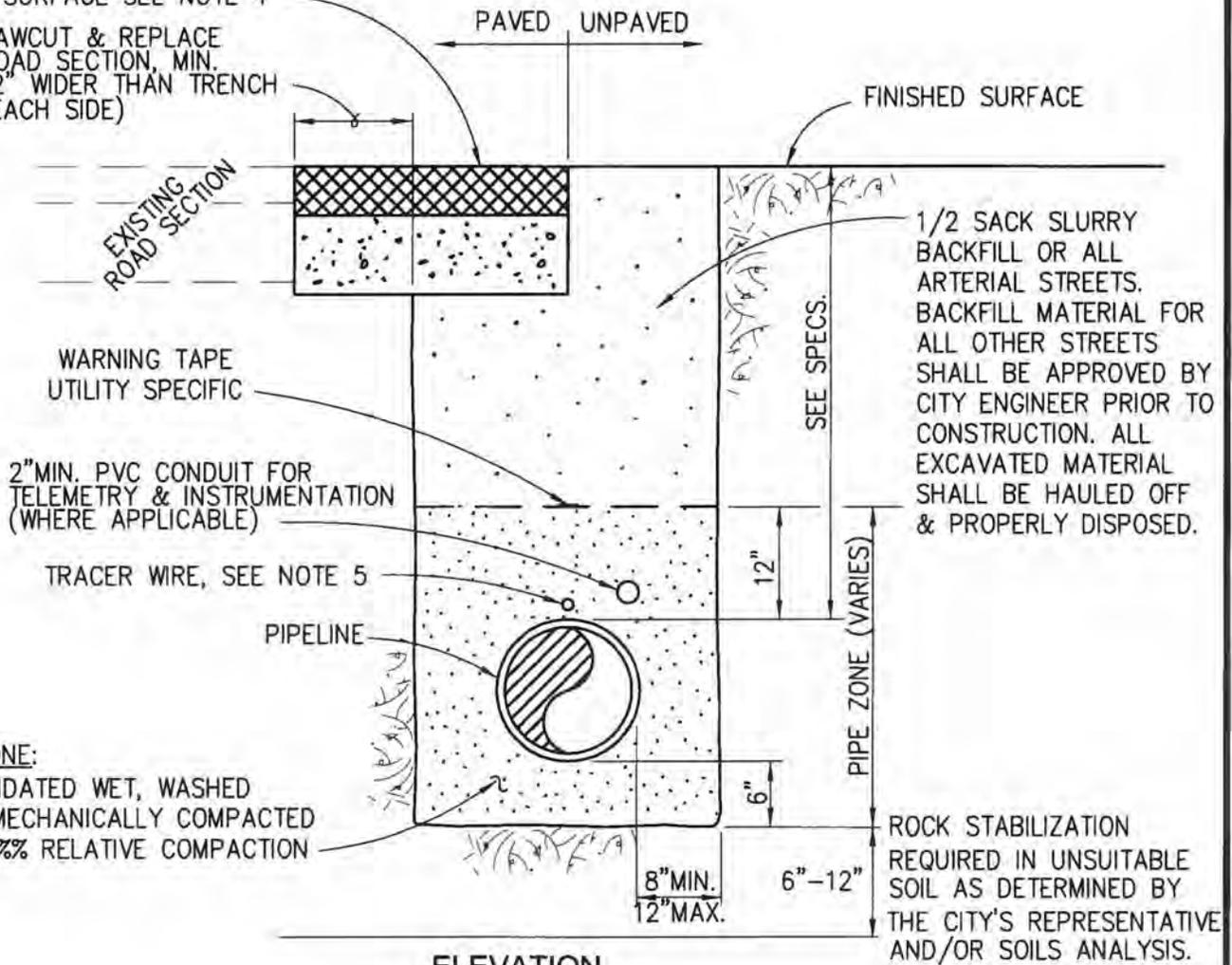
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SHEET 2 OF 2

AC FINISH SHALL BE A SMOOTH CONTINUATION OF ADJACENT AC SURFACE SEE NOTE 4

SAWCUT & REPLACE ROAD SECTION, MIN. 12" WIDER THAN TRENCH (EACH SIDE)



ELEVATION
NTS

NOTES:

1. AC FINISH SURFACE SHALL BE A SMOOTH CONTINUATION OF ADJACENT AC SURFACE.
2. CONTRACTOR SHALL REFER TO CITY OF SANTA PAULA AC PAVEMENT TRENCH RESURFACING STD. 425.
3. DEPENDING UPON THE CLASSIFICATION OF THE STREET, A CEMENT SLURRY BACKFILL MAY BE REQUIRED.
4. DEPENDING UPON THE CLASSIFICATION OF THE STREET, A COLD PLANED AC PATCH MAY BE REQUIRED.
5. #10 PLASTIC COATED SOLID CORE COPPER TRACER WIRE TAPED TO MAIN EVERY 10' WITH POLY TAPE WHEN PVC PIPE IS INSTALLED.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

**TRENCH SECTION FOR
DI, PVC AND STEEL PIPE**

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE

STANDARD PLAN

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SHEET 1 OF 2

1. PIPE DEPTH: DEPTH OF PIPES SHALL CONFORM TO THE FOLLOWING SCHEDULE UNLESS NOTED OTHERWISE ON THE PLANS:
 - UP TO 12" DIAMETER-42" COVER
 - UP TO 24" DIAMETER-48" COVER
 - OVER 24" DIAMETER-AS SHOWN ON THE PLANS
2. SELECTED MATERIAL FOR PIPE BEDDING AND PIPE ZONE: SELECTED MATERIAL FOR PIPE BEDDING AND PIPE ZONE BACKFILL SHALL BE SELECTED NATIVE MATERIAL FREE FROM CLODS, STICKS, VEGETATION, CHUNKS OF ASPHALT PAVING, OR OTHER DELETERIOUS MATERIALS AND SHALL BE FREE OF ROCKS OR STONES WHICH ARE LARGER THAN 3/4 INCH IN GREATEST DIMENSION. NATIVE MATERIAL MAY ONLY BE USED IF THESE REQUIREMENTS ARE MET AND/OR APPROVED BY THE CITY'S REPRESENTATIVE. OTHERWISE SAND CONFORMING TO THESE SPECIFICATIONS SHALL BE WASHED SAND ONLY.
3. SAND: SAND MATERIAL SHALL BE CLASSIFIED AS "WASHED SAND" FOR BEDDING, PIPE ZONE, AND BACK FILL PURPOSES. IF SAND IS TO BE USED FOR PIPE BEDDING OR PIPE ZONE, IT SHALL BE FREE FROM FOREIGN MATERIALS SUCH AS ROCKS, STICKS, VEGETATION, ETC., AND SHALL MEET THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENTAGE PASSING (BY WEIGHT)
3/8 INCH	100
NO. 4	75 - 100
NO. 30	12 - 50
NO. 100	5 - 20
NO. 200	0 - 10

4. AGGREGATE BASE: IF AGGREGATE IS REQUIRED FOR PIPE BEDDING FOUNDATION, IT SHALL BE NO. 67 CRUSHED AGGREGATE AS DEFINED BY ASTM D 448 AND SHALL BE FREE FROM FOREIGN AND ORGANIC MATTER.
GRADATION - ASTM D-448 (NO. 67)

SIEVE SIZE	PERCENTAGE PASSING (BY WEIGHT)
1 INCH	100
3/4 INCH	90 - 100
3/8 INCH	20 - 55
NO. 4	0 - 10
NO. 8	0 - 5

5. 1/2 SACK CEMENT SLURRY BACKFILL: CLASS 100-E-100 IN ACCORDANCE WITH THE 2 SACK STANDARD
6. ASPHALT PAVEMENT: ASPHALT CONCRETE PAVING SHALL CONFORM TO STANDARD DRAWING ES005, NOTE 6.
7. COMPACTION TESTS: COMPACTION TESTS WILL BE MADE BY THE TESTING LABORATORY DESIGNATED BY THE CITY'S REPRESENTATIVE. THE NUMBER OF TESTS AND THEIR LOCATION AND DEPTH SHALL BE DETERMINED BY THE CITY'S REPRESENTATIVE. RELATIVE COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH ASTM D-1556 OR AS APPROVED BY THE CITY'S REPRESENTATIVE. THE COST(S) OF THE TEST SHALL BE BORNE BY THE CONTRACTOR.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

TRENCH SECTION FOR
DI, PVC AND STEEL PIPE

APPROVED BY:

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PUBLIC WORKS DIRECTOR / CITY ENGINEER

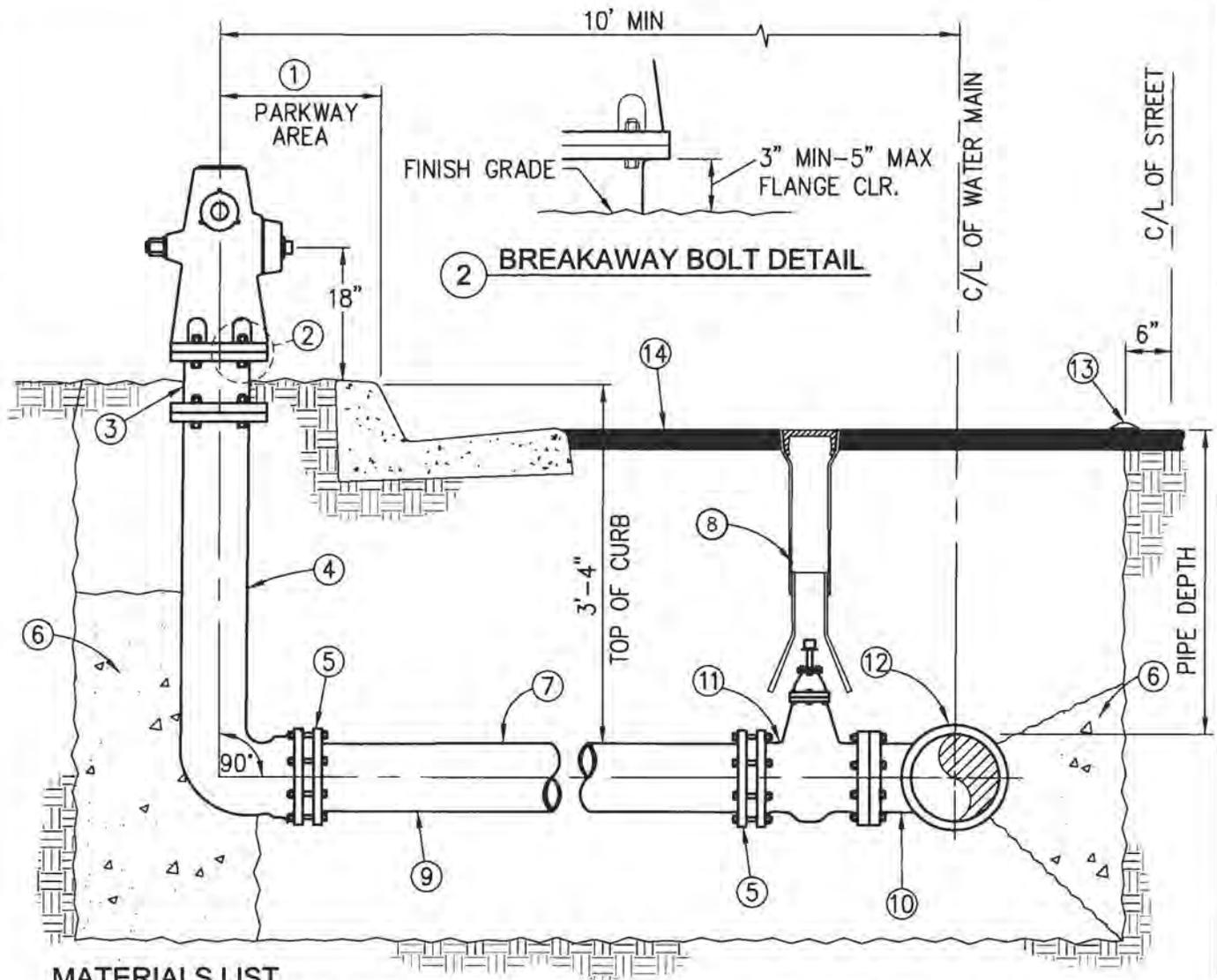
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DATE

STANDARD PLAN

103

SHEET 2 OF 2



MATERIALS LIST

- ① 18" WHERE CURB/SIDEWALK ARE INTEGRAL, 24" IN AREAS WITH PARKWAY
- ② 6 - HOLLOW BREAKWAY BOLTS WITH NUTS ON UPPER FLANGE (SEE DETAIL 2)
- ③ 6" DIAMETER FLANGED "SPOOL" TO GROUND AS REQUIRED
- ④ 6"x36" WITH FLG. RISER AND MECHANICAL JOINT OR APPROVED EQUAL
- ⑤ MECHANICAL JOINT WITH MJ RETAINER GLANDS
- ⑥ POUR THRUST BLOCK AGAINST UNDISTURBED SOIL PER STD. PLAN 116, FIG. 2
- ⑦ PIPELINE PROTECTIVE COVERING
- ⑧ VALVE BOX AND COVER PER STANDARD PLAN 104
- ⑨ 6" D.I.P. OR PVC.
- ⑩ HYDRANTS TEE U-590, AS MANUFACTURED BY U.S. PIPE FOUNDRY CO. OR APPROVED EQUAL. OTHERWISE, HYDRANT TEE SHALL BE MECHANICAL TYTON JOINT x 6" FLG. TEE
- ⑪ 6" FLANGE x MECHANICAL JOINT OR FLANGE RESILIENT WEDGE GATE VALVE
- ⑫ WATER MAIN
- ⑬ BLUE REFLECTOR. SEE SHEET 2
- ⑭ FINISHED PAVEMENT



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

FIRE HYDRANT

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE

STANDARD PLAN

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SHEET 1 OF 3

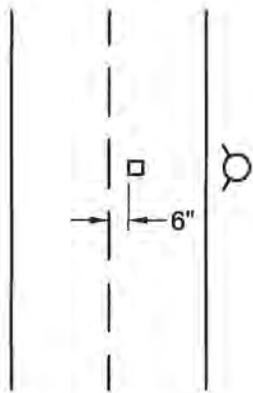


FIGURE 1
TWO LANE STREET

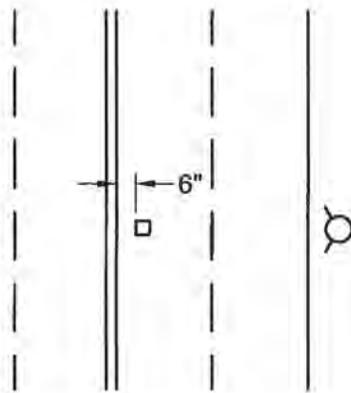


FIGURE 2
MULTI - LANE STREET

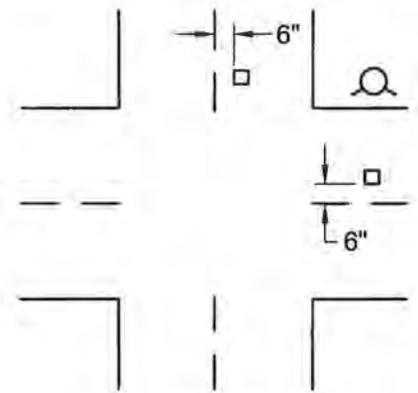


FIGURE 3
AN INTERSECTION

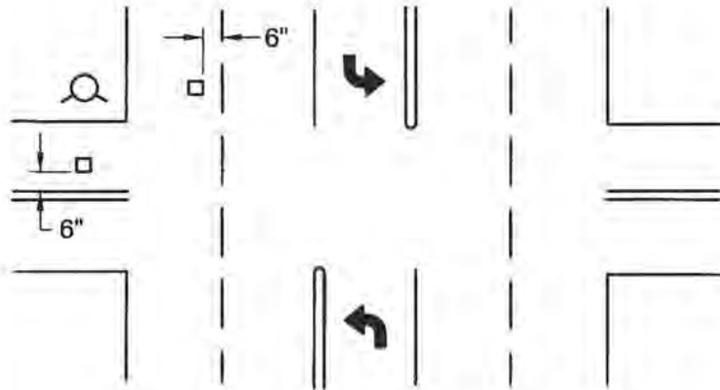


FIGURE 4
FOURLANE STREET WITH TURN LANE
AT INTERSECTION

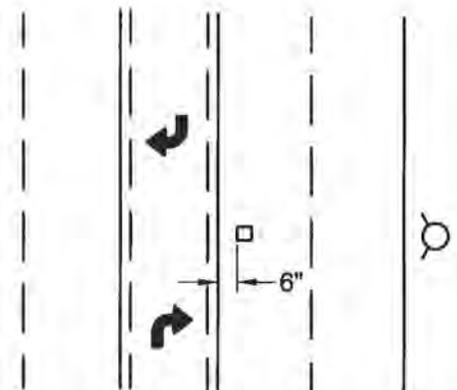


FIGURE 5
MULTI - LANE STREET
WITH TURN LANE

☉ = FIRE HYDRANT

□ = BLUE REFLECTIVE PAVEMENT MARKER

NOTE:
WHEN A STREET HAS NO PAINTED CENTERLINE, THE MARKER SHALL BE PLACED
6 INCHES FROM THE APPROXIMATE CENTER OF THE ROADWAY ON THE SIDE
NEAREST THE HYDRANT.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

FIRE HYDRANT

105

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE

SHEET 2 OF 3

FIRE HYDRANT GENERAL NOTES

1. 2-WAY HYDRANTS SHALL BE USED OTHERWISE NOTED AND SHALL HAVE ONE 2-1/2" UPPER HOSE OUTLET AND ONE 4" LOWER STEAMER OUTLET.
2. FIRE HYDRANT AND BURY SHALL BE CALIFORNIA TYPE "WET BARREL" HYDRANT CONFORMING TO AWWA AND SHALL BE SELECTED FROM THE FOLLOWING LIST OR AN APPROVED EQUAL.
 - A. AVK 2470/2420
 - B. JONES 4040/4065 SERIES
 - C. CLOW 900 SERIES
3. FIRE HYDRANT SHALL BE LOCATED 3" MIN. - 5' MAX. DISTANCE BEYOND THE CURB RETURN. FOR 25' AND 35' CURB RADII WITH DRIVE APRON ADJACENT TO B.C., LOCATE HYDRANT 3' TO 4' INSIDE CURB RETURN. IF LOCATED AT OTHER THAN A STREET INTERSECT, HYDRANTS SHALL BE LOCATED AT PROPERTY LINE EXTENSIONS, OR AS NOTED ON PLANS.
4. COAT ALL BOLTED JOINTS BELOW GROUND LEVEL WITH RUBBERIZED UNDERCOATING AND COVER WITH 10 MIL PLASTIC OR APPROVED EQUAL.
5. ALL FIRE HYDRANTS ARE TO BE ROTATED AT THE TIME OF INSTALLATION SO THAT HYDRANT OUTLETS ARE POSITIONED 45° SYMMETRICALLY TO A THEORETICAL CENTER LINE PERPENDICULAR TO THE NEAREST VEHICLE ROADWAY OR PATH.
6. FIRE HYDRANTS SHALL BE PAINTED WITH TWO COATS OF CAL-OSHA SAFETY YELLOW AND APPROVED BY CITY REPRESENTATIVE.
7. A SINGLE BI-DIRECTIONAL REFLECTOR SHALL BE INSTALLED 6" FROM CENTERLINE OF STREET ADJACENT TO FIRE HYDRANT.
8. HYDRANT TO HAVE BRASS OR CAST IRON CAPS (NO PLASTIC).
9. CONTRACTOR SHALL PROVIDE A CERTIFIED FLOW TEST FOR EACH HYDRANT - SEE NOTE ON STD. PLAN 101, SHT. 1 OF 3.
10. IF NOTED, 3-WAY HYDRANTS SHALL BE USED IN COMMERCIAL AREAS OR AS SPECIFIED BY THE CITY ENGINEER. 3-WAY HYDRANTS SHALL HAVE ONE 2 1/2" UPPER HOSE OUTLET AND TWO 4" LOWER STEAMER OUTLETS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

FIRE HYDRANT

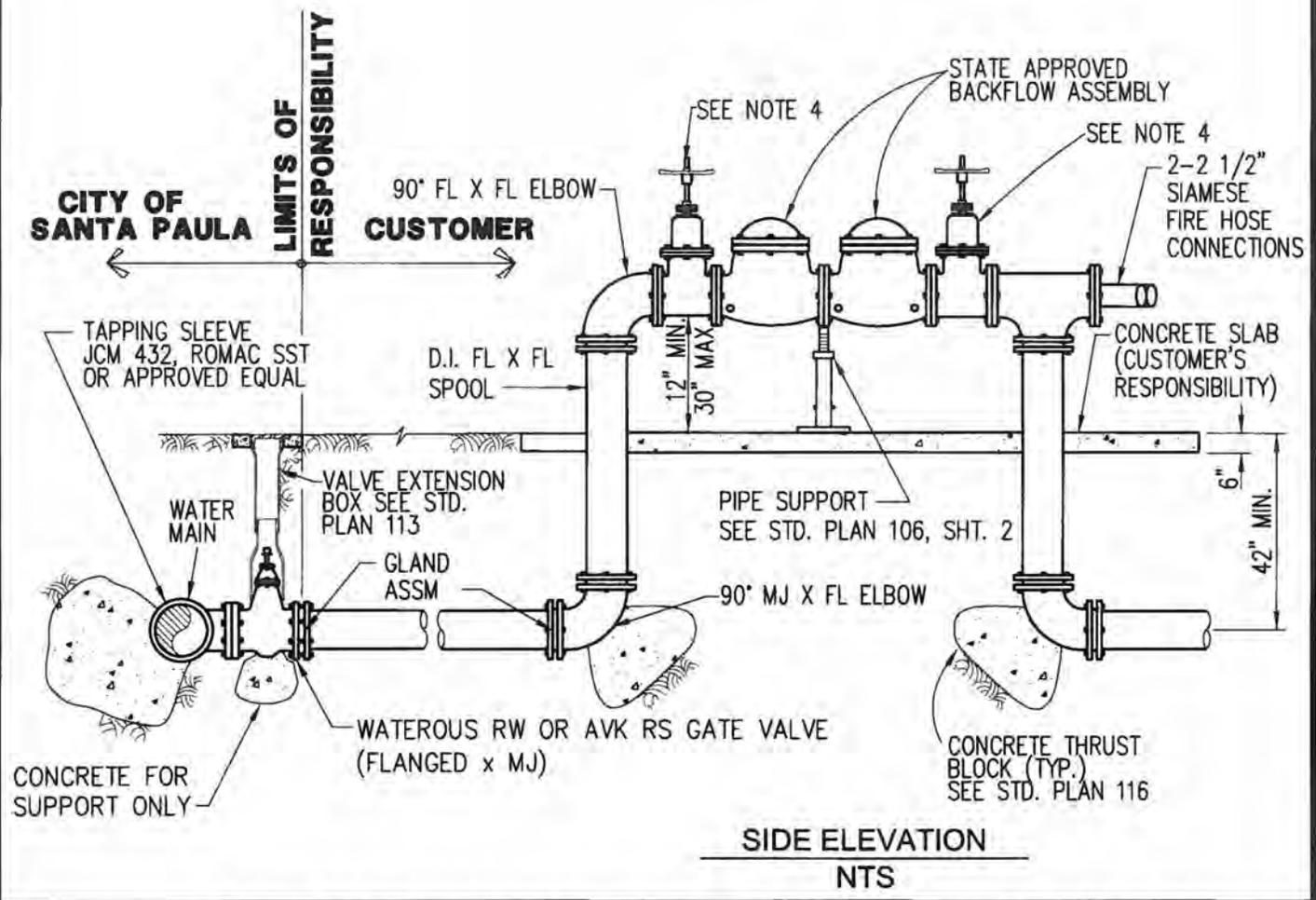
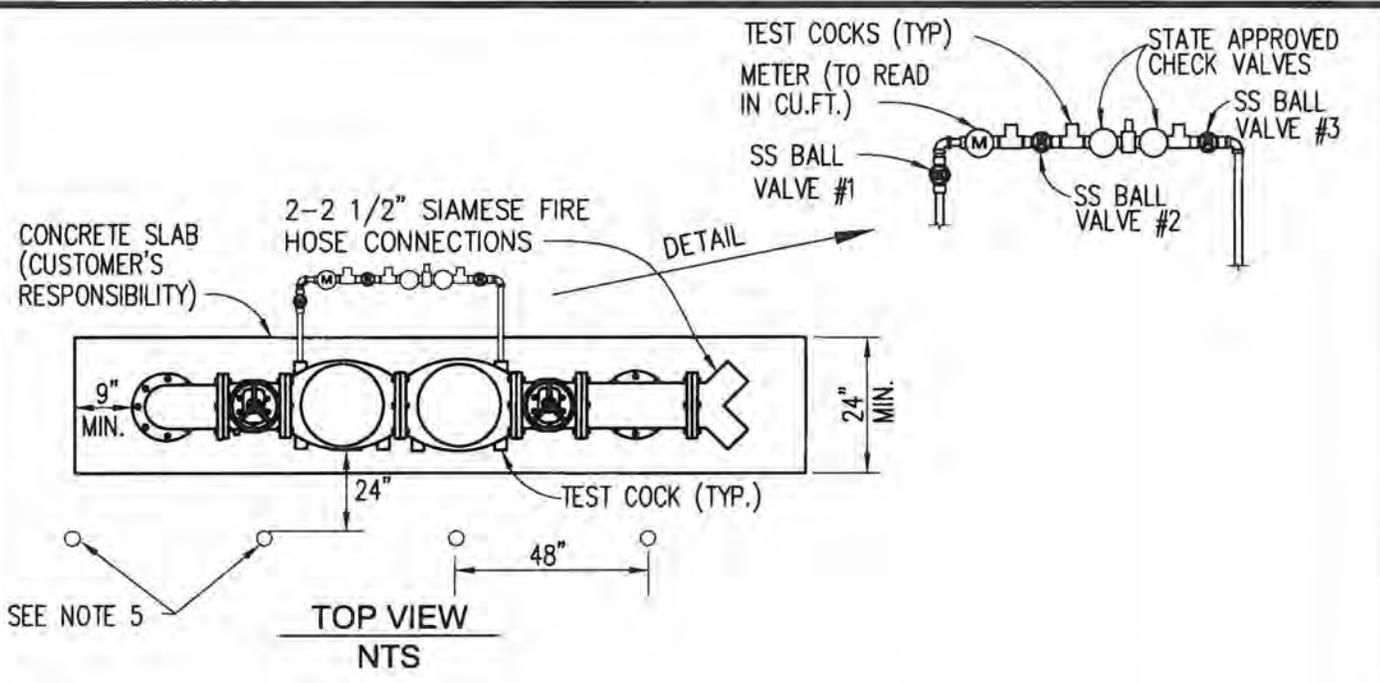
APPROVED BY: *Clifford G. Finley* 1-28-09

PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

STANDARD PLAN

105

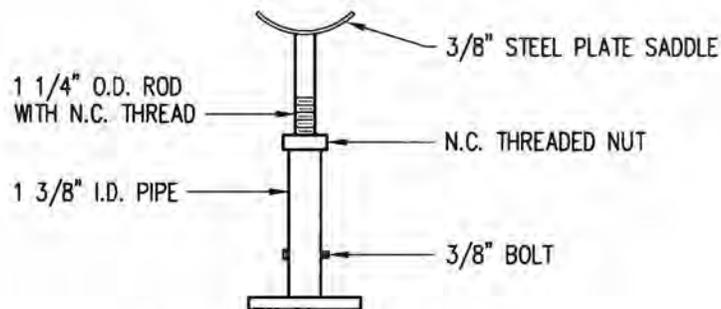
SHEET 3 OF 3



	CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT		STANDARD PLAN
	FIRE SERVICE		106
	APPROVED BY:	<i>Clifford G. Finley</i>	2-2-09	SHEET 1 OF 2
	PUBLIC WORKS DIRECTOR / CITY ENGINEER	DATE	

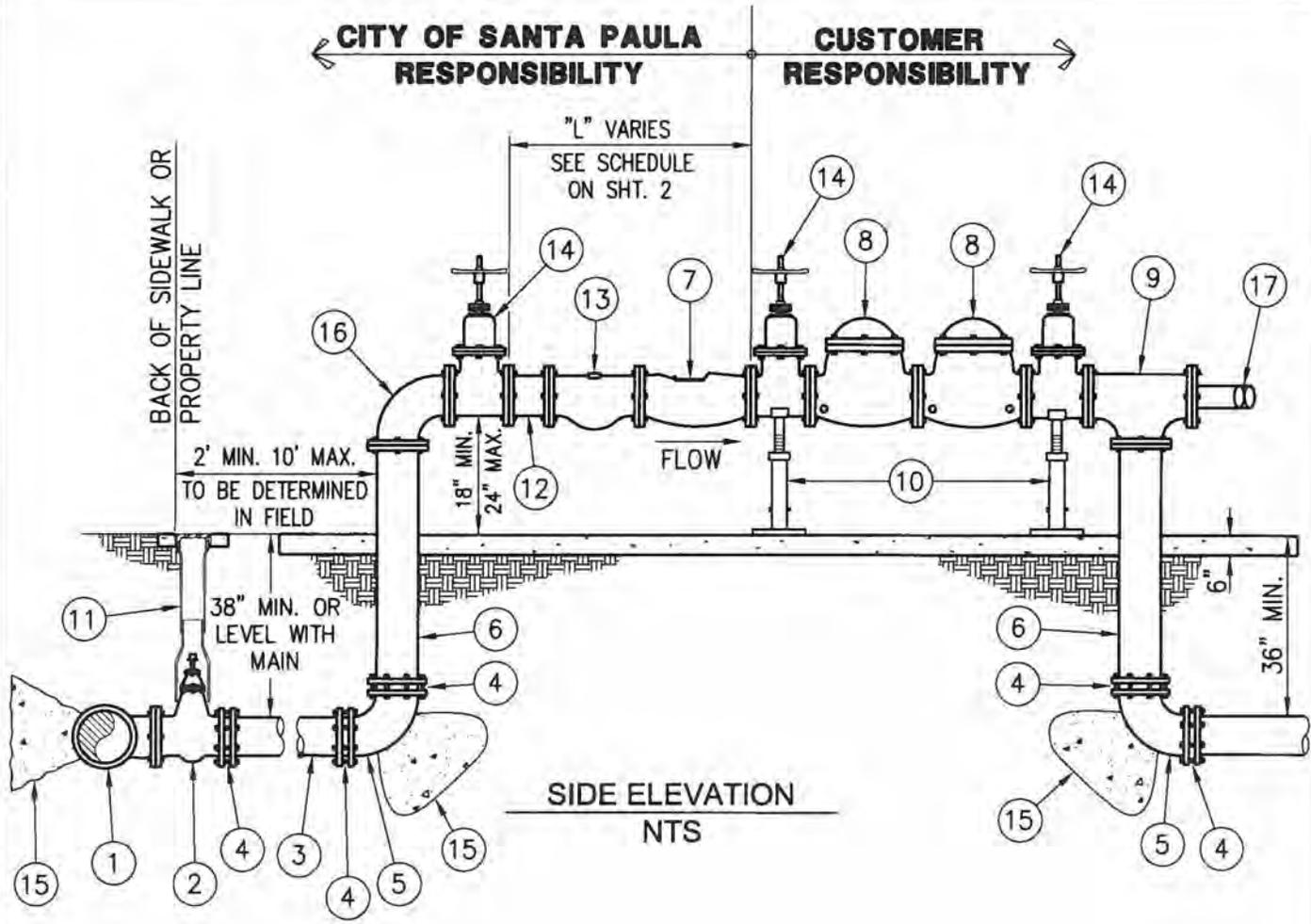
NOTES:

1. FIRE SERVICES SHALL BE INSTALLED ON ALL NEW MULTI-FAMILY RESIDENTIAL, COMMERCIAL AND INDUSTRIAL DEVELOPMENTS, REGARDLESS OF SIZE. THE FIRE SPRINKLER SERVICE SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF SANTA PAULA FIRE DEPARTMENT STANDARDS. THE FIRE SERVICE LATERAL AND BACKFLOW PROTECTION DEVICE SHALL BE INSTALLED IN THE MANNER PRESCRIBED BY THIS STANDARD.
2. THE ABOVE GROUND PORTION OF THE FIRE SERVICE LATERAL SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE PUBLIC RIGHT OF WAY. THE FINAL LOCATION AND SCREENING SHALL BE SUBJECT TO THE APPROVAL OF THE BUILDING & SAFETY, PLANNING, FIRE AND PUBLIC WORKS DEPARTMENTS. THE ENTIRE ASSEMBLY SHALL BE PAINTED IN ACCORDANCE WITH APPLICABLE PUBLIC WORKS STANDARDS.
3. THE INSTALLED BACKFLOW PREVENTION, DEVICE SHALL BE FIELD TESTED AND CERTIFIED BY A VENTURA COUNTY APPROVED TESTER PRIOR TO ACTIVATION. NORMAL OPERATION OF THE ISOLATION VALVE(S) SHALL BE DEMONSTRATED IN THE PRESENCE OF THE CITY'S REPRESENTATIVE PRIOR TO ACCEPTANCE.
4. COUNTY APPROVED O.S.&Y. WITH POST INDICATING VALVES LOCKED IN OPEN POSITION WITH CHAIN. ALL VALVES SHALL HAVE TAMPER SWITCHES.
5. BOLLARDS SHALL BE INSTALLED AS REQUIRED OR AS DIRECTED BY THE CITY ENGINEER.
6. ALL BACKFLOW ASSEMBLIES SHALL BE SELECTED FROM THE STATE OF CALIFORNIA, DEPT. OF HEALTH APPROVED LIST.
7. CONTRACTOR SHALL INSTALL FIRE SERVICE LATERALS PERPENDICULAR TO THE MAIN LINE.
8. CUSTOMER SHALL PROVIDE THE CITY WITH WRITTEN PROOF OF BACKFLOW TEST RESULTS PRIOR TO ACTIVATION OF SERVICE.
9. VALVE SUPPORTS - STD. PLAN 123
10. CONCRETE SLAB TO BE INSTALLED BY CUSTOMER PER PLAN.
11. ALL FIRE HYDRANTS LOCATED ON SITE (PRIVATE PROPERTY) SHALL BE PAINTED RED AND SHALL BE PERMANENTLY MARKED/TAGGED "FIRE USE ONLY".
11. FIRE SERVICES LESS THAN 3 INCHES IN DIAMETER SHALL BE COPPER PIPING UNDERGROUND. FLANGED PIPE IS NOT REQUIRED. ALL OTHER REQUIREMENTS REMAIN THE SAME.
12. ALL FIRE SERVICES SHALL BE CHLORINATED AND PRESSURE TESTED PRIOR TO CONNECTION TO SYSTEM.



PIPE SUPPORT DETAIL

	CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT	STANDARD PLAN
	FIRE SERVICE	
	APPROVED BY: <i>Clifford G. Finley</i>	1-28-09	106
	PUBLIC WORKS DIRECTOR / CITY ENGINEER	DATE
		SHEET 2 OF 2



SIDE ELEVATION
NTS

MATERIALS LIST

- | | |
|--|---|
| <ul style="list-style-type: none"> ① 12"x 12"x 6" TEE ② 6" GATE VALVE (RW) ③ 6" DUCTILE IRON PIPE ④ MJ RETAINER GLANDS ⑤ 90° MJ ⑥ SPOOL (6" DUCTILE IRON FLANGE BY PLAIN END) ⑦ METER. SEE NOTES 12 & 13 ON SHT. 2 ⑧ STATE APPROVED BACKFLOW ASSEMBLY ⑨ TEE FL. | <ul style="list-style-type: none"> ⑩ PIPE SUPPORT PER CITY STD. PLAN 106 ⑪ VALVE BOX PER CITY STD. PLAN 113 ⑫ 6" DUCTILE IRON PIPE ⑬ FLANGE SPOOL. SEE NOTE 10 ON SHT. 2 ⑭ GATE VALVE (RW) WITH STANDARD AWWA OPERATOR NUT. SEE NOTE 12 ON SHT. 2 ⑮ THRUST BLOCKS PER CITY STD. PLAN 116. SEE SHT. 2 FOR LAYING ⑯ 90° FL. REDUCING ELBOW, SEE NOTE 1 ON SHT. 2 ⑰ 2-2 1/2" SIAMESE FIRE HOSE CONNECTIONS AS REQUIRED |
|--|---|



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

MASTER METER AND BACKFLOW ASSEMBLY

APPROVED BY: *Clifford G. Finley* 1-28-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

STANDARD PLAN

107

SHEET 1 OF 2

NOTES

1. 3" AND 4" METERS MUST BE INSTALLED WITH A 6" SERVICE AND A REDUCED ELBOW AS SHOWN OR A 6" ELBOW AND A REDUCER.
2. DOUBLED RUBBER GASKETS REQUIRED AT METER FLANGES.
3. METER TO BE PURCHASED THROUGH THE CITY OF SANTA PAULA ENGINEERING DIVISION.
4. ALL FITTINGS TO BE CEMENT LINED.
5. INSTALLATION SHALL BE PAINTED BY THE CONTRACTOR WITH ONE COAT OF PRIMER FOLLOW WITH TWO COATS OF HUNTER GREEN ENAMEL.
6. FIRE SERVICES SHALL BE INSTALLED ON ALL COMMERCIAL AND INDUSTRIAL DEVELOPMENTS, REGARDLESS OF SIZE. THE FIRE SPRINKLER SERVICE SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF SANTA PAULA FIRE DEPARTMENT STANDARDS. THE FIRE SERVICE LATERAL AND BACKFLOW PROTECTION DEVICE SHALL BE INSTALLED IN THE MANNER PRESCRIBED BY THIS STANDARD.
7. THE ABOVE GROUND PORTION OF THE FIRE SERVICE LATERAL SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE PUBLIC RIGHT OF WAY. THE FINAL LOCATION AND SCREENING SHALL BE SUBJECT TO THE APPROVAL OF THE BUILDING & SAFETY, PLANNING, FIRE AND PUBLIC WORKS DEPARTMENTS. THE ENTIRE ASSEMBLY SHALL BE PAINTED IN ACCORDANCE WITH APPLICABLE PUBLIC WORKS STANDARDS.
8. THE INSTALLED BACKFLOW PREVENTION DEVICE SHALL BE FIELD TESTED, AND CERTIFIED BY AN APPROVED TESTER PRIOR TO ACTIVATION. NORMAL OPERATION OF THE ISOLATION VALVE(S) SHALL BE DEMONSTRATED IN THE PRESENCE OF THE CITY'S REPRESENTATIVE PRIOR TO ACCEPTANCE.
9. ALL HYDRANTS LOCATED ON SITE (PRIVATE PROPERTY) SHALL BE PAINTED RED AND SHALL BE PERMANENTLY MARKED/TAGGED "FIRE USE ONLY".
10. METERS MAY REQUIRE INSTALLATION OF FITTINGS (ELBOWS, TEE, CROSSES) TO BE 10 TIMES THE PIPE DIAMETER UPSTREAM AND 5 TIMES THE PIPE DIAMETER DOWNSTREAM. SEE MANUFACTURER'S PRODUCT SPECIFICATIONS AND REQUIREMENTS.
11. BOLLARDS SHALL BE INSTALLED AS REQUIRED OR AS DIRECTED BY THE CITY ENGINEER.
12. COUNTY APPROVED O.S.&Y. WITH POST INDICATING VALVES LOCKED IN OPEN POSITION WITH CHAIN. ALL VALVES SHALL HAVE TAMPER SWITCHES. AS REQUIRED.
13. THE WATER METER SHALL BE PAID FOR BY THE OWNER AND SUPPLIED BY THE CITY. THE OWNER/CONTRACTOR SHALL NOT BUILD BACKFLOW ASSEMBLY UNTIL THE CITY HAS SUPPLIED THE METER AND APPROVED THE INSTALLATION.
14. VALVE SUPPORTS - STD. PLAN 106, SHT. 2.
15. CONCRETE SLAB TO BE INSTALLED BY CUSTOMER PER PLAN.
16. ALL FIRE SERVICES SHALL BE CHLORINATED AND PRESSURE TESTED PRIOR TO CONNECTION TO SYSTEM.

LAYING LENGTH SCHEDULE

<table border="0"> <tr> <td style="text-align: center;">⑫</td> <td>SPOOL</td> <td>3"</td> <td>12"</td> </tr> <tr> <td></td> <td>"</td> <td>4"</td> <td>18"</td> </tr> <tr> <td></td> <td>"</td> <td>6"</td> <td>18"</td> </tr> </table>	⑫	SPOOL	3"	12"		"	4"	18"		"	6"	18"	<table border="0"> <tr> <td style="text-align: center;">⑦</td> <td>METER</td> <td>3"</td> <td>12"</td> </tr> <tr> <td></td> <td>"</td> <td>4"</td> <td>24"</td> </tr> <tr> <td></td> <td>"</td> <td>6"</td> <td>36"</td> </tr> </table>	⑦	METER	3"	12"		"	4"	24"		"	6"	36"
⑫	SPOOL	3"	12"																						
	"	4"	18"																						
	"	6"	18"																						
⑦	METER	3"	12"																						
	"	4"	24"																						
	"	6"	36"																						
<table border="0"> <tr> <td style="text-align: center;">⑬</td> <td>STRAINER</td> <td>3"</td> <td>7"</td> </tr> <tr> <td></td> <td>"</td> <td>4"</td> <td>9"</td> </tr> <tr> <td></td> <td>"</td> <td>6"</td> <td>9"</td> </tr> </table>	⑬	STRAINER	3"	7"		"	4"	9"		"	6"	9"													
⑬	STRAINER	3"	7"																						
	"	4"	9"																						
	"	6"	9"																						



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

COMBINED DOMESTIC AND FIRE SERVICE

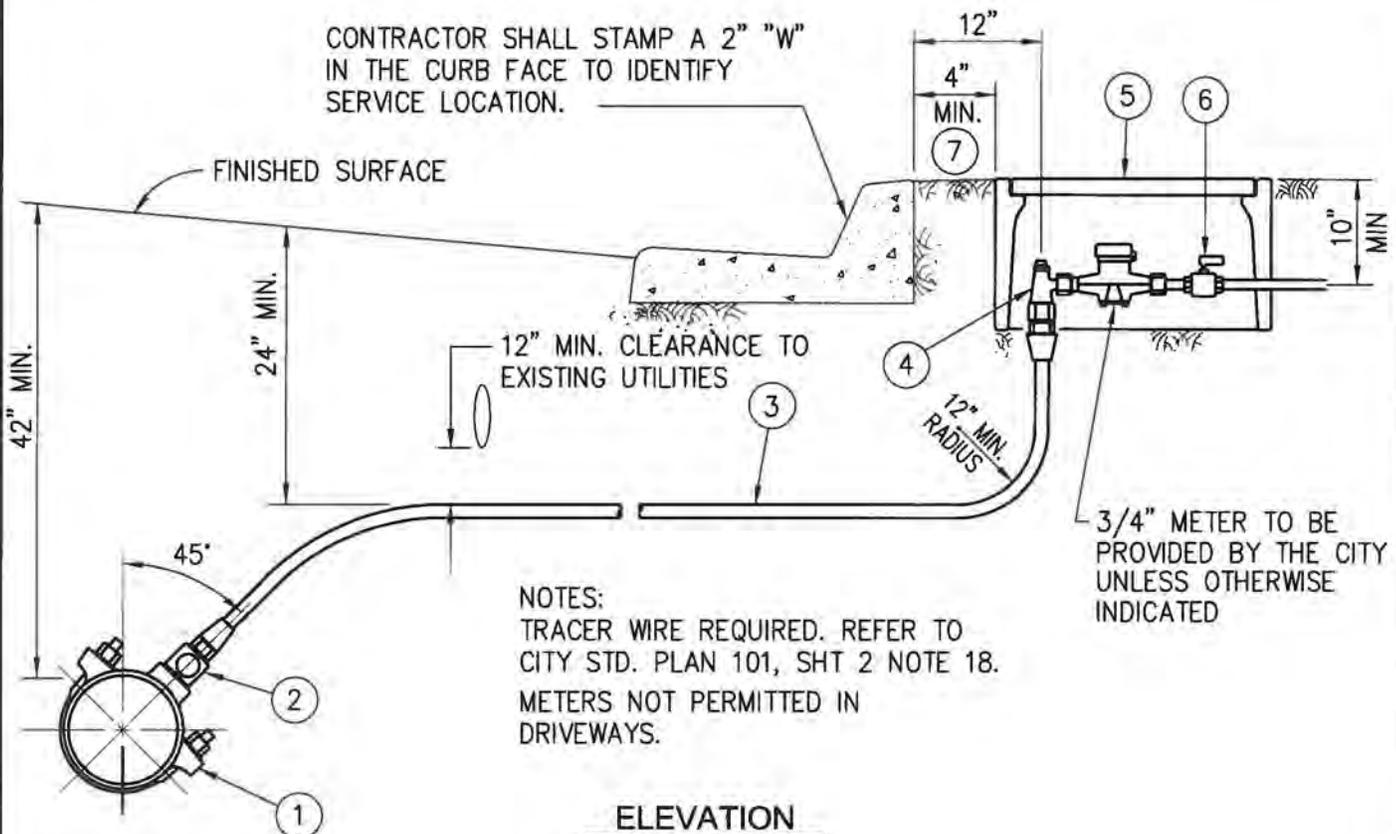
APPROVED BY:

Clifford G. Finley 1-28-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

STANDARD PLAN

107

SHEET 2 OF 2



CONTRACTOR SHALL STAMP A 2" "W"
IN THE CURB FACE TO IDENTIFY
SERVICE LOCATION.

FINISHED SURFACE

12" MIN. CLEARANCE TO
EXISTING UTILITIES

3/4" METER TO BE
PROVIDED BY THE CITY
UNLESS OTHERWISE
INDICATED

NOTES:
TRACER WIRE REQUIRED. REFER TO
CITY STD. PLAN 101, SHT 2 NOTE 18.
METERS NOT PERMITTED IN
DRIVEWAYS.

ELEVATION
NTS

MATERIALS LIST

- | | |
|--|--|
| <ul style="list-style-type: none"> ① SADDLE ON PVC PIPE USE FORD 202BS
SADDLE ON DUCTILE IRON PIPE USE FORD 202B ② CORP STOP: FORD FB1100-4Q-NL ③ HDPE SERVICE COPPER TUBE SIZE ④ ANGLE STOP: FORD BA43-444WQ-NL | <ul style="list-style-type: none"> ⑤ METER BOX: CHRISTY POLYMER BOX 12"x20"
WITH LID. NO. FL12 ⑥ CUSTOMER VALVE: FORD B13-444W WITH
HB-34(HANDLE) ⑦ MAINTAIN 4" CLEARANCE TO OTHER
CONCRETE FEATURES, EDGE OF SIDEWALK,
OR PULL BOXES |
|--|--|

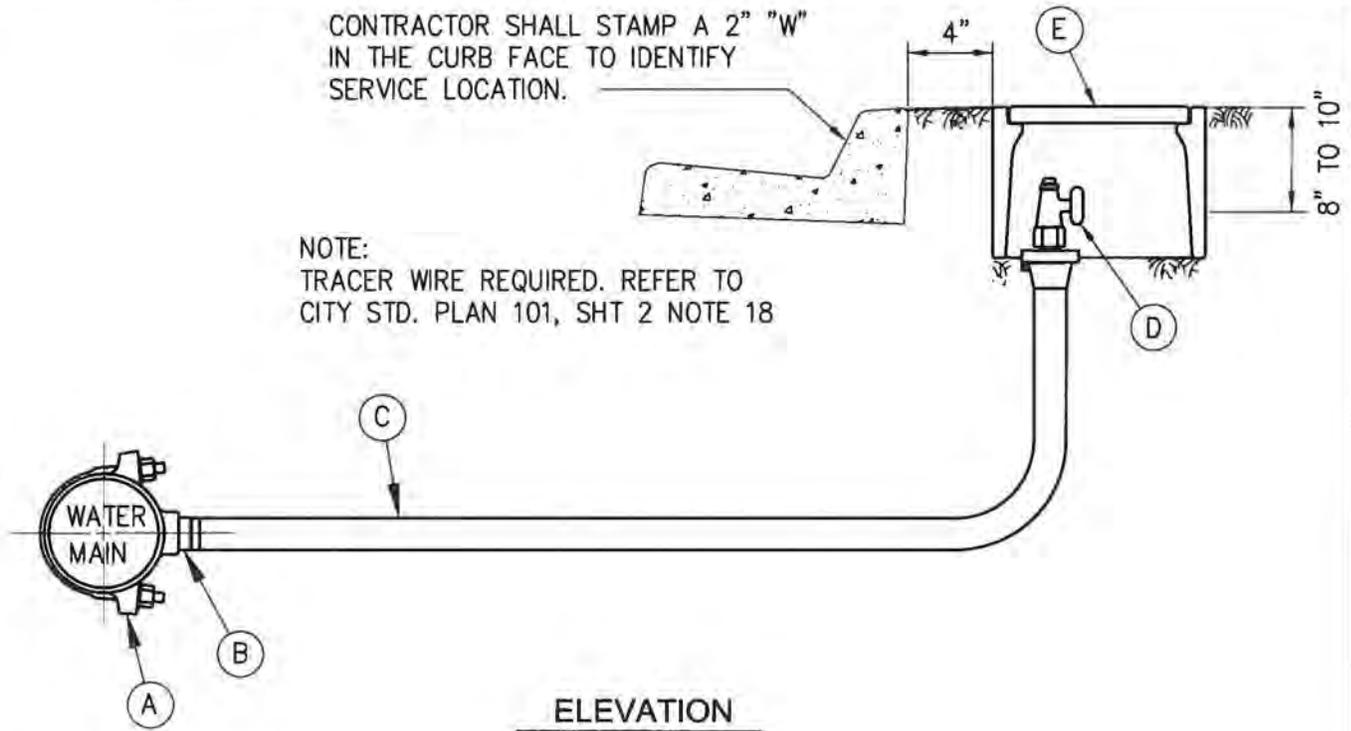
NOTES:

1. NEW SERVICES WILL NOT BE SPLICED WHEN DAMAGED, SERVICE WILL BE RENEWED.
2. CITY APPROVED CROSS-CONNECTION CONTROL DEVICES REQUIRED ON ALL NEW & RENEWED COMMERCIAL, INDUSTRIAL, IRRIGATION & PARTICULAR RESIDENTIAL WATER SERVICES, REGARDLESS OF SIZE.
3. THE WATER METER SHALL EXTEND PERP TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP.
4. THE METER AND CUSTOMER VALVE WILL BE FURNISHED BY THE CITY, BUT PAID FOR BY THE CONTRACTOR. THE CONTRACTOR TO CONNECT SERVICE TO THE CUSTOMER VALVE.
5. THE METER LOCATION SHALL BE AS SHOWN UNLESS OTHERWISE SPECIFIED BY THE CITY.
6. FOR EXISTING SERVICES, THE CONTRACTOR SHALL INSTALL ANGLE METER SETUP AS SHOWN AND ADJUST SERVICE LINE TO CONNECT TO METER.
7. 3/4"x 1" BUSHING WILL BE REQUIRED FOR 3/4" METER (A34).

	CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT	STANDARD PLAN
	1" WATER SERVICE CONNECTION	
	APPROVED BY: <i>Clifford G. Finley</i>	DATE: 2-2-09	108
	PUBLIC WORKS DIRECTOR / CITY ENGINEER	SHEET <u>1</u> OF <u>1</u>

CONTRACTOR SHALL STAMP A 2" "W"
IN THE CURB FACE TO IDENTIFY
SERVICE LOCATION.

NOTE:
TRACER WIRE REQUIRED. REFER TO
CITY STD. PLAN 101, SHT 2 NOTE 18



ELEVATION
NTS

MATERIALS LIST

- (A) SADDLE ON PVC PIPE USE FORD 202BS
SADDLE ON DUCTILE IRON PIPE USE FORD 202B
- (B) CORP STOP: FORD FB1100-7Q-NL
- (C) 2" HDPE SERVICE PIPE COPPER TUBE SIZE
- (D) ANGLE STOP: FORD BFA43-777WQ-NL
- (E) METER BOX: CHRISTY POLYMER BOX 17"x30"
WITH LID. NO. FL36

NOTES:

1. MATERIALS AND INSTALLATION SHALL CONFORM WITH THE APPLICABLE SECTIONS OF THE CITY OF SANTA PAULA SPECIFICATIONS FOR DOMESTIC WATER SYSTEMS.
2. NEW SERVICES WILL NOT BE SPLICED WHEN DAMAGED, SERVICE WILL BE RENEWED COMPLETELY.
3. FOR INSTALLATIONS WHERE SIDEWALK ABUTS CURB, METER BOXES MAY BE SET FLUSH IN SIDEWALK OR BEHIND SIDEWALK. WHEN METER BOXES ARE SET IN SIDEWALK, THEY SHALL BE LOCATED 4" FROM THE BACK OF CURB. LONGITUDINAL AXIS PERPENDICULAR TO AND DIRECTLY BEHIND CURB. METER BOXES ARE NOT PERMITTED IN DRIVEWAYS.
4. CITY APPROVED CROSS-CONNECTION CONTROL DEVICES REQUIRED ON ALL NEW AND RENEWED COMMERCIAL, INDUSTRIAL, IRRIGATION AND PARTICULAR RESIDENTIAL WATER SERVICES, REGARDLESS OF SIZE.
5. INSTALLATION MAY BE ABOVE GROUND, BEHIND THE SIDEWALK, OR IN A PLANTER WITH PRIOR APPROVAL.
6. THE METER AND CUSTOMER VALVE WILL BE FURNISHED BY THE CITY, BUT PAID FOR BY THE CONTRACTOR. THE CONTRACTOR TO CONNECT SERVICE TO THE CUSTOMER VALVE.
7. A IN-LINE VALVE WILL BE REQUIRED FOR ALL ABOVE GROUND SERVICES.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

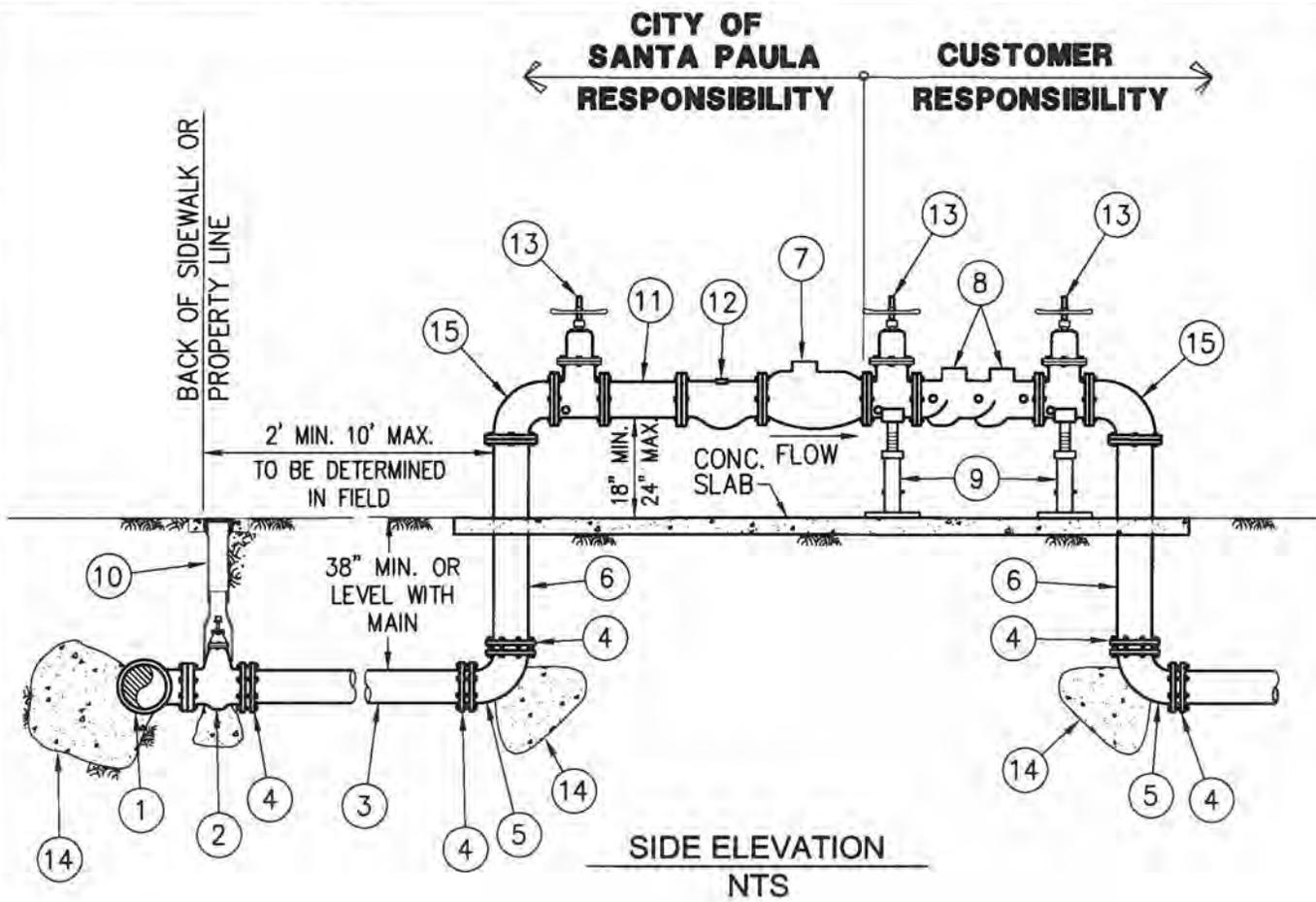
2" HDPE SERVICE

110

APPROVED BY:

Clifford G. Finley 1-28-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

SHEET 1 OF 1



MATERIALS LIST

- ① 12"x 12"x 4" TEE
- ② 4" GATE VALVE (RW)
- ③ 4" DUCTILE IRON PIPE
- ④ MJ RETAINER GLANDS
- ⑤ 90° MJ
- ⑥ SPOOL (4" DUCTILE IRON FLANGE BY PLAIN END)
- ⑦ METER. SEE NOTES 12 & 13 ON SHT. 2
- ⑧ STATE APPROVED BACKFLOW ASSEMBLY
- ⑨ PIPE SUPPORT PER CITY STD. PLAN 106
- ⑩ VALVE BOX PER CITY STD. PLAN 113
- ⑪ 4" DUCTILE IRON PIPE
- ⑫ FLANGE SPOOL. SEE NOTE 10 ON SHT. 2
- ⑬ GATE VALVE (RW) WITH STANDARD AWWA OPERATOR NUT. SEE NOTE 12 ON SHT. 2
- ⑭ THRUST BLOCKS PER CITY STD. PLAN 116. SEE SHT. 2 FOR LAYING
- ⑮ 90° FL. REDUCING ELBOW, SEE NOTE 1 ON SHT. 2



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

**4" AND LARGER WATER SERVICE
W/ CROSS-CONNECTION CONTROL**

APPROVED BY:

Clifford G. Finley 1-28-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

STANDARD PLAN

111

SHEET 1 OF 2

NOTES

1. 3" AND 4" METERS MUST BE INSTALLED WITH A 4" SERVICE AND A REDUCED ELBOW AS SHOWN OR A 4" ELBOW AND A REDUCER.
2. DOUBLED RUBBER GASKETS REQUIRED AT METER FLANGES.
3. METER TO BE PURCHASED THROUGH THE CITY OF SANTA PAULA ENGINEERING DIVISION.
4. ALL FITTINGS TO BE CEMENT LINED.
5. INSTALLATION SHALL BE PAINTED BY THE CONTRACTOR WITH ONE COAT OF PRIMER FOLLOW WITH TWO COATS OF HUNTER GREEN ENAMEL.
6. FIRE SERVICES SHALL BE INSTALLED ON ALL COMMERCIAL AND INDUSTRIAL DEVELOPMENTS, REGARDLESS OF SIZE. THE FIRE SPRINKLER SERVICE SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF SANTA PAULA FIRE DEPARTMENT STANDARDS. THE FIRE SERVICE LATERAL AND BACKFLOW PROTECTION DEVICE SHALL BE INSTALLED IN THE MANNER PRESCRIBED BY THIS STANDARD.
7. THE ABOVE GROUND PORTION OF THE FIRE SERVICE LATERAL SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE PUBLIC RIGHT OF WAY. THE FINAL LOCATION AND SCREENING SHALL BE SUBJECT TO THE APPROVAL OF THE BUILDING & SAFETY, PLANNING, FIRE AND PUBLIC WORKS DEPARTMENTS. THE ENTIRE ASSEMBLY SHALL BE PAINTED IN ACCORDANCE WITH APPLICABLE PUBLIC WORKS STANDARDS.
8. THE INSTALLED BACKFLOW PREVENTION DEVICE SHALL BE FIELD TESTED, AND CERTIFIED BY AN APPROVED TESTER PRIOR TO ACTIVATION. NORMAL OPERATION OF THE ISOLATION VALVE(S) SHALL BE DEMONSTRATED IN THE PRESENCE OF THE CITY'S REPRESENTATIVE PRIOR TO ACCEPTANCE.
9. ALL HYDRANTS LOCATED ON SITE (PRIVATE PROPERTY) SHALL BE PAINTED RED AND SHALL BE PERMANENTLY MARKED/TAGGED "FIRE USE ONLY".
10. METERS MAY REQUIRE INSTALLATION OF FITTINGS (ELBOWS, TEE, CROSSES) TO BE 10 TIMES THE PIPE DIAMETER UPSTREAM AND 5 TIMES THE PIPE DIAMETER DOWNSTREAM. SEE MANUFACTURER'S PRODUCT SPECIFICATIONS AND REQUIREMENTS.
11. BOLLARDS SHALL BE INSTALLED AS REQUIRED OR AS DIRECTED BY THE CITY ENGINEER.
12. COUNTY APPROVED O.S.&Y. WITH POST INDICATING VALVES LOCKED IN OPEN POSITION WITH CHAIN. ALL VALVES SHALL HAVE TAMPER SWITCHES. AS REQUIRED.
13. THE WATER METER SHALL BE PAID FOR BY THE OWNER AND SUPPLIED BY THE CITY. THE OWNER/CONTRACTOR SHALL NOT BUILD BACKFLOW ASSEMBLY UNTIL THE CITY HAS SUPPLIED THE METER AND APPROVED THE INSTALLATION.
14. VALVE SUPPORTS - STD. PLAN 106, SHT. 2.
15. CONCRETE SLAB TO BE INSTALLED BY CUSTOMER PER PLAN.
16. ALL FIRE SERVICES SHALL BE CHLORINATED AND PRESSURE TESTED PRIOR TO CONNECTION TO SYSTEM.

LAYING LENGTH SCHEDULE

⑫ SPOOL	3"	12"	⑦ METER	3"	12"
"	4"	18"	"	4"	24"
"	6"	18"	"	6"	36"
⑬ STRAINER	3"	7"			
"	4"	9"			
"	6"	9"			



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

4" AND LARGER WATER SERVICE W/ CROSS-CONNECTION CONTROL

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE

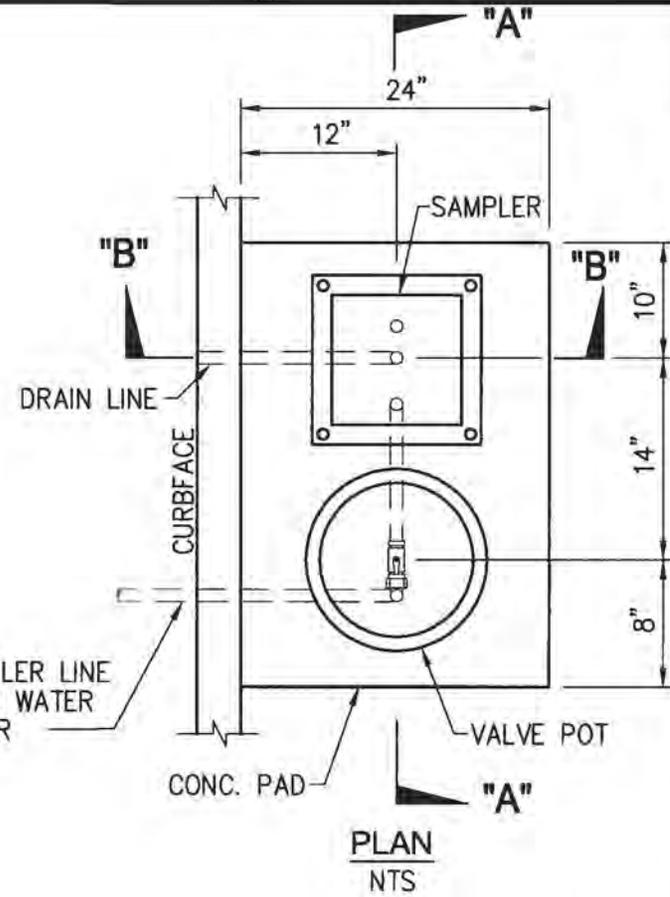
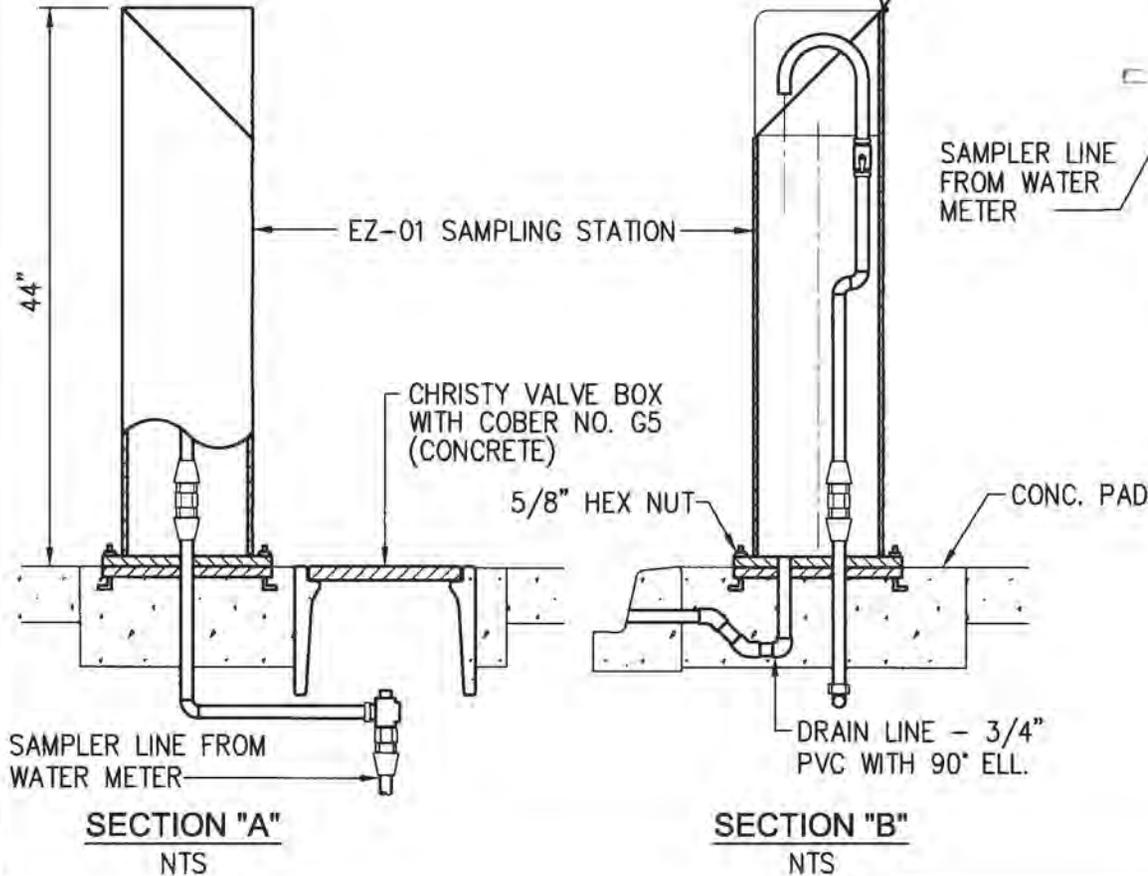
STANDARD PLAN

111

SHEET 2 OF 2

NOTES:

1. SAMPLER HOUSING MUST BE INSTALLED PLUMB.
2. DO NOT INSTALL SAMPLER ON PRIVATE PROPERTY OR IN TRAVELED WALKWAYS
3. COAT EXTERIOR AS SPECIFIED AFTER INSTALLATION.
4. APPLY SYMBOLS AND LETTERING AS DIRECTED BY WATER DEPARTMENT.



STANDARD PLAN

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SHEET 1 OF 2

CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

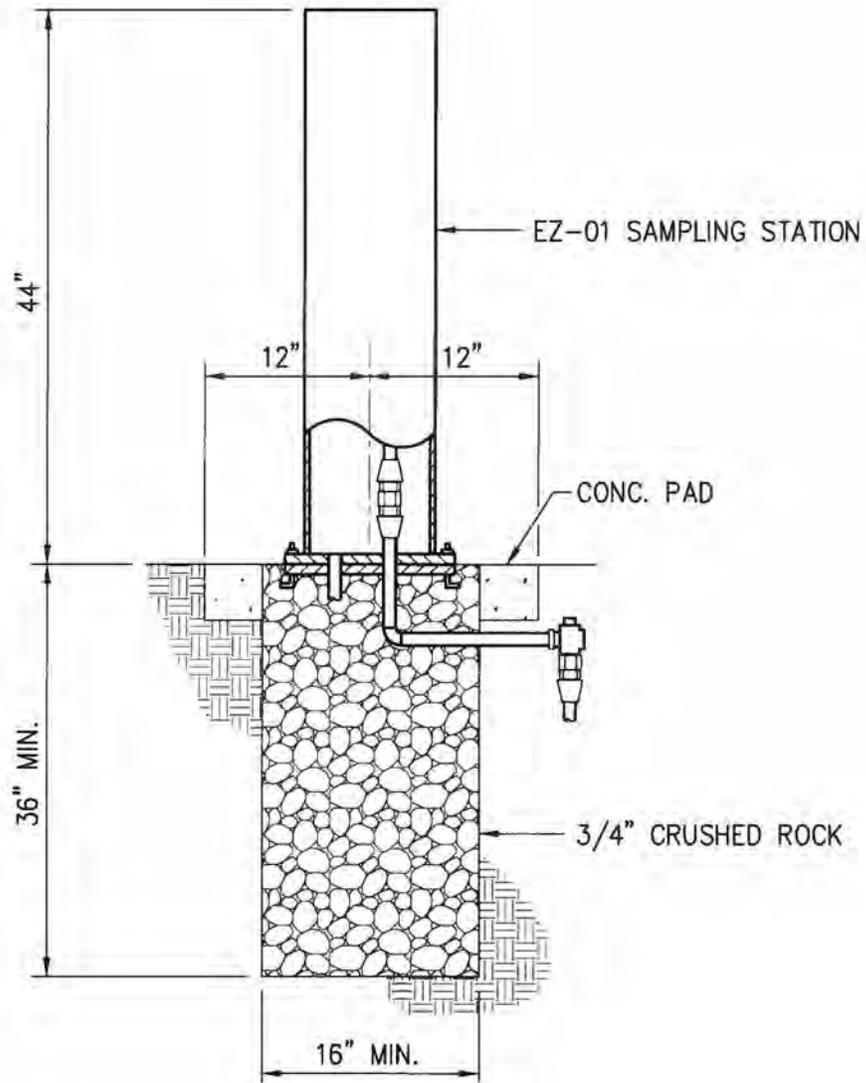
SAMPLE STATION WITH CURB DRAIN

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE





SECTION
NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SAMPLE STATION WITHOUT CURB DRAIN

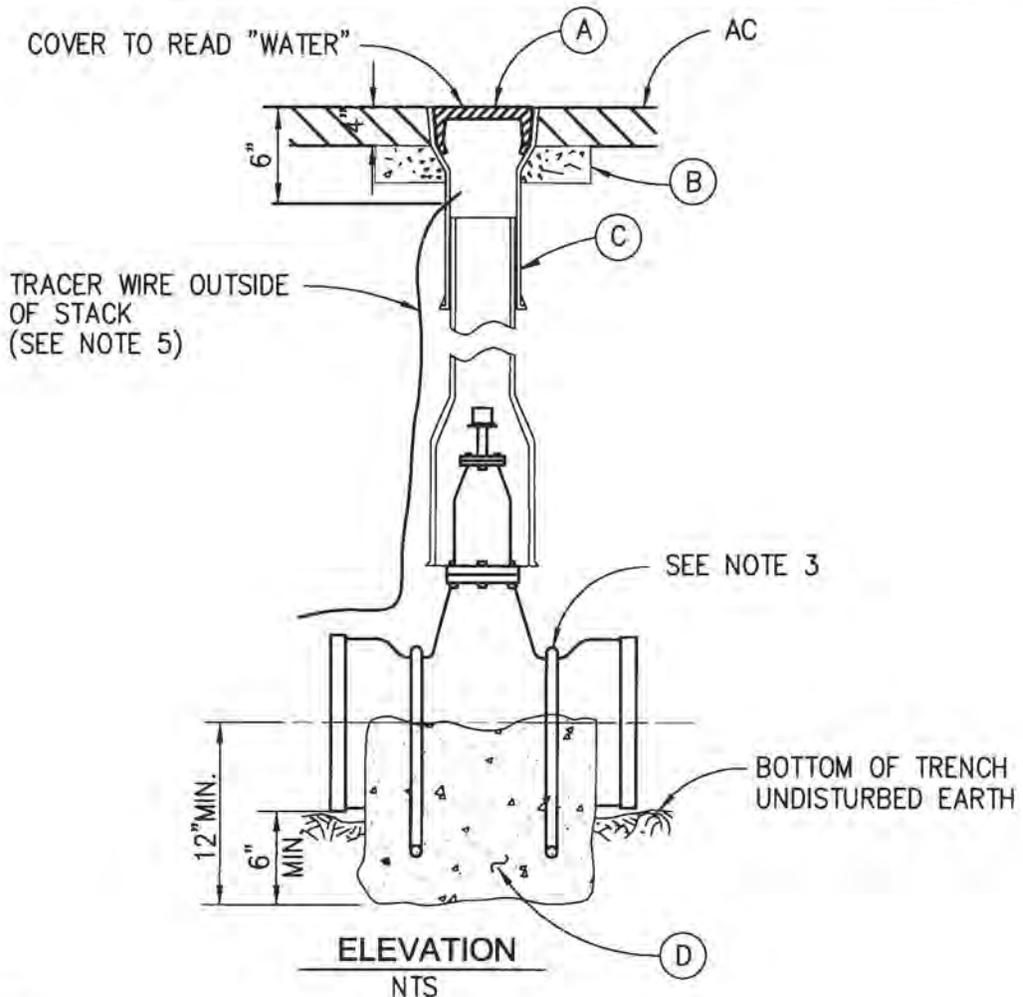
112

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE

SHEET 2 OF 2



MATERIALS LIST

(A)	SET COVER OF VALVE BOX TO FINISH GRADE
(B)	20" DIA. X 4" THICK CONCRETE
(C)	ASSEMBLY CONSISTS OF TYLER TWO-PIECE VALVE BOX OR CHRISTY G3 ASSEMBLY WITH COVER.
(D)	CONCRETE THRUST BLOCK AND SUPPORT.

NOTES:

1. VALVES MAY BE AVK, CLOW, OR APPROVED EQUAL.
2. MATERIALS AND INSTALLATION SHALL CONFORM WITH APPLICABLE SECTIONS OF SPECIFICATIONS FOR DOMESTIC WATER SYSTEMS.
3. 3/8" OR 1/2" REBAR TO BE USED ON ANY CAST IRON FITTINGS. SUCH AS TEE'S, 45°, 90°, 22-1/2° OR ANY BENDS.
4. APPLY CITY APPROVED COATING TO ALL NUTS & BOLTS.
5. #10 SOLID CORE PLASTIC COATED COPPER TRACER WIRE TO BE CONNECTED OUTSIDE OF GATE VALVE STACK AND INSERTED INTO STACK ON TOP.
6. EXTENSION ROD REQUIRED WITH 2" OPERATING NUT 6" BELOW GRADE WHEN VALVE CENTER LINE IS OVER 4'-0" BELOW GRADE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

BURIED GATE VALVE

113

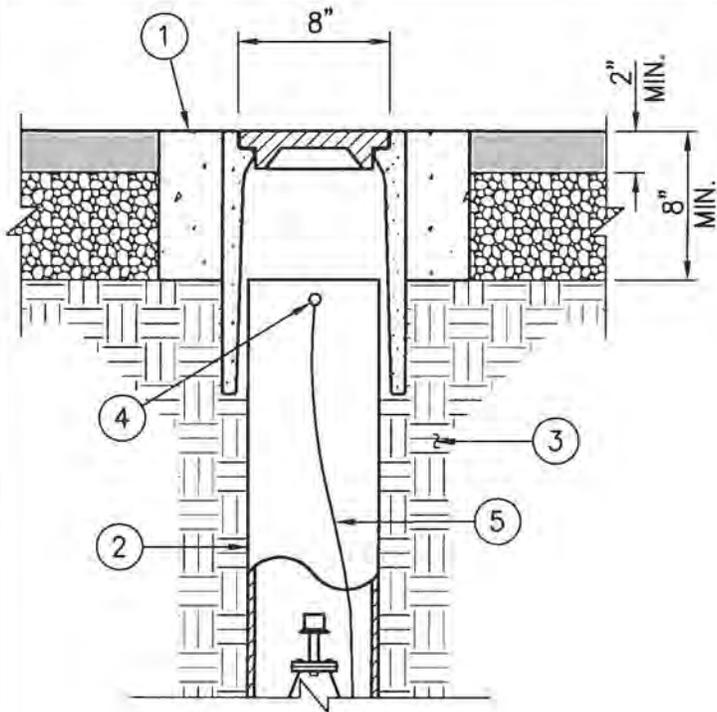
APPROVED BY: *Clifford G. Finley* 1-28-09
 PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

SHEET 1 OF 2

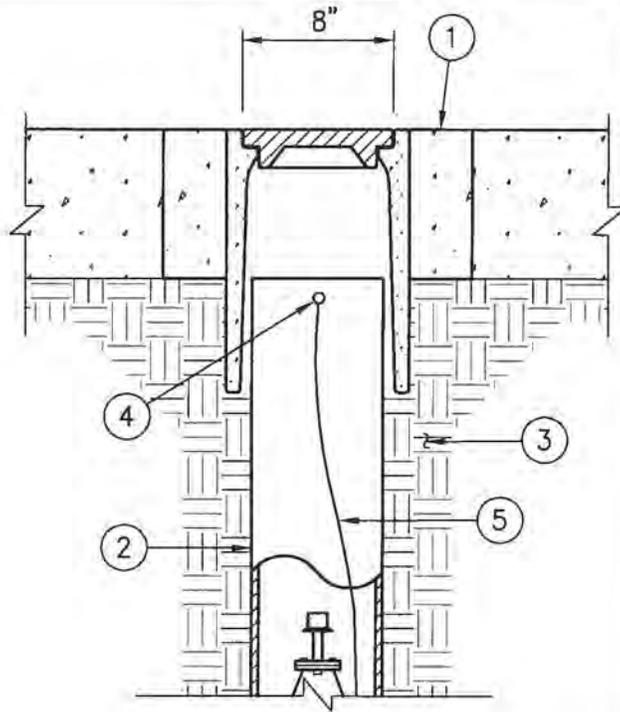
NOTES:

1. MATERIALS AND WORKMANSHIP: RESILIENT SEAT GATE VALVES SHALL CONFORM TO THE REQUIREMENTS FOR AWWA C-509 AND THE REQUIREMENTS SET FORTH HEREIN. RESILIENT SEAT GATE VALVES, UNLESS OTHERWISE INDICATED, SHALL BE THE SAME SIZE AS THE MAIN IN WHICH THEY ARE INSTALLED AND SHALL BE CONNECTED TO DUCTILE IRON FITTINGS BY FLANGES OR MECHANICAL JOINTS. ALL VALVES SHALL BE NON-RISING STEM, COUNTERCLOCKWISE OPENING. VALVES SHALL HAVE THE SAME TYPE ENDS AS THE PIPE OR FITTING ON WHICH THEY ARE INSTALLED. VALVES ARE TO HAVE 2-INCH-SQUARE CAST-IRON OPERATING NUTS. VALVES SHALL BE MARKED WITH RAISED LETTERING CAST ON THE BODY INDICATING MANUFACTURER AND WORKING PRESSURE. MINIMUM WATER WORKING PRESSURE TO BE 200 PSIG. VALVES SHALL BE IRON BODIED WITH RESILIENT SEAT DISC. THE BRONZE STEM NUT SHALL BE SOLID BRONZE CONFORMING TO ASTM B-62 (4-6% ZINC). THE BRONZE STEM SHALL BE CAST BRONZE OR FORGED BRONZE OR FORGED BRONZE BAR STOCK CONTAINING 2% ZINC. VALVES SHALL BE MANUFACTURED BY AVK, CLOW, OR APPROVED EQUAL.
2. INTERIOR AND EXTERIOR COATINGS: THE INTERIOR AND EXTERIOR OF THE VALVE BODY SHALL BE FUSION EPOXY LINED AND COATED AT THE PLACE OF MANUFACTURE. SURFACES SHALL BE SANDBLASTED IN ACCORDANCE WITH SSPC-SP-5 (WHITE METAL BLAST CLEANING).
3. FLANGED VALVES: VALVES WITH FLANGED ENDS SHALL BE BOLTED WITH CADMIUM PLATED STEEL MACHINE BOLTS AND NUTS CONFORMING TO ASTM A-307, GRADE B. ALL BOLT THREADS SHALL BE LUBRICATED WITH GRAPHITE AND OIL PRIOR TO INSTALLATION. FLANGE FACES SHALL BE WIRE BRUSHED AND CLEANED PRIOR TO JOINING EACH FLANGE. GASKETS SHALL BE FULLFACE, 1/8-INCH NEOPRENE (DUROMETER 60-80) WITH PREPUNCHED BOLT HOLES.
4. MECHANICAL JOINTED VALVES: VALVES WITH MECHANICAL JOINT ENDS SHALL CONFORM TO THE REQUIREMENTS OF AWWA C111. GASKETS SHALL CONFORM TO AWWA C111 WITH DUCK TIPS AND BACKS.
5. PUSH-ON JOINTED VALVES: VALVES WITH PUSH-ON JOINTS SHALL CONFORM TO THE REQUIREMENTS OF AWWA C111. GASKETS SHALL ALSO CONFORM TO AWWA C111.
6. PLASTIC FILM WRAP: ALL BURIED VALVES AND FITTINGS SHALL BE COMPLETELY ENCAPSULATED WITH A 8-MIL WRAP OF POLYETHYLENE FILM.

	CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT	STANDARD PLAN
	BURIED GATE VALVE	
	APPROVED BY: <i>Clifford G. Finley</i> PUBLIC WORKS DIRECTOR / CITY ENGINEER	2-2-09 DATE	113 SHEET 2 OF 2



SECTION IN A.C. PAVEMENT



SECTION IN CONCRETE PAVEMENT
OR IN UNIMPROVED AREAS

LEGEND

- ① CONCRETE RING OR CONCRETE PAVEMENT. SEE TOP VIEW ON SHT. 2 OF 2.
- ② 8" O.D., SCHEDULE 80 PLASTIC PIPE DIAMETER.
- ③ NATIVE BACKFILL AS REQUIRED TO MATCH EXISTING (COMPACT TO 90% RELATIVE DENSITY).
- ④ 5/16" GALVANIZED HEX BOLT AND NUT.
- ⑤ 10 GAUGE SOLID CORE PLASTIC COATED COPPER LOCATION WIRE TO BE USED WITH NON-METALLIC WATER PIPE (PVC AND CONCRETE PIPE). WIRE TO RUN ALONG VALVE STACK THE ENTIRE LENGTH.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

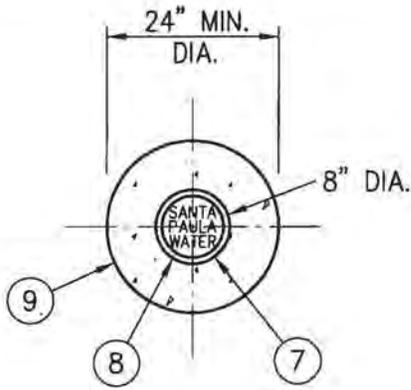
VALVE BOX ASSEMBLY

114

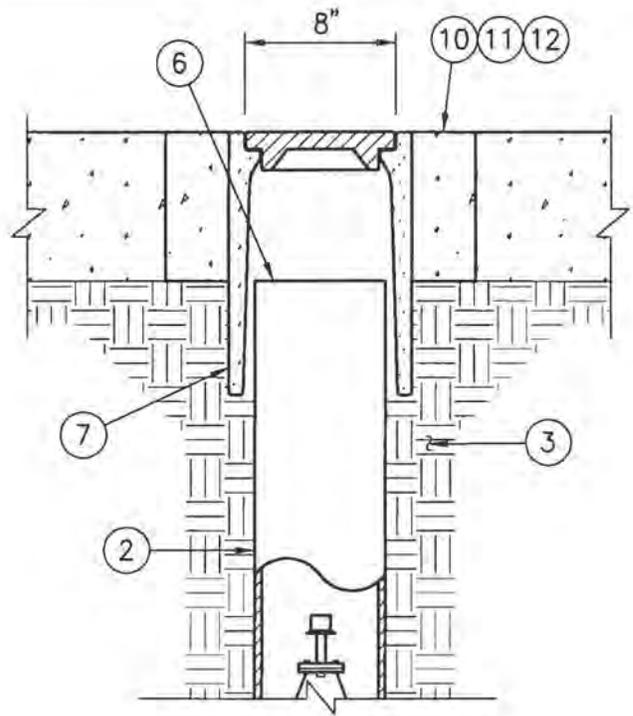
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SHEET 1 OF 2



TOP VIEW



VALVE STACK RAISING DETAIL

LEGEND (CONT'D)

- (6) PLANE OF TRIM CUT SHALL BE PARALLEL TO FINISH GRADE OR PAVEMENT AND TRIMMED TO BE A MINIMUM OF 4" INSIDE BOX.
- (7) VALVE BOX AND CAP TO BE INSTALLED BEFORE PAVING. CHRISTY G-3 VALVE BOX AND CAP.
- (8) COAT EDGE OF VALVE BOX WITH GREASE SO CONCRETE WILL NOT STICK.
- (9) 8" MIN. THICK CONCRETE, CLASS 517-C 3000.
- (10) FOR VALVE STACK EXTENSIO, REMOVE EXISTING CONCRETE RING, CUT AND RE-INSTALL EXTENSION IN KIND TO FINISH GRADE. REPLACE ALL NON-COMPLIANT BOXES WITH CHRISTY G-3. CUT 6" BELOW FINISH GRADE. MINIMUM EXTENSION TO BE 6". REPLACE CONCRETE RING.
- (11) TOP OF CONCRETE (AT FINISH GRADE) TO BE BLACK.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

VALVE BOX ASSEMBLY

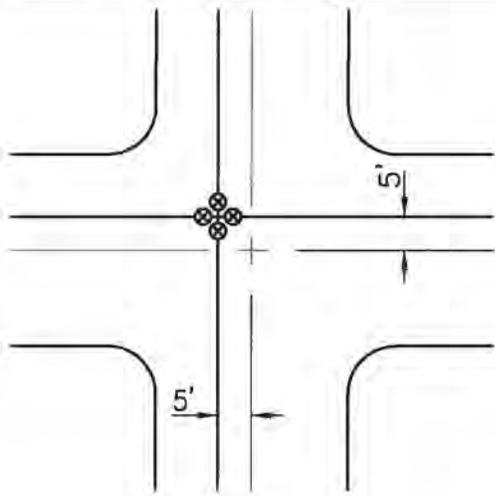
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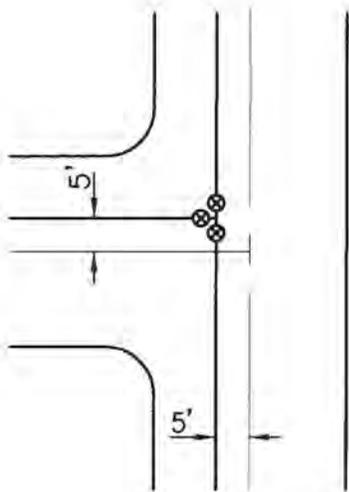
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1-28-09
DATE

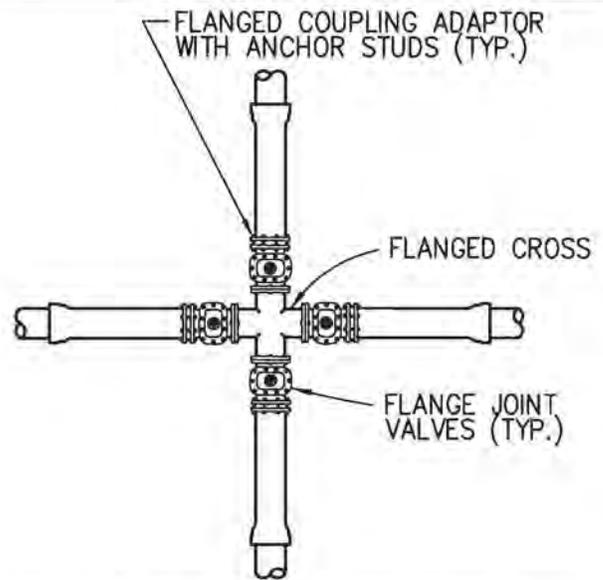
SHEET 2 OF 2



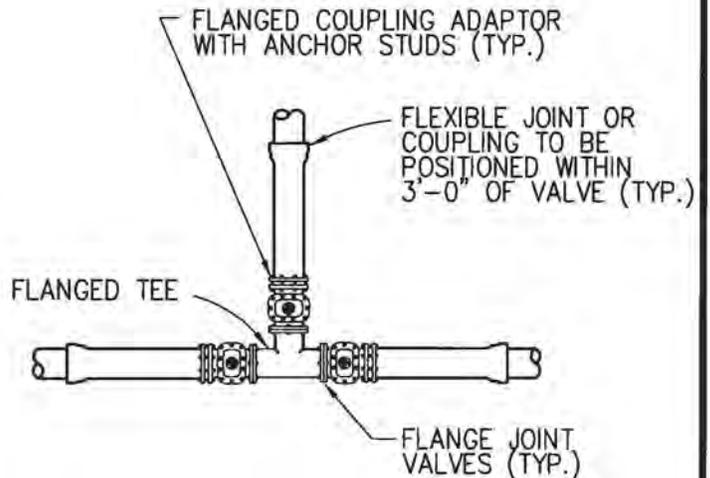
PLAN
NTS



PLAN
NTS



CROSS - TYPICAL CONNECTIONS
NTS



TEE - TYPICAL CONNECTIONS
NTS

NOTES:

1. VALVES SHALL GENERALLY BE LOCATED ON EACH BRANCH OF WATER MAIN INTERSECTIONS. WHERE RELATIVELY SHORT LINES (LESS THAN 500 FEET IN LENGTH) ARE INVOLVED, ONE OF THE TWO VALVES BETWEEN INTERSECTIONS MAY BE OMITTED.
2. WATER MAINS IN PUBLIC STREETS SHALL BE LOCATED PARALLEL TO AND 5 FEET NORTH OR WEST OF STREET CENTERLINES WHENEVER POSSIBLE.
3. SEE STANDARD PLAN 116 FOR THRUST BLOCK DETAILS.
4. SEE STANDARD PLAN 113 FOR VALVE BOX DETAILS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

**WATER MAIN
CONNECTIONS AT INTERSECTIONS**

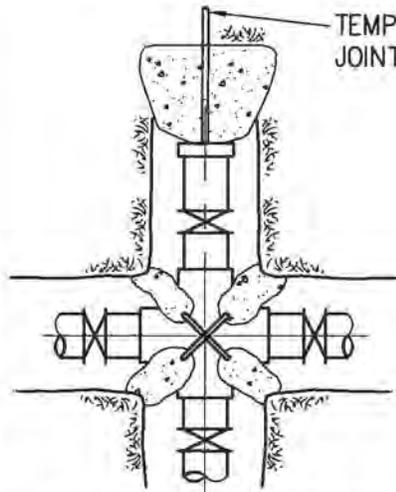
115

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DATE

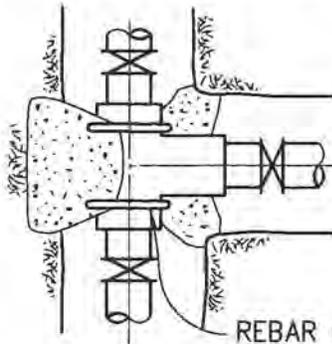
SHEET 1 OF 1



END CAP OR CROSS

FIG. 1

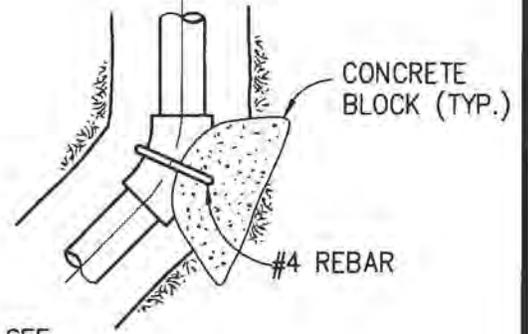
TEMPORARY BLOW-OFF WILL BE REQUIRED. ONE FULL JOINT OF PIPE ON ALL STUB OUTS.



TEE

FIG. 2

REBAR (TYP.) SEE STD. PLAN WT311



HORIZONTAL OR VERTICAL BEND

FIG. 3

CONCRETE BLOCK (TYP.)

#4 REBAR

3/8" x 2" STRAPS W/ 5/8" ANCHOR BOLTS. BOLTS TO EXTEND THE ENTIRE DEPTH OF BLOCK

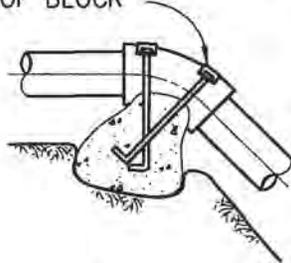


FIG. 4

NOTES:

1. TABLE DENOTES MINIMUM DESIGN STANDARDS FOR THRUST BLOCK INSTALLATION. SPECIAL DESIGN IN FIELD SHALL BE REQUIRED WHEN DETERMINED BY THE CITY REPRESENTATIVE THAT THE SOIL BEARING LOAD AREA IS BELOW 1500 LB/SQ.FT.
2. TABLE DENOTES MINIMUM DESIGN STANDARDS FOR CLASS 150 PIPE. FOR CLASS 200 PIPE, INCREASE AREAS AND VOLUMES SHOWN IN TABLE BY 33%.
3. CONCRETE BLOCKS SHALL BEAR ON UNDISTURBED EARTH.
4. APPLY CITY APPROVED COATING TO ALL BOLTS AND NUTS.
5. CONCRETE SHALL BE A MINIMUM OF 2000 PSI STRENGTH.

SIZE OF PIPE	MIN. BEARING AREA IN SQUARE FEET						CUBIC FT. OF CONCRETE		
	FIG.1		FIG.2		FIG.3		FIG.4		
			90°	45°	22 1/2'	11 1/4'	90°	22 1/2'	11 1/4'
	CL.150	CL.150	CL.150	CL.150	CL.150	CL.150	CL.150	CL.150	CL.150
4"	3	3	4	2	1	1	19	10	5
6"	5	5	7	4	2	1	-	20	10
8"	9	9	12	7	3	2	SPECIAL DESIGN REQUIRED		18
10"	14	14	20	11	6	3		30	
12"	20	20	29	16	8	4		-	
14"	28	28	39	21	11	5		-	



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

THRUST BLOCK DETAILS

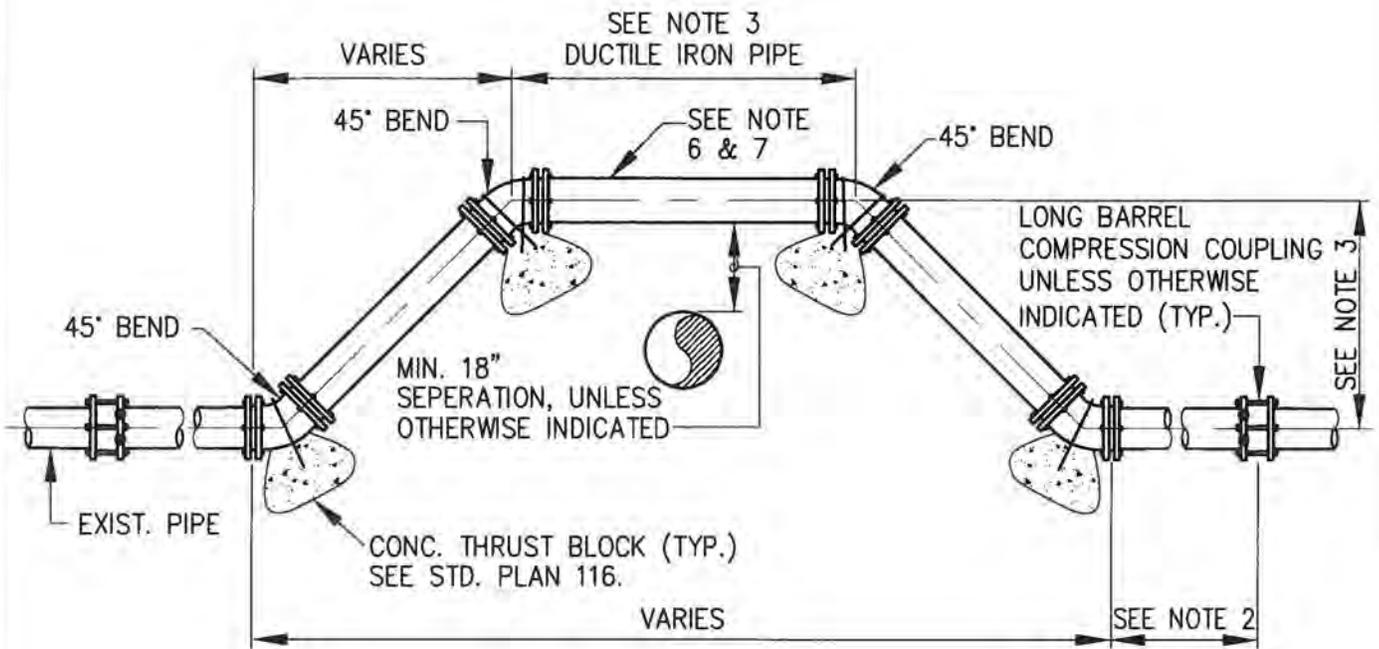
116

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1-28-09
DATE

SHEET 1 OF 1



SIDE ELEVATION
NTS

NOTES:

1. ALL FITTINGS SHALL BE LOCKING GLANDS (RESTRAINED JOINTS).
2. LENGTH SHALL BE DETERMINED BY NEXT EXISTING COUPLING.
3. LENGTH, DEPTH, AND HEIGHT SHALL BE FIELD DETERMINED.
4. APPLY CITY APPROVED COATING TO ALL NUTS AND BOLTS.
5. BACKFILL SHALL CONFORM TO STD. PLAN 103.
6. AIR RELEASE VALVES ON OVERCROSSINGS ARE REQUIRED, AND SHALL CONFORM TO STD. PLAN WT313, UNLESS OTHERWISE INDICATED.
7. AIR & VACUUM RELEASE VALVES ON OVERCROSSINGS ARE REQUIRED AND SHALL CONFORM TO STD. PLAN 118, UNLESS OTHERWISE INDICATED.
8. CONCRETE ENCASEMENT OR CONCRETE APRON MAY BE REQUIRED ON TOP.
9. GATE VALVES MAY BE REQUIRED ON EITHER SIDE OF INSTALLATION.
10. BLOW OFF ASSY. ARE REQUIRED ON UNDER CROSSINGS, STD. PLAN 119.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

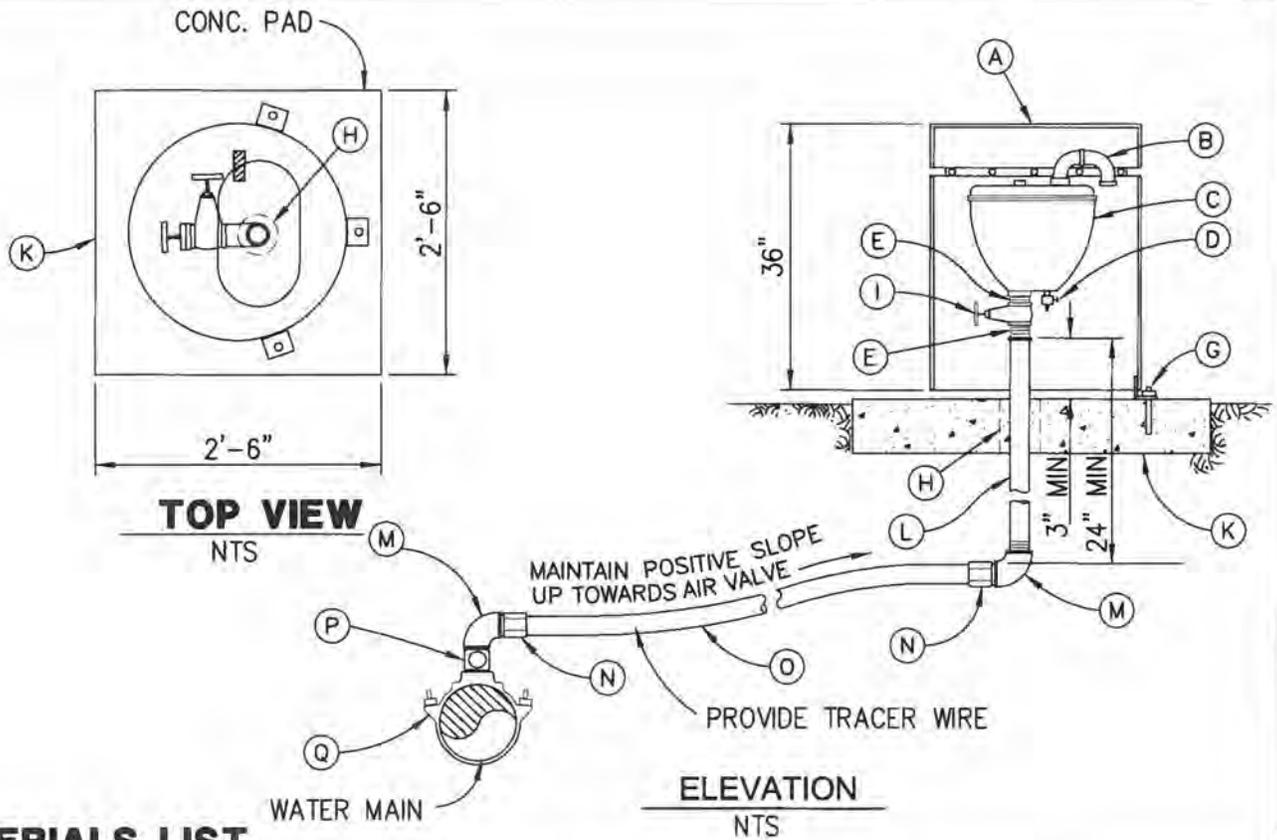
**RELOCATION PLAN
(UNDER AND OVER CROSSING)**

117

APPROVED BY:

Clifford G. Finley 1-28-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

SHEET 1 OF 1



MATERIALS LIST

(A) ARMORCAST 24" x 36" AIR VACUUM VALVE ENCLOSURE PART NUMBER P6002001	(L) 2" BRASS NIPPLE
(B) 2 - 90° STREET ELL'S-GALV. MESH SCREEN ON END	(M) 2" BRASS ELBOW - 90° STREET ELL
(C) COMB. AIR RELEASE & AIR VAC. VALVE, APCO HEAVY DUTY MODEL 145C	(N) 2" MALE I.P.T. X COMPRESSION COUPLING (FORD C84-77)
(D) TEST DRAIN VALVE - 1/2" I.P.T. x 3/4" H.T.	(O) 2" HDPE - COPPER TUBING SIZE
(E) 2" x 3" BRASS NIPPLES (3" LONG)	(P) 2" CORPORATION STOP, IPT x FIPT
(F) NOT USED	(Q) BRONZE DOUBLE STRAP SADDLE WITH I.P.T.
(G) 3/8" x 4" ANCHOR BOLTS - 3 REQUIRED	(R) NOT USED
(H) 4" CAST HOLE	(S) NOT USED
(I) 2" BRASS BALL VALVE FORD B11-777W/JONES J-1900W	(T) NOT USED
(J) NOT USED	
(K) 2'-6" x 2'-6" x 6" CONCRETE PAD W/ NO.4 Ø	

NOTES:

- ASSEMBLIES INSTALLED AT EASEMENTS, ROADS AND STREETS WITHOUT CURBS SHALL BE PROTECTED WITH GUARD POSTS PAINTED AMERON YE-3 OSHA. POSITION POSTS 2' IN FRONT OF AND 2.5' EACH SIDE OF ASSEMBLIES. SEE STD. PLAN ES008 FOR GUARD POST DETAIL.
- COMBINATION AIR RELEASE AND VACUUM VALVE ASSEMBLIES SHALL BE LOCATED BEHIND THE SIDEWALK BUT WITHIN THE PUBLIC SERVICE EASEMENTS AND ON THE PROPERTY LINE SEPARATING LOTS.
- BRASS 90° STREET ELBOW MAY BE USED OUT OF SADDLE TO MEET GRADE.

*** FOR A 1" AIR AND VACUUM ASSEMBLY, USE 1" PIPING AND FITTINGS**



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

2" AIR AND VACUUM RELIEF VALVE ASSEMBLY

118

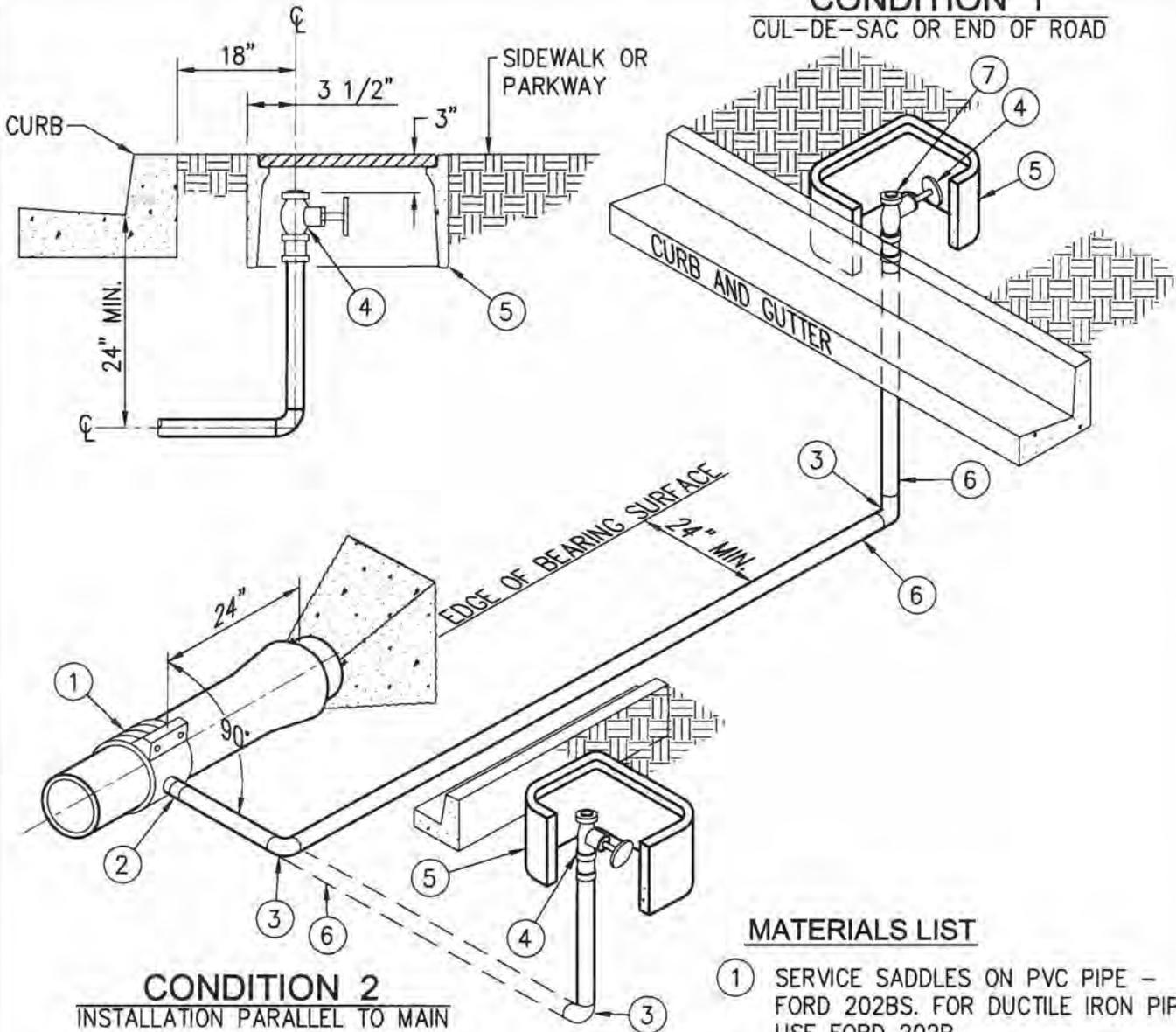
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1-28-09
DATE

SHEET 1 OF 1

CONDITION 1
CUL-DE-SAC OR END OF ROAD



CONDITION 2
INSTALLATION PARALLEL TO MAIN

NOTES:

1. ALL LOCATIONS AND DIMENSIONS GIVEN SHALL BE AS SHOWN UNLESS SPECIFIED BY THE CITY.
2. ALL MATERIALS SPECIFIED ON THIS STANDARD SHALL BE AS SHOWN OR AN APPROVED EQUAL BY THE CITY ENGINEER IN WRITING.

MATERIALS LIST

- ① SERVICE SADDLES ON PVC PIPE – FORD 202BS. FOR DUCTILE IRON PIPE USE FORD 202B.
- ② 2" CORP. STOP – FORD FB1100-7Q-NL OR APPROVED EQUAL.
- ③ 2" 90° ELBOW FORD L44-77Q-NL.
- ④ 2" BALL VALVE FORD B41-777WQ-NL.
- ⑤ METER BOX CHRISTY FL12.
- ⑥ 2" HDPE – COPPER SIZED SERVICE PIPE OR APPROVED EQUAL.
- ⑦ THREADED PLUG – PLASTIC.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

2" BLOW-OFF ASSEMBLY

119

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1-28-09
DATE

SHEET 1 OF 1

BACKFILL WITH NATIVE
OR IMPORTED MATERIAL
PER SPECIFICATIONS.
SEE STD. DWG. S-15

TRENCH WIDTH
MIN. - PIPE O.D. + 12"
MAX. - PIPE O.D. + 20"

#5 CONT.
AS SHOWN

PIPELINE

#4 TIES @ 24"

CONCRETE PER
SPECIFICATIONS

8" MIN.
12" MAX.

SECTION
NTS

NOTES:

1. SEE STD. DWG. S-15 FOR TRENCH BACKFILL AND FINISHED SURFACE REPAIRS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

**TYPICAL CONCRETE ENCASEMENT
DETAIL**

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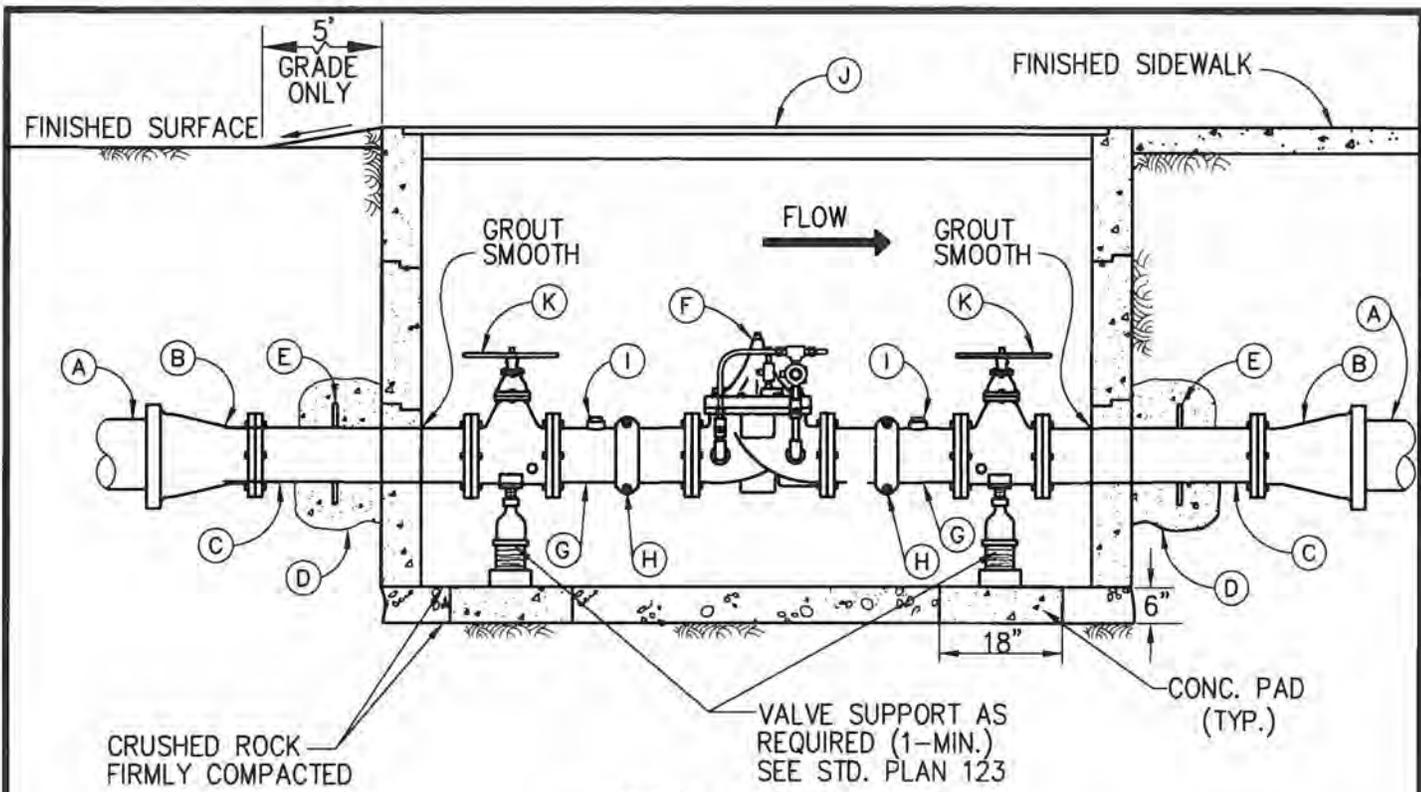
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1-28-09
DATE

STANDARD PLAN

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SHEET 1 OF 1



MATERIALS LIST

SIDE ELEVATION

NTS

(A) 6" C-900 CL. 150/200 PVC PIPE. MIN. 3' EACH SIDE. INSTALL TRANS CPLG. AS REQUIRED, UNLESS OTHERWISE INDICATED.	(G) 4" STD. STEEL SPLIT SPOOL
(B) 6"X4" FLG. REDUCER, UNLESS OTHERWISE INDICATED.	(H) VICTAULIC STYLE 99 ROUST-A-BOUT CPLG. OR FLEX CPLG.
(C) 4" STD. STEEL SPOOL (SEE NOTE 4).	(I) 1" TAP WITH PLUG
(D) CONCRETE THRUST BLOCK SET IN UNDISTURBED SOIL. SEE STD. PLAN 116.	(J) BROOKS 746 SECT. VAULT W/SPRING ASSISTED GALV. STEEL TRAFFIC COVER (ID 45-1/2"X69-1/2", 60" DEEP)
(E) WELDED SLIP FLANGE	(K) 4" FLG. RESILIENT WEDGE GATE VALVE WITH HANDWHEEL, UNLESS OTHERWISE INDICATED.
(F) 4" PRESSURE REDUCING VALVE. CLA-VAL 92-01, OR APPROVED EQUAL.	

NOTES:

1. PLACE 6" MIN. CRUSHED ROCK UNDER BOTTOM OF VAULT.
2. PROVIDE 18" MIN. CLEARANCE BETWEEN BOTTOM OF PIPE AND BOTTOM OF VAULT.
3. INSURE THAT UPSTREAM VALVE IS PROVIDED FOR ISOLATION OF CONTROL VALVE.
4. PAINT ALL ABOVE GROUND PIPING CONTAINED WITHIN THE CONCRETE VAULT WITH A CITY APPROVED COATING. THE COLOR SHALL BE DETERMINED BY THE CITY REPRESENTATIVE.
5. ALL PIPING CONTAINED WITHIN THE VAULT SHALL BE FUSION EPOXY LINED AND COATED STEEL PIPE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH APPLICABLE AMERICAN WATER WORKS ASSOCIATION STANDARDS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

UNDERGROUND 4-INCH PRESSURE REDUCING STATION

APPROVED BY: *Clifford G. Finley* 1-28-09
 PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

STANDARD PLAN

124

SHEET 1 OF 2

NOTES:

1. THE CITY OF SANTA PAULA WATER SYSTEM OPERATES ON FOUR (4) DISTINCT PRESSURE GRADIENTS. THEY ARE THE 200, 400, 600 AND 900 ZONES, RESPECTIVELY. PRESSURE REDUCING STATIONS WITH PRESSURE SUSTAINING DEVICES SHALL BE INSTALLED BETWEEN ADJACENT ZONES IN THE MANNER PRESCRIBED BY THIS STANDARD. THE BELOW GRADE STATION SHALL BE INSTALLED WITHIN THE PUBLIC RIGHT OF WAY TO THE MAXIMUM EXTENT POSSIBLE, UNLESS DIRECTED OTHERWISE BY THE CITY'S REPRESENTATIVE.
2. THE INSTALLED DEVICE SHALL BE FIELD CALIBRATED BY CITY WATER OPERATIONS PERSONNEL PRIOR TO ACTIVATION. NORMAL OPERATION OF THE ISOLATION VALVE(S) SHALL BE DEMONSTRATED IN THE PRESENCE OF THE CITY'S REPRESENTATIVE PRIOR TO ACCEPTANCE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

**UNDERGROUND 4-INCH
PRESSURE REDUCING STATION**

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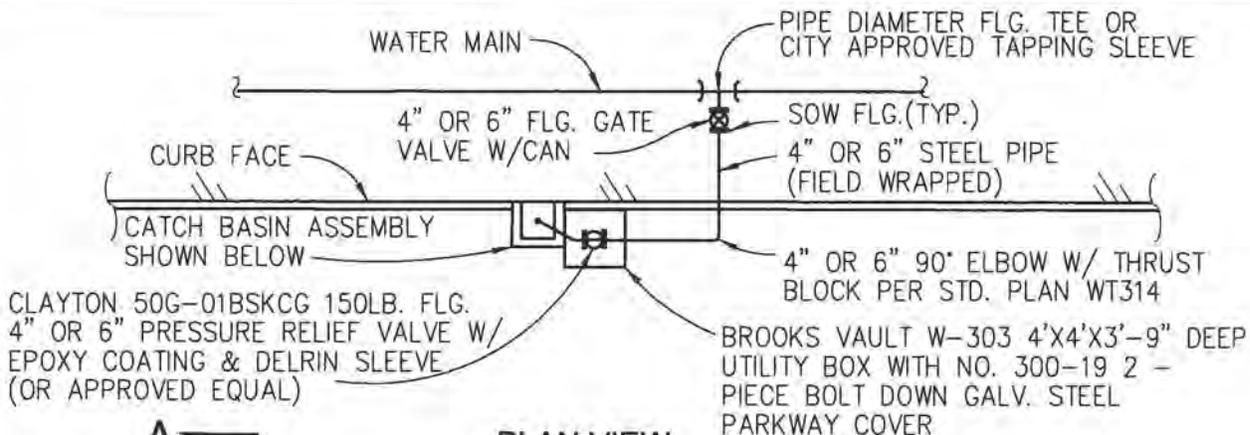
Clifford G. Finley
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1-28-09
DATE

STANDARD PLAN

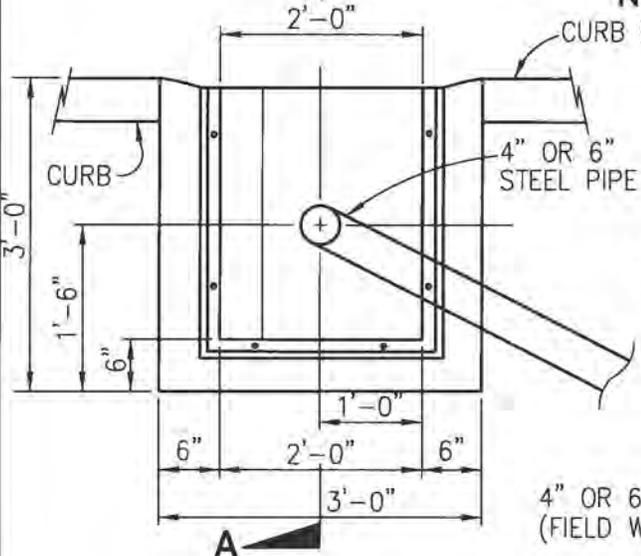
124

SHEET 2 OF 2

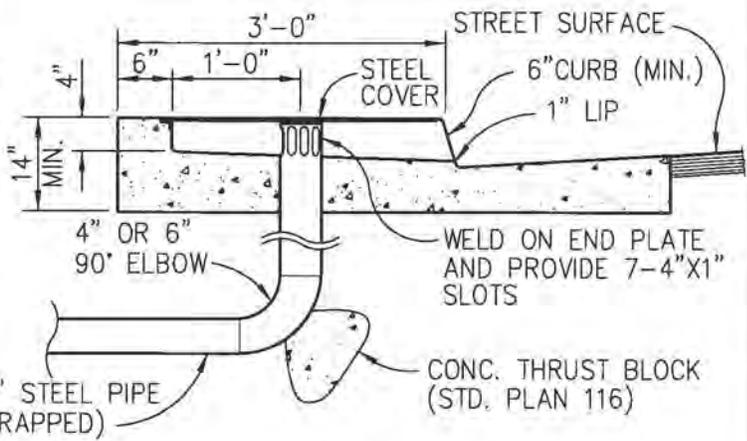


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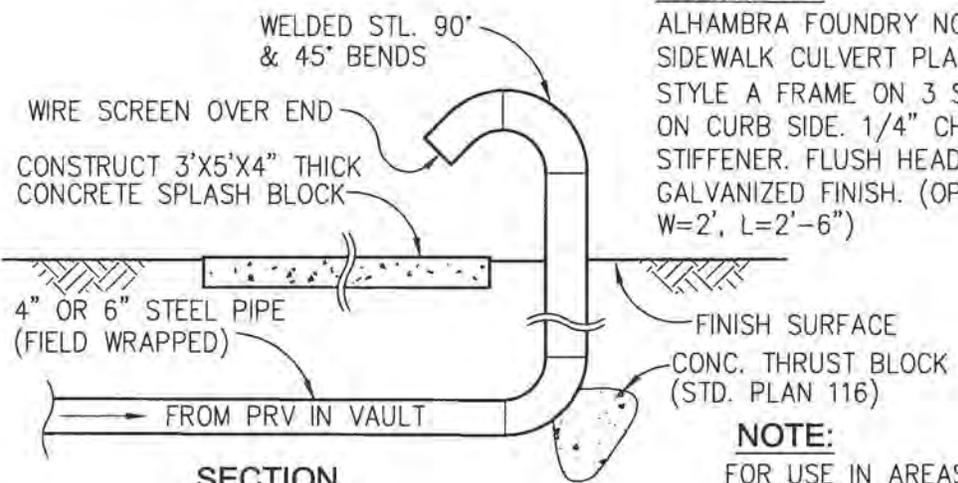
PLAN VIEW
NTS



PLAN VIEW
NTS



SECTION A-A
NTS



SECTION
NTS

STEEL COVER
ALHAMBRA FOUNDRY NO. A-1094 MODIFIED SIDEWALK CULVERT PLATE COVER (TYPE 1). STYLE A FRAME ON 3 SIDES. NO. 1 NOSING ON CURB SIDE. 1/4" CHECKER PLATE W/ STIFFENER. FLUSH HEAD STAINLESS STL. SCREWS. GALVANIZED FINISH. (OPENING DIMENSIONS: W=2', L=2'-6")

NOTE:
FOR USE IN AREAS WITH NO CURB. LOCATION TO BE DETERMINED IN FIELD BY CITY REPRESENTATIVE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

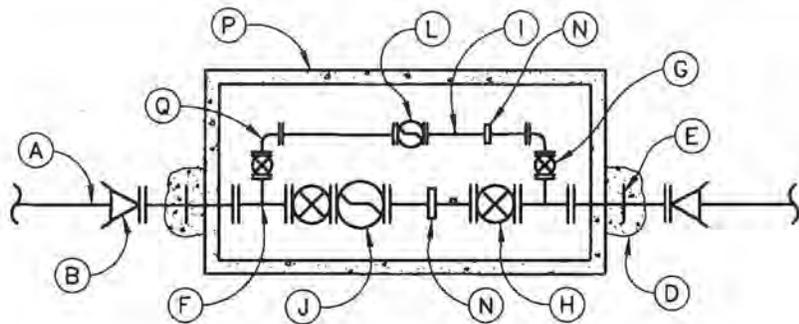
4-INCH AND 6-INCH PRESSURE RELIEF STATION

APPROVED BY: *Clifford G. Finley* 1-28-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

STANDARD PLAN

125

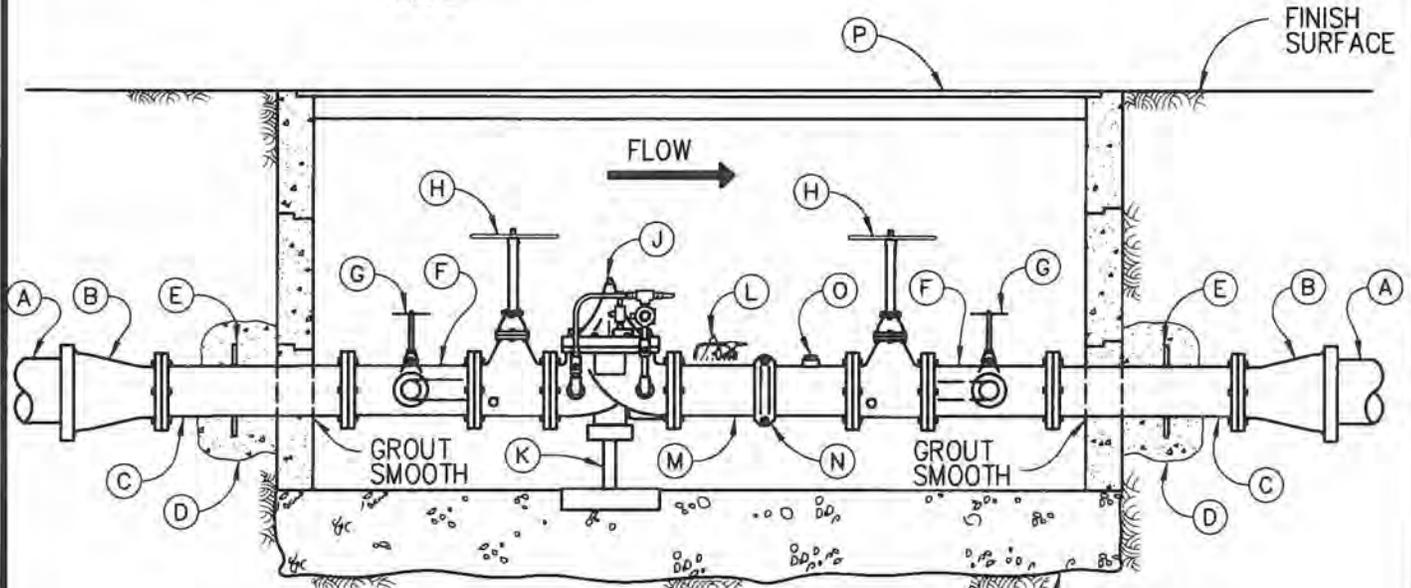
SHEET 1 OF 1



PLAN VIEW
NTS

NOTES:

1. PROVIDE A MIN. 6" GRAVEL BED UNDER BOTTOM OF VAULT.
2. PROVIDE 18" MIN. CLEARANCE UNDER FITTINGS.
3. PROVIDE A MINIMUM OF ONE SUPPORT BRACE FOR ASSEMBLY.



SIDE ELEVATION
NTS

LEGEND

(A) WATER MAIN	(J) 6" PRESSURE REDUCING VALVE. CLA-VAL 90G-01ABJKCKG. EPOXY COATED W/ DELRIN SLEEVE OR APPROVED EQUAL.
(B) APPROPRIATE REDUCER/ADAPTOR W/6" FLANGE	(K) ADJUSTABLE SUPPORT STAND. SEE STD. PLAN WT317.
(C) 6" STD. STEEL SPOOL	(L) 2" PRESSURE REDUCING VALVE. CLA-VAL 90G-01ABJKC. EPOXY COATED OR APPROVED EQUAL.
(D) CONCRETE THRUST BLOCK (MUST BE SET IN UNDISTURBED SOIL). SEE STD. PLAN 116.	(M) 6" STD. STEEL SPLIT SPOOL
(E) WELD ON STEEL DONUT	(N) VICTAULIC STYLE 99 ROUST-A-BOUT COUPLING OR FLEX. COUPLING (1-2" & 1-6")
(F) 6"x2" FLG. TEE	(O) 1" TAP WITH PLUG
(G) 2" FLG. OS & Y RESILIENT WEDGE GATE VALVE WITH HANDWHEEL	(P) BROOKS 8610 SECTIONAL VAULT W/SPRING ASSISTED PARKWAY COVER (ID 69-1/2"x117-1/2"x48"DEEP). NO KNOCKOUTS REQUIRED. FIELD CUT OPENINGS.
(H) 6" FLG. OS & Y RESILIENT WEDGE GATE VALVE WITH HANDWHEEL	(Q) 2" 90° BEND (TOTAL OF 2)
(I) 2" STD. STEEL PIPE W/ SOW FLGS.	



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

6-INCH x 2-INCH
PRESSURE REDUCING STATION

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE

STANDARD PLAN

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CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

WATER TRUCK AIR GAP REQUIREMENTS

APPROVED BY:

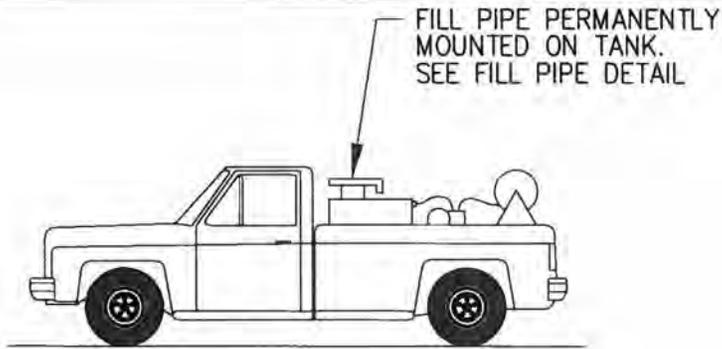
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PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE

STANDARD PLAN

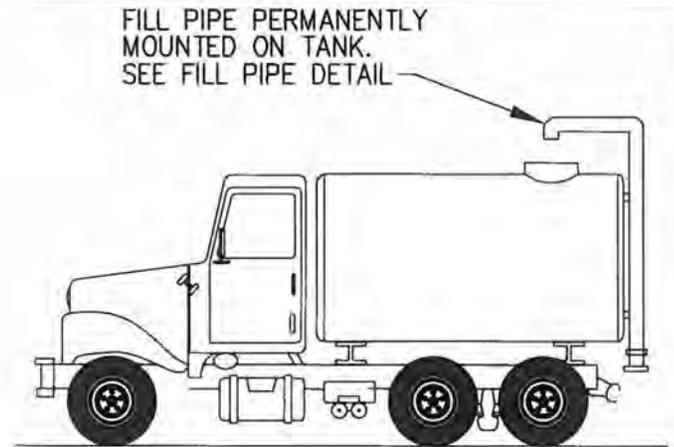
127

SHEET 1 OF 2



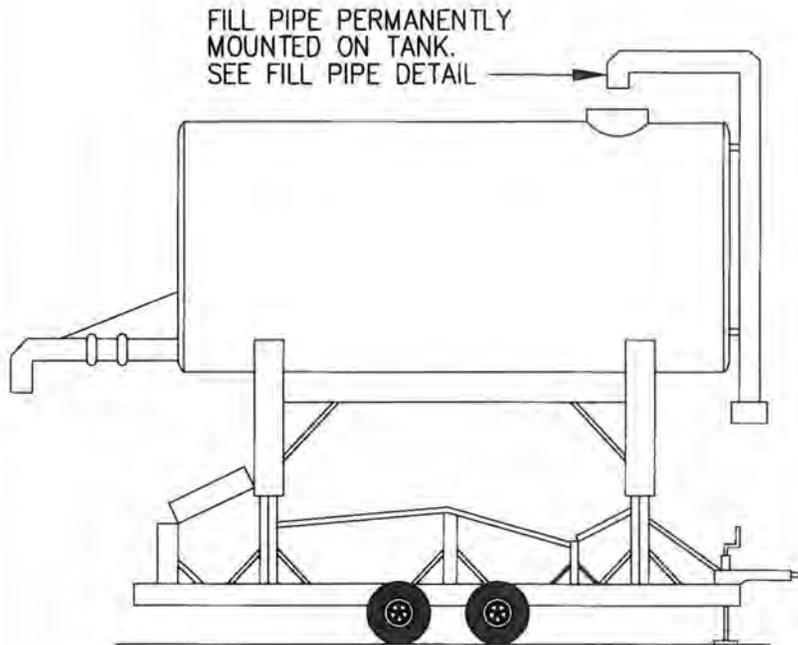
PESTICIDE APPLICATOR TRUCK

NTS



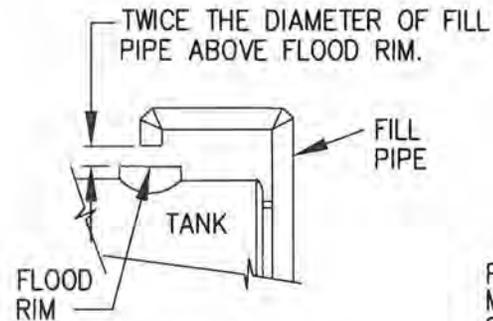
WATER TRUCK

NTS



ELEVATED TANK

NTS



FILL PIPE DETAIL

NTS



WATER WAGON

NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

WATER TRUCK AIR GAP REQUIREMENTS

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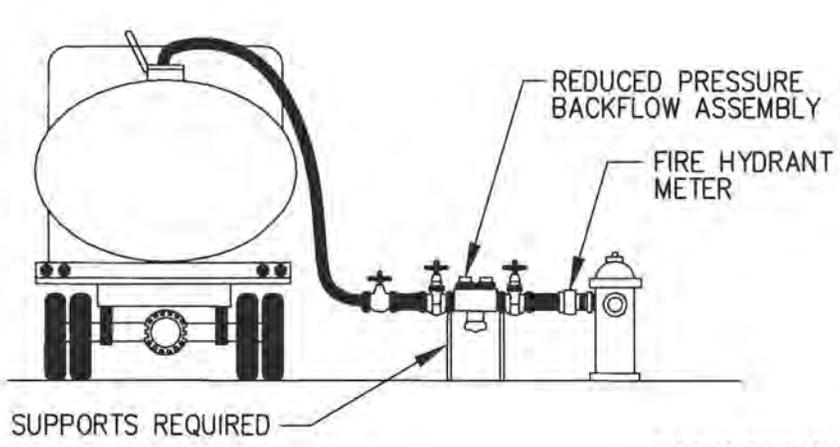
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PUBLIC WORKS DIRECTOR / CITY ENGINEER

1-28-09
DATE

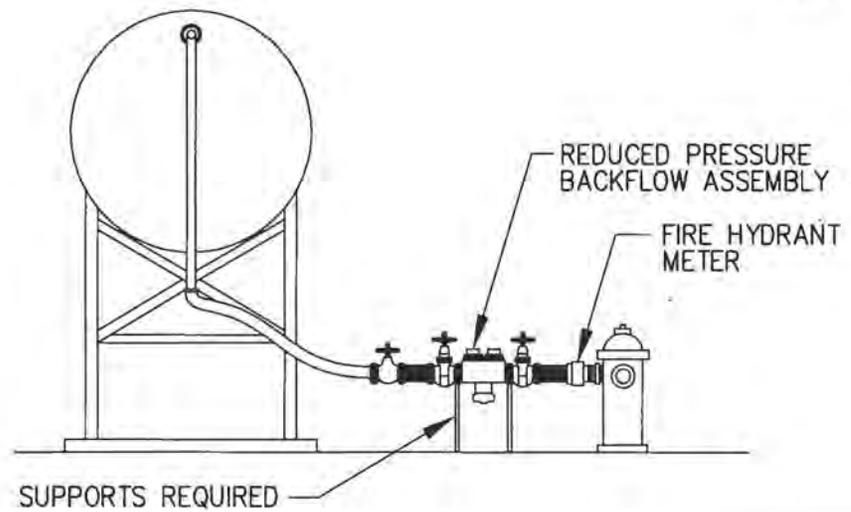
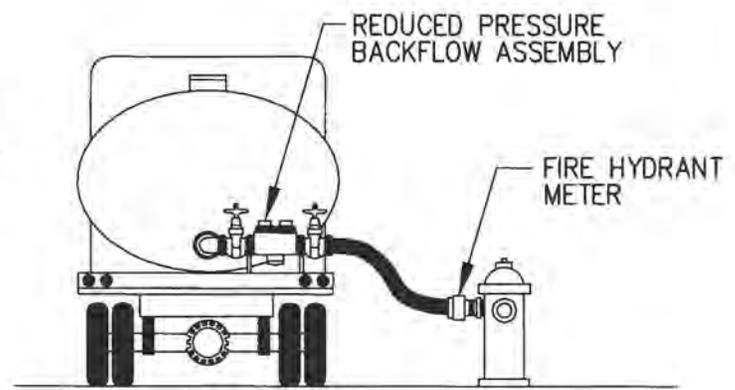
STANDARD PLAN

127

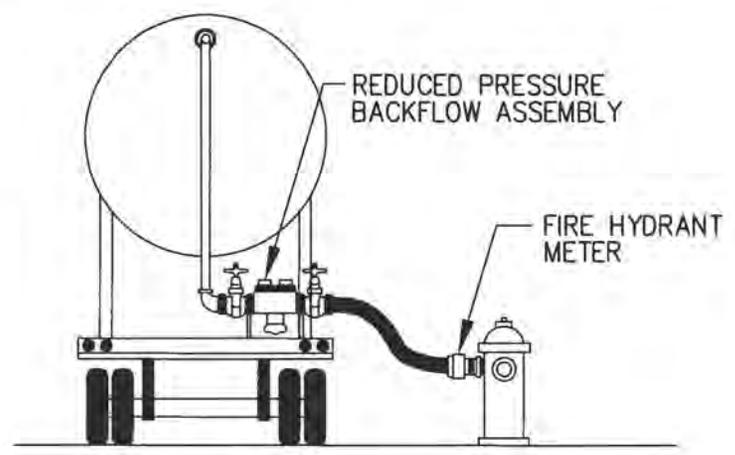
SHEET 2 OF 2



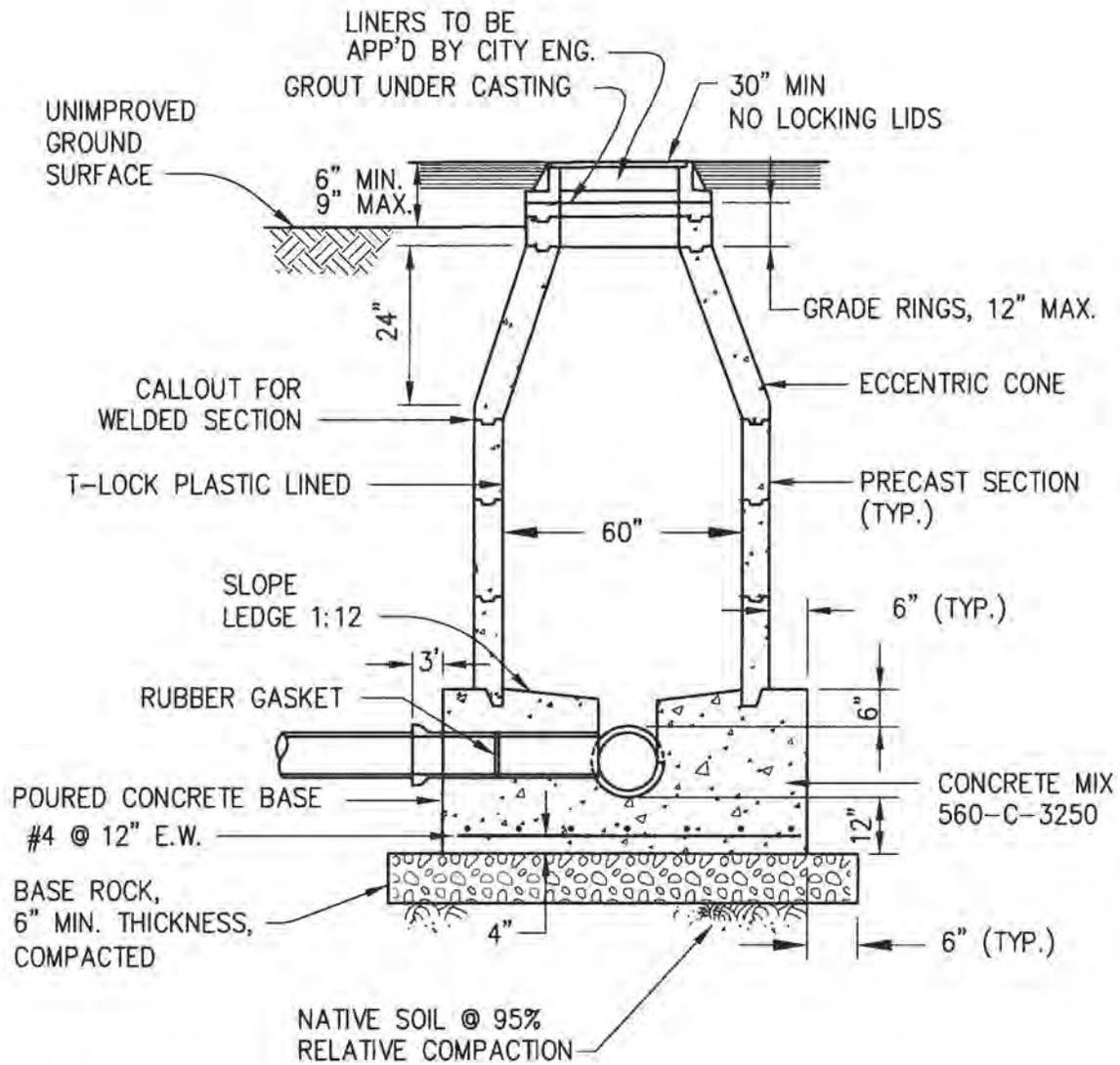
TANK TRUCKS
NTS



ELEVATED TANKS
NTS



NOTE:
BACKFLOW DEVICES SHALL BE APPROVED AND TESTED PRIOR TO BEING USED.



ILLUSTRATIVE SECTION

NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SEWER MANHOLE

201

APPROVED BY:

Clifford G. Ffalek
 PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09
 DATE

SHEET 1 OF 3

NOTES:

1. THE PRECAST CONCRETE UNITS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ASTM C 478.
2. RISER SECTIONS MAY BE REINFORCED OR UNREINFORCED. REINFORCED SECTIONS SHALL BE REINFORCED IN ACCORDANCE WITH ASTM C 478 AND SHALL HAVE A MINIMUM WALL THICKNESS OF 5". UNREINFORCED RISER SECTIONS SHALL HAVE A MINIMUM WALL THICKNESS OF 6".
3. THE ECCENTRIC CONES SHALL BE REINFORCED. THE WALL THICKNESS SHALL BE NOT LESS THAN 6".
4. JOINTS SHALL BE TONGUE AND GROOVE. JOINTS FOR REINFORCED STRUCTURES SHALL CONFORM WITH ASTM C 478 SECTION 14.
5. PRECAST CONCRETE UNITS SHALL BE ASSEMBLED USING CLASS "B" MORTAR, AND A PREFORMED MASTIC SEALING GASKET BETWEEN JOINTS.
6. FOR REINFORCED PRECAST CONCRETE STRUCTURES, ALL REINFORCEMENT SHALL HAVE A MINIMUM OF 2" OF COVER OVER THE STEEL ON THE INSIDE FACE.
7. WHERE PIPELINE IS 24" OR LARGER, MANHOLE DIAMETER SHOULD BE INCREASED TO 72".
8. MANHOLE FRAME AND COVER SHALL MEET SSPWC STD. PLAN 632-2 REQUIREMENTS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SEWER MANHOLE

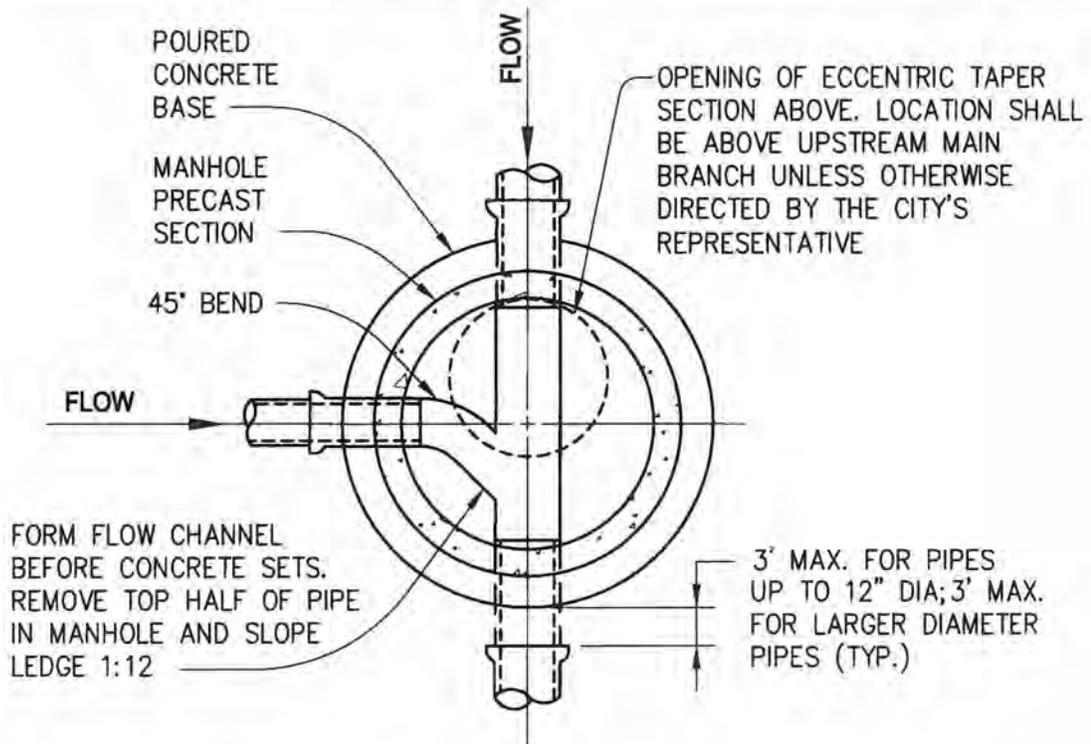
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APPROVED BY:

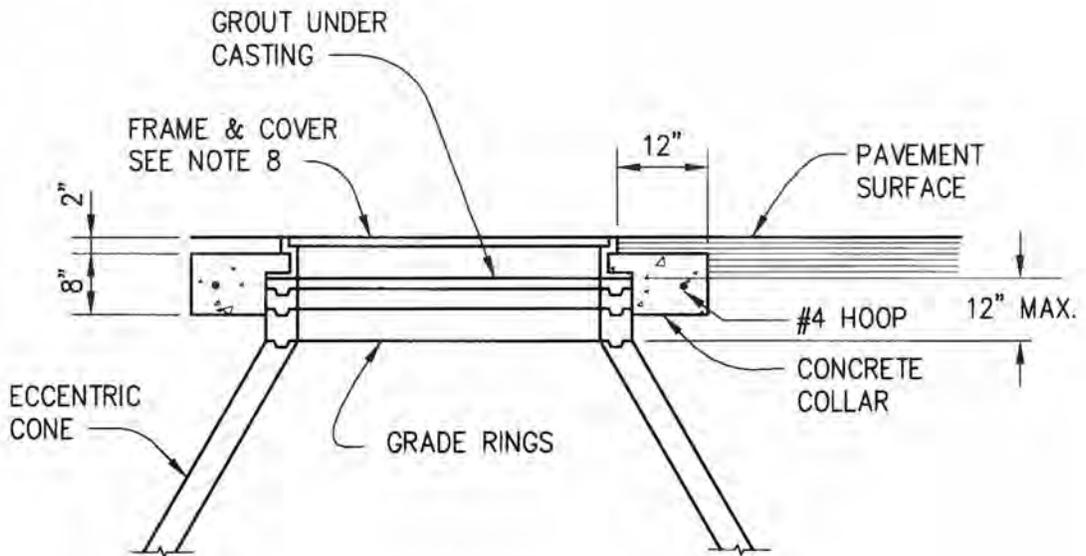
Clifford G. Finley
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2-2-09
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SHEET 2 OF 3



SECTIONAL PLAN



**SECTION
MANHOLE CONCRETE COLLAR DETAIL**

NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

**SEWER MANHOLE AND
CONCRETE COLLAR**

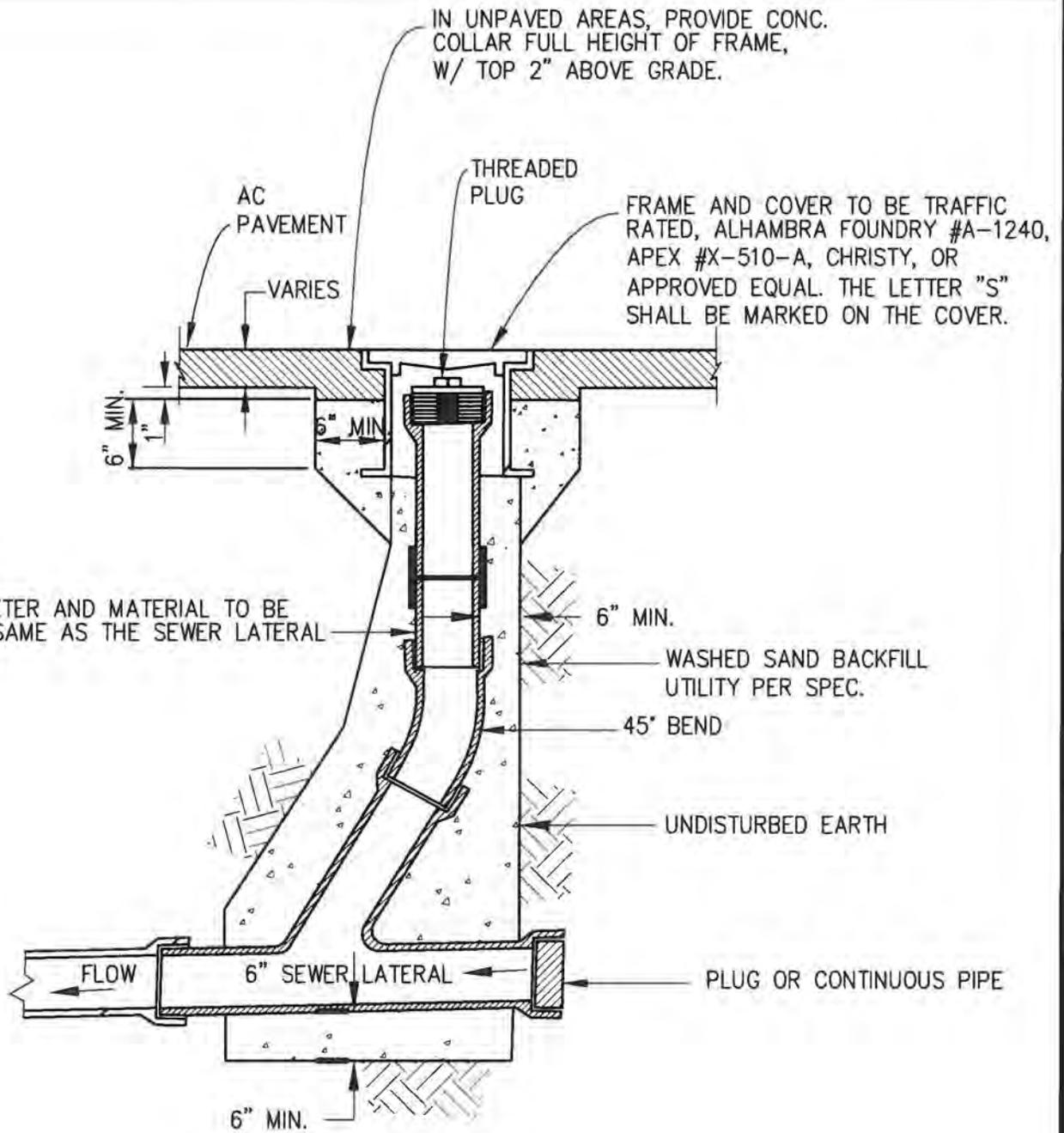
201

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SHEET 3 OF 3



IN UNPAVED AREAS, PROVIDE CONC. COLLAR FULL HEIGHT OF FRAME, W/ TOP 2" ABOVE GRADE.

FRAME AND COVER TO BE TRAFFIC RATED, ALHAMBRA FOUNDRY #A-1240, APEX #X-510-A, CHRISTY, OR APPROVED EQUAL. THE LETTER "S" SHALL BE MARKED ON THE COVER.

DIAMETER AND MATERIAL TO BE THE SAME AS THE SEWER LATERAL

IN LINE SECTION

NTS

NOTES:

1. PIPE SHALL BE PVC SEWER PIPE SDR 35 D3034.
2. PIPES AND FITTINGS SHALL BE PROPERLY ALIGNED AND MAINTAINED DURING BACKFILL. JOINTS FOR PIPES AND FITTINGS SHALL BE MADE PRIOR TO PLACING CONCRETE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

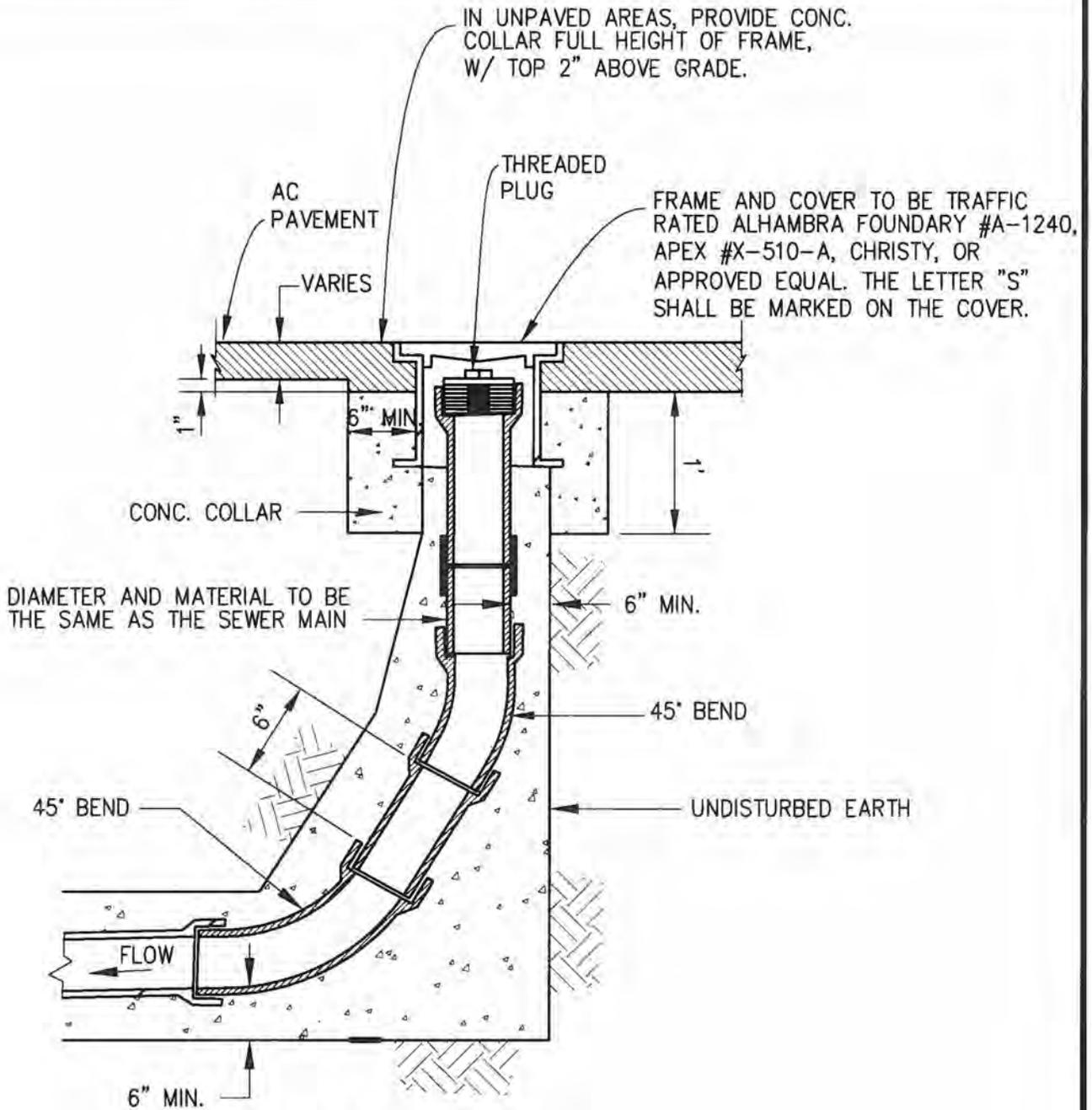
CLEANOUTS

202

APPROVED BY:

Clifford G. Finley 2-2-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

SHEET 1 OF 2



END OF LINE SECTION

NTS

NOTES:

1. PIPE SHALL BE PVC SEWER PIPE SDR 35 D3034.
2. PIPES AND FITTINGS SHALL BE PROPERLY ALIGNED AND MAINTAINED DURING BACKFILL. JOINTS FOR PIPES AND FITTINGS SHALL BE MADE PRIOR TO PLACING CONCRETE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CLEANOUTS

202

APPROVED BY:

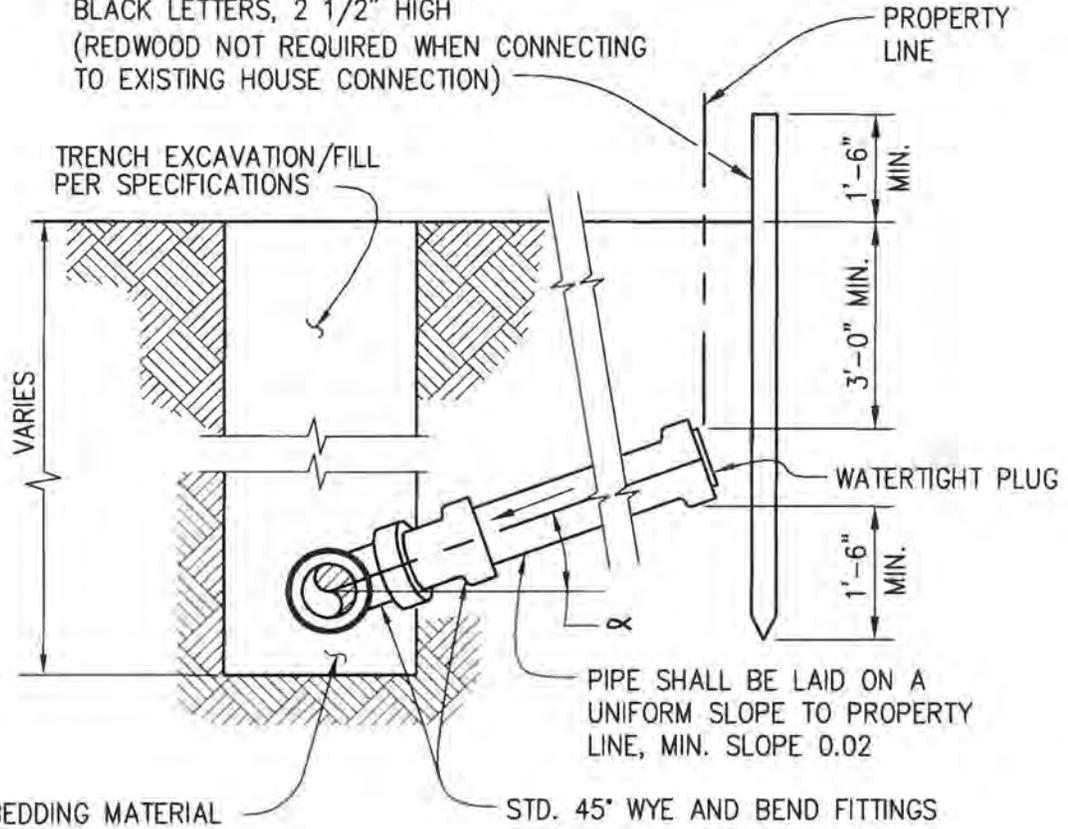
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SHEET 2 OF 2

LATERAL

TEMPORARY REDWOOD (2"x4") PAINTED WHITE WITH THE WORD "LATERAL" PAINTED IN BLACK LETTERS, 2 1/2" HIGH (REDWOOD NOT REQUIRED WHEN CONNECTING TO EXISTING HOUSE CONNECTION)



SECTION

NTS

NOTES:

1. PIPE SHALL BE HIGH STRENGTH VCP OR PVC SEWER PIPE.
2. CONTRACTOR SHALL MARK A 2" HIGH "S" ON THE CURB FACE AT ALL SEWER LATERALS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SERVICE LATERAL

203

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Clifford G. Finley
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SHEET 1 OF 3

1. $10' < \infty < 30'$, USE STANDARD PLAN SS403-A, SHEET 1.
 $30' < \infty < 45'$, USE STANDARD PLAN SS403-A, SHEET 2.
 $\infty > 45'$, USE STANDARD PLAN SS403-A, SHEET 3.
2. INSTALL HOUSE PLUMBING PER UNIFORM PLUMBING CODES, SECTION 1106.
3. ON EXISTING SEWER MAIN, INSTALL APPROVED STANDARD SADDLE. USE SEWER TAPPING MACHINE OR APPROVED EQUAL. A PLAIN END SECTION OF MAIN WITH PRE-MOLDED "Y" AND COUDER COUPLINGS MAY BE USED.
4. WHEN COVER OVER LATERAL IS 3.5' (IN PAVED STREET SECTION) A P.C.C. CAP (4" THICK) IS REQUIRED FOR TRENCH WIDTH + 6" EACH SIDE OF TRENCH ON MAINS AND LATERALS.
5. INSTALL A PREFORMED "Y" OR MANHOLE IF THE SERVICE LATERAL IS LARGER THAN 1/2" I.D. OF THE MAIN SEWER I.D.
6. NO SERVICE LATERAL PERMITTED WITHIN DRIVEWAY APRON AND FIRE LANE.
7. NO SERVICE LATERAL PERMITTED WITHIN 5-FEET OF MANHOLE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SERVICE LATERAL

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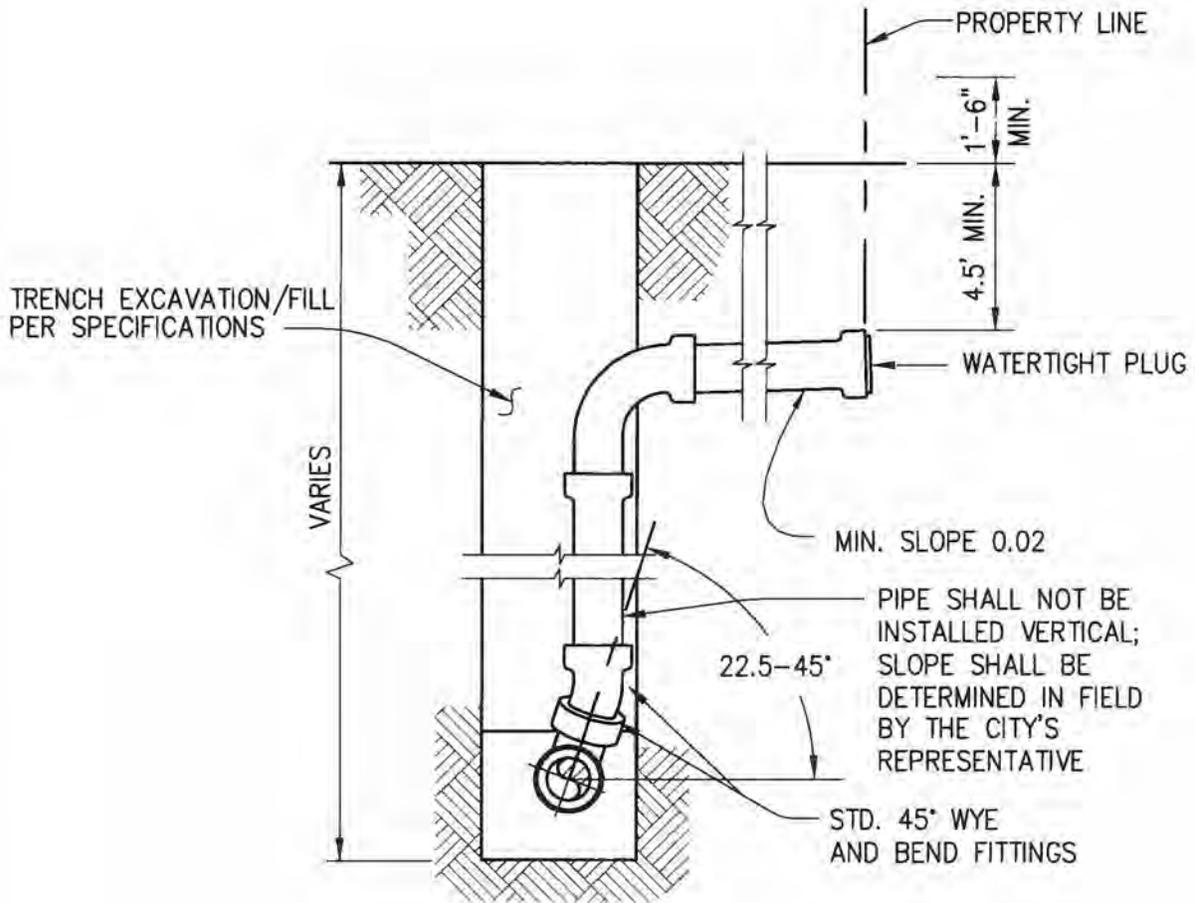
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2-2-09
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SHEET 2 OF 3

LATERAL



SECTION

NTS

NOTES:

1. PIPE SHALL BE HIGH STRENGTH VCP OR PVC SEWER PIPE.
2. CONTRACTOR SHALL MARK A 2" HIGH "S" ON THE CURB FACE AT ALL SEWER LATERALS.
3. DEPENDING ON THE SLOPE OF THE LATERAL, THE CITY REPRESENTATIVE MAY REQUIRE CONCRETE ENCASEMENT.
4. ON EXISTING SEWER MAIN, INSTALL APPROVED STANDARD SADDLE (CUT IN WYE, STANDARD SADDLE, INSERT A TEE). USE SEWER TAPPING MACHINE OR APPROVED EQUAL. A PLAIN END SECTION OF MAIN WITH PRE-MOLDED "Y" AND COUDER COUPLINGS MAY BE USED.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SERVICE LATERAL

203

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Clifford G. Finley
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SHEET 3 OF 3

1 GENERAL SEWER SYSTEM DESIGN GOALS AND ACCEPTABLE PROCEDURES

1-1 GENERAL REQUIREMENTS:

The design and construction of sanitary sewers in the City of Santa Paula shall be in accordance with good engineering practice. The work shall comply with these design goals except where specific modifications have been approved by the Public Works Director in writing. The Director shall decide all questions of interpretation of "Good Engineering Practice". All work on sewers and sewer services outside the City right-of-way or sewer easements will be governed by the provisions of the Uniform Plumbing Codes. Where City requirements and standards are more restrictive than U.P.C., the City requirements shall govern.

1-2 VELOCITY:

The velocity of flow (average over the wetted cross section) for sanitary sewers flowing part-full of full should be between 2.00 f.p.s. and 10.00 f.p.s. The most commonly used formula for velocity and flow computation is Manning's, which is:

$$V = [1.486 R^{2/3} S^{1/2}] / n \dots \dots \text{in f.p.s.}$$

Where n is roughness coefficient (See section

R is hydraulic radius = A / P

S is energy gradient. In open channels, for uniform flow condition it is equal to invert slope.

$$Q = A \times V \dots \dots \dots \text{in c.f.s.}$$

Where V is average velocity in f.p.s.

A is wetted cross-sectional area in square feet

Also, $Q \text{ (g.p.m.)} = Q \text{ (c.f.s.)} \times 448.83$

1-3 FLOW DEPTH:

a. For pipe 10" and less in diameter:

Design pipe size so that peak flow rate will be carried when the pipe is flowing at about one-half (1/2) depth. Discharge at one-half depth equals one-half discharge when flowing full, however, velocity at one-half depth equals velocity when flowing full.

b. For pipe 12" and larger in diameter:

Design pipe size so that peak flow rate will be carried when the pipe is flowing at about two-third (2/3) depth. Discharge at two-third (2/3) depth equals ? discharge when flowing full. In no case gravity sewer lines will be designed to flow full or pressurize the system.

1-4 MINIMUM STREET SEWER SIZE:

Minimum street sewer size shall be 8", except that 6" pipe may be used where all of the following conditions are met:

- a. The minimum invert slope shall be 0.008 or greater.
- b. The length shall not exceed 200' with no possibility of future extension.
- c. No more than ten (10) house laterals contribute to the sewer line.
- d. Minimum cover of the line shall be 5.0 feet.

1-5 MINIMUM INVERT GRADE:

Slope of sewer invert shall equal or exceed those set forth in the following table. For case of checking maximum flow capacity at these minimum slope is given for V.C.P. (n = 0.013) and P.V.C. (n = 0.011) in c.f.s. and g.p.m.

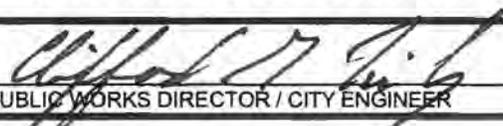
	CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT	STANDARD PLAN
	SEWER DESIGN STANDARDS	
	APPROVED BY:  PUBLIC WORKS DIRECTOR / CITY ENGINEER	2-2-09 DATE
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TABLE 11-1

PIPE DIAMETER	MINIMUM SEWER INVERT SLOPE	MAXIMUM FLOW CAPACITY IN C.F.S. (G.P.M)	
		V.C.P.	P.V.C.
6"	0.0060	0.218 (97.7)	0.257 (115.5)
8"	0.0040	0.383 (171.8)	0.452 (203.0)
10"	0.0028	0.581 (260.6)	0.686 (308.0)
12"	0.0020	1.250 (561.0)	1.477 (663.0)
14"	0.0020	1.885 (846.2)	2.228 (1,000.0)
15"	0.0016	2.027 (909.8)	2.396 (1,075.2)
16"	0.0016	2.408 (1,080.6)	2.845 (1,277.0)
18"	0.0012	3.296 (1,479.4)	3.895 (1,748.4)
20"	0.0012	3.781 (1,696.8)	4.468 (2,005.3)
21"	0.0012	4.306 (1,932.6)	5.089 (2,284.0)
24"	0.0012	6.148 (2,759.2)	7.265 (3,260.9)
27"	0.0012	8.416 (3,777.4)	9.946 (4,464.1)
30"	0.0012	11.15 (5,002.7)	13.17 (5,912.3)
33"	0.0012	14.37 (6,450.4)	16.98 (7,623.2)
36"	0.0012	18.12 (8,135.0)	21.42 (9,614.0)

The flow values given in above table shall be used as limiting values for given pipe size and given minimum invert slope. Substandard slopes below the minimum slopes listed in above table may be used in order to avoid pumping only upon the special approval of the Public Works Director. Such approval should be solicited well in advance of completion of the final project design.

2-1 SEWER CONNECTION PERMIT:

No person shall connect any sewer line on private property, within or outside the City limits, to the City's Sewer System without first procuring a permit from the City of Santa Paula to make such connection. Any person desiring to obtain such a permit shall submit to the City Public Works Department the following:

- a. Completed application
- b. Accurate estimate of quantity and quality of sewage flow to be discharged in the City's Sewer System.
- c. Variation in sewage discharges on a daily basis and seasonal basis.
- d. Sewer connection fees as determined based on above facts.

2-2 ENCROACHMENT PERMIT:

City of Santa Paula requires all persons to obtain an encroachment permit for all works within Public right-of-way. Upon request by the contractor, the Public Works Department will issue the permit without charge on City project contracts. For privately funded projects, payment of encroachment permit fee will be required.

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	PUBLIC WORKS DIRECTOR / CITY ENGINEER	

2-3 PLANS AND CONSTRUCTION:

Plans are required for the construction of main line sewers and service laterals. They shall conform to the City's Public Works Department's requirements. All design calculations and field information pertaining to tie-in point shall be submitted for review and approval. All construction shall conform to the plans unless a change is approved in writing by the Public Works Director and noted on revision block. All sewers shall be videotaped in VHS format and tapes to be delivered to the inspector at the time of taping.

2-4 CITY INSPECTION:

All new construction shall be subject to inspection by the City Public Works inspectors. All development projects are required to pay for such inspection as required by the City.

2-5 OVER SIZING AND EXTRA DEPTH:

Over sizing and extra depth of certain tract sewers may be required where such sewers can logically serve upstream tributary area in future.

3 SEWER LOCATION

3-1 STREETS AND ROADWAYS:

Street sewer main shall be 5 feet north or west of and parallel to the centerline of undivided street. In divided roadways, it shall be 10 feet north or west of and parallel to the centerline of the roadway. Exception to these location requirements may be made only on approval of the Public Works Director.

Sewer mains in public alleys shall be north or west of and parallel to centerline of the alleys. In hillside development conceptual layout of sewer mains and service laterals shall be reviewed and approved by the Public Works Director.

3-2 EASEMENTS:

Sewer easements shall be not less than 12 feet wide for 5' deep sewer line. The easement width shall be increased by one foot increment for every additional one foot depth. (i.e. for 10' deep sewer main, the easement width shall be 17' minimum).

Where easements follow common lot lines, the full easement width shall be on one lot, in such a manner that access to manholes will not be obstructed by walls, trees, or any permanent improvements. Where this requirement can not be met without interfering with existing buildings, easements may straddle lot lines.

Deeds for easements shall provide for restrictions of permanent construction within easement to provide ingress and egress for the maintenance of the sewer system.

Where easements follow common lot lines, the full easement width shall be on one lot, in such a manner that access to manholes will not be obstructed by walls, trees, or any permanent improvements. Where this requirement can not be met without interfering with existing buildings, easements may straddle lot lines.

Deeds for easements shall provide for restrictions of permanent construction within easement to provide ingress and egress for the maintenance of the sewer system.

3-3 FUTURE EXTENSIONS:

When an area outside the tract can be logically served by future extension of a tract sewer, then the tract sewer shall extend to the tract boundary or to the end of paved street or alley in a manner to facilitate the future extension without removing permanent facilities.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SEWER DESIGN STANDARDS

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SHEET 3 OF 7

4 ALIGNMENT

4-1 Sewer mains shall be laid on a straight alignment and grade between manholes.

4-2 Minimum horizontal radius of curvature is as follows:

P.V.C.	or V.C.P.	.....	.....	6" through 12"	.....	.....	200 feet
P.V.C.	or V.C.P.	.....	.....	15" through 24"	.....	.....	300 feet
P.V.C.	or V.C.P.	.....	.....	27" through 36"	.....	.....	400 feet
P.V.C.	or V.C.P.	.....	.....	39" through 42"	.....	.....	600 feet

Minimum grade of horizontally curved sewer shall be at least same as straight sewers and preferably higher. Reverse curves are not permitted between manholes. All curved lines to be inspected by closed circuit television camera before acceptance by the City at Contractor's expense.

4-3 Vertical curves may be used in combination with horizontal curves where invert slopes exceed 1.00% throughout the reach between the manholes.

4-4 The arithmetic sum of all horizontal and vertical deflection in curved sewers between two adjacent manholes shall not exceed 60 ".

4-5 WATER - SEWER SEPARATION:

State of California, Department of Health requirements shall be met for water - sewer separation.

5 DEPTH OF SEWERS

5-1 BASIC REQUIREMENT:

Sewers shall be installed at a depth which will provide suitable service to the properties connected and will allow subsequent installation of water lines in accordance with the Water - Sewer Separation requirements with a minimum of special construction of water lines other than joint spacing.

5-2 STANDARD DEPTHS:

Compliance with above requirement will usually assured if the main sewer is located at a depth of 7 feet to the top of pipe below the flow line of the existing or proposed gutter, or where no gutter exists, from the elevation of the outermost edge of the traveled way, and the house laterals are located either:

- a. 6' to top of pipe below the ground surface at the property line, or
- b. at a depth below the ground surface at the property line that will provide for the construction of a straight run of private sewers at a slope of 0.020 from one foot below the surface at any point within the established building setback line, excluding any areas steeper than 5 horizontally to one vertically, whichever depth is greater.

5-3 EXCEPTIONS:

Designs not in accordance with above section shall be submitted to the City Engineer for approval together with evidence that it complies with the requirements of section 15-1.

6 STRUCTURES

6-1 MANHOLES:

- a. Manholes shall be located at all abrupt changes in alignment or grade and at junctions of sewer mains.
- b. Manholes shall be located at least every 350 feet along lines smaller than 12" in diameter. Spacing of manholes on lines 15" in diameter and larger will usually be at 400 feet but may be extended subject to the approval of the City Engineer.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

SEWER DESIGN STANDARDS

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SHEET 4 OF 7

c. The center of upper most (last) manhole for sewers on "through" streets shall be a minimum of 8 feet upstream from the sewer lateral of the last lot served (laterals to be perpendicular to sewer main). Manholes at the end of cul-de-sac streets shall end (depending on available space) 10' to 15' before the curb face at the end of the street.

6-2 DROP MANHOLES:

Drop manholes shall be used whenever sewers enter manholes at more than 32 inches above the outlet elevation of the manhole. Vertical curves may be used to eliminate drop manholes in accordance with the requirements of section 14.

6-3 PROTECTION:

Where new tract sewers are to be connected into a manhole which is in active use, the designer shall call for such protection as is necessary to prevent construction debris from being washed into the active sewers. Plugged inlets or other suitable protection shall be called for in the active manhole before beginning manhole modifications or tract sewer cleaning.

6-4 RIM ELEVATIONS:

In paved areas, the manhole rim elevation shall match the finished grade. In other than paved areas or traveled ways, the height of the manhole rim will normally be 18" above the finished grade, high water mark, or above the top of future fill areas. In areas where the top of the manhole will need to be below the surface, such as fields that are being farmed, a water tight frame and cover will be required. The elevations shown for the tops of manholes on the design plans shall not relieve the contractor from making final adjustments to match street surfaces.

6-5 CLEANOUTS:

Dead end sewers not over 200 feet in length shall terminate in standard manholes or cleanouts. Dead ends over 200 feet long shall terminate in standard manholes unless future extension of said dead end will include a manhole within 350 feet of the upper most manhole, in which case a temporary cleanout is permitted. Where dead ends are on a slope of 0.01 or greater, the length for use of a cleanout may be extended to 275 feet.

End structures shall be located five (5) feet upstream from the down grade lot line of the last lot served unless greater length is necessary to serve the property. Cleanouts at the end of cul-de-sac streets shall end 10' to 15' (depending on available space) before the curb face at the end of the street.

6-6 SERVICE LATERALS:

Wherever it is known or can be reasonably assumed that a building sewer connection is required, a service lateral shall be shown on the plans and installed a minimum of 5' inside the property line as a part of the street sewer construction, prior to paving. Service laterals shall be installed whenever possible during construction of the sewer main using prefabricated fittings. All laterals shall be perpendicular to the sewer main, with the exception in cul-de-sac area and knuckle area. Sewer laterals shall not be located within driveways.

Service laterals for single dwellings and small single stores or offices shall be 4" or larger provided the plumbing code does not require the building sewer to be larger than 4". All other service laterals shall be 6" or larger and at least equal to the size of the building sewer.

Service laterals shall be at the minimum depths herein provided and in addition such depth shall be sufficient to provide a connection to any point on the lot within the established building setback lines (excluding any area steeper than 5 horizontally to one vertically) with a cover of one foot and a slope of not less than 0.020. Any exception to this requirement may be made only upon approval by the Public Works Director.

Unused openings shall be tightly sealed and supported in a manner to facilitate their future location and use. Developer's engineer shall select appropriate service lateral locations and shall instruct contractor to locate laterals according to the design elevations and locations.

Each individual dwelling unit on a property shall have a dedicated sewer service. For a duplex or triplex, each unit will have a dedicated service to the sewer main line in the street. For a fourplex or larger development, the developer shall extend the City's sewer collection system onto the property and install manholes or cleanouts as directed by the City Engineer. Individual unit laterals will connect to the new sewer main. The onsite sewer main shall be located within an easement as directed by the City Engineer.



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SEWER DESIGN STANDARDS

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SHEET 5 OF 7

Sewer main shall be designed and constructed to preclude the back flow of sewage into laterals except when this is economically not feasible. Back flow of sewage into laterals may occur in any building that has waste receiving inlets, which are lower than the rim elevation of the next upstream manhole or other structure providing hydraulic relief. While the Plumbing Code provides for the customer to install check valves under certain conditions, the conditions stated do not cover all possibilities of back flow and check valves frequently fail to operate properly. Causes of sewer stoppage include: the introduction of foreign objects into manholes, the buildup of grease in the sewer crown at locations where hydraulic jumps occur, high flow rates due to ground or surface water entering the sewer, difficulties while balling sewers, and undersized sewers.

6-7 CONNECTION TO CESSPOOLS OR SEPTIC TANKS:

A person shall not connect or cause to be connected any cesspool seepage pit or septic tank to any main line sewer or to any service lateral leading thereto. Any home owner who has problem with existing cesspool or septic tank and desire to connect to the City sewer main may do so if there is existing sewer main in the vicinity. He shall abandon existing cesspool or septic tank in accordance with the requirements of Ventura County Public Health Department. Connection to sewer service requires connection charge and monthly service charge over and above the connection and plumbing cost.

6-8 CURB MARKINGS:

The location of all sewer service laterals shall be marked on the curb face at the completion of curb or curb and gutter construction. Sewer service laterals shall be marked by engraving "S" about 3" high and about 1/8" deep groove in to the fresh concrete.

6-9 LATERAL ABANDONMENT:

An inspection fee, of the amount approved by City Council, shall be collected and a written permit shall be issued. A public works inspector shall inspect the exposed sewer lateral to see that it has been plugged or capped to insure that any future infiltration is eliminated. The inspector shall determine whether the on-site lateral shall remain intact or be crushed in place or removed.

7 STRUCTURAL REQUIREMENTS

7-1 ROADS:

All structures and pipe placed under public roads shall be of sufficient strength to support with (an adequate factor of safety) the backfill, road surfacing and H-20 truck loading with anticipated impact loads.

7-2 OTHER PIPES AND STRUCTURES:

Sewers under other pipes and structures shall be protected from damage and shall be constructed so as not to endanger the other pipe or structure. Minimum clearance between outside of pipes or between pipes and other structures is 6" unless approved by the Public Works Director.

7-3 FLEXIBLE JOINTS:

Flexible joints which will allow for differential settlements or other movement of sewer of pipe, sewer pipe, sewer structures, adjacent pipe and adjacent structures shall be provided where sewer lines enter encasements, manholes or other structures. Flexible joints shall be within 4 feet of such structures.

7-4 STEEP GRADES:

Sewers laid on grades steeper than 10%, which are not under pavements, shall be anchored in place and protected from erosion in a manner approved by the Public Works Director.

8 FORCE MAINS AND LIFT STATIONS

8-1 REQUIREMENTS:

All sewage shall reach the system by gravity flow, in a fresh condition susceptible to conventional sewage treatment processes. Where extreme hardship conditions prevail, and a substantial area cannot be sewered by gravity sewers in accordance with these requirements, a sewage pumping station may be installed. No pumping facilities shall be incorporated in sewer plans without prior approval of Public Works Director.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SEWER DESIGN STANDARDS

204

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09

DATE

SHEET 6 OF 7

8-2

LIFT STATION DESIGN:

Lift stations, where allowed, shall be of the dry-pit type incorporating the following features:

- a. Pumps or other devices shall be provided in duplicate, arranged for positive priming.
- b. Capacity shall be provided to handle ultimate peak flow from the tributary area with largest pump out of service. Stage installation of pumps is allowed provided necessary space is provided for future installations.
- c. Access shall be provided to site for removal and repair of equipment.
- d. A means for dewatering force mains shall be provided.
- e. An overflow to natural channel or storm drain shall be provided or an alternate method of protection approved by the Public Works Director.
- f. The lift station not in City road right-of-way except with permission from the Engineer.

8-3

FORCE MAIN DESIGN:

Force mains need not comply with the requirements for gravity sewers. Design to be approved by city engineer.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SEWER DESIGN STANDARDS

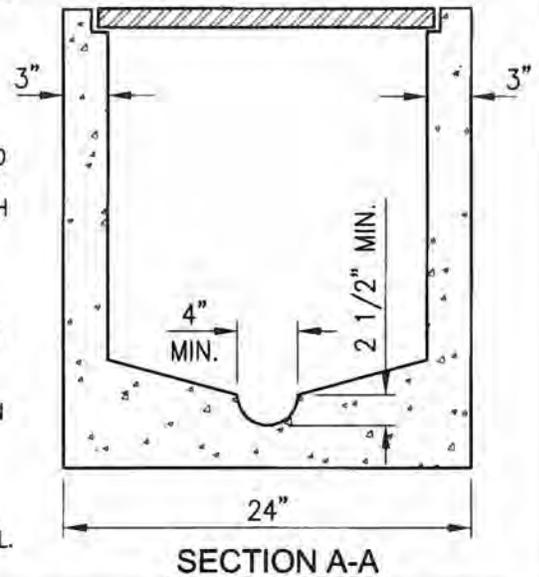
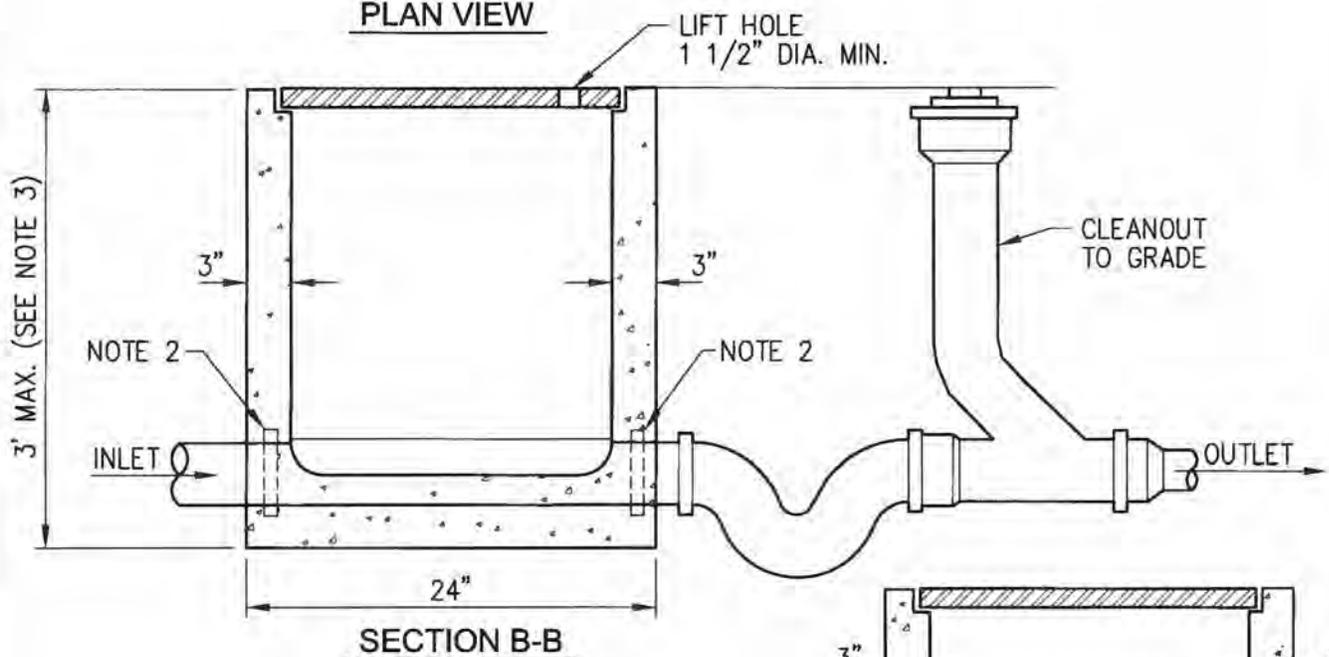
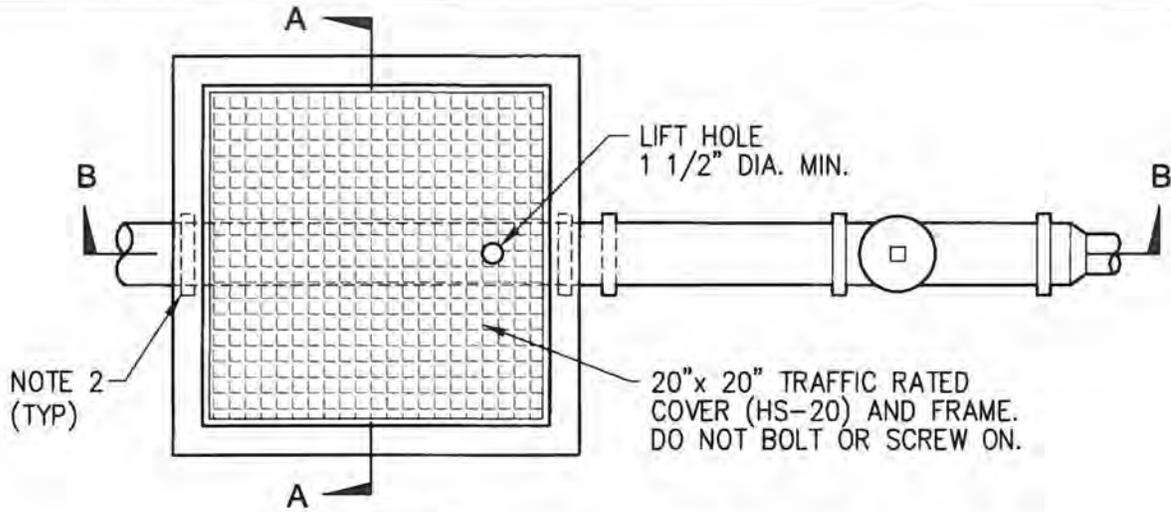
204

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Clifford G. Finley
 PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09
 DATE

SHEET 7 OF 7



NOTES:

1. APPROVAL FOR THE LOCATION OF THE SAMPLING WELL SHALL BE OBTAINED FROM THE PUBLIC WORKS DEPT PRIOR TO INSTALLATION. WHEN INSTALLING THE SAMPLE WELL, BE SURE THAT THE INVERT OF THE WELL IS LEVEL WITH THE INVERT OF THE INLET AND OUTLET PIPES. ELEVATE THE SIDEWALLS ABOVE THE SURROUNDING GROUND SURFACE TO EXCLUDE STORM WATER AND/OR SURFACE WATER RUNOFF.
2. PLASTIC PIPE WILL REQUIRE A TIGHT FITTING RUBBER RING (WALL FLANGE) AT THE MIDPOINT WHERE IT PASSES THROUGH THE CONCRETE.
3. PRECAST CONCRETE MANHOLE PER CITY STD. PLAN 201 IS REQUIRED WHEN DEPTH IS GREATER THAN THREE FEET.
4. FINAL INSPECTION BY PUBLIC WORKS AND BUILDING AND SAFETY DEPTS.
5. INTERIOR COATING TO BE T-LOCK AND SPARK TESTED PRIOR TO APPROVAL.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SAMPLING WELL

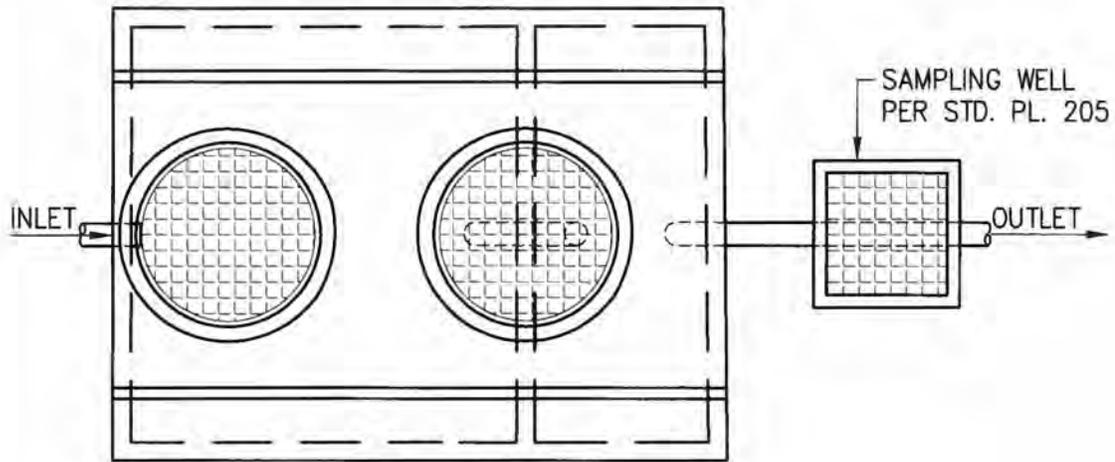
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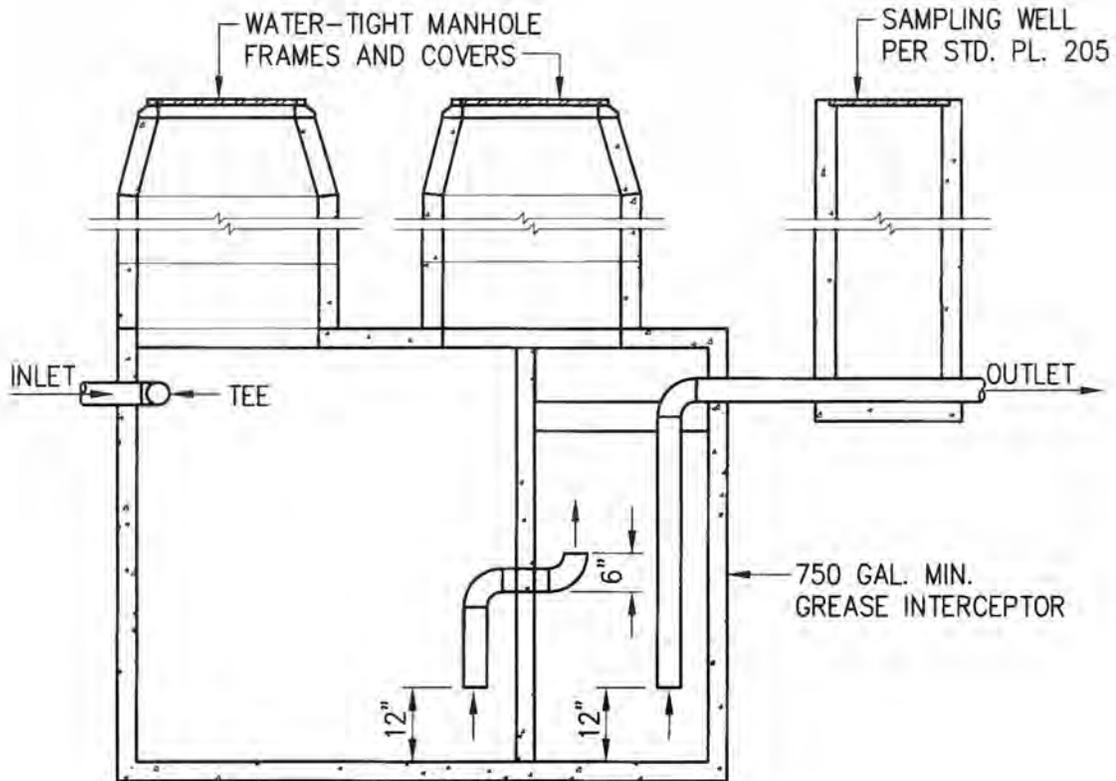
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2-2-09
DATE

SHEET 1 OF 1



PLAN VIEW



LONGITUDINAL SECTION

NOTE:
PROTECTIVE COATING PER STD. PLAN 205



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

GREASE INTERCEPTOR

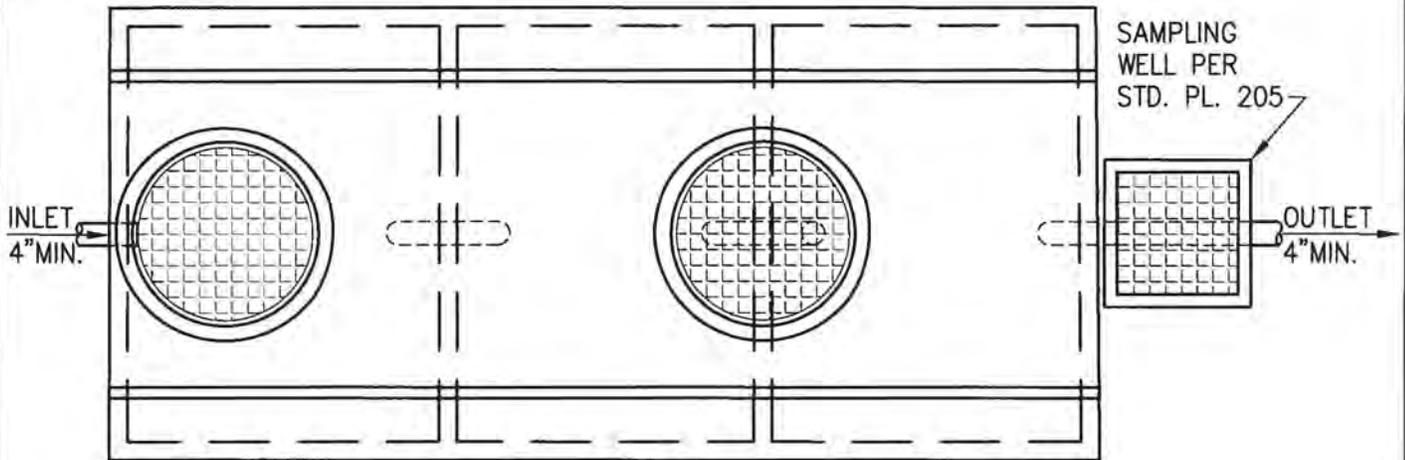
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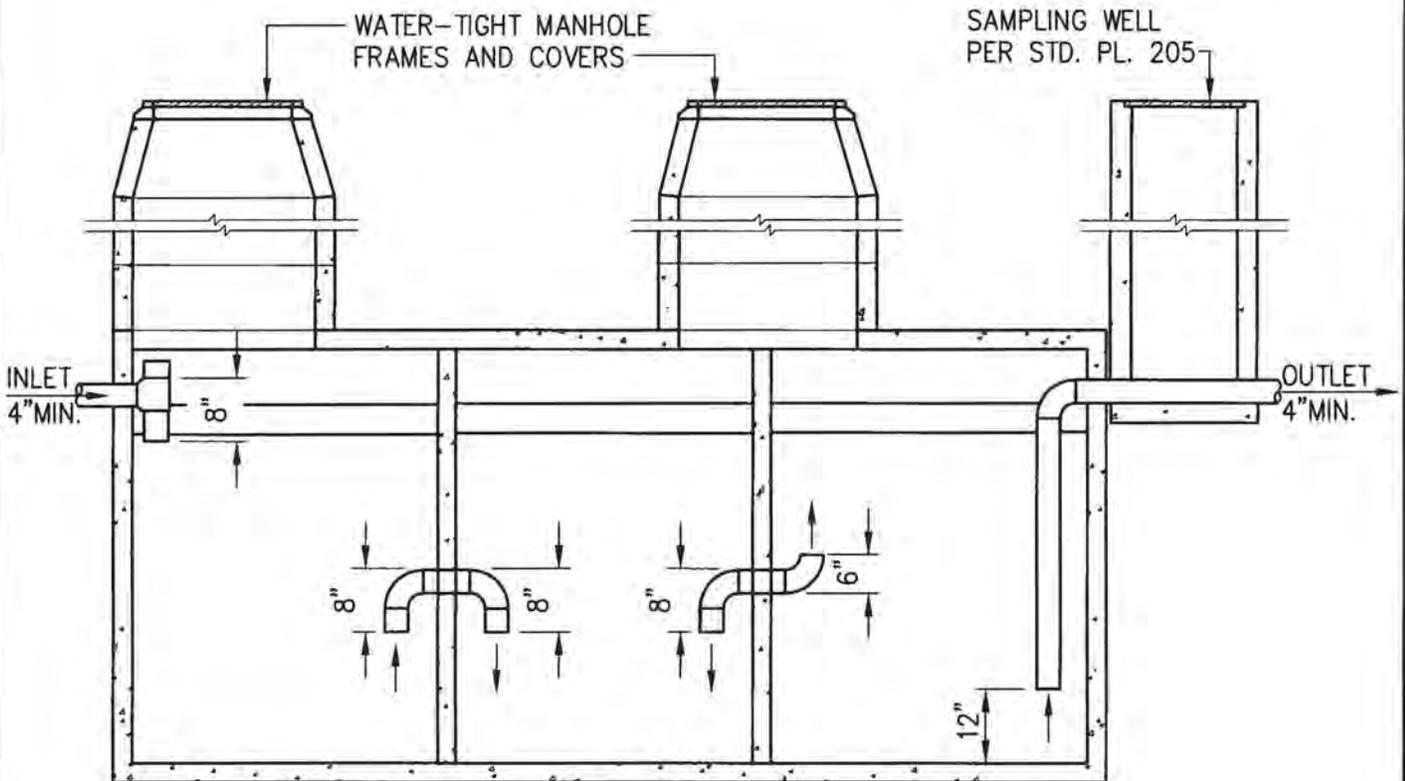
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2-2-09
DATE

SHEET 1 OF 1



PLAN VIEW



LONGITUDINAL SECTION

NOTE:

PROTECTIVE COATING PER STD. PLAN 205



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

GRAVITY SEPARATOR DEVICE

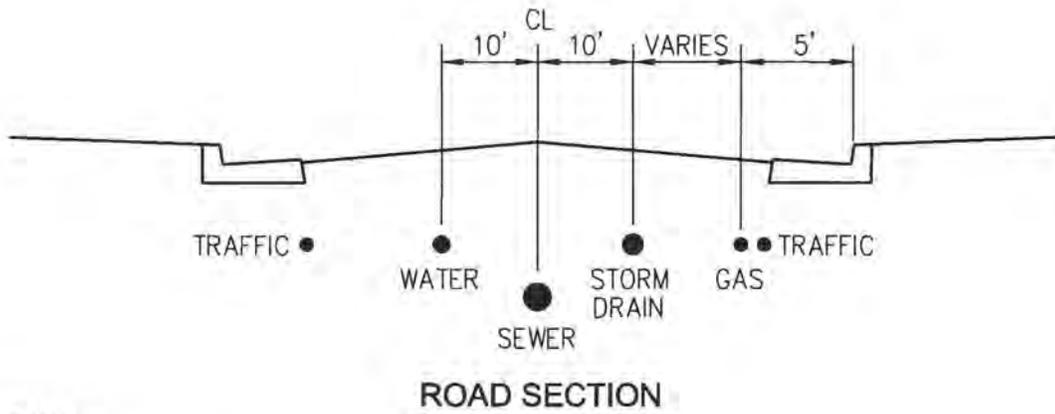
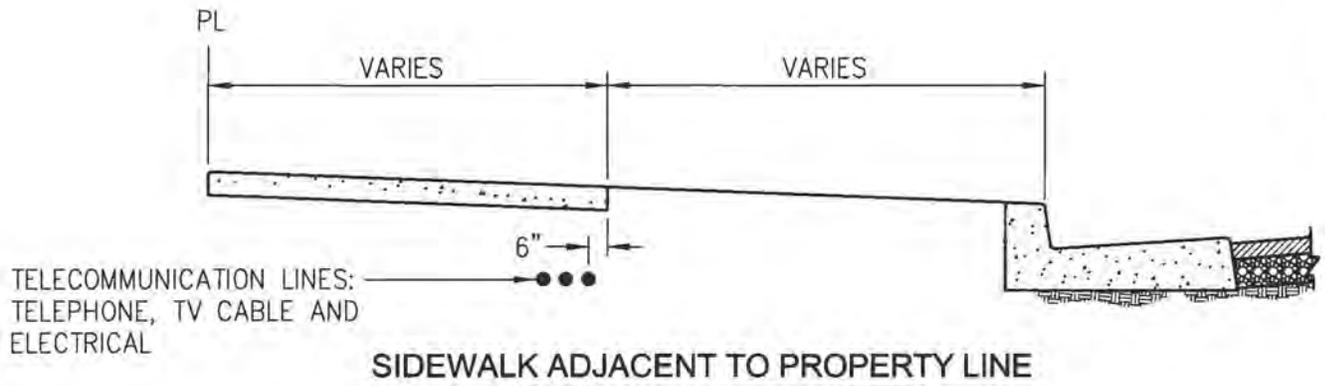
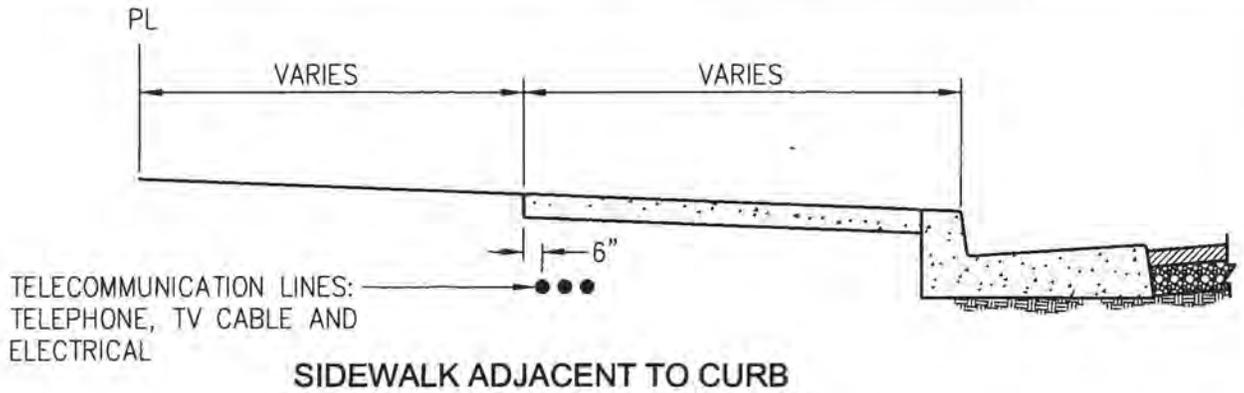
207

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2-2-09
DATE

SHEET 1 OF 1



NOTES:

1. DO NOT INSTALL UTILITIES UNDER MEDIANS UNLESS APPROVED BY THE CITY ENGINEER.
2. ALL UTILITIES TO HAVE A MINIMUM OF 30" COVER IN THE STREET AND A MINIMUM OF 18" COVER UNDER THE SIDEWALK. TRAFFIC SIGNAL CONDUITS TO HAVE A MINIMUM OF 24" COVER IN THE STREET AND A MINIMUM OF 18" COVER UNDER THE SIDEWALK.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

TYPICAL UNDERGROUND UTILITY LOCATIONS

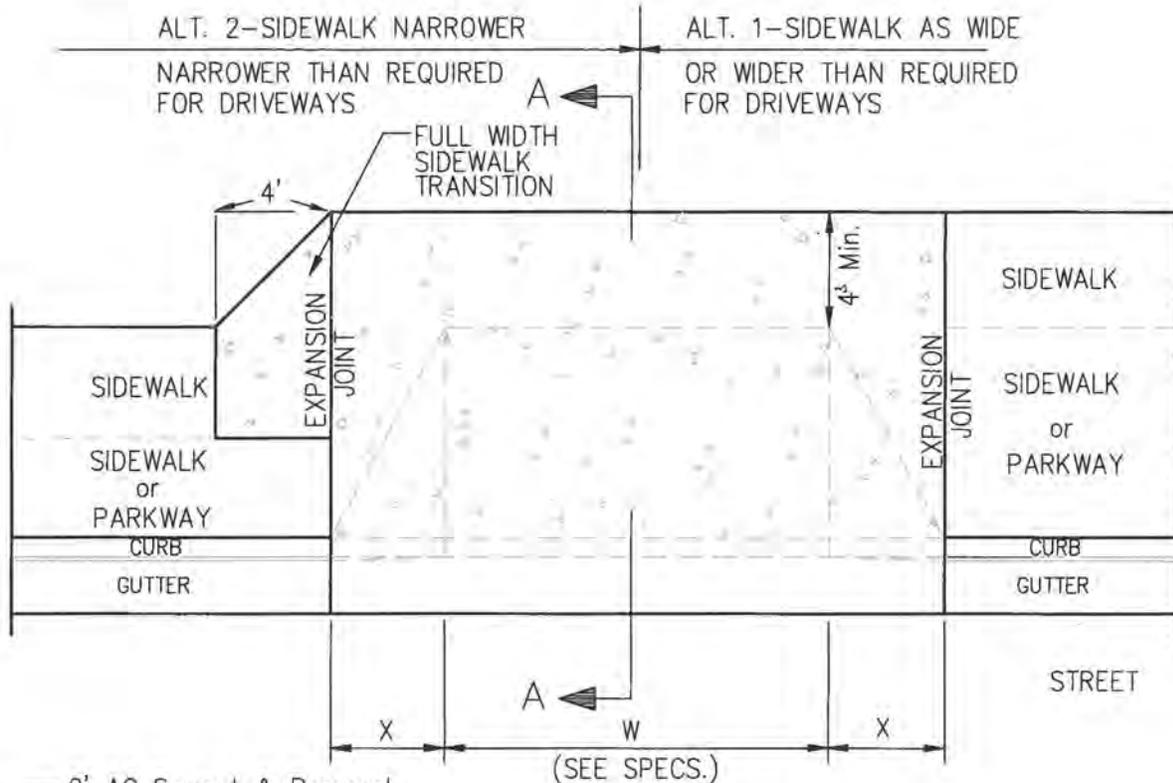
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2-2-09
DATE

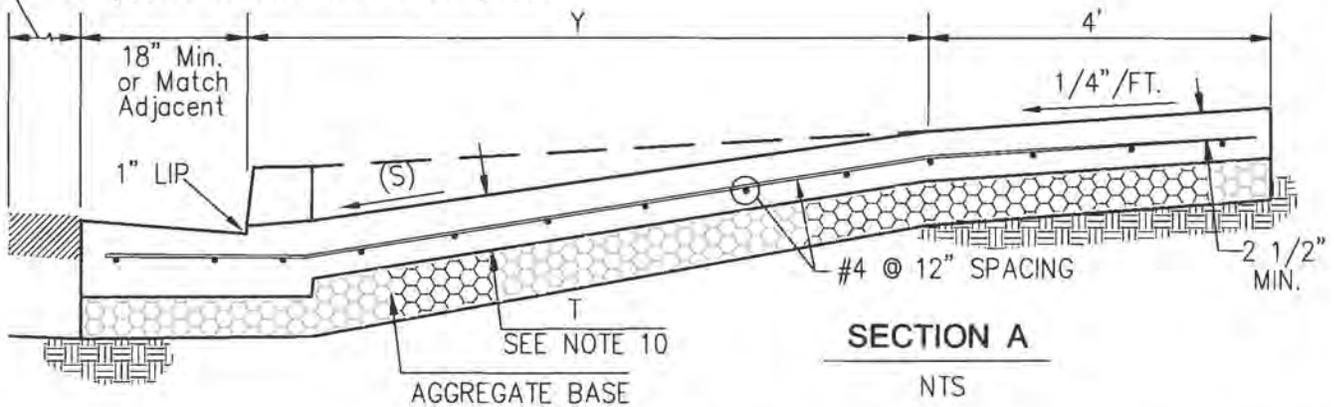
SHEET 1 OF 1



2' AC Sawcut & Removal
Slot Pave with 3/8" AR 8000
Hot Mix Asphalt Paving to a
depth of 4" over 6" Aggregate Base,
Compacted to 95% Relative Compaction

PLAN VIEW

NTS



SECTION A

NTS

Reinforcing steel to be set on top
of approved concrete blocks, (dobies).

TABLE OF X & Y DIMENSIONS AND SLOPE (S)

CURB FACE*	6"	8"
X	3'-0"	4'-0"
Y (MIN.)	5'-0"	7'-0"
SLOPE (S)	10.42%	9.83%

* WHERE CURB FACE HEIGHT IS MORE THAN 8", VALUES
FOR X & Y SHALL BE AS APPROVED BY CITY ENGINEER.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CONCRETE DRIVEWAY APRON

401

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09
DATE

SHEET 1 OF 2

1. CONSTRUCTION OF CONCRETE DRIVEWAY APRONS ARE AN ENCROACHMENT INTO THE PUBLIC RIGHT-OF-WAY. THE PROPERTY OWNER IS FULLY RESPONSIBLE FOR ITS MAINTENANCE. THE OWNER CONSENTS TO USE OF THE APRON AND SIDEWALK TRANSITION BY THE PUBLIC FOR PEDESTRIAN TRAVEL.
2. DEPRESSED CURB & GUTTER SHALL BE CONSTRUCTED MONOLITHIC WITH DRIVEWAY.
3. THE EXISTING SIDEWALK, CURB AND GUTTER SHALL BE SAWCUT ALONG EXISTING SCORE LINES, OR AS APPROVED BY CITY REPRESENTATIVE.
4. DRIVEWAY APRON MUST BE MINIMUM OF 5' FROM UTILITY POLE, FIRE HYDRANT OR BEGINNING OF CURB RETURN MEASURED FROM TOP OF "X". ALSO, THE DRIVEWAY MUST BE MINIMUM OF 3' FROM PROPERTY LINE, OR 4' FROM PROPERTY LINE IF A SIDEWALK TRANSITION IS REQUIRED. ANY DEVIATION SHALL BE APPROVED BY THE CITY ENGINEER.
5. LIMITS OF DRIVEWAY WIDTH SHALL BE AS FOLLOWS:
 RESIDENTIAL DRIVEWAYS: W=10' MIN., W=20' MAX.
 COMMERCIAL DRIVEWAYS: W=16' MIN., W=36' MAX.
 DRIVEWAYS IN EXCESS OF 36' WIDE SHALL BE APPROVED BY THE CITY ENGINEER.
 A) THE SUM OF ALL DRIVEWAYS IS LIMITED TO 40% OF THE TOTAL LOT FRONTAGE.
 B) THE DISTANCE BETWEEN TOPS OFF DRIVEWAY WARPED SECTION OF ADJACENT DRIVEWAYS SHALL BE: A) 22 FEET ON THE SAME PROPERTY, OR B) 1 FOOT ON ADJACENT PROPERTIES.
 AT LEAST ONE 25' DRIVEWAY IS ALLOWED FOR EACH LOT.
6. WHERE THE ROAD GRADE EXCEEDS 5% AND THERE IS NO SIDEWALK ADJACENT TO THE CURB, A DEFLECTOR CURB SHALL BE INSTALLED ON THE DOWNSLOPE SIDE OF EACH DRIVEWAY. THE DEFLECTOR CURB SHALL BE PER STD. PLAN 405.
7. ALL CONCRETE SHALL BE 560-C-3250 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
8. 4" OF MECHANICALLY COMPACTED SELECT NATURAL BASE IS REQUIRED UNDER SIDEWALK WHERE THE SOILS EXPANSION IS 5% OR GREATER.
9. WHERE SIDEWALK WIDTH IS LESS THAN THAT REQUIRED FOR DRIVEWAY, SIDEWALK TRANSITIONS SHALL BE PER ALTERNATIVE 2. IF THE REQUIRED APRON EXTENDS INTO PRIVATE PROPERTY,
10. THICKNESS:
 FOR RESIDENTIAL DRIVEWAYS T= 6" PORTLAND CEMENT CONCRETE ON 4" CRUSHED AGGREGATE BASE OR SAND.
 FOR COMMERCIAL DRIVEWAYS T= 8" PORTLAND CEMENT CONCRETE ON 6" CRUSHED AGGREGATE BASE.
 THE CRUSHED AGGREGATE BASE SHALL CONFORM TO SECTION 202-2.4 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. ALL SUBGRADE MATERIAL SHALL BE COMPACTED TO "FIRM AND UNYIELDING."
11. NEW DRIVEWAYS SHALL CONFORM TO ALL CITY ORDINANCES. ANY REQUEST FOR MODIFICATION SHALL BE MADE IN WRITING TO THE CITY ENGINEER.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CONCRETE DRIVEWAY APRON

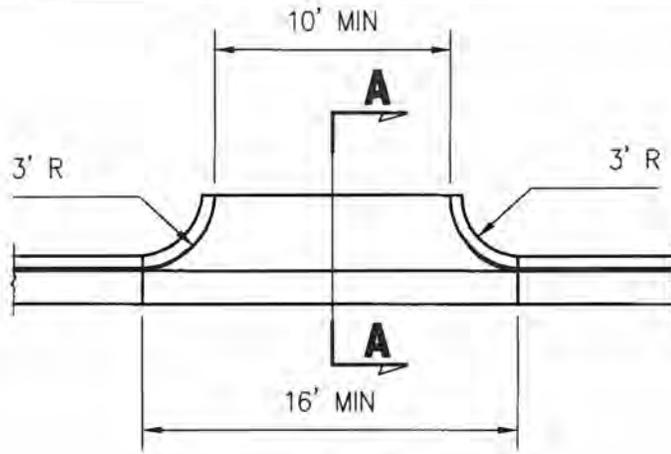
401

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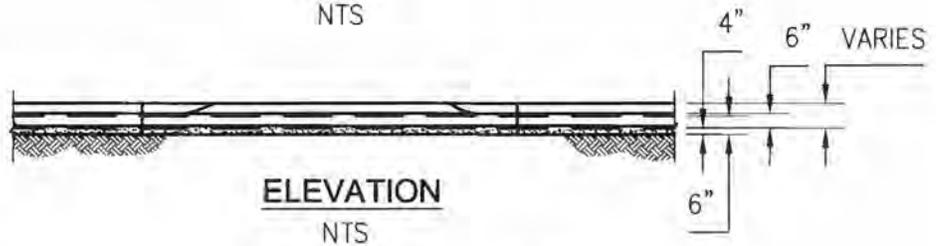
2-2-09
 DATE

SHEET 2 OF 2



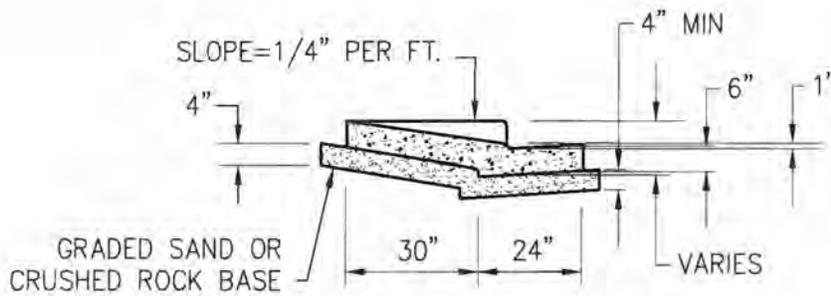
PLAN

NTS



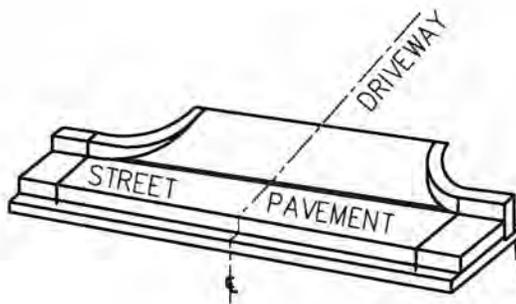
ELEVATION

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SECTION A-A

NTS



PERSPECTIVE VIEW

SEE PLATE (D-1)
FOR DETAILS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

**RESIDENTIAL DRIVEWAY
TYPE III**

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09
DATE

STANDARD PLAN

402

SHEET 1 OF 2

GENERAL NOTES:

1. WIDTH BETWEEN TOES OF RAMP SHALL NOT EXCEED 12 FT. FOR SINGLE, AND 23 FT. FOR DOUBLE DRIVE.
2. CONCRETE SHALL CONTAIN NOT LESS THAN 5 SACKS OF PORTLAND CEMENT PER CU. YD. STATE CLASS "B".
3. ANY REQUIREMENTS ARE SUBJECT TO THE ROAD COMMISSIONER'S APPROVAL & WILL BE PERMITTED ONLY IF LISTED AS SPECIFIC WAIVER IN THE ENCROACHMENT PERMIT.
4. IF EXISTING EXPANSION JOINT IS WITHIN 5 FT. OF NEW CONSTRUCTION, CURB & CUTTER SHALL BE REMOVED TO SUCH JOINT & REPLACES AS PART OF DRIVEWAY CONSTRUCTION.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

RESIDENTIAL DRIVEWAY
TYPE III

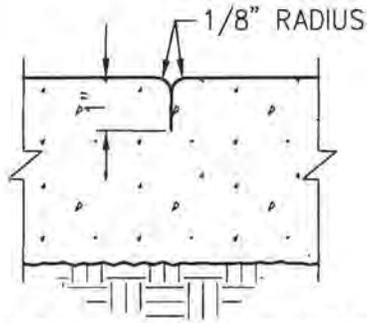
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APPROVED BY:

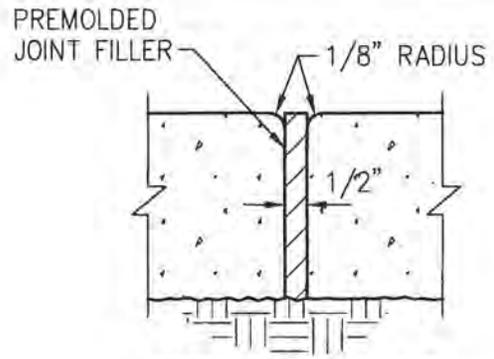
Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09
DATE

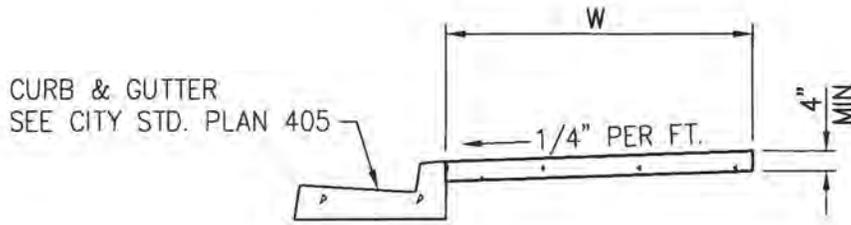
SHEET 2 OF 2



WEAKNED PLANE JOINT

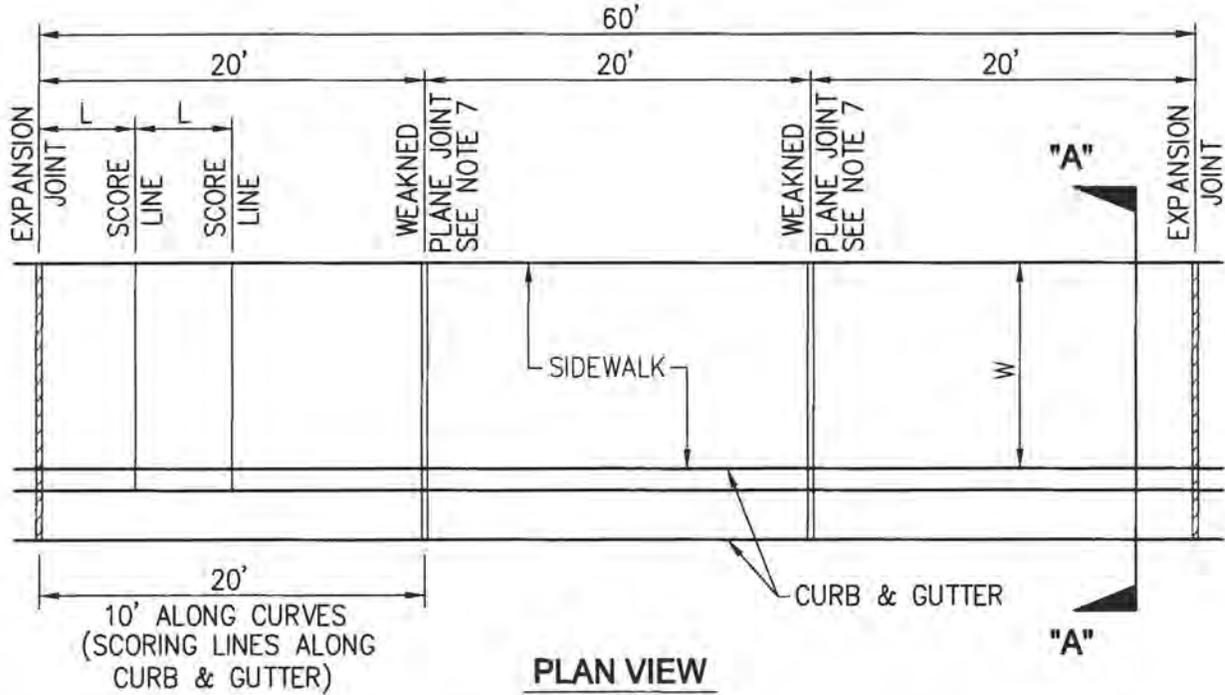


EXPANSION JOINT



SECTION "A"

SEE NOTES ON SHEET 2



PLAN VIEW



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SIDEWALK DETAILS

403

APPROVED BY:

Clifford G. Finley
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2-2-09
DATE

SHEET 1 OF 2

SCORE LINE SCHEDULE

W	L
4'	4'
5'	5'
6'	5'
8'	4'
10'	5'

WHEN "W" EXCEEDS 6', ADD ADDITIONAL SCORE LINE AT 1/2 "W".

NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION EXCEPT AS OTHERWISE NOTED. CLASS 560-C-3250 (MAX. 4 INCH SLUMP).
2. EXPANSION JOINTS SHALL BE 1/2" THICK AND PLACED AT THE B.C. AND E.C. OF ALL RETURNS, OUTER EDGES OF DRIVEWAYS (INCLUDING "X" DISTANCES) AND AT UNIFORM INTERVALS AS SHOWN FOR ALL CONCRETE FLAT WORK.
3. WEAKENED PLANE JOINTS, ONE INCH DEEP, SHALL BE CONSTRUCTED AT EQUAL SPACING BETWEEN EXPANSION JOINTS IN WALKS AND CURB AND GUTTERS.
4. SCORING LINES SHALL BE 3/8 INCH DEEP AND CONSTRUCTED IN CURBS AT THE SAME LOCATION OF THE WEAKENED PLANE JOINTS IN THE TOP OF CURB AND IN THE WALK AS SHOWN.
5. JOINTS IN THE CURB AND GUTTER SHALL ALIGN WITH THE CORRESPONDING JOINTS IN THE SIDEWALK.
6. LONGITUDINAL SCORING LINES WILL BE REQUIRED IN WALKS WIDER THAN 6 FEET.
7. WEAKENED PLANE JOINTS IN THE SIDEWALK SHALL BE CONSTRUCTED WITH DEEP GROOVING TOOL.
8. SIDEWALK SHALL BE PLACED ON 4" OF FILL WITH SAND EQUIVALENT OF 20 OR HIGHER AND COMPACTED TO 90% MINIMUM.
9. FOR THE INSTALLATION OF ABOVE AND BELOW GROUND UTILITIES IN NEW OR EXISTING SIDEWALKS, THE SIDEWALK SHALL BE CONSTRUCTED FULL WIDTH AND TO THE NEAREST COLD JOINT OR PERPENDICULAR SCORE MARK.
10. REPAIR ALL DAMAGED EXISTING SIDEWALK ADJACENT TO NEW SIDEWALK.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SIDEWALK DETAILS

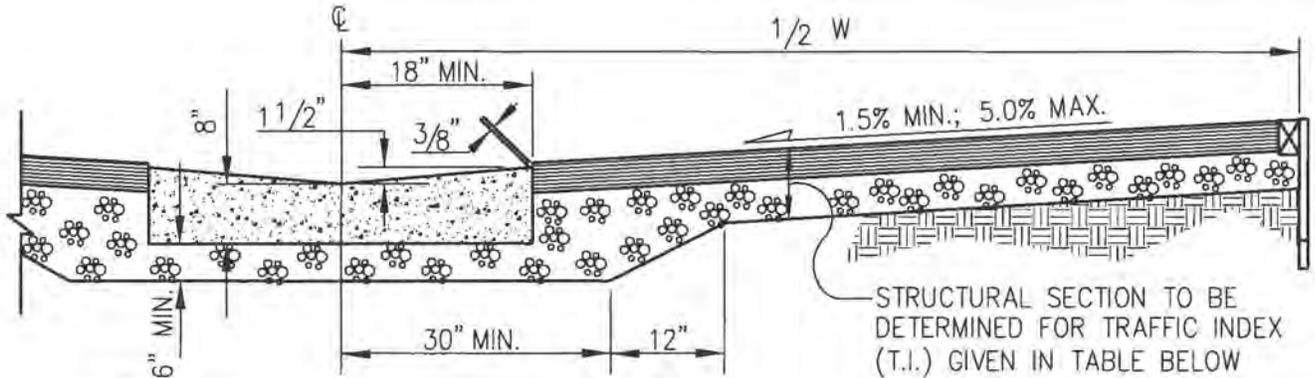
403

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Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09
DATE

SHEET 2 OF 2



NOTES:

1. 2" X 4" REDWOOD HEADERS STAKED AT 8 FOOT INTERVALS WITH 2 FOOT LONG STAKES OR CONCRETE CURB (TYPE - "A") SHALL BE PLACED AT OUTER EDGES OF THE ALLEY.
2. 2.5" A.C. MINIMUM, TYPE IIIB2-AR4000 ON 6" MINIMUM CLASS 2 AGGREGATE BASE OVER COMPACTED NATURAL GROUND OR THICKER SECTION AS RECOMMENDED BY SOILS ENGINEERS.
3. AS AN ALTERNATIVE TO ABOVE STRUCTURAL SECTION, REINFORCED CEMENT CONCRETE (7" THICK WITH #3 REBARS AT 16" ON CENTER BOTHWAYS) CAN BE USED. 3/8" LIP AT THE RIBBON GUTTER SHOULD BE ELIMINATED AND PAVEMENT AND THE GUTTER SHOULD BE POURED MONOLITHICALLY.
4. ALLEY WIDTH "W" AT STREET CURB LINE MAY BE WIDENED TO PROVIDE WIDER APPROACH.
5. ALL ALLEY APPROACHES MUST A MINIMUM OF 5' FROM STREET LIGHT, FIRE HYDRANT OR BEGINNING OF CURB RETURN MEASURED FROM END OF "W". APPROACH MUST BE A MINIMUM OF 3' FROM PROPERTY LINE AND MUST LEAVE A MINIMUM OF 20' OF FULL CURB BETWEEN DRIVEWAYS.
6. THE EXISTING CURB AND GUTTER SHALL BE SAWED AT THE NEAREST SCORING LINE.
7. ALL CONCRETE SHALL BE CLASS 520-C-2500.
8. COMMON DRIVEWAYS ARE PERMITTED UPON APPROVAL BY THE PUBLIC WORKS DIRECTOR.

WIDTH OF ALLEY AND PRIVATE DRIVES

TYPE OF STREET		RESIDENTIAL		COMMERCIAL/ INDUSTRIAL		ARTERIAL	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
TYPE OF DEVELOPMENT		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
SINGLE FAMILY RESIDENTIAL TRAFFIC INDEX UP TO 6.0		12'	15'	-	-	-	-
MULTIPLE FAMILY RESIDENTIAL TRAFFIC INDEX UP TO 6.5		12'	25'	-	-	-	-
COMMERCIAL TRAFFIC INDEX = 9	ONE WAY TRAFFIC	-	-	18'	25'	20'	30'
	TWO WAY TRAFFIC	-	-	25'	36'	30'	36'
INDUSTRIAL - CARS TRAFFIC INDEX=10	ONE WAY TRAFFIC	-	-	18'	25'	20'	30'
	TWO WAY TRAFFIC	-	-	25'	36'	30'	36'
INDUSTRIAL - PREDOMINANTLY TRUCKS TRAFFIC INDEX = 10.5		-	-	30'	45'	30'	45'



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

TYPICAL ALLEY SECTION

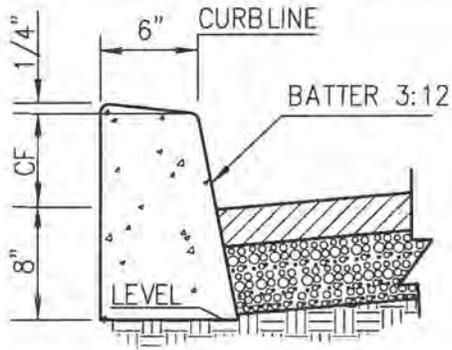
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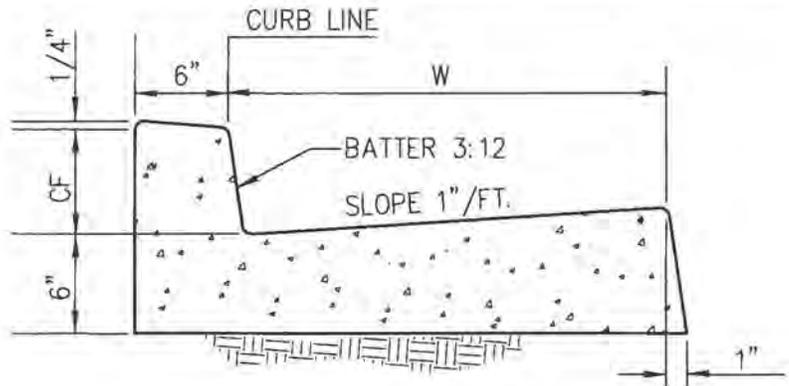
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DATE

SHEET 1 OF 1



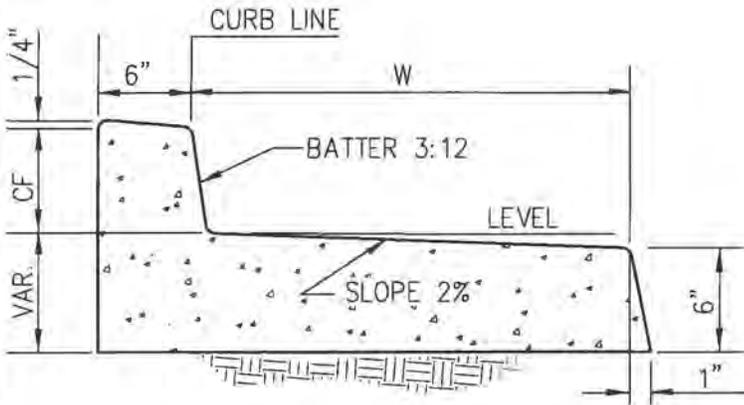
A1-(6) AND A1-(8)

NTS



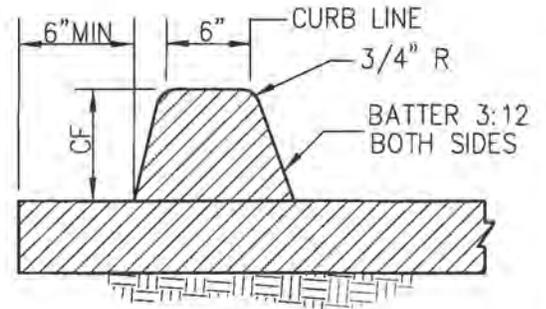
A2 -(6) AND A2-(8)

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A3-(6) AND A3-(8)

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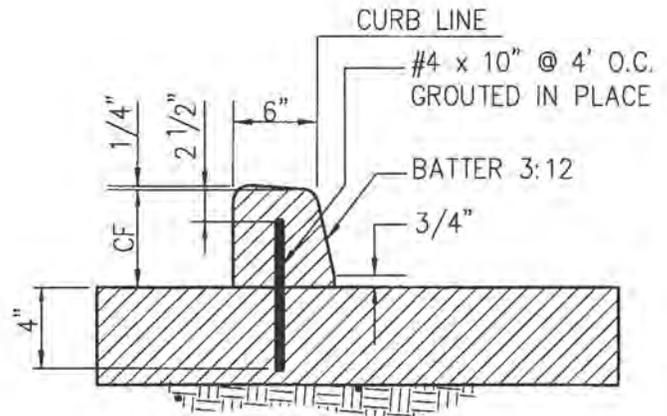


D1-(6) AND D1-(8)

NTS

NOTES:

1. THE LAST NUMBER IN THE DESIGNATION IS THE CURB FACE (CF) HEIGHT.
2. GUTTER WIDTH, W, IS 18" OR 24" AS SPECIFIED ON THE PLAN.
3. TYPES A1, A2, A3 AND C1 SHALL BE CONSTRUCTED FROM PCC.
4. TYPE D1 CURB SHALL BE CONSTRUCTED FROM ASPHALT CONCRETE.
5. TYPE C1 CURB SHALL BE ANCHORED WITH STEEL DOWELS AS SHOWN OR WITH AN EPOXY APPROVED BY THE CITY'S REPRESENTATIVE.
6. ALL EXPOSED CORNERS ON PCC CURBS AND GUTTERS SHALL BE ROUNDED WITH A 1/2" RADIUS.
7. CONCRETE MIX SHALL BE 560-C-3250



C1-(6) AND C1-(8)

NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CURB AND GUTTER - BARRIER

405

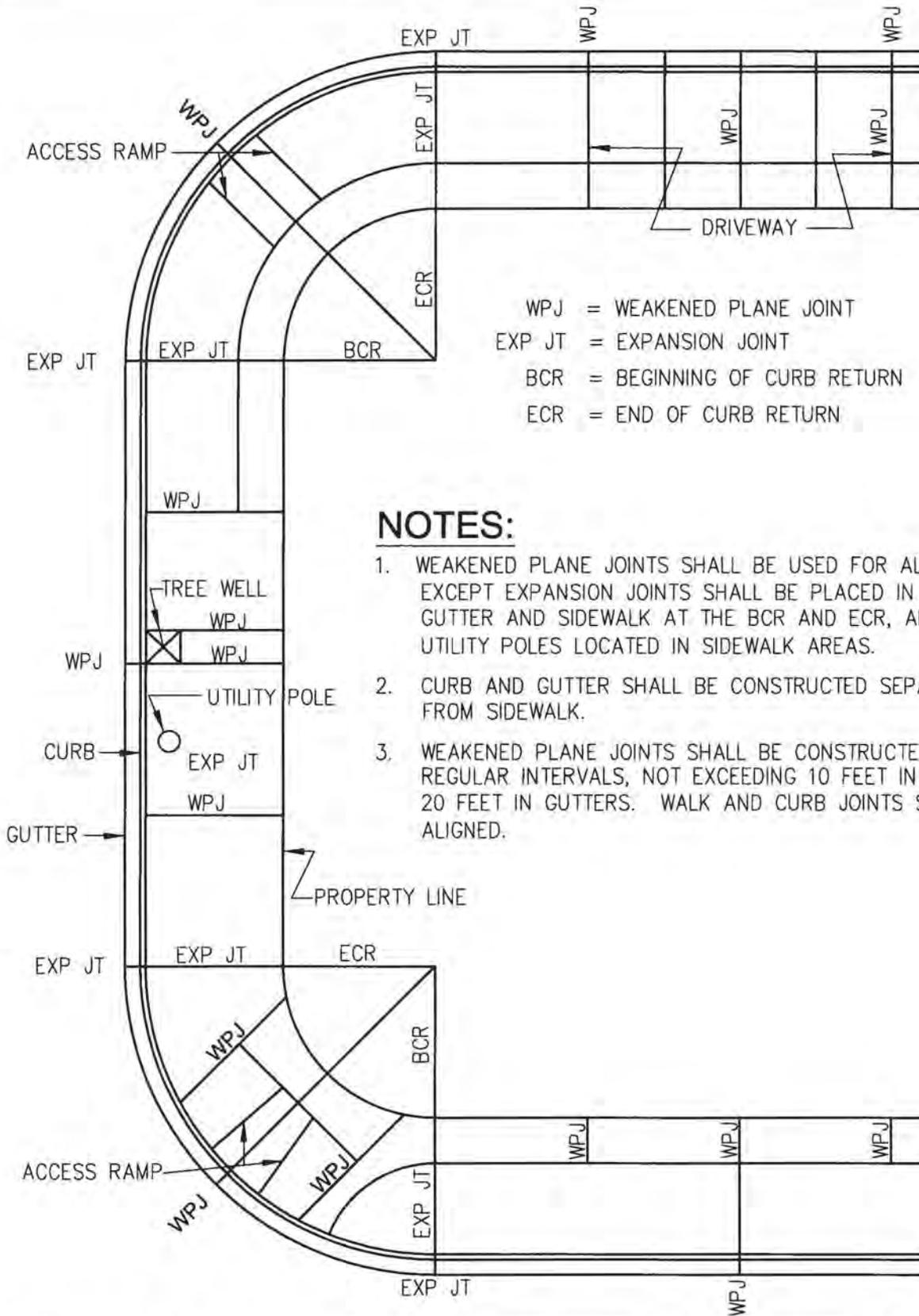
APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09

DATE

SHEET 1 OF 1



NOTES:

1. WEAKENED PLANE JOINTS SHALL BE USED FOR ALL JOINTS, EXCEPT EXPANSION JOINTS SHALL BE PLACED IN CURB, GUTTER AND SIDEWALK AT THE BCR AND ECR, AND AROUND UTILITY POLES LOCATED IN SIDEWALK AREAS.
2. CURB AND GUTTER SHALL BE CONSTRUCTED SEPARATELY FROM SIDEWALK.
3. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT REGULAR INTERVALS, NOT EXCEEDING 10 FEET IN WALKS OR 20 FEET IN GUTTERS. WALK AND CURB JOINTS SHALL BE ALIGNED.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CURB AND SIDEWALK JOINTS

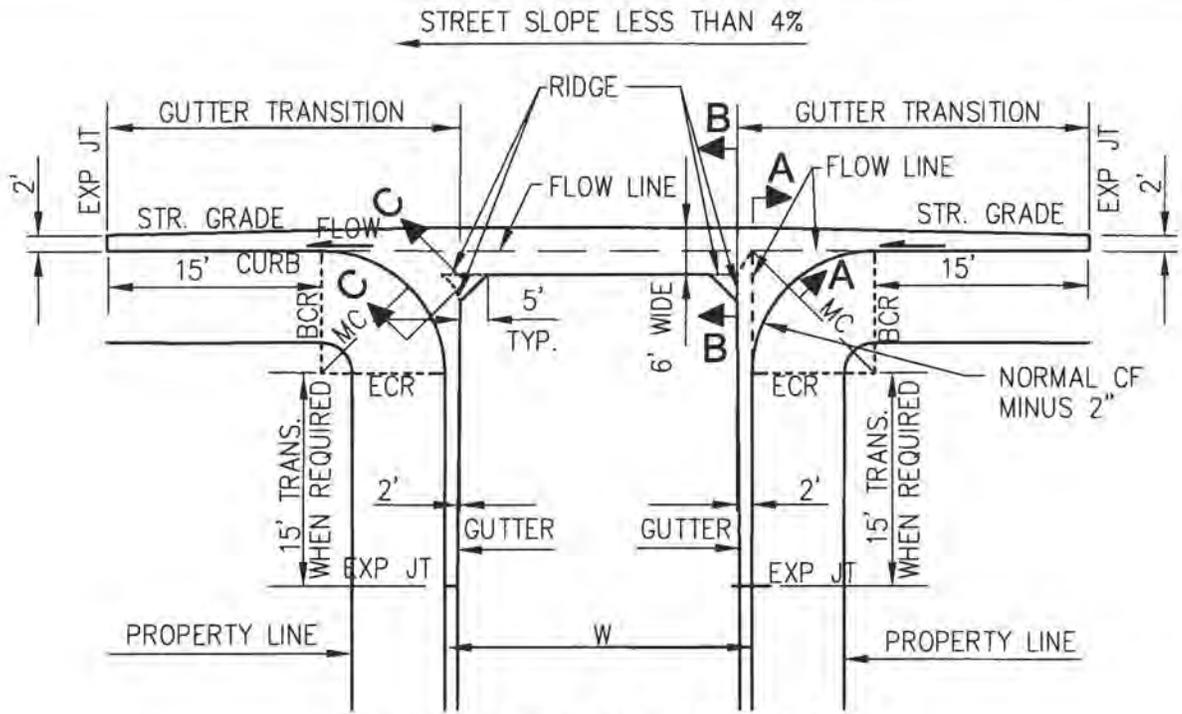
406

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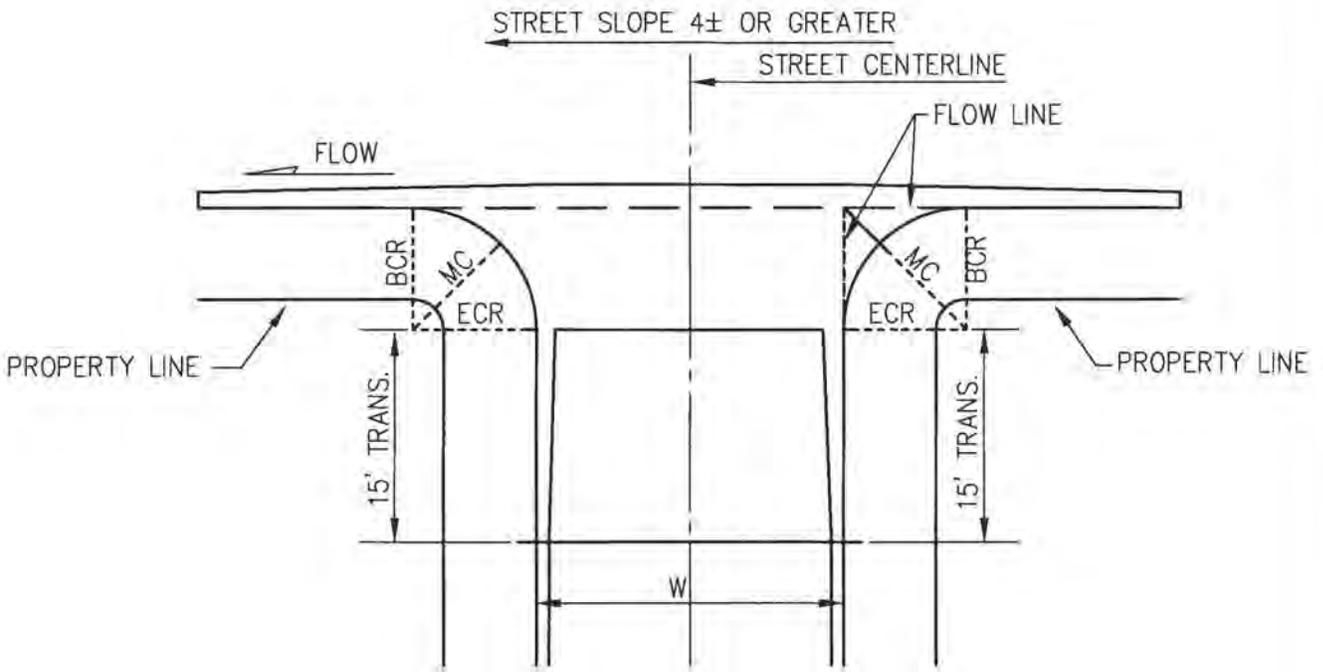
2-2-09
DATE

SHEET 1 OF 1



**TYPICAL CROSS GUTTER PLAN
(STREET SLOPE LESS THAN 4%)**

NTS



**TYPICAL CROSS GUTTER PLAN
(STREET SLOPE MORE THAN 4%)**

NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CROSS AND LONGITUDINAL GUTTERS

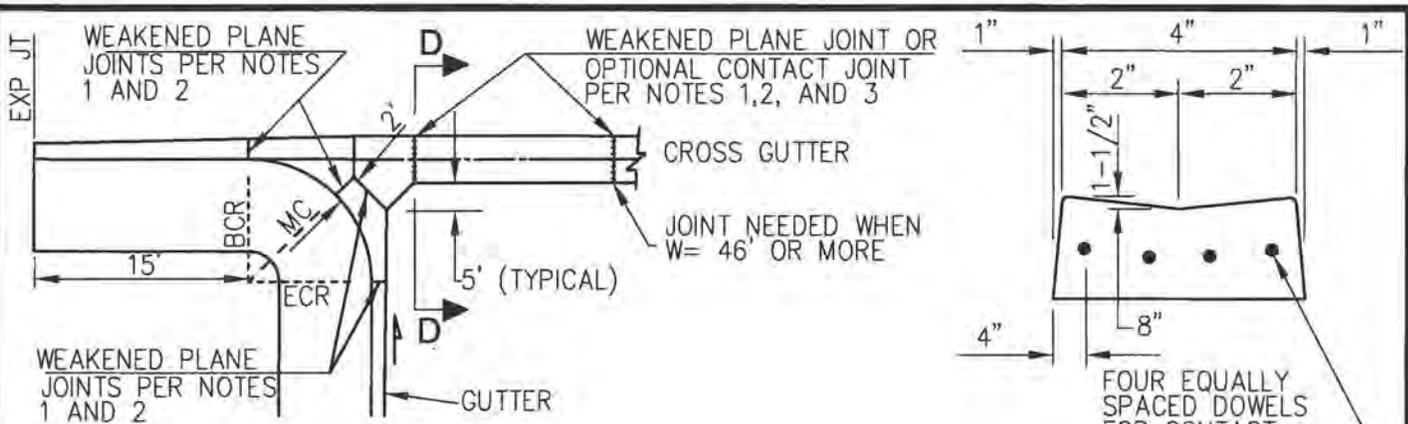
407

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DATE

SHEET 1 OF 2

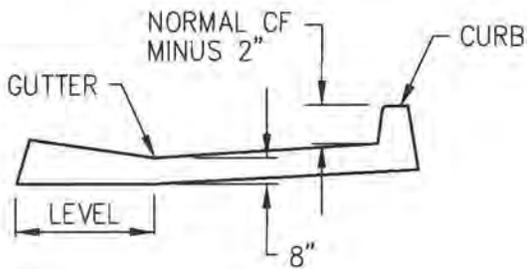


TYPICAL JOINT PLAN

NTS

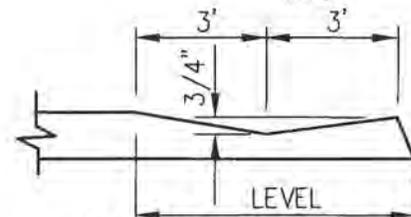
LONGITUDINAL GUTTER

NTS



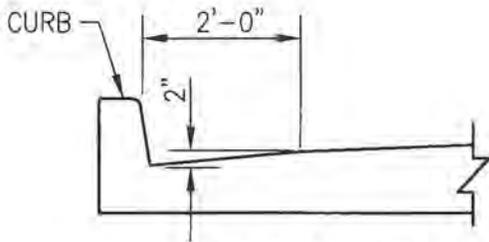
SECTION A-A

NTS



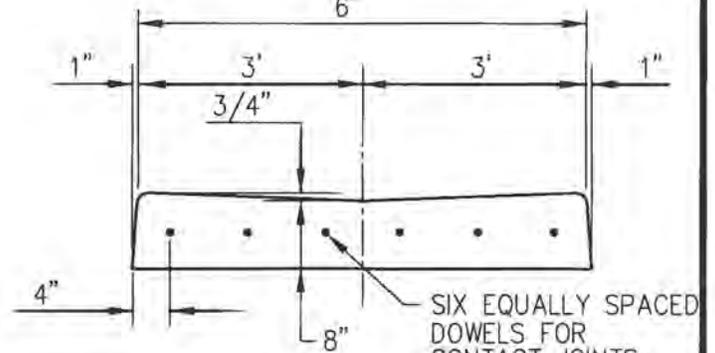
SECTION B-B

NTS



SECTION C-C

NTS



SECTION D-D

NTS

NOTES:

1. WEAKENED PLANE AND/OR CONTACT JOINTS SHALL BE PLACED IN CURB AND GUTTER AT LOCATIONS SHOWN ON THE TYPICAL JOINT PLAN HEREON.
2. WEAKENED PLANE JOINTS SHALL BE PLASTIC CONTROL JOINTS OR 1.5" DEEP SAW CUTS. CONCRETE SAWING SHALL TAKE PLACE WITHIN 24 HOURS AFTER CONCRETE IS PLACED.
3. DOWELS FOR CONTACT JOINTS SHALL BE #4 REBARS - 18" LONG.
4. PLACE A WEAKENED PLANE OR CONTACT JOINT WHERE LONGITUDINAL ALLEY GUTTER JOINS CONCRETE ALLEY INTERSECTION.
5. ALL EXPOSED CORNERS ON PCC GUTTERS SHALL BE ROUNDED WITH A TOOL OF 0.5" RADIUS.
6. CONCRETE SHALL BE INTEGRAL WITH CURB UNLESS OTHERWISE SPECIFIED.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CROSS AND LONGITUDINAL GUTTERS

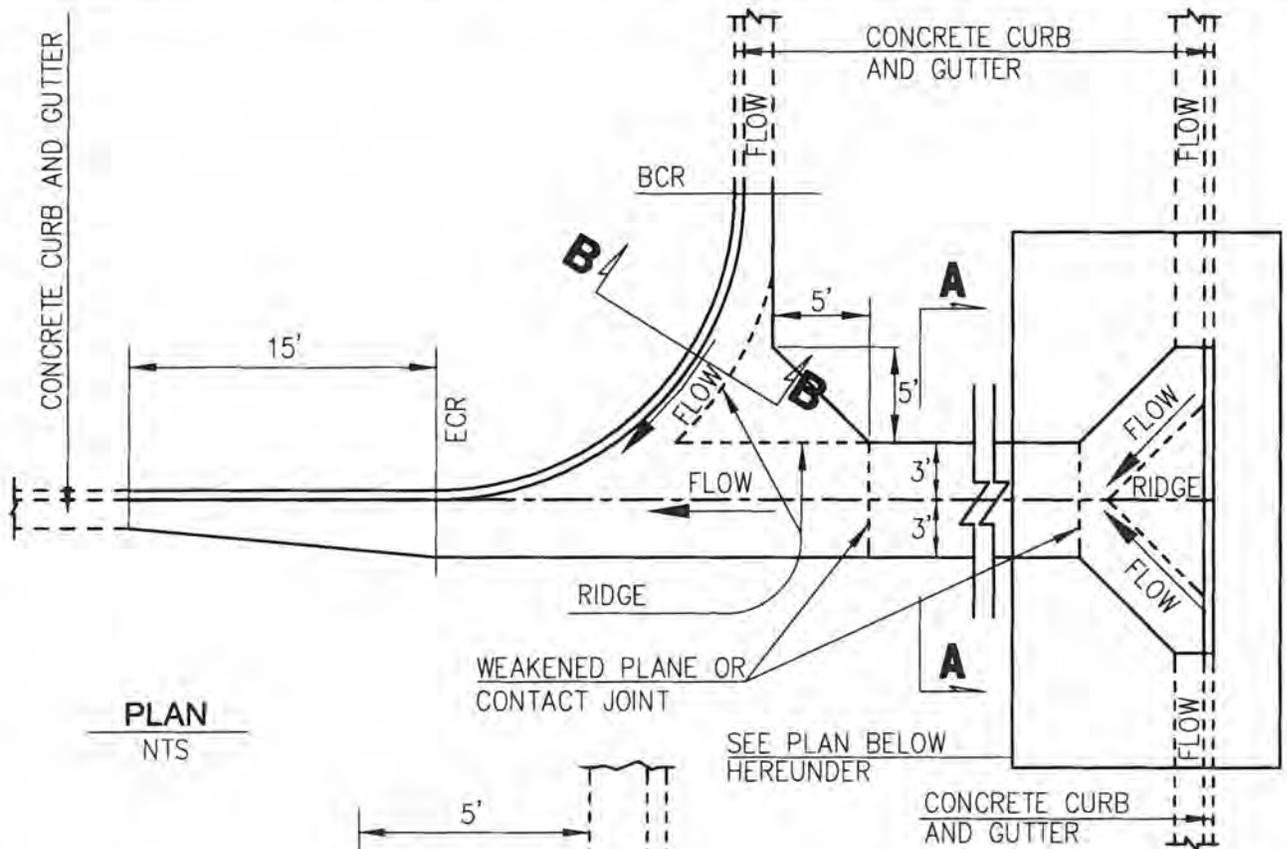
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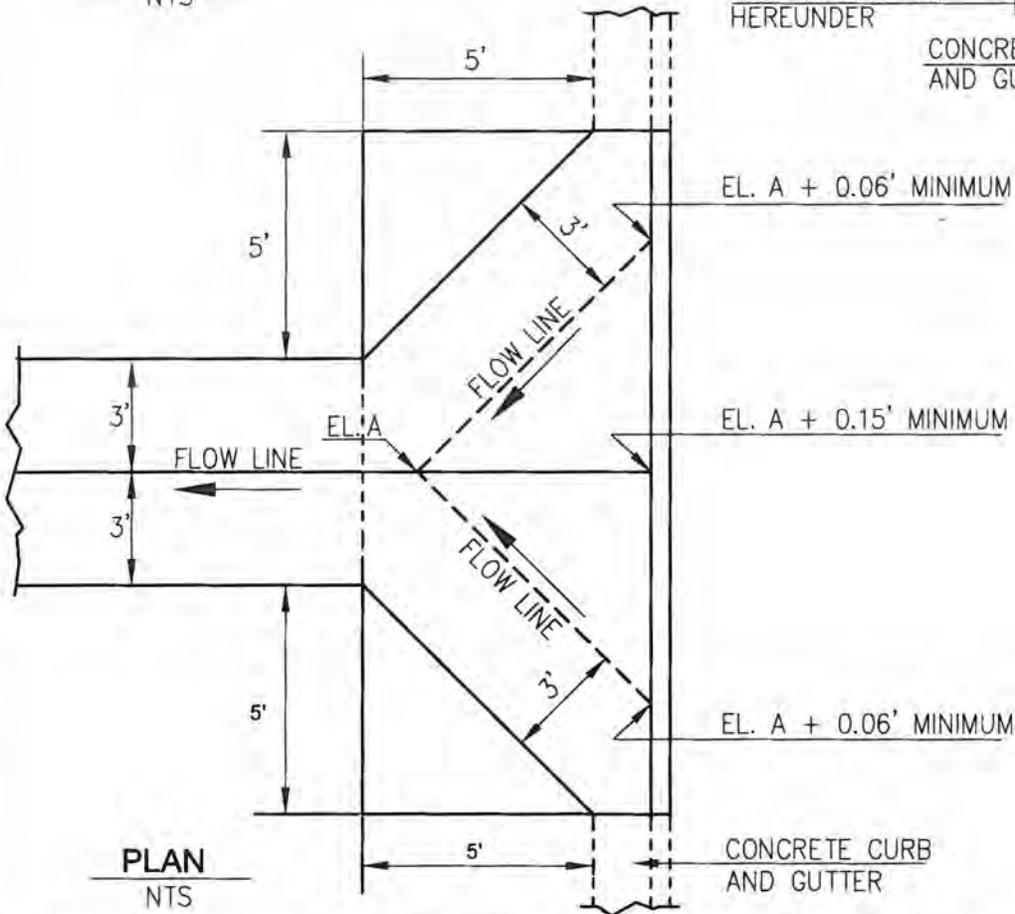
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2-2-09
DATE

SHEET 2 OF 2



PLAN
NTS



PLAN
NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CROSS GUTTER AT "T" INTERSECTION

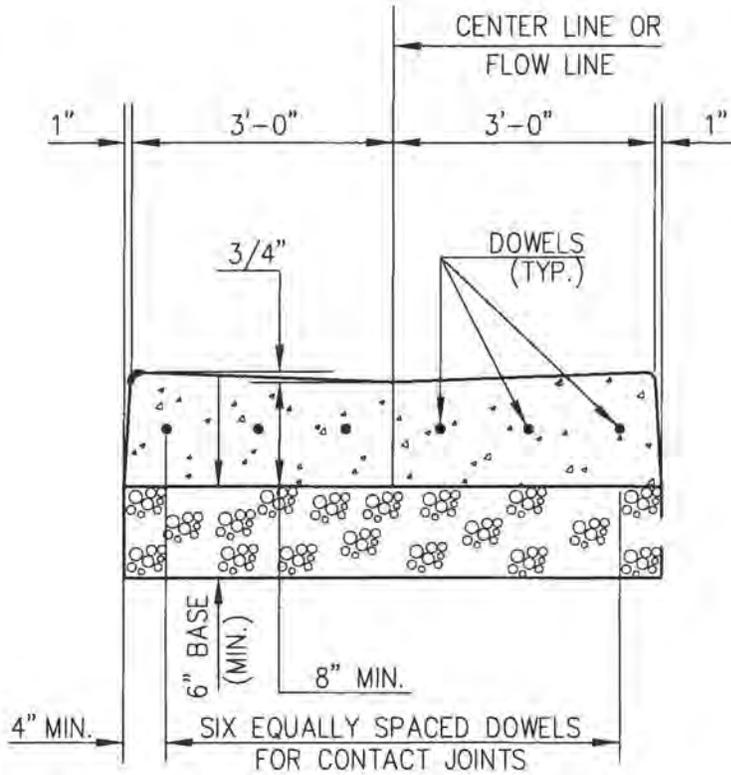
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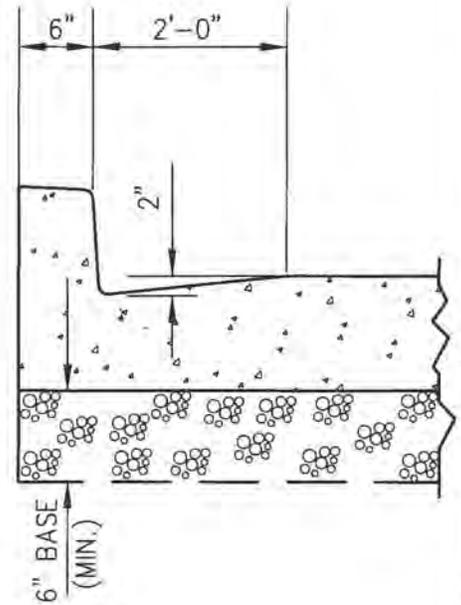
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2-2-09
DATE

SHEET 1 OF 2



SECTION A-A
NTS



SECTION B-B
NTS

NOTES:

1. WEAKENED PLANE JOINTS SHALL BE PLASTIC CONTROL JOINTS OR 1.5" DEEP SAW CUTS. CONCRETE SAWING SHALL TAKE PLACE WITHIN 24 HOURS AFTER CONCRETE IS PLACED.
2. DOWELS FOR CONTACT JOINTS SHALL BE #4 REBARS - 18" LONG.
3. ALL EXPOSED CORNERS SHALL BE ROUNDED WITH A TOOL OF 0.5" RADIUS.
4. CONCRETE SHALL BE INTEGRAL WITH CURB UNLESS OTHERWISE SPECIFIED.
5. CONCRETE SHALL BE CLASS 560-C-3250.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CROSS GUTTER AT "T" INTERSECTION

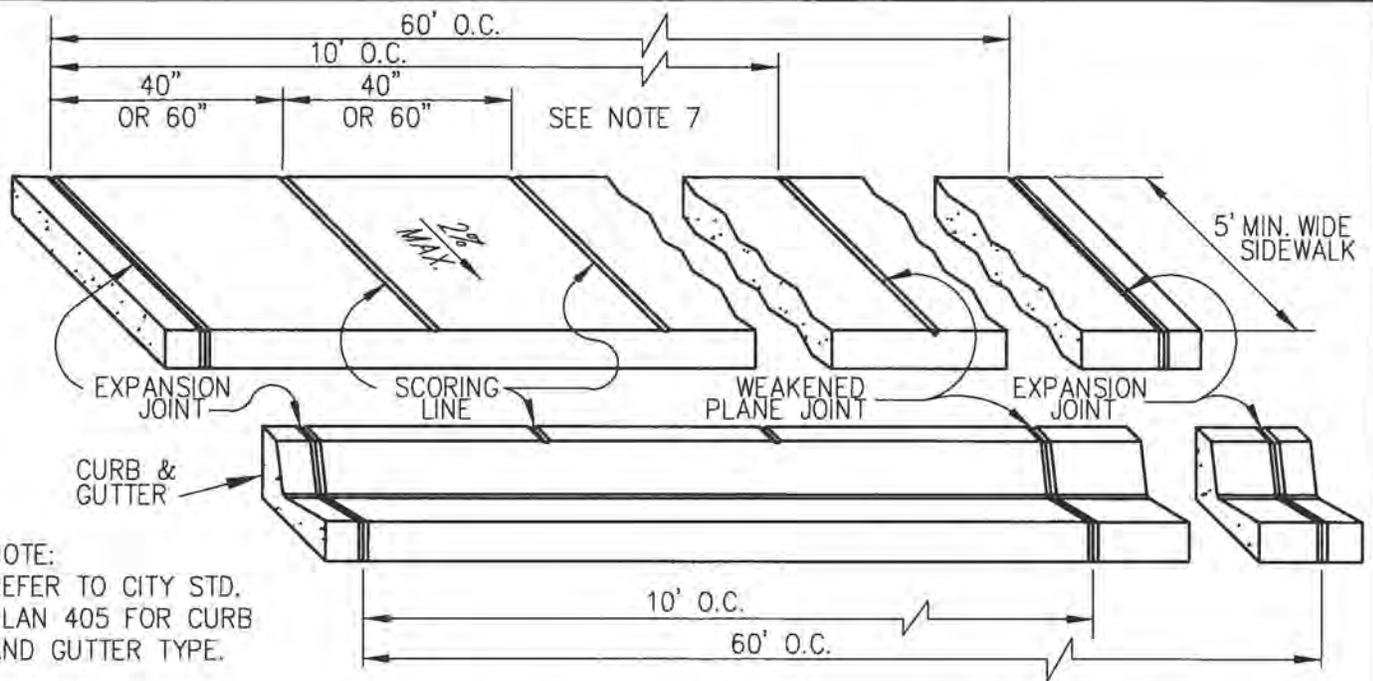
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APPROVED BY:

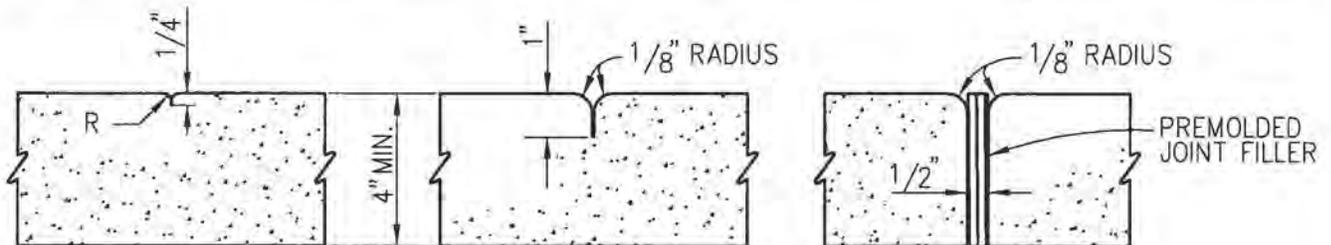
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2-2-09
DATE

SHEET 2 OF 2



NOTE:
REFER TO CITY STD.
PLAN 405 FOR CURB
AND GUTTER TYPE.



SCORING LINE

**WEAKENED
PLANE JOINT**

EXPANSION JOINT

NOTES:

1. CONCRETE FOR SIDEWALK SHALL BE CLASS 560-C-3250 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.(MAXIMUM 4" SLUMP).
2. EXPANSION JOINTS, 1/2" THICK, SHALL BE PLACED AT B.C., E.C. AND ALL RETURNS, AT THE OUTER EDGES OF DRIVEWAYS INCLUDING "X" DISTANCES, AND AT UNIFORM INTERVAL AS SHOWN IN STANDARD PLAN 406 OR AS DIRECTED BY THE CITY'S REPRESENTATIVE.
3. WEAKENED PLANE JOINTS, ONE INCH DEEP, SHALL BE CONSTRUCTED AT EQUAL SPACING BETWEEN EXPANSION JOINTS IN THE WALK AND CURB AND GUTTERS.
4. SCORING LINES, 1/4" DEEP, SHALL BE CONSTRUCTED IN CURBS AT LOCATIONS OF WEAKENED PLANE JOINT IN TOP OF CURB AND IN THE WALK AS SHOWN.
5. JOINTS IN THE CURB AND GUTTER SHALL ALIGN WITH CORRESPONDING JOINTS IN THE SIDEWALK.
6. LONGITUDINAL SCORING LINES WILL BE REQUIRED IN WALKS WIDER THAN 5 FEET.
7. WEAKENED PLANE JOINTS IN SIDEWALK SHALL BE CONSTRUCTED WITH DEEP GROOVING TOOL.
8. WHEN EXPANSION = 5%, OR WHEN R VALUE OF BASE IS 14 OR LESS, PLACE 4" THICK SAND OR SELECT SUB BASE (R = 40 OR BETTER) UNDER CONCRETE CURB, CURB & GUTTER FOR 12" BEHIND CURBLINE AND UNDER THE SIDEWALK.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

**EXPANSION JOINTS, WEAKENED
PLANE JOINTS AND SCORE**

409

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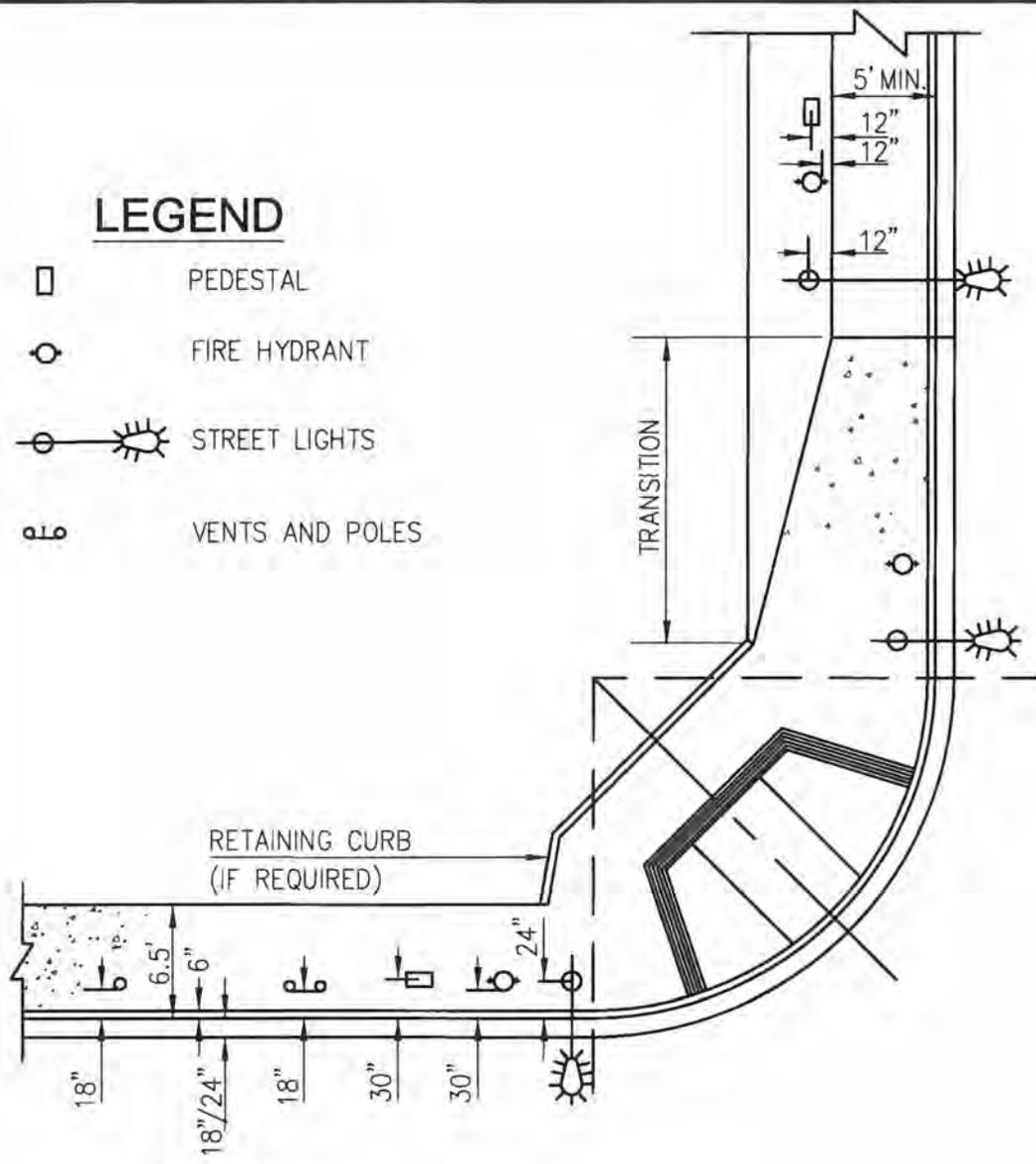
Clifford G. Finley
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2-2-09
DATE

SHEET 1 OF 1

LEGEND

- PEDESTAL
- FIRE HYDRANT
- STREET LIGHTS
- ⊕ VENTS AND POLES



NOTES:

1. NO ABOVEGROUND UTILITIES ARE ALLOWED IN CONCRETE SIDEWALK LESS THAN 6.5' WIDE.
2. WHEN SIDEWALK IS 6.5' WIDE OR MORE, ABOVEGROUND UTILITIES ARE ALLOWED AT LOCATIONS NOTED ON PLAN.
3. IN THE RETURN AND SIDEWALK TRANSITION AREAS, ONLY UTILITIES CONSISTING OF STREET LIGHTS, TRAFFIC SIGNAL AND FIRE HYDRANTS ARE ALLOWED.
4. FIRE HYDRANTS SHALL NOT BE PLACED AT THE SAME CURB RETURN OCCUPIED BY STREET LIGHT.
5. PEDESTALS SHALL BE PLACED AT AN INCONSPICUOUS LOCATION.
6. IN THE ABSENCE OF CURBS, THE FACE OF ALL ABOVEGROUND STRUCTURES SHALL BE LOCATED A MINIMUM OF 10' AWAY FROM THE TRAVELED WAY ON ALL RURAL HIGHWAYS AND 8' ON RESIDENTIAL STREETS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

ABOVE GROUND UTILITIES LOCATION IN PARKWAY

410

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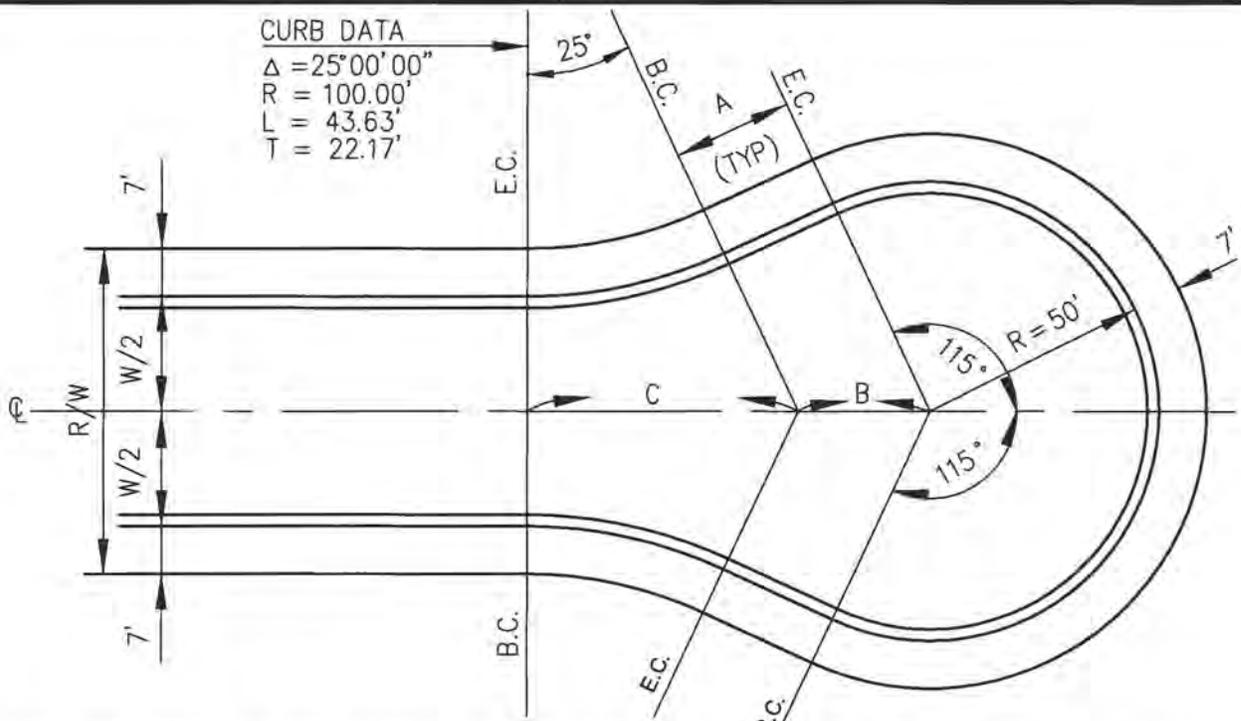
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2-2-09
DATE

SHEET 1 OF 1

CURB DATA

$\Delta = 25^{\circ}00'00''$
 $R = 100.00'$
 $L = 43.63'$
 $T = 22.17'$

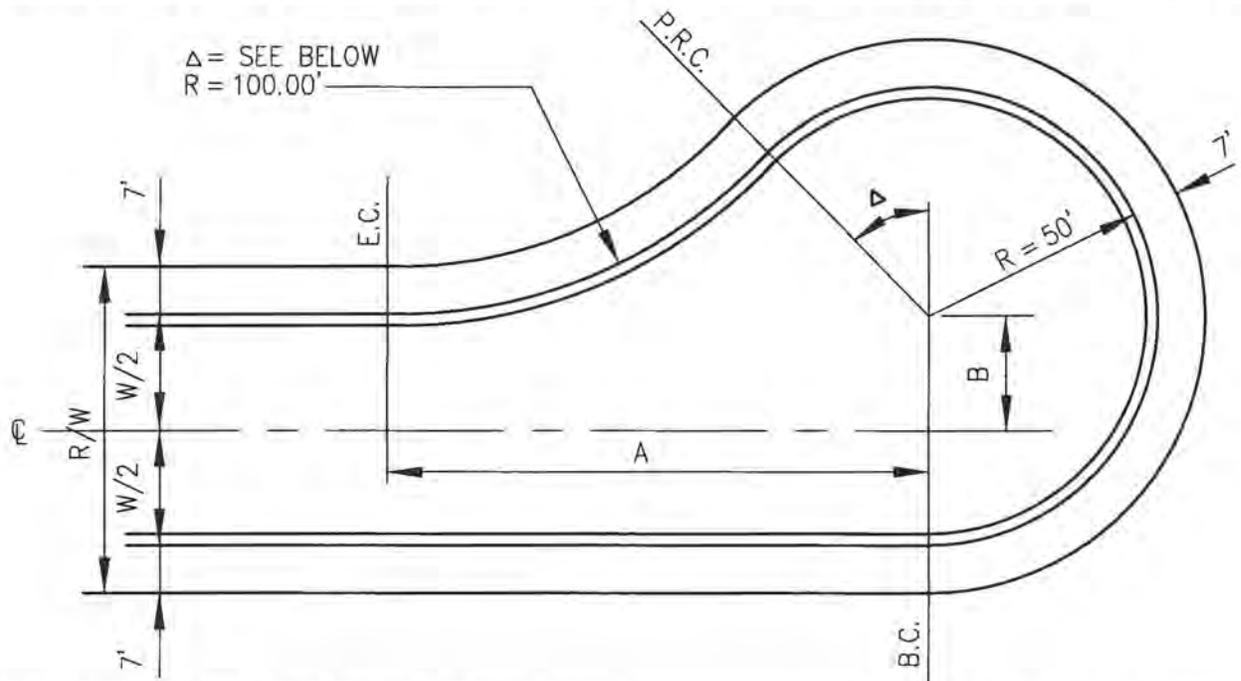


R/W	W	W/2	A	B	C
60'	46'	23'	30.63'	33.80'	57.36'
74'	60'	30'	14.07'	15.52'	60.62'

(a) SYMMETRICAL

MAX. LENGTH OF CUL-DE-SAC = 600'

$\Delta = \text{SEE BELOW}$
 $R = 100.00'$



R/W	W	W/2	A	B	Δ
60'	46'	23'	115.26'	27'	50° 12' 29"
74'	60'	30'	101.98'	20'	42° 50' 00"

(b) ASYMMETRICAL

MAX. LENGTH OF CUL-DE-SAC = 600'



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

INDUSTRIAL CUL-DE-SAC

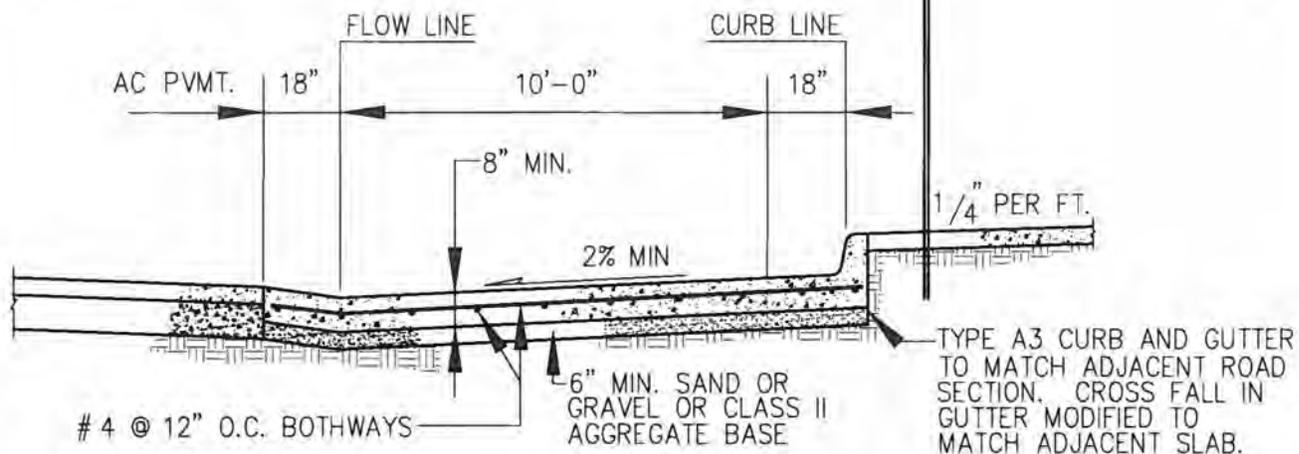
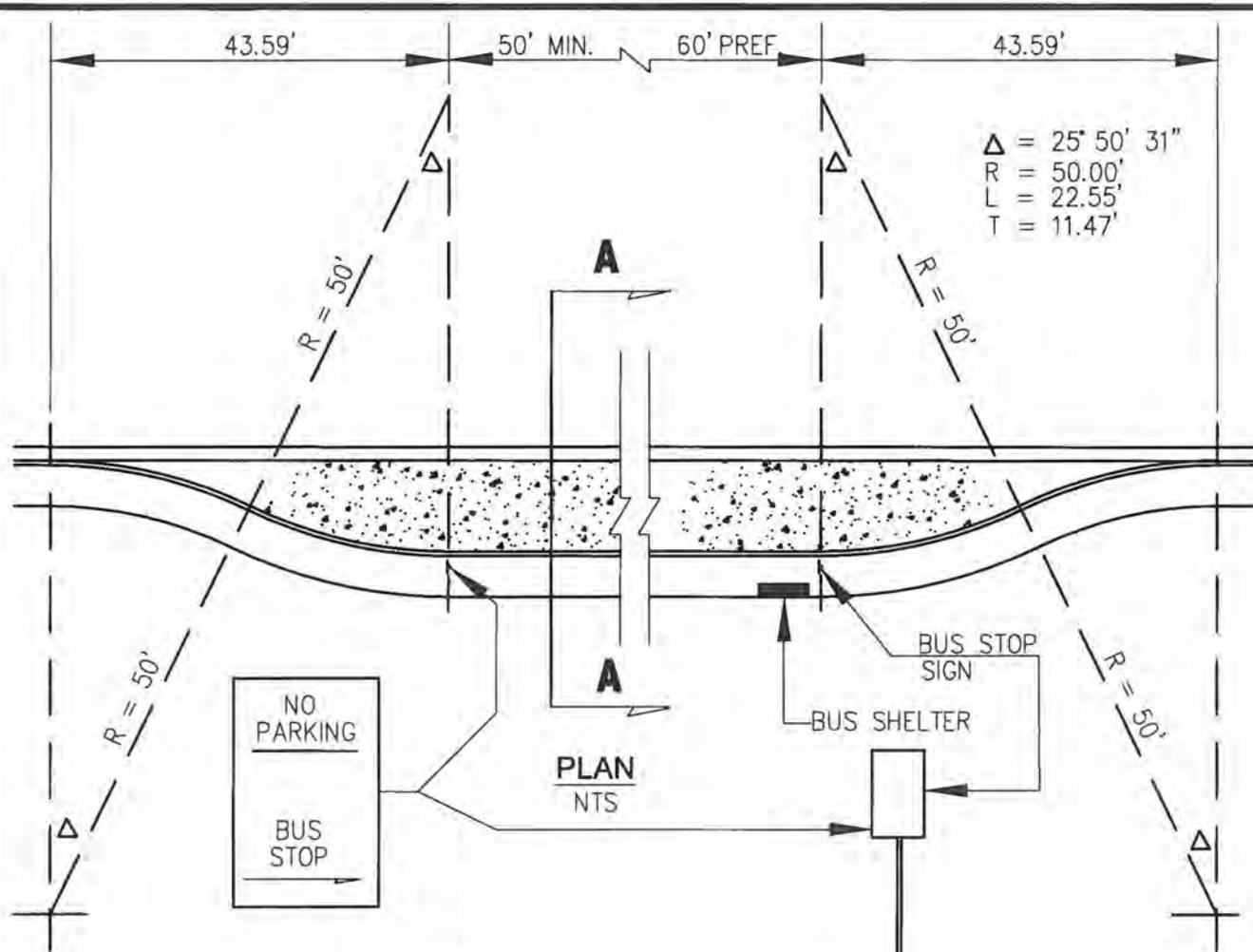
411

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2-2-09
 DATE

SHEET 1 OF 1



NOTES:

1. CONCRETE USED SHALL BE CLASS 560-C-3250 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND STEEL SHALL BE 60 GRADE REINFORCEMENT.
2. FOR EACH ADDITIONAL PASS THROUGH BUS BERTH ADD 50' AND FOR EACH ADDITIONAL LAYOVER BUS BERTH ADD 80'.

SECTION A-A
NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

**BUS TURNOUT
FOR STREET W/O PARKING LANE**

412

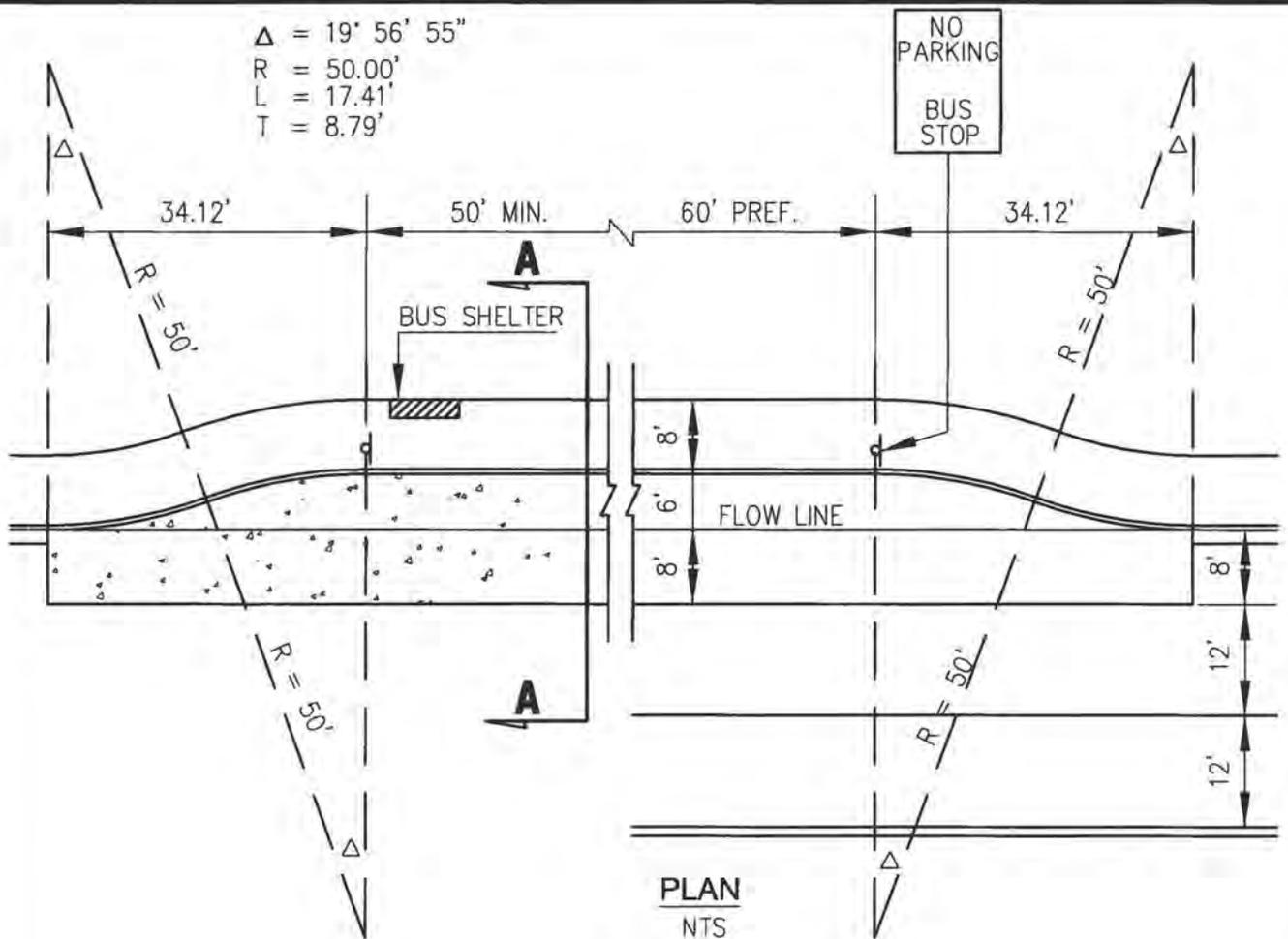
APPROVED BY:

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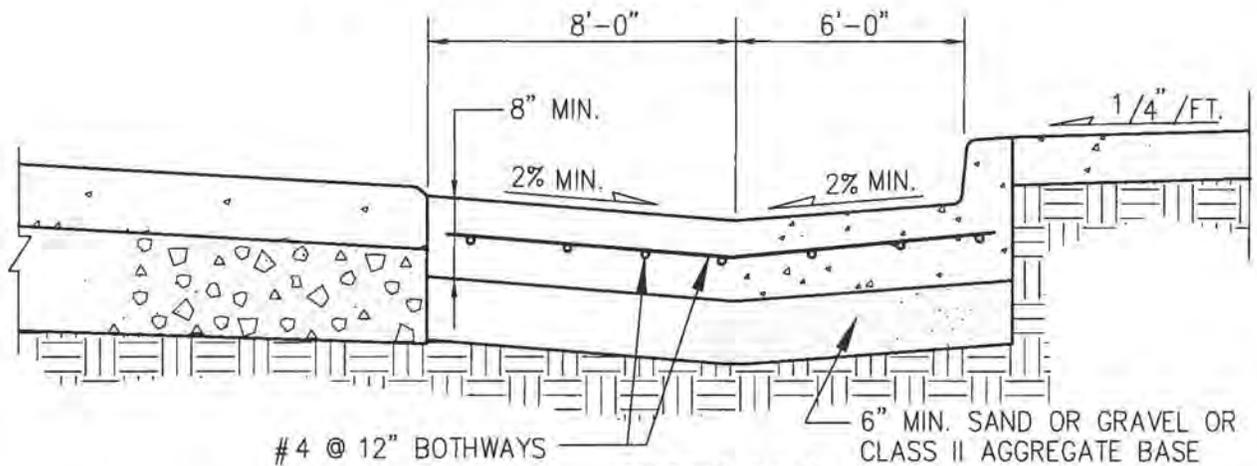
2-2-09
DATE

SHEET 1 OF 1

$\Delta = 19^\circ 56' 55''$
 $R = 50.00'$
 $L = 17.41'$
 $T = 8.79'$



PLAN
 NTS



SECTION A-A
 NTS

NOTES:

1. CONCRETE USED SHALL BE CLASS 560-C-3250 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND STEEL SHALL BE 60 GRADE REINFORCEMENT.
2. FOR EACH ADDITIONAL PASS THROUGH BUS BERTH ADD 50' AND FOR EACH ADDITIONAL LAYOVER BUS BERTH ADD 80'.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

BUS TURNOUT
FOR STREET W/ PARKING LANE

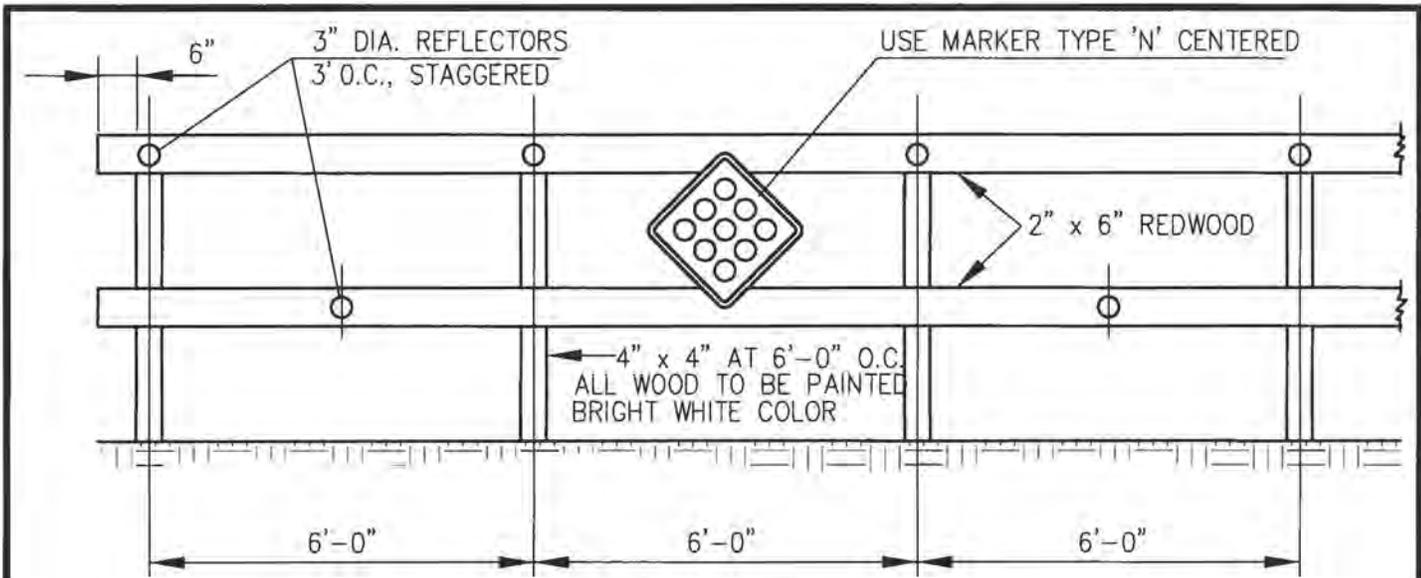
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APPROVED BY:

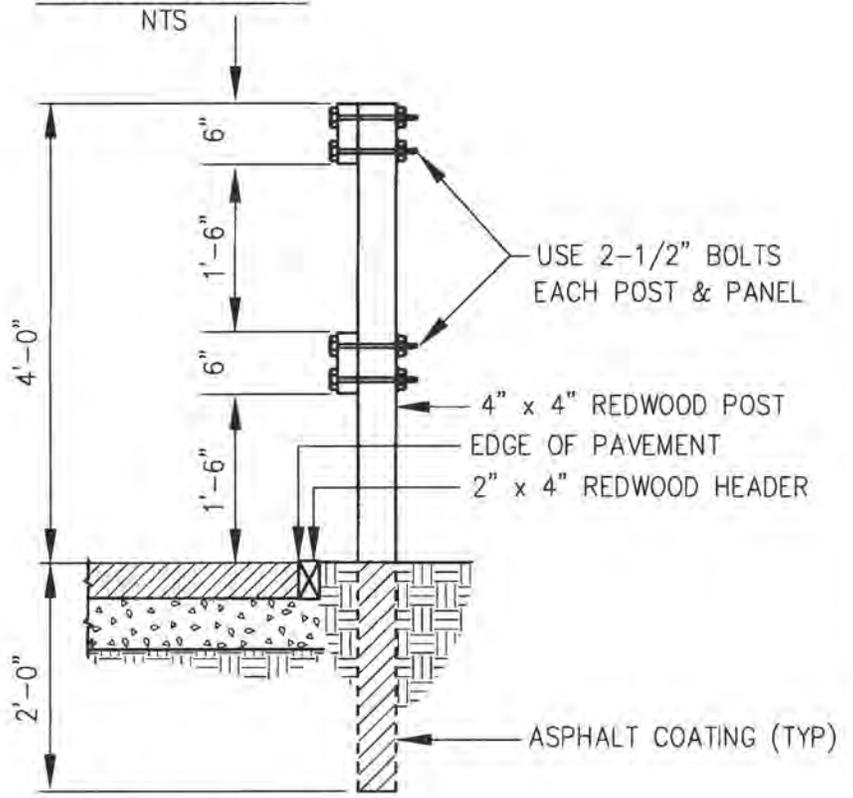
PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09
 DATE

SHEET 1 OF 1



ELEVATION VIEW
NTS



CROSS SECTION
NTS

NOTES:

1. TEMPORARY BARRICADE MAY BE INSTALLED ONLY IF THE FINAL MAP HAS BEEN RECORDED ON ADJACENT PROPERTY. FOR TEMPORARY BARRICADE, FIR TIMBER AND NAILS MAY BE USED. USE PAINT AND REFLECTORS AS INDICATED.
2. BARRICADE MUST BE CONSTRUCTED TO EXTEND FROM PROPERTY LINE TO PROPERTY LINE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

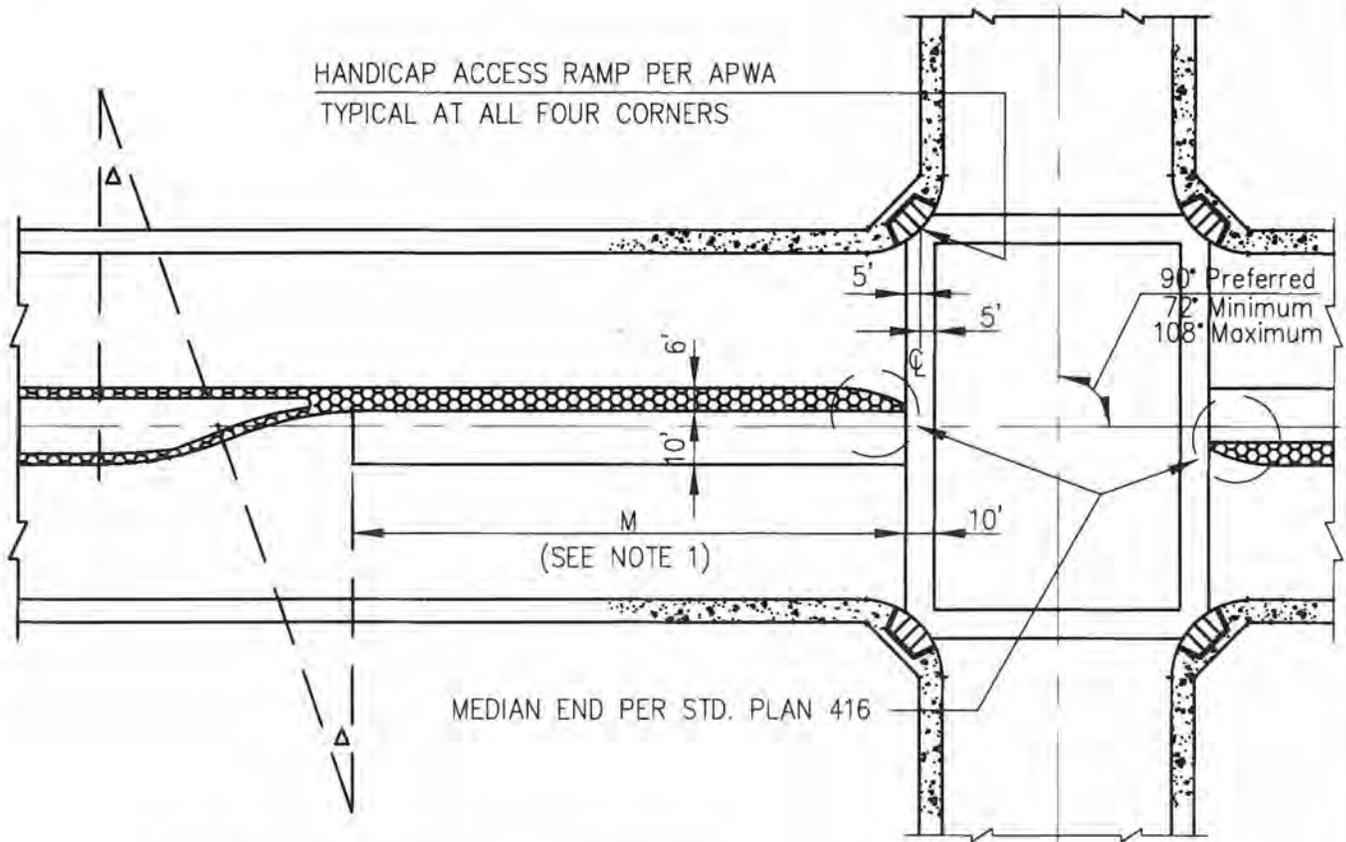
STREET AND ROAD BARRICADE

APPROVED BY: *Clifford G. Finley* 2-2-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

STANDARD PLAN

414

SHEET 1 OF 1



HANDICAP ACCESS RAMP PER APWA
TYPICAL AT ALL FOUR CORNERS

90° Preferred
72° Minimum
108° Maximum

M
(SEE NOTE 1)

MEDIAN END PER STD. PLAN 416

MEDIAN CURB RETURN FOR LEFT TURN POCKET

$$\Delta = 12' 50' 18''$$

$$R = 200'$$

$$L = 44.81'$$

PLAN
NTS

NOTES:

1. LENGTH OF LEFT TURN POCKET WILL BE AS REQUIRED BY THE CITY'S REPRESENTATIVE.
2. MEDIAN CURB HEIGHT SHALL BE 8" UNLESS OTHERWISE APPROVED BY THE CITY'S REPRESENTATIVE.
3. COLORED STAMPED CONCRETE MEDIAN PAVING SHALL CONFORM TO THE REQUIREMENTS AND APPROVAL OF THE CITY'S REPRESENTATIVE.
4. MINIMUM SPACING IN MEDIAN BREAKS SHALL BE 1200' ON ARTERIALS UNLESS OTHERWISE APPROVED BY THE CITY'S REPRESENTATIVE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

INTERSECTION AND LEFT TURN POCKET

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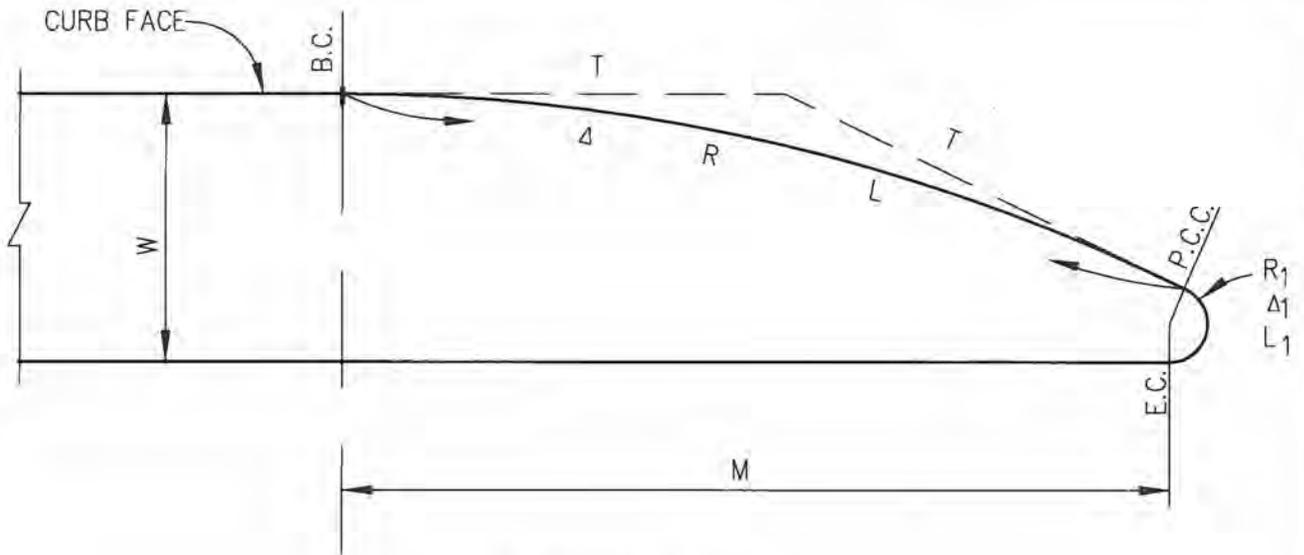
Clifford G. Finley
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2-2-09
DATE

STANDARD PLAN

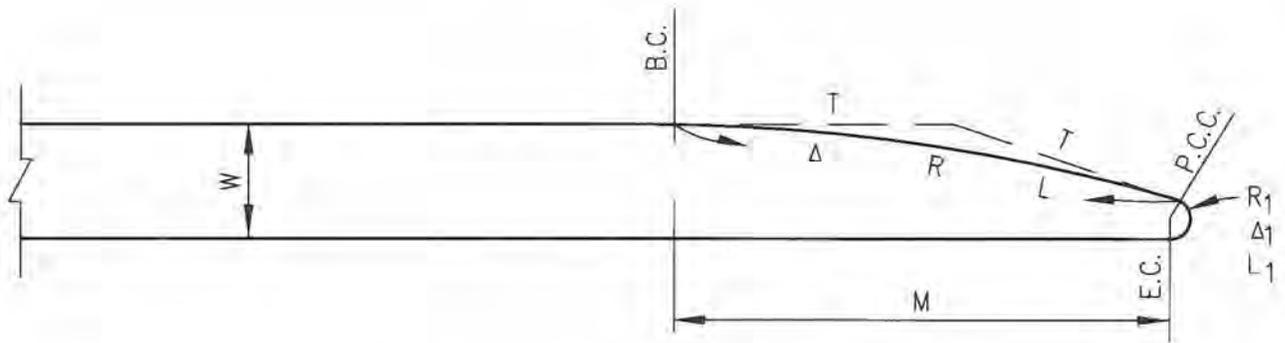
415

SHEET 1 OF 1



MEDIAN - END

NTS



LEFT TURN POCKET FINGER

NTS

W	M	R	Δ	L	T	R_1	Δ_1	L_1	T_1
14'	43.13'	100'	26 ° 06' 32"	45.57'	23.19'	2'	153°53'28"	5.37'	8.63'
4'	13.86'	50'	16 ° 25' 35"	14.33'	7.22'	1'	163°34'25"	2.85'	6.93'
16'	46.99'	100'	28 ° 39' 06"	50.01'	25.54'	2'	151°20'54"	5.28'	7.83'
6'	19.39'	50'	23 ° 18' 41"	20.34'	10.31'	1'	156°41'19"	2.73'	4.85'

NOTES:

ALL NECESSARY SIGNING AND STRIPING SHALL BE IN ACCORDANCE WITH THE CURRENT STATE STANDARDS AND/OR AS DIRECTED BY THE CITY'S REPRESENTATIVE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

MEDIAN END DETAILS

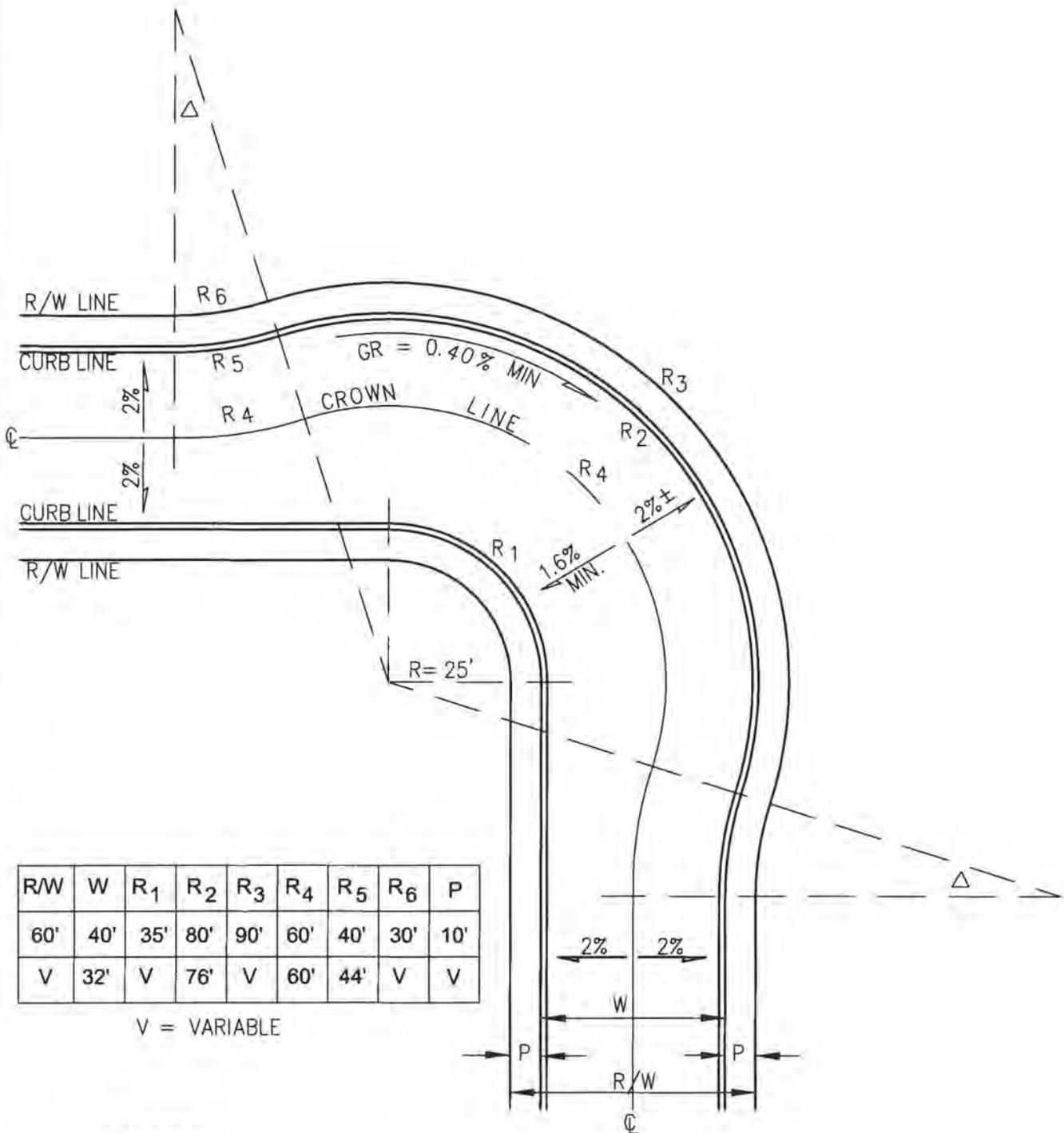
416

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2-2-09
DATE

SHEET 1 OF 1



R/W	W	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	P
60'	40'	35'	80'	90'	60'	40'	30'	10'
V	32'	V	76'	V	60'	44'	V	V

V = VARIABLE

NOTES:

WHEN Δ IS LESS THAN 72°, A SMOOTH CURVE WITH A MINIMUM $\frac{C}{4}$ RADIUS CONFORMING WITH THE STREET STANDARDS FOR THE APPLICABLE GEOMETRIC SECTION SHALL BE USED.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

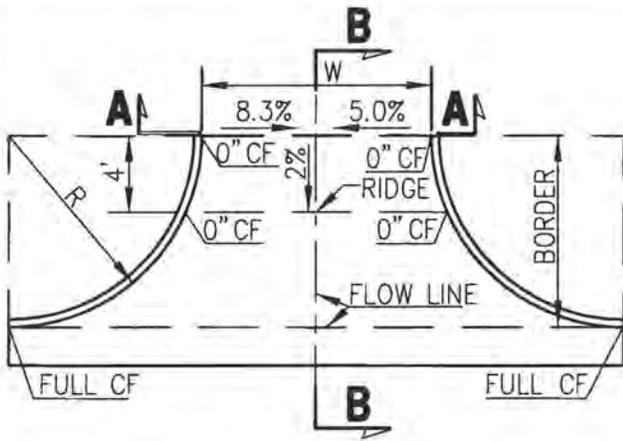
KNUCKLE INTERSECTION

APPROVED BY: *Clifford G. Finley* 2-2-09
 PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

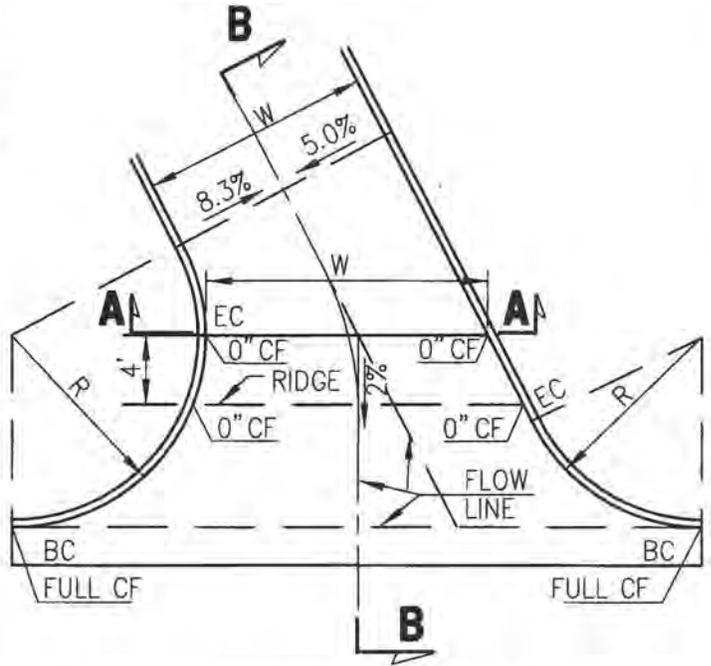
STANDARD PLAN

417

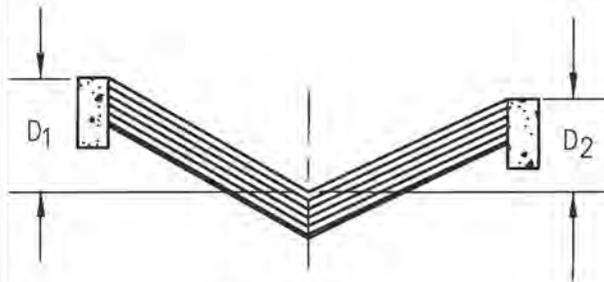
SHEET 1 OF 1



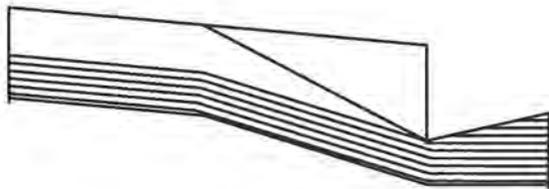
STANDARD APPROACH
NTS



ANGLED (SKEW) APPROACH
NTS



SECTION A-A
NTS



SECTION B-B
NTS

ALLEY WIDTH	8'	10'	15'	20'	25'	30'
D ₁ MAX.	0.33'	0.42'	0.63'	0.83'	1.04'	1.25'
D ₂ MIN.	0.17'	0.25'	0.25'	0.25'	0.25'	0.25'

NOTES:

1. THE RADIUS OF THE CURB RETURN, R , IS EQUAL TO THE PARKWAY WIDTH.
2. ALLEY INTERSECTION SHALL BE REINFORCED CEMENT CONCRETE, CLASS 520-C-2500, 7" MINIMUM THICKNESS WITH #4 AT 18" O.C. BOTHWAYS. CURB SHALL BE TYPE "A" POURED MONOLITHIC WITH THE APRON.
3. GRADES SHOWN ON THIS SKETCH ARE MAXIMUM. THE MINIMUM GRADE SHALL BE 2%.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

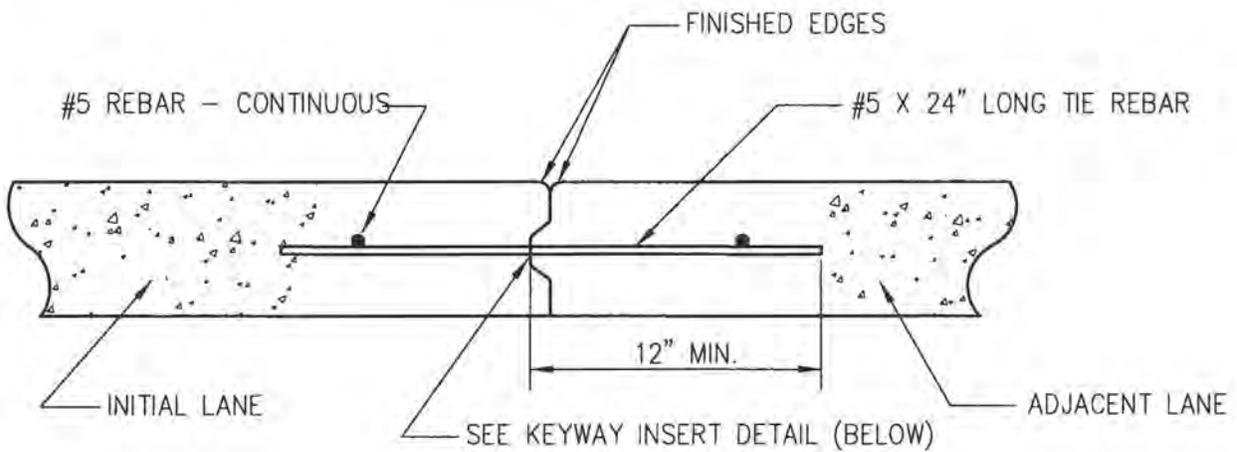
ALLEY INTERSECTION

418

APPROVED BY:

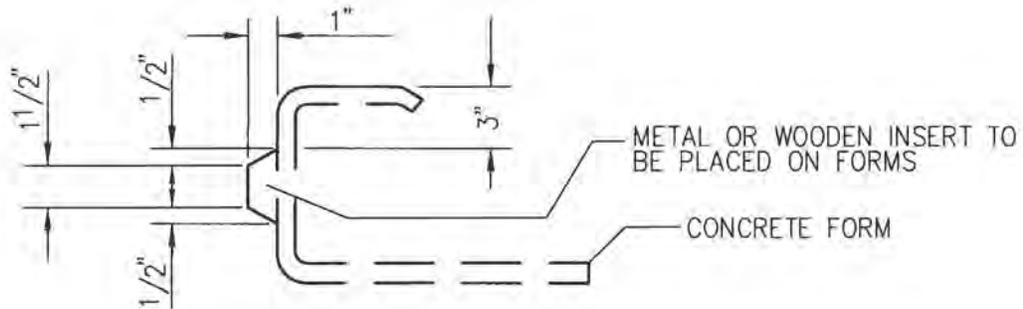
Clifford A. Finley 2-2-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

SHEET 1 OF 1



CONTACT JOINT WITH KEYWAY AND TIE BAR

NTS



TYPICAL KEYWAY INSERT DETAIL

NTS

NOTES:

1. LONGITUDINAL JOINTS SHALL BE LOCATED AS SHOWN ON THE DESIGN DRAWINGS. CONTACT OR WEAKENED PLANE JOINTS MAY BE USED AT CONTRACTOR'S OPTION.
2. TRANSVERSE WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT INTERVALS OF 15 FEET AND SHALL BE AT LEAST 5 FEET FROM ANY TRANSVERSE CONTACT JOINT. (SEE NOTE 5 BELOW).
3. TRANSVERSE CONTACT JOINTS SHALL BE CONSTRUCTED AS SHOWN HEREON AT ALL CONSTRUCTION JOINTS AND AS DIRECTED BY THE CITY'S REPRESENTATIVE.
4. SPACE TIE BARS AT 36" ON CENTER FOR TRANSVERSE JOINTS AND 45" ON CENTER FOR ALL LONGITUDINAL JOINTS. PLACE THE TIE BAR IN MIDDLE THIRD OF SLAB.
5. SEE SECTION 302-6.5 OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION FOR DETAILS ON CONCRETE PAVEMENT JOINTS.
6. CONSTRUCT CONTACT JOINTS IN THE APPROACH SLABS AT FIRST THREE TRANSVERSE JOINTS OF CONCRETE INTERSECTIONS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

CONCRETE PAVEMENT JOINT DETAILS

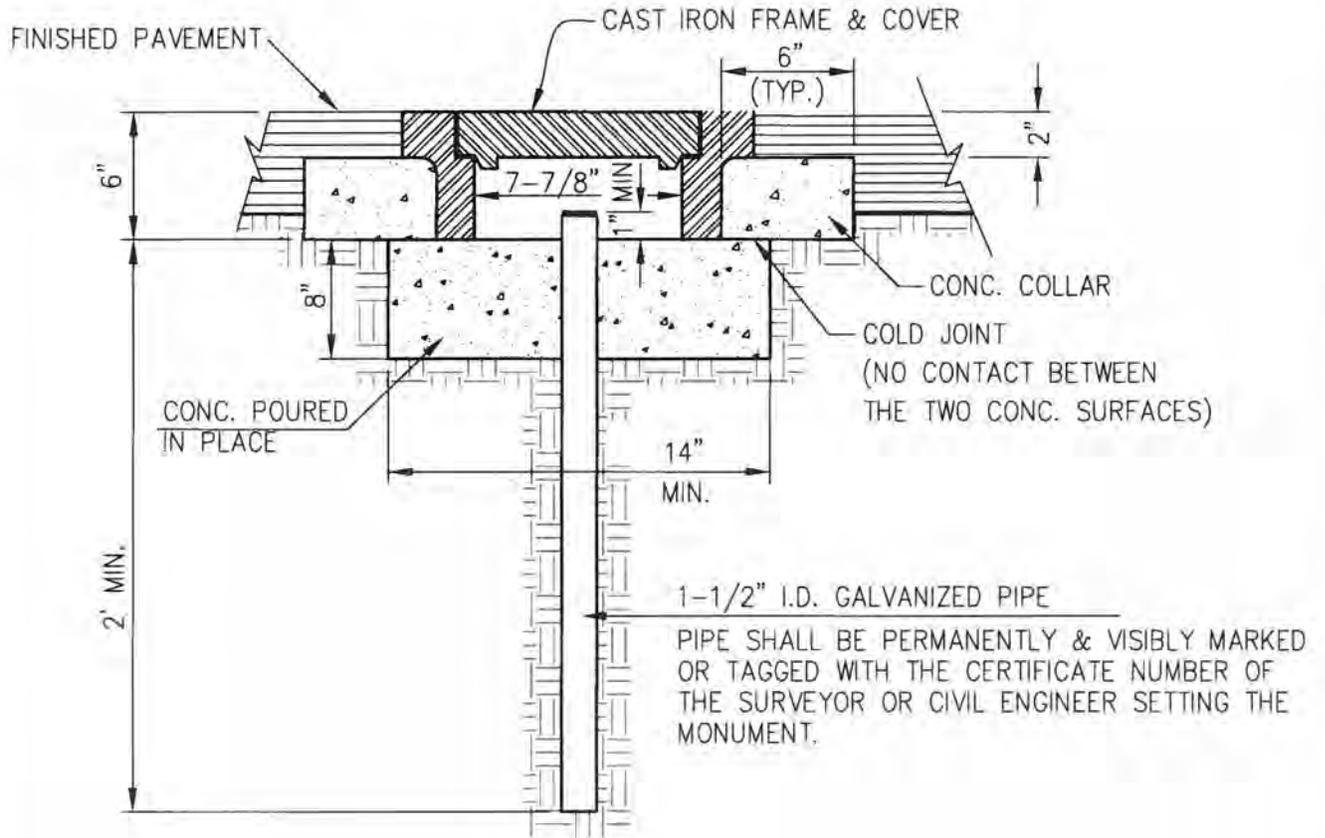
419

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2-2-09
DATE

SHEET 1 OF 1



ELEVATION
NTS

NOTES:

1. FRAME AND COVER SHALL BE ALHAMBRA FOUNDRY NO. A-2925, OR APPROVED EQUAL; CONCRETE SHALL BE CLASS 470-C-2000 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SURVEY MONUMENT - TYPE A

420

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2-2-09
DATE

SHEET 1 OF 1

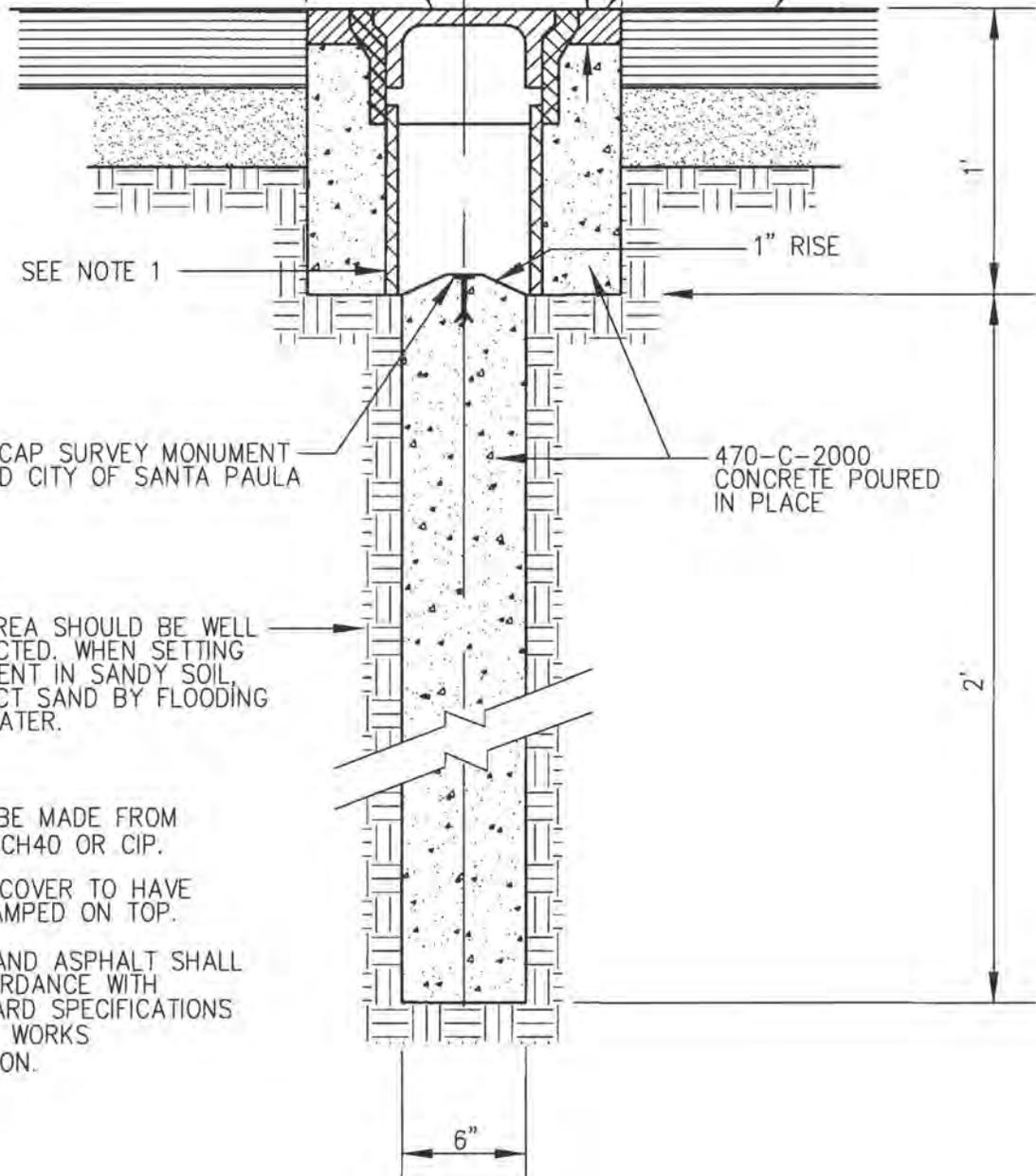
CAST IRON FRAME AND COVER PER ALHAMBRA FOUNDRY A-2925 OR APPROVED EQUAL SEE NOTE 2.

15" MIN.

PATCH WITH A.C. TYPE III C2-AR4000

FINISH SURFACE

2"



SEE NOTE 1

1" RISE

BRASS CAP SURVEY MONUMENT STAMPED CITY OF SANTA PAULA

470-C-2000 CONCRETE POURED IN PLACE

THIS AREA SHOULD BE WELL COMPACTED. WHEN SETTING MONUMENT IN SANDY SOIL, COMPACT SAND BY FLOODING WITH WATER.

NOTES:

1. SLEEVE TO BE MADE FROM VPC, PVC-SCH40 OR CIP.
2. CAST IRON COVER TO HAVE SURVEY STAMPED ON TOP.
3. CONCRETE AND ASPHALT SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

ELEVATION
NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SURVEY MONUMENT - TYPE B

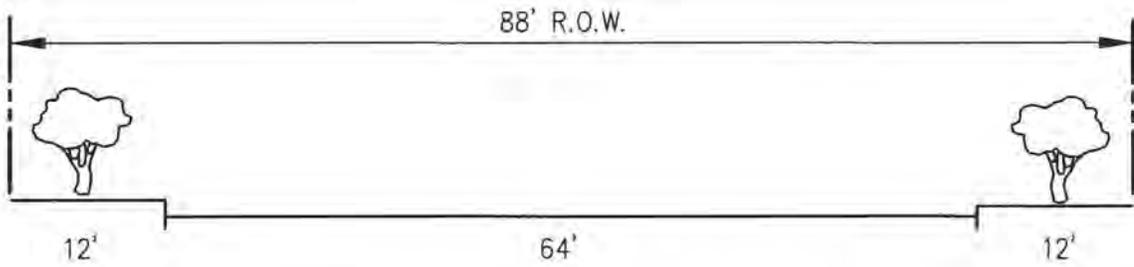
421

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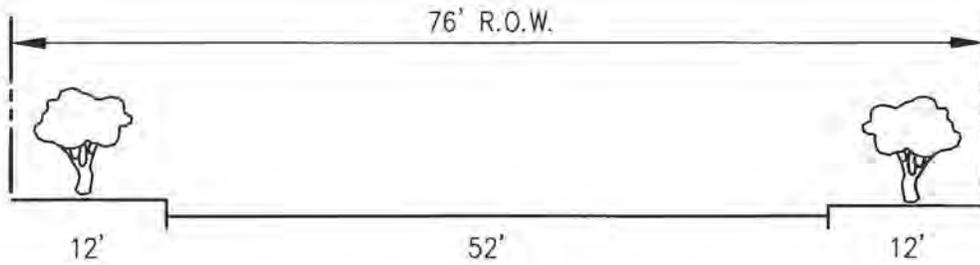
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DATE

SHEET 1 OF 1



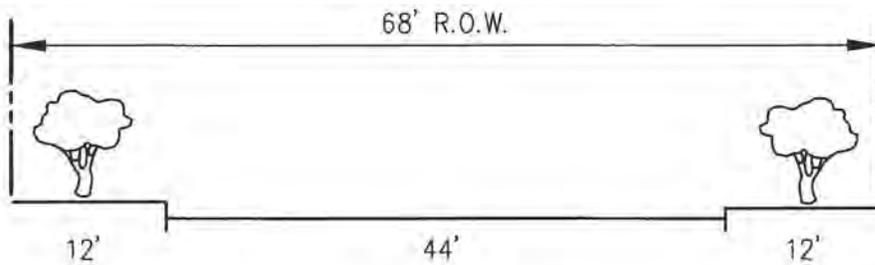
MAJOR COMMERCIAL/INDUSTRIAL STREET

NTS



COMMERCIAL/INDUSTRIAL STREET

NTS



MINOR INDUSTRIAL STREET

NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

STREET CROSS SECTIONS

422

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09
DATE

SHEET 1 OF 6

STREET CROSS SECTIONS:

THE STREET CROSS SECTIONS DEFINE THE GENERAL RIGHT-OF-WAY WIDTH AND CONFIGURATION FOR EACH STREET TYPE PROPOSED WITHIN THE CITY. THE CROSS SECTIONS DESIGNATED WILL GENERALLY BE REQUIRED AS NEW DEVELOPMENT OCCURS ADJACENT TO THE ROADWAY SEGMENTS.

COMMERCIAL/INDUSTRIAL STREET:

- MAJOR COMMERCIAL/INDUSTRIAL STREET (2-4 LANES, 64' CURB-TO-CURB, 88' ROW).

FUNCTIONAL CHARACTERISTICS:

MAJOR COMMERCIAL/INDUSTRIAL STREETS ARE DESIGNED FOR HEAVIER COMMERCIAL/INDUSTRIAL TRAFFIC AND ALLOW FOR VEHICULAR ACCESS TO ADJACENT LAND USES. THESE ROUTES WOULD BE UNDIVIDED AND COULD ACCOMMODATE 4 LANES WITH BIKE LANES OR PARKING, OR 2 LANES WITH BOTH BIKE LANES AND PARKING. THE SIDEWALK/PARKWAY AREA WOULD INCLUDE 12 FEET ON EACH SIDE OF THE ROADWAY.

- COMMERCIAL/INDUSTRIAL STREET (2 LANES, 52' CURB-TO-CURB, 76' ROW).

FUNCTIONAL CHARACTERISTICS:

COMMERCIAL/INDUSTRIAL STREETS ARE DESIGNED FOR INDUSTRIAL TRAFFIC AND PROVIDE FOR ACCESS TO ADJACENT LAND USES. THEIR WIDTH IS SUFFICIENT TO ACCOMMODATE 2 LANES FOR TRAFFIC WITH PARKING. THE SIDEWALK/PARKWAY AREA WOULD CONSIST OF 12 FEET ON EACH SIDE OF THE ROADWAY.

- MINOR INDUSTRIAL STREET (2 LANES, 44' CURB-TO-CURB, 68' ROW).

FUNCTIONAL CHARACTERISTICS:

MINOR INDUSTRIAL STREETS ARE DESIGNED TO ACCOMMODATE LOCAL INDUSTRIAL TRAFFIC. THIS CLASSIFICATION IS THE MINIMUM WIDTH CONSIDERED ADEQUATE FOR INDUSTRIAL STREETS. THE ROADWAY WIDTH IS SUFFICIENT TO ACCOMMODATE TRUCK TRAFFIC, WITH ON-STREET PARKING ALLOWED. THE SIDEWALK/PARKWAY AREA WOULD CONSIST OF 12 FEET ON EACH SIDE OF THE ROADWAY.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

STREET CROSS SECTIONS

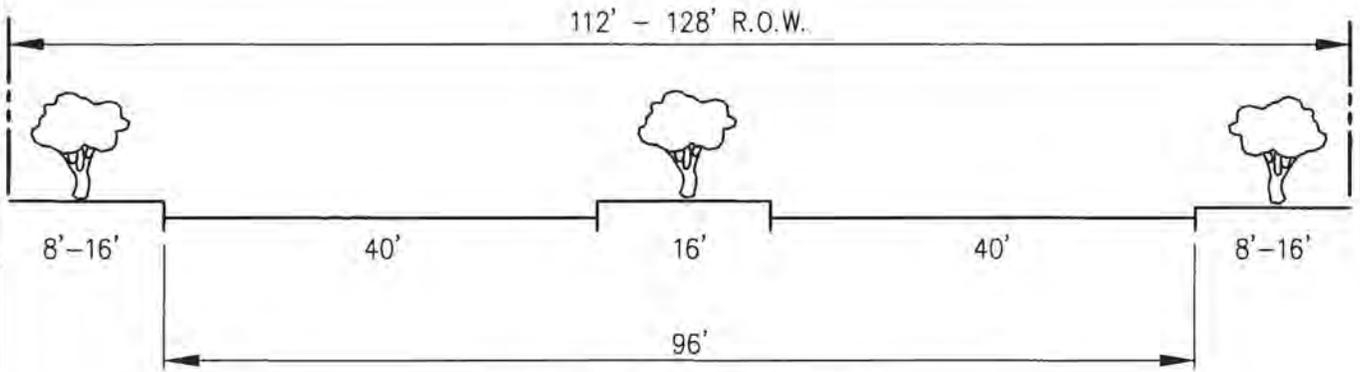
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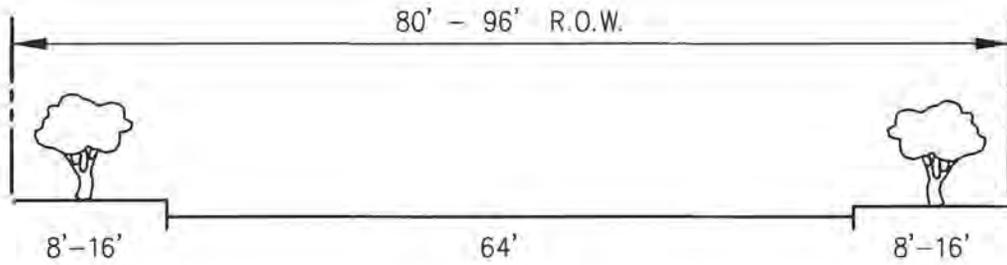
2-2-09
DATE

SHEET 2 OF 6



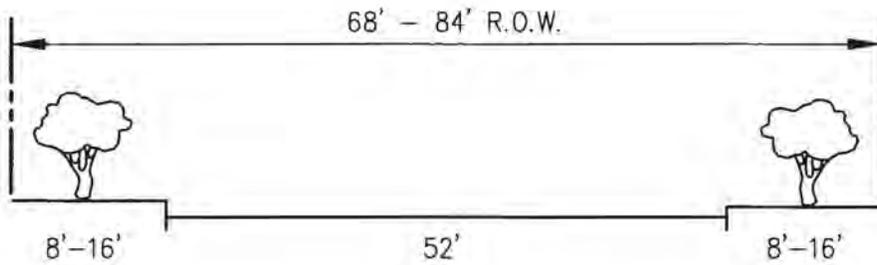
MAJOR ARTERIAL STREET

NTS



ARTERIAL STREET

NTS



MINOR ARTERIAL STREET

NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

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STREET CROSS SECTIONS

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ARTERIALS

- MAJOR ARTERIAL – DIVIDED (4-6 LANES, 96' CURB-TO-CURB, 112' TO 128' ROW).

FUNCTIONAL CHARACTERISTICS:

THESE ARTERIALS CARRY THE HEAVIEST LOCAL TRAFFIC THROUGH THE PLANNING AREA. ACCESS WOULD BE LIMITED ON THESE ROUTES TO PERMIT EFFICIENT, HIGH VOLUME TRAFFIC CIRCULATION. THESE ROUTES WOULD HAVE RAISED MEDIANS, AND COULD ACCOMMODATE BETWEEN 4 AND 6 LANES OF TRAFFIC AND BIKE LANES. TURN CHANNELIZATION WILL ALSO BE PROVIDED AT INTERSECTIONS. THE SIDEWALK/PARKWAY AREA WOULD RANGE BETWEEN 8 TO 16 FEET ON EACH SIDE OF THE ROADWAY. ACCESS TO ADJACENT PROPERTY MAY BE LIMITED.

- MAJOR ARTERIAL – UNDIVIDED (4 LANES, 88' CURB-TO-CURB, 104' TO 120' ROW).

FUNCTIONAL CHARACTERISTICS:

THESE ARTERIALS ARE ALSO DESIGNED TO CARRY HEAVY TRAFFIC VOLUMES, WITH LIMITED LAND USE ACCESS ALONG THE ROUTES TO PERMIT EFFICIENT TRAFFIC CIRCULATION. THESE ROUTES WOULD BE UNDIVIDED (NO MEDIAN), AND COULD ACCOMMODATE 4 LANES OF TRAFFIC WITH BIKE LANES AND PARKING. TURN CHANNELIZATION WILL ALSO BE PROVIDED AT INTERSECTIONS. THE SIDEWALK/PARKWAY AREA WOULD RANGE BETWEEN 8 TO 16 FEET ON EACH SIDE OF THE ROADWAY.

- ARTERIAL (2-4 LANES, 64' CURB-TO-CURB, 80' TO 96' ROW).

FUNCTIONAL CHARACTERISTICS:

THESE ARTERIALS PROVIDE FOR BOTH THROUGH TRAFFIC ACROSS THE CITY AS WELL AS ACCESS TO ADJACENT LAND USES. THESE ROUTES WOULD BE UNDIVIDED AND COULD ACCOMMODATE 4 LANES WITH BIKE LANES OR PARKING, OR 2 LANES WITH BOTH BIKE LANES AND PARKING. LEFT TURN CHANNELIZATION IS TYPICALLY PROVIDED AT MAJOR INTERSECTIONS. THE SIDEWALK/PARKWAY AREA WOULD INCLUDE 8 TO 16 FEET ON EACH SIDE OF THE ROADWAY. INDIVIDUAL RESIDENTIAL LOT ACCESS IS USUALLY RESTRICTED FROM THESE ROADS, WHILE COMMERCIAL AND/OR INDUSTRIAL ACCESS IS ALLOWED AT SELECTED LOCATIONS.

- MINOR ARTERIAL (2 LANES, 52' CURB-TO-CURB, 68' TO 84' ROW).

FUNCTIONAL CHARACTERISTICS:

MINOR ARTERIALS REPRESENT THE SMALLEST OF THE ARTERIAL STREET CLASSIFICATIONS. THESE ROADWAYS PROVIDE FOR BOTH THROUGH TRAFFIC ACROSS THE CITY AS WELL AS GOOD ACCESS TO ADJACENT LAND USES. MINOR ARTERIALS COULD ACCOMMODATE 2 TRAVEL LANES WITH BIKE LANES AND PARKING. LEFT-TURN CHANNELIZATION IS TYPICALLY PROVIDED AT MAJOR INTERSECTIONS. THE SIDEWALK/PARKWAY AREA WOULD INCLUDE 8 TO 16 FEET ON EACH SIDE OF THE ROADWAY. ACCESS TO ADJACENT LAND USES IS GENERALLY ALLOWED AT SELECTED LOCATIONS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

STREET CROSS SECTIONS

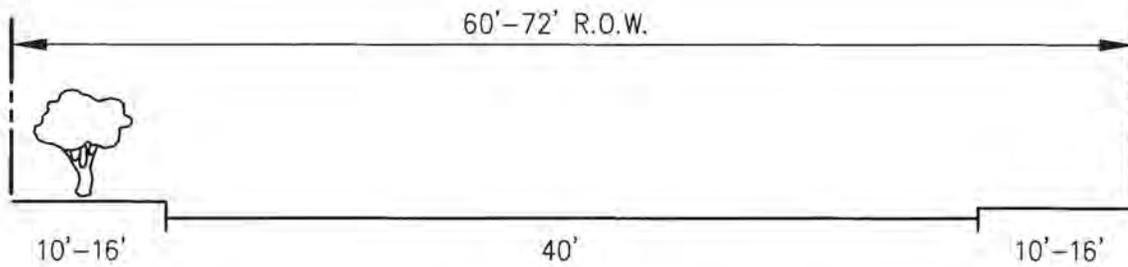
422

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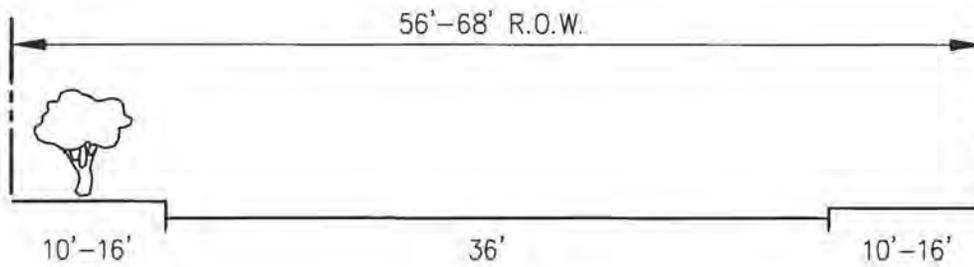
2-2-09
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SHEET 4 OF 6



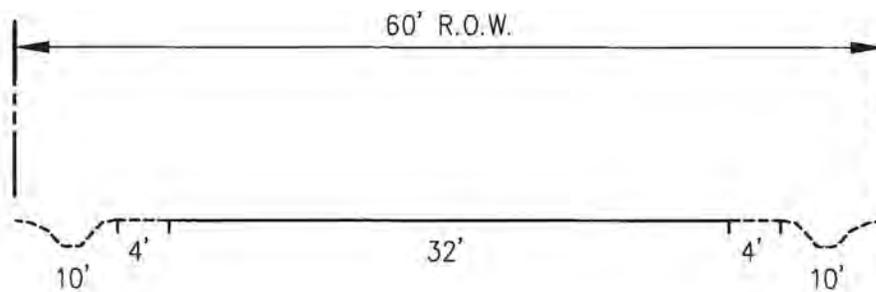
RESIDENTIAL COLLECTOR STREET

NTS



RESIDENTIAL STREET

NTS



ESTATE RESIDENTIAL STREET

NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

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STREET CROSS SECTIONS

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RESIDENTIAL STREETS

- RESIDENTIAL COLLECTOR STREET (2 LANES, 40' CURB-TO-CURB, 60' TO 72' ROW).

FUNCTIONAL CHARACTERISTICS:

RESIDENTIAL COLLECTOR STREETS CONNECT LOCAL STREETS TO ARTERIAL STREETS. SEVERAL NEIGHBORHOODS MAY BE ACCESSED BY COLLECTOR STREETS. THIS CLASSIFICATION ALLOWS FOR 2 VEHICLE LANES AND PARKING ON EACH SIDE OF THE STREET. PARKING RESTRICTIONS ON WIDENING MAY BE REQUIRED AT INTERSECTIONS TO PROVIDE FOR TURN CHANNELIZATION AND/OR TRANSIT BUS STOPS. THE CURB-TO-CURB STREET WIDTH MAY BE REDUCED BY 6 FEET IN CERTAIN AREAS IF THE CITY ENGINEER FINDS THAT REDUCED DEMANDS FOR ON-STREET PARKING WILL ALLOW FOR PARKING TO BE PROHIBITED ON ONE SIDE OF THE ROADWAY. THE SIDEWALK/PARKWAY AREA WOULD TYPICALLY INCLUDE 16 FEET ON EACH SIDE OF THE ROADWAY, BUT MAY BE REDUCED TO 10' IN CERTAIN AREAS. IN HILLSIDE AREAS, THE SIDEWALK/PARKWAY AREA WOULD CONSIST OF 8 FEET ON ONE SIDE AND 3 FEET ON THE OTHER SIDE OF THE ROADWAY.

- RESIDENTIAL STREET (2 LANES, 36' CURB-TO-CURB, 56' TO 68' ROW).

FUNCTIONAL CHARACTERISTICS:

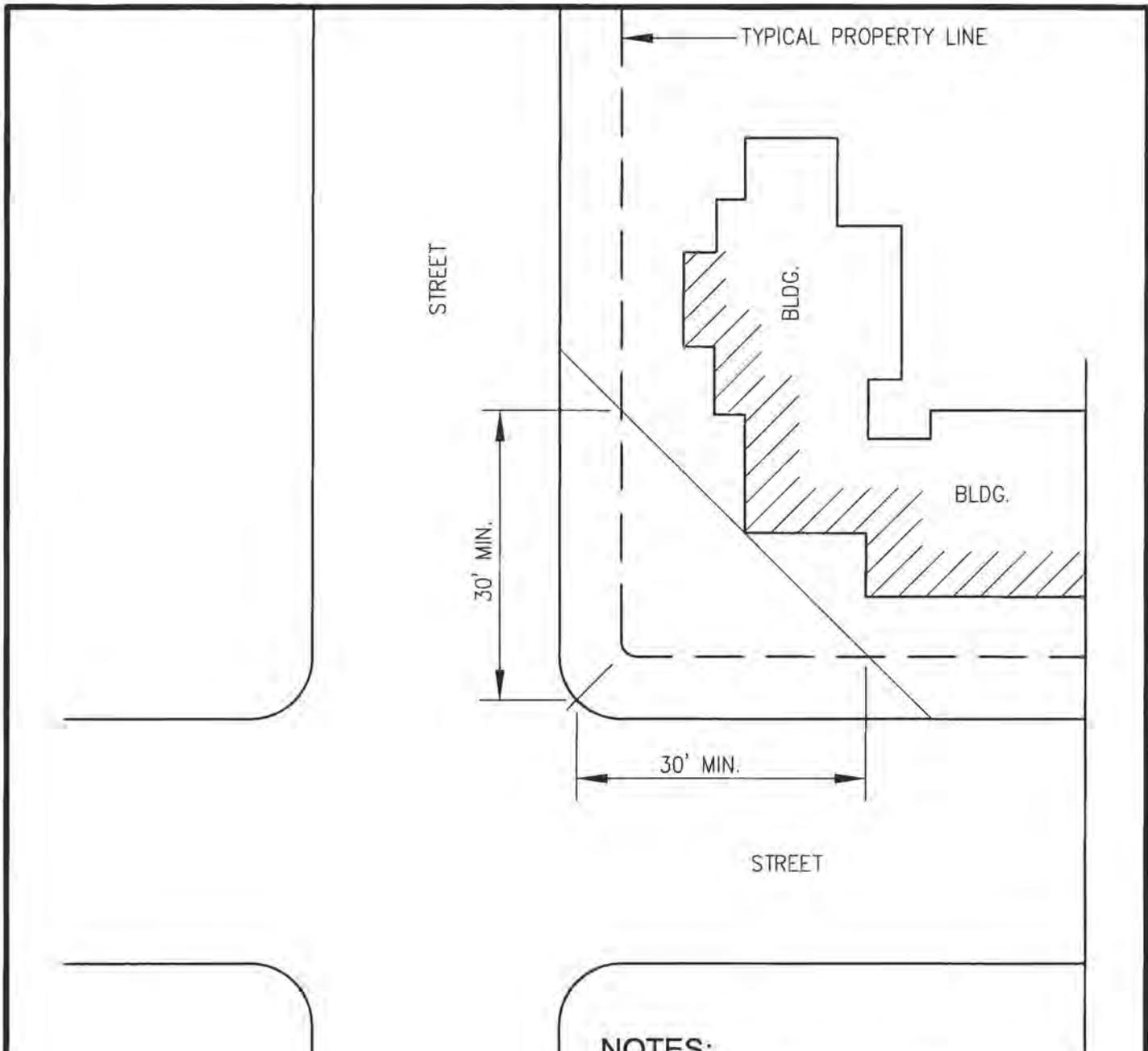
RESIDENTIAL STREETS ARE DESIGNED TO SERVE INDIVIDUAL SUBDIVISIONS AND NEIGHBORHOODS WITHIN RESIDENTIAL AREAS. THEY ARE NOT APPROPRIATE FOR USE IN NON-RESIDENTIAL AREAS, DUE TO THEIR LACK OF ADEQUATE WIDTH FOR PARKING AND TRAVEL LANES, PARTICULARLY IN AREAS WITH TRUCK ACTIVITY. THE CURB-TO-CURB STREET WIDTH MAY BE REDUCED BY 6 FEET IN CERTAIN AREAS IF THE CITY ENGINEER FINDS THAT REDUCED DEMANDS FOR ON-STREET PARKING WILL ALLOW FOR PARKING TO BE PROHIBITED ON ONE SIDE OF THE ROADWAY. THE SIDEWALK/PARKWAY AREA WOULD TYPICALLY INCLUDE 16 FEET ON EACH SIDE OF THE ROADWAY, BUT MAY BE REDUCED TO 10 FEET IN CERTAIN AREAS. IN HILLSIDE AREAS, THE SIDEWALK/PARKWAY AREA WOULD CONSIST OF 8 FEET ON THE SIDE AND 3 FEET ON THE OTHER SIDE OF THE ROADWAY.

- ESTATE RESIDENTIAL STREET (2 LANES, 32' CURB-TO-CURB, 60' ROW).

FUNCTIONAL CHARACTERISTICS:

ESTATE RESIDENTIAL STREETS ARE DESIGNED TO SERVE RURAL RESIDENTIAL DEVELOPMENTS WITH LOW DENSITIES AND MINIMAL TRAFFIC VOLUMES. THESE ROADWAYS WOULD CONSIST OF 2 TRAVEL LANES WITH GRAVEL SHOULDERS. THE PARKWAY AREA WOULD INCLUDE 14 FEET ON EACH SIDE. NO SIDEWALKS WOULD BE PROVIDED.

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	STREET CROSS SECTIONS		422
	APPROVED BY:	 PUBLIC WORKS DIRECTOR / CITY ENGINEER	2-2-09 DATE



NOTES:

THE MAXIMUM HEIGHT OF OBSTRUCTIONS WITHIN THE TRAFFIC SAFETY SITE AREA IS 48" WHERE VISIBILITY THROUGH THE OBSTRUCTION EXCEEDS 50% AND 42" WHERE VISIBILITY THROUGH THE OBSTRUCTION IS LESS THAN 50%. TREES, POLES, AND OTHER OBJECTS MAY EXCEED THIS LIMIT PROVIDED ONLY THE NARROW PORTION OF THE TRUNK OR POLE OBSTRUCTS THE LINE OF SIGHT. REF. SANTA PAULA MUNICIPAL CODE #70.09



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

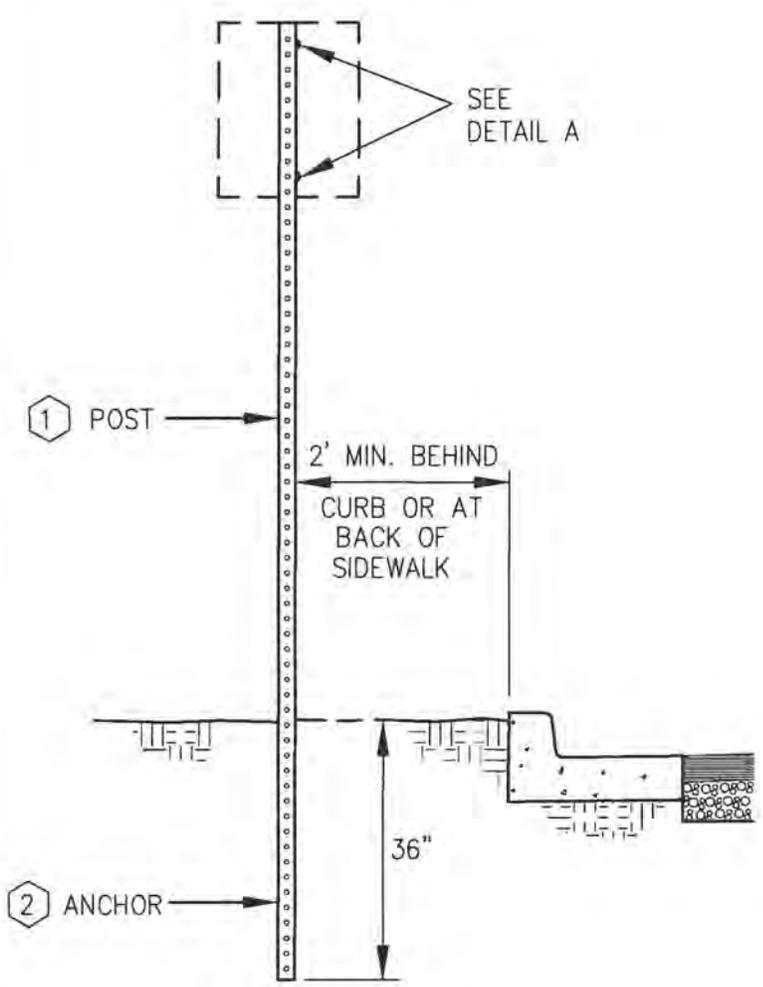
SIGHT AREA AT STREET CORNERS

423

APPROVED BY:

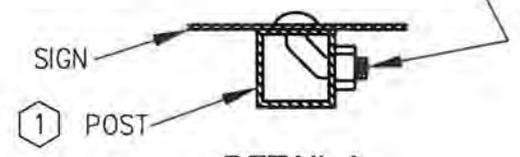
Clifford G. Finley 2-2-09
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SHEET 1 OF 1



ELEVATION
NTS

1-11/32" x 31/32" THRD. x 5/16" ϕ
CORNER BOLT WITH 5/16" SELF
LOCKING NUT



DETAIL A
SIGN MOUNTING
NTS

LEGEND

- 1 POST - 1-3/4" x 1-3/4" SQUARE PERFORATED 0.105" GALVANIZED STEEL TUBING (PAINTED GREEN)
- 2 ANCHOR - 2" x 2" x 36", SQUARE PERFORATED 0.105" GALVANIZED STEEL TUBING (PAINTED GREEN)



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

SIGN POST

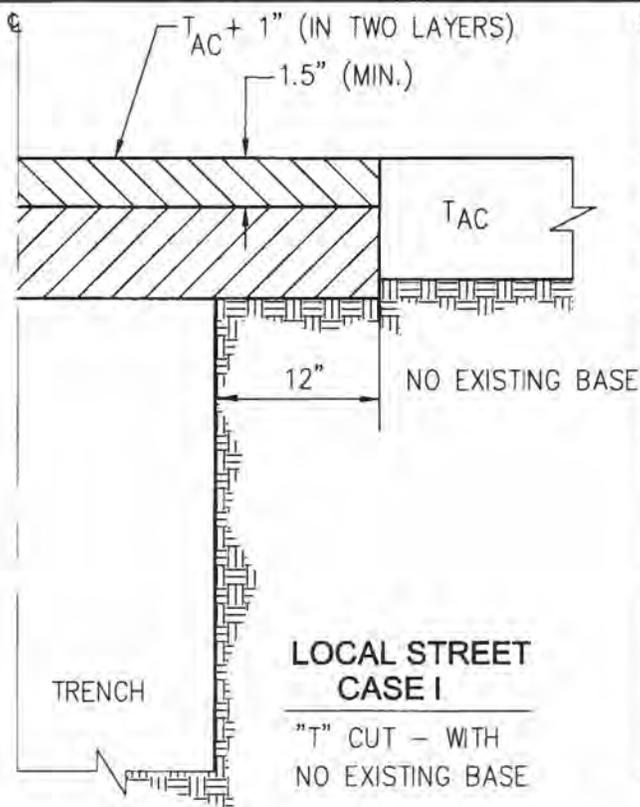
424

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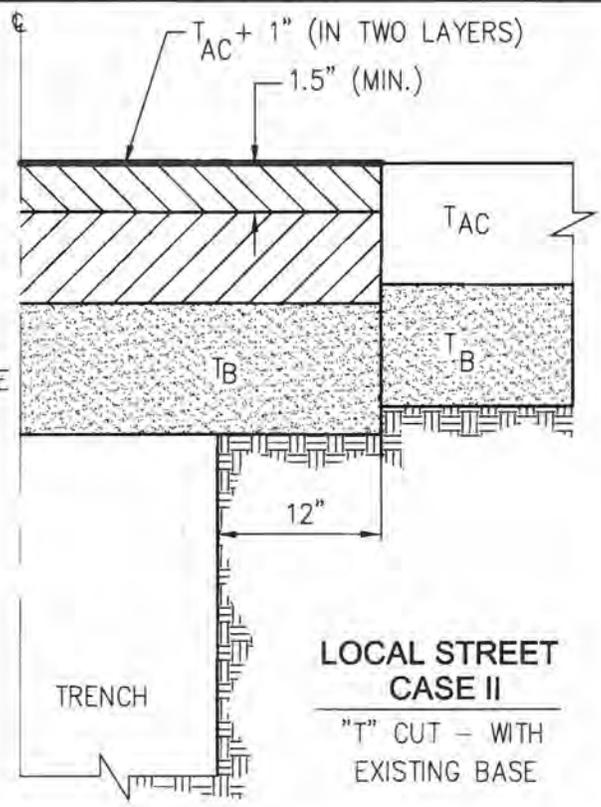
2-2-09
DATE

SHEET 1 OF 1



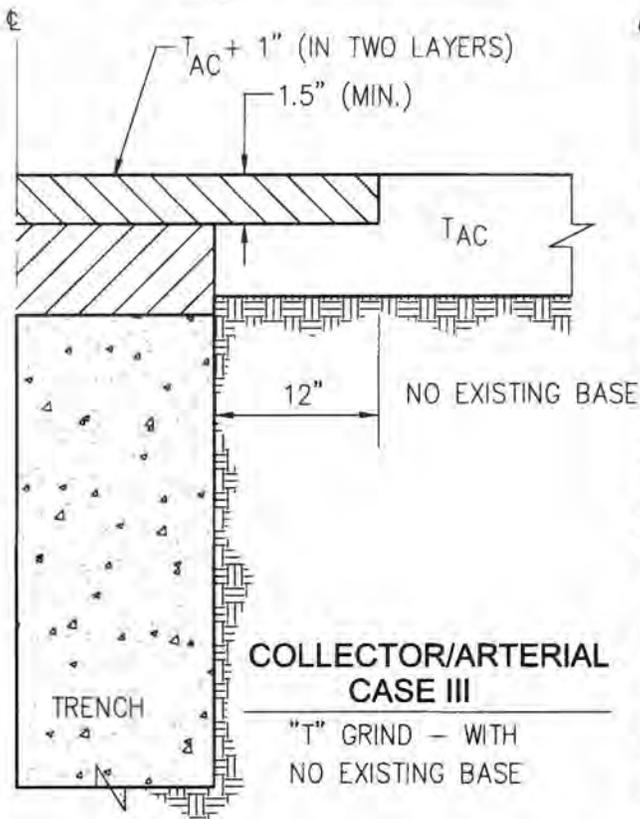
LOCAL STREET CASE I

"T" CUT - WITH NO EXISTING BASE



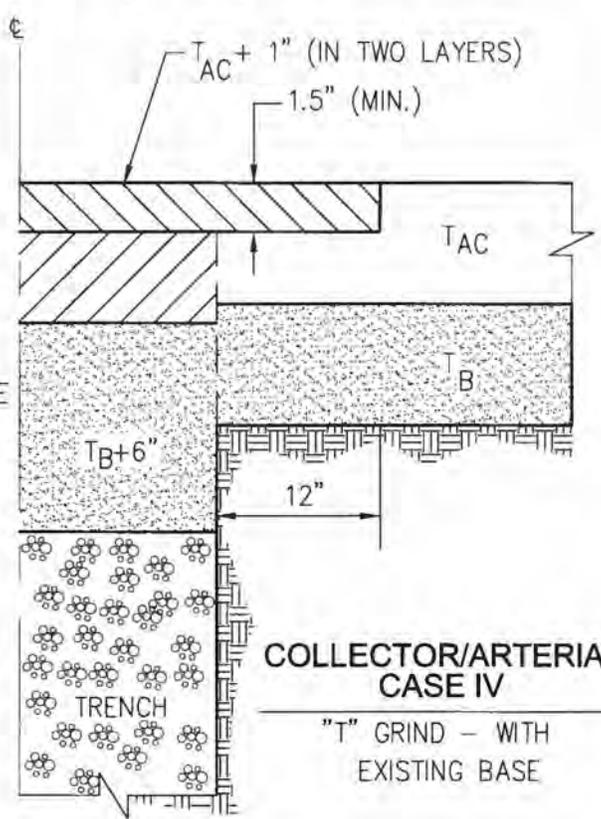
LOCAL STREET CASE II

"T" CUT - WITH EXISTING BASE



COLLECTOR/ARTERIAL CASE III

"T" GRIND - WITH NO EXISTING BASE



COLLECTOR/ARTERIAL CASE IV

"T" GRIND - WITH EXISTING BASE

REFER TO CITY STD. PLAN 103 FOR TRENCH DETAILS AND SPECIFICATIONS.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

A.C. TRENCH RESURFACING

425

APPROVED BY:

Clifford G. Finley
PUBLIC WORKS DIRECTOR / CITY ENGINEER

2-2-09
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SHEET 1 OF 3

1. PAVEMENT REMOVAL: ALL PAVEMENT REMOVAL SHALL BE MADE ALONG STRAIGHT LINE SAW CUTS AT A MINIMUM DEPTH OF 1.5 INCHES AND SHALL HAVE A UNIFORM WIDTH AND PARALLEL EDGES, UNLESS DIRECTED OTHERWISE BY THE CITY'S REPRESENTATIVE
2. STANDARD PATCH: THE STANDARD ASPHALT CONCRETE PATCH SHOWN ON STANDARD PLAN ES005 SHEET 1 IS APPLICABLE TO LOCAL STREETS (CASE I OR CASE II), DEPENDING ON THE EXISTING PAVEMENT SECTION.
3. COLD PLANING: COLD PLANED ASPHALT CONCRETE PATCH AS SHOWN ON STANDARD PLAN ES005 SHEET 1 (CASE III OR CASE IV) IS APPLICABLE TO ARTERIAL AND COLLECTOR STREETS AS SHOWN ON STANDARD PLAN ES005 SHEET 3. MINIMUM DEPTH OF COLD PLANE ALONG TRENCH IS 1.5 INCHES. THE CONTACT EDGES SHALL THEN BE SEALED WITH EMULSIFIED ASPHALTIC OIL. THE CITY'S REPRESENTATIVE MAY WAIVE THE REQUIREMENTS FOR COLD PLANED ASPHALT CONCRETE PATCHING FOR EXCAVATIONS LOCATED OUTSIDE THE TRAVEL WAY.
4. ENHANCED BACKFILL: ENHANCED BACKFILL (1-1/2 SACK CEMENT SAND SLURRY) IS REQUIRED (EXCEPT IN THE PIPE ZONE) ON ALL ARTERIALS AND MAJOR COLLECTORS (AS SHOWN ON SHEET 3). THE CITY'S REPRESENTATIVE MAY WAIVE THE REQUIREMENTS FOR SLURRY BACKFILL FOR EXCAVATIONS LOCATED OUTSIDE THE TRAVEL WAY.
5. TEMPORARY AC PAVEMENT: TEMPORARY AC PAVEMENT RESURFACING SHALL BE PLACED AT THE CONTRACTOR'S EXPENSE, IMMEDIATELY AFTER BACKFILLING, UNLESS DIRECTED OTHERWISE BY THE CITY'S REPRESENTATIVE. IT SHALL BE PLACED LEVEL WITH THE EXISTING PAVEMENT ON COMPACTED TRENCH BACKFILL AND SHALL BE A MINIMUM OF 2 INCHES THICK.
6. PERMANENT AC PAVEMENT: PERMANENT AC PAVEMENT RESURFACING SHALL BE OF HOT ASPHALT CONCRETE MIX AND SHALL BE INSTALLED WITHIN TWO (2) WEEKS AFTER BACKFILLING OF TRENCHES HAS BEEN COMPLETED, AND ONLY AFTER SETTLEMENT HAS TAKEN PLACE AND THE FILL SURFACE HAS SUFFICIENTLY DRIED. ASPHALT RESURFACING SHALL BE MINIMUM 4 INCHES THICK AND INSTALLED IN TWO (2) LIFTS. BASE COURSE, TYPE III B2-AR8000, SHALL BE A MINIMUM OF 2.5 INCHES THICK. FINISH COURSE, TYPE III C2-AR8000, SHALL BE A MINIMUM OF 1.5 INCHES THICK.
7. TACK COAT: TACK COAT SHALL BE APPLIED TO ALL CONTACT SURFACES OF EXISTING PAVEMENT, MANHOLE FRAMES AND SHAFTS, AND CONCRETE SURFACES BEFORE THE PERMANENT ASPHALT TRENCH RESURFACING IS APPLIED.
8. THE TOTAL NUMBER OF MAIN LINE POPOUTS AND MAIN LINE TRANSITIONS SHALL NOT EXCEED ONE PER 100 LINEAL FEET OF MAIN LINE. THE TOTAL NUMBER OF LATERAL POPOUTS AND LATERAL WIDTH TRANSITIONS SHALL NOT EXCEED ONE PER 100 LINEAL FEET OF LATERAL. POPOUTS OR WIDTH TRANSITIONS AT SUBSTRUCTURES ARE EXCLUDED FROM THE AFOREMENTIONED LIMITATIONS.
9. ENCROACHMENT EXCAVATIONS WITHIN THE TRAFFIC LANES OF ANY PAVED STREET THAT EXCEED 250 FEET IN LENGTH MEASURED PARALLEL TO THE CENTER LINE OF THE STREET, SHALL BE PAVED USING A SELF PROPELLED MECHANICAL SPREADING AND FINISHING MACHINE FOR PLACEMENT OF THE TOP LAYER OF ASPHALT PAVING MATERIAL.
10. CASE I AND CASE II SHALL APPLY TO LOCAL STREETS.
CASE III AND CASE IV SHALL APPLY TO ARTERIAL AND COLLECTORS STREETS.



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A.C. TRENCH RESURFACING

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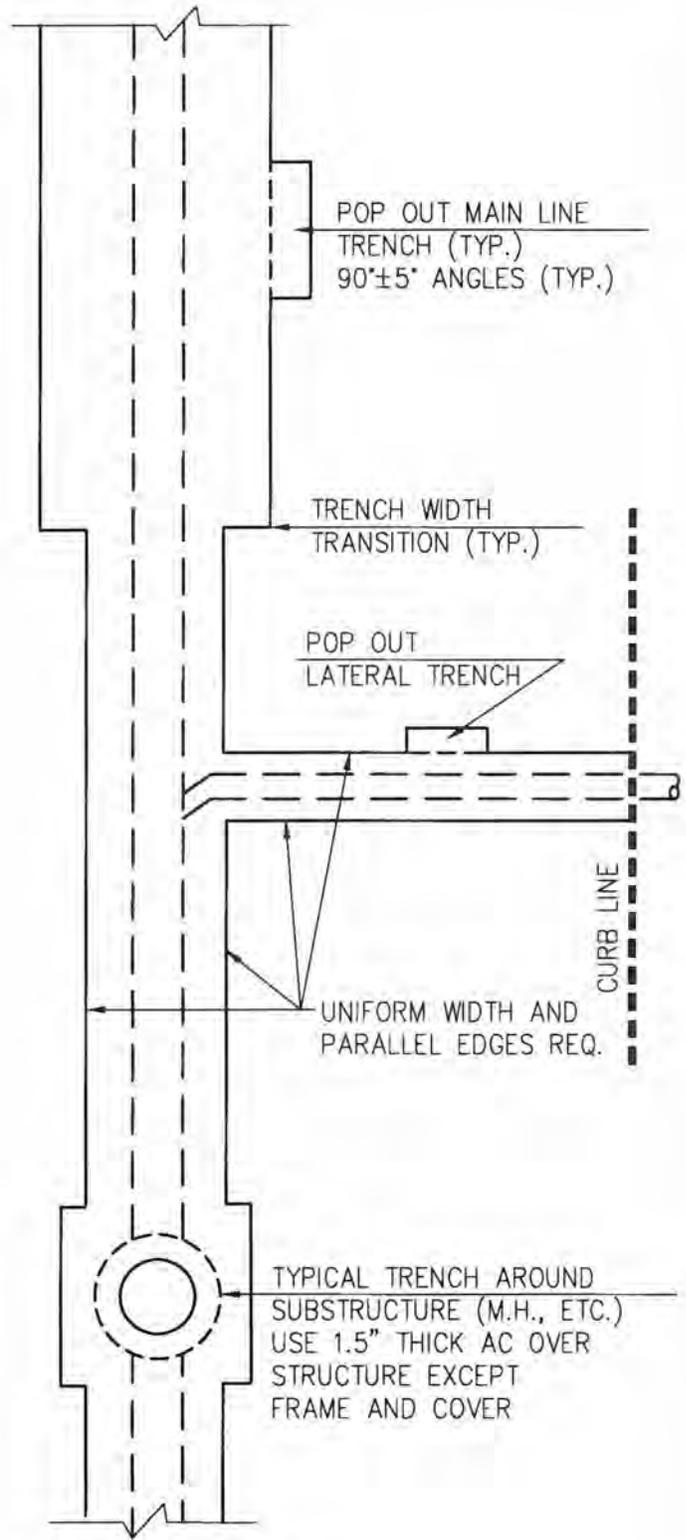
PARALLEL
TANGENTS



A. CURVED ALIGNMENT

USE SHORT STRAIGHT TANGENTS TO FORM PARALLEL EDGES AND UNIFORM TRENCH WIDTH ON CURVED ALIGNMENT.

MAXIMUM ALLOWABLE POP OUTS AND TRANSITIONS = ONE PER 100 L.F. OF TRENCH - (COMPUTED SEPARATELY FOR MAIN LINE TRENCH AND LATERALS), UNLESS APPROVED OTHERWISE BY THE CITY'S REPRESENTATIVE.



POP OUT MAIN LINE
TRENCH (TYP.)
90°±5° ANGLES (TYP.)

TRENCH WIDTH
TRANSITION (TYP.)

POP OUT
LATERAL TRENCH

UNIFORM WIDTH AND
PARALLEL EDGES REQ.

TYPICAL TRENCH AROUND
SUBSTRUCTURE (M.H., ETC.)
USE 1.5" THICK AC OVER
STRUCTURE EXCEPT
FRAME AND COVER

CURB LINE

B. STRAIGHT ALIGNMENT



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

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SHEET 3 OF 3

1 GENERAL ROAD DESIGN GOALS AND PROCEDURES

All streets and roadways to be build within and made part of the City road system shall be designed to conform to these standards. Where standards are not definitive, design shall conform to good engineering practice approved by the Public Works Director. The Caltrans Design Manuals generally provide guidance in "good engineering practice" of road design.

The Public Works Director may issue, modify, revise or cancel standards showing engineering and construction details for roadways and other construction.

Deviation from Right-of-way and improvements of these standards shall be allowed only with the approval of the Public Works Director. Deviation from the technical requirements of the standards may be granted by the Public Works Director. Any request for deviation from the requirements of these standards must be accompanied with sufficient supporting data. The applicant requesting the deviations shall provide the supporting data well in advance and obtain the approval prior to utilizing the proposed deviation in his design.

Turning lanes at the intersections and bicycle lanes may require Right-of-way and improvement widths greater than those shown on the graphic design standards.

Design loading for box culverts and bridges on all roadways shall be AASHTO H-20.

Vertical clearance on all roadways shall be 16 feet minimum.

Sight distance on all curvilinear roads shall be per Table 3-1.

2 GRADES

2-1 LONGITUDINAL GRADE:

All streets and roadways shall have minimum grade of 0.40% on straight reach. On curved alignment, minimum grade of 0.40% is required on outer radius of the curve. This will entail steeper grades along centerline of the roadway.

2-2 Minimum grade of cross-gutter and spandrel flow line shall be 0.50%. This grade will be required on centerline of the street parallel to the cross-gutter. Cross fall of the pavement shall not be adjusted to accomplish the required grade of the flow line.

2-3 Minimum grade across "Knuckle" is 0.40% along outer curb. This will require steeper grades along centerline and inner curb line.

2-4 Minimum grade on flow line of a cul-de-sac shall be 0.40%. Adjust the centerline grade such that cross-f all ranges between 1.60% minimum and 3.6% maximum.

2-5 TRANSVERSE GRADE:

More commonly known as cross fall shall be not less than 1.60%. Preferable value of the cross fall is 2.00%. It shall not be more than 3.60% unless approval of higher value is granted by the Public Works Director.

2-6 GRADE BREAKS:

Grade breaks on all streets and roadways shall be limited to 0.50% maximum. Where grade differential is greater than 0.50% vertical curve shall be required per Table-3 of Section 3-4. A maximum of 1.00% grade break is allowed on curb returns before a vertical curve is required. For the ease of plan checking show your grade break points on profile. Also, show tangent grades in parentheses when actual finish surface profile is a vertical curve. Grade breaks must not be closer together than the length of vertical curve for grade changes of 1.00%.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

ROAD DESIGN STANDARDS

426

APPROVED BY:

Clifford G. Finley 2-2-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

SHEET 1 OF 4

3 GEOMETRIC DESIGN STANDARDS

3-1 HORIZONTAL CURVES:

Minimum horizontal curve design criteria for streets and roadways within the City jurisdiction shall be as summarized as follows in Table 3-1.

TABLE 3-1 MINIMUM HORIZONTAL CURVE DESIGN CRITERIA

DESIGN CRITERIA	RES. STREETS	COMMERC/ INDUSTRIAL	LOCAL/SEC. ARTERIAL	PRIMARY ARTERIAL
Design Speed (m.p.h.)	30	35	45	55
Minimum Centerline radius (feet)	200	300	850	1,150
Min. horizontal sight distance (ft.)	200	250	370	510
Min. reverse curve tangent (feet)	100	200	300	500
Minimum approach tangent at intersections (feet)	100	200	300	500

3-2 MINIMUM CURB RETURN AND PROPERTY LINE RADII:

Minimum curb return and property line radii shall be as follows:

TABLE 3-2 MINIMUM RADII AT INTERSECTIONS

Type of Intersection	Curb Return	Property Line
Residential to Residential	25'	12'
Residential to Commercial/Industrial	30'	17'
Comm/Industrial to Comm/Industrial	30'	17'
Comm/Industrial to Local Collector	30'	15'
Comm/Industrial to Primary Arterial	35'	20'
Local Collector to Local Collector	35'	20'
Local Collector to Primary Arterial	40'	25'
Primary Arterial to Primary Arterial	40'	25'

3-3 ROAD WIDTH TRANSITION TAPERS:

When constructing a roadway that will directly connect with an existing roadway of less width, it is necessary to install a transition taper between the two. The length of taper depends upon the offset difference between the outside traveled edge of the two sections and the speed limit or design speed as shown in the taper formula below. These values are not to be used in the design of speed change or left turn storage lanes.

$$L = S \times W \dots \text{for speed } \geq 40 \text{ m.p.h.}; \quad \text{and} \quad L = W S^2 / 60 \dots \quad \text{for speed } < 40 \text{ m.p.h.}$$

Where, L = Length of taper (100' Minimum); W = Width of offset (feet)

S = Numerical value of posted speed limit or 85th%ile speed.

3-4 VERTICAL CURVES:

Minimum vertical curve design criteria for streets and roadways within the City jurisdiction are based on Caltrans' design formulas. The adopted stopping sight distances for various speeds are as given below. The minimum length of vertical curves to maintain required sight distances and smooth riding characteristics are as given in Table 3-3.

TABLE 3-3 MINIMUM VERTICAL CURVE DESIGN CRITERIA

A = Algebraic difference in grades. For values of "A" between tabulated values, use next higher value to derive required vertical curve length.



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ROAD DESIGN STANDARDS

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B = Length of vertical curve at bulb end of cul-de-sac.

DESIGN SPEED		25 m.p.h.		30 m.p.h.		35 m.p.h.		40 m.p.h.		45 m.p.h.	
Stopping Sight Dist.		160 feet		200 feet		250 feet		310 feet		370 feet	
A	B	SAG	CREST	SAG	CREST	SAG	CREST	SAG	CREST	SAG	CREST
0.50	0	0	0	0	0	0	0	0	0	0	0
1	10	10	10	10	10	10	10	10	10	10	20
2	10	10	10	20	20	20	20	20	20	20	30
3	10	20	20	20	20	30	30	30	30	40	40
4	10	20	20	30	30	40	40	40	40	60	80
5	20	30	30	40	40	80	50	130	160	180	280
6	20	80	30	130	70	190	170	250	270	320	400
7	30	130	60	180	130	250	230	330	350	410	500
8	30	160	100	220	170	300	270	390	420	490	600
9	40	190	120	260	210	350	320	460	490	560	700
10	40	220	150	300	230	400	360	520	550	650	800
11	50	240	180	330	260	450	410	580	620	730	900
12	50	270	200	370	290	500	450	650	690	810	1,000
13	60	300	220	400	320	550	500	720	760	890	1,100
14	60	320	240	440	350	600	550	780	830	970	1,200

4 INTERSECTION:

All at-grade intersections provide linkage between two or more streets. Design considerations should be such that intersections provide smooth riding characteristics and ample unobstructed sight distances. Minimize the use of cross-gutters, whenever possible. Also, all intersections and certain approach distances withstand greater acceleration and deceleration forces. To help minimize the wear and tear of the pavement, increase the design value of the traffic index (TI) by 0.5 and upgrade structural section. If the intersection is formed by the junction of two or more roadways, then the entire intersection shall be designed for the upgraded TI of the street with higher TI. The entire intersection means, full pavement width traversing along main street from the beginning of first curb return to the end of last curb return plus the maximum coverage of the secondary street by extending perpendicular lines from the farthest end of curb returns.

The approach distances shall be those sight distances given in Table-1 and measured beyond the limit of the intersection as defined above. The approaches on main street shall be designed for the TI = designed TI for the roadway + 0.50. Similarly the approaches on secondary street shall be designed for TI = designed TI for the secondary street + 0.50. This could be accomplished by thickening asphalt concrete and/or base material or any combination thereof.

5 MATERIAL TESTING:

All design for thickness of pavements, including soils testing, and all control testing during construction shall be performed by a Materials Engineer. A Materials Engineer acceptable to the Public Works Director shall be employed and paid by the developer of any land development project and by permittee on job requiring permits. The Materials Engineer, or a consulting Soils Engineer employed by the City, shall be the Materials Engineer on City projects. A materials engineer shall be a Registered Civil Engineer knowledgeable in the field of Soil mechanics and road building materials.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

ROAD DESIGN STANDARDS

426

APPROVED BY:

Clifford G. Finley 2-2-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

6 TEST METHODS AND REPORTS:

Materials shall be tested in accordance with "City Standard Specifications," as well as those supplementary test methods required by the Public Works Director. Appropriate number of soils tests shall be made, as required, prior to pavement design. Tests for pavement design shall not be done until rough grading has been completed to within one foot of final finish surface grade, nor until it is assured that the soils sampled are representative of those at the final grade.

Sufficient number of tests shall be made during construction to assure that the quality of construction and component materials is equal to that required by the specifications. These test requirements include, but not limited to, fill densities and bearing capacities, subgrade and base quality, gradation and compaction. When treated soil or aggregate base is used, a quality control plan must be submitted and approved by the City.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

ROAD DESIGN STANDARDS

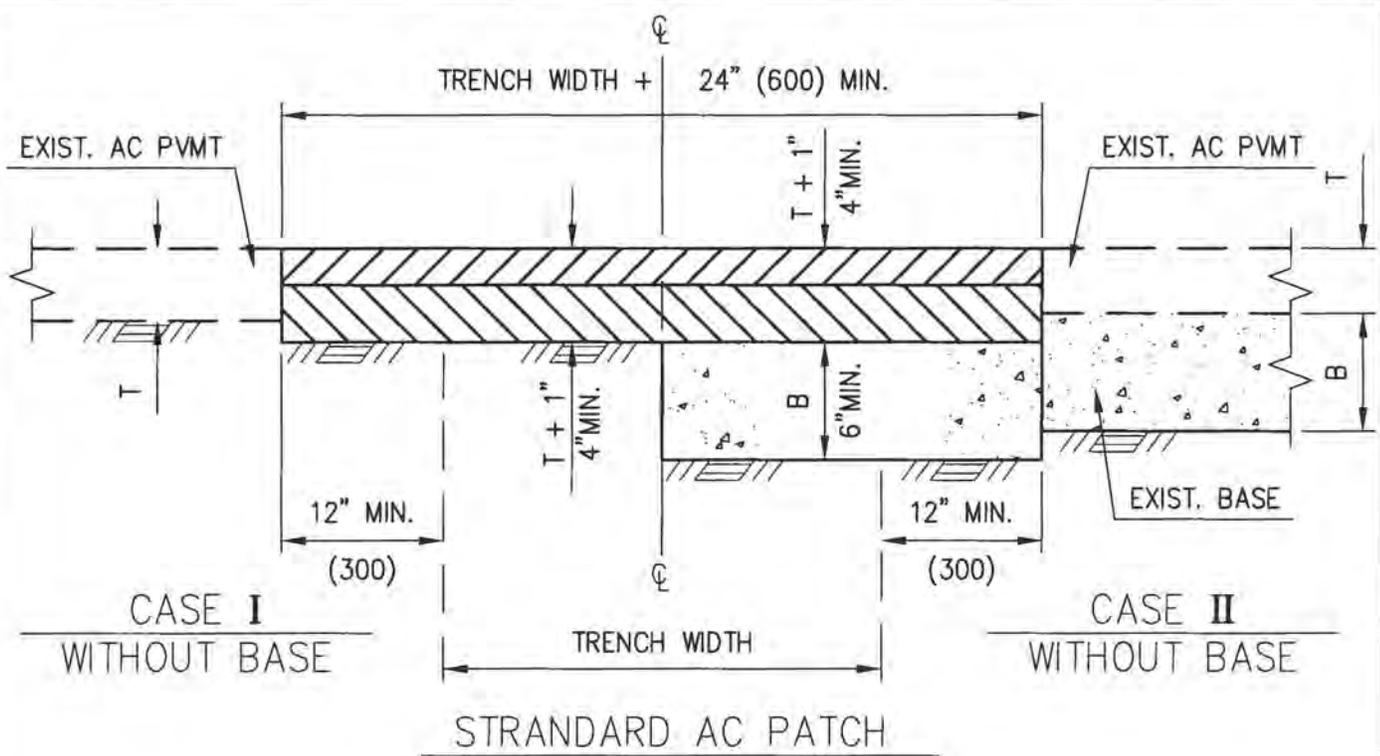
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2-2-09
DATE

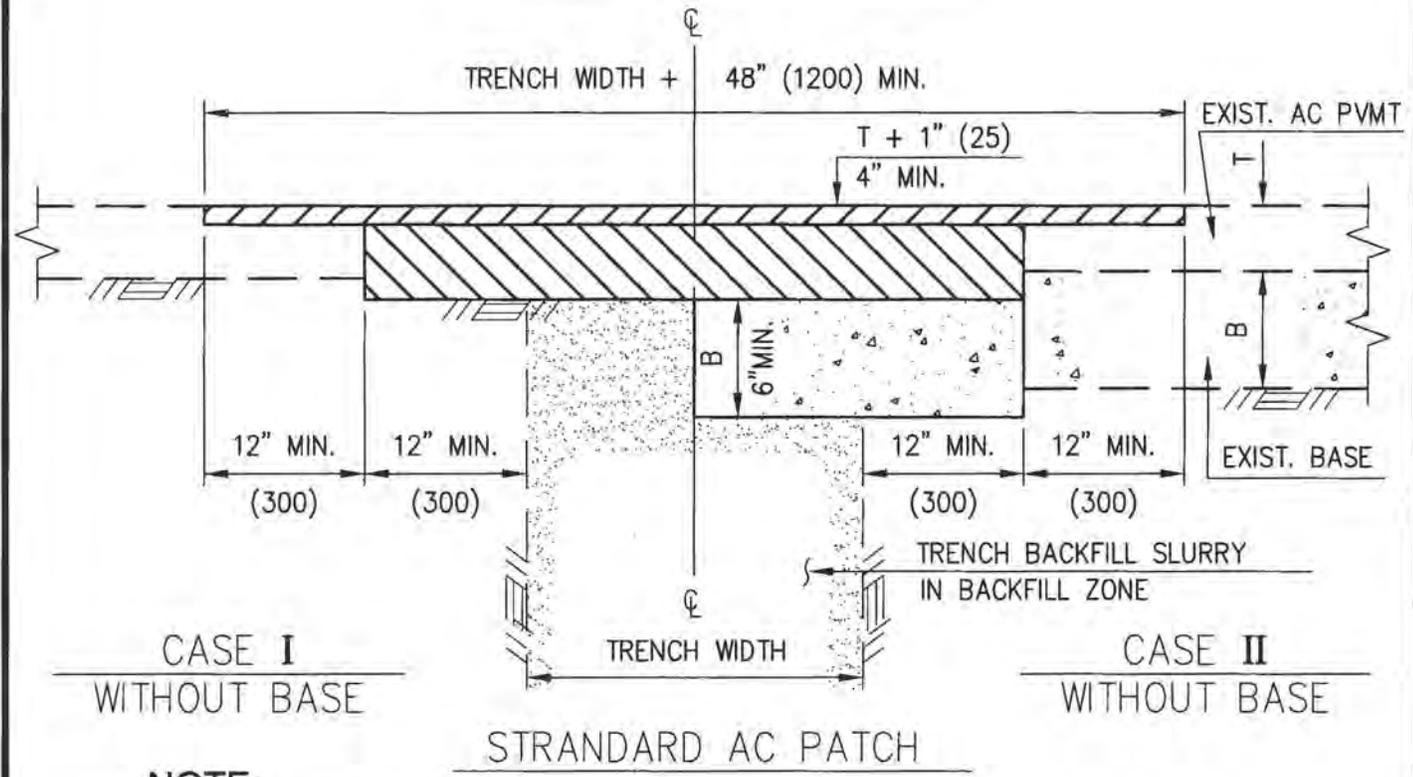
SHEET 4 OF 4



CASE I
WITHOUT BASE

CASE II
WITHOUT BASE

STRANDARD AC PATCH



CASE I
WITHOUT BASE

CASE II
WITHOUT BASE

STRANDARD AC PATCH

NOTE:

IN ALL CASE, NEW ASPHALT 1" (25) THICKER THAN EXISTING AC PAVEMENT. NEW ASPHALT, MINIMUM 4" (100) THICK, TO BE INSTALLED IN TWO LIFTS: MIN. 1.5" (38) THICK FINISH COURSE OVER 2.5" (62) THICK BASE COURSE.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

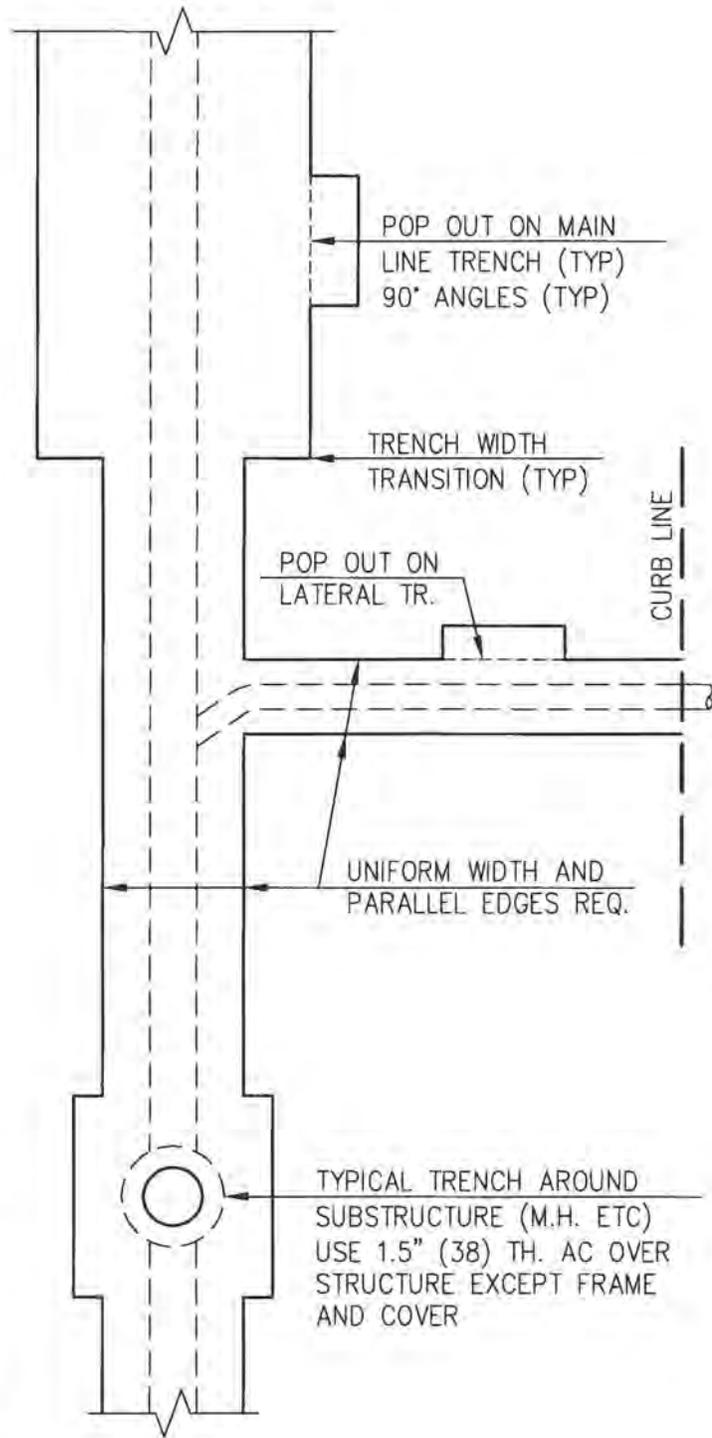
ASPHALT CONCRETE PAVEMENT RESURFACING

APPROVED BY: *Clifford G. Finley* 2-2-09
PUBLIC WORKS DIRECTOR / CITY ENGINEER DATE

STANDARD PLAN

427

SHEET 1 OF 3



MAXIMUM ALLOWABLE POP OUTS AND TRANSITIONS = ONE PER 100 L.F. OF TRENCH - (COMPUTED SEPARATELY FOR MAIN LINE TRENCH AND LATERALS), UNLESS APPROVED OTHERWISE BY PUBLIC WORKS DIR.

B. STRAIGHT ALIGNMENT



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

ASPHALT CONCRETE PAVEMENT RESURFACING

APPROVED BY: *Clifford G. Finley* 2-2-09
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SHEET 2 OF 3

GENERAL NOTES:

1. All pavement removal shall be made to straight line saw cuts a minimum depth of 1.5 inches (38). All pavement removal shall have a uniform width and parallel edges. The existing pavement shall be removed to cut lines or as directed by the engineer.
2. During excavation and subgrade preparation, the contractor shall take all necessary steps to ensure the protection of all improvements, whether public or private, including other utilities and their services, from any damage that could occur due to contractor's operation.
3. Standard ac patch as shown on sheet no.1 is applicable to Minor streets. It may be case I or case II depending upon the existing pavement section.
4. Cold planed ac patch as shown on sheet no.1 is applicable to arterial and collector street. Cement-sand slurry backfill (except in the pipe zone) is required. The public works director may waive the requirements for cold planed ac patching and slurry backfill for excavations located outside the traveled way.
5. Temporary pavement resurfacing shall be placed at the contractor's expense. Immediately after backfilling, unless otherwise specified by the engineer. It shall be placed level with the existing pavement on compacted trench backfill and shall be minimum of 2 inches (50) thick.
6. Permanent pavement resurfacing shall be of hot asphalt concrete mix and installed within two (2) weeks after backfilling of trenches has been completed, and only after settlement has taken place and fill surface has sufficiently dried. All cuts shall be clean and straight.
7. Contact surfaces of existing pavement. Manhole frames and shafts and concrete surfaces shall be given a tack coat before permanent asphalt trench resurfacing is applied.
8. New asphalt resurfacing shall be minimum 4 inches (100) thick and installed in two lifts. Base course, type III B2-AR4000, shall be minimum of 2.5 inches (62) thick. Finish course, type III C2-AR4000, shall be minimum of 1.5 inches (38) thick.
9. Minimum depth of cold plane along trench is 1.5 inches (38). It shall be filled with finish course asphalt. The contact edges shall then be sealed with emulsified asphaltic oil.
10. The total numbers of main line popouts and main line transitions shall not exceed one per 100 lineal feet of main line. The total number of lateral popouts and lateral width transitions shall not exceed one per 100 lineal feet of lateral. Popouts or width transitions at substructures are excluded from the above limitations
11. Encroachment excavations within the traffic lanes of any paved street. Which excavation exceeds 250 feet in length measured parallel to the center line of the street. Shall be paved using a self-propelled mechanical spreading and finishing machine for placement of the top layer of asphalt concrete paving material.
12. All requirements of trench resurfacing material, construction methods and public convenience and safety shall conform to the applicable sections of the "green book" standard specifications for public works construction - latest edition, unless approved otherwise by the public works director.



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

ASPHALT CONCRETE PAVEMENT RESURFACING

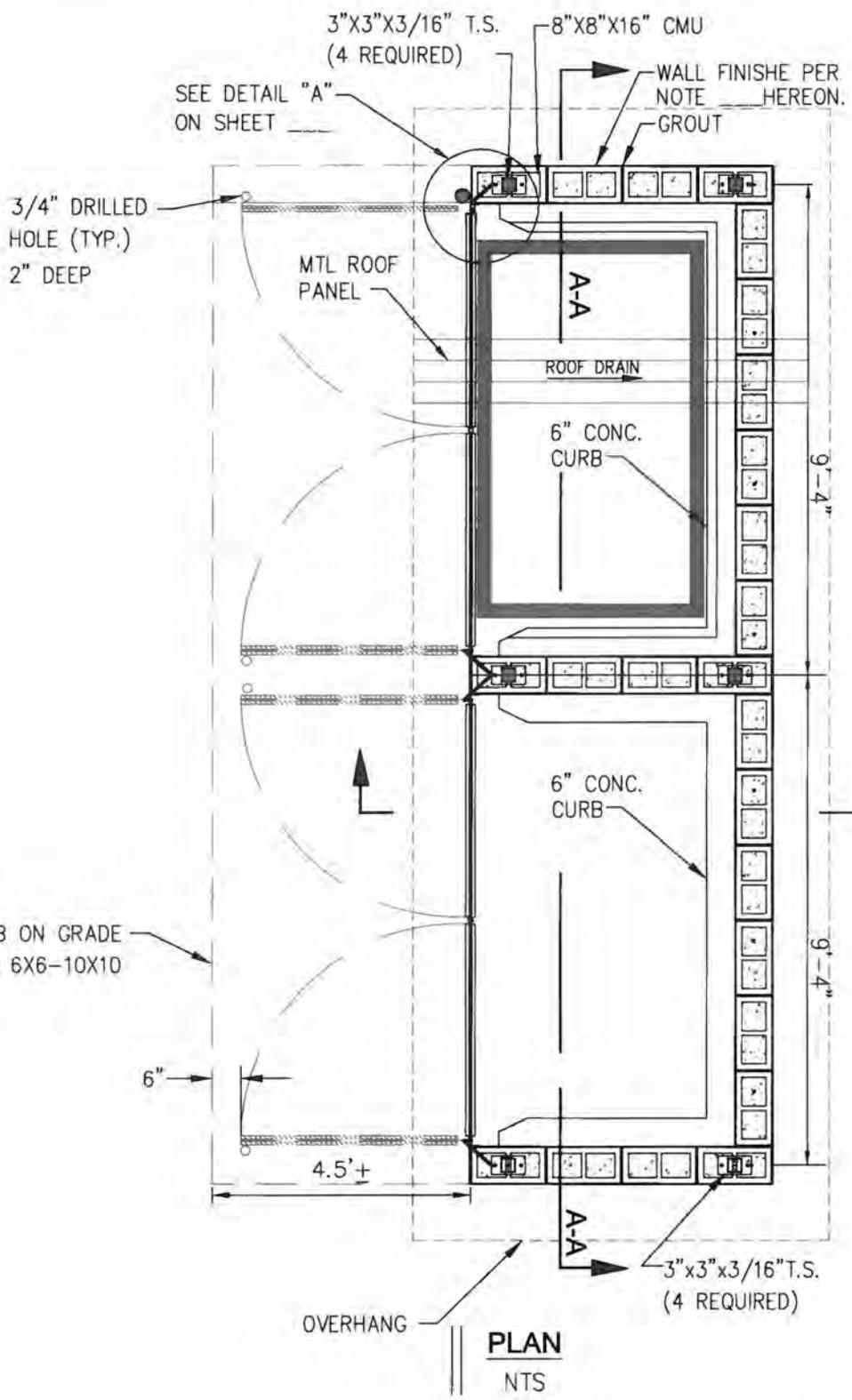
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SHEET 3 OF 3



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

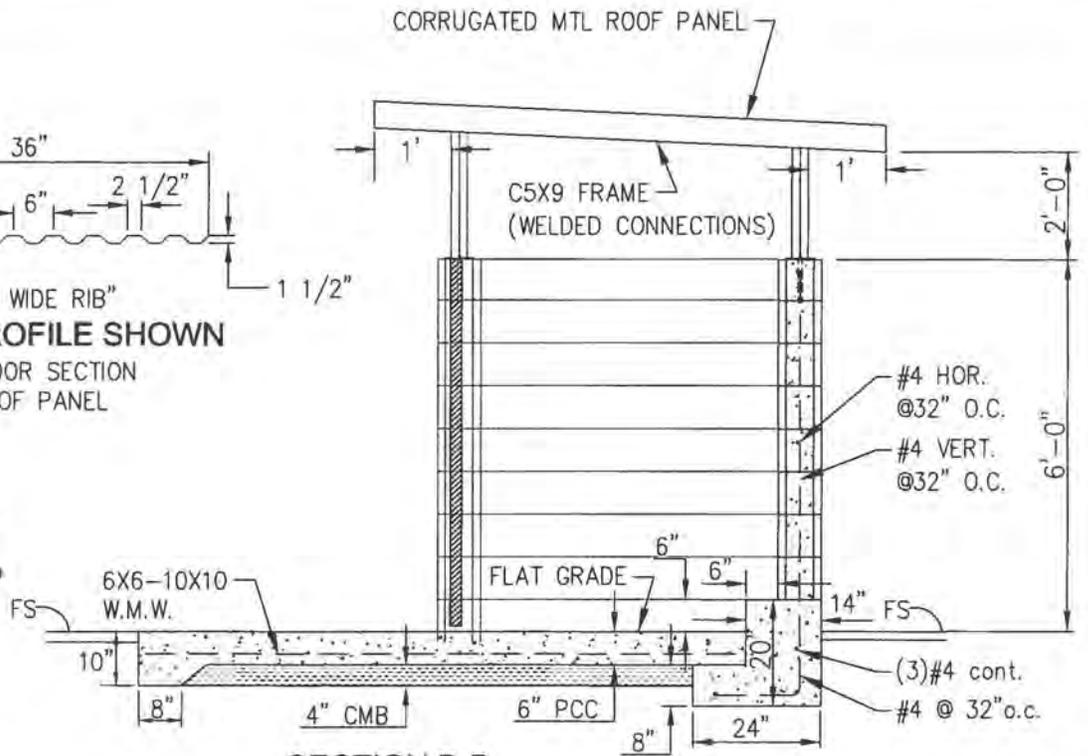
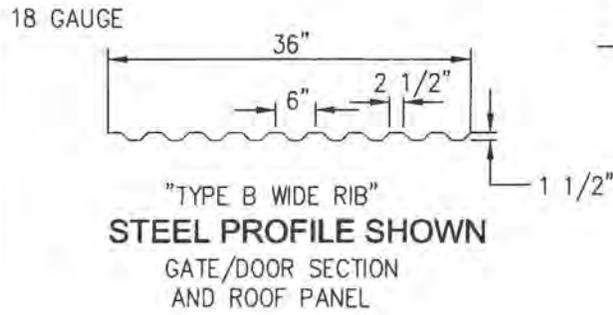
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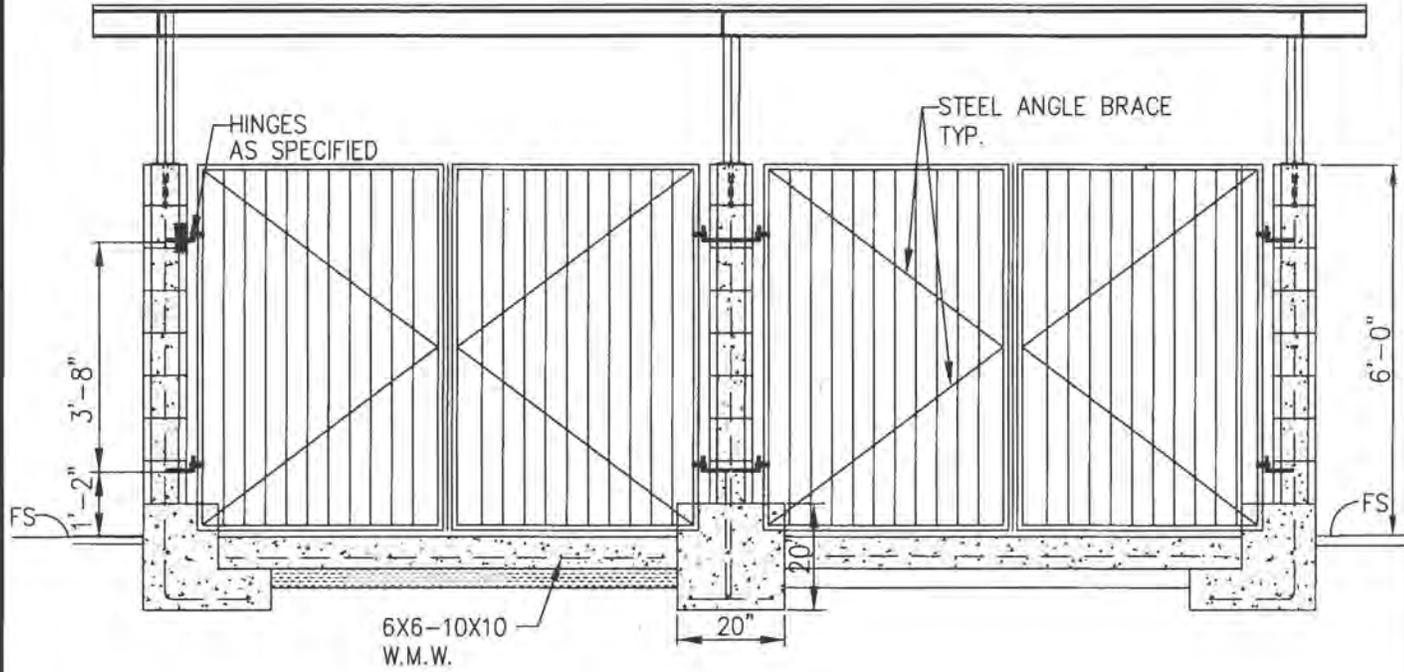
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SHEET 1 OF 4



SECTION B-B
NTS



SECTION A-A
NTS



CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT

STANDARD PLAN

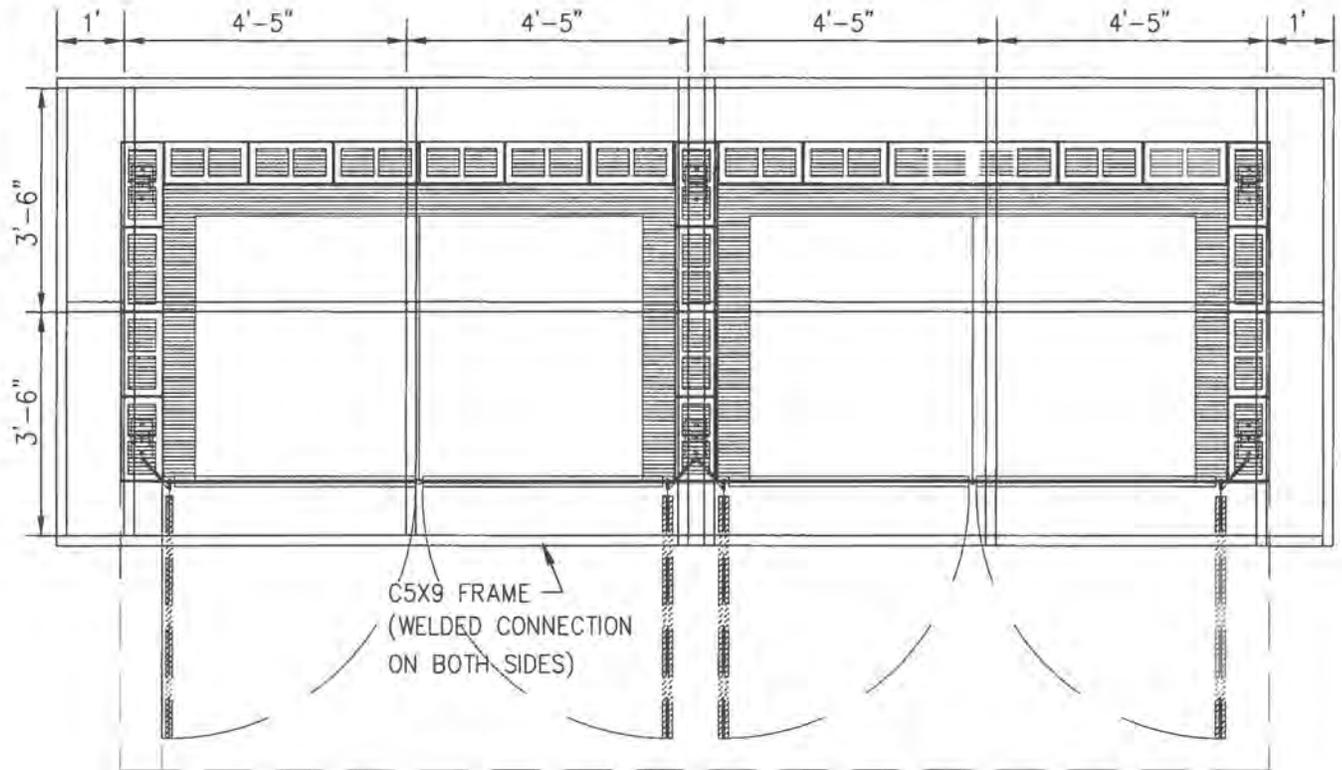
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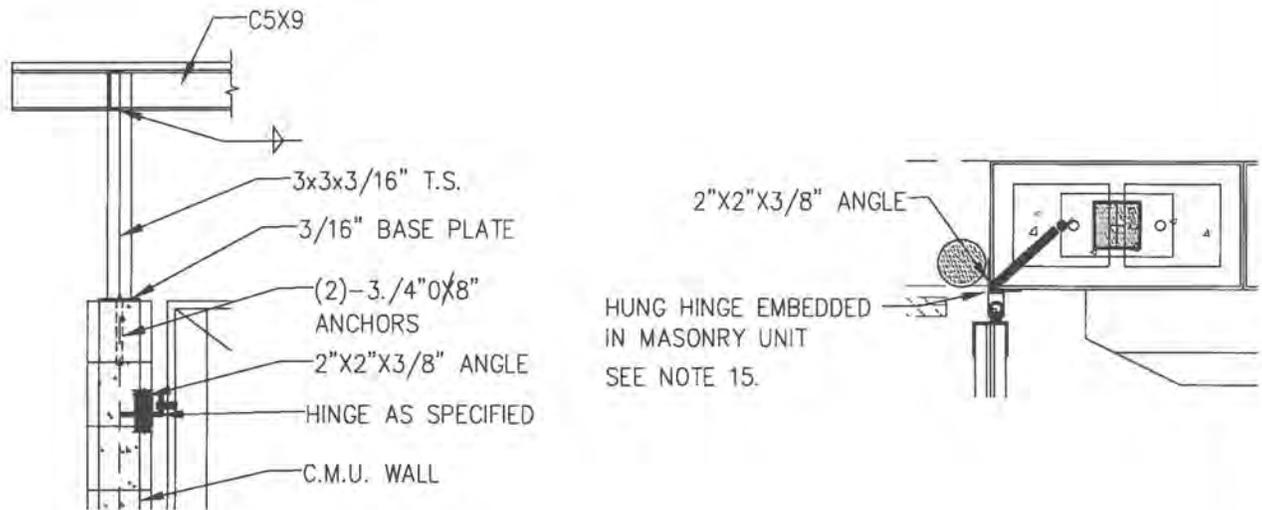
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SHEET 2 OF 4



ROOF FRAMING
NTS



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REFUSE ENCLOSURE

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DATE

SHEET 3 OF 4

NOTES:

1. ALL EXTERIOR COLORS, MATERIALS AND FINISHES SHALL BE REVIEWED AND APPROVED BY THE PLANNING DEPARTMENT. THE TRASH ENCLOSURE SHALL BE PAINTED TO MATCH THE BUILDING WITH WEATHER RESISTANT PAINT. APPLY AN ANTI-GRAFFITI COATING.
2. WALLS SHALL BE 8X8X16 CMB BLOCK.
3. GATES SHALL REMAIN CLOSED AT ALL TIMES.
4. WALLS: WALLS TO BE CONSTRUCTED OF 8X4X16 CONCRETE MASONRY UNITS WITH ALL CELLS GROUTED.
 MASONRY: $f_m=1500\text{psi}$.
 REBAR: $f_s=24,000\text{psi}$.
 CONCRETE: $f'_c=2000\text{psi}$.
 MORTAR... 1: 0.05: 4.5 PORTLAND CEMENT:LIME:SAND RATIO
 GROUT... 1: 3: 2 PORTLAND CEMENT:SAND:PEA GRAVEL RATIO
5. ALL CONCRETE SHALL BE POURED IN ACCORDANCE WITH SSPWC SECTION 300-3.3
6. PROVIDE FULL MORTAR BED AT THE BOTTOM OF THE FIRST COURSE.
7. HORIZONTAL JOINTS SHALL BE TOOLED CONCAVE OR WEATHERED. VERTICAL JOINTS SHALL BE TOOLED CONCAVE OR RAKED.
8. REINFORCING STEEL SHALL BE GRADE 300 (GRADE 40), AND LAPPED A MINIMUM 40 BAR DIA.
9. SPECIAL INSPECTION IS NOT REQUIRED.
10. CONCRETE FOUNDATION AND SLAB: ALL CONCRETE SHALL BE 520-C-2500 AND SHALL BE PER THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
11. ACCESS DOORS: SHALL BE 3' WIDE, STEEL FRAME W/ STEEL ANGLE BRACE TYPE METAL 18 GAUGE AND STEEL MINI V-BEAM PANEL AND IT SHALL BE HUNG ON BLOCK. HINGES SHALL BE AS SPECIFIED.
12. LOCATION: THE LOCATION OF TRASH ENCLOSURE SHALL BE APPROVED BY THE CITY.
13. ACCESSIBILITY: ENCLOSURE SHALL NOT BE LOCATED BEHIND A LOCKED ENTRY OR GATE. THE CLOSURE OPENING MAY NOT BE BLOCKED BY PARKING OR LOADING SPACES.
14. FIRE REQUIREMENTS: ENCLOSURE SHALL NOT BE PLACED WITHIN FIVE (5) FEET OF COMBUSTIBLE WALLS, OPENING, OR ROOF EAVES UNLESS PROTECTED BY A CITY OF SANTA PAULA FIRE DEPARTMENT APPROVED AUTOMATIC SPRINKLER SYSTEM.
15. GATES SHALL NOT OPEN INTO DRIVING LANES OR PARKNG SPACES.
16. ROOF MATERIAL SPECIFICATIONS:
 ALUMINUM: ALLOY 3004 IN COMPLIANCE WITH THE ALUMINUM ASSOCIATION COMPOSITION SPECIFICATIONS AND CONFORMING TO ASTM B209-96.
 STEEL: GRADE A STRUCTURAL QUALITY CONFORMING TO ASTM A653, GALVANIZED TO ASTM A924, G90 CLASS IS STANDARD.
17. INSTALLATION AND FASTENING GUIDELINES:
 RECOMMENDED ROOF SLOPE = 1/2" PER FOOT
 MINIMUM END LAPS:
 SIDING = 4"
 ROOFING = 9"
 REQUIRES SEALANT AT SIDE AND END LAPS
 FASTENING TO PATTERNS FOR 20PSF LOADING:
 PANEL FIELD: 8" o.c.
 PANEL END LAPS: 8" o.c.
 PANEL SIDELAPS: 16" o.c.

	CITY OF SANTA PAULA - PUBLIC WORKS DEPARTMENT	STANDARD PLAN
	REFUSE ENCLOSURE	
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