

2020

CITY OF RIVERSIDE

STANDARD DRAWINGS

FOR CONSTRUCTION







CITY OF RIVERSIDE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

STANDARD PLANS FOR
PUBLIC WORKS CONSTRUCTION

PREPARED UNDER THE SUPERVISION OF



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JANUARY 2020

SPECIAL PROVISIONS

INTRODUCTION: The City of Riverside Public Works Department requires Contractors/Applicants/Residents comply with the Riverside Municipal Code (RMC) when performing work or traffic control within the City Right-of-Way. An Encroachment, Construction and/or Street Opening Permit is required when working within the Public Right-of-Way. The format of these Special Provisions follows the 2012 Edition of the "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION". These Special Provisions supplement, modify and take precedence over the Standard Specifications. The Standard Specifications are hereby amended and supplemented as follows:

TABLE OF CONTENTS

PART 1. GENERAL PROVISIONS....1-31
Section 1 – Terms, Definitions, Abbreviations, And Symbols 1
Section 2 – Scope and Control of the Work....2
Section 4 – Control Of Materials....6
Section 5 – Utilities....7
Section 6 – Prosecution, Progress And Acceptance Of The Work 10
Section 7 – Responsibilities Of The Contractor....11

PART 2. CONSTRUCTION MATERIALS 33-36

PART 3. CONSTRUCTION METHODS....37-69
EXHIBIT – SAMPLE PUBLIC NOTIFICATION OF CONSTRUCTION....68-69

PART 10. STANDARD DRAWINGS AND MISCELLANEOUS ITEMS 70-213
Public Works Engineering Division Standard Drawings

INDEX OF STANDARD DRAWINGS

GENERAL

1 – Underground & Topo Legend
2 – Standard Abbreviations
3 – Shading Standards

STREETS

101 – Standard Street Dimensions
102 – Cul-de-Sac
103 – Industrial Cul-de-Sac
104 – Standard Knuckle
110 – Alley Sections
111 – Class I Bikeway
115 – Alley Turnaround
116 – Right Angle Alley Turn
120 – Intersection Layout
121 – Median Openings
122 – Reverse Taper
123 – Parabolic Flare
180 – Treatment for Street Terminus
200 – Curb & Gutter
201 – Permeable Concrete Gutter
202 – Permeable Concrete Curb & Gutter Adjacent to Parkway
210 – Curb Transitions
220 – Cross Gutters
250 – Asphalt Concrete Berms
251 – Speed Bump (Type I)
301 – Area Covered by Permit for Driveway Approach with Property Line Sidewalk
302 – Driveway Approach
304 – Wheelchair Ramp (ADA Ramp)
325 – Sidewalk
326 – Tree well & Covers
380 – Chain Link Fence

DRAINS

400 – Storm Water Catch Basin Type 1
401 – Storm Water Catch Bain Type 2
402 – Catch Basin Inlet
403 – Catch Basin Inlet Steel Plate Alternative
404 – Catch Basin Outlet Transition Structure
405 – Catch Basin Type 3
406 – Catch Basin Type 4
407 – Catch Basin Type 5
408 – Catch Basin Type 6
409 – Catch Basin Type 7
410 – Parkway Drain
411 – Culvert Ramp Detail
412 – CSP Inlet
421 – Junction Structure B
422 – Junction Structure C
423 – Junction Structure No. 4
424 – Concrete Collar (Pipe 12"-66")
425 – Cleanout Box
430 – Manhole Ax
431 – Manhole EZ
432 – Manhole JM
433 – 22" Manhole Frame & Cover
434 – 24" Manhole Frame & Cover
450 – Catch Basin Frame & Cover
451 – Concrete Rings, Reducer, & Pipe for Manhole Shaft
452 – Pipe Bedding
453 – Trench Backfill
454 – Utility Pothole/Core Repair
455 – Concrete Encasement
456 – Microtrenching

SEWERS

500 – Precast Concrete Sewer Manhole
503 – Drop Manhole
554 – Remodeling Details for Sewer Laterals
555 – Sewer Mainline "P" Trap Detail
559 – Precast Concrete Force Main Cleanout
560 – Sewer Main Cleanout
561 – Standard Chimney Pipe
562 – Sewer Lateral with PL C.O.
564 – Sewer Pipe Encasement Across Trenches

TRAFFIC & PARKING

600 – Traffic Signal & Lighting Symbols
606 – Traffic Signal Pull Box
612 – Traffic Signal Overhead Electrical
640 – High Visibility Crosswalk
650 – Stop Approach Layout
662 – Street Name Signs
663 – Traffic Signal Street Name Signs
664 – Sign Standards
665 – Sign Markers
666 – Median Nose Detail
667 – Electrical Service Details to Traffic Controller
670 – Type "C" and "D" Detector
675 – Traffic Control General Notes

INDEX OF STANDARD DRAWINGS
(CONTINUED)

MISCELLANEOUS

704 – Concrete Block Wall (Freestanding)

PART 1
GENERAL PROVISIONS

SECTION 1
TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

1-2 TERMS AND DEFINITIONS

Agency/City or State	The City of Riverside.
As-Builts	Revisions and dimensions of final construction of the approved construction plans and or details.
Base Course	The layer(s) of pavement placed between the surface course and the subgrade.
Board	The City Council of the City of Riverside.
Director	Director of Public Works.
City Engineer	The City Engineer or his designee.
Inspector	The representative of the City Engineer who is assigned to inspect conformance of the work in accordance with Plans and Specifications.
Overlay	A supplemental surface course placed on an existing pavement to improve its surface conformation or to increase its strength.
Private Engineer	(If applicable) the engineer who has prepared and has signed the Plans.
Right-of-Way	(ROW) Includes City of Riverside Public Rights-of-Way and City of Riverside Public Easements.
RFI	Request for Information.
Sewer Lateral	House Connection Sewer.

Standard Plans	City of Riverside Standard Drawings for Construction.
Standard Specifications	2012 edition of the Standard Specifications for Public Works Construction.
Surface Course	The top layer of pavement designed to provide structural value and/or a surface resistant to traffic abrasion.
Traveled Way	That portion of the roadway reserved for the movement of vehicles for the general public, exclusive of shoulders and auxiliary lanes. Where traffic has been diverted or restricted to certain lanes, with the approval of the City Engineer, these diversions or restricted lanes become the traveled way.

1-3 ABBREVIATIONS

ARHM-GG	Asphalt Rubber Hot Mix- Gap Graded
DGAC	Dense Graded Asphalt Concrete
R & R	Remove and Replace
ROW	Right-Of-Way
Std. Specs.	Standard Specifications

The abbreviations shown on Standard Drawing may also apply.

1-5 SYMBOLS

The symbols shown on Standard Drawing may also apply.

SECTION 2
SCOPE AND CONTROL OF THE WORK

NOTE:
MORATORIUM: THE CITY OF RIVERSIDE HAS A THREE (3) YEAR MORATORIUM ON ALL NEWLY OVERLAYED STREETS. WHEN STREET SEGMENTS FALL UNDER A MORATORIUM, NO CONSTRUCTION WORK SHALL COMMENCE. IF AN APPLICANT IS PERMITTED TO WORK WITHIN THE MORATORIUM LIMITS, REFURBISHMENT OF THE ASPHALT AND STRIPING LIMITS SHALL BE GREATER.

2-1 AWARD AND EXECUTION OF THE CONTRACT

2-1.1 Contractor Customer Service Standards. When a Contractor is working within the Public Right-of-Way, the Contractor shall at all times represent the City in a professional, friendly manner, and will be required to comply with the requirements of the City of Riverside Contractor Service Standards.

2-1.7.1 Contractor's License.

All contractors and/or sub-contractors of any trade must be properly licensed to perform the work within the public right-of-way in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code and the Rules and Procedures of the California State Contractor's License Board and in good standing with the Board. Proof of such license shall be provided as required by Business and Professions Code Section 7031.5. Failure to be so licensed shall result in rejection of all work, and permit(s) revoked.

2-3 SUBCONTRACTS

2-3.1.1 Subcontractor licenses. All Permitees shall provide a list of contractors working on their project along with their City of Riverside Business license and Contractor's license.

2-5 PLANS AND SPECIFICATIONS

2-5.1 General

2-5.1.1 Standard Specifications. The work embraced herein shall be done in accordance with the provisions of the STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, **2012** Edition, written by Public Works Standards, Inc., insofar as the same may apply, which specifications are hereinafter referred to as the Standard Specifications, and as modified herein, City of Riverside Municipal Code (RMC), Federal Clean Water Act, Caltrans, etc. shall also apply when constructing or performing any work within the Public Right-of-Way.

Where reference is made to the "Standard Plans", the City of Riverside "Standard Drawings for Construction" shall apply.

2-5.3 Submittals. Submittals are required for **ANY** materials that are expected to be used in the public right-of-way. No work or purchasing of materials shall commence unless the Applicant has received written approval on a materials submittal.

2-5.3.2 Working Drawings. Working drawings, when required, need not be reproducible unless specified herein.

2-5.3.3 Shop Drawings. Shop drawings, when required, need not be reproducible unless specified herein. A minimum of four (4) copies shall be submitted for approval by the City Engineer or his designee. The Contractor shall submit shop drawings for diverting sewer flows when remodeling existing structures and when connecting proposed structures to the existing sewer. The Contractor shall submit shop drawings for the Spill Containment Plan required in Section 7-8.5.3.1 of these Special Provisions.

2-9 SURVEYING

The City does not provide survey. However, four (4) copies of cut-sheets, survey correspondence from developers shall be turned over to the Public Works Inspector upon request.

2-9.1 Permanent Survey Markers. The Contractor shall be responsible for preserving all survey monuments during construction of the project. If any survey monument is disturbed or destroyed due to the construction, it will be the Contractor's responsibility to reestablish the monument. The work shall be performed by a professional engineer or a land surveyor, licensed by the State of California to perform such work. Such licensed engineer or land surveyor shall be responsible for filing Corner Record Forms referencing survey monuments subject to disturbance in the Office of the County Surveyor prior to start of construction and also prior to completion of construction for the replacement of survey monuments.

2-9.2 Survey Service. The Applicant shall be responsible for the performance of all surveying required for the construction of the project. All plans, descriptions and calculations related to surveying, including grade sheets, shall be signed and stamped by the Contractor's Land Surveyor, or Professional Engineer authorized by the State of California to practice land surveying. Grade sheets shall be submitted to the City Engineer for review and final release at least two working days prior to the start of the work requiring the grade sheets. **No construction** on the work requiring the grade sheets shall take place without City approval and or release of the grade sheets from the City Engineer.

The Contractor's Land Surveyor, or Professional Engineer authorized by the State of California to practice land surveying, shall upon completion of construction be required to submit final certification that the project has

been constructed in substantial conformance with the plans and any approved alterations thereof.

2-11 INSPECTION

2-11.1 Inspection Scheduling. Inspection will be provided Monday through Friday, excluding City holidays. When the Contractor's operations or public safety requires inspection beyond the regular work hours or work days, the cost of the additional inspection shall be borne by the Contractor and shall be billed accordingly.

A pre-construction site meeting is required with a Public Works Construction Inspector prior to commencement of ANY work. The applicant shall submit an inspection request for the meeting at

https://www.riversideca.gov/publicworks/engineering/engineering/schedule-inspection

At any time when working within the Public Right-of-Way (ROW) such as excavating, pulling conductors, placing traffic control, overhead work or underground work, tree trimming, final inspections, etc., the applicant shall give notification to the City of Riverside, Public Works Department 48 hrs. using the online web-scheduler at

https://www.riversideca.gov/publicworks/engineering/engineering/schedule-inspection

Prior to any applicant requesting inspections outside and or beyond regular working hours, the applicant shall obtain written approval from the City Engineer no less than two working days before the planned work.

2-11.2 City Holidays. City holidays will be observed on the following days and no work shall be completed by the Contractor unless prior written approval from the City Engineer:

January 1st	New Year's Day
Third Monday in January	Martin Luther King Jr's Birthday
Third Monday in February	President's Day
Last Monday in March (Generally)	Cesar Chavez Day
Last Monday in May	Memorial Day
July 4th	Independence Day
First Monday in September	Labor Day
Second Monday in October	Columbus Day
November 11	Veteran's Day
Fourth Thursday in November	Thanksgiving Day

Friday following Thanksgiving Day	Day After Thanksgiving
December 25	Christmas Day

If a holiday falls on a Saturday, it will be observed on the preceding Friday. If a holiday falls on a Sunday, it will be observed on the following Monday.

SECTION 4
CONTROL OF MATERIALS

4-1 MATERIALS AND WORKMANSHIP

4-1.1 General.

4-1.1.A Submittals. Submittals are required for **ANY** materials that are expected to be used in the public right-of-way. No work or purchasing of materials shall commence unless the Applicant has received written approval on a materials submittal.

4-1.1.1 Suppliers Sources. The Contractor shall notify the City Engineer in writing within 5 days after City approval of the materials of the proposed suppliers and sources for material to be incorporated into the project.

4-1.4.1 Materials and Conditions to be Tested. The Contractor shall be responsible for controlling the quality of the material entering the work and of the work performed, and shall perform testing as necessary to ensure control. The test methods used for quality control testing shall be as determined by the approved testing method(s). The results of the testing shall be made available to the City Engineer upon request. These tests are for the Contractor's use in controlling the work and will not be accepted for use as acceptance tests.

Full compensation for performing quality control tests and making the results available to the City Engineer. **All compaction testing shall be at the expense of the permit Applicant.**

The City may perform quality assurance testing at the discretion of the City Engineer. The contractor shall provide reasonable access and time to the City Engineer to perform quality assurance testing. The cost of retesting any portion of the work or materials, which have failed the initial quality assurance test taken by the City, shall be borne by the permit applicant.

SECTION 5
UTILITIES

5-1 LOCATION

As to the discretion of the Engineer, saw cutting of the asphalt and or concrete shall be performed when alligator cracking is present.

5-1.1 Utility Marking/Coordination. The Public Works Department shall not issue a construction permit as referenced in Section 7-5.1 of these Special Provisions for any work involving excavation for underground facilities unless the applicant has been provided an inquiry identification number by Underground Service Alert (USA) of Southern California.
The Contractor shall tie-out the location of any utility facility with a minimum of two reference points prior to paving and shall mark its location on the street with paint in accordance with the USA utility identification color code, after paving.

5-1.2 Sewer [Storm Drain] Video Inspection. It shall be the contractor's responsibility to locate all service sewer mainlines and laterals horizontally and vertically for each parcel, either vacant or occupied, within the limits of construction area as shown on the Plans. The contractor must assume that any parcel either vacant or built upon shall have a sewer lateral that requires location, even if not marked by USA.

Notification of entrance into City **Sewer** manholes shall be given to the Public Works Water Quality Control Plan Operations at 951-351-6056 a minimum of 48 hours prior to commencement of work. Dates and times of entrance may be restricted by the City. The applicant shall schedule accordingly,

Notification of entrance into City **Storm Drain** manholes shall be given to the Public Works Street Department at 951-351-4217 a minimum of 48 hours prior to commencement of work. Dates and times of entrance may be restricted by the City. The applicant shall schedule accordingly,

The Contractor shall give the Inspector a 48-hour notice prior to commencing any video work by scheduling on the City WebScheduler: **https://www.riversideca.gov/publicworks/engineering/engineering/schedule-inspection**

The pre-construction videos shall be performed and a digital (DVD, portable drive, etc…) copy of the videos and a tabulation of sewer laterals and their locations shall be delivered to the City Engineer prior to the start of construction on the main line sewer. A post-construction video shall be

performed at the end of the project to determine if the work was completed per contract documents and that all service connections have been reinstalled as required. A copy of the inspection report in pdf format shall be submitted together with the digital video file.

Digital video captured files shall conform to the following requirements:

1. Picture size: NTSC 704x480 at 29.97 frames per second.
2. Data / Bit Rate: MPEG2 at 5 M-bits/sec.

Materials:

1. Digital video files shall be to be stored on new, unused DVR-R media.
2. Digital report data and photograph, if applicable, shall be stored on an unused CD-R media.

Execution:

1. CCTV operators shall be NASSCO/PACP certified.
2. The camera shall be set as near the center of the pipe as possible and shall be moved through the pipe at a steady pace not to exceed 30 feet per minute.
3. Hemispherical head or fisheye lens type cameras are not permitted.
4. Steam and fog in the pipe shall be eliminated by introducing forced airflow via a fan.
5. Camera lens shall remain free of grease or other deleterious matter to ensure optimal clarity.
6. Inspection video images shall be produced in MPEG2 format in either one or a combination of the following methods:
    a. Video capture card and software designed to create and store real-time MPEG2 digital file direct to computer hard drive;
    b. By means of video capture card and software compress image to create MPEG2 digital file. Data compression bit rate set at a minimum of 5 M-bits/sec.
    c. Create separate digital file with separation title for each inspection report per each individual pipe run. Identify each report title on the DVD menu.
7. Set zero change at face of every manhole [at entrance into pipe, or at start of pipe culvert].
8. Report and record on full length of pipeline from inside face to inside face between manhole [from outlet end of pipes, or from one end of pipe culvert to the other].
9. All manholes [junction structures, catch basins] must be video inspected at the start and end of each run.
10. Note condition of pipe joints at manhole [junction structure walls, and inlet catch basin walls] at the beginning and end of each pipeline.

11. Data generator to electronically generate and clearly display on the viewing monitor and video recording a record of the following minimum information prior to the start of each run:
    a. Name and company of the camera operator
    b. Manhole [junction structure, inlet catch basin] (from-to) / pipe length reference numbers;
    c. Pipe line dimensions
    d. Pipe material
    e. Type of use for pipe [sanitary sewer or storm]
    f. Date of survey (yyyy.mm.dd)
    g. Road name, location, or nearest cross street intersection
    h. Direction of travel (U—Upstream, D—Downstream)
    i. Inspection report number
    j. Verbal description of all of the above on screen information.
12. Data Generator shall electronically generate and clearly display on the viewing monitor and recording record of the following information:
    a. Camera's meter reading position from adjusted zero;
    b. Manhole/pipe length reference numbers;
    c. Type of use for pipe [sanitary sewer or storm]
    d. Inspection report number of each run
    e. All displayed digital information shall be positioned in a way such that it will not interfere with the video image on the screen
13. Stop camera at each defect, change of condition of pipe, or at each service connection to record said change or defect in accordance with WRc codes.
14. Add WRc code overlay to digital video at defects or connections in addition to continuously displayed data.
15. Pan to each service connection such that the camera looks down the centerline of the service, pause for a minimum of five (5) seconds and note condition of the joint and/or pipe/service interface. Location and position of all service connections shall be documented in the video and in the report.

Recording Resolution:
A recording resolution test with use of a Marconi or resolution chart shall be performed at the beginning of each video DVD or when a substitute camera is introduced.

Camera Position:
Camera lens shall be positioned centrally in the pipeline to a tolerance of plus or minus 10% off the vertical centerline axis of the pipeline except for when viewing service connections of panning/zooming in at defects.

Coding Sheets:

1. Each pipeline length shall be recorded according to the MSCC. Any variation from the manual shall be noted in the report.
2. Standard coding from shown on page 14 of MSCC shall be modified as follows:
    a. Line 2, field 8 (date) shall be eight (8) characters in the format of yyyy.mm.dd (year, month, day).
    b. Condition detail number (video count) to be six (6) characters in the format of hh.mm.ss (hours, minutes, seconds).

SECTION 6
PROSECUTION, PROGRESS AND ACCEPTANCE OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK

6-1.1.1 Construction Schedule. The contractor shall submit a construction schedule to the City Engineer at the pre-construction conference. The construction schedule shall indicate the following:

a. Proposed schedule for potholing near/at the proposed traffic signal foundations. The work day(s) for potholing shall not count toward the Contract Time as indicated on Section 6-7.1.1 and is required prior to ordering the traffic signal poles.
b. Proposed schedule to order and secure materials including traffic signal shafts and mast arms.
c. Proposed schedule to commence and complete the project. The schedule shall take into account holidays and special events as required.

During the construction, the Contractor shall review and update the schedule on a weekly basis. Rescheduling any work under this Contract shall not be permitted to allow the Contractor the ability to accommodate another contract, including other work within the City.

The first order of work shall be the installation of the public notification signs. The signs shall be posted a minimum of one week prior to commencing with construction operations on the street.

Upon submittals approval, the Contractor shall proceed with the ordering of materials including traffic signal poles and/or street light poles to be furnished on the project. These material delivery dates shall be reflected on the construction schedule.

The contractor's construction schedule shall be submitted at the pre-construction conference. Upon review of the Contractor's construction schedule by the City Engineer.

Failure to submit a schedule as specified shall be considered as noncompliance, and the issuance of a Stop Work Notice may be issued.

6-1.2.1 Commencement of Work.
No work shall commence within the Public Right-of-Way if a pre-construction meeting was NOT requested by the permit Applicant.

A pre-construction site meeting is required with a Public Works Construction Inspector prior to commencement of ANY work. The applicant shall submit an inspection request for the meeting at https://www.riversideca.gov/publicworks/engineering/engineering/schedule-inspection

6-3 SUSPENSION OF THE WORK

6-3.3 Stage III Smog Episode. No work shall be done on a day for which a Stage III smog episode is forecasted as defined by the Air Quality Management District (AQMD).

6-8 COMPLETION, ACCEPTANCE, AND WARRANTY

When, in the judgment of the City Engineer, the work has been completed in accordance with the Plans and Specifications and is ready for final acceptance, the City Engineer may accept the work as complete, including completion of punch-list items and all required tasks as noted in Section 7-5.3, the City may approve the release of the Certificate of Occupancy (CofO).

SECTION 7
RESPONSIBILITIES OF THE CONTRACTOR

7-5 PERMITS

7-5.1 City Permit. No work shall be started within the street right-of-way or on City property until the Contractor has obtained a construction permit from the Public Works Department.

A pre-construction site meeting is required with a Public Works Construction Inspector prior to commencement of ANY work. The applicant shall submit an inspection request for the meeting at:

https://www.riversideca.gov/publicworks/engineering/engineering/schedule-inspection

Public Works is authorized and empowered to suspend, cancel or withdraw the permit issued for the performance of any work which is not being done in accordance with the APPROVED Permit, plans and specifications, and or other requirements mandated by other utilities or agencies.

Failure to Comply: In accordance with *Riverside Municipal Code (RMC) 13.08.030*, the Director of Public Works may refuse to issue future permits for work performed under this chapter to any person, applicant or contractor who has failed to comply with the provisions of this chapter, permit, OSHA, plans & specifications, and/or notices until such person has corrected any deficiencies to the satisfaction of the Director of Public Works.

DAMAGE TO ANY UTILITIES OR FACILITIES: If damage occurs to any utility, facilities, either private or public, the applicant shall immediately notify the designated Public Works Construction Inspector and or emergency services. The applicant shall bear the total expenses for the repair and or replacement of said damaged structures or substructures AT NO COST TO THE CITY.

7-5.2 Other Permits.
Other utilities, agencies, districts, special districts, municipalities, easement holders such as Railroads or Caltrans may require special permits and or inspections when crossing within their ROW. It is the applicants' responsibility to obtain all necessary permits and provide copies of the permit(s) to the Public Works Construction Inspector or City staff prior to the Public Works Permit issuance.

The Contractor shall obtain and pay for all licenses necessitated by the Contractor's operations. Prior to starting any work, the Contractor shall be required to have a City of Riverside Business Tax Registration valid for the life of the Contract; subcontractors shall also have Business Tax Registrations valid for the time they are engaged in the work.

7-5.3 City Permit Final – Close Out. Below is a list of required documentation that must be submitted to the Public Works Inspector, and approved before finaling any permit.

- **AS-BUILT PLANS**
- **BMP/WQMP Certification**
- **Copy of NOC from the State Water Board W.D.I.D**
- **Grade Certification**
- **Soils report FINAL**
- **Sewer and Strom Drain Videos acceptance by the City**
- **Final to review the site conditions by the Inspector,**

- **Punch List and completion of Final punch list**
- **Upon completion of all work, all Underground Service Alert (USA) marking shall be removed within the project limits, squared off.**

RMC 13.08.030: The Director of Public Works is authorized and empowered to suspend, cancel or withdraw the permit issued for the performance of any work which is not being done in accordance with the Permit, plans and specifications, and or other requirements mandated by other utilities or agencies,

RMC 13.12.150 Failure to Comply: The Director of Public Works may refuse to issue future permits for work performed under this chapter to any person who has failed to comply with the provisions of this chapter, permit, OSHA, plans & specifications, notices until such person has corrected any deficiencies to the satisfaction of the Director of Public Works.

The Contractor shall also have a permit for excavation from the Division of Industrial Safety as provided for in Labor Code Section 6500 when applicable. A copy of this permit shall be kept at the jobsite.

7-5.4 National Pollutant Discharge Elimination System (NPDES) Permit. Federal regulations control storm water discharges from construction sites into storm drains and surface waters. The requirements are outlined in the National Pollutant Discharge Elimination System (NPDES) permit held by the Riverside County Flood Control and Water Conservation District to which the City is a co-permittee. The regulations require a Storm Water Pollution Prevention Plan (SWPPP) for projects that include clearing, grading and excavation of over 1-acre to obtain an NPDES permit. Refer to Section 7-8.6 "Water Pollution Control" for the NPDES permit requirements.

7-6 THE CONTRACTOR'S REPRESENTATIVE

The Applicant and the General Contractor Superintendent is required to attend the pre-construction conference.

7-8 WORK SITE MAINTENANCE

7-8.1.1 General. The generation of dust shall be controlled as required by the Air Quality Management District. Grading activities shall cease during periods of high winds (greater than 25 MPH). Trucks hauling soil, sand or other emissive materials shall have their loads covered with a tarp or other protective cover as determined by the City Engineer. All types of dust control and/or methods for controlling dust shall be utilized.

7-8.1.2 Site cleanliness. The contractor shall be responsible to maintain a graffiti free work zone. This includes but is not limited to structures, appurtenances, equipment and signage. The clean-up and/or abatement shall be performed on a daily basis.

This section applies to equipment on the project or associated with the project, including but not limited to trucks, transit mixers, stationary equipment, and transient equipment.

The Contractor shall comply with all local sound control and noise level rules, regulations, and ordinances that apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without the muffler.

NOISE CONTROL: RMC Section 7.35.010.B.5, NO work shall start before 7:00 a.m. Monday-Friday and 8:00 a.m. on Saturday and at no time on Sunday or Holiday. No work or deliveries outside of approved working hours.

7-8.4.2 Storage in Public Streets and Right-of-Way. Construction equipment and materials **shall not be stored** in public streets and right-of-way. If the Contractor does not adhere, a STOP WORK NOTICE may be issued and/or permits suspended.
Excavated material, except that which is to be used as backfill in the adjacent trench, **shall not be stored** in public streets and right-of-way unless otherwise specified in these Special provisions or approved by the City Engineer. Immediately after placing backfill, all excess material shall be moved from the Work site.

7-8.4.3 Storage of Equipment and Material on Private Property. If the Contractor wishes to use private property as a Construction Yard, then prior to any staging, storing, or parking of any Contract equipment and/or materials on said private property, the Contractor shall comply with the following requirements:

a. The Contractor must provide the City Engineer a site map for review indicating the proposed location of the Construction Yard;
b. The location of the Construction Yard must be approved by the City Engineer and written approval must be provided to the contractor by the City Engineer;
c. The Contractor shall submit to the City Engineer a copy of the written agreement with the legal owner of the affected property to be used as a Construction Yard;

d. Within the Construction Yard itself, the Contractor must comply with the Best Management Practices for storm water protection as required by the Contract documents and current Public Works Standard Drawings for construction; and
e. The contractor shall also not deliver or remove any equipment or material outside the approved construction work hours. If the Contractor does not adhere to this requirement, the contractor shall be subject to a Stop Work Notice, and or revoked of using the property.

7-8.4.4 Haul Routes (All Types).

1) Haul Routes must be submitted two weeks in advance for review and approval prior to commencement of hauling materials.
   A. The applicant shall provide the following to the PW Construction Inspector:
      - Map depicting the to and from locations (Within City Limits ONLY)
      - The number of trucks used
      - The types of trucks (belly dump, super 10's, etc.)
      - Quantity of sweepers. Minimum 1ea. sweeper at each location
      - Days expected to haul
      - Start day and end day (duration). No weekends or Holidays
      - If the haul is within the City, the grading permit number for the site and for the receiving site (if material is shipped outside the City, no permit number is required)
      - Site contact information (phone, name, etc.)
   B. The Public Works Inspector will review the information for the haul route and comment on any potential conflicts with schools, stations, doubling up on routes, etc.
   C. Once the Public Works Inspector completes the review, the inspector will turn the information over to the Contract Administrator (CA) for final approval and or comments.
   D. Once approved by the CA, the Public Works Inspector will then notify the applicant of the approval and route associated documents to the applicant.

7-8.5.3.1 Sewage Spill Containment Plan. Chapter 14.12.295 of the Riverside Municipal Code prohibits the discharge of any pollutant to a storm drain or any surface, pipe, or waterway leading to a storm drain. The contractor shall prepare and submit to the City Engineer for review a sewage spill containment plan. No work will be permitted on the existing sewer system until the City Engineer's review

is completed. A copy of the plan shall be kept on the project site during construction. This plan shall describe the methods to be used to prevent or contain sewage spills. At a minimum, the plan shall provide:

- A scaled drawing showing any proposed emergency containment area(s) and the methods used to construct them. This plan shall also show any storm drain inlets that could be affected by an accidental spill and methods to be used to prevent the inlets from accepting any sewage. In addition, show the controls to be use to limit access to the spill area by the public.

- Describe the methods to be used for removing sewage and cleaning of storm drain inlets, storm drains, canals, and arroyos. This description shall include methods for solids removal.

- Describe cleanup methods including disinfecting the spill area . These methods shall show how disinfecting materials will be prevented from entering storm drains, canals, and arroyos.

- A scaled drawing(s) showing any proposed sewage bypass pipes. This drawing shall indicate any sewer manholes proposed to be plugged and the day and time of day this operation will occur.

- The size and material of any bypass pipes.

- The methods to be used to connect the bypass pipe(s) to the existing sewer system.
- If pumping is proposed, describe the number and capacity of the pumps. Each pump, at a minimum, must be capable of passing a 3-inch diameter solid.

- If storage is proposed, provide the methods to be used for the sewage storage and removal from the site. If a truck with a storage tank is to be used provide the capacity of the tank. If a water truck is proposed for this purpose it must be dedicated only for this operation.

In the event of a spill the contractor shall contact the City Engineer and the Field Maintenance Technician at 951-906-9066 (If not available contact the Wastewater Treatment Plant at 951-351-6280). The Contractor shall document the spill by photographing its extent.

These photographs shall be submitted to the City for inclusion in the Spill Report.

7-8.6 Water Pollution Control.

7-8.6.1 Description. The discharge of any pollutants into the City storm drain system or natural drainage areas is prohibited per Section 14 of the City Municipal Code and the Riverside County Area-Wide Municipal Storm Water permit issued by the State Water Resources Control Board. Drainage from construction sites and construction activities is prohibited from entering the City storm drain system and natural drainage areas. Any violations of the above provisions are subject to fines by the City and by the State Water Resources Control Board. **The City Engineer may order the suspension of construction operations if the Contractor fails to comply with the requirements of this section.**

7-8.6.2.1 Best Management Practices. The Contractor must follow and implement the Best Management Practices (BMPs) required by the Federal Clean Water Act. The following best management practices (BMPs) are to be implemented for the construction activities listed. These BMPs are considered to be a minimum of the activities necessary to protect the City storm drain system.

CONSTRUCTION ACTIVITIES	BEST MANAGEMENT PRACTICE
Portable Toilets	• The toilets may not be located in the street right-of-way. • Perimeter protection must be placed around the toilet area to contain any drainage.
Sawcutting, grinding, paving	• Debris from these types of activities are to be swept or vacuumed daily (at a minimum) and properly disposed of. • Drainage from these activities shall be contained or catch basins down stream of these activities shall be protected. • Drainage contained shall be vacuumed daily (at a minimum) and the remaining debris properly disposed of.
Concrete wash outs	• A washout/spoil area on site must be identified that will contain the concrete washout wastewater. The debris shall be removed at the end the day, or;The washout must be contained and removed off site daily.

Trenching	• Perimeter protection of the trenching spoil or trench area itself must be provided to prevent any erosion from the site. • Catch basin protection must be provided to prevent damage from entering the storm drain system. • Any sediment or debris shall be swept up daily at a minimum.
Spoil piles	• Spoil piles with the potential for draining off-site shall have perimeter erosion control and may need temporary cover.
Tracking	• Tracking pads are required for larger jobs as well as a continual sweeping plan. • Smaller jobs must sweep daily.
Vehicle maintenance	• Regularly scheduled vehicle maintenance activities such as oil changes and fluid refills shall be conducted off-site. • Any chemicals leaking from faulty equipment will be contained and repaired immediately. • A spill response plan must be identified that properly contains and disposes of any potential spill or leaks of hazardous materials including at a minimum oil, grease, hydraulic fluid, etc.
Vehicle washing	• Vehicle washing shall not occur on site
Sloped areas	• Sloped areas shall at a minimum be protected by perimeter erosion control. Larger slopes may also need erosion control at the top of slopes. These BMPs shall stay in place and be maintained until after the landscaping has completely been established.

In addition to the listed BMPs, all construction work shall conform to the requirements in the latest version of the California Stormwater Quality Association (CASQA) Construction BMP Handbook. The contractor must implement the necessary BMPs to ensure proper protection of the storm drain system and natural drainage ways. BMPs must be implemented for the following categories:

- Erosion Control
- Sediment Control
- Wind Erosion Control
- Tracking Control

Any BMP required to protect storm water quality shall be installed within 24 hours of the time contractor is notified by the City Engineer or regulatory agencies to install such BMPs. Each 24 hour period elapsed without installation of the required BMPs by the Contractor will be considered an incident. Failure of the Contractor to meet the 24 hour period for installing the required BMPs may result in the issuance of a STOP WORK NOTICE.

7-8.6.2.1.a Soil Stabilization. Implementation of soil stabilization practices and sediment control BMPs for soil-disturbed areas, including but not limited to, rough graded access roads, slopes, channel inverts, operational inlets and outlets of the project shall be completed prior to soil disturbance.

The City Engineer may require the contractor, on a case-by-case basis, to reduce the active, soil-disturbed area limit of the project. The Contractor shall demonstrate the ability and preparedness to fully deploy soil stabilization practices and sediment control BMPs to protect soil-disturbed areas of the project site by maintaining an adequate quantity of soil stabilization and sediment control materials onsite to protect exposed, soil-disturbed areas and a detailed plan for the mobilization of sufficient labor and equipment to fully deploy the required BMPs prior to the onset of precipitation and for the duration of the project.

Throughout the duration of the project, soil-disturbed areas of the project site shall be considered to be inactive whenever soil disturbing activities are expected to be discontinued for a period of fourteen (14) calendar days or more. Areas that will become inactive should be fully protected with soil stabilization practices such as covering with mulch, temporary seeding, fiber rolls, blankets, etc., within ten (10) calendar days of the discontinuance of soil disturbing activities or two (2) calendar days prior to the onset of precipitation, whichever is first to occur. Areas that will become inactive shall be fully protected with sediment control BMPs within ten (10) calendar days of the discontinuance of soil disturbing activities or prior to the onset of precipitation, whichever is first to occur.

7-8.6.2.2 Training. Contractor shall provide copies of certification that the superintendent or foreman has attended a Stormwater Pollution Prevention course within the last 12 months. Any work

requiring the placement of BMPs shall not begin until this certification is provided to the City Engineer.

7-8.6.2.3 Other Permits. The Contractor shall become fully informed of and comply with the applicable provisions of the State Construction General Permit, General De Minimis Permit, and other Federal, State and local regulations that govern the Contractor's activities and operation pertaining to both stormwater and non-stormwater discharges from both the project site and areas of disturbance outside the project limits during construction. The Contractor shall, at all times, keep copies of the General Permit, General De Minimis Permit, approved Storm Water Pollution Prevention Plan (SWPPP) and all amendments at the project site. The SWPPP shall be made available upon request of a representative of the California State Water Quality Control Board (SWQCB), Santa Ana Regional Water Quality Control Board (RWQCB), United States Environmental Protection Agency (USEPA) or local stormwater management agency.

The Contractor shall, during work hours, allow authorized agents of the SWQCB, RWQCB, USEPA or local stormwater management agency, as may be required by law, to:

1. Enter upon the construction site and the Contractor's facilities pertinent to the work;

2. Have access to and copy any records required to be kept as specified in the Construction General Permit;

3. Inspect the construction site, including any offsite staging areas or material storage areas, and related soil stabilization practices and sediment control BMPs; and

4. Sample or monitor for the purpose of ensuring compliance with the Construction General Permit.

The Contractor shall notify the City Engineer immediately upon request from regulatory agencies to enter, inspect, sample, monitor or otherwise access the project site or the Contractor's records.

7-8.6.2.4 Drawings. The following notes (or notes of substantially similar intent) that address pollution prevention to the Maximum Extent Practicable during the construction phase of a project on a year-

round basis need to be placed on required Stormwater and Non-Stormwater Pollution Control Drawings:

- Erosion control BMPs shall be implemented and maintained to minimize and/or prevent the entrainment of soil in runoff from disturbed soil areas on construction sites.

- Sediment control BMPs shall be implemented and maintained to prevent and/or minimize the transport of soil from the construction site.

- Stockpiles of soil shall be properly contained to eliminate or reduce sediment transport from the site to streets, drainage facilities or adjacent properties via runoff, vehicle tracking or wind.

- Appropriate BMPs for construction-related materials, wastes, spills or residues shall be implemented to eliminate or reduce transport from the site to streets, drainage facilities or adjoining properties by wind or runoff.

- Runoff from equipment and vehicle washing shall be contained at construction sites and must not be discharged to receiving waters or the local storm drain system. Washwaters or reinstate from ready mix, concrete, or cement vehicles must be handled appropriately and may not be discharged to receiving waters or any storm drain system.

- All construction contractor and subcontractor personnel are to be made aware of the required best management practices and good housekeeping measures for the project site and any associated construction staging areas.

- At the end of each day of construction activity all construction debris and waste materials shall be collected and properly disposed of as required by applicable laws.

- Construction sites shall be maintained in such a condition that a storm does not carry wastes or pollutants off the site. Discharges other than stormwater (non-stormwater discharges) are prohibited, except as authorized by an individual NPDES permit or the State-wide General Permit for Storm Water Discharges Associated with Construction Activity. Potential pollutants include but are not limited to:

solid or liquid chemical spills; wastes from paints, stains, sealants, solvents, detergents, glues, lime, pesticides, herbicides, fertilizers, wood preservatives and asbestos fibers; paint flakes or stucco fragments; fuels, oils, lubricants and hydraulic, radiator or battery fluids; concrete and related cutting or curing residues; floatable wastes; wastes from engine/equipment steam cleaning or chemical degreasing; wastes from street cleaning; and super-chlorinated potable water from line flushing and testing. During construction, disposal of such materials should occur in a specified and controlled temporary area onsite physically separated from potential stormwater runoff, with ultimate disposal in accordance with local, State and Federal requirements.

- Discharging contaminated groundwater produced by dewatering groundwater that has infiltrated into the construction site is prohibited. Discharging of contaminated soils via surface erosion is also prohibited.

- The Contractor is required to notify and obtain approval from the City ten (10) days prior to any non-stormwater discharge or dewatering associated with Contractor's construction activities.

- Construction sites shall be managed to minimize the exposure time of disturbed soil areas through phasing and scheduling of grading to the extent feasible and the use of temporary and permanent soil stabilization.

- BMPs shall be maintained at all times. In addition, BMPs shall be inspected prior to predicted storm events and following storm events.

7-10 PUBLIC CONVENIENCE AND SAFETY

7-10.1 Access. The Contractor shall provide traffic control and schedule the construction work based on the following criteria and constraints:

1. No reduction of the traveled way width shall be permitted before **8:30 a.m**. nor after **3:30 p.m.** on any street unless prior approval in writing is obtained from the City Engineer. During operations that require lane reduction, the Contractor shall provide and maintain two twelve-foot-wide lanes to provide one thru lane in each direction at all times. The Contractor shall also not store

construction equipment within any public streets and right-of-way outside the aforementioned hours. The Contractor shall also not deliver/remove any equipment or material to/from the Construction Yard or work area outside the aforementioned hours from 8:30 a.m. to 3:30 p.m. Failure of the Contractor to maintain these requirements will result in the issuance of a STOP WORK NOTICE.

2. Access to all properties shall be maintained at all times and not impact daily operations. If necessary, the Contractor shall construct driveways in phases or install steel plating to maintain accessibility.

3. The Applicant may be required to install Public Notification signs at locations adjacent to the project limits. The Contractor is responsible to protect, maintain and move these signs as necessary. At the completion of the project, the Contractor is responsible to remove signs from posts, remove posts from ground without cutting, carefully remove any concrete from the posts, repair the posthole, and bind the posts.

4. The Contractor shall provide the City evidence of a date certain in which the signal and/or street light poles will be delivered to the project site. The poles shall be delivered to the project site no later than **by the date specified on the plans, if noted.**

5. Shoulder Excavation: When temporary traffic lanes have a vertical edge 2 inches deep or deeper within 6 feet from the travel ways, the Applicant/Contractor shall have a minimum 4:1 compacted slope (Choker) along the entire travel edge. Road users shall be warned of excavations utilizing signs such as LOW SHOULDER (W8-9) or OPEN TRENCH (C27(CA)). In addition, edge line channelizers delineation shall be placed every 25 feet for the length of the excavation to warn road users of the excavation.

6. The contractor shall allow the City's RPU Water Division forces two (2) working days for each facility to be relocated or newly installed, including water meters, fire hydrants, blow-off valves, air release valves, etc, for connecting each facility to an existing City water line. The Contractor shall provide the City Engineer a ten (10) working day written notice in order to schedule the City RPU Water Division work.

7. The contractor shall allow the City's RPU Electric Division forces two (2) working days for electric facility proposed or relocated including all services to any proposed electric facilities to be installed by the contractor. The contractor shall provide the City Engineer a ten (10) working day written notice in order to schedule the City RPU Electric Division work.

8. Engineered traffic control plans shall be required when working within 250' of a signalized intersection, railroad, Caltrans, or utility right-of-way or easement.

9. The contractor shall provide and maintain traffic control during all construction activities in accordance with the Work Area Traffic Control Manual Handbook (WATCH). If the contractor cannot provide and maintain traffic control as required, then the City Engineer may direct the contractor to provide, maintain, and update a full traffic control plan.

10. The contractor shall provide traffic control for the protection of the City survey crew when required.

11. The contractor shall install, maintain, and relocate as necessary a minimum of two (2) portable changeable message signs two weeks prior to commencement of construction. Final locations shall be approved by the City Engineer prior to installation, however the signs shall be generally placed prior to the project limits facing the direction of vehicular travel at the following locations:

    Changeable Message Signs (CMS) are required to be posted two weeks prior to the start of ANY work. The CMS's shall read "DATES", "DETOUR IN PLACE" and "CHOOSE ALTERNATE ROUTE",

    a. Submit CMS messages to the City's Public Works Department for approval, if required.

12. The Contractor shall be responsible to obtain all replacement gate valve, pull box, and/or water meter boxes when directed by the City Engineer **if damaged or when adjustment is required.**

13. At all Bus Pad locations, continuous lane closures (not to exceed 3 continuous working days) will be permitted Monday through Friday. Work will be permitted between the normal working hours specified for those days. Bus Pads shall be excavated, rebar shall

be installed, concrete shall be poured utilizing "High Early Strength" concrete as specified in Section 201-1.1.4.1, and traffic shall be returned to its normal traffic circulation within 3 consecutive working days of the commencement of excavation activities. Consecutive working days will not be permitted to extend over a weekend, unless otherwise specified in the following item.

14. For the proposed bus pads to be constructed at the following location(s), lane reductions will be allowed beginning at 4:00 p.m. on Fridays thru 7:00 a.m. on Mondays. Excavation shall commence on Fridays after 4:00 p.m. and the base material shall be installed and compacted before 11:00 p.m. on Fridays. No work will be allowed between 11:00 p.m. on Fridays thru 7:00 a.m. on Saturdays. The steel reinforcement shall be installed and the "High Early Strength" concrete shall be poured by 7:00 p.m. Saturday. No work will be allowed after 7:00 p.m. on Saturdays. The concrete shall be allowed to cure for 24 hours minimum and traffic shall be returned to its normally allowed traffic circulation before 7:00 a.m. on Monday:

15. Haul route requirements are subject to Section 7-8.4.4. Haul routes must be submitted two weeks in advance for review and approval prior to commencement of hauling materials.

16. The Contractor is required pave the roadway within five (5) working days after the commencement of Cold Milling (Types CM2 and CM3) work; pour concrete after the commencement of excavation work for all new sidewalks, driveways, driveway match-ups, pedestrian ramps, and/or curb and gutter; and/or complete the asphalt repair for the open slots.

17. Upon completing the application of slurry, the contractor shall install signs within the applicable roadways indicating the following unless otherwise approved by the City Engineer:

    "Fresh Oil Paving. Slow Speeds Required. No Sharp Turns. No U-Turns."

    Sign(s) shall remain and maintained until the slurry product cures (one week minimum).

No work will be allowed in the downtown Riverside area between the dates November 1 and at the end of the Festival of Lights (FOL). The downtown

area will be bounded by First St and Fifteenth St going north and south and the 91 Freeway and Brockton Ave going east to west. No work will be allowed within 1000 feet of the Galleria at Tyler or the Riverside Plaza during the same time. Any exceptions must be approved by the City Engineer.

7-10.1.1.2 Pedestrian Access. The Contractor shall provide and maintain a minimum 5-foot-wide path for pedestrian traffic through the construction site. If a path through the construction site and within street right-of-way is not possible, the Contractor shall lay out and maintain a safe and direct pedestrian path around the construction site within the public right-of-way. The pedestrian path shall be approved by the City Engineer.

7-10.2.2 Traffic Control Plan (TCP).

7-10.2.2.1 General. The applicant/contractor shall submit traffic control plans to Public Works for review, comment and or approval at the time of the application process. The plans shall be prepared, stamped and signed by a California Registered Traffic or Civil Engineer. The preparation of the plan shall be in accordance with the latest edition of the California Manual on Uniform Traffic Control Devices (CA MUTCD) and the State Standard Specifications. The plan(s) shall be to scale, typically 1"=40' or 1"=50' and shall follow Caltrans Plan Preparation Manual, latest edition. The plan shall reflect existing signing and striping, curbs, lane widths, raised medians, etc. The Contractor, at the pre-construction meeting, shall submit two full size bond plan sets for review. Work shall not commence without an approved traffic control plan.

When working within school limits, traffic control times may be adjusted in order to accommodate school bell schedules for the safety of the students and the general public. Contact the Public Works Construction Inspector to get start times and/or restrictions.

Engineered Traffic Control Plan required when affecting any SIGNALIZED intersection and or within 250' feet of a signalized intersection.

Traffic control may require adjustments in order to accommodate the public safety and or due to field conditions.

The Contractor shall provide and maintain two twelve-foot-wide lanes for two-way traffic at all times.

When other applicants/contractors/developers are expected in the same work area, the applicant is responsible for coordinating work efforts to prevent conflict with traffic control. Access to the drive approach shall be available at all times to the residents/business.

No work will be allowed in the downtown Riverside area between the dates November 1 and the end of the Festival Of Lights (FOL). The downtown area will be bounded by First St. and Fifteenth St., and the 91 Freeway and Brockton Ave. No work will be allowed within 1000' feet of the Galleria at Tyler or the Riverside Plaza during the same time. Any exceptions must be approved by the Public Works City Engineer.

7-10.2.3 Street Closures, Detours, Barricades. For convenience to the Contractor to comply with the other provisions of this section, the following telephone numbers are listed:

Police Department	(951) 826-5700
Fire Department	(951) 826-5321
Traffic Engineering Division	(951) 826-5366
Traffic Signal Maintenance	(951) 351-6103
Street Light Repair	(951) 351-6103
City Electric, Water (After hours)	(951) 687-0791
AMR Ambulance Service	(951) 684-5520
RTA	(951) 684-0850
Street Superintendent	(951) 351-6103
Riverside Schools	(951) 788-7134
Alvord Schools	(951) 351-9325
Special Services Transportation	(951) 687-8080
AT&T (Emergency)	(951) 811-2121
Gas Company (Emergency)	(800) 427-2200
Gage Canal Office	(951) 780-1333
United States Post Office (USPS)	(951) 276-6252
Verizon Wireless (24-7 Repairs)	(800) 483-2000
Sherman Indian High School	(951) 276-6325

The contractor is not relieved of the responsibility of notifying the various departments and agencies, if these telephone numbers are changed.

Contact Riverside Transit Agency (RTA) and coordinate traffic control when effecting ANY RTA bus stops. Sam Wattana 951-377-0569.

Contact Urban Forestry at 951-351-6103 when excavating within City Right-of-Way and/or affecting any irrigation lines.

7-10.3.1 Street Closures, Detours, Barricades. <u>NO Street Closures Permitted</u>. The applicant will not be permitted to close any road without prior written permission and plan approval from the Public Works Director. The applicant will be required to submit for approval a "Road Closure and Traffic Control Plan" that has been prepared by either a licensed Traffic or Civil Engineer. If a full closure is required, submittal of the plan shall be at least fifteen (15) working days prior to the start of work. Partial traffic control plan(s) shall be submitted at least ten (10) working days prior to the start of work. The plan shall indicate the location and type of signs and barricades to be utilized. The adequacy of the signage shall be determined by the City Engineer. Prior to preparation of the Plan, the Contractor is advised to discuss the proposed Plan with the City Engineer/Construction Inspector. The applicant MUST notify the Public two weeks prior to any Street Closure.

<u>Changeable Message Signs (CMS) are required to be posted two weeks prior to the start of ANY work. The CMS's shall read "DATES", "DETOUR IN PLACE" and "CHOOSE ALTERNATE ROUTE",</u>

If the permit applicant or contractor closes a street without written approval **a STOP WORK NOTICE shall be issued, and <u>NO</u> work shall commence.**

No work (except for emergencies) that requires lane closures shall be allowed on the day before a City Holiday unless specifically approved by the City Engineer in advance.

The Contractor shall notify the Inspector 48 hours prior to any change in the approved Traffic Control Plan. In case of a full closure, the Contractor shall provide barricades and reflectorized "Road Closed to Through Traffic" signs at the intersections immediately in advance of all such closures, at entrances to the closures, and at all detour route signing. Detour signs shall be posted on wood or metal posts. Signs shall not be posted on any tree, utility pole or traffic signs.

Construction signs, barricades, and their applications shall conform with the most current issues of the State of California Business and Transportation Agency, Department of Transportation, Division of Operations "Uniform Sign Chart" and the "Manual of Traffic Controls" for Construction and Maintenance Work Zones.

Pedestrian Traffic Control required per CA MUTCD and or WATCH manuals. The applicant shall obtain approval from the Public Works Construction Inspector prior to implementing Traffic Control devices.

7-10.4.3 Use of Explosives. If explosives are to be used, the Contractor, in addition to meeting the other requirements of this Section of the Standard Specifications, shall obtain a blasting permit from the City of Riverside Fire Department and pay the required fees (the exact amount of the fee can be obtained from the Fire Department, at (909) 826-5455 and shall give four days notice to the City Engineer and the Fire Department prior to any blasting.

7-10.4.6 Public Safety During Non-Working Hours. Public safety at or in the affected vicinity of the jobsite is the contractor's responsibility at all times. If, in the absence of the contractor, the City Engineer determines that an unsafe condition exists at or in the affected vicinity of the jobsite, the City Engineer will endeavor to notify the contractor to correct the unsafe condition. However, the City Engineer reserves the right to direct City forces to perform any functions City Engineer may deem necessary to ensure public safety. If such procedure is implemented the Applicant or contractor will bear all expenses incurred by the City. In all cases the judgment of the City Engineer shall be final in determining whether or not an unsafe situation exists.

7-10.4.7 Shoulder Excavations. Road users shall be warned of excavation 2 inches deep or deeper without a 4:1 fillet in the parking lanes or shoulders. LOW SHOULDER (W8-9) or OPEN TRENCH (C27(CA)) signs shall be placed to warn the road user that an excavation has been made in the parking lane or shoulder. In addition, edge line channelizer delineation shall be placed every 25 feet for the length of the excavation to warn road users of the excavation.

7-10.6 Public Notification of Construction. The construction schedule required under Section 6-1.1 of these Special Provisions shall allow ample "on-street" parking for affected people, within a reasonable distance from their homes and businesses. Requests for changes to the schedule shall be

submitted by the contractor to the City Engineer at least 48 hours prior to the scheduled operation to be changed.

The contractor/applicant shall provide a construction advisory letter, subject to the approval of the City Engineer, to all affected residences and businesses adjacent to the work site a minimum of 7 days and maximum of 14 days prior to construction in each area of the project (see sample letter attached as Exhibit A). The letter shall indicate the duration of the proposed construction and state if alternate parking arrangements will be necessary. Projects that have multiple locations shall have a separate letter for each location and distribution for each area shall be **7 to 14 days prior to** construction beginning in the area. The City Inspector shall be notified 48 hours in advance of letter distribution and shall be on site during distribution of letter **(Letters shall not be placed in mailboxes)**.

In addition, the Contractor shall provide another construction advisory letter, subject to the approval of the City Engineer, to all affected residences and businesses adjacent to the work site a minimum of 48 hours prior to construction on each street. The letter shall indicate the duration of the proposed construction and also state if alternate parking arrangements will be necessary.

"Temporary No Parking Signs" shall be posted for a continuous 48 hour period in advance of the work. These signs shall read “Temporary Tow-Away Zone, No Parking, RMC 10.12.080(b), (c); CVC 22651 (l), (n)". A sample will be provided at the pre-construction conference. The signs shall be placed and shall also display the following:

a. Date:
b. Time:
c. Contractor Name:

Postings shall be no more than 100 feet apart on each side of the street and at shorter intervals if conditions warrant. The Contractor shall provide the signs and will be responsible for adding the dates and hours of closure to the signs. All signs shall be removed within 24 hours after the effective date. If the date of closure is changed, the Applicant/Contractor will be responsible for reposting the signs in accordance with the above requirements.

At the discretion of the City Engineer, public notification signs may be required and shall be posted at the project site. Signs shall be posted a minimum of one week prior to commencement of construction. Sign locations shall be approved by the Engineer. Prior to fabrication of public notification signs, Contractor shall submit drawings to the Engineer for

approval. The submittal shall include sign sizes, colors, legends (including text size) and the method of erecting. Fabrication, erection, maintenance and removal of public notification signs shall be included as part of the permit requirements. All other construction signing, delineation, barricades and traffic control will be required.

7-10.6.1 Portable Changeable Message Signs. Changeable Message Signs (CMS) could be required when performing any work within the public right-of-way, such as pipe work, paving, etc.

Work includes furnishing, placing, operating, maintaining, and removing portable changeable message signs. Signs shall be installed 2 weeks prior to commencement of construction. When no longer required on the project, the Contractor shall remove the signs within 24 hours of notification.

The signs shall comply with Section 12-3.12 "Portable Changeable Message Signs," of the State Standard Specifications.

Definitions
Useable shoulder area: Paved or unpaved contiguous surface adjacent to the traveled way with:

1. Sufficient weight bearing capacity to support portable changeable message sign,
2. Slope not greater than 6:1 (horizontal: vertical).

Submittals
Upon request, submit a Certificate of Compliance for each portable changeable message sign under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

Quality Control and Assurance
The signs shall comply with the manufacturer's operating instructions for portable changeable message signs.

Approaching drivers must be able to read the entire message for all phases at least twice at the posted speed limit before passing portable changeable message sign. You may use more than 1 portable changeable message sign to meet this requirement.

Display the message shown on the plans, ordered by the City Engineer, or specified in these special provisions.

Materials

Portable changeable message sign must have 24-hour timer control or remote control capability.

The text of the message displayed on portable changeable message sign must not scroll, or travel horizontally or vertically across the face of the message panel.

Construction

Continuously repeat the entire message in no more than 2 phases of at least 3 seconds per phase.

If useable shoulder area is at least 15 feet wide, the displayed message on portable changeable message sign must be minimum 18-inch character height. If useable shoulder area is less than 15 feet wide, you may use a smaller message panel with minimum 12-inch character height to prevent encroachment in the traveled way.

The contractor of the contractor's representative must be available by cell phone for operations that require portable changeable message signs. At the request of the City Engineer, immediately comply with the request to modify the displayed message.

Place portable changeable message sign as far from the traveled way as practicable where it is legible to traffic and does not encroach on the traveled way. Place portable changeable sign before or at the crest of vertical roadway curvature where it is visible to approaching traffic. Avoid placing portable changeable message sign within or immediately after horizontal roadway curvature. Where possible, place portable changeable message sign behind guardrail or temporary railing (Type K).

Except where placed behind guardrail or temporary railing (Type K) use traffic control for shoulder closure to delineate portable changeable message sign.

CMS placement must be approved by the Public Works Construction Inspector, and the applicant must remove portable changeable message sign when not in use.

END OF PART 1.

PART 2
CONSTRUCTION MATERIALS

200-2 UNTREATED BASE MATERIALS

In lieu of crushed aggregate base, the Contractor may use crushed miscellaneous base per Section 200-2.4 of the Standard Specifications, or processed miscellaneous base per Section 200-2.5 of the Standard Specifications, or Pulverized Miscellaneous Base per Section 200-2.8, or Class 2 aggregate base per Section 26-1.02A of the State Standard Specifications.

When the Plans specify aggregate subbase, the material used shall be select subbase as specified in Section 200-2.6 of the Standard Specifications.

201-1 PORTLAND CEMENT CONCRETE

201-1.1.4.1 Concrete Specified by Compressive Strength. All concrete furnished or used for all Bus Pads, shall be "High Early Strength" Type II/V (ASTM C-150) and shall achieve a compressive strength of 3000 psi @ 24 hours. All concrete shall be mixed and delivered in accordance with ASTM C-94 and the proposed mix shall be submitted to the City Engineer for approval.

201-1.2.1 Portland Cement. Portland Cement for CSPB shall be Type II or V. There are no substitutions for Portland Cement.

201-1.4.4 Hand Mixing. Hand mixing of PCC materials is NOT allowed.

201-1.6 Permeable Concrete

201-1.6.1.1 Contractor Qualifications.

a. Contractor shall employ no less than one National Ready Mixed Concrete Association (NRMCA) Certified Pervious Concrete Craftsman who must be onsite, overseeing each placement crew during all concrete placement, or the Contractor shall employ no less than three NRMCA Certified Persons Concrete Installers, who shall be on site working as members of each placement crew during all concrete placement unless otherwise specified.

b. If the Contractor has insufficient experience with pervious concrete pavement (less than 3 successful jobs), the Contractor shall retain an experienced consultant or NRMCA Certified Pervious Craftsman to monitor production, handling, and placement operations at the Contractors Expense.

c. Samples of Permeable Gutter: Regardless of qualification, Contractor is to place, joint and cure two test samples of pervious curb and gutter each at a minimum of 10 feet long to demonstrate the functionality, appearance, and structural integrity of the permeable concrete curb and gutter.

201-1.6.2.1 Materials and Construction. Materials and construction shall consist of:

a. Concrete aggregate shall be clean and gap-graded with a mixture of one part 3/8" pea gravel to 2 parts 1/2" crushed rock.

b. Pervious concrete section installed within gutters shall be 6" thick.

c. Contractor shall install a minimum of 24" thick ¾" rock base at 90% minimum relative compaction below the PCC curb and pervious concrete gutter.

d. A minimum 1' wide AC pavement repair patch is required when PCC or pervious concrete is placed adjacent to existing AC pavement.

e. A 10 mil Visqueen water barrier shall be placed below the 3/4" rock base and adjacent to all sides and ends of the pervious concrete gutter but open to the back side of the curb and gutter to keep drainage out of the roadway subgrade and directed into the parkway.

f. Portland Cement shall be Type II or Type V.

201-1.6.3.1 Mix Design. Mix design shall consist of:

a. Water-cement content ratio shall be 0.30.

b. Contractor shall achieve a minimum 20% air void structure.

c. Permeable flow rates shall be a minimum 8 Gal/SF/Min for pervious concrete gutter.

203-5 SLURRY SEAL

203-5.4.2.1 Aggregate. Aggregate shall be Type II.

203-5.4.2.2 Emulsified Asphalt. Emulsified asphalt shall be CQS-1h.

203-5.4.2.4 Latex. The latex additive shall be ULTRAPAVE 65K or an approved equal. The latex shall be added at the emulsion plant after weighing the asphalt and before the addition of mixing water. The latex shall be added at a rate of 2% by weight of the asphalt emulsion.

203-5.4.4 Mix Design Certification. Contractor shall provide a certificate of compliance that the emulsion-aggregate slurry mix meets the requirements in the Standard Specifications and these Special Provisions.

203-6 ASPHALT CONCRETE

Where dense graded asphalt is being constructed in two layers or more, the Asphalt Concrete pavement for the base course shall be B-PG 70-10. When dense graded asphalt is being constructed in a single layer and for a finishing course or Asphalt Concrete overlay, the Asphalt Concrete pavement shall be C2-PG 70-10.

Blast furnace or steel slag is not acceptable as an aggregate in asphalt concrete. The materials listed below shall be used unless otherwise specified.

TYPE	USE
B PG-70-10	Base course for streets.
C2 PG-70-10	Base course for alleys and trench resurfacing; Base course for streets with grades over 10%; Surface course for streets alleys and trenches.
D2 PG-70-10	Berm

D2 PG-70-10	Speed Humps
E PG-70-10	Hand raking in inaccessible areas and feather-edging.
D2 PG-70-10	Overlay less than 1" thick

203-11 ASPHALT RUBBER HOT MIX (ARHM) WET PROCESS

203-11.2.3 Crumb Rubber Modifier (CRM). The Contractor shall certify that all crumb rubber used in the project is derived from California used and waste tires.

203-11.3 Composition and Grading. The Contractor shall use ARHM-GG-C, conforming to the requirements of Table 203-11.3 (A) of the Standard Specifications.

207 PIPE

207-2 REINFORCED CONCRETE PIPE

207-2.1.1 Submittal. Prior to the delivery of RCP to the jobsite, the Contractor shall submit, to the City Engineer for approval, the manufacturer's certification that all RCP to be used on the project meets the requirements of the Standard Specifications.

208 PIPE JOINT TYPES AND MATERIALS

RCP: Tongue-and-Groove with mortar sealant as described in Section 306-1.2.4.1 of these Special Provisions.

END OF PART 2.

PART 3
CONSTRUCTION METHODS

NOTE:
MORATORIUM: WHEN STREETS ARE UNDER MORATORIUM WITHIN THREE (3) YEARS FROM LAST PAVED, NO WORK SHALL COMMENCE. IF PERMITTED TO WORK WITHIN THE MORATORIUM LIMITS, REFURBISHMENT OF THE ASPHALT AND STRIPING LIMITS SHALL BE GREATER.

300-1 CLEARING AND GRUBBING

300-1.3 Removal and Disposal of Materials. Clearing and grubbing shall be performed wherever construction is to be performed. Clearing and grubbing includes removal and disposal of all aboveground material including, but not limited to, abandonment of conduits and structures, demolishing of structures as required, complete traffic signal footings & poles, and vegetation including small trees. The Contractor is responsible for the proper disposal of any construction debris and any surplus excavation material. All materials shall be legally disposed of.

Prior to cutting any service systems, such as sprinklers, the Contractor shall test the system and make necessary adjustments to keep the remaining irrigated areas serviced.

Traffic signs to be salvaged shall be completely disassembled and delivered to the City of Riverside storage facility. The Contractor shall call the Street Services Division at 951-351-6103 for delivery location and instructions. No Posts will be accepted.

Disposition of other existing signs shall be as shown on the plan(s) and/or as directed by the City Engineer. This may include temporary sign relocations due to construction or stockpiling of signs at the job site. The contractor will be responsible for maintaining the condition of all signs specified herein.

Mailboxes and posts within the construction area shall be salvaged and temporarily set in an upright condition where easily accessible for mail delivery and accessible by the property owner. Posts and boxes shall be reinstalled in final position by the Contractor as shown. Broken posts shall be replaced. Replaced posts shall be, at the option of the Contractor, 4" x 4" redwood or 2" galvanized steel pipe.

If the Contractor encounters existing asphalt material extending onto the PCC gutter, and the gutter is not proposed to be overlaid, then the

contractor shall be required to remove the overlay in such a manner that damage to the gutter will not occur. If, in the opinion of the City Engineer, the existing gutter's flow or riding characteristic have been altered by the AC

removal, the Contractor, at Contractor's expense, shall make repairs to restore the gutter quality to its original state.

300-1.3.2 Requirements.

(b) Concrete Pavement. When trenching in concrete pavement, the concrete pavement shall be removed on each side of the trench by one additional foot.

(c) Concrete Curbs, Walks, Gutters, Cross gutters, Driveways and Alley Intersections.

1. **Curb or Curb and Gutter.** Curb or curb and gutter section to be replaced shall be not less than 5 feet in length. All saw cuts will be at right angles to the alignment of the curb or curb and gutter. Where curb or curb and gutter are on a curve, the saw cut will be on a radial line. If the saw cut would fall within one foot of a construction join, expansion joint, weakened plane joint, or score mark, the cut shall be made on the joint or mark. The curb or curb and gutter shall not be cut in a place that would leave a piece less than 5 feet in length. Historical removals are not allowed unless directed by the City Engineer.
2. **Sidewalks.** No section of sidewalk to be replaced shall be less than 25 square feet in size. The length of sidewalk to be replaced shall be equal to the width. Where the sidewalk exceeds 8 feet in width, the minimum length shall be 4 feet. The exception to the above is when a section of sidewalk is removed for the installation of anything that requires a concrete foundation or a fire hydrant. The size of this section shall not exceed one-half the width of the sidewalk and shall be square. When the alignment of the sidewalk is on a curve, the saw cut shall be on a radial line; if the saw cut would fall within one foot of a construction joint, expansion joint, weakened plain joint, or score mark, the cut shall be made on the joint

or mark. The sidewalk shall not be cut in a place that would leave a piece of sidewalk less than 25 square feet in size.

3. **Driveway Approaches.** Driveway approaches can only be saw cut at right angles to the curb alignment or on a radial line where the curb alignment is on a curve. The minimum length of section to be replaced or section that will remain shall be one-half of the difference between dimensions "A" and "B" plus 5 feet. This length shall be measured the same as "B" dimension. The curb and gutter shall be cut and replaced as curb and gutter on all types of driveway approaches with the minimum length of one-half the "B" dimension.

4. **Cross Gutters / Spandrels.** Cross gutters shall only be saw cut at right angles to the cross gutter and shall extend the full width of the cross gutter. The section to be removed or the section to remain in place shall not be less than 10 linear feet in length.

   The saw cutting of the spandrel will be as directed in the field or as shown on the plans.

(d) Signal Detector Frame and Foundation. Signal detector frame and foundation shall be removed and the remaining void shall be backfilled and compacted with residue AC from cold milling operations or crushed aggregate base to the level of the existing grade. Additional AC may have to be placed as a leveling course to provide a smooth ride across the detector removal areas. The Contractor shall be responsible for the lawful disposal of the removed items.

300-2 UNCLASSIFIED EXCAVATION

300-2.2.2 Wet Material. In the event that the depth of the proposed pipeline is below groundwater level it is anticipated that a portion of the excavated material from the trench will be too wet to use as trench backfill. If, in the contractor's opinion, this condition presents itself during trenching operations the contractor shall immediately notify the City Engineer. The City Engineer will determine the suitability of the soil as backfill material. Based on the City Engineer's decision the contractor may be directed to remove and dispose of all wet materials and replace with suitable materials.

Measurement of the wet unsuitable material shall be taken from the trench. The volume will be measured by the following: The depth will be determined at the point the wet material is found to the depth where suitable material is found or the bottom of the trench, whichever is less; the width of the trench is as shown on the plans; and the length will be measured along the centerline of the pipe for the length of the unsuitable material. The length will be measured through any structures and no additional trench width will be allowed for structures.

300-4 UNCLASSIFIED FILL

300-4.1.1 Stockpiling. Contractor shall complete all stockpiling activities adhering to all State and City regulations and as directed by the Engineer. Stockpiled material shall not exceed a height of 6 feet at any time. Stockpiled material located within City right-of-way shall be removed the on same day the excavation work is completed unless otherwise approved by the Engineer.

301-1 SUBGRADE PREPARATION

301-1.6.1 Schedule and Tolerances of Manhole Adjustment. Sewer and storm drain manhole frames and covers shall be raised to the finished grade by the Contractor within 48 hours of final paving. The Contractor shall raise the tops of all frames and covers to range from flush to 1/4" above the finished grade of the immediately adjacent pavement. Regardless if any utility frame or cover, within the limits of the improvements, requires an adjustment to complete the project, the contractor shall thoroughly clean all covers to remove any markings, stains, striping, etc., unless otherwise directed by the City Engineer.

301-1.6.2 Riverside Public Utilities (RPU) - Water Manholes and Valve Boxes. At the option of the City, the contractor shall adjust water manhole frames and covers and water gate valve covers to range from flush to 1/4" above the finished grade of the adjacent pavement. All dirt and debris are to be removed from the valve box to a depth of 6" below the operating nut.

Adjustment of water gate valve covers installed after March, 1983 (cap & liner type) shall be in accordance with STD. DWG. C.W.D. - 515. On water gate valve covers installed prior to March, 1983 (frame & lid type); if the frame skirt is raised above the existing gate box material (steel pipe), the gate box material should be extended as required. This extension must match the existing steel pipe O.D. & I.D.

and must be secured with at least (3) equally spaced one inch welds OR the contractor may choose to replace the Frame & Lid with a contractor supplied Cap & Liner. If a Cap & Liner is used, the contractor must drill a 1/4" hole in the new cap, 3/8" inside the interior ring on the cap surface. A contractor supplied 1/4" x 1-1/2" brass roundhead screw must be installed and the existing gate tag (with copper wire) inserted on the inside of the cap, then held on with a 1/4" brass washer and nut. The top of all water valve covers shall be painted in accordance with Riverside Public Utilities Water Division Specification No. 205.

Marking Paint - Lead Free
Aervoe Pacific - #203 Blue
Ground Traffic Coating - VOC<66%

Valve boxes smaller than (8) inches in diameter shall be replaced with 8" gate box material and a "cap & liner" type gate valve cover, in accordance with Riverside Public Utilities Water Division Specification No. 205. Any valve box found to be corroded, bent or otherwise previously damaged, making adjustment impractical or not feasible, shall be replaced. The inspector shall determine at the time of construction if the valve boxes in question shall be adjusted or replaced. The City will furnish new gate box materials and "caps and liners" for valve box replacements, however the Contractor shall be responsible for obtaining the materials from the City Corporation Yard to the Project site. Arrangements for obtaining these materials from the City's Corporation Yard at 8095 Lincoln Avenue shall be made through the Inspector 15 working days prior to scheduled installation.

Two foot by two foot rectangular valve covers marked "Riverside Water Company" will be adjusted to grade by the City.

301-1.6.3 Riverside Public Utilities - Electric Vaults and Manholes. At the option of the City, the Contractor shall adjust electric manhole vault frames and equipment covers so the top ranges from flush to 1/4 inch above the finished grade of the adjacent pavement. All electric manhole and equipment covers adjusted to grade by the Contractor shall be cleaned. Adjustments shall be in accordance with Riverside Public Utilities Electric Division Drawings UGS-053, UGS-062, UGS-435, and UGS-541. All work shall be accomplished in the presence of the Electric Operations representative. The Contractor shall notify the Electric Superintendent of the City Electric Division at

351-6373, two working days in advance of adjustment for scheduling of the representative.

Riverside Public Utilities electric facilities shall be designated as follows:

Manholes use Drawings UGS-062 and UGS-435
Vaults use Drawings UGS-053 and UGS-541

Since electric manholes and vaults contain energized cable and equipment, the Contractor shall use workers that have been properly trained in applicable electrical safety and work procedures to make the manhole and vault adjustments.

Except for the gate box and valve box materials as noted, the Contractor shall provide all the necessary tools, equipment, and materials necessary to perform all adjustments.

When the CIR process is utilized for asphalt pavement reconstruction, the Contractor shall not lower any RPU structure below the recycled depth and the Contractor shall avoid their structures while completely while completing the work.

If the CIR process is utilized for asphalt pavement reconstruction, the Contractor shall double adjust all utility facilities as specified herein. For all facilities requiring double adjustments, the associated facility below the recycled depth shall be included in the adjusted to the final grade.

301-1.8 Traffic Signal Pullbox Adjustments.

Adjustment of traffic signal pullboxes to grade will be subject to the following requirements:

1. The Contractor shall grout the bottom of existing pullboxes that are to remain in place and that are not already grouted with material specified in Section 87-1.03C(1) of the State Standard Specifications. The Contractor shall remove all grout that does not meet the material specifications of Section 87-1.03C(1) of the State Standard Specifications and the Contractor shall excavate within the pullbox to proper depth prior to grouting;

2. The Contractor shall adjust all conduits as necessary so the conductors do not touch the pull box lid. In addition, a minimum

clearance of 3" between the top of all conduits and the bottom of the traffic pullbox lid shall be maintained; and,

3. The Contractor shall replace "in-kind" any traffic pullbox damaged as a result of his operations except that the minimum size replacement will be a No. 5 pullbox as described on State Standard Plan ES-8. Plastic Type No. 5 pullboxes will not be permitted.

302-1 COLD MILLING OF EXISTING PAVEMENT

302-1.1.1 Cold Milling Types. All removal and replacement work shall be performed after cold milling. After performing Type CM1, CM2, or CM3 the contractor shall ramp all vertical edges with a minimum of 12 inches or at 8:1 whichever is greater prior to opening ground areas to traffic; the Contractor shall be subject to the issuance of a "STOP WORK" notice, if the applicant fails to ramp vertical edges as described above within the given timeframe.

"Cold Milling – Type CM1" shall be performed in areas designated on the Plans and shall have a minimum width of 5' unless otherwise indicated on the plans. Width shall be shall be measured from the existing gutter lip or the longitudinally joint line. Cold milling shall be 0.12' below the existing pavement.

"Cold Milling – Type CM2" shall be performed in areas designated on the Plans. The milling shall be 0.12' deep minimum unless otherwise indicated on the plans. All 0.12' cold mill areas shall be paved within 5 working days after commencement of milling. Where the CM2 milling exceeds 0.15', the asphalt shall be replaced within in 24 hours after the commencement of the milling. Where the CM2 milling exceeds 0.20', the asphalt shall be replaced utilizing a minimum of 2 lifts (0.10' minimum per lift) with the following criteria: the base course lift(s) shall be completed the same day as the completion of the CM2 milling; and upon completion of the base course replacement pavement, the milled areas may only be 0.10' minimum to 0.12' maximum below the original asphalt surface elevations, unless otherwise indicated on the plans and the finish coarse shall be replaced within 5 working days after initial commencement of milling. The Contractor shall be subject to the issuance of a "STOP WORK" notice, if the applicant fails to replace the asphalt as described above within the given timeframe.

"Cold Milling – Type CM3" shall be "Full-Depth Milling" **as described in Section 302-1.5** of the Standard Specifications and performed in areas

designated on the Plans. The milling shall completely remove the asphalt pavement to the depth of the existing base or subgrade. When the replacement asphalt thickness indicated on the plans exceeds the actual existing asphalt thickness, the Contractor shall remove the existing base and/or subgrade and re-compact as necessary to install the new asphalt to the depth indicated, unless otherwise noted or directed by the City Engineer. The replacement asphalt for CM3 milling shall be completed utilizing a minimum of 2 lifts (0.10' minimum per lift) with the following criteria: the base course lift(s) shall be completed the same day as the completion of the CM3 milling; and upon completion of the base course replacement pavement, the milled areas may only be 0.10' minimum to 0.12' maximum below the original asphalt surface elevations, and replaced within 5 working days after initial commencement of milling. The Contractor shall be subject to the issuance of a "STOP WORK" notice, if the applicant fails to replace the asphalt as described above within the given timeframe; unless otherwise indicated on the plans. The width of removal and re-compaction of existing base and/or subgrade shall be 5' when adjacent to the existing roadway of pavement and 10' at the pavement cold milling limits.

Shoulder Excavation: When temporary traffic lanes have a vertical edge 2 inches deep or deeper within 6 feet from the travel ways, the Applicant/Contractor shall have a minimum 4:1 compacted slope (Choker) along the entire travel edge. Road users shall be warned of excavations utilizing signs such as LOW SHOULDER (W8-9) or OPEN TRENCH (C27(CA)). In addition, edge line channelizers delineation shall be placed every 25 feet for the length of the excavation to warn road users of the excavation.

The Contractor shall determine the thickness of the existing pavement sections including asphalt and base for all streets designated for CM3 cold milling, unless already completed by the City. Prior to commencing any CM3 cold milling, the Contractor shall complete a minimum of 1 core per street that was not previously cored.

302-4 SLURRY SEAL SURFACING

Crack Treatment appears under Asphalt Concrete Pavement

302-4.1.1 Pavement Preparation. Pavement preparation shall consist of the following:

1. All cracks greater than 1/8" but less than 1/2" in width shall

be routed to a minimum width of 1/2” and to a depth of 3/4" to 1" deep.

2. All cracks greater than 1/2” in width shall be routed to a depth of 3/4" to 1".

3. Seven days prior to the crack routing operation, all cracks with existing weeds or grasses shall be treated with a contact herbicide such as Ranger Pro or City approved equal and to the manufacturer's recommendation. Prior to the application of any sealant, all cracks shall be completely cleaned of deleterious material using a blower or an air compressor. All wedged-in materials that are not readily removed by air should be removed by gouging or plowing. In addition, the street surface shall be completely cleaned of all pavement preparation debris by a power-driven street sweeper or other suitable means at the end of each work day.

4. After cleaning and routing but prior to the application of any sealant all cracks shall be treated with a selective pre-emergent herbicide such as ACME Industrial Products Barrier 50W Dichlobenil Herbicide or City approved equal and to the manufacturer's recommendation.

5. All cracks less than 1" in width shall be filled with a Crafco Polyflex Type 3 Sealant or approved equal. Application shall be with a Heated Joint Seal Machine Crafco Model BC-220 or City approved equal and to the manufacturer's recommendation. These may be obtained from Crafco Inc., P.O. Box 20133, Phoenix, Arizona 85036. This treatment method shall be called "Crack Fill."

6. All cracks greater than 1" in width shall be filled with PG 64-16 asphalt concrete. This treatment method shall be called "Crack Repair."

7. All "alligator" cracked areas of the pavement shall be removed to a depth specified by the City Engineer as described in Section 300-2 of these Special Provisions and replaced with DGAC. Replacement DGAC shall be described as "Construct DGAC Pavement" on the Plans and in these Special Provisions.

8. Perform traffic control for all work described above.

302-4.8.1 Spreading at Joints. The joint between the edge of pavement and the concrete gutter shall be sealed with slurry seal. The slurry may overlap the concrete gutter edge no more than one (1) inch. The edges of the slurry shall be maintained in a neat and uniform line.

302-4.12 Cleanup of Tools. The Contractor shall not allow any liquids used for cleanup of tools and equipment (such as diesel fuel or solvents) to spill on the pavement, curbs, gutter, parkways, or other improved areas.

302-5 ASPHALT CONCRETE PAVEMENT

302-5.2 Pavement Preparation. Pavement preparation shall consist of the following:

1. All cracks greater than 1/8" but less than 1/2" in width shall be routed to a minimum width of 1/2" and to a depth of 3/4" to 1" deep.

2. All cracks greater than 1/2" in width shall be routed to a depth of 3/4" to 1".

3. Seven days prior to the crack routing operation, all cracks with existing weeds or grasses shall be treated with a contact herbicide such as Ranger Pro or City approved equal and to the manufacturer's recommendation. Prior to the application of any sealant, all cracks shall be completely cleaned of deleterious material using a blower or an air compressor. All wedged-in materials that are not readily removed by air should be removed by gouging or plowing. In addition, the street surface shall be completely cleaned of all pavement preparation debris by a power-driven street sweeper or other suitable means at the end of each work day.

4. After cleaning and routing but prior to the application of any sealant all cracks shall be treated with a selective pre-emergent herbicide such as ACME Industrial Products Barrier 50W Dichlobenil Herbicide or City approved equal and to the manufacturer's recommendation. Herbicide shall NOT have glyphosate.

5. All cracks less than 1" in width shall be filled with a Crafco Polyflex Type 3 Sealant or approved equal. Application shall be with a Heated Joint Seal Machine Crafco Model BC-220 or City approved equal and to the manufacturer's recommendation. These may be obtained from Crafco

Inc., P.O. Box 20133, Phoenix, Arizona 85036. This treatment method shall be called "Crack Fill."

6. All cracks greater than 1" in width shall be filled with PG 64-16 asphalt concrete. This treatment method shall be called "Crack Repair."

7. All "alligator" cracked areas of the pavement shall be removed to a depth specified by the City Engineer as described in Section 300-2 of these Special Provisions and replaced with DGAC.

8. Perform traffic control for all work described above.

302-5.4.1 Tack Coat. Tack coat shall be required as specified in Sec. 302-5.4 "Tack Coat" of the Standard Specifications, consisting of 0.05/gallon residue per square yard of HPS "No Track Tack" asphaltic emulsion by Paramount Petroleum Corporation or approved equal. Final pavement cap shall not be applied until the tack coat has cured. The tack coat shall be considered cured when the water content is reduced to a minimum.

302-5.5.1 Distribution and Spreading. A paving machine that picks up the asphalt concrete material from a windrow then spreads the material to a specified thickness may be used. However, the City Engineer may require the Contractor to use a paving machine which accepts the asphalt concrete material directly from the delivery truck, at no additional cost to the City, if the temperature of the asphalt concrete in the windrow cannot be maintained above the lower temperature limit specified in Section 302-5.5 of the Standard Specifications, or if the windrow blocks access to any driveway or side street for more than fifteen minutes prior to the paving machine spreading the asphalt concrete material.

The City Engineer reserves the right to suspend delivery of AC to the jobsite to ensure the AC placement operations are completed and the full traveled way is opened to traffic prior to the time limits specified in Subsection 7-10.1 of these Special Provisions.

On street widening projects, if the width of asphaltic concrete to be placed is 8 foot or less and/or the project length is not more than 150 feet, the Contractor, with the approval of the City Engineer, may use a spreader box.

Contractor shall not start paving operations after 12:00 p.m. without permission from the City Engineer.

On street widening projects where new paving joins the existing paving, the contractor shall overlay the existing paving as shown on the plans or as directed by the City Engineer to produce a smooth crown section.

302-5.7.1 Pavement Joints. Where new pavement joins an existing pavement, the surface will be inspected for smoothness of the seam between the two surfaces. When a six feet long straightedge is laid across the seam between "new" and "old" pavement, the surface shall not vary more than 0.03 feet from the lower edge. At join lines along new concrete gutters or where the existing asphalt pavement has been removed, the finished surface shall not vary more than 0.05' higher than the concrete surface that is being joined. On existing or proposed bike routes the finished surface shall not exceed 0.02' above the gutter lip.

302-5.8.1 Fog Seal. Over all newly laid asphalt paving, the contractor shall apply a seal coat of emulsified asphalt SS-1h as per Section 203-3 of the Standard Specifications. Rate of application shall be approximately 0.10 gallons per square yard or as directed by the City Engineer.

302-9 ASPHALT RUBBER HOT MIX (ARHM)

302-9.1.1 Pavement Preparation. Pavement preparation shall consist of the following:

1. All cracks greater than 1/8" but less than 1/2" in width shall be routed to a minimum width of 1/2" and to a depth of 3/4" to 1" deep.

2. All cracks greater than 1/2" in width shall be routed to a depth of 3/4" to 1".

3. Seven days prior to the crack routing operation, all cracks with existing weeds or grasses shall be treated with a contact herbicide such as Ranger Pro or City approved equal and to the manufacturer's recommendation. Prior to the application of any sealant, all cracks shall be completely cleaned of deleterious material using a blower or an air compressor. All wedged-in materials that are not readily removed by air should be removed by gouging or plowing. In addition, the street surface shall be completely cleaned of all pavement preparation debris by a power-driven street sweeper or other suitable means at the end of each work day.

4. After cleaning and routing but prior to the application of any sealant all cracks shall be treated with a selective pre-emergent herbicide such as ACME Industrial Products Barrier 50W Dichlobenil Herbicide or City approved equal and to the manufacturer's recommendation. Herbicide shall NOT have glyphosate.

5. All cracks less than 1" in width shall be filled with a Crafco Polyflex Type 3 Sealant or approved equal. Application shall be with a Heated Joint Seal Machine Crafco Model BC-220 or City approved equal and to the manufacturer's recommendation. These may be obtained from Crafco Inc., P.O. Box 20133, Phoenix, Arizona 85036. This treatment method shall be called "Crack Fill."

6. All cracks greater than 1" in width shall be filled with PG 64-16 asphalt concrete. This treatment method shall be called "Crack Repair".

7. All "alligator" cracked areas of the pavement shall be removed to a depth specified by the City Engineer as described in Section 300-2 of these Special Provisions and replaced with DGAC. Replacement DGAC shall be described as "Construct DGAC Pavement" on the Plans and in these Special Provisions.

8. Perform traffic control for all work described above is required.

302-9.2.1 Tack Coat. Tack coat shall be required as specified in Sec. 302-5.4 "Tack Coat" of the Std. Spec., consisting of 0.05/gallon residue per square yard of HPS "No Track Tack" asphaltic emulsion by Paramount Petroleum Corporation or approved equal. Final pavement cap shall not be applied until the tack coat has cured. The tack coat shall be considered cured when the water content is reduced to a minimum.

302-9.3.1 Methods of Distribution and Spreading. A paving machine that picks up the asphalt concrete material from a windrow then spreads the material to a specified thickness may be used. However, the City Engineer may require the Contractor to use a paving machine which accepts the asphalt concrete material directly from the delivery truck, at no additional cost to the City, if the temperature of the asphalt concrete in the windrow cannot be maintained above the lower temperature limit specified in Section 302-5.5 of the Standard Specifications, or if the windrow blocks access to any driveway or side street for more than fifteen minutes prior to the paving machine spreading the asphalt concrete material.

The City Engineer reserves the right to suspend delivery of AC to the jobsite to ensure the AC placement operations are completed and the full traveled way is opened to traffic prior to the time limits specified in Subsection 7-10.1 of these Special Provisions.

302-10 ASPHALT RUBBER AND AGGREGATE MEMBRANE (ARAM)

302-10.1.A Pavement Preparation. Pavement preparation shall consist of the following:

1. All cracks greater than 1/8" but less than 1/2" in width shall be routed to a minimum width of 1/2" and to a depth of 3/4" to 1" deep.

2. All cracks greater than 1/2" in width shall be routed to a depth of 3/4" to 1".

3. Seven days prior to the crack routing operation, all cracks with existing weeds or grasses shall be treated with a contact herbicide such as Ranger Pro or City approved equal and to the manufacturer's recommendation. Prior to the application of any sealant, all cracks shall be completely cleaned of deleterious material using a blower or an air compressor. All wedged-in materials that are not readily removed by air should be removed by gouging or plowing. In addition, the street surface shall be completely cleaned of all pavement preparation debris by a power-driven street sweeper or other suitable means at the end of each work day.

4. After cleaning and routing but prior to the application of any sealant all cracks shall be treated with a selective pre-emergent herbicide such as ACME Industrial Products Barrier 50W Dichlobenil Herbicide or City approved equal and to the manufacturer's recommendation. Herbicide shall NOT have glyphosate.

5. All cracks less than 1" in width shall be filled with a Crafco Polyflex Type 3 Sealant or approved equal. Application shall be with a Heated Joint Seal Machine Crafco Model BC-220 or City approved equal and to the manufacturer's recommendation. These may be obtained from Crafco Inc., P.O. Box 20133, Phoenix, Arizona 85036. This treatment method shall be called "Crack Fill."

6. All cracks greater than 1" in width shall be filled with PG 64-16 asphalt concrete. This treatment method shall be called "Crack Repair".

7. All "alligator" cracked areas of the pavement shall be removed to a depth specified by the City Engineer as described in Section 300-2 of these Special Provisions and replaced with DGAC. Replacement DGAC shall be described as "Construct DGAC Pavement" on the Plans and in these Special Provisions.

8. Perform traffic control for all work described above is required.

302-10.1.B Application. In addition to the minimum temperature requirements listed in the Standard Specifications, the maximum allowable atmospheric temperature for application of the Asphalt-Rubber Chip Seal shall be 100 degrees Fahrenheit. The Contractor shall provide a pavement temperature reading, with an infrared heat measurement instrument, when requested by the City Engineer.

A tack coat shall be required as specified in Sec. 302-5.4 "Tack Coat" of the Std. Spec., consisting of 0.05/gallon residue per square yard of HPS “No Track Tack” asphaltic emulsion by Paramount Petroleum Corporation or approved equal. Final pavement cap shall not be applied until the tack coat has cured. The tack coat shall be considered cured when the water content is reduced to a minimum.

The method and equipment for combining the rubber, asphalt and extender oil or kerosene shall be so designed and accessible that the City Engineer can readily determine the percentages, by weight, of each of the materials being incorporated into the mixture.

Application of asphalt-rubber shall be discontinued sufficiently early in the day to permit the termination of traffic control to meet the requirements of Section 7-10.1 of these Special Provisions.

A light brooming shall be performed to remove loose screenings: (1) before traffic is permitted on the asphalt-rubber, (2) at the end of each day's work; and (3) as a first order of work on the morning following the application of screenings. The exact time for brooming will be determined by the City Engineer. The surface of the asphalt-rubber and adjacent pavement shall be swept or broomed as often as necessary each day (including weekends or holidays) after applying screenings to maintain the entire paved roadbed free of loose screenings. At the end of each day after applying screenings, any excess screenings shall be removed from all paved areas. Sweeping or brooming of seal coat surfaces shall

be performed in such a manner that the screenings set in the binder will not be displaced.

Following the completion of the paving, sweeping shall be performed as follows:

i) For a period of one week after the completion of the paving sweeping shall be performed every other day.

ii) For the subsequent five weeks sweeping shall be performed once a week.

In addition to any traffic control for other items of construction, the Contractor shall provide additional signs for the ARAM operation advising of the construction zone speed limit and loose gravel warning signs. These signs will be placed at intervals not exceeding 500' with additional signs placed at each side street entering the construction zone. Additional advance warning signs may also be required by the City Engineer at each end of the project and on key side streets to allow alternate routes to be used.

302-10.2.1 Placement of Emulsion-Aggregate Slurry. The placement of the slurry seal as part of a Cape Seal shall be delayed for a sufficient time to allow for adequate setting of the asphalt-rubber (typically 24 to 48 hours), but shall not exceed 96 hours prior to starting of slurry operations. If determined necessary by the City Engineer, the placement of ARAM may be delayed to allow coordination of the slurry sealing to maintain compliance with the above time requirements.

302-14 FOG SEAL

Fog seal shall be accomplished at locations designated on the Plans. Fog sealing shall be in accordance with Section 37 "Bituminous Seals" of the State Standard Specifications. Material for the fog seal shall be SS-1h. The rate of application shall be between 0.05 Gal/S.Y. and 0.10 Gal./S.Y. Water shall be added to the emulsion and mixed therewith in such proportion that the resulting mixture will contain not more than 25% of added water, the exact quantity of added water shall be determined by the City Engineer. Asphaltic emulsion shall be reheated as necessary, so that when the material is transported to the site of the work, the temperature will be between 150°F and 160°F.

302-15 ASPHALT CONCRETE BERMS AND DIKES

302-15.1 General. Asphalt concrete berms and dikes shall be shaped and compacted with an extrusion machine or other equipment capable of shaping and compacting the material to the required cross section.

303-1 CONCRETE STRUCTURES

303-1.4.4.1 Inlet/Catch Basin Marker. The Contractor shall apply a City furnished Inlet marker on the top of every catch basin/inlet within the project limits as directed by the Engineer. The curb marker shall be picked up by the Contractor at the City of Riverside City Hall, Public Works Counter, 3900 Main Street, 3rd Floor, Riverside, CA 92522. Application of inlet marker shall be as follows:

1) Application shall be installed in accordance to the manufacturer's recommendations.
2) Do not install on soil-saturated surfaces, joint or crack-seal filled areas, surfaces with sealing compounds, previous stencils, all other deleterious material attached to the concrete surface, or surfaces with standing water. Area to receive curb marker must be cleaned of the above using a broom, air sweeper, and sandblaster.
3) Oil and grease residue must be completely removed by steam cleaning or other methods as approved by the Engineer.
4) Concrete less than three months old must be sandblasted to remove curing compound. Concrete should be free of moisture for 24 hours or more prior to application of marker.
5) Markers are to be placed on center and on top of the inlet. If there are no curb, then the marker shall be affixed to the concrete adjacent to the grate.

303-5 CONCRETE CURBS, WALKS, GUTTERS, CROSS GUTTERS, ALLEY INTERSECTIONS, PEDESTRIAN RAMPS, AND DRIVEWAYS

303-5.1.3 Driveway Entrances. Unless otherwise specified on the plans or by the City Engineer driveway approaches and alley approaches shall be constructed in accordance with Standard Drawing No. 302.

If a new driveway approach is to connect to an existing curb and gutter, or when an existing curb and gutter depression is to be replaced with a full curb face curb, construction shall be in accordance with Standard Drawing No. 303.

Alley approaches which are to drain an alley more than 50 feet long shall have the back of the alley approach at is center depressed by 0.25 feet to accept drainage.

303-5.1.4 General Requirements. In areas where mail delivery is curbside, the Contractor shall provide openings in the sidewalk for the installation of posts for mail boxes. The openings shall be 6 inches square or 6 inch diameter round. The center of the opening shall be 16 inches from the curb face, adjacent to the driveway on the far side related to normal vehicle traffic directions.

Where curb and gutter is to be removed and replaced, the Contractor shall also remove a minimum of 12" of existing pavement to facilitate the setting of forms and compaction of backfill. Paving replacement shall be 6" full depth AC.

Curb and gutter shall be poured independent (separate) of driveways, pedestrian ramps and sidewalks.

When the grade of C&G is less than 0.4%, the Contractor, at no additional cost, shall place (2) #3 reinforcing bars in the gutter. Construction stakes for curbs with flatter grades than 0.4% shall be every 12.5'.

Where new or replacement curb and gutter lengths are fifty (50) feet or greater, the City Engineer will determine the need for construction stakes for grade.

The Contractor shall take measures to prevent graffiti, footprints, tire marks, etc., in the fresh concrete. The Contractor shall be responsible for all markings.

On projects with sidewalk construction, the Contractor, unless otherwise instructed, shall grade the parkway and slopes as shown on Standard Drawing No. 325.

When relocation of water meters are indicated, the Contractor shall be responsible reconnect the private side of the water line to the back of the meter's new location including extending new pipe as necessary.

On projects with median hardscape construction, the Contractor shall provide a 3" diameter blockout in the concrete at each median nose that is at least 4 feet wide for installation of traffic signs. This shall be accomplished by embedding a 3" PVC pipe in the concrete 5 feet from the curb face at the median nose.

For the construction of concrete spandrels the curb returns will be counted as C&G with a gutter 2 feet wide. Only the remainder of the spandrel will be paid for as cross gutter and spandrel.

When pedestrian ramps are proposed to be constructed within existing concrete spandrels, the Contractor shall sawcut the sprandel to construct the new pedestrian ramp per the City standard drawings including any modifications indicated on the plans.

No mortar finish coat shall be required for curbs.

New sidewalk constructed in areas of existing sidewalk shall be scored to match the existing score pattern. Failure to score the sidewalk appropriately shall be cause for rejection.

On projects with pedestrian ramp construction, the AC pavement shall be placed flush with the concrete gutter along the pedestrian ramp. Removal and replacement of curb, gutter and sidewalk for pedestrian ramps shall be to the nearest joints. Sections less than 5' in width/length shall be removed and replaced as directed by the City Engineer. The PCC retaining curb shall be poured monolithic with the adjacent sidewalk or pedestrian ramp.

It is the Contractor's responsibility to mark the approximate saw cut limits for the construction of pedestrian ramps including asphalt pavement areas. The City's Inspector shall review the marked limits before any removals. If the Inspector requests additional removals, then the Contractor must adjust the limits as necessary.

No survey work or staking will be provided by the City for pedestrian ramps, curb, gutter, driveway, and sidewalk construction or replacement.

303-5.3.1 Concrete cleanup. The contractor shall have a concrete washout plan approved by the City prior to concrete being delivered to the site.

303-5.5.2 Curb. The face and top of curb shall be carefully troweled to a smooth and even finish. The top of curb shall be finished with a transverse slope toward the gutter and the edges rounded in accordance with Standard Drawing No. 200. The troweled surface shall be finished with a fine-hair broom applied parallel with the line of work. The edge of the concrete at all expansion joints shall be rounded to a 1/4" radius. Joints shall conform with Subsection 303-5.4 of the Standard Specifications.

Application of class "B" mortar to face of curb is not required. Stamping of Contractor's name and the year shall not be performed.

When a straight edge ten (10) feet long is laid on the top or face of the

curb or on the surface of gutters, the surface shall not vary more than one-eighth (1/8) inch from the edge of the straight edge; except at grade changes or curves.

303-5.7.1 Reasons for Rejection.

1. Transverse cracks through the C&G, exceeding 0.01 foot in width at any point.

2. Vertical displacement exceeding 0.01 foot, or which causes water to pond in the gutter for a distance exceeding 2 feet.

3. Serious or extensive surface imperfections.

4. Graffiti, footprints, tire marks, etc., in the fresh concrete. The Contractor shall be responsible for prevention of all markings.

5. Transverse cracks causing 5 feet or less of C&G to be "floating," or unattached to other C&G.

6. Cracks causing 25 square feet or less of sidewalks, approaches, cross gutters, or aprons to be "floating," or unattached to other approaches, cross gutters, or aprons.

Rejected concrete work shall be removed by means of a sawcut at a score line. If no score line exists, the minimum removed area or unscored area left in place shall be 25 square feet and the minimum width shall be 4 feet.

Temporary resurfacing shall be required only at times and locations determined by the City Engineer during construction. Paving may be required to be performed on non-holiday weekends, barring any special event activities.

When completing any concrete improvements adjacent to existing asphalt pavement, the Contractor shall repair the open asphalt slot created within five (5) calendar days after commencement of any removals. Permanent paving is required WITHIN 2-WEEKS of completing any excavation. If the Contractor does not adhere to this requirement, a "STOP WORK" notice will be issued.

When an existing irrigation system is disrupted and/or the existing landscaping is damaged and/or removed to remove and replace any of the existing concrete work described, the Contractor shall repair/modify the existing irrigation system to provide adequate irrigation coverage and

replace the existing landscaping, in-kind, within 48 hours after the initial associated disruption and/or removal. Sod shall be utilized to replace any removed and/or damaged grass coverage.

303-8 PERVIOUS CONCRETE

303-8.9.10 Submittal. Prior to commencement of the work the contractor shall submit the following:

a. Concrete Materials:
    1. Proposed concrete mixture proportions including all material weights, volumes, density (unit weight), water-to-cement (cementitious) ratio, and void content.
    2. Aggregate type, source, and grading.
    3. Cement, supplementary cementitious materials, and chemical admixture manufacturer certifications.

b. Aggregate base materials: washed aggregate type, source, grading, and void content (percent porosity).

c. Qualifications and Certifications.

d. Project details including a jointing plan, construction details, schedule, construction procedures, and quality control plan.

e. List of all subcontractors, material suppliers, and testing laboratories to be used on the project.

306-1 OPEN TRENCH OPERATIONS

306-1.A Tunneling: When tunneling occurs under any structure, pipe, conduit, sidewalk, curb & gutter, structures, ramps, fixed object, etc., one (1) sack slurry shall be used to achieve minimum 90% compaction,

Refurbishment of asphalt may be required to be performed on Saturdays (Non-Holiday weekend) using ARHM,

At the discretion of the City Engineer, saw cutting of the asphalt and or concrete shall be performed when alligator cracking is present or not.

306-1.B UTILITY POTHOLE/CORE REPAIR:

- Utility pothole work shall be completed utilizing Saw-cut or core drilling methods. When saw-cutting methods are used, refer to

City Standard Drawing No. 453 for determination of asphalt refurbishment limits or as directed by the City Engineer.

- If pothole/core work removes traffic striping, replace striping shall be replaced in-kind.
- When utility pothole/core work is completed within concrete areas, the contractor shall be responsible to replace full concrete panels or sections per the associated City Standard Drawing.
- When trench backfill and roadway repair work is performed, refer to the notes indicated in City Standard Drawing No. 453.
- When multiple potholes are completed parallel to the traffic lane, with a spacing of 24' or less, coldmill and overlay requirements shall adhere to City Standard Drawing No. 453 or as directed by the City Engineer.
- No utility pothole/core work will be allowed on streets that have paved/resurfaced within three years, except for emergency situations or in conjunction with providing utility service connections.

Backfill shall consist of one (1) sack slurry or as approved by the City Engineer. NO hand mixing.

306-1.1.1 General. Where trench is close to street lights, catch basins, or other structures, the Contractor shall brace as necessary to prevent dislocation of the structure. In the area of any such structures, the trench backfill shall be compacted to 95% to the full depth of the structure.

306-1.1.5 Removal and Replacement of Surface Improvements. Removal and replacement of bituminous pavement and base material shall be in accordance with City Standard Drawing No. 453.

306-1.1.7 Alternate Pipe for Sanitary Sewers. As an alternate to the Vitrified Clay Pipe (VCP) specified on the Plans, the Contractor, subject to the City Engineer's approval, may use any plastic pipe described and specified in the Standard Specification with the following limitations:

1. Plastic pipe shall be limited to use in areas that are predominantly residential and to sizes not exceeding 15 inches in diameter.

2. The engineer of record shall specify the type of pipe bedding on the plans per City Standard Drawing No. 452 or provide special pipe bedding detail.

3. Change in pipe material is not allowed between two manholes. All house connection sewer laterals shall be of the same material as the main pipe with that reach.

4. Unless otherwise specified on the plans, plastic pipe shall be bedded as follows:

Type of Pipe	Depth of Cover Above Bedding	Bedding
Solid Wall (ABS & PVC)	0 to 4'	Case III
	4' to 17'	Case I
	17' to 30'	Case II N=D'+1"
	over 30'	Special Design
ABS and PVC Composite	less than 4'	Case II
	4' to 9'	Case I
	9' to 21'	Case I
	21' to 30'	Case II N=D'+1"
	over 30'	Special Design

5. When the plans call for installing plastic pipe, such option shall apply to a minimum reach of the sewer between any two manholes and shall include all house connection sewer laterals within that reach.

306-1.1.8 Unsuitable Material. The conditions and requirements for the determination and disposition of unsuitable material in trench excavations shall be in accordance with Section 300-2.2, "Unsuitable Material" of the Standard Specifications.

306-1.1.9 Steel Plate Bridging. If, at the end of the working day, open trench backfilling operations have not been properly completed, steel plate bridging shall be required to make the entire roadway section safe and available to pedestrians and the travelling public. All steel plates used within the Public Right-of-Way shall be NON-SKID type. The maximum length of steel plate bridging allowed over an open trench for the entire project is 50 feet unless the Contractor obtains prior written approval of the City Engineer. Placement of steel plate bridging shall be approved by the City Engineer.

306-1.1.9.a Steel Plate Bridging Method. The steel plate bridging installation shall conform to the following:

1. For speeds greater than 45 mph: The pavement shall be cold planed to a depth equal to the thickness of the plate and to a width and length equal to the dimensions of the plate.

2. For speeds 45 mph or less: Approach plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway by a minimum of 2 dowels pre-drilled into the corners of the plate and drilled 2 inches into the pavement. Subsequent plates are butted to each other. Fine grade asphalt concrete shall be compacted to form ramps, maximum slope 8.5% with a minimum 12 inch taper to cover all edges of the steel plate. When steel plates are removed, the dowel holes in the pavement shall be backfilled with either graded fines of asphalt concrete mix, concrete slurry, or an equivalent slurry satisfactory to the City Engineer.

The Contractor shall be responsible for daily maintenance of the steel plates, shoring, and asphalt concrete ramps.

Unless prior permission is obtained, steel plate bridging should not exceed 4 consecutive working days in any given week. Backfilling of excavations shall be covered with a minimum 3 inch temporary layer of cold asphalt concrete compacted with a steel wheel roller when steel plates are not being used. Permanent re-paving is required within 15 days of excavation.

The following table shows the minimum thickness of steel plate bridging required for a given trench width:

Trench Width (inches)	Minimum Plate Thickness (inches)
10"	1/2"
23"	3/4"
31"	7/8"
41"	1"
63"	1 1/4"

For spans greater than 63", a structural design shall be prepared by a California registered Civil Engineer.

Steel plate bridging shall be steel designed for HS20-44 truck loading per the State Bridge Design Specifications Manual.

The Contractor shall maintain on the steel plate a non-skid surface having a minimum coefficient of friction equivalent to 0.35 as determined by California Test Method 342. If a different test method is used, the Contractor may utilize standard test plates with known coefficients of friction to correlate skid resistance results to California Test Method 342. These test plates are available from Caltrans District Materials Engineer.

A Rough Road sign (W33), with black lettering on an orange background, may be used in advance of steel plate bridging. This sign is to be used along with other required construction signing.

306-1.1.10 Excavations Adjacent to Trees. The following specifications are to be adhered to when excavating adjacent to street trees in the City. Any exception to these requirements must be approved by the City Engineer. (Chapter 15.08.020, Riverside Municipal Code.).

No excavation shall take place within the following specified distances from the perimeter of trees at ground level:

Tree Size	Clearance (ft)	Tree Size (inches)	Clearance (ft)
Palm Trees only	1.5 ft	13-24” diameter	4.5 ft
0-6” diameter	3.0 ft	25-36” diameter	5.0 ft
7-12” diameter	3.5 ft	37” and up	6.0 ft

Tunneling is permitted if it is not through the center of the tree at a depth that will not destroy the anchor roots of the tree. Where it is necessary to excavate adjacent to existing trees, the Contractor shall avoid injuries to trees and tree roots. Excavation in areas where 2-inch and larger roots occur shall be done by hand. All roots 2 inches and larger in diameter shall be tunneled under and shall be heavily wrapped with wet burlap to prevent scarring or drying. Where a trenching machine is operated close to trees having roots smaller than 2 inches in diameter, the wall of the trench adjacent to the trench shall be hand trimmed, making a clean cut through the roots. Any tree roots 1 inch or larger in diameter shall be painted with two coats of tree seal or approved equal. Trenches adjacent to trees shall be closed within 24 hours. No dirt can be piled up against a tree without a protective separator such as lumber, plywood, etc. The protective separator shall not be nailed to the street tree. The party responsible for any damage to a street tree will be billed in accordance with the Riverside Municipal Code.

306-1.2 Installation of Pipe. The materials used for the construction of sanitary sewer shall remain the same between manholes. When reconstructing sanitary sewer laterals the new pipe shall be the same as the existing lateral.

306-1.2.1 Bedding. Pipe bedding shall be per Std. Dwg. No. 452, Case I, unless otherwise shown on the Plans or as follows:

Type of Pipe	Depth of Cover Above Bedding	Bedding
Solid Wall (ABS & PVC)	0 to 4 ft	Case III
	4 to 17 ft	Case I
	17 to 30 ft	Case II N=D'+1
	Over 30 ft	Special Design
Composite (ABS & PVC)	0 to 4 ft	Case II
	4 to 9 ft	Case I
	9 to 21 ft	Case I
	21 to 30 ft	Case II N=D'+1
	Over 30 ft	Special Design

306-1.2.4.1 RCP Tongue-and-Groove Mortar Sealant. For all pipe diameters measuring 24" and larger, the application of the mortar as described in the Standard Specifications shall be applied to the interior and exterior of all pipe joints. For all pipe diameters measuring less than 24" the application of the mortar shall lonely apply to the interior of all pipe joints.

306-1.2 Backfill and Densification. Trench backfill shall be per Std. Dwg. No. 453. contractor shall provide to the City Engineer compaction test results certified by an approved civil or soils engineer of all work done including AC pavement. All costs for testing shall be borne by the contractor.

306-1.3.2 Mechanically Compacted Backfill. Impact type pavement breakers (stompers) will be permitted over vitrified clay pipe only after a minimum of four feet of backfill has been placed over the top of pipe and compacted by other means.

306-1.3.9 Backfill in Easements. Backfill shall comply with the same requirements as backfill in streets.

306-1.5.1 Temporary Resurfacing. Temporary resurfacing shall be required only at times and locations determined by the City Engineer

during construction. The cost to maintain all temporary resurfacing areas shall be the responsibility of the Permit Applicant and shall be responsible for furnishing, placing, maintaining, removing, and disposing of such temporary materials.

306-1.6 Open Trench Installations. The Permit Applicant shall be responsible for shoring, bracing, or worker protection for excavation of a trench 5 feet or greater in depth.

Providing and placing steel plates for bridging open trenches; cutting and removal of asphalt pavement and PCC pavement prerequisite to trenching; removal of sub-surface material including any hard rock; removal of the interfering portions of laterals; protection of existing pipelines and structures which are adversely affected by the trenching operation; removal of interfering portions of abandoned conduits, sewer mains and capping of the remainder as required; sewer bypass pumping; placement of pipe bedding per Plans and Specifications; providing and placing sewer pipe; backfill and compaction as specified in Standard Drawing No. 453 and as shown on the plans; testing of the pipeline; cross gutter, and/or driveway improvements removed to install the pipeline; any temporary resurfacing, base paving flush with the street; landscape and irrigation replacement; blue fire hydrant pavement markers; and lawful disposal of all excess material generated by the work.

306-1.8 Trench Shoring. Trench shoring including furnishing and placing such shoring or bracing as required by the Standard Specifications or as directed by the City Engineer and in compliance with Article 6, Section 1541 of the most current edition of "Construction Safety Order" published by the Department of Industrial Safety, State of California. All shoring plans must be submitted to the City Engineer for approval at least seven working days prior to commencing work.

306-5 ABANDONMENT OF CONDUITS AND STRUCTURES

306-5.1 General. Abandonment of Conduits and Structures includes the abandonment and demolition of existing sanitary sewer pipe, manholes, and other appurtenant structures in accordance with the requirements of Section 306-5 of the Standard Specifications as modified by these special provisions.

Abandonment and demolition of existing sewer main and manholes shall include all labor, equipment, materials and incidentals necessary to remove interfering portion and legally disposal of the removed items or abandon in place the existing sewer main and manholes in the locations

specified in the plan drawings. Work required to complete this task includes, but is not limited removing and salvaging to the owner manhole frame and cover assemblies, filling existing underground pipelines with sand or cellcrete, removing and hauling to disposal the uppermost 4-feet of the manhole barrels, breaking out the manhole bases to allow drainage and abandoning the concrete in the hole, backfilling the remaining portions of the manholes with sand to a depth of 3-feet below surface grade, backfilling and compacting the manhole location within 4-feet of the surface with approved backfill materials, and completing necessary surfaces repairs as required to complete the work.

306-7 CURB DRAINS

306-7.1 General. Two 30" long No. 3 reinforcing bars shall be embedded in the curb, centered over the drain. ABS pipe is not allowed.

306-9 DEMOLITION OF EXISTING PUMP STATION

Following the construction and successful testing of the new sewer, the existing pump station shall be demolished pursuant to the Technical Specifications Section 02050 and as shown on the Plans.

314 TRAFFIC STRIPING, CURB AND PAVEMENT MARKINGS, AND PAVEMENT MARKERS

Striping and pavement markings shall conform to Section 84-2 “Traffic Stripes and Pavement Markings” of the State Standard Specifications.

Pavement markers shall conform to Section 81-3 “Pavement Markers” of the State Standard Specifications.

Unless otherwise noted, Thermoplastic paint shall be utilized for the project. All cat-tracking shall be in place within 48 hours from the completion of asphalt overlay and/or rubberized emulsion-aggregate slurry application. Unless otherwise approved by the City Engineer; once cat-track is complete, a request for cat-track approval shall be forwarded to the project manager or inspector. Contractor shall allow 2 working days for cat-track approval. Once cat-track is approved, striping installation shall commence within 2 working days, except in cases where loop detectors are required or slurry has been installed. In cases where loops are required, loops installation is to commence within 2 working days of cat-track approval and striping work shall commence within 2 working days of loop install completion. In cases where slurry is proposed, a minimum of 7 days to a maximum of 10 days shall lapse between the slurry and striping installation work, unless otherwise approved by the City Engineer. The applicant must notify the

Traffic Signal Division a minimum of 48 hours before cutting/damaging ANY traffic signal loops.

Traffic Signal Division Supervisor:
Cell (951) 453-5185
Office (951) 351-6060

The thermoplastic material shall be applied by extrusion method in a single uniform layer. Stencils shall be used when applying thermoplastic material for pavement markings. The pavement surface to which thermoplastic material is applied shall be completely coated by the material and the voids of the pavement surface shall be filled.

If green bicycle lane pavement markings is specified it shall consist of preformed thermoplastic markings. The markings shall be PreMark ViziGrip, or approved equal, and must be a resilient light green color thermoplastic product. The markings must contain glass beads and abrasives in an alternating pattern. The markings must be resistant to the detrimental effects of motor fuels, lubricants, hydraulic fluids etc. Lines, legends and symbols are capable of being affixed to bituminous and/or Portland cement concrete pavements by the use of the normal heat of a propane torch.

The markings must be capable of conforming to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastic when heated with the torch. The markings shall not have minimum ambient and road temperature requirements for application, storage, or handling. The PreMark Vizigrip material must be composed of an ester modified rosin resistant to degradation by motor fuels, lubricants etc. in conjunction with aggregates, pigments, binders, abrasives, and glass beads which have been factory produced as a finished product, and meets the requirements of the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways. The thermoplastic material shall conform to AASHTO designation M249-79 (98), with the exception of the relevant differences due to the material being supplied in a preformed state.

The Light Green Pigment color shall be manufactured with appropriate pigment to ensure that the resulting color complies with the Light Green color as specified in the FHWA Memorandum dated April 15, 2011: Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes (IA-14).

If paint (2 coats) is specified it shall consist of painting traffic stripes and pavement markings, including applying glass beads. The material and application of the paint materials shall- conform to the provisions of Section 84-2, “Paintings,” of the State Standard Specifications.

Temporary pavement delineation, including but not limited to raised flexible reflective tabs and/or reflective adhesion tape, shall be installed and maintained by the Contractor during or between construction stages and operations for the purpose of providing traffic control and public safety. The specific type or method of temporary pavement delineation used by the contractor shall be approved by the City Engineer prior to application.

When using raised flexible reflective tabs or reflective adhesion tape for temporary pavement delineation along the direction of travel (longitudinal lines), temporary stripes shall be placed on the pavement surface at a 6 inch or 12 inch offset left of the proposed permanent pavement stripe. Prior to the application of the permanent stripe the Contractor shall remove the tabs or tape from the pavement surface.

When reflective adhesive tape is used for lane delineation, a minimum of 3-foot strip of tape shall be placed at 12-foot intervals (gaps) regardless of the posted speed for the zone requiring temporary striping. When raised reflective tabs are used for lane delineation, the tab spacing shall not exceed 24 feet. Raised flexible reflective tabs shall not be utilized for limit lines (stop bars) or crosswalks without prior approval of the City Engineer.

When temporary pavement delineation is needed on a roadway surface that has been grinded, **temporary paint shall be utilized**. Said temporary pavement delineation must match the alignment, spacing, color, and paint requirements of the permanent or previous pavement delineations. Contractor must maintain the visibility of the temporary paint and re-apply new coats as deemed necessary by the City Engineer.

When temporary pavement delineation is needed on a roadway surface that has been slurried, the Contractor shall not use reflective adhesion tape or temporary paint. The Contractor shall use raised flexible reflective tabs that follow the alignment of the permanent paint. Prior to the application of the permanent stripe the Contractor shall remove the tabs from the pavement surface.

When temporary pavement delineation is needed on a roadway that has received the installation of ARAM, the Contractor shall not use reflective adhesion tape or raised flexible reflective tabs. The Contractor shall use temporary paint that follows the alignment of the permanent paint.

Traffic stripes shall be measured by the linear foot without deduction for gaps in the broken traffic stripes. A double extruded thermoplastic traffic stripe consisting of two 6-inch-wide yellow stripes is measured as 2 traffic stripes. Pavement markings and a 12-inch solid lane lines shall be measured by the area covered in square feet.

All painted striping removals including traffic stripes, markings, legends and other striping details shall be removed by wet sandblasting and then fog sealed if the roadway is not being resurfaced. All thermoplastic striping removals including traffic stripes, markings, legends and other striping details shall be removed by grinding method (micro-planer method, or City approved equal) and then fog sealed if the roadway is not being resurfaced. The fog seal shall conform to Section 302-14 of these Special Provisions. The fog seal shall be used to seal and protect the existing asphalt surface and reduce raveling due to the striping removals.

Pavement markers shall be placed in conformance with the provisions in Section 81-3, "Pavement Markers," of the State Standard Specifications. Attention is directed to "Traffic Control System For Moving Lane Closure on Multilane Highways" (Standard Plan T16) of the State Standard Plans regarding the use of moving lane closures during placement of pavement markers. The contractor shall furnish the City Engineer certificates of compliance for the pavement markers in conformance with the provisions in Section 81-3.018, "Submittals", of the State Standard Specifications.

The Contractor shall be required to furnish and install Stimsonite Model 88AB Two-Way Blue Reflective Markers as shown on the City of Riverside Public Utilities Department Standard Drawing CWD-700. Stimsonite Model 88AB Two-Way Blue Reflective Markers shall be included in the cost for striping.

315 ROADSIDE AND STREET NAME SIGNS

315-1 Placement of Roadside Signs. Roadside sign(s) shall include installation of sign panel(s), fastening hardware, back braces, straps and saddle brackets, and frame assemblies for multiple sign panels. A roadside sign includes a traffic sign with 1 or more sign panel(s) attached to a supporting structure. A supporting structure is typically 1 or 2 posts, a signal standard, or street light standard.

The sign must not be chipped or bent. Traffic sign face shall be 3M Diamond Grade DG3 Reflective Sheeting (ASTM XI) with protective graffiti film. All warning signs shall have a fluorescent yellow background and school signs shall have a fluorescent yellow-green background. Sign and/or post installation shall be per City of Riverside Standard Drawing No. 664.

315-2 Placement of Street Name Signs. Street Name Signs shall include installation of sign panels (both streets), breakaway signpost system if applicable and fastening hardware to provide a complete street name sign unit. The street name sign installation shall be per City of Riverside Standard Drawing No. 662.

EXHIBIT A. SAMPLE NOTICE OF CONSTRUCTION

NOTE: The letter should be printed on Contractor's letterhead and should be updated, as needed, to reflect the current project details and location(s).

NOTICE OF CONSTRUCTION

[Insert Contactor Name] has been contracted by the City of Riverside Public Works Department to complete [Insert Formal Project Name]; Wards Where Work is Taking Place [Insert Actual project name and location(s)].

The project consists of removal and replacement of damaged curb, gutter, sidewalk, driveway approaches, cross gutters, ADA non-compliant wheelchair ramps, and construction of new wheelchair ramps where needed. Concrete work will be followed up by asphalt refurbishment.

Concrete work will take place on High Street from Victoria to Carlton and on Rancho from High Street to Sedgewick between 09/25/17 and 10/13/17. Pending weather conditions.

Improvements are in most area of the City. Once concrete work is completed in all areas a secondary notice will be distributed advising of the asphalt work and timelines. Asphalt is anticipated to start 4 to 5 months after concrete work is completed in your area.

Temporary No Parking signs will be posted at least 48 hours in advance. Dates and times that parking is restricted will also be posted. Access for emergency vehicles, pedestrians, traffic, and trash services will be maintained at all times. We ask that you refrain from running excess water in the gutters during construction as it may delay the work.

Thank you in advance for your cooperation during construction.

Should you have concerns regarding the project, please contact;
###-### – Contractor Name during working hours or,
###-#### - Contractor Representative 24 hours a day if your concern is of an emergency nature.

We look forward to completion of a successful project.

(Attach construction area map to backside of notification letter***)***

SAMPLE

Construction Area



(***Modify to project spec – highlight streets actually being worked on***)

SAMPLE

END OF PART 3.

EXISTING UNDERGROUND UTILITIES:

SANITARY SEWER —— 8"S ——
WATER LINE —— 6"W ——
STORM DRAIN —— 24"SD ——
GAS LINE —— 3"G ——
IRRIGATION LINE —— 20" IRR ——
ABANDONED UTILITY —— 6"G(ABAN'D.) ——
ELECTROLIER LIGHTING CONDUIT —— ELC —— ELC ——
(Formerly: STREET LIGHTING) —— SL —— SL ——)

TELEPHONE CONDUIT —— T —— T ——
ELECTRICAL CONDUIT —— E —— E ——
TRAFFIC SIGNAL —— SIG —— SIG ——
FIRE ALARM —— F —— F ——
CABLE TV —— TV —— TV ——

EXISTING TOPOGRAPHY:

BLOCK WALL
BOARD FENCE
WIRE FENCE
CHAIN LINK FENCE

(S) SANITARY SEWER M.H.
C.O. SANITARY SEWER CLEANOUT
(D) STORM DRAIN M.H.
(I) IRRIGATION WEIR
(W) WATER M.H.
(G) GAS M.H.
(E) ELECTRIC M.H.
(T) [T] TELEPHONE M.H. OR VAULT
W WATER METER
FIRE HYDRANT
SPRINKLER HEAD
VALVE
f AIR VALVE
V AIR VENT
(B) BUS STOP SIGN
B.O. BLOW-OFF VALVE
(SP) IRRIGATION STAND PIPE

P POLE & GUY ANCHOR
PP POWER POLE
T TELEPHONE POLE
T TELEPHONE RISER
J JOINT USE POLE
PULL BOX
TRAFFIC SIGN
PARKING METER
F FIRE ALARM BOX
STREET NAME SIGN
G GAS METER
MAIL BOX
FAUCET
PEDESTRIAN SIGNAL INDICATION
ELECTRICAL TEST STATION
PPB PEDESTRIAN PUSH BUTTON

TOP OF SLOPE
TOE OF SLOPE
DIRECTION OF FLOW

RAILROAD TRACKS
RAILROAD SIGN
RAILROAD SIGNAL
VEHICLE SIGNAL INDICATION
VEHICLE SIGNAL INDICATION ON MAST ARM
TRAFFIC SIGNAL CONTROLLER CABINET
TRAFFIC SIGNAL LOOP DETECTOR
LUMWARE & TRAFFIC SIGNAL ON MAST ARM
STREET LIGHT (UPRIGHT)
STREET LIGHT
STEEL POST
WOOD POST

WHEEL STOP

APPROVED BY: _____ CITY ENGINEER
05/02/19 DATE

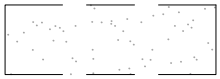
MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

UNDERGROUND & TOPO LEGEND

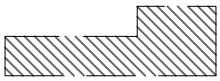
STANDARD DRAWING NO. 1

EXISTING TOPOGRAPHY (CONT.)


CONCRETE


ASPHALT


EDGE OF PAVEMENT


BUILDING

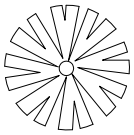

UNDERGROUND STRUCTURE

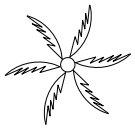

OVERHANGING STRUCTURE

PCC CURB

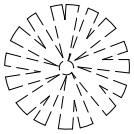

PCC CURB & GUTTER


AC BERM


DECIDUOUS TREE


PALM TREE


SHRUBBERY


TREE STUMP

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

UNDERGROUND & TOPO LEGEND

STANDARD DRAWING NO. 1

Ac. – Acre
Ang. or ∠ – Angle
Area – Spell Out
Ave. – Avenue
Avg. – Average
Blvd. – Boulevard
Calc. – Calculated
C – Center
Cir. – Circle
c.f.m. – Cubic Feet/Minute
c.f.s. – Cubic Feet/Second
corr. – Corrugated
Co. – County or Company
C.M.P.– Corrugated Metal Pipe
C.M.P.A. – Corrugated Metal Pipe Arch
cor. – Corner
C.P. – Concrete Pipe
C.R. – Curb Return
cu. ft. – Cubic Feet
c.y. – Cubic Yards
D.G. – Decomposed granite
Dr. – Drive
E – East
E'ly – Easterly
Elev.– Elevation
Est. – Estimate
E.T.W. – Edge of Traveled Way
Ft – Foot
F.B. – Field Book
Fd. – found
Gar. – Garage
guy – Guy wire or pole
Hse. – House
Irr. – Irrigation Pipe
Lat. – Latereal
L.F. – Linear Feet
Ln. – Lane
Lt – Left
Min. – Minimum
M.O. – Middle Ordinate
M.O.C. – Middle of Curve
N – North
N'ly – Northerly
NE'ly – Northeasterly
NW'ly – Northwesterly
N.I.C. – Not In Contract
N.T.S. – Not to Scale
No. – Number
Pl. – Place
P/L – Property Line
Pt. – Point
R – Radius
R & R – Remove and Replace
Rd. – Road
R.E. – Registered Engineer
Rec. – Record
Riv. – Riverside
R/S – Record of Survey
Rwy. – Railway
Rt. – Right
R.W. Hdr. – Redwood Header
R/W – Right of Way
S.B. – San Bernardino
SBB&M – San Bernardino Base and Meridian
S – South
S'ly – Southerly
SE'ly – Southeasterly
SW'ly – Southwesterly
Sec. – Section
Shld. – Shoulder
Sq. – Square
Spk. – Spike
St. – Street
Stk. – Stake
T.P. – Top of Pavement
Typ. – Typical
Vic. – Vicinity
V.P.I. – Vertical Point of Intersection
W – West
W'ly – Westerly

APPROVED BY:
CITY ENGINEER
05/02/19
DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

STANDARD ABBREVIATIONS

STANDARD DRAWING NO. 2

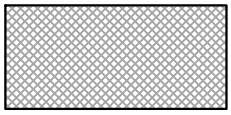
Sheet 1 of 1

SHADING STANDARDS

PLAN

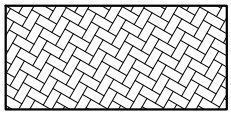
PROPOSED CONSTRUCTION

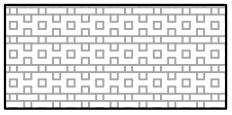

PCC


AC PAVING
(BEHIND CURB)


AC PAVING
(ROADWAY)

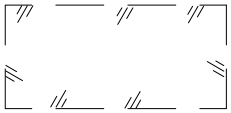

AC OVERLAY

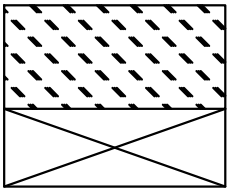

DG SURFACE


REMOVE & REPLACE

EXISTING CONSTRUCTION


PCC


AC

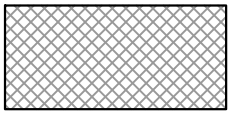

BUILDING

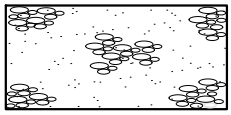
ROOF OR OVER
HANG

SECTION

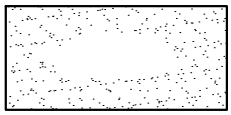
PROPOSED CONSTRUCTION

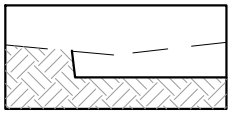

PCC

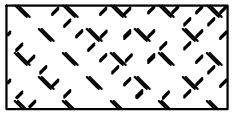

AC PAVING

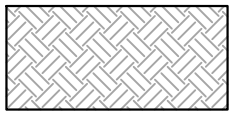

BASE

EXISTING CONSTRUCTION

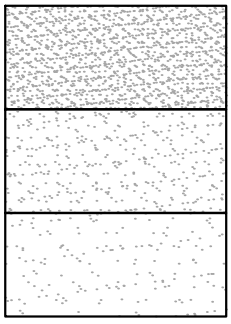

PCC


AC PAVEMENT


ROCK


UNDISTURBED SOIL

FILL COMPACTIONS


95% RELATIVE
COMPACTION

90% RELATIVE
COMPACTION

85% RELATIVE
COMPACTION

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CITY ENGINEER

05/02/19
DATE

MARK	REVISIONS	APPR.	DATE

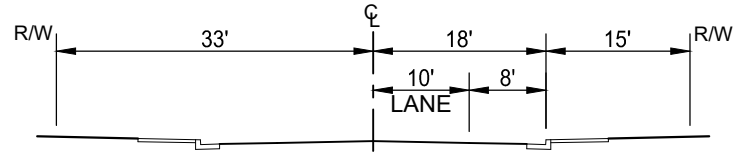
CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

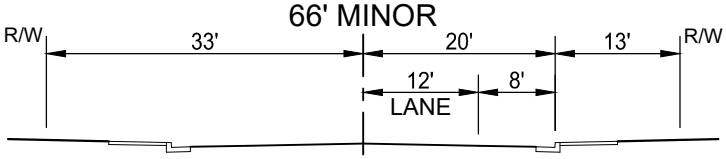
SHADING STANDARDS

STANDARD DRAWING NO. 3

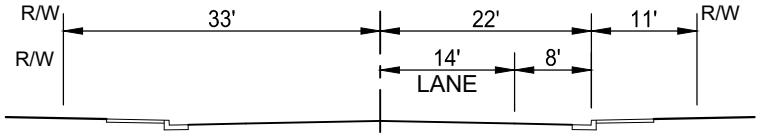
Sheet 1 of 1



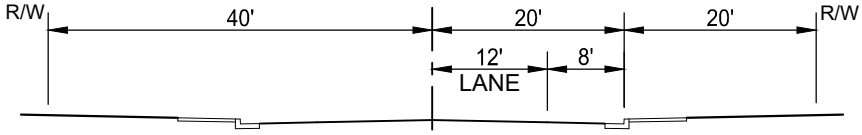
66' MINOR



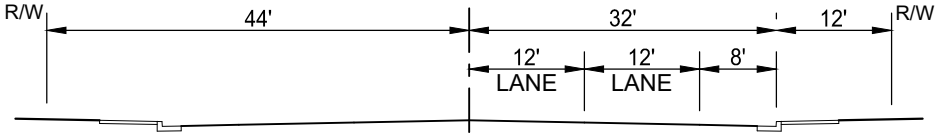
66' SECONDARY OR COLLECTOR



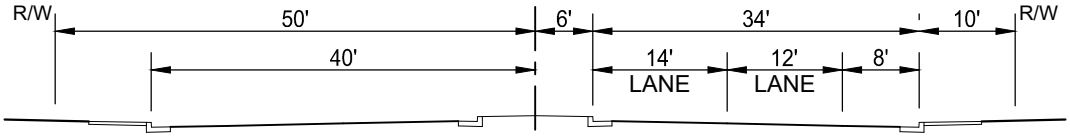
66' INDUSTRAL COLLECTOR



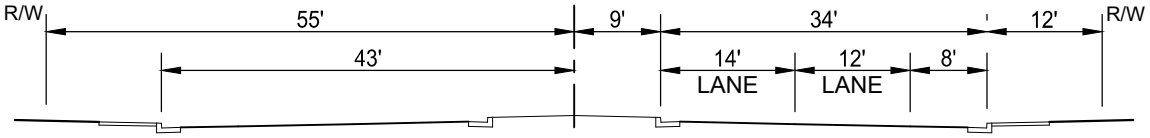
80' SECONDARY



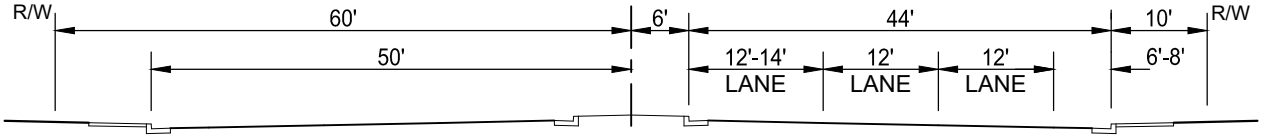
88' ARTERIAL



100' ARTERIAL

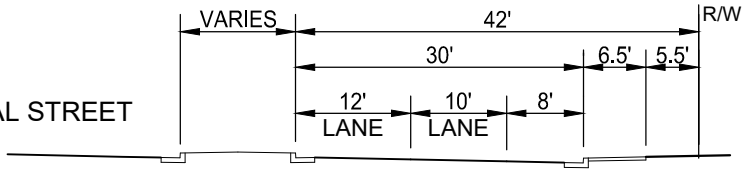


110' ARTERIAL



120' ARTERIAL

ARTERIAL STREET



FRONTAGE ROAD

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05/02/19

DATE

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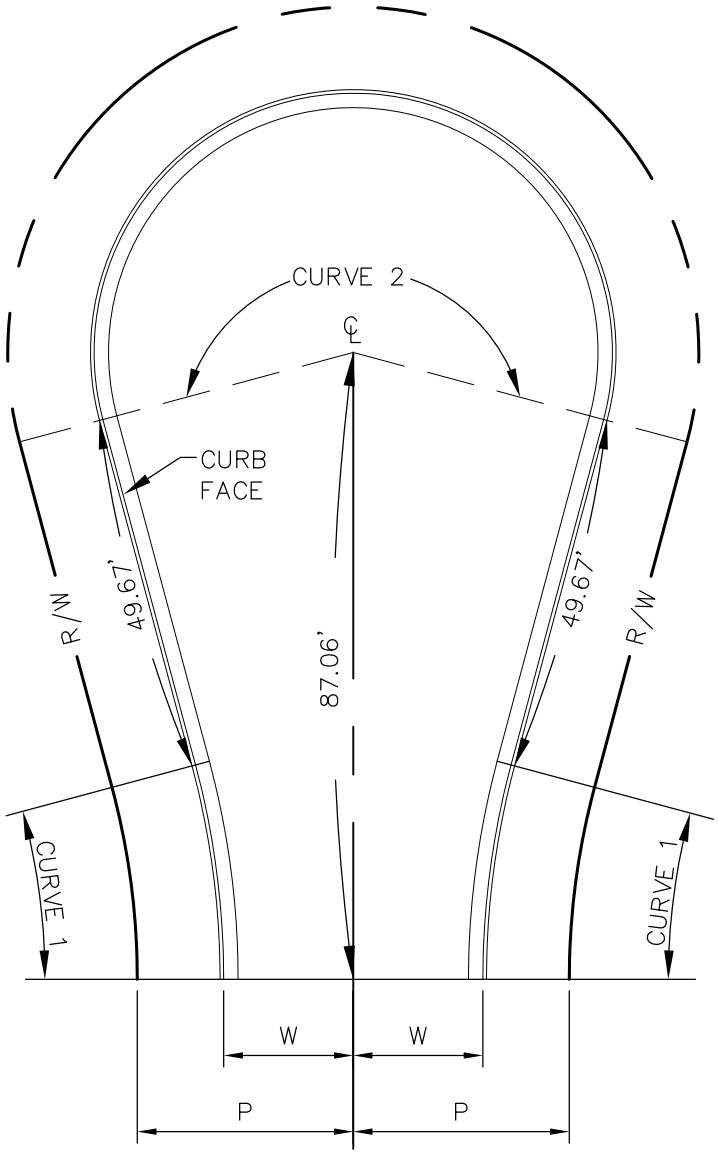
PUBLIC WORKS DEPARTMENT

STANDARD STREET DIMENSIONS

STANDARD DRAWING NO. 101

Sheet 1 of 1

MARK	REVISIONS	APPR.	DATE



TYPE I

	R/W CURB CURVE DATA								PVMT AREA S.F.
	CURVE 1					CURVE 2			
W	R	△	T	L		R	△	L	
18'	115'	15°	15.14'	30.11'		36'	210°	131.95'	5,991
20'	113'	15°	14.88'	29.58'		38'	210°	139.28'	6,667

	R/W CURB CURVE DATA						
	CURVE 1				CURVE 2		
W	R	△	T	L	R	△	L
30'	103'	15°	13.56'	26.97'	48'	210°	175.93'
33'	100'	15°	13.17'	26.18'	51'	210°	186.93'

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CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

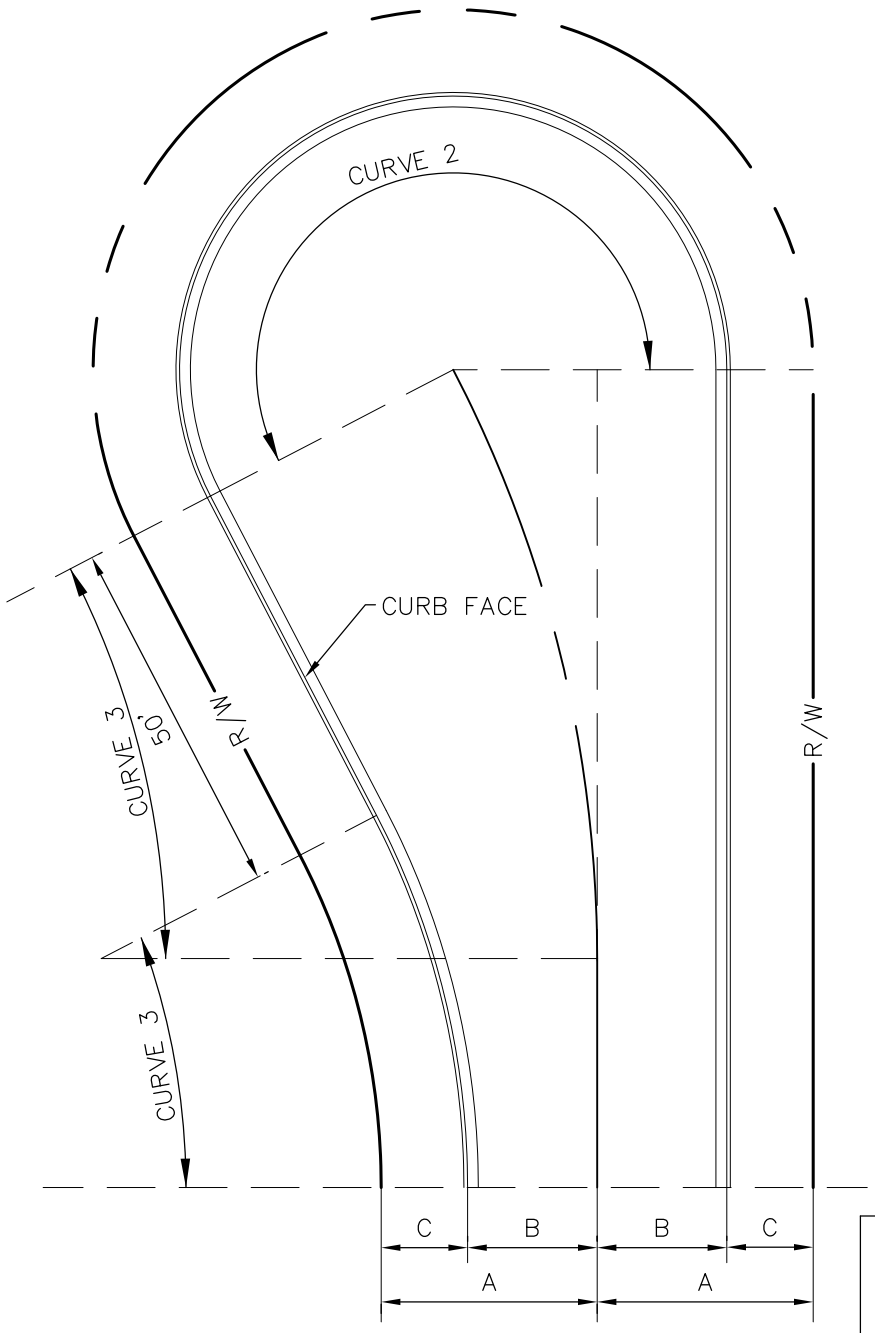
PUBLIC WORKS DEPARTMENT

CUL-DE-SAC

STANDARD DRAWING NO. 102

Sheet 1 of 2

MARK	REVISIONS	APPR.	DATE



TYPE II

CURVE 1								CURVE 2							
		CURB		R/W					CURB		R/W				
R/W	A	B	C	D	E	△	R	L	R	L	△	R	L	R	L
56'	28'	18'	10'	112.87'	31.436'	27°35'48"	110'	52.98'	100'	52.98'	207°35'48"	38'	137.68'	100'	173.916'
60'	30'	18'	12'	113.58'	31.79'	27°28'54"	112'	53.72'	100'	53.72'	207°28'54"	38'	137.61'	100'	181.06'
60'	30'	20'	10'	108.90'	29.45'	25°31'48"	110'	49.01'	100'	49.01'	205°31'48"	38'	136.31'	100'	172.18'
66'	33'	22'	11'	104.94'	27.47	23°20'19"	111'	45.21'	100'	45.21'	203°20'19"	38'	134.86'	100'	173.90'
74'	37'	22'	15'	106.15'	28.08'	23°09'45"	115'	46.49'	100'	46.49'	203°09'45"	38'	134.74'	100'	187.93'
78'	39'	28'	11'	121.38'	35.069'	28°47'56"	111'	55.79'	100'	55.79'	208°47'56"	50'	182.21'	100'	222.30'

CURVE 3			
	CROWN		
△	R	L	
27°35'48"	175.795'	84.672'	
27°28'54"	177.24'	85.01'	
25°31'48"	184.35'	82.14'	
23°20'19"	195.54'	79.65'	
23°09'45"	198.48'	80.24'	
28°47'56"	177.87'	89.41'	

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

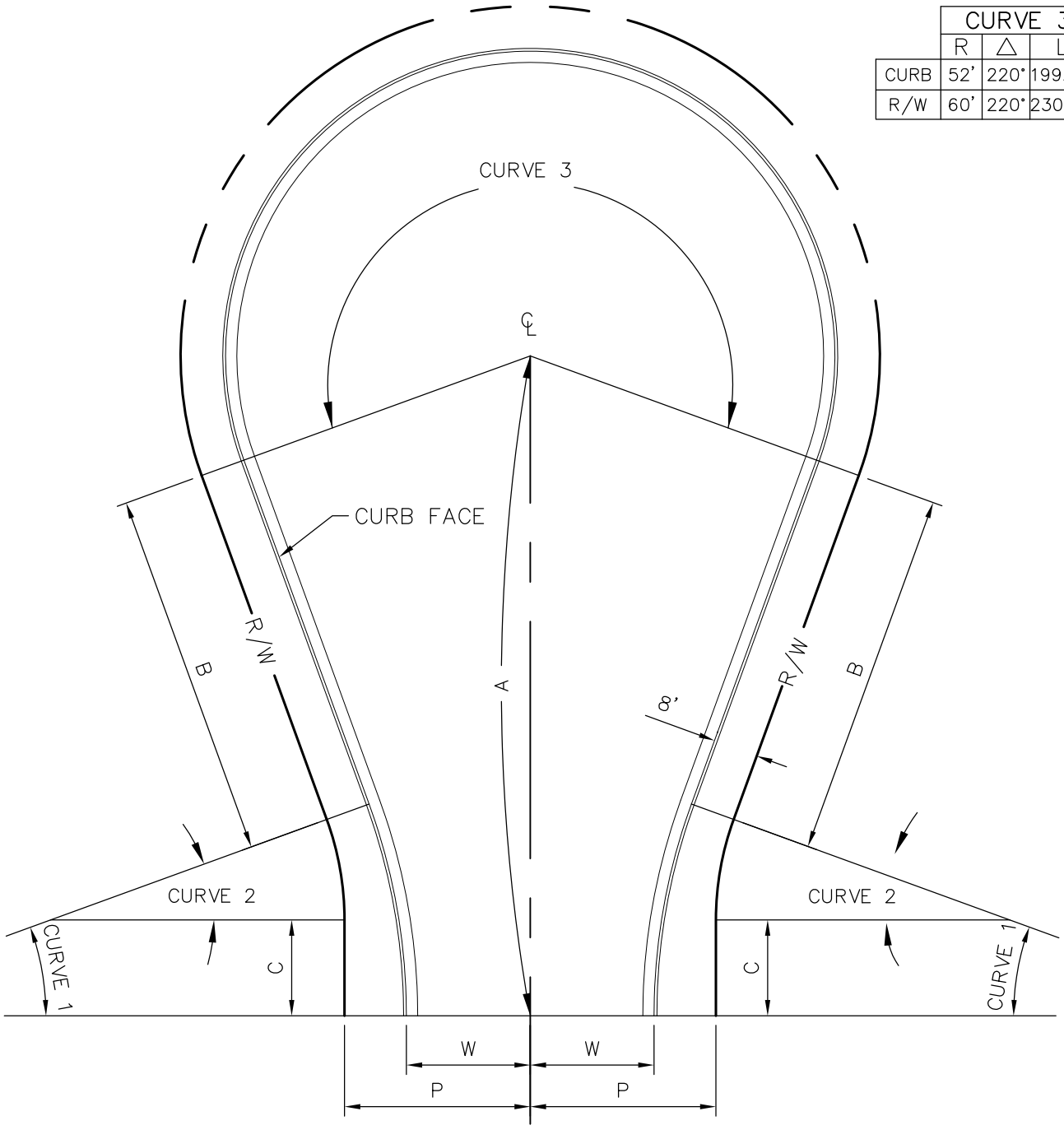
OFFSET CUL-DE-SAC

STANDARD DRAWING NO. 102

Sheet 2 of 2

MARK	REVISIONS	APPR.	DATE

	CURVE 3		
	R	△	L
CURB	52'	220°	199.67'
R/W	60'	220°	230.38'



					CURB CURVE DATA								PVMT AREA S.F.
					CURVE 1				CURVE 2				
W	P	A	B	C	R	△	T	L	R	△	T	L	
20'	33'	116.49'	65.00'	28.36'	110'	20°	19.40'	38.40'	19.08'	20°	3.36'	6.66'	11,534
22'	33'	110.99'	59.15'	17.02'	110'	20°	19.40'	38.40'	52.24'	20°	9.21'	18.24'	11,404

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CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

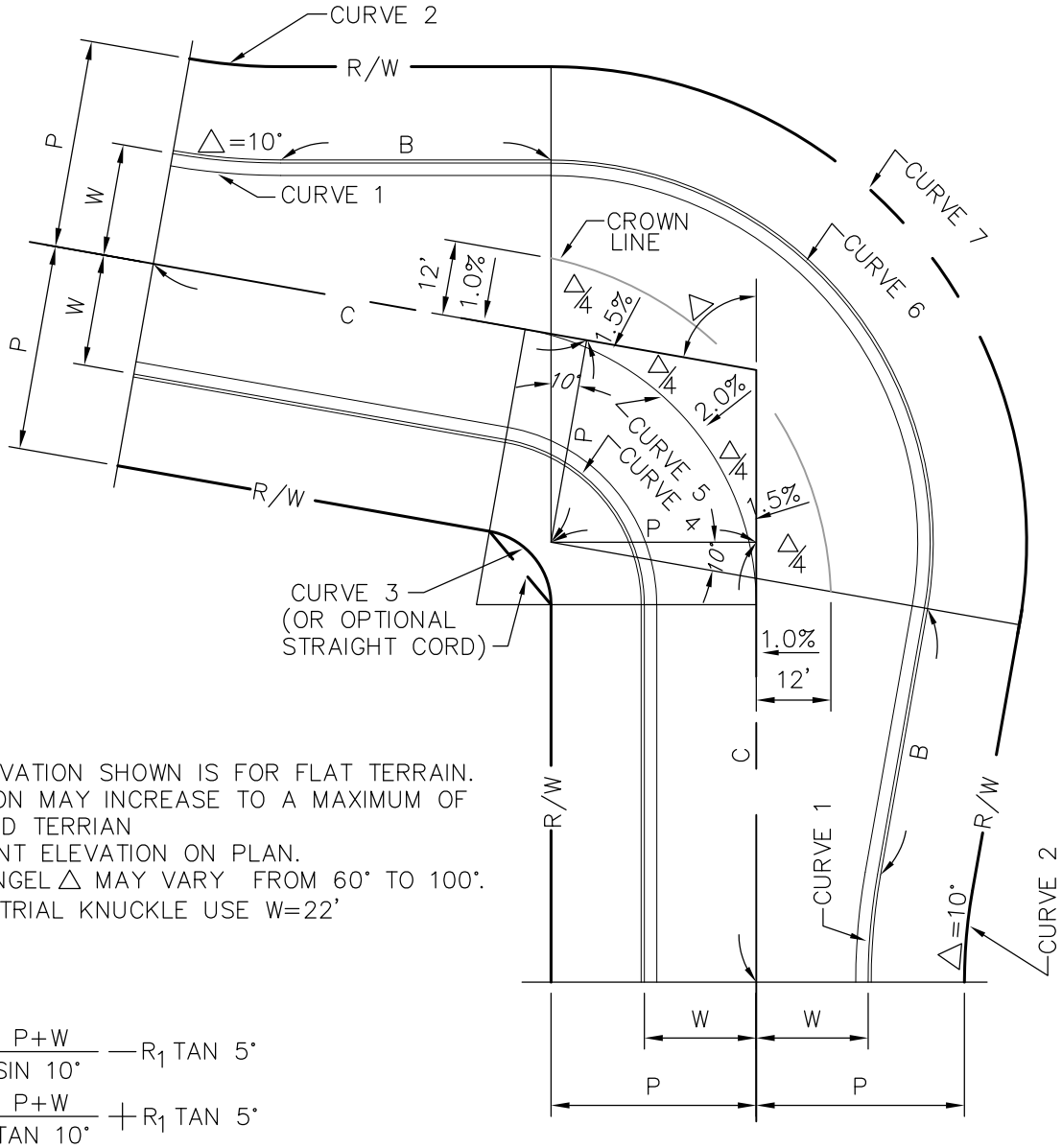
PUBLIC WORKS DEPARTMENT

INDUSTRIAL CUL-DE-SAC

STANDARD DRAWING NO. 103

Sheet 1 of 1

MARK	REVISIONS	APPR.	DATE



1. THE SUPERELEVATION SHOWN IS FOR FLAT TERRAIN. SUPERELEVATION MAY INCREASE TO A MAXIMUM OF 6% FOR SLOPED TERRIAN
2. SHOW PAVEMENT ELEVATION ON PLAN.
3. DEFLECTION ANGEL △ MAY VARY FROM 60° TO 100°.
4. FOR AN INDUSTRIAL KNUCKLE USE W=22'

$$A = P \text{ TAN } \frac{\triangle^{\circ}}{2}$$

$$B = \frac{R_6}{\text{TAN } 10^{\circ}} - \frac{P+W}{\text{SIN } 10^{\circ}} - R_1 \text{ TAN } 5^{\circ}$$

$$C = \frac{R_6}{\text{SIN } 10^{\circ}} - \frac{P+W}{\text{TAN } 10^{\circ}} + R_1 \text{ TAN } 5^{\circ}$$

				100°>△ >75°			75°> △>65°			65°> △>60°						
P	W	R_1	R_2	R_3	R_4	R_5	R_3	R_4	R_5	R_3	R_4	R_5	R_6	R_7	B	C
30	18	100	88	15	27	45	23	35	53	33	45	63	61	73	60.78	87.81
	20	100	90	17	27	47	25	35	55	35	45	65	61	71	49.26	76.47
	22	111	103	27	35	57	32	40	62	42	50	72	65	73	59.47	89.11
33	18	100	85	12	27	45	20	35	53	30	45	63	61	76	43.50	70.80
	20	100	87	14	27	47	22	35	55	32	45	65	61	74	31.98	59.46
	22	111	100	24	35	57	32	40	62	39	50	72	65	76	42.19	72.11

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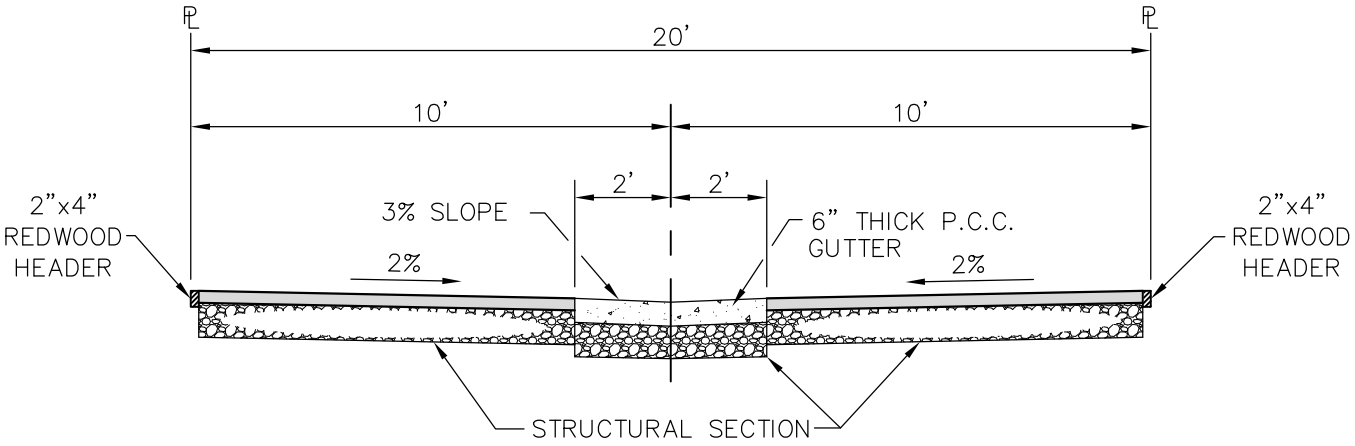
PUBLIC WORKS DEPARTMENT

STANDARD KNUCKLE

STANDARD DRAWING NO. 104

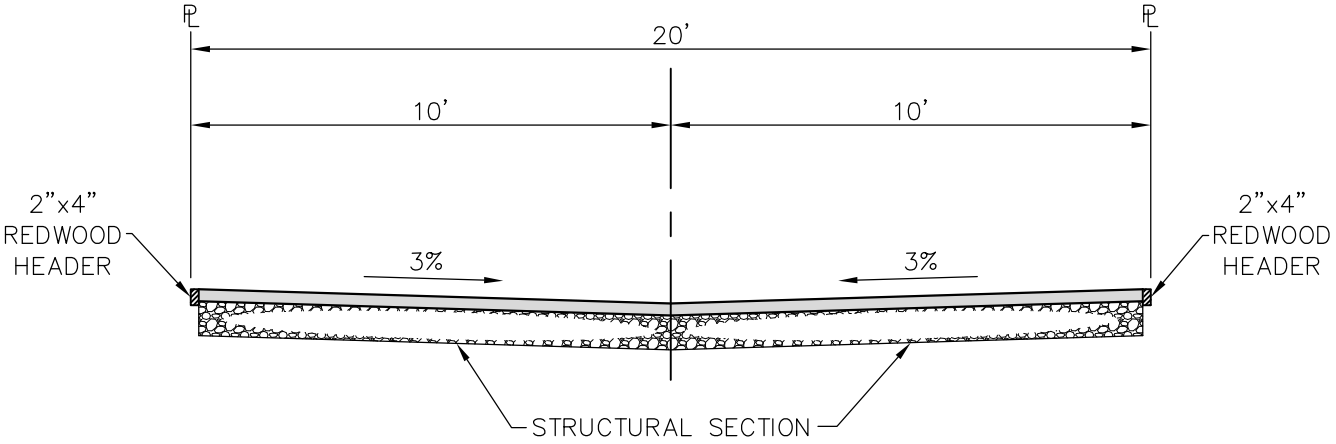
Sheet 1 of 1

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TYPE 2

GRADES LESS THAN 2.00%



TYPE 2

GRADES OVER 2.00%

NOTES:

1. ALLEY WIDTH CAN BE REDUCED IN CASE OF EXISTING SUBSTANDARD RIGHT-OF-WAY.
2. CROSS FALL MAY BE ADJUSTED TO MEET EXISTING IMPROVEMENTS (1% MIN.)
3. REDWOOD HEADERS REQUIRED AT EDGE OF A.C. WHEREVER EDGE IS NOT PROTECTED BY OTHER STRUCTURAL MATERIALS, SUCH AS EXISTING PAVEMENT, CONCRETE, ETC.
4. CONCRETE FOR VALLEY GUTTER SHALL BE CLASS 560-C-3250.
5. STRUCTURAL SECTION SHALL BE AS SHOWN ON PLAN (T.I.=5.)
6. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED IN VALLEY GUTTER AT 10' INTERVALS.

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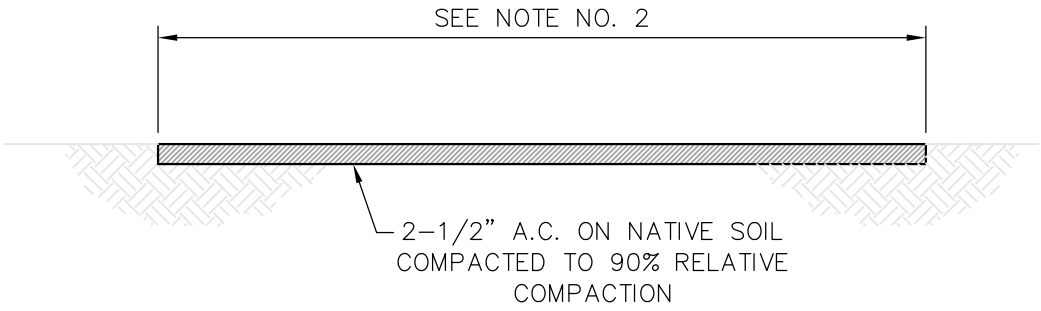
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PUBLIC WORKS DEPARTMENT

ALLEY SECTIONS

STANDARD DRAWING NO. 110

Sheet 1 of 1



NOTES:

1. CROSS SLOPES AND LONGITUDINAL SLOPES SHALL BE AS DIRECTED BY THE ENGINEER AND IN SUCH A MANNER AS TO PROVIDE FOR ADEQUATE DRAINAGE AND SMOOTH RIDING CHARACTERISTICS. CROSS SLOPE SHALL NOT BE LESS THAN 2% NOR MORE THAN 5%
2. THE MINIMUM WIDTH OF THE BIKEWAY SHALL BE 8' FOR A TWO–WAY BIKEWAY AND 5' MINIMUM WIDTH PER HIGHWAY DESIGN MANUAL FOR A ONE–WAY BIKEWAY UNLESS OTHERWISE SHOWN ON PLAN.
3. LOCATION AND ALIGNMENT OF BIKEWAY SHALL BE AS SHOWN ON PLANS.
4. ALL TREE LIMBS OVERHANGING THE BIKEWAY AND LESS THAN 8' ABOVE THE BIKEWAY SHALL BE TRIMMED BACK AS DIRECTED BY THE ENGINEER. MINIMUM LATERAL CLEARANCE TO OBSTRUCTIONS SHALL BE 3'.
5. ASPHALT CONCRETE SHALL BE CLASS D2–PG 64–10.
6. PRIOR TO PLACING ASPHALT CONCRETE, APPLY HERBICIDE, RATE OF APPLICATION PER MANUFACTURERS RECOMMENDATIONS.

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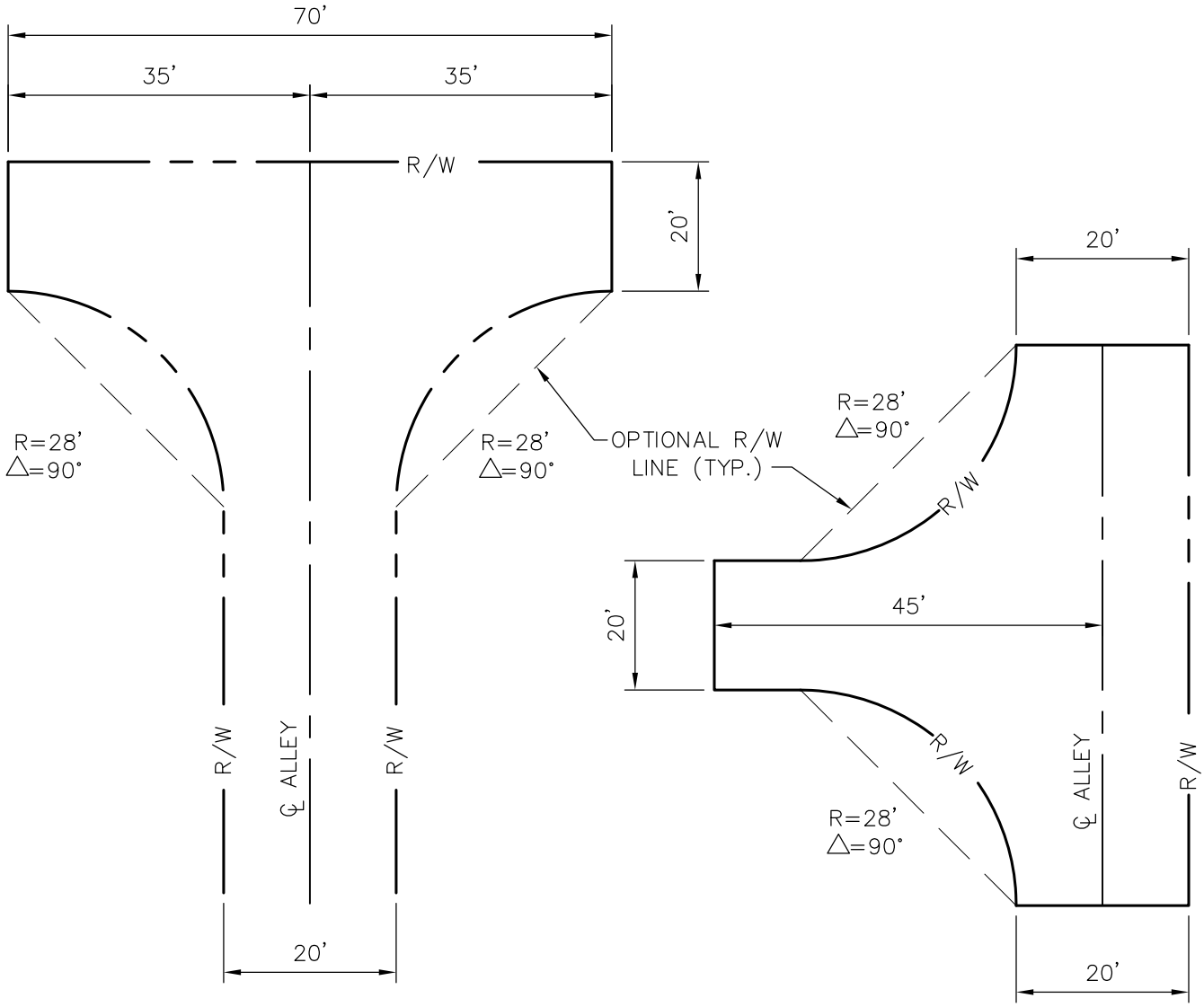
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CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

CLASS I BIKEWAY

STANDARD DRAWING NO. 111

Sheet 1 of 1



ALTERNATE "A"

ALTERNATE "B"

NOTES:

1. THE ENGINEER HAS THE OPTION OF USING EITHER ALTERNATE.
2. PAVE ENTIRE RIGHT-OF-WAY PER STANDARD DRAWING NO. 110.
3. THE ENGINEER MAY USE OPTIONAL RIGHT-OF-WAY LINES AS SHOWN FOR EACH ALTERNATE.

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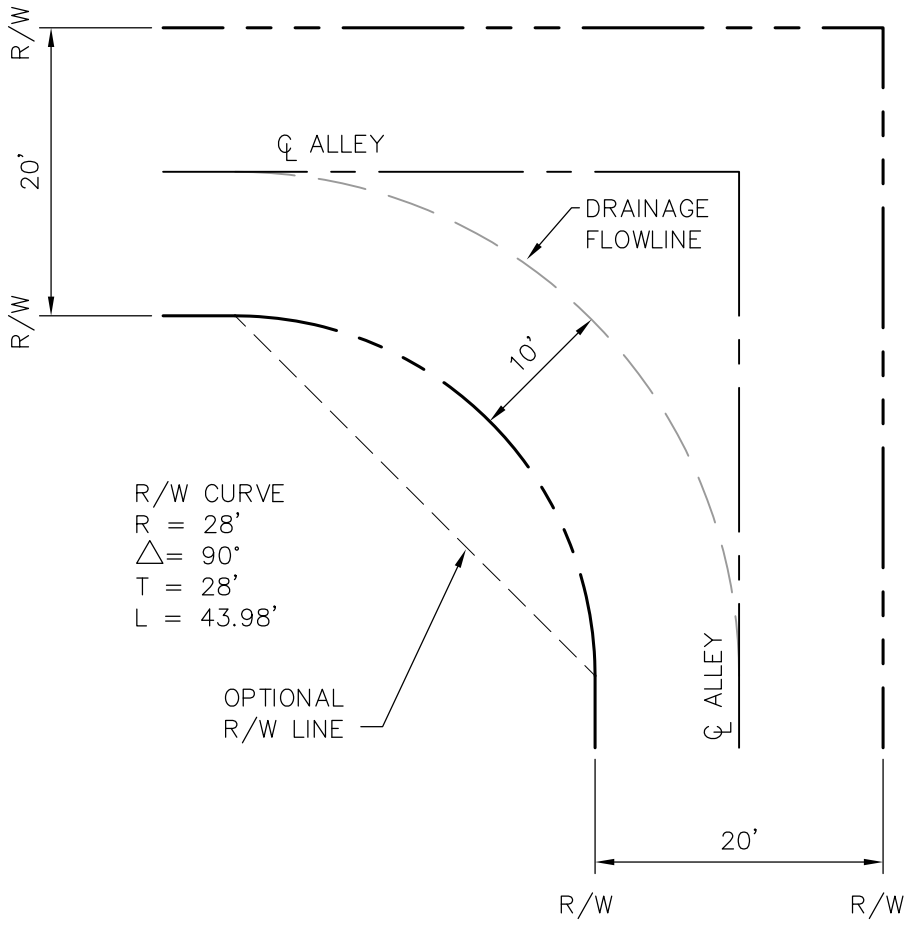
CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

ALLEY TURNAROUND

STANDARD DRAWING NO. 115

Sheet 1 of 1



NOTES:

1. PAVE ENTIRE RIGHT-OF-WAY PER STANDARD DRAWING NO. 110.
2. THE ENGINEER MAY USE OPTIONAL RIGHT-OF-WAY LINE AS SHOWN.

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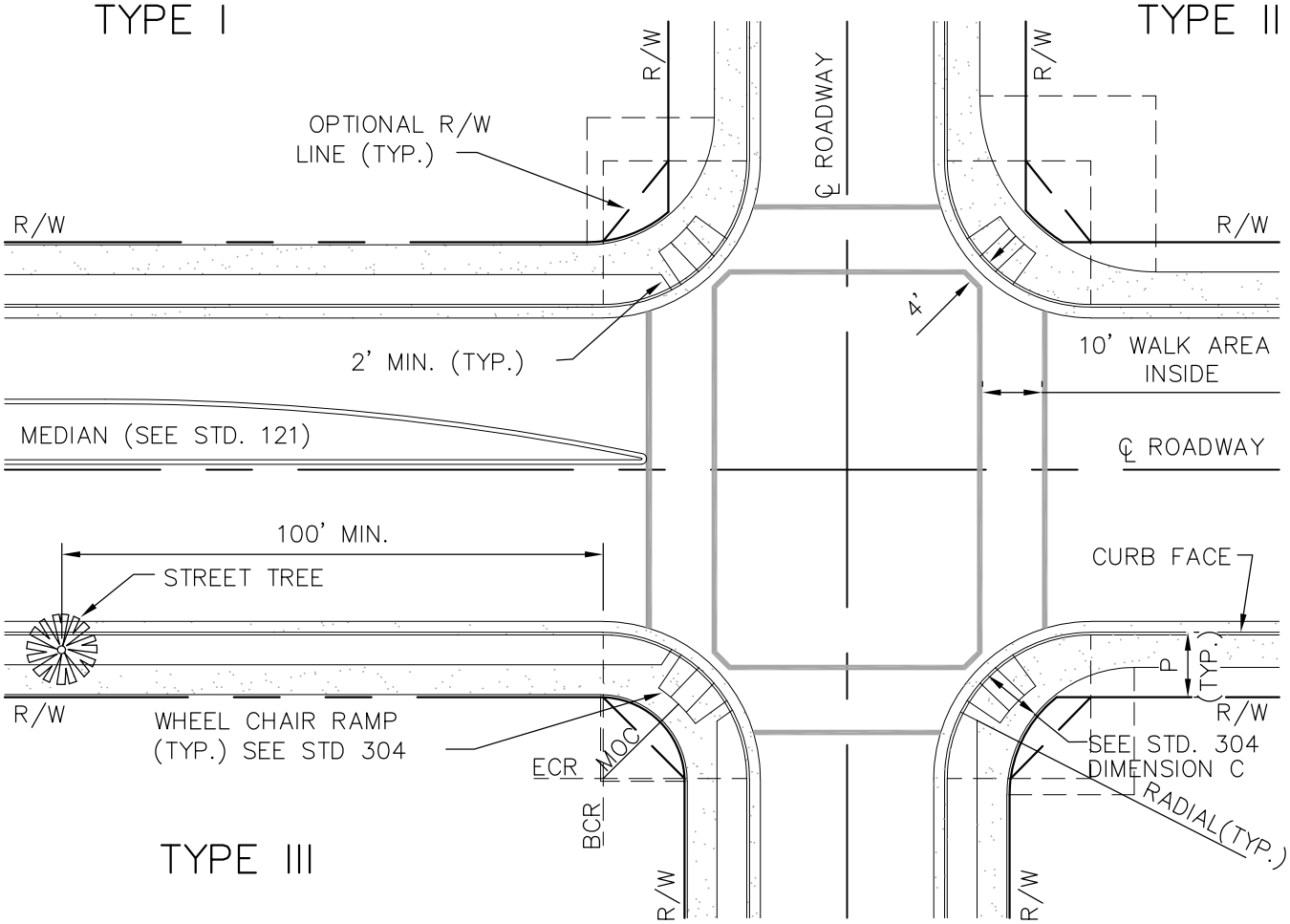
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CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

RIGHT ANGLE ALLEY TURN

STANDARD DRAWING NO. 116

Sheet 1 of 1



NOTES:

1. CURB RETURN RADIUS SHALL BE 27' EXCEPT THAT IT SHALL BE 35' ON STREET:
   A) SHOWN ON THE CIRCULATION AND TRANSPORTATION ELEMENT OF THE GENERAL PLAN.
   B) IN INDUSTRIAL AREAS.
   C) AS DETERMINED BY CITY ENGINEER.
2. R/W CURVES SHALL BE CONCENTRIC WITH BACK OF SIDEWALK CURVES.
3. WHERE WHEEL CHAIR RAMPS ARE REQUIRED SEE STANDARD DRAWING 304 FOR LOCATION.
4. WHERE INTERSECTION ANGLE IS SKEWED MORE THAN 10%, CROSSWALK LOCATION SHALL BE DETERMINED BY THE CITY TRAFFIC ENGINEER.
5. WHERE INTERSECTION ANGLE IS SKEWED BY MORE THAN 15% AND/OR WHERE "P" IS GREATER THAN 15', BACK OF SIDEWALK CURVES SHALL BE DETERMINED BY THE ENGINEER TO MAINTAIN 4' MINIMUM BETWEEN THE BACK OF SIDEWALK AND BACK OF WHEEL CHAIR RAMP.
6. MEDIAN TO END AT CROSS WALK AS SHOWN.
   REF: #662 FOR SIGN LOCATIONS.
7. THE CHART FOR BACK OF SIDEWALK CURVES IS OPTIONAL. MINIMUM DISTANCE FROM CURB FACE TO BACK OF SIDEWALK VARIES WITH THE HEIGHT OF THE CURB FACE, WITH 0.5' MINIMUM DISTANCE FROM THE BACK OF SIDEWALK TO RIGHT-OF-WAY.

BACK OF SIDEWALK CURVES

TYPE	P	C.R. RADIUS			
		27'		35'	
		6"CF	8"CF	6"CF	8"CF
I	12'	26.5'	33'	35'	41'
	15'	21'	28'	29'	36'
II	N/A	35'	42'	44'	49.5'
III	12'*	16'	22.5'	24'	30.5'
	13'*	14.5'	21'	22.5'	29'
	15'*	7.5'	14'	15.5'	22'

* IF "P" IS DIFFERENT FOR INTERSECTING STREET, USE LARGER VALUE.

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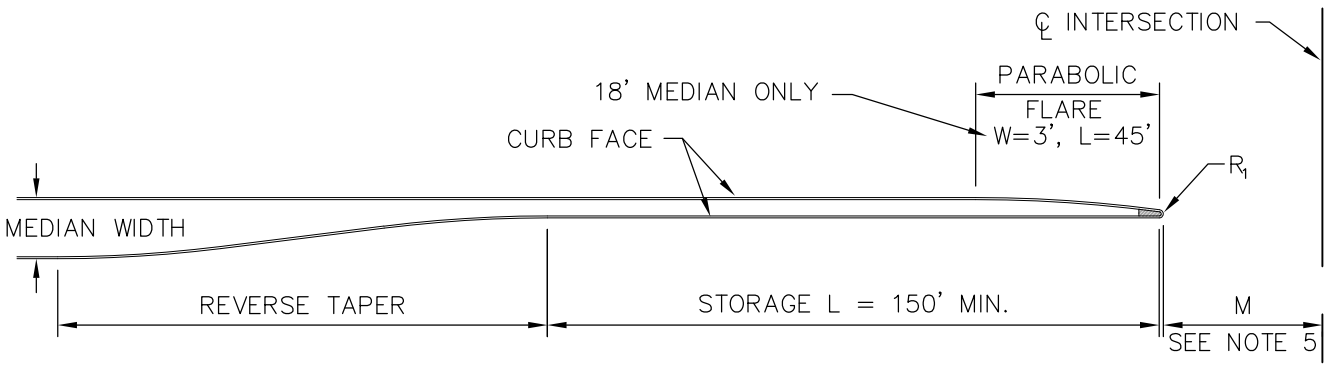
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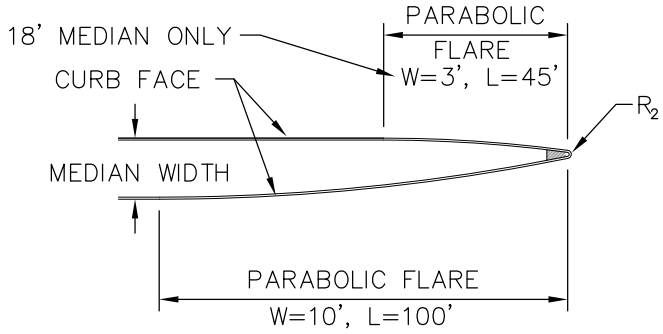
INTERSECTION LAYOUT

STANDARD DRAWING NO. 120

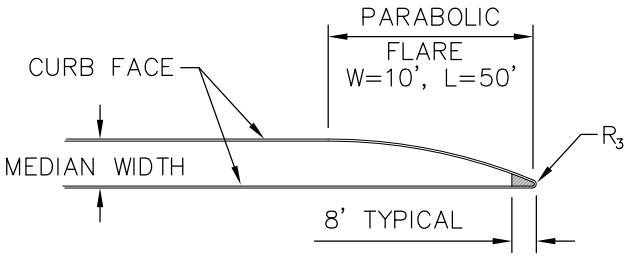
Sheet 1 of 1



TYPE I – PROVIDES STORAGE FOR LEFT TURN



TYPE II – PROVIDES FOR LEFT TURN WITH NO STORAGE



TYPE III – FOR USE WHERE LEFT TURN IS PROHIBITED

NOTES:

1. SHOW ALL MEDIAN OPENING DETAILS ON PLAN.
2. ALL MEDIAN OPENINGS REQUIRE APPROVAL OF THE CITY TRAFFIC ENGINEER.
3. LENGTHS OF FLARES, REVERSE TAPERS, AND STORAGE LANES MAY BE CHANGED BECAUSE OF PHYSICAL LIMITATIONS OR TRAFFIC REQUIREMENTS.
4. TYPE I AND II ARE NORMALLY USED AT "T" INTERSECTIONS ONLY.
5. FOR INTERSECTIONS WITH DRIVEWAYS M=30'. FOR INTERSECTIONS WITH STREETS SEE STANDARD DWG. 120
6. SEE DETAIL STD. 666 FOR PLACEMENT OF RETRO-REFLECTIVE MARKERS.

REFERENCE DWGS.

STD. 122 REVERSE TAPERS.
STD. 123 PARABOLIC FLARES.

MEDIAN DIMENSIONS (FEET)					
MEDIAN WIDTH	REVERSE TAPER		NOSE RADIUS		
	W	L	R_1	R_2	R_3
18	10	120	2.5	2.5	4
12	10	120	1	1	1

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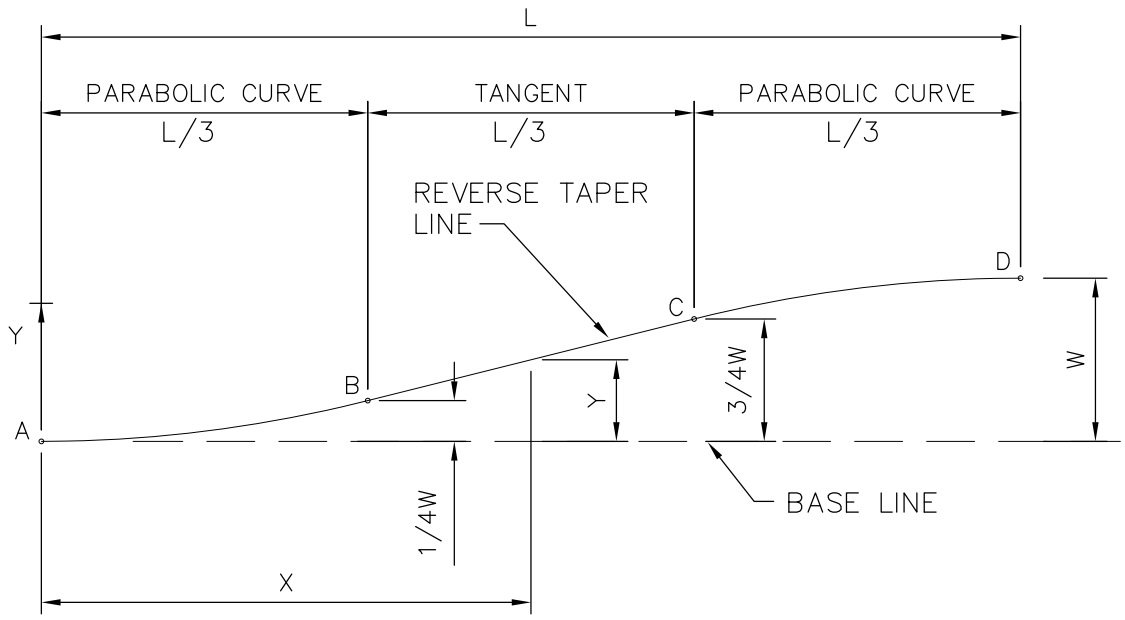
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PUBLIC WORKS DEPARTMENT

MEDIAN OPENINGS

STANDARD DRAWING NO. 121

Sheet 1 of 1



ORIGIN IS AT POINT A

AB: $Y=2.25W(\frac{X}{L})^2$

BC: $Y=0.50W(\frac{3X}{L}-0.5)$

CD: $Y=0.5W\left(-4.5(\frac{X}{L})^2+9(\frac{X}{L})-2.5\right)$

NOTE:

1. BASE LINE IS PARALLEL TO TRAVELED WAY.
2. WHERE THE BASE LINE IS CURVED THE CENTRAL PORTION WILL NOT BE TANGENT. USE PROPORTIONAL OFFSET TO DEFINE CURVE.

L	DISTANCE "X" ALONG BASE LINE (FT.)									
60'	5	10	15	20	30	40	45	50	55	60
90'	7.5	15	22.5	30	45	60	67.5	75	82.5	90
120'	10	20	30	40	60	80	90	100	110	120
W	OFFSET "Y" FROM BASE LINE (FT.)									
8'	0.12	0.50	1.12	2.00	4.00	6.00	6.88	7.50	7.88	8.00
9'	0.14	0.56	1.26	2.25	4.50	6.75	7.74	8.44	8.86	9.00
10'	0.16	0.62	1.41	2.50	5.00	7.50	8.59	9.38	9.84	10.00
11'	0.17	0.69	1.55	2.75	5.50	8.25	9.45	10.31	10.83	11.00
12'	0.19	0.75	1.69	3.00	6.00	9.00	10.31	11.25	11.81	12.00

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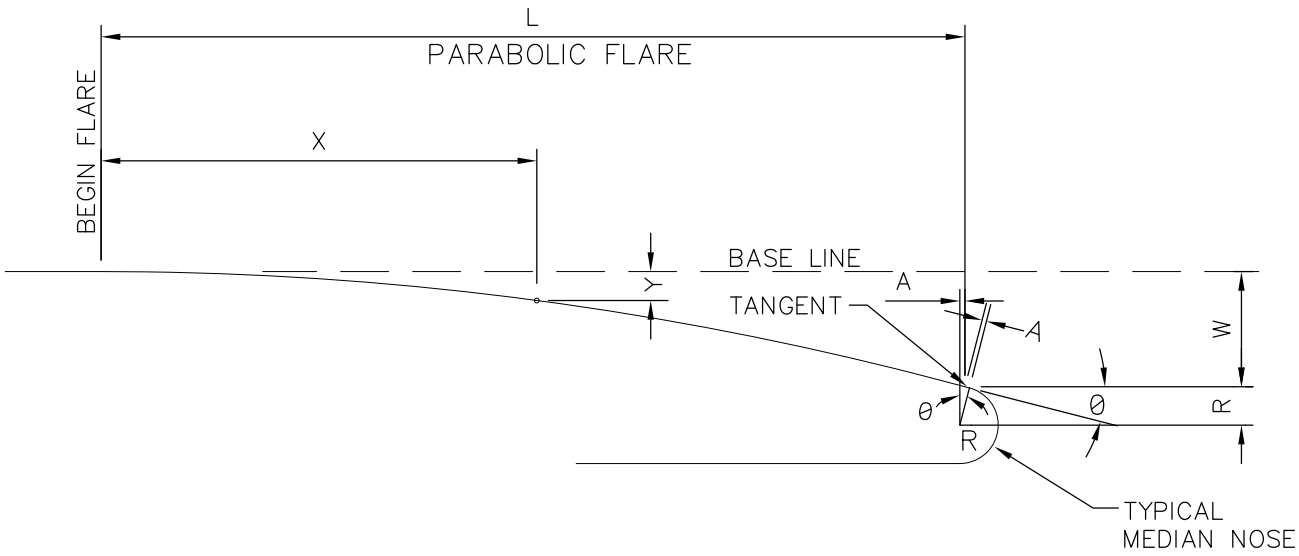
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REVERSE TAPER

STANDARD DRAWING NO. 122

Sheet 1 of 1

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		OFFSET (Y) AT DISTANCES (X) ALONG BASE LINE (FT).														
W	L \ X	10	20	25	30	40	45	50	60	70	75	80	90	100	θ	TAN1/2 θ
5	25	0.80	3.20	5.00											21°48'05"	.1926
10	50	0.40	1.60		3.60	6.40		10.00								
5	50	0.20	0.80		1.80	3.20		5.00							11°18'36"	.0990
10	100	0.10	0.40		0.90	1.60		2.50	3.60	4.90		6.40	8.10	10.00		
3	45	0.15	0.59		1.33	2.37	3.00								7°35'41"	.0664
5	75	0.09	0.36		0.80	1.42		2.22	3.20	4.36	5.00					
6	90	0.07	0.30		0.67	1.19		1.85	2.67	3.63		4.74	6.00			

NOTE:

1. SHOW W, L, AND "BEGIN FLARE" STATION PLAN.
2. SEE DETAIL STD. 666 FOR PLACEMENT OF RETRO-REFLECTIVE MARKERS.

L= LENGTH OF FLARE IN FEET
W= MAXIMUM OFFSET DISTANCE IN FEET
X= DISTANCE ALONG BASELINE IN FEET
Y= OFFSET FROM BASELINE IN FEET

DESIGN DATA

$$\tan\theta = \frac{2W}{L}$$

$$A = R \tan\frac{1}{2}\theta$$

$$Y = W\left(\frac{X}{L}\right)^2$$

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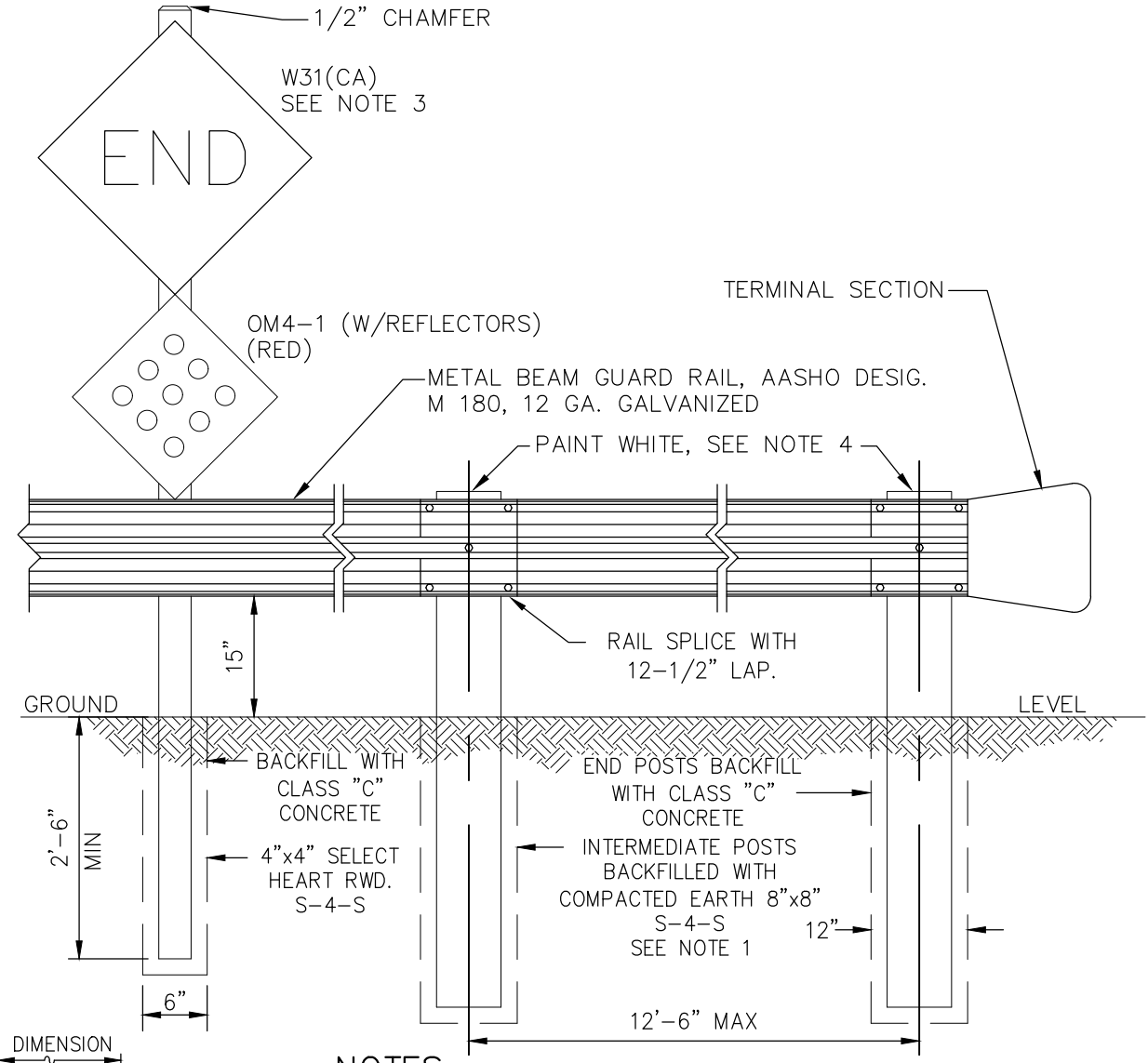
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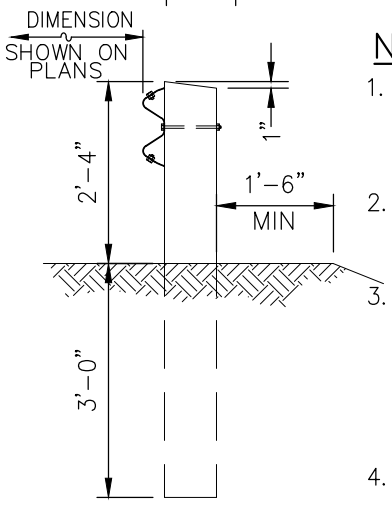
PARABOLIC FLARE

STANDARD DRAWING NO. 123

Sheet 1 of 1

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NOTES:

1. BARRICADE POSTS SHALL BE DENSE STRUCTURAL REDWOOD OR CONSTRUCTION GRADE DOUGLAS FIR FREE OF HEART CENTER. DOUGLAS FIR SHALL BE PRESSURE TREATED WITH APPROVED SALTS SUCH AS THAT THE POSTS MAY BE REPAINTED.
2. OVERALL LENGTH OF BARRICADE SHALL BE WITHIN R/W OF STREET AND TERMINAL SECTIONS OF BARRICADE SHALL BE AS CLOSE TO R/W LINES AS USE OF STANDARD 12'-6" SECTION LENGTHS WILL ALLOW.
3. SIGNS SHALL BE 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING (ASTM XI) AND INCLUDE A W-31(CA) (36"X36"-BLACK ON YELLOW) AND A OM4-1 (36"x36"-RED) SIGNS SHALL BE ON .08" THICK ALUMINUM BLANKS. SIGNS SHALL BE LOCATED ON CENTERLINE OF EACH APPROACHING DRIVE LANE, AND MOUNTED ON 4"x4"x10'-0" REDWOOD POSTS. NO PORTION OF THE SIGN SHALL BE BELOW TOP OF GUARDRAIL.
4. ALL 8"x8" POSTS SHALL BE PAINTED WITH ON COAT OF WOOD PRIMER AND TWO COATS OF FAST DRYING PAINT FOR WOOD.

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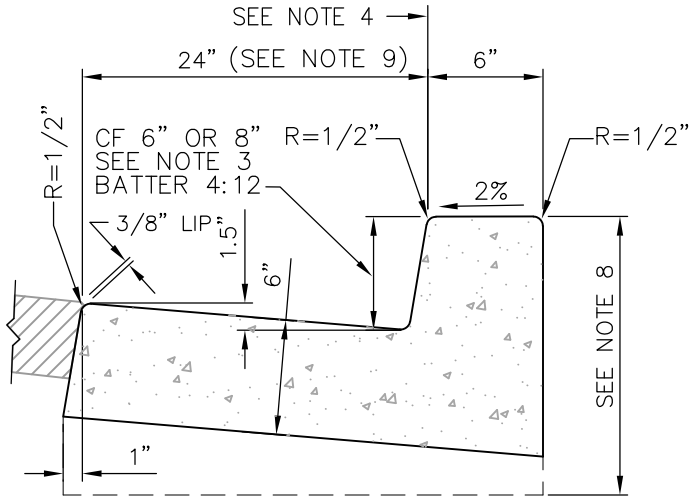
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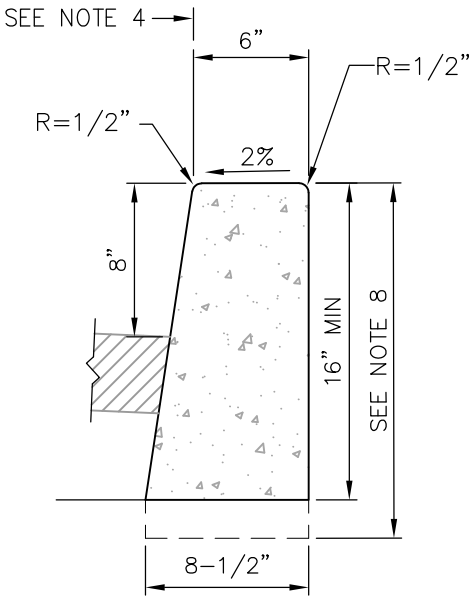
TREATMENT FOR STREET TERMINUS

STANDARD DRAWING NO. 180

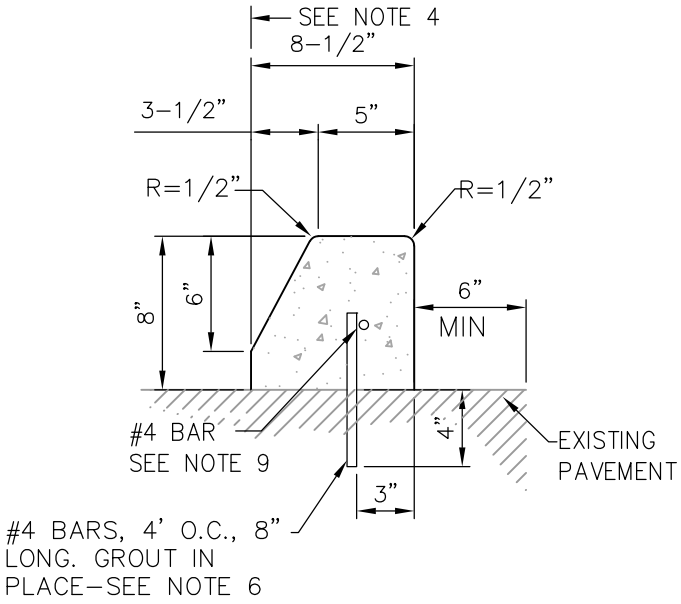
Sheet 1 of 1



TYPE I



TYPE II



TYPE III

CONCRETE QUANTITIES		
TYPE	C.F.	C.Y. PER L.F.
I	6"	0.05825
I	8"	0.06211
II	8"	0.02972
III	8"	0.0147
C1	—	0.02752
C2	—	0.06457
C3	—	0.00965

(ALL CURB AND GUTTER SHALL HAVE BMP PROTECTION
ONCE FORMS ARE REMOVED OR 24 HRS AFTER INSTALLED.)

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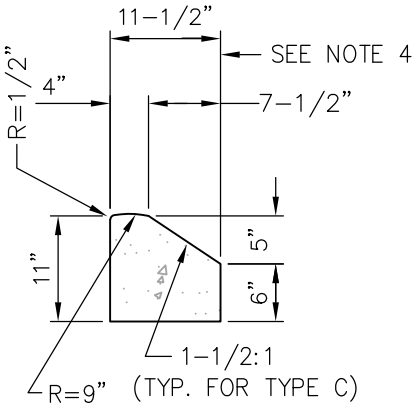
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CURB AND GUTTER

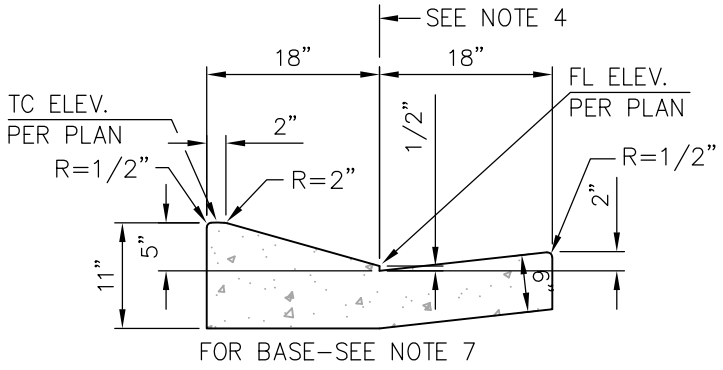
STANDARD DRAWING NO. 200

Sheet 1 of 2

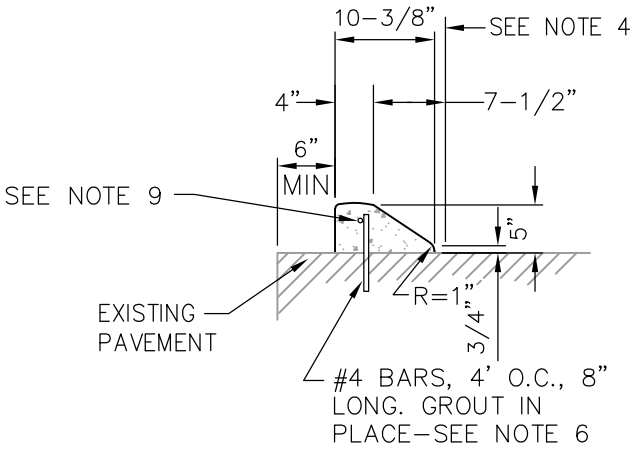
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C1



C2



C3

TYPE C

NOTES:

1. CONCRETE SHALL BE CLASS 560-C-3250 FOR FORMED CURB OR EXTRUDED CURB.
2. TYPES II AND III CURB SHALL BE USED ONLY WHERE PAVEMENT SLOPES AWAY FROM CURB EXCEPT AS APPROVED BY CITY ENGINEER.
3. TYPES I, II, OR III CURB FACE SHALL BE AS SPECIFIED ON PLANS.
4. CURB LOCATION DIMENSIONS ON PLAN SHALL BE TO THIS POINT.
5. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 10' INTERVALS THROUGHOUT THE LENGTH OF THE CURB, AT QUARTER POINTS OF THE CURB RETURNS, AND AT ANY POINT WHERE THE CURB SECTION IS INTERRUPTED BY A DRAINAGE OUTLET THROUGH THE CURB.
6. EPOXY APPROVED BY CITY MAY BE USED IN LIEU OF BARS.
7. WHEN STRUCTURAL SECTION THICKNESS EXCEEDS 14", THE BASE SHALL BE REPLACED AT A MINIMUM OF 6" THICK UNDER THE CURB AND GUTTER.
8. AT MEDIAN WHERE THERE IS LANDSCAPING, THE MINIMUM CURB DEPTH SHALL BE 18" OR TO THE BOTTOM OF THE BASE, WHICHEVER IS GREATER.
9. WHERE LONGITUDINAL SLOPE IS EQUAL TO OR GREATER THAN 0.4%, CURB AND GUTTER SHALL BE STAKED WITH 3' OFFSETS AT 25' AT INTERVALS. WHERE LONGITUDINAL SLOPE IS LESS THAN 0.4%, CURB AND GUTTER SHALL BE STAKED WITH 3' OFFSETS 12.5' INTERVALS AND ONE NUMBER 4 RE-BAR SHALL BE PLACED IN GUTTER WITH ¾" DOWEL PINS AT ALL EXPANSION JOINTS.

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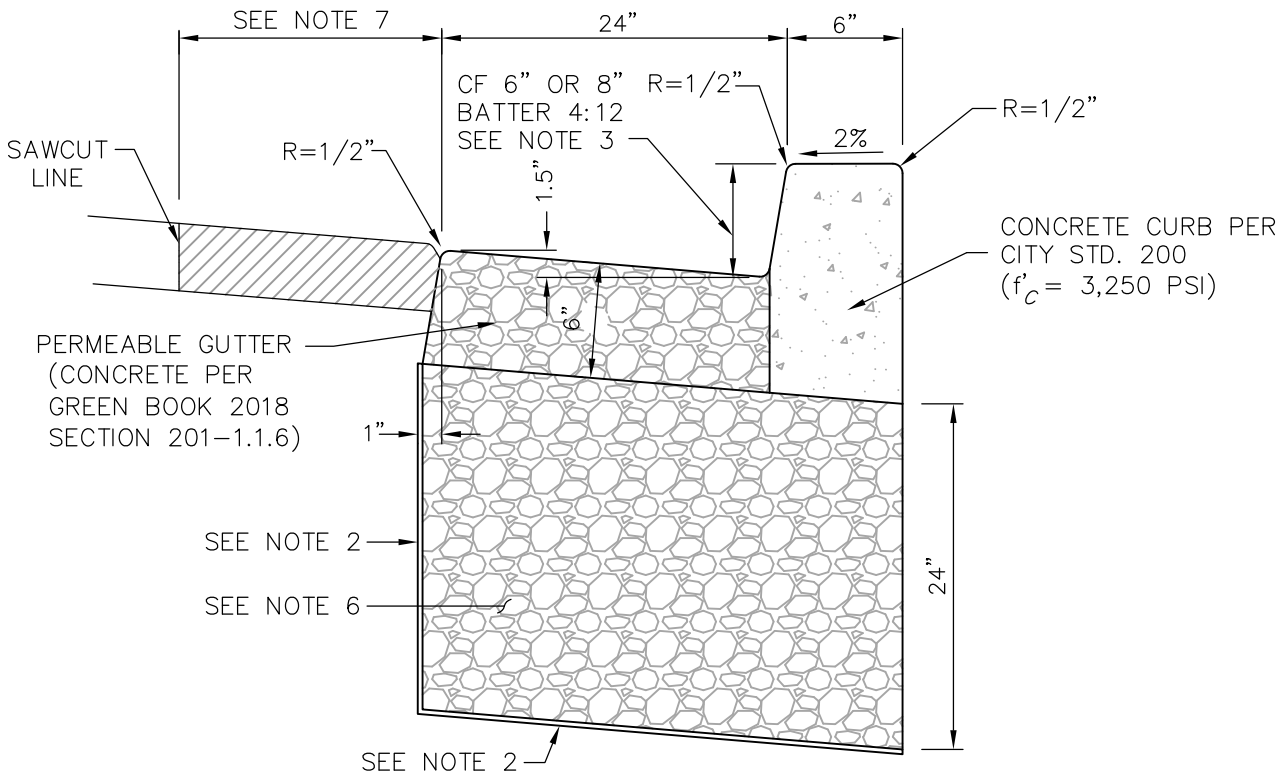
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CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

CURB AND GUTTER

STANDARD DRAWING NO. 200



TYPE I

NOTES:

1. CONCRETE SHALL BE PORTLAND CEMENT TYPE II OR V CONFORMING TO ASTM C 150.
2. A 10-MIL VISQUEEN WATER BARRIER SHALL BE PLACED BELOW AND ADJACENT TO ALL SIDES AND ENDS OF THE PERMEABLE CONCRETE CURB AND GUTTER BUT OPEN TO THE BACK SIDE TO KEEP THE DRAINAGE OUT OF THE ROADWAY SUBGRADE AND DIRECTED INTO THE PARKWAY.
3. CURB FACE SHALL MATCH EXISTING CURB FACE HEIGHT REMOVED.
4. PERMEABLE FLOW RATES SHALL BE OF 3 GAL/SF/MIN. AND 8 GAL/SF/MIN.
5. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 10' INTERVALS THROUGHOUT THE LENGTH OF THE CURB, AT QUARTER POINTS OF CURB RETURNS, AND AT ANY POINT WHERE THE CURB SECTION IS INTERRUPTED BY A DRAINAGE OUTLET THROUGH THE CURB.
6. INSTALL A MIN. 24" THICK 3/4" ROCK AT 90% MINIMUM RELATIVE COMPACTION BELOW PERMEABLE CONCRETE CURB AND GUTTER.
7. A MINIMUM 1' WIDE AC PAVEMENT REPAIR PATCH IS REQUIRED WHEN THE PERMEABLE CONCRETE CURB AND GUTTER IS PLACED ADJACENT TO EXISTING AC PAVEMENT.
8. ALL CURB AND GUTTER SHALL HAVE BMP PROTECTION ONCE FORMS ARE REMOVED WITHIN 24 HRS AFTER INSTALLED.

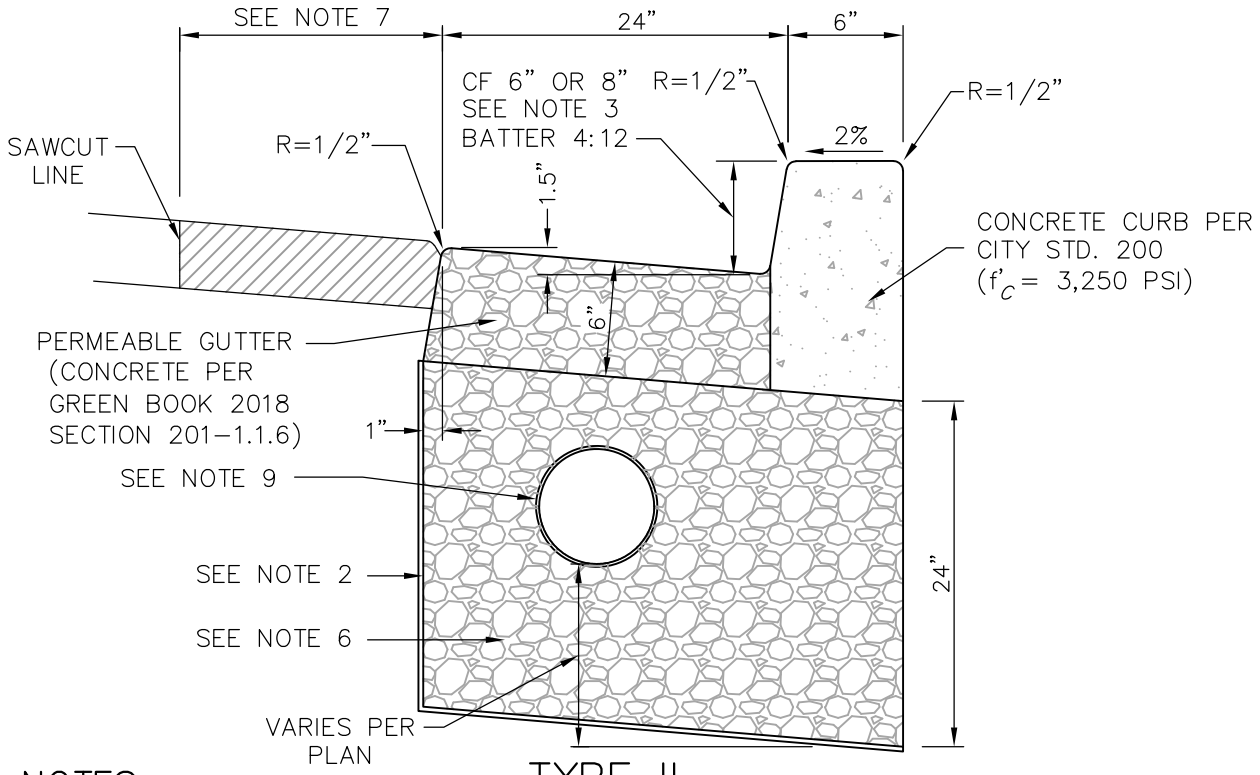
APPROVED BY: _____ 05/02/19
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

PERMEABLE CONCRETE GUTTER

STANDARD DRAWING NO. 201



TYPE II

NOTES:

1. CONCRETE SHALL BE PORTLAND CEMENT TYPE I CONFORMING TO ASTM C 150.
2. A 10 MIL. VISQUEEN WATER BARRIER SHALL BE PLACED BELOW AND ADJACENT TO ALL SIDES AND ENDS OF THE PERMEABLE CONCRETE CURB AND GUTTER BUT OPEN TO THE BACK SIDE TO KEEP THE DRAINAGE OUT OF THE ROADWAY SUBGRADE AND DIRECTED INTO THE PARKWAY.
3. CURB FACE SHALL MATCH EXISTING CURB FACE HEIGHT REMOVED.
4. PERMEABLE FLOW RATES SHALL BE OF 3 GAL/SF/MIN. AND 8 GAL/SF/MIN.
5. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 10' INTERVALS THROUGHOUT THE LENGTH OF THE CURB, AT QUARTER POINTS OF CURB RETURNS, AND AT ANY POINT WHERE THE CURB SECTION IS INTERRUPTED BY A DRAINAGE OUTLET THROUGH THE CURB.
6. INSTALL A MIN. 24" THICK 3/4" ROCK AT 90% MINIMUM RELATIVE COMPACTION BELOW PERMEABLE CONCRETE CURB AND GUTTER.
7. A MINIMUM 1' WIDE AC PAVEMENT REPAIR PATCH IS REQUIRED WHEN THE PERMEABLE CONCRETE CURB AND GUTTER IS PLACED ADJACENT TO EXISTING AC PAVEMENT.
8. ALL CURB AND GUTTER SHALL HAVE BMP PROTECTION ONCE FORMS ARE REMOVED WITHIN 24 HRS AFTER INSTALLED.
9. PVC SDR26 6" PERFORATED PIPE WRAPPED IN FILTER FABRIC. PERFORATED SIDE FACES DOWN AT 0.5% MINIMUM SLOPE TO OUTLET

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

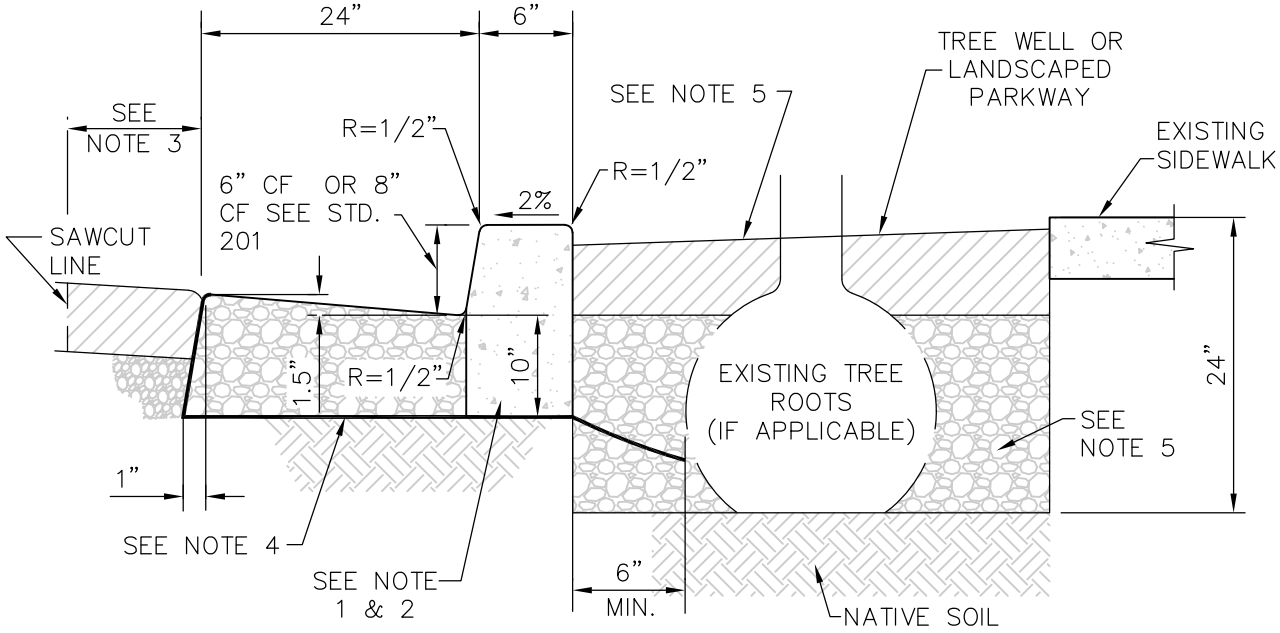
MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

PERMEABLE CONCRETE GUTTER WITH DRAIN PIPE

STANDARD DRAWING NO. 201



NOTES:

1. POROUS PERMEABLE CURB AND GUTTER MAY BE USED ADJACENT TO TREE WELLS AND LANDSCAPED PARKWAYS TO ELIMINATE SIGNIFICANT WATER PONDING FROM LOW SPOTS IN THE EXISTING CURB AND GUTTER WHEN NO OTHER ACCEPTABLE METHOD FOR ELIMINATION OF WATER PONDING HAS PROVEN EFFECTIVE.

2. PERMEABILITY FLOW RATES SHALL BE BETWEEN 3 GAL/SF/MIN. AND 8 GAL/SF/MIN.

3. A MINIMUM 1' WIDE AC PAVEMENT REPAIR PATCH IS REQUIRED WHEN POROUS PERMEABLE CURB AND GUTTER IS PLACED ADJACENT TO EXISTING AC PAVEMENT.

4. A 10 MIL. VISQUEEN WATER BARRIER SHALL BE PLACED BELOW AND ADJACENT TO ALL SIDES AND ENDS OF THE PERMEABLE CURB AND GUTTER BUT OPEN TO THE PARKWAY OR TREE WELL.

5. REMOVE EXISTING NATIVE SOIL AND LANDSCAPING IN THE PARKWAY AREA OR FROM AROUND THE TREE ROOTS (IF APPLICABLE) TO MATCH THE LENGTH OF THE POROUS PERMEABLE CURB AND GUTTER TO A DEPTH OF 24" BELOW THE SIDEWALK OR PARKWAY FINISH GRADE. INSTALL PEA GRAVEL, ¾" CRUSHED ROCK OR WASHED PLASTER SAND IN THE PARKWAY AREA OR AROUND THE EXISTING TREE ROOTS TO WITHIN 6" OF THE SIDEWALK OR PARKWAY FINISHED GRADE. FOR LANDSCAPED PARKWAYS, INSTALL APPROXIMATELY 5"–6" OF NATIVE TOP SOIL ON TOP OF THE PEA GRAVEL/CRUSHED ROCK/SAND AND REPLACE THE PREVIOUSLY REMOVED LANDSCAPING IN–KIND.

APPROVED BY: _____ 05/02/19
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

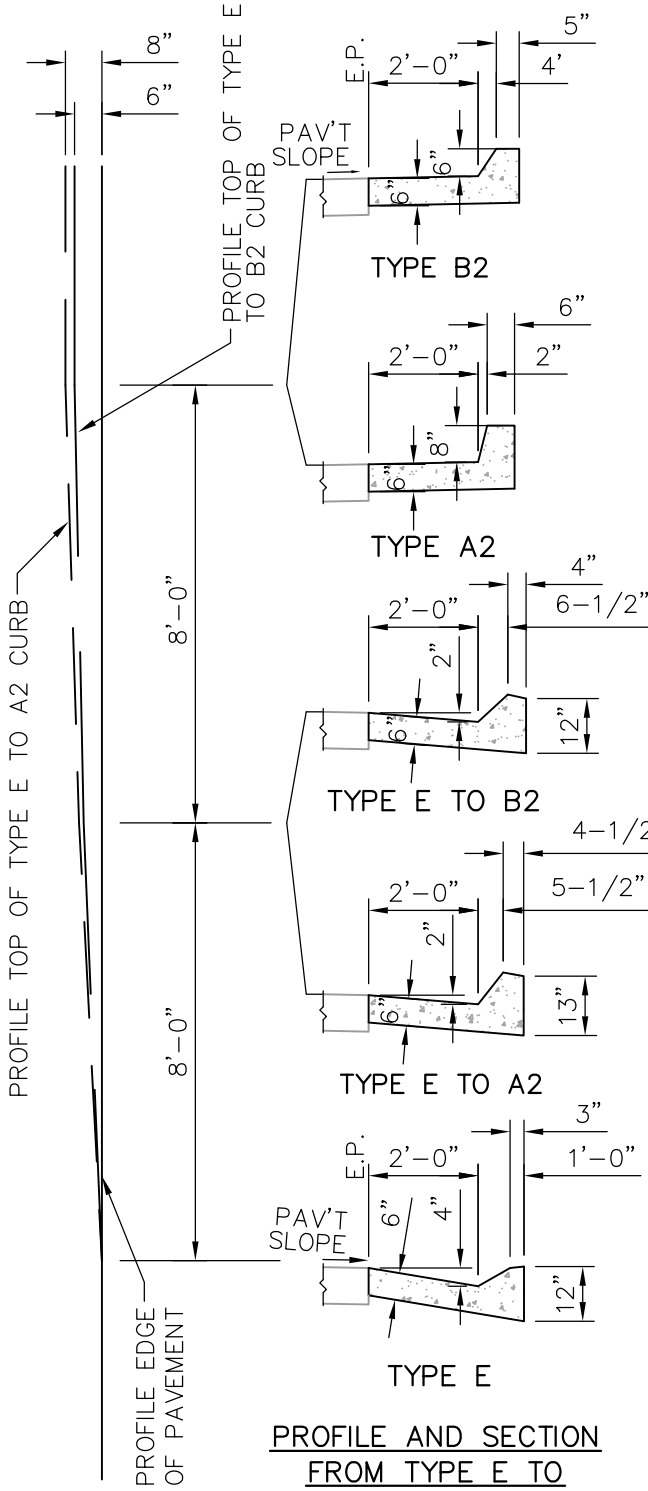
CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

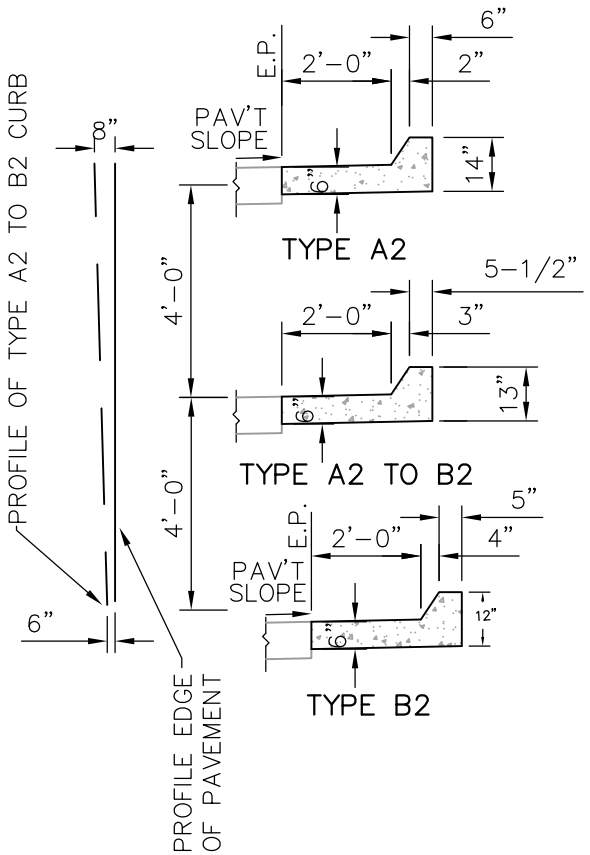
PREMEABLE CONCRETE
CURB & GUTTER ADJACENT TO PARKWAY

STANDARD DRAWING NO. 202

Sheet 1 of 1



PROFILE AND SECTION
FROM TYPE E TO
TYPE A2 OR B2 CURB



PROFILE AND SECTION
FROM TYPE A2
TO TYPE B2 OR CURB

NO SCALE

APPROVED BY:
CITY ENGINEER
05/02/19
DATE

CITY OF RIVERSIDE

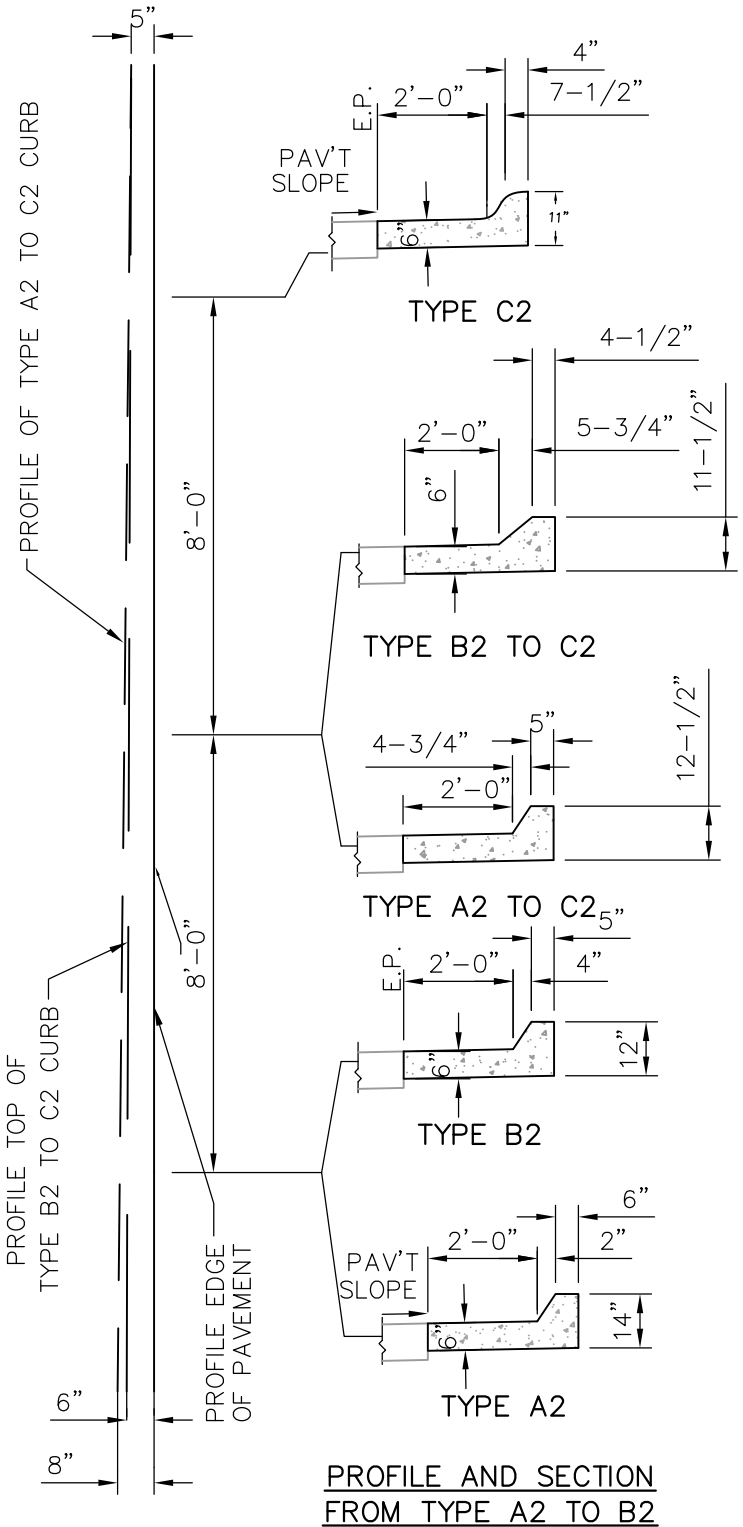
PUBLIC WORKS DEPARTMENT

CURB TRANSITIONS

STANDARD DRAWING NO. 210

Sheet 1 of 2

MARK	REVISIONS	APPR.	DATE



PROFILE AND SECTION FROM TYPE A2 TO B2 TO TYPE C2 CURB

NO SCALE

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05/02/19
DATE

CITY OF RIVERSIDE

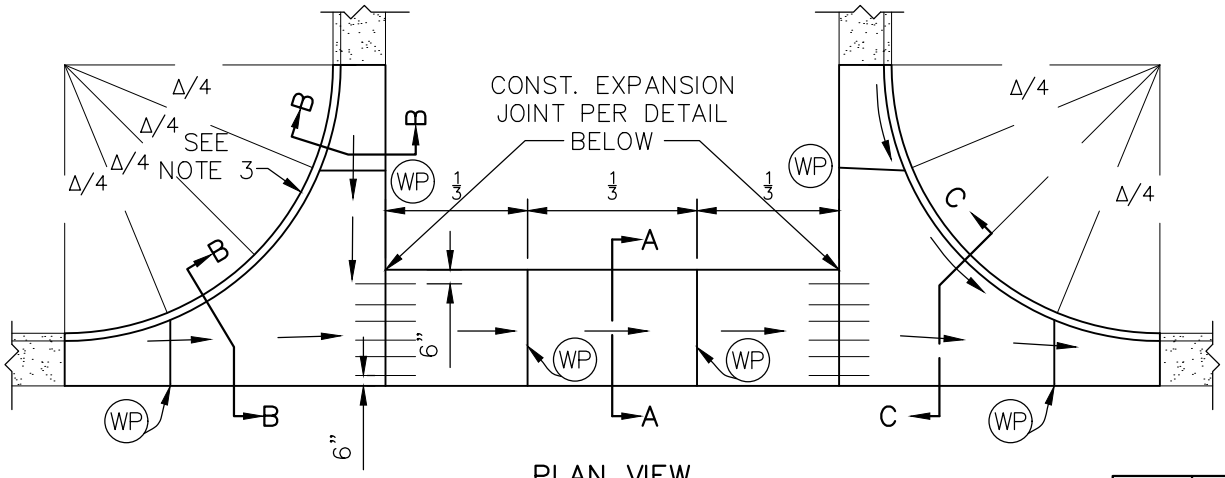
PUBLIC WORKS DEPARTMENT

CURB TRANSITIONS

STANDARD DRAWING NO. 210

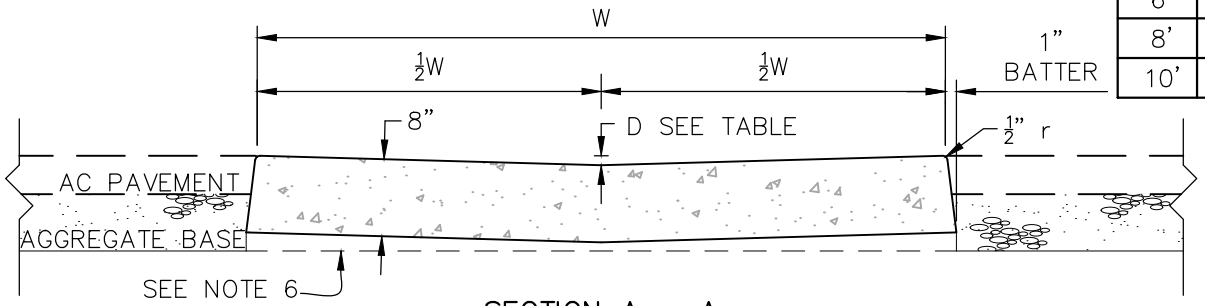
Sheet 2 of 2

MARK	REVISIONS	APPR.	DATE

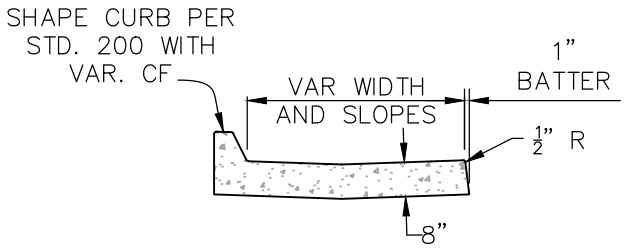


PLAN VIEW

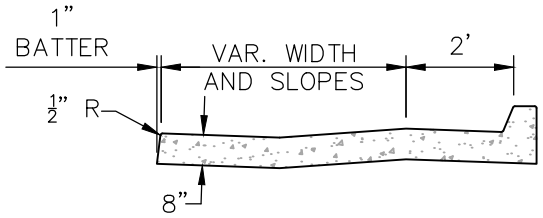
W	D
6'	1"
8'	1¼"
10'	1½"



SECTION A – A



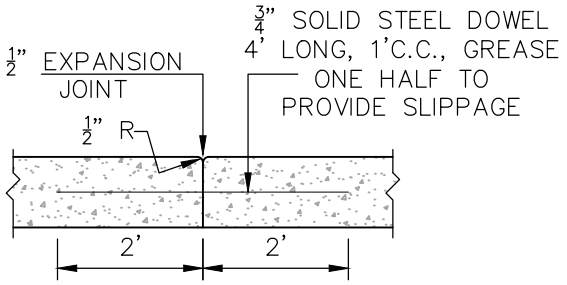
SECTION B – B



SECTION C – C

NOTES:

1. CONCRETE SHALL BE CLASS 560-C-3250.
2. W SHALL BE 6' UNLESS OTHERWISE SPECIFIED.
3. REDUCE C.F. TO INSURE DRAINAGE AWAY FROM FL ON UPSTREAM CURB RETURN.
4. CONSTRUCT WEAKENED PLANE JOINTS AT LOCATIONS INDICATED BY (WP).
5. WHEN STRUCTURAL SECTION EXCEEDS 14", THE BASE SHALL BE CONTINUED UNDER CROSS GUTTER.
6. FOR COMMERCIAL DRIVEWAY APPROACH SEE STD. 302.
7. CURB/GUTTER AND SPANDREL MONOLITHIC



EXPANSION JOINT DETAIL

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

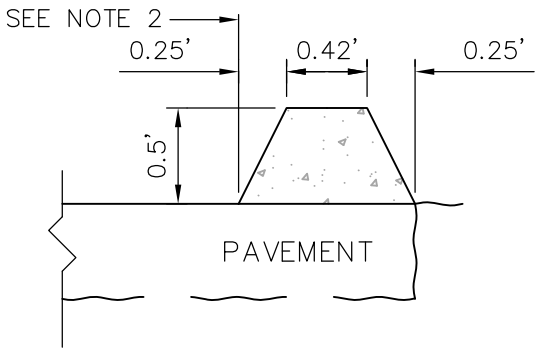
PUBLIC WORKS DEPARTMENT

CROSS GUTTERS

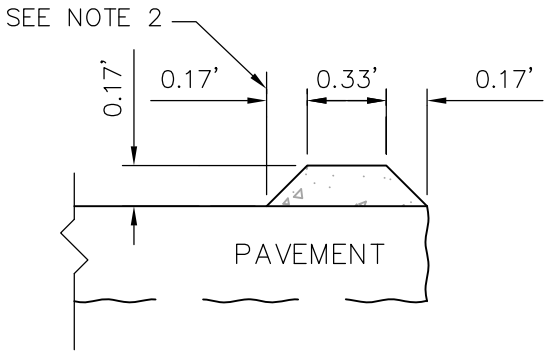
STANDARD DRAWING NO. 220

Sheet 1 of 1

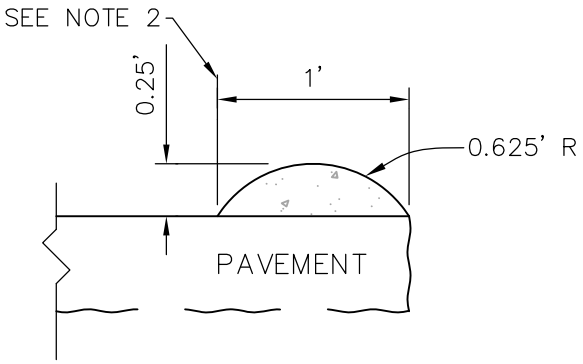
MARK	REVISIONS	APPR.	DATE



TYPE I – TRAPEZOIDAL



TYPE II – TRAPEZOIDAL



TYPE III – ROLLED

NOTES:

1. ASPHALT CONCRETE FOR BERM SHALL BE CLASS D2–DG64–10
2. BERM LOCATION DIMENSIONS ON PLAN SHALL BE TO THIS POINT.
3. THE TYPE OF BERM TO BE USED SHALL BE SPECIFIED ON THE PLAN.

* WITH CITY ENGINEER'S APPROVAL ON SMALL QUANTITIES USE AR–8000

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

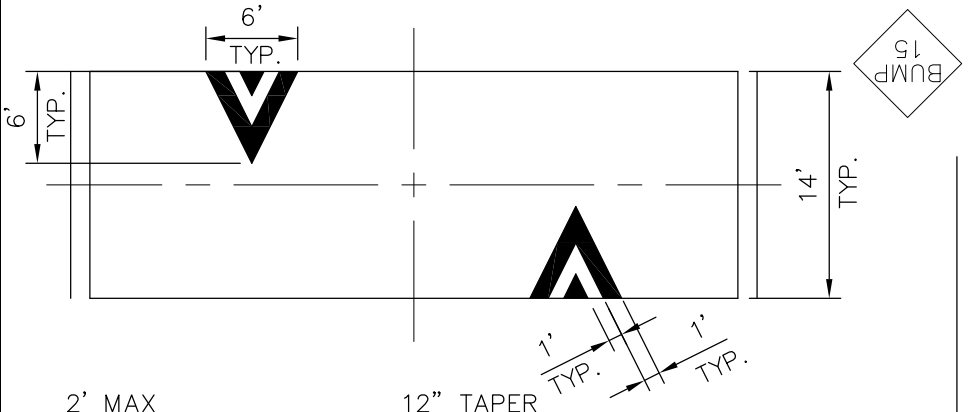
PUBLIC WORKS DEPARTMENT

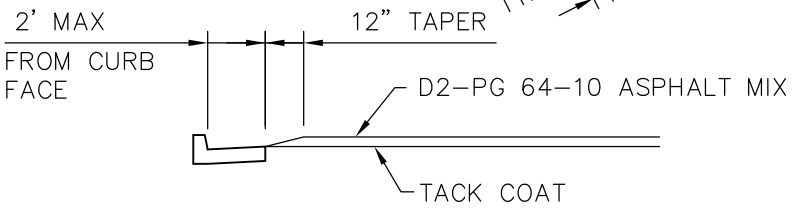
ASPHALT CONCRETE BERMS

STANDARD DRAWING NO. 250

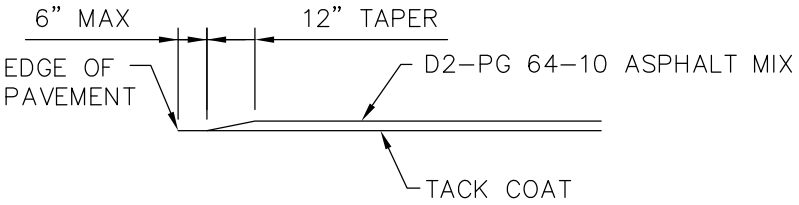
Sheet 1 of 1

MARK	REVISIONS	APPR.	DATE

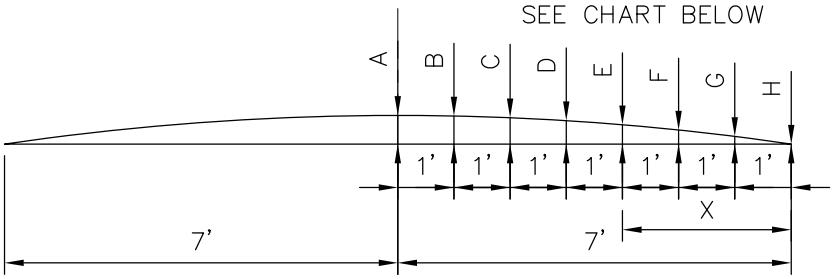




CURB DETAIL

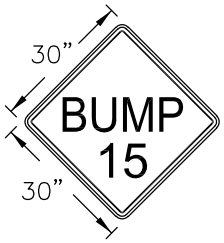


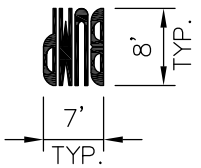
SHOULDER DETAIL



PARABOLIC CROWN

	X	A
A	7'	3.5"–4.0"
B	6'	3.4"–3.5"
C	5'	3.2"–3.4"
D	4'	2.8"–3.2"
E	3'	2.2"–2.8"
F	2'	1.6"–2.2"
G	1'	0.8"–1.6"
H	0'	0"–0.8"





NOTE:

1. THIS STANDARD SHALL ONLY BE USED WITH THE APPROVAL OF THE CITY ENGINEER OR HIS/HER REPRESENTATIVE.
2. "BUMP" SIGN NEEDS TO BE BLACK ON YELLOW.
3. **NO LANE LINE STRIPING THROUGH SPEED BUMP.**

APPROVED BY: _____ CITY ENGINEER

05/02/2019 DATE

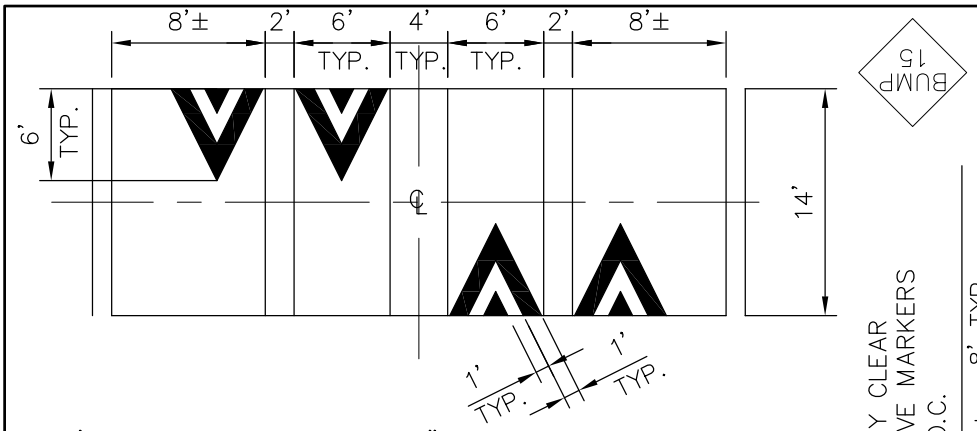
CITY OF RIVERSIDE

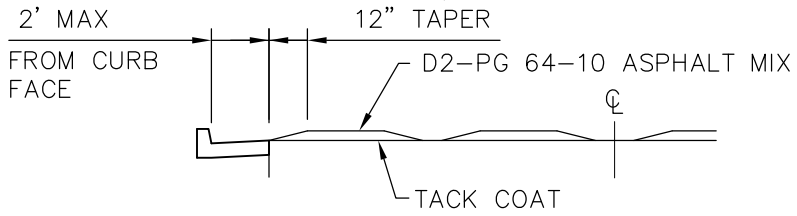
PUBLIC WORKS DEPARTMENT

MARK	REVISIONS	APPR.	DATE

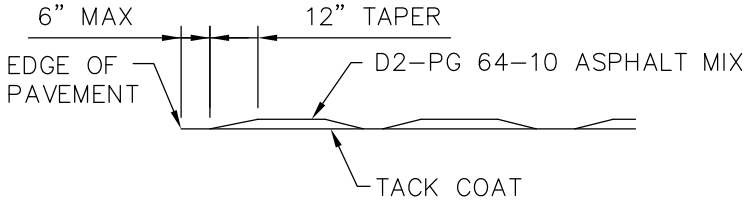
SPEED BUMP (TYPE I)

STANDARD DRAWING NO. 251

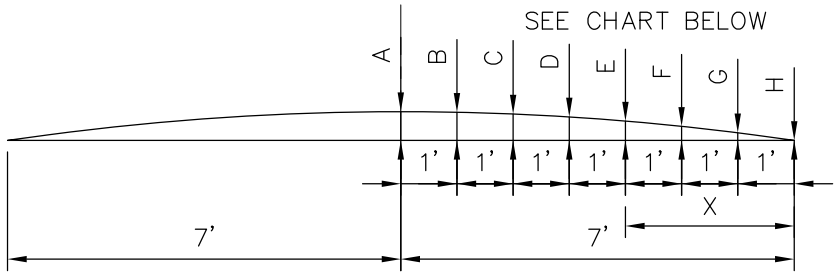




CURB DETAIL

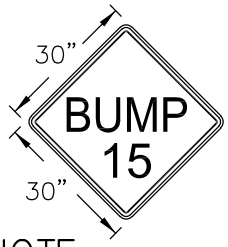


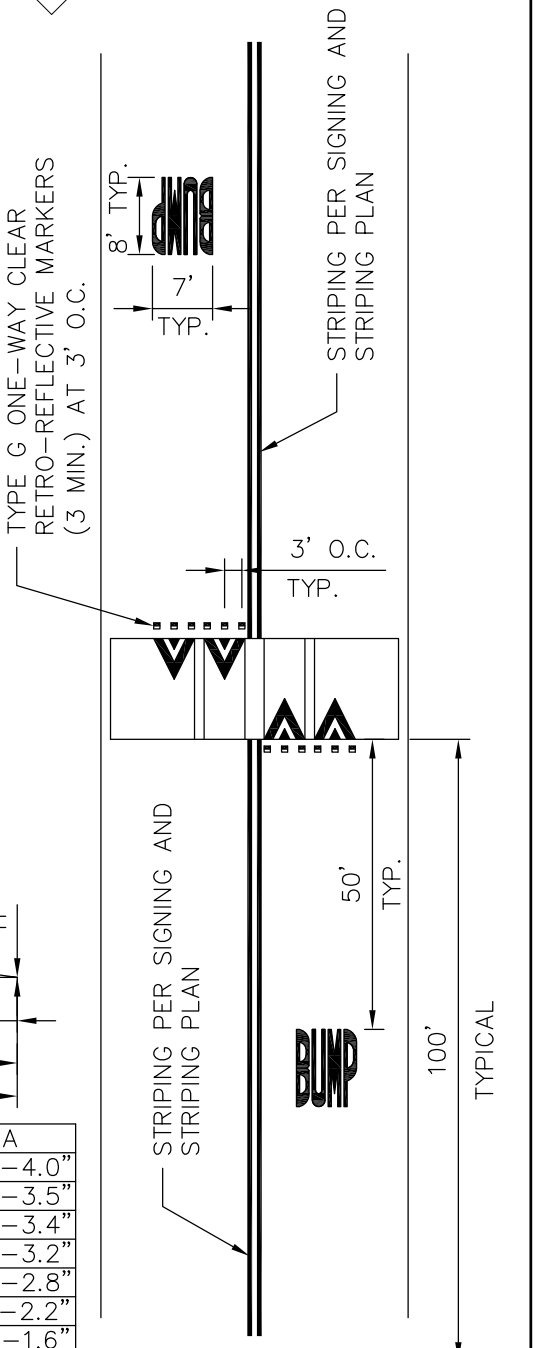
SHOULDER DETAIL



PARABOLIC CROWN

	X	A
A	7'	3.5"–4.0"
B	6'	3.4"–3.5"
C	5'	3.2"–3.4"
D	4'	2.8"–3.2"
E	3'	2.2"–2.8"
F	2'	1.6"–2.2"
G	1'	0.8"–1.6"
H	0'	0"–0.8"





NOTE:

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2. "BUMP" SIGN NEEDS TO BE BLACK ON YELLOW.
3. **NO LANE LINE STRIPING THROUGH SPEED BUMP.**

APPROVED BY:

CITY ENGINEER

05/02/2019
DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

MARK	REVISIONS	APPR.	DATE

SPEED BUMP (TYPE II)

STANDARD DRAWING NO. 251

R–1 ZONING

1. IF SIDEWALK IS SOUND (NO CRACKS, ETC.) AND IS NOT TO BE REPLACED DELETE 75 SQUARE FEE FROM SIDEWALK AREA WHEN ISSUING A PERMIT FOR SIDEWALK AND DRIVEWAY APPROACH.

2. IF LESS THEN 25 SQUARE FEET OF SIDEWALK IS SOUND (NO CRACKS, ETC.) REPLACE EXISTING SIDEWALK WITH 6" SIDEWALK.

OTHER THAN R–1 ZONING

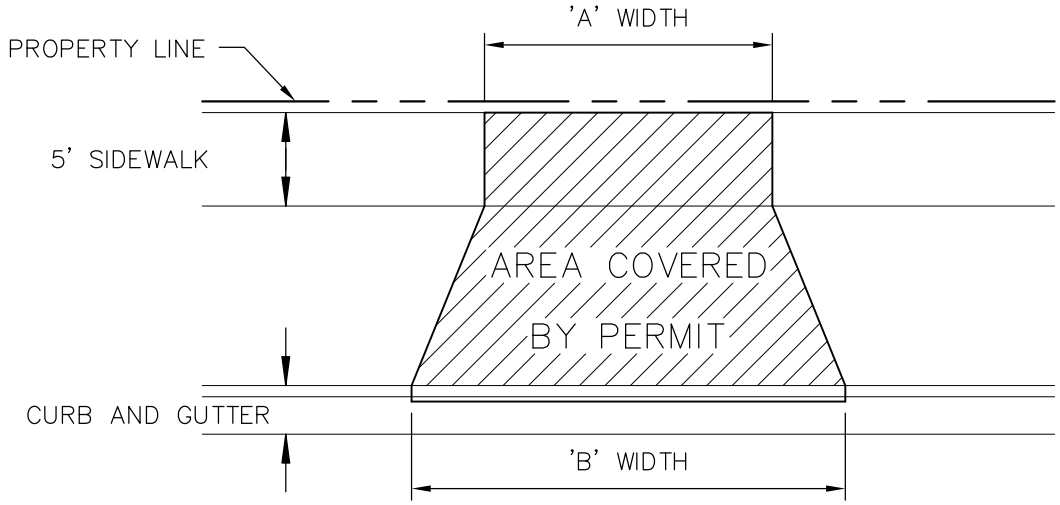
REMOVE EXISTING SIDEWALK AND REPLACE WITH 6" SIDEWALK.

ALL ZONING CONDITIONS

CROSS HATCH AREA – AREA COVERED BY PERMIT IF THERE IS NO EXISTING SIDEWALK.

R–1 ZONE ONLY

SHADED AREA – AREA COVERED BY PERMIT IF EXISTING SIDEWALK IS SOUND.



ZONE		
TYPE		
WIDTH	A	B
NEW S/W	YES	NO

NOTE: NO WATER METER OR UTILITY BOXES SHALL BE IN DRIVE APPROACHES

APPROVED BY: _____ 05/02/19
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

AREA COVERED BY PERMIT FOR DRIVEWAY APPROACH WITH PROPERTY LINE SIDEWALK

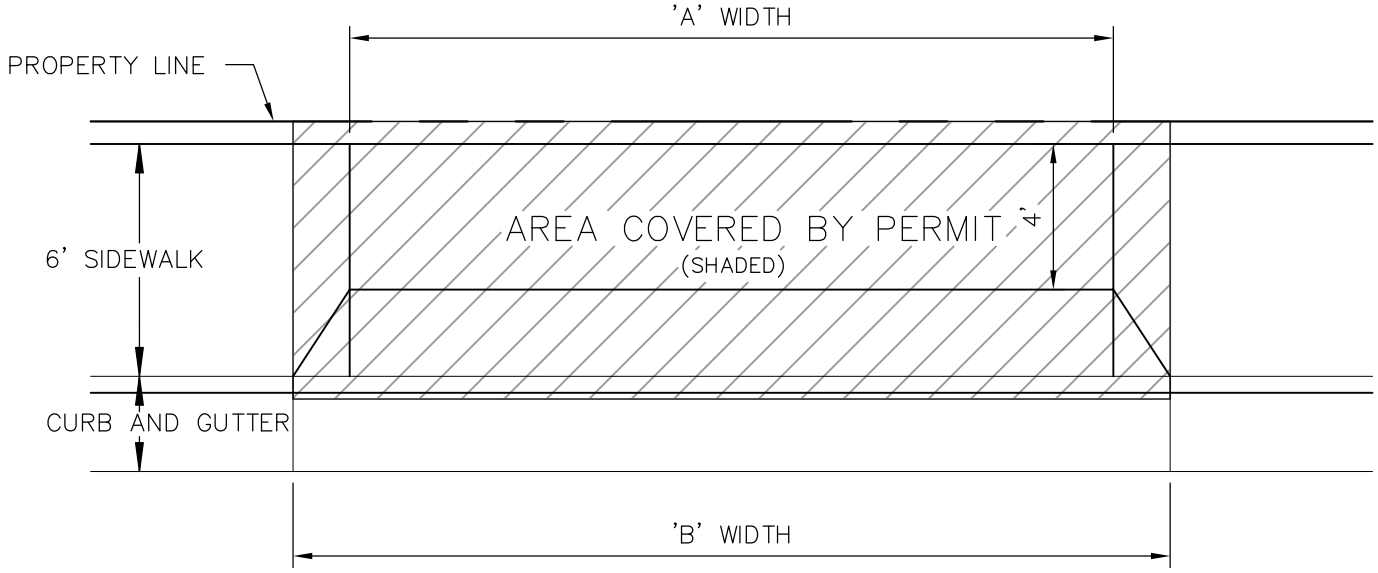
STANDARD DRAWING NO. 301

R–1 ZONING

DELETE 132 SQ. FT. FROM SIDEWALK AREA WHEN ISSUING A PERMIT FOR BOTH SIDEWALK AND DRIVEWAY APPROACH.

OTHER THAN R–1 ZONING

DELETE SQUARE FOOTAGE FOR 'B' WIDTH FROM SIDEWALK AREA WHEN ISSUING A PERMIT FOR BOTH SIDEWALK AND DRIVEWAY APPROACH



ZONE		
TYPE		
WIDTH	A	B
NEW S/W	YES	NO

NOTE: NO WATER METER OR UTILITY BOXES SHALL BE IN DRIVE APPROACHES

APPROVED BY: _____ 05/02/19
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

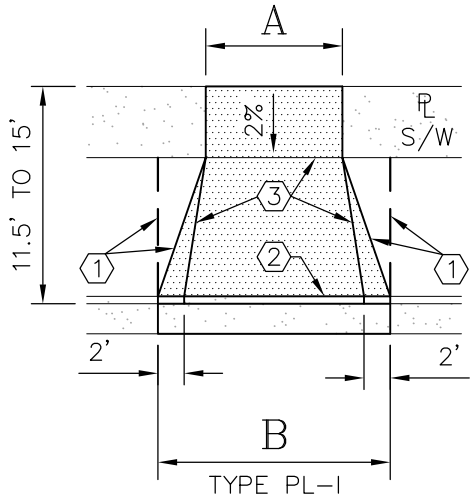
CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

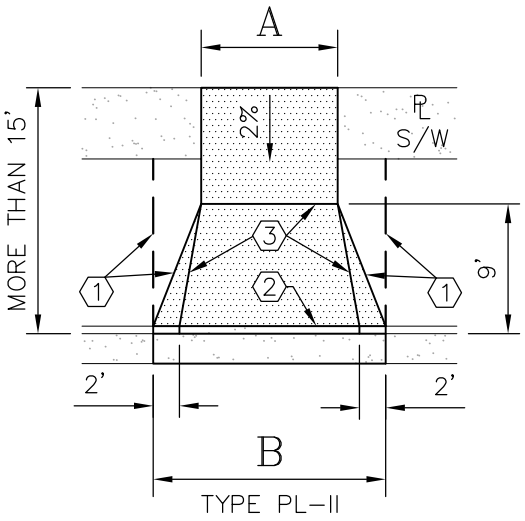
AREA COVERED BY PERMIT FOR DRIVEWAY APPROACH WITH CURB SIDEWALK

STANDARD DRAWING NO. 301

DRIVEWAY APPROACH WITH PROPERTY–LINE SIDEWALK

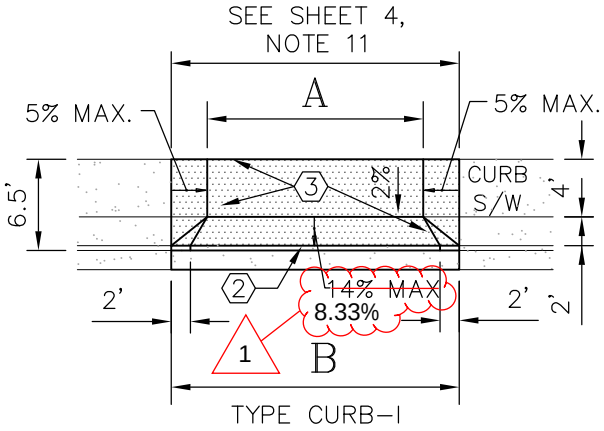


TYPE PL–I

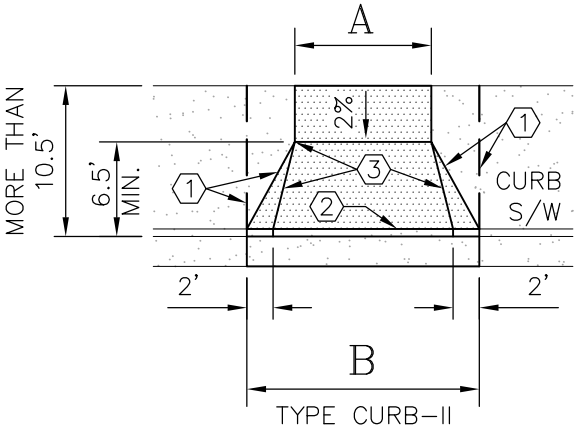


TYPE PL–II

DRIVEWAY APPROACH WITH CURB SIDEWALK



TYPE CURB–I



TYPE CURB–II

CONCRETE IN THE SHADED AREA SHALL BE AT LEAST 6" THICK.

(1) DASHED LINE SHOWS OPTIONAL DRIVEWAY/SIDEWALK CONFIGURATION. WHEN THE OPTIONAL CONFIGURATION IS CHOSEN, THE ADDITIONAL CONCRETE SHALL BE AT LEAST 6" THICK.

(2) SCORE LINE OR COLD JOINT.

(3) GRADE BREAK LINES SHALL BE PRECISE AND STRAIGHT. SCREEDS AND/OR FALSE FORMS MUST BE USED TO ACHIEVE PRECISE CONSTRUCTION.

NOTE:
NO WATER METER OR UTILITY BOXES SHALL BE IN DRIVE APPROACHES

APPROVED BY:

CITY ENGINEER

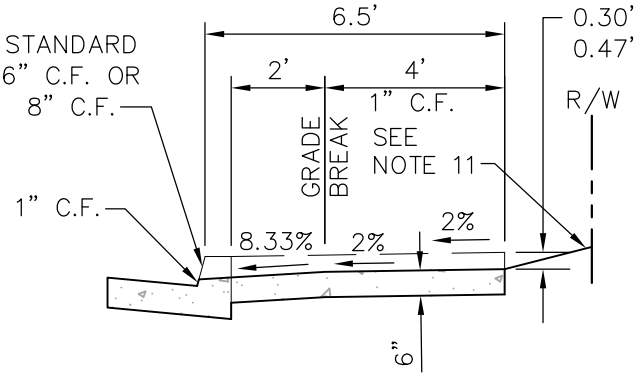
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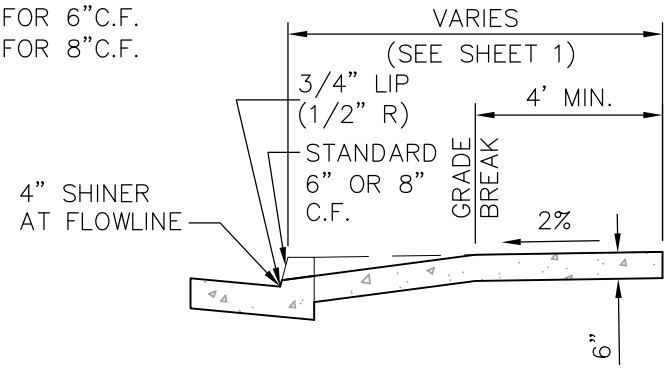
DRIVEWAY APPROACH

MARK	REVISIONS	APPR.	DATE
1	MODIFIED APPROACH SLOPE	NM	11/24/25

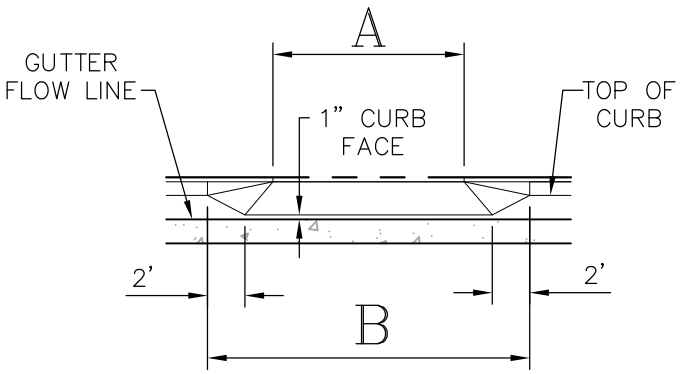
STANDARD DRAWING NO. 302



TYPE CURB–I



TYPES CURB–II, PL–I & PL–II



ELEVATION

DRIVEWAY APPROACH DIMENSIONS				
LAND USE AND DRIVEWAY TYPE		A	B	B*
RESIDENTIAL (SINGLE OR DUPLEX)	SINGLE GARAGE	10' (MIN.)	(A+7')	A+14'
	DOUBLE GARAGE	20' (MAX.)		
	TRIPLE GARAGE	28'		
COMMERCIAL OR APARTMENT		30'	A+14'	A+18'
COMMERCIAL (JOINT)		36'		

* USE THIS "B" DIMENSION WHEN THE DRIVEWAY APPROACH IS ON A MAJOR STREET OR WHEN A DRIVING LANE IS ADJACENT TO THE CURB.

NOTE: NO WATER METER OR UTILITY BOXES SHALL BE IN DRIVE APPROACHES

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

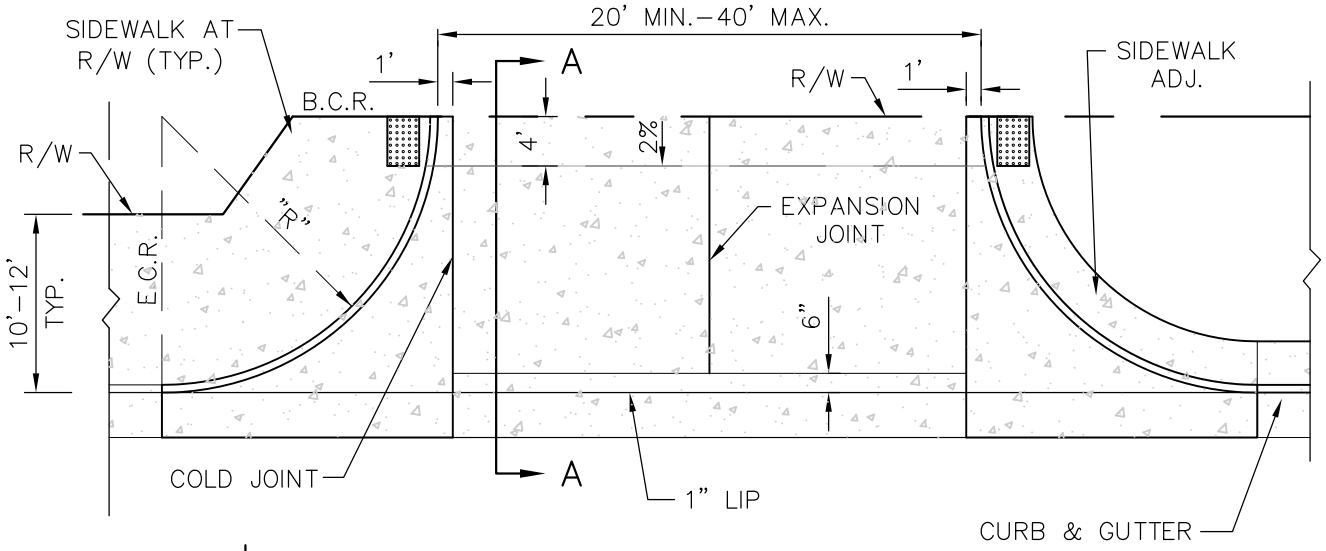
PUBLIC WORKS DEPARTMENT

DRIVEWAY APPROACH

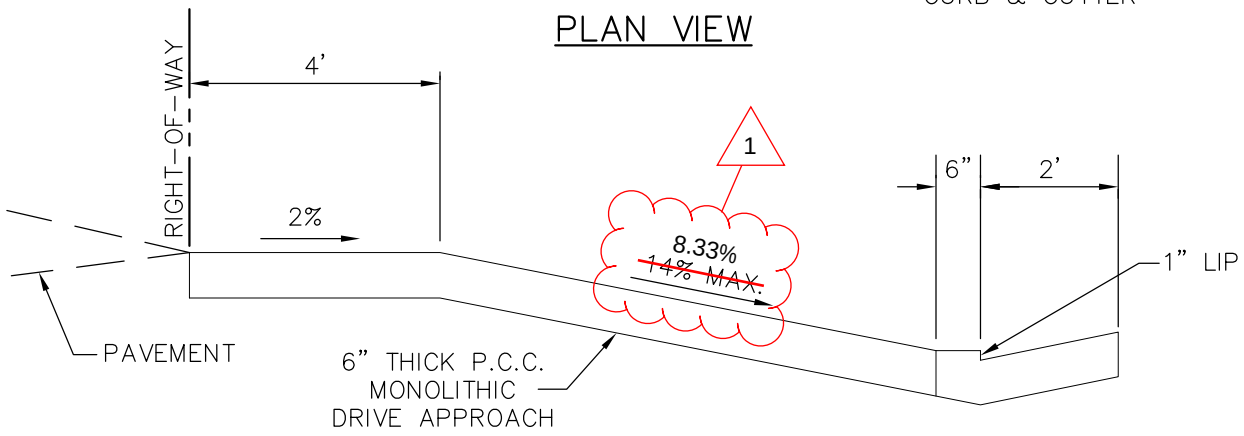
STANDARD DRAWING NO. 302

Sheet 2 of 4

MARK	REVISIONS	APPR.	DATE



PLAN VIEW



SECTION A–A

NOTES:

1. CURB RETURN RADII VARIES ACCORDING TO PARKWAY WIDTHS OR AS RECOMMENDED BY THE CITY TRAFFIC ENGINEER.
2. SPECIAL DRIVE APPROACH SHALL BE USED FOR ALLEY ENTRANCE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
3. CONCRETE SHALL BE CLASS 560–C–3250 PER SECTION 201 OF THE STANDARD. SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, CURED WITH TYPE 1–D CURING COMPOUND.
4. "R" DIMENSIONS SHALL BE ADEQUATE TO ACCOMMODATE TRUCK TURNING AS APPROVED BY THE CITY ENGINEER.
5. RIGHT OF WAY OR EASEMENT SHALL BE DEDICATED AS NECESSARY TO PROVIDE ADA ACCESS ACROSS DRIVEWAY.
6. MINIMUM LONGITUDINAL SLOPE SHALL BE 0.5%

NOTE: WATER METER OR UTILITY BOXES SHALL NOT BE INSTALLED IN DRIVE APPROACHES

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CITY ENGINEER DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

DRIVEWAY APPROACH

MARK	REVISIONS	APPR.	DATE
1	MODIFIED APPROACH SLOPE	NM	11/24/25

STANDARD DRAWING NO. 302

NOTES:

1. A CONSTRUCTION PERMIT IS REQUIRED PRIOR TO CONSTRUCTION OF A DRIVEWAY APPROACH. AS A PREREQUISITE TO THE CONSTRUCTION PERMIT, THE PERMITTEE SHALL SUBMIT FOR REVIEW AND APPROVAL OF THE CITY ENGINEER A DETAILED PLOT PLAN SHOWING THE LOCATION OF THE PROPERTY LINES, THE EXISTING AND PROPOSED GARAGES, DRIVEWAY, CURB AND GUTTER, SIDEWALK, TREES, FIRES HYDRANTS, UTILITY VAULTS AND POLES AND OTHER IMPROVEMENTS WHICH MAY BE AFFECTED BY THE PROPOSED CONSTRUCTION. THE PLOT PLAN SHALL SPECIFY THE TYPE AND LOCATION OF THE PROPOSED DRIVEWAY APPROACH WITH ITS DIMENSIONS "A" AND "B".
2. A DRIVEWAY APPROACH REQUIRING RELOCATION OR REMOVAL OF TREES, POLES, UTILITIES OR OTHER APPURTENANCES SHALL BE APPROVED BY THE AFFECTED UTILITY COMPANY AND/OR CITY DEPARTMENTS PRIOR TO ISSUANCE OF THE CONSTRUCTION PERMIT. ALL SUCH WORK SHALL BE DONE AT THE EXPENSE OF THE PERMITTEE.
3. NO PORTION OF A DRIVEWAY APPROACH SHALL BE LOCATED WITHIN A CURB RETURN.
4. ANY UNUSED DRIVEWAY OPENING SERVING THE PROPERTY ON WHICH A NEW DRIVEWAY IS BEING BUILT SHALL BE CLOSED WITH FULL HEIGHT CURB; SEE STD. DWG. 303 FOR REMOVAL OF CURB ONLY.
5. THE EDGE OF THE DRIVEWAY APPROACH AT THE CURB SHALL BE AT LEAST 5' FROM THE EXTENSION OF THE NEAREST PROPERTY LINE AT THE CURB.
6. WHEN A JOINT DRIVEWAY APPROACH IS PERMITTED, A RECORED EASEMENT ALLOWING FOR MUTUAL ACCESS ON THE ADJOINING PROPERTIES IS REQUIRED.
7. CONCRETE SHALL BE CLASS 560-C-3250.
8. CURB AND GUTTER SHOULD NOT BE POURED MONOLITHIC WITH DRIVEWAY.
9. A CONSTRUCTION JOINT OR A WEAKENED PLANE JOINT SHALL BE INSTALLED BETWEEN THE DRIVEWAY APPROACH AND THE ADJACENT SIDEWAK AND DRIVEWAY.
10. A WEAKENED PLANE JOINT SHALL BE CONSTRUCTED THROUGH THE CENTER OF THE DRIVEWAY APPROACH WHEN "A" EXCEEDS 15'.
11. WHEN A DRIVEWAY APPROACH IS TO JOIN AN ALLEY, THE DRIVEWAY APPROACH AND THE ALLEY SHALL BE CONSTRUCTED TO ALLOW FOR PROPER DRAINAGE.
12. FOR TYPE CURB-1, A POSITIVE SLOPE BEYOND THE DRIVEWAY APPROACH AS WELL AS TRANSITION CURBS BEHIND THE SIDEWALK AND ADJACENT TO THE DRIVEWAY MAY BE REQUIRED TO CONTAIN 100-YEAR STROM RUNOFF WITHIN THE RIGHT-OR-WAY.
13. WHEN DRIVEWAY APPROACH IS TO BE USED AS A MIDBLOCK WHEELCHAIR RAMP USE STD. DWG. 304 TYPE VII.
14. FOR ANY VARIATION FROM THIS STANDARD, APPROVAL MUST BE OBTAINED FROM THE CITY ENGINEER. 1
15. AT THE DISCRETION OF THE ENGINEER, THE DRIVEWAY APPROACH SLOPE MAY BE INCREASED FROM 8.33% TO A MAXIMUM SLOPE OF 14%.

NOTE: NO WATER METER OR UTILITY BOXES SHALL BE IN DRIVE APPROACHES

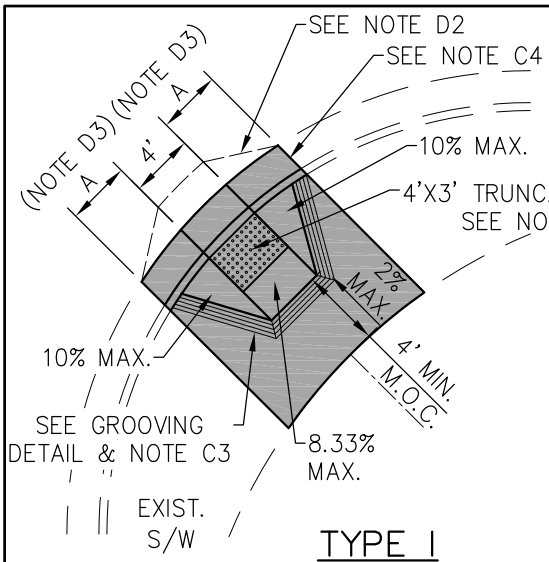
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CITY ENGINEER DATE

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PUBLIC WORKS DEPARTMENT

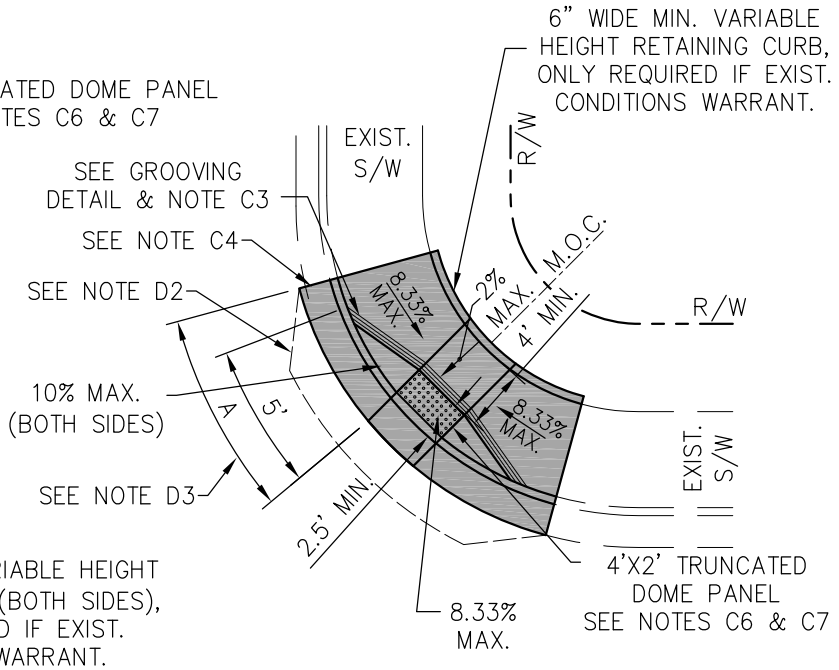
DRIVEWAY APPROACH

MARK	REVISIONS	APPR.	DATE
1	ADDED NOTE FOR MAX SLOPE	NM	11/24/25

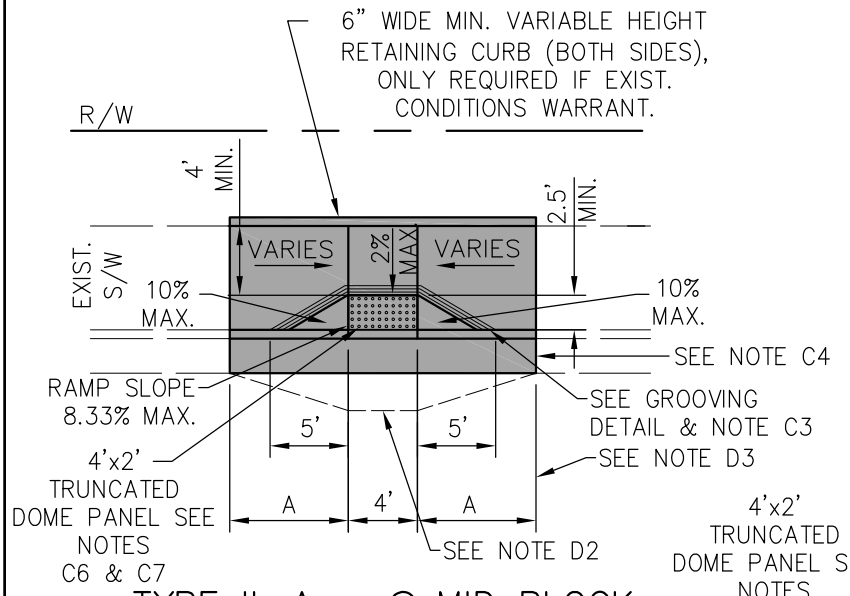
STANDARD DRAWING NO. 302



TYPE I



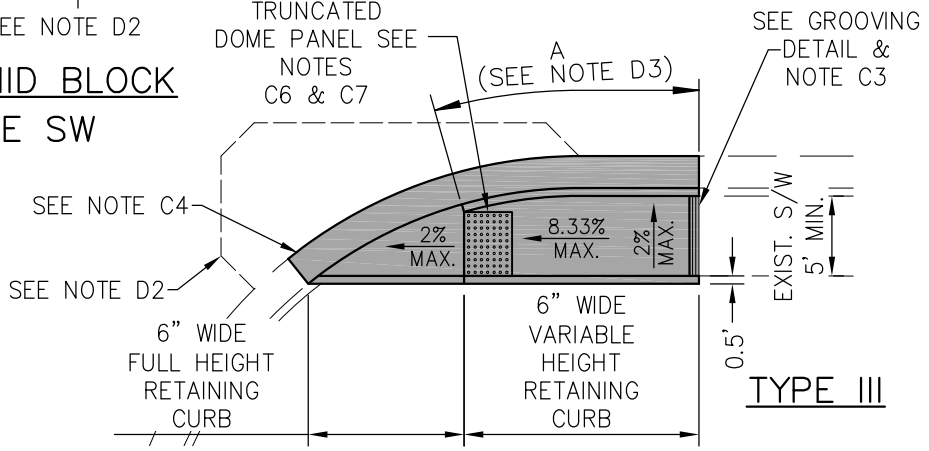
TYPE II



TYPE 1–A – @ MID BLOCK
W/ PROPERTY LINE SW

CONSTRUCTION TYPE 1 RAMP MODIFIED TO ELIMINATE THE 10% WINGS AND REPLACED WITH 6" WIDE VARIABLE HEIGHT CURB ALONG BOTH SIDES OF RAMP.

TYPE II–A – @ MID BLOCK
W/ CURB SIDE SW



TYPE III

NOTE:
THE "A" DIMENSION SHALL BE ADJUSTED TO MEET THE SLOPE REQUIREMENTS AS SHOWN ON THIS PLAN

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CITY ENGINEER

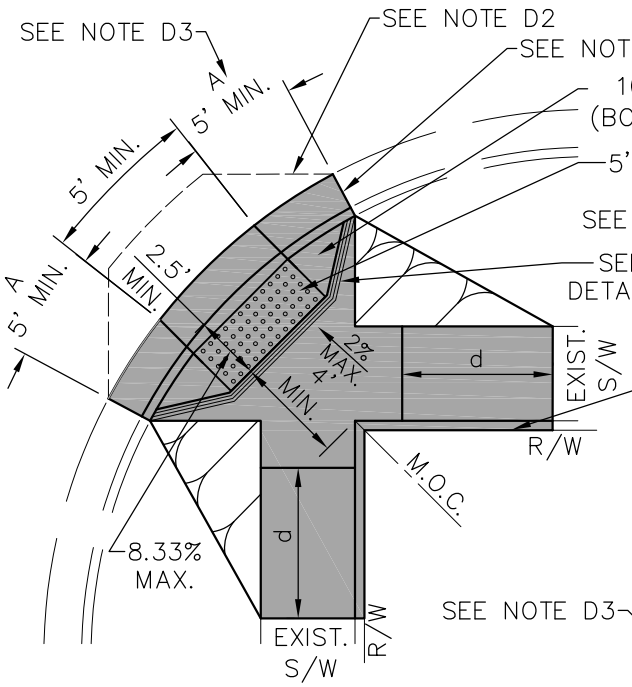
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DATE

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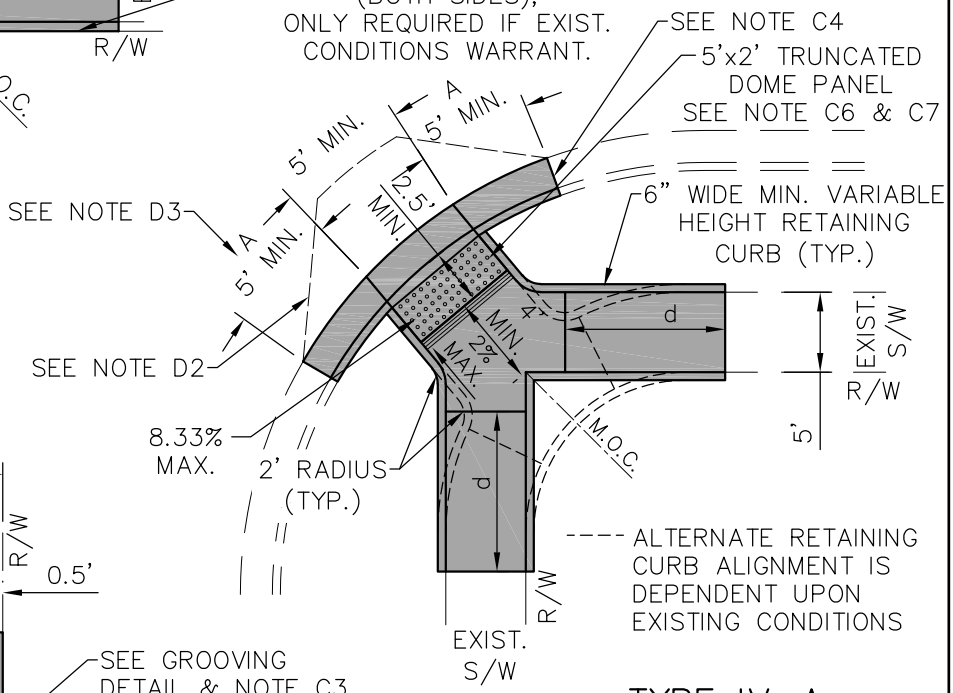
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WHEELCHAIR RAMP (ADA RAMP)

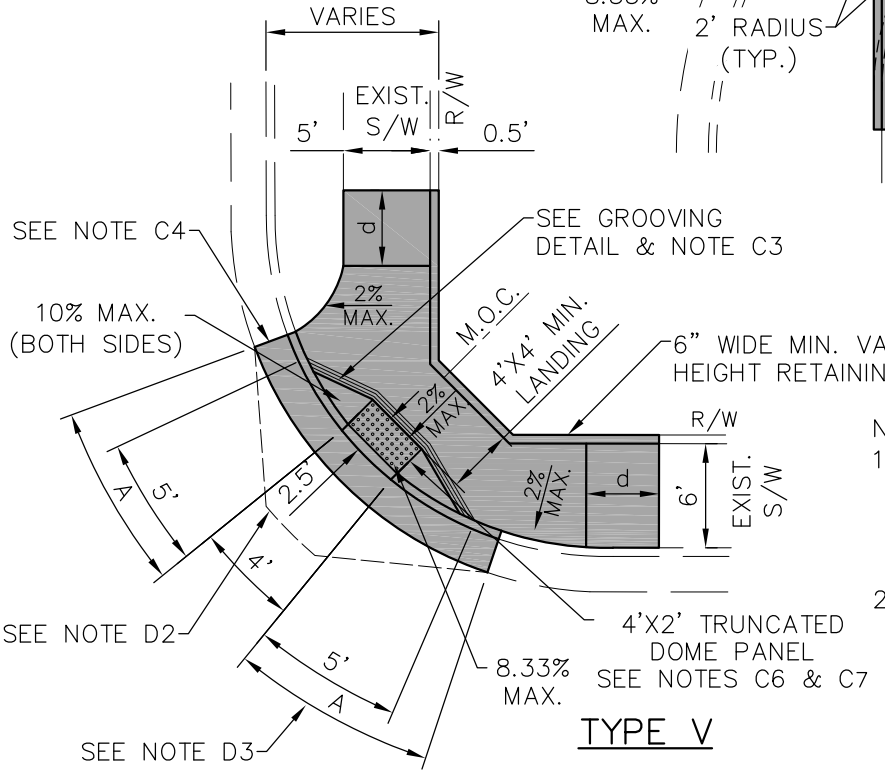
STANDARD DRAWING NO. 304



TYPE IV



TYPE IV-A



TYPE V

NOTE:
1. $5' \leq d \leq 12'$ AT 5% MAX. WITHOUT GROOVES OR IF LARGER THAN 5%, GROOVES ARE REQUIRED AND SHALL NOT EXCEED 8.33% IN ANY CASE.
2. PROVIDE SMOOTH TRANSITION FOR ASPHALT PAVEMENT AT THE DIRECTION OF THE CITY ENGINEER.

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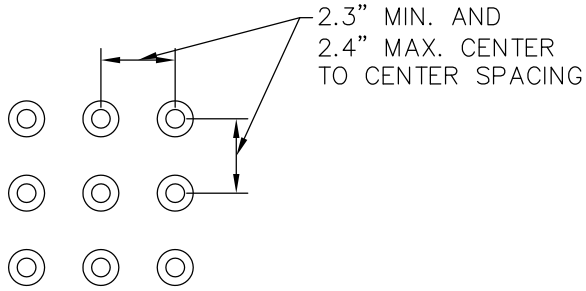
CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

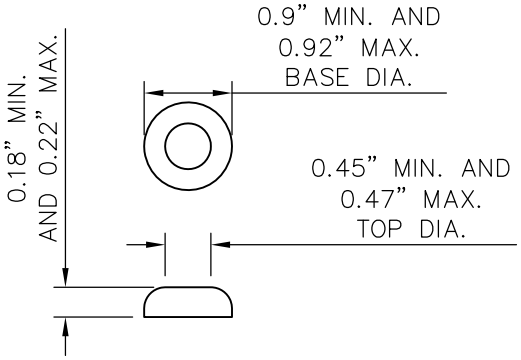
MARK	REVISIONS	APPR.	DATE

WHEELCHAIR RAMP (ADA RAMP)

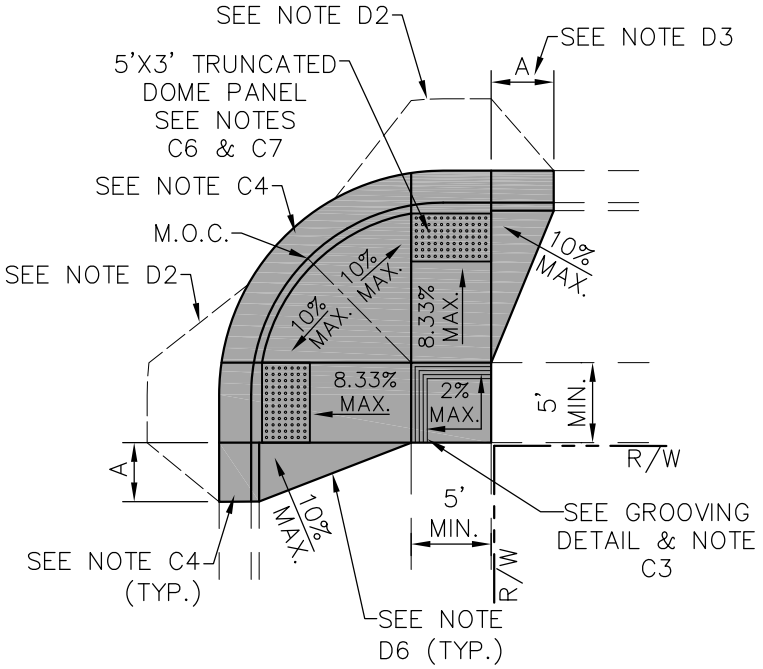
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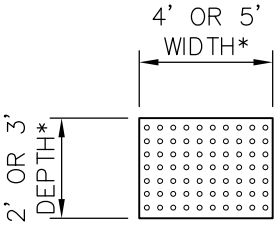
RAISED TRUNCATED DOME PATTERN



RAISED TRUNCATED DOME

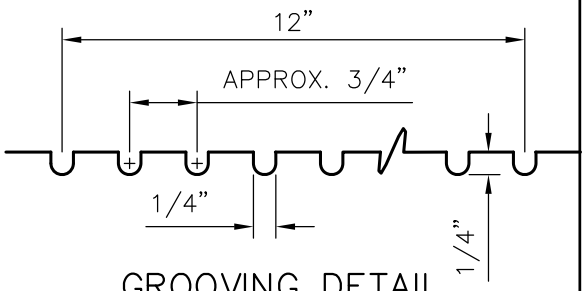


TYPE VI

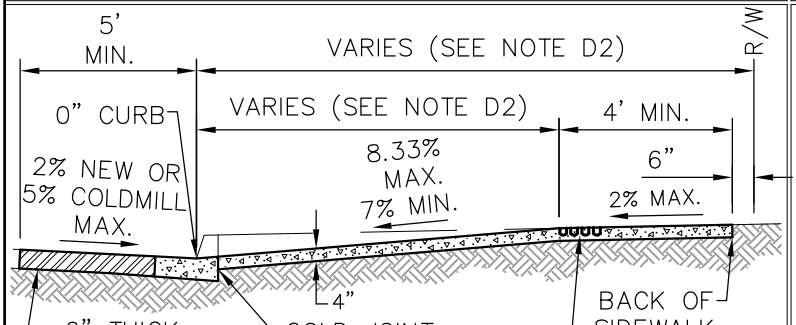


PANEL DIMENSIONS

NOTE: ONE SOLID PANEL SHALL BE INSTALLED (TILES WILL NOT BE ALLOWED)

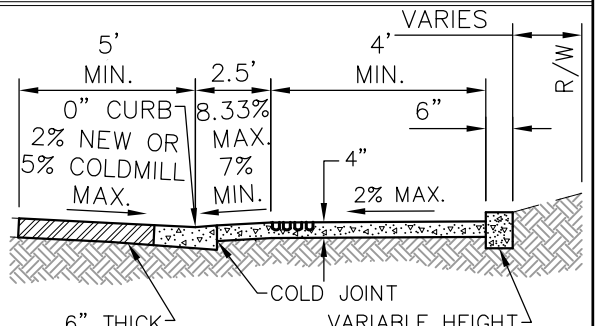


GROOVING DETAIL



CROSS SECTION

TYPE I, III & VI



CROSS SECTION

TYPE II, II-A, IV, IV-A & V

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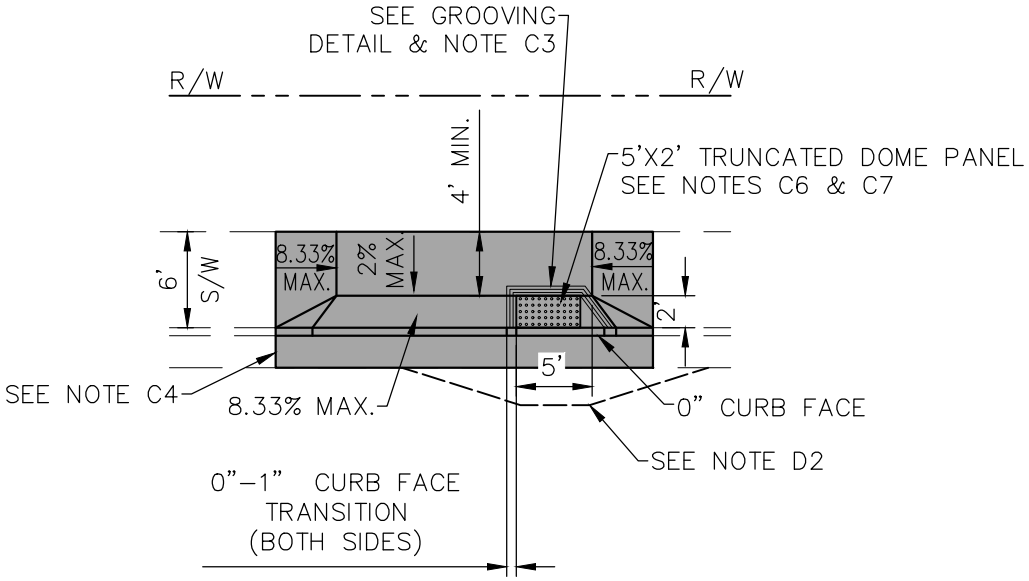
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WHEELCHAIR RAMP (ADA RAMP)

STANDARD DRAWING NO. 304

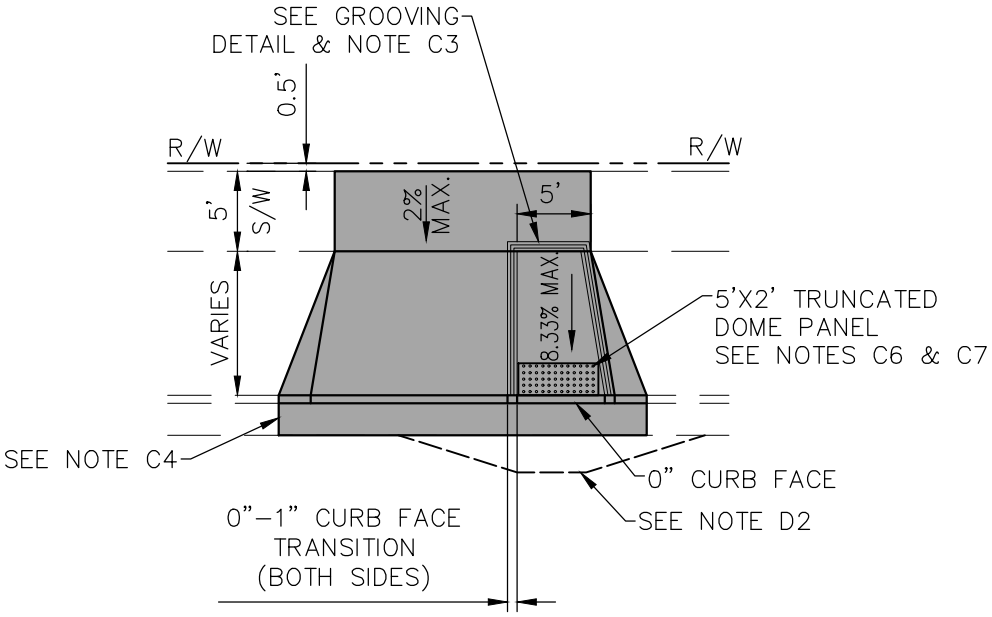
Sheet 3 of 5

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TYPE VII @ MID–BLOCK DWY

W/ CURB SIDE SIDEWALK
(REFER TO STD. 302 FOR DWY)
(SEE STD. DWG. 304 FOR NOTES REFERENCE HEREON)



TYPE VII @ MID–BLOCK DWY

W/ PROPERTY LINE SIDEWALK
(REFER TO STD. 302 FOR DWY)
(SEE STD. DWG. 304 FOR NOTES REFERENCE HEREON)

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

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CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

PEDESTRIAN RAMP TYPE VII

STANDARD DRAWING NO. 304

CONSTRUCTION NOTES:

C1. CONCRETE SHALL BE PER CURRENT EDITION OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION." (560-C-3250)

C2. THE RAMP SHALL BE POURED MONOLITHICALLY WITH THE ADJACENT SIDEWALK AND ALSO POURED SEPARATE FROM THE CURB/GUTTER AND SPANDREL.

C3. THE RAMP SHALL HAVE A 12" WIDE BORDER WITH 1/4" GROOVES APPROXIMATELY 3/4" O.C. SEE GROOVING DETAIL, SHEET 3. THE SURFACE OF THE RAMP SHALL HAVE A TRANSVERSE BROOMED SURFACE TEXTURE ROUGHER THAN THE SURROUNDING SIDEWALK.

C4. GUTTER CROSS SLOPE SHALL BE TRANSITIONED FROM THE STANDARD OR EXISTING AT THE FULL HEIGHT CURB THROUGH THE 'A' DISTANCE TO 5% AT THE BOTTOM OF THE RAMP WHERE THE 0" CURB FACE.

C5. CROSSWALKS SHALL BE ALIGNED PER THE LATEST EDITION OF THE CALIFORNIA MUTCD. THE CHAMFER SHALL BE 4' FROM THE GUTTER FLOWLINE TO THE NEAREST EDGE OF THE 12" STRIPE.

C6. ALL RAMPS SHALL HAVE A YELLOW TRUNCATED DOME PANEL, THAT EXTENDS THE FULL WIDTH OF THE RAMP AND PER THE DEPTH INDICATED FOR EACH RAMP TYPE. SEE DETAIL, SHEET 3 OF 4. FOR NEW CONSTRUCTION, TRUNCATED DOMES SHALL BE SET IN WET CONCRETE (CAST-IN-PLACE TYPE). GLUE DOWN DOMES NOT ALLOWED.

C7. THE EDGE OF THE TRUNCATED DOME PANEL NEAREST THE STREET SHALL BE 6"-8" FROM THE GUTTER FLOWLINE.

C8. A MINIMUM OF 1 EXISTING SIDEWALK PANELS ADJACENT TO NEW RAMPS SHALL BE REPLACED IF THE CROSSFALL EXCEEDS 2%.

DESIGN NOTES:

D1. TYPE I RAMP SHALL BE USED FOR ALL NEW CONSTRUCTION OR WHEREVER EXISTING CONDITIONS PERMIT. RAMP TYPES II THROUGH V ARE TO BE USED WHEREVER EXISTING CONDITIONS RESTRICT THE USE OF A TYPE I RAMP. VARIABLE HEIGHT RETAINING CURB SHALL BE USED ONLY ADJACENT TO NON-TRAVERSIBLE AREAS. ALL RAMP TYPES SHALL BE LOCATED AT THE MIDDLE OF THE CURB RETURN (M.O.C.) EXCEPT TYPE II-A, III AND VI.

D2. VARIABLE DEPTH COLDMILL AND DGAC OVERLAY AS NECESSARY TO ACHIEVE 5% MAX. SLOPE AT LANDING. SLOPE SHALL NOT EXCEED 14% BEYOND LANDING TO JOIN EXISTING.

D3. RAMP LENGTHS AND "A" DIMENSIONS SHALL BE ADJUSTED TO MEET THE SLOPE REQUIREMENTS AS SHOWN, EXCEPT THE "A" DIM. MUST NOT EXTEND BEYOND THE END OF THE CURB RETURN. (TYPE III & VI EXEMPT)

D4. RAMPS SHALL BE INSTALLED AT EACH CORNER OF AN INTERSECTION INCLUDING MIDBLOCK "T" LOCATIONS.

D5. RAMPS IN MID-BLOCK (AT "T" INTERSECTIONS) SHALL BE PLACED IN LINE WITH RAMPS ON THE OPPOSITE SIDE OF THE STREET. IF NO OPENING IS PROVIDED IN A MEDIAN (ON DIVIDED STREETS), THE RAMPS SHALL BE OMITTED IN THE MID-BLOCK LOCATION.

D6. WHERE THE GUTTER CAN BE RAISED TO THE TOP OF THE CURB (NO DRAINAGE IN THE RETURN AREA BECAUSE OF CATCH BASINS OR HIGH POINT IN GRADE) THE RAMP MAY BE ELIMINATED BY RAISING THE GUTTER GRADE AND DECREASING THE CURB FACE TO 0". THE 12" WIDE BORDER AS DESCRIBED IN NOTE C3 SHALL BE PLACED ALONG THE BACK OF CURB THROUGH THE WIDTH OF THE 0" CURB FACE WITH APPROVAL FROM ENGINEER.

D7. RAMPS SHALL BE LOCATED AS SHOWN ON SHEETS 1, 2 & 3 EXCEPT UNDER THE FOLLOWING:

(A) WHEN LOCATION CONFLICTS WITH EXISTING STORM DRAIN, TRAFFIC SIGNAL OR UTILITY FACILITIES, THE RAMP SHALL BE RELOCATED TO AN APPROPRIATE POSITION WITHIN OR ADJACENT TO THE CURB RETURN AREA AS APPROVED BY THE CITY ENGINEER. HOWEVER, IF THE RAMP CANNOT BE POSITIONED IN A SAFE LOCATION, THE CONFLICTING FACILITY IS TO BE RELOCATED.

(B) WHEN THE RAMP IS TO BE CONSTRUCTED IN A RETURN THAT IS DOWNSTREAM OF A CROSS GUTTER AND THE RAMP MAY CAUSE A DRAINAGE PROBLEM, THE RAMP SHALL BE RELOCATED TO AN APPROPRIATE AREA DOWNSTREAM OF THE M.O.C.

(C) IN EXISTING CURB RETURNS WITH RIGHT-OF-WAY LIMITATIONS, THE RAMP SHALL BE LOCATED WITHIN THE CURB RETURN AREA WHERE THE RIGHT-OF-WAY WIDTH IS SUFFICIENT.

D8. WHEELCHAIR RAMP WINGS OR RETAINING CURBS:

(A) WHERE ADJACENT AREAS ARE PAVED, WHEELCHAIR RAMP WINGS (10% SLOPE) SHALL BE INSTALLED.

(B) WHERE ADJACENT AREAS ARE LANDSCAPED OR RAMP CONSTRUCTION IS ADJACENT TO EXISTING FACILITIES (AS LISTED IN D7-A) VARIABLE HEIGHT RETAINING CURB SHALL BE INSTALLED.

D9. THE RAMP MUST BE LOCATED TO BE ALIGNED COMPLETELY WITHIN A STRIPED CROSSWALK.

D10. CURB/GUTTER AND SPANDREL SHALL BE POURED SEPARATELY FROM THE RAMP

D11 CONTRACTOR MUST PERFORM A WATER TEST TO ENSURE POSITIVE FLOW AROUND THE RAMP WITHOUT PONDING.

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

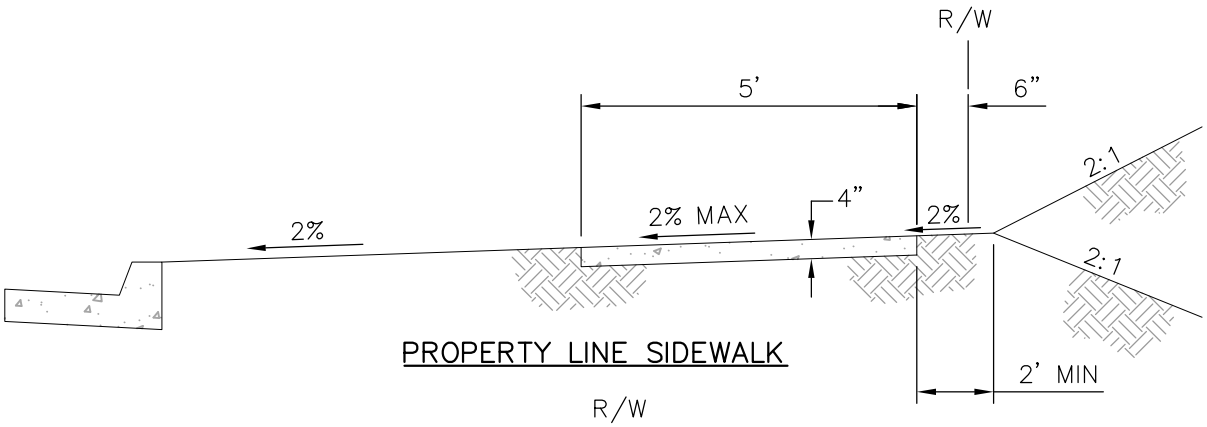
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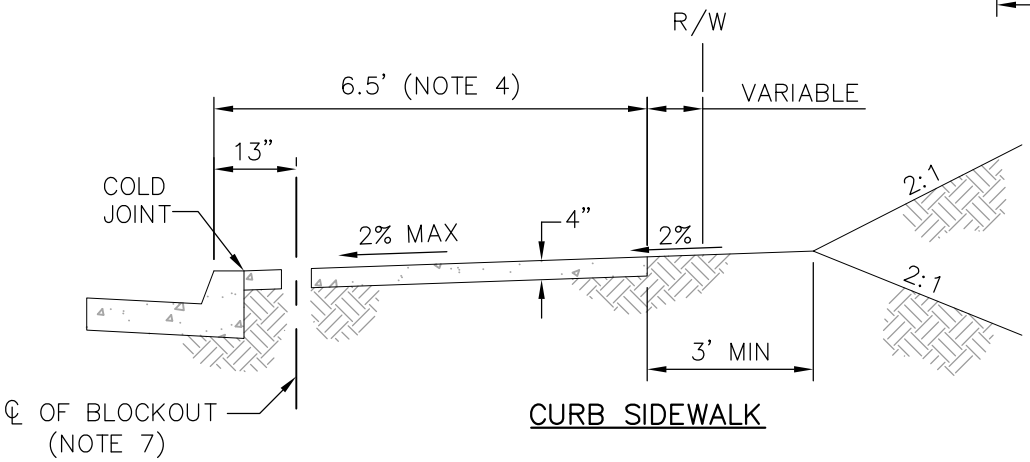
MARK	REVISIONS	APPR.	DATE

WHEELCHAIR RAMP (ADA RAMP)

STANDARD DRAWING NO. 304



PROPERTY LINE SIDEWALK



CURB SIDEWALK

TYPICAL SECTIONS

NOTES:

1. CONCRETE SHALL BE PER CURRENT EDITION OF THE "STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION" (560-C-3250)
2. HALF INCH THICK TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT ALL CURB RETURNS. QUARTER INCH THICK EXPANSION JOINTS SHALL BE INSTALLED BETWEEN THE SIDEWALK AND THE BACK OF CURB AT CURB RETURNS AND AROUND DRAINAGE STRUCTURES, POLES, AND PIPES WHICH ARE IN THE SIDEWALK. CURB SIDEWALK SHALL HAVE THE EXPANSION JOINTS AT THE SAME LOCATIONS AS THOSE IN THE CURB.
3. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 10 FOOT MAXIMUM INTERVALS THROUGHOUT THE LENGTH OF THE SIDEWALK AND AT LOCATIONS WHERE THE SIDEWALK SECTION IS INTERRUPTED BY TREE WELLS, UTILITY VAULTS, BLOCK OUT FOR STREET LIGHTS AND SIMILAR OBJECTS.
4. A SIDEWALK WIDER THAN 6.5 FEET MAY BE REQUIRED IN COMMERCIAL AREAS AND AREAS HIGH PEDESTRIAN TRAFFIC.
5. FOR TYPICAL CURB RETURN SIDEWALK SEE STANDARD DRAWING NO. 120
6. WHEN A POLE (STREET LIGHT STANDARD, SIGNAL POLES, UTILITY POLES, ETC...) IS TO BE PLACED IN THE SIDEWALK, BLOCK OUT A THREE FOOT SQUARE AROUND THE STANDARD AND BRING THE POLE FOUNDATION TO GRADE AFTER IT IS PLUMB.
7. IN RESIDENTIAL AREAS 6"x6" OR 6" DIAMETER BLOCK OUTS FOR MAILBOXES ARE REQUIRED IN CURB SIDEWALK 13" FROM CURB FACE AT THE PROPERTY LINE BETWEEN ADJACENT RESIDENCES. FOR MAILBOXES FOR BUSINESS, MOBILE HOME PARK OR APARTMENT HOUSES, DEVELOPER TO CHECK WITH U.S.P.S. FOR THE NUMBER AND LOCATION OF MAILBOXES.
8. 4 FEET WIDTH OF SIDEWALK IS THE MINIMUM WIDTH BETWEEN EDGE OF SIDEWALK AND ANY OBJECTS THAT INTERFERE WITH PEDESTRIAN R/W (TREE WELLS, FIRE HYDRANTS, ETC.)
9. COLD JOINT WHEN SIDEWALK IS ADJACENT TO BACK OF CURB.

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

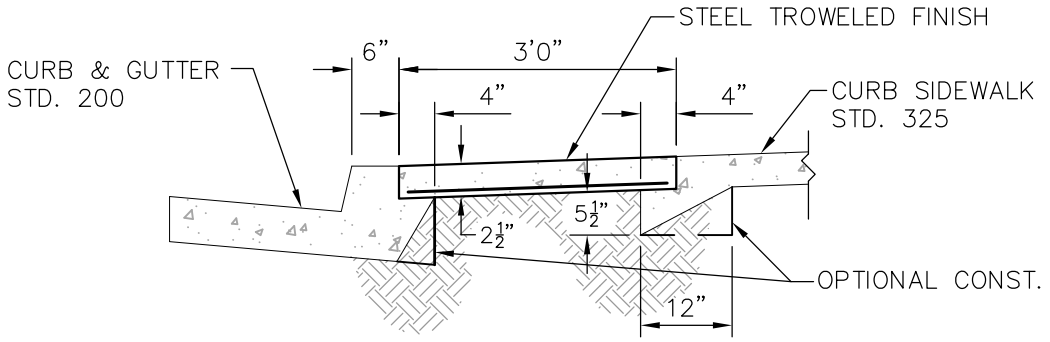
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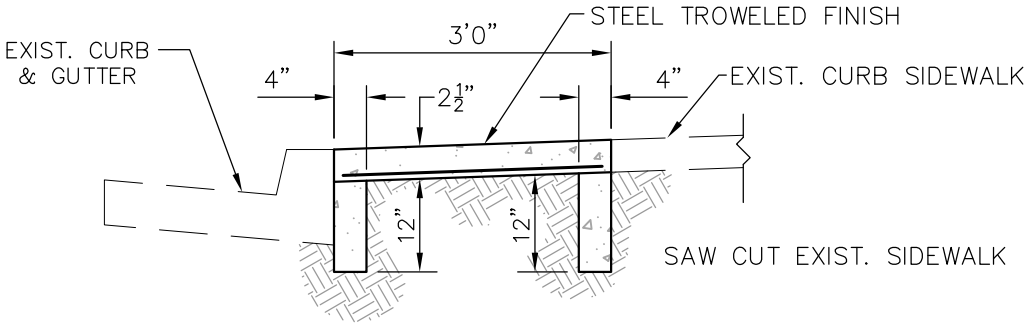
SIDEWALK

STANDARD DRAWING NO. 325

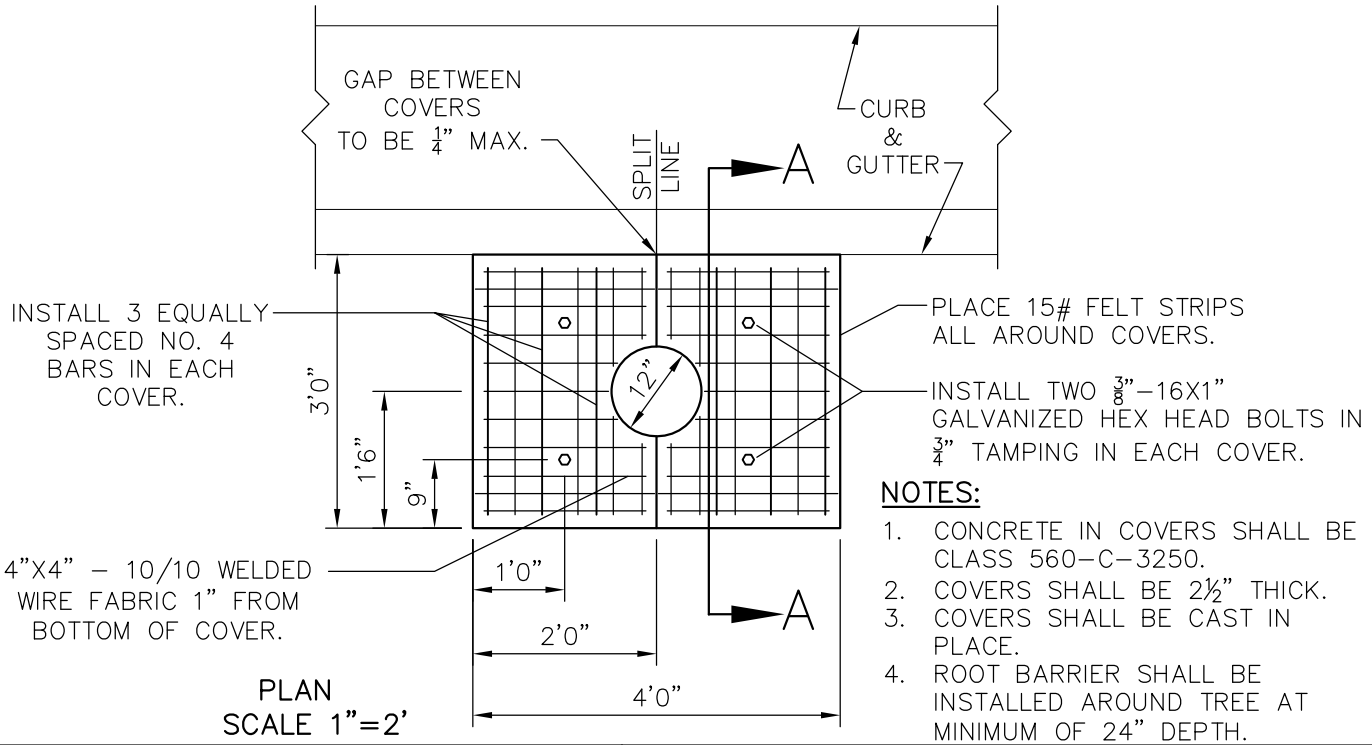
Sheet 1 of 1



SECTION A–A
NEW CURB, GUTTER AND SIDEWALK



SECTION A–A
EXIST. CURB, GUTTER AND SIDEWALK
SCALE 1"=2'



PLAN
SCALE 1"=2'

NOTES:

1. CONCRETE IN COVERS SHALL BE CLASS 560–C–3250.
2. COVERS SHALL BE 2½" THICK.
3. COVERS SHALL BE CAST IN PLACE.
4. ROOT BARRIER SHALL BE INSTALLED AROUND TREE AT MINIMUM OF 24" DEPTH.

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

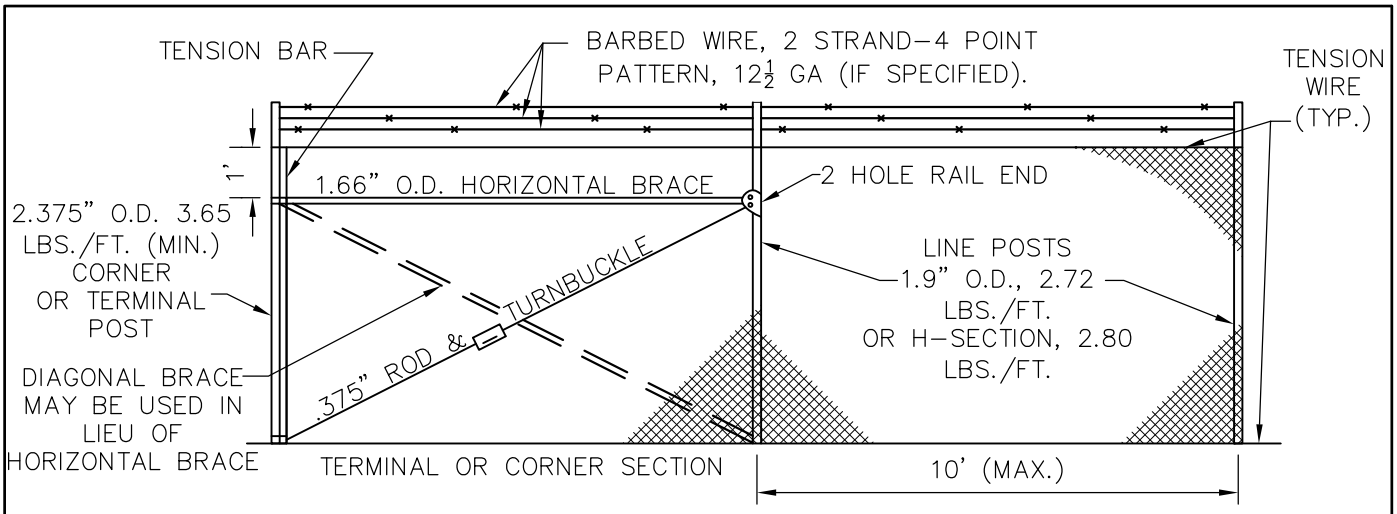
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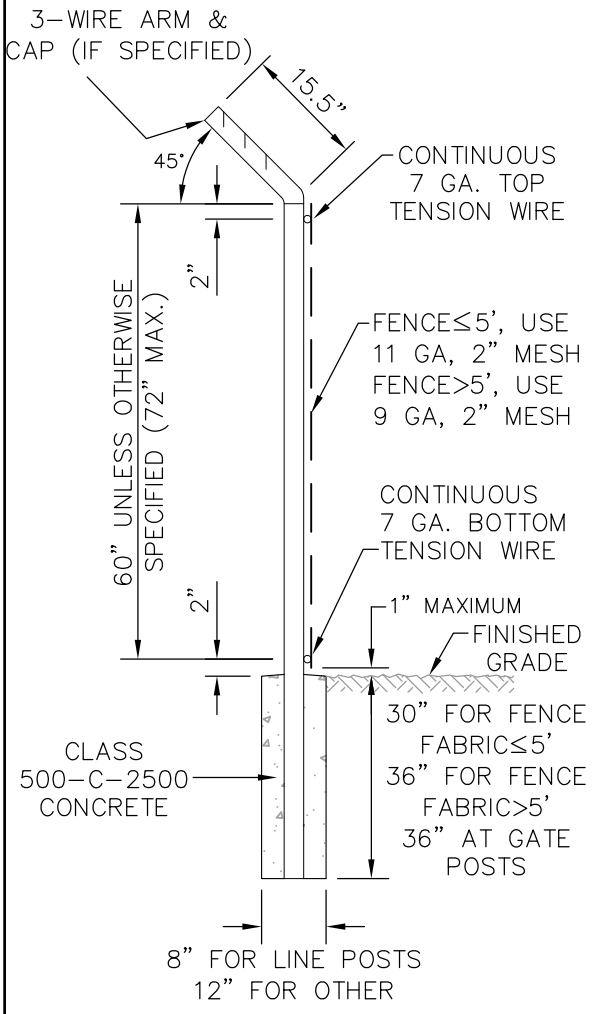
TREE WELL AND COVERS

STANDARD DRAWING NO. 326

Sheet 1 of 1

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POST DETAIL

NOTES

1. ALL PARTS OF THE FENCE TO BE GALVANIZED PER STD. SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
2. CORNER POSTS, 1.625" BRACES, AND .375" RODS AND TURNBUCKLE TO BE INSTALLED AT CORNERS OF 30° DEFLECTION OR GREATER.
3. LINE POSTS TO BE DOUBLE BRACED AND TURNBUCKLED EVERY 500' IN STRAIGHT SECTIONS OF FENCE (SEE SHEET 2 OF 2).
4. BRACES TO BE 1.25" PIPE, 2.27 LBS./FT. – EXTENDING FROM CORNER, GATE, OR TERMINAL POSTS TO FIRST ADJACENT LINE POST, AND SECURELY FASTENED TO POSTS WITH PRESSED STEEL CONNECTIONS, THEN TRUSSED WITH .375" DIAMETER ROUND ROD AND TURNBUCKLED.
5. TOP AND BOTTOM TENSION WIRES TO BE SECURELY FASTENED TO ALL POSTS AND TIED TO FABRIC AT 24" SPACES.
6. THE GROUND SURFACE SHALL BE FILLED AND COMPACTED TO WITHIN 1" OF BOTTOM OF FABRIC.
7. MESH FABRIC TO BE TIED PER STD. SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
8. LINE POSTS TO HAVE 45° ARM AND CAP CARRYING 3 STRANDS OF GALVANIZED BARBED WIRE OF 4 POINT PATTERN, EACH COMPOSED OF 2 STRANDS OF 12¼ GA WIRE IF REQUIRED.
9. FOR REPAIR OF DAMAGED ZINC COATINGS, SEE STD. SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
10. WHEN CONSTRUCTING A DOUBLE GATE, USE HORIZONTAL BRACES ON EACH SIDE OF THE GATES.
11. TOP AND BOTTOM TENSION WIRES SHALL BE FASTENED SECURELY AND TERMINATED TO LINE POST AT EACH 500' BRACING INTERVAL.

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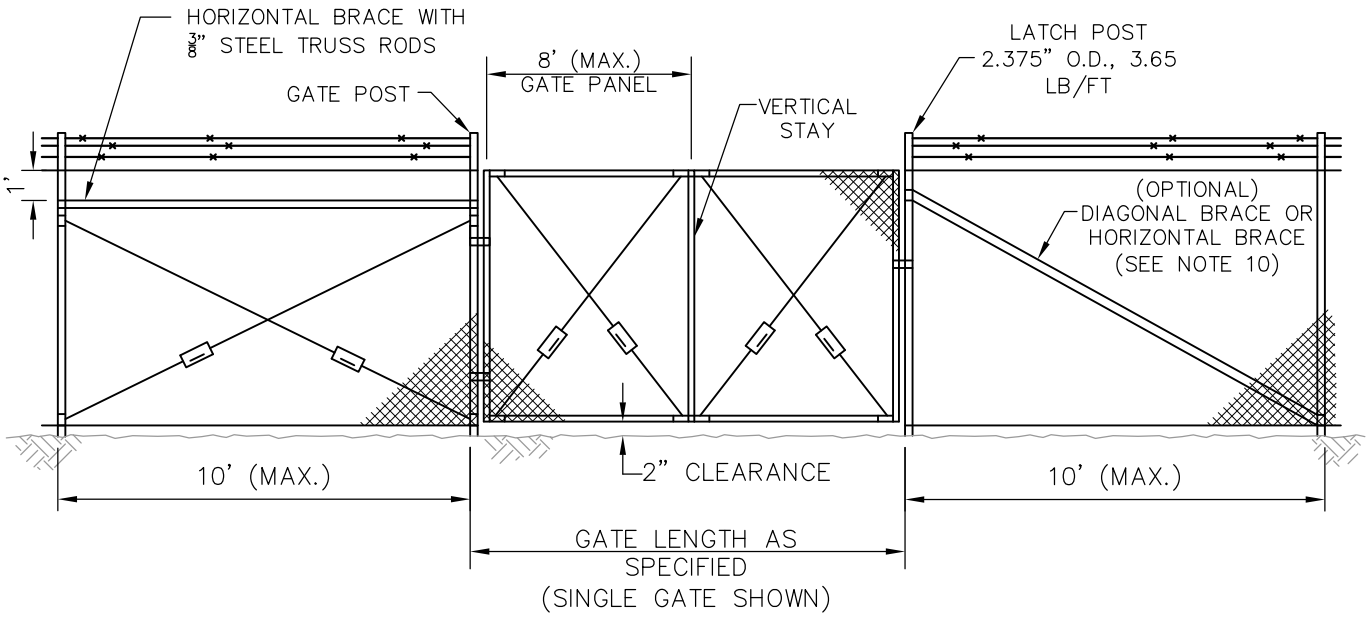
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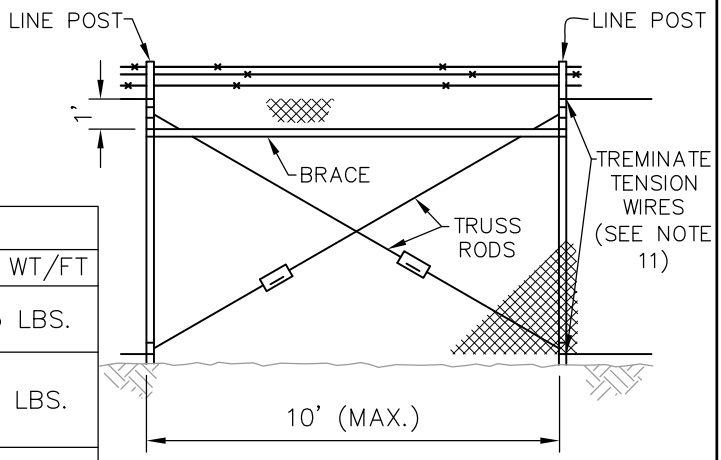
PUBLIC WORKS DEPARTMENT

CHAIN LINK FENCE
(FOR FENCE UP TO 72" HIGH)

STANDARD DRAWING NO. 380



GATE DETAIL



LINE POSTS AT 500' MAXIMUM INTERVALS, BRACED AND TRUSSED IN BOTH DIRECTIONS. SEE NOTE 11 FOR TENSION WIRE TERMINATION.

LINE POST BRACING DETAIL

GATES			
FRAME	OPENING	POST O.D.	POST WT/FT
1.9" O.D.	SINGLE TO 6' OR DBL. TO 12' INCL.	2.375"	3.65 LBS.
1.9" O.D.	SGL., OVER 6' TO 13' OR DOUBLE, OVER 12' TO 26' INCL.	4.000"	9.11 LBS.
1.9" O.D.	SINGLE, OVER 13' TO 18' OR DBL., OVER 26' TO 36' INCL.	6.625"	18.97 LBS.
1.9" O.D.	SGL., OVER 18' OR DOUBLE, OVER 36'	8.625"	24.70 LBS.

NOTE:
ABOVE DIMENSION AND WEIGHTS ARE MINIMUM. LARGER SIZES MY BE USED ON APPROVAL OF ENGINEER.

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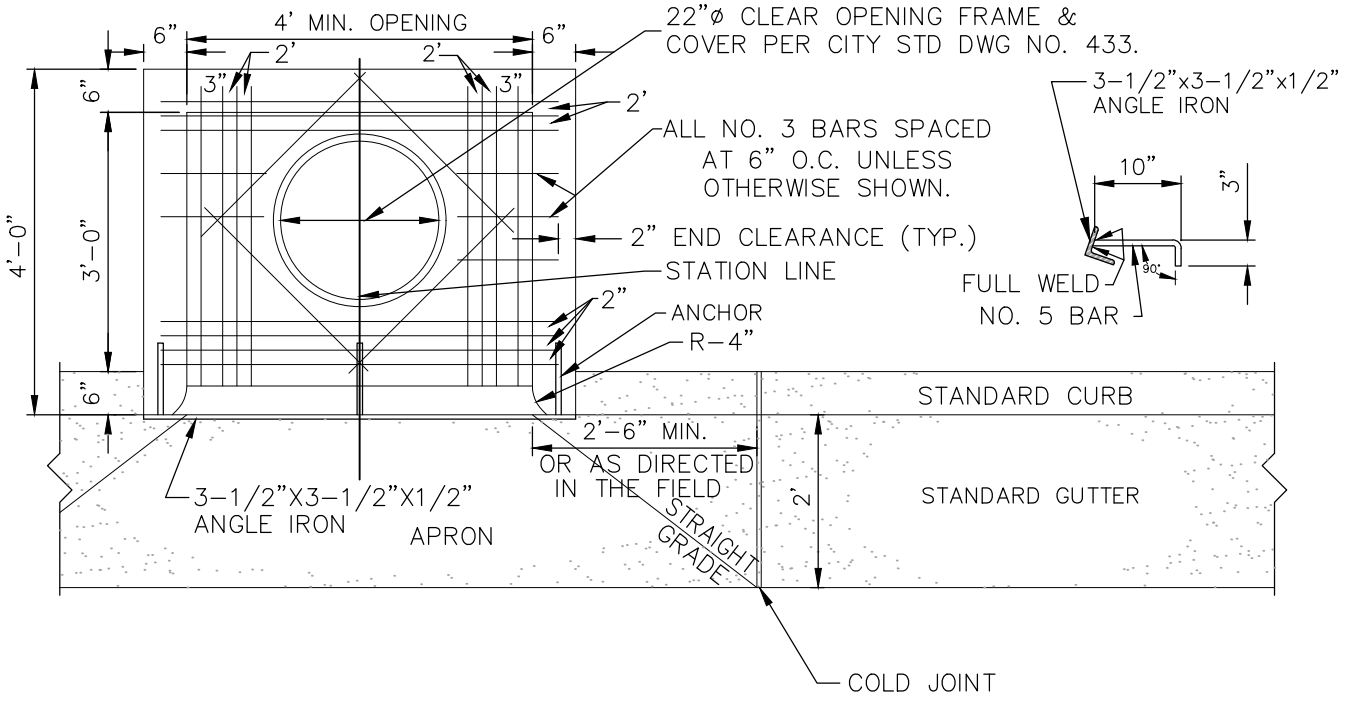
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CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

CHAIN LINK FENCE
(FOR FENCES UP TO 72" HIGH)

STANDARD DRAWING NO. 380



TOP VIEW

SCALE: 1" = 2'

ONLY APPLICABLE TO REPAIRS OF EXISTING CATCH BASINS

NOTES:

1. PIPE SIZE AND OUTLET TO BE SHOWN ON GENERAL PLANS. STANDARD CATCH BASIN TO BE 4'-0" x 3'-0" INSIDE UNLESS OTHERWISE SHOWN ON GENERAL PLANS. CONSTRUCT ½" PER FOOT SLOPE ON BOTTOM OF CATCH BASIN TOWARD OUTLET. THE AMOUNT & LENGTH OF STEEL USED IN CONSTRUCTION TO VARY ACCORDING TO THE SIZE OF THE CATCH BASIN. SIDEWALK SHALL BE MONOLITHICALLY POURED WITH CATCH BASIN DECK. CATCH BASIN WALL SHALL BE DOUBLE FORMED.
2. TOP OF BASIN SHALL SLOPE 2% TOWARD CURB EXCEPT WHEN OTHERWISE SHOWN ON THE PLAN OR TO FIT EXISTING SIDEWALK. TO BE POURED MONOLITHIC WITH S/W IF CURB S/W IS USED.

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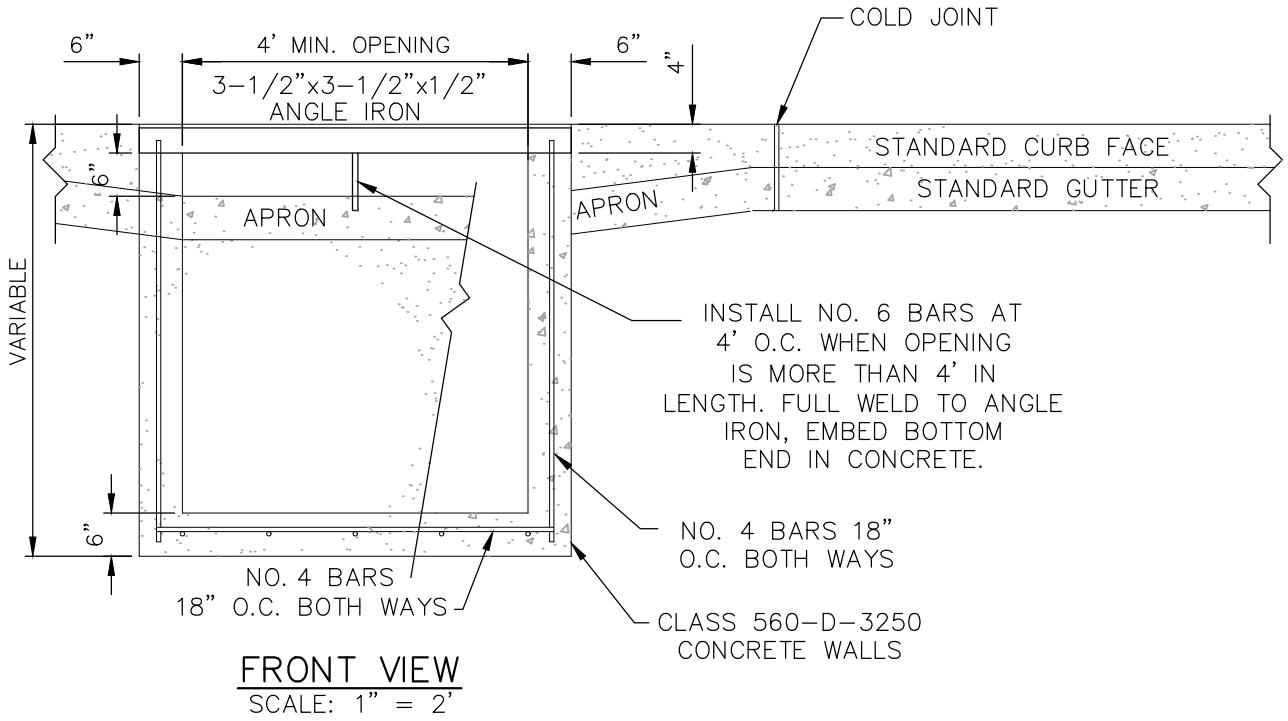
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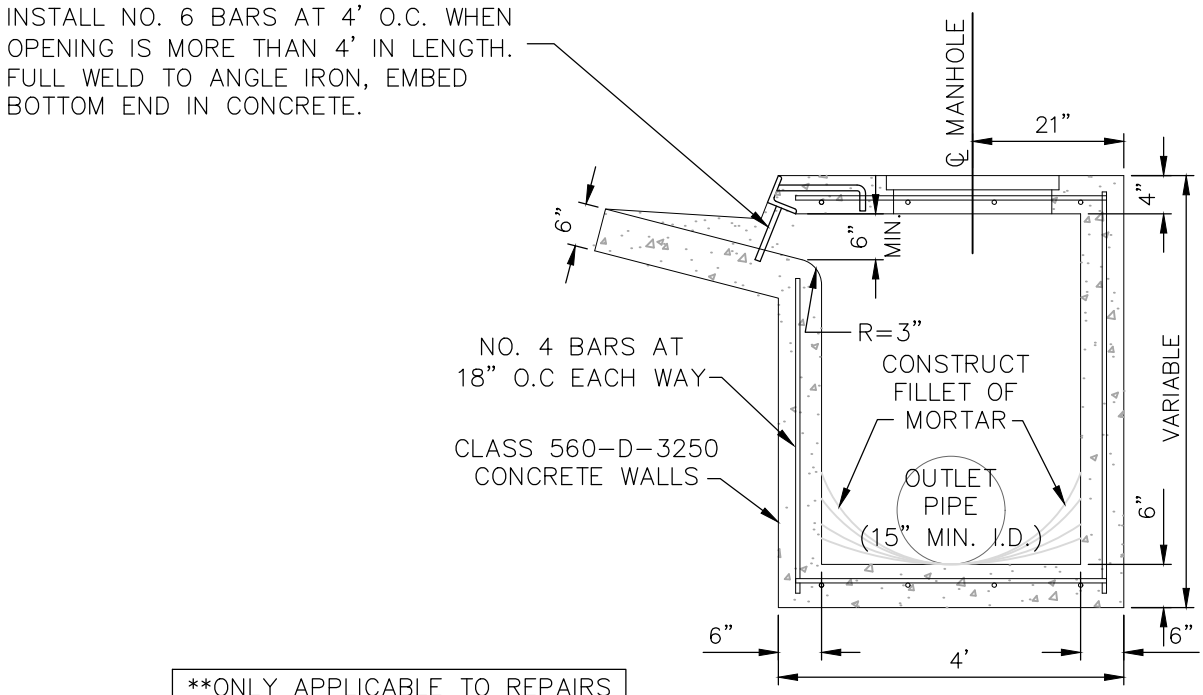
PUBLIC WORKS DEPARTMENT

STORM WATER CATCH BASIN TYPE 1

STANDARD DRAWING NO. 400**



FRONT VIEW
SCALE: 1" = 2'



ONLY APPLICABLE TO REPAIRS OF EXISTING CATCH BASINS

SIDE VIEW
SCALE: 1" = 2'

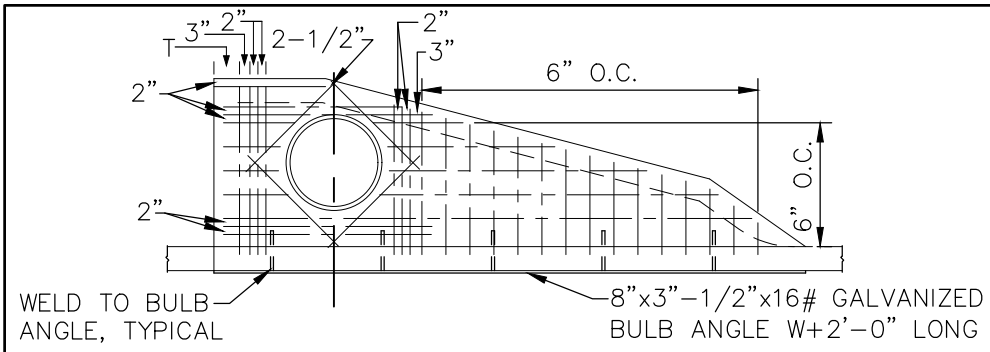
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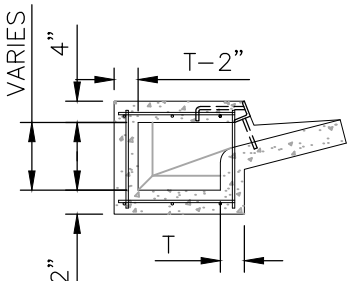
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STORM WATER CATCH BASIN TYPE 1

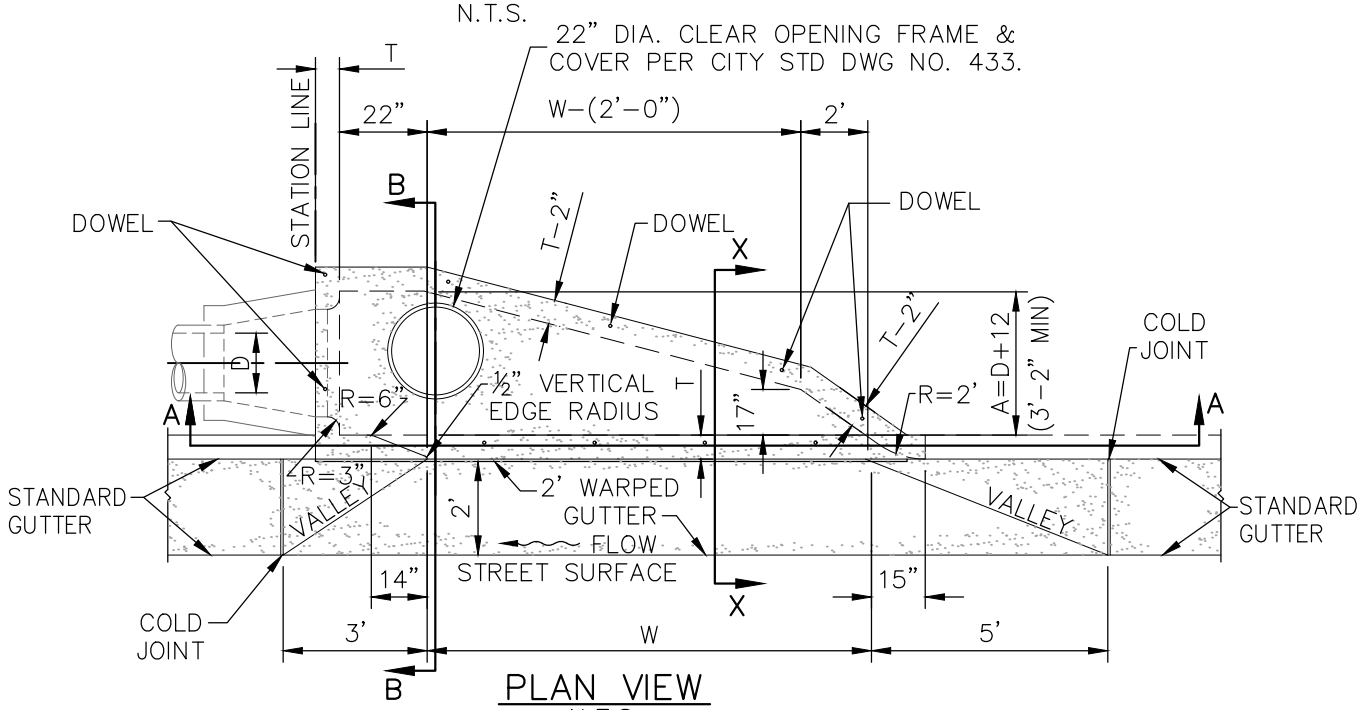
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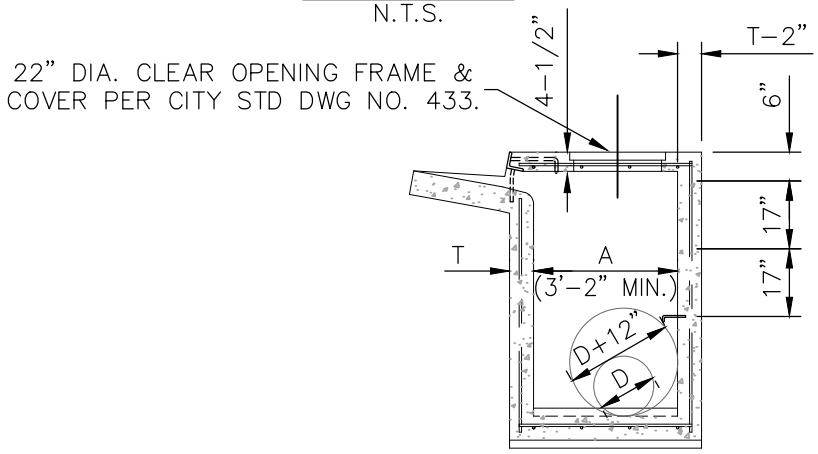
TOP SLAB REINFORCING PLAN
N.T.S.



SECTION X-X
N.T.S.



PLAN VIEW
N.T.S.



SECTION B-B
N.T.S.

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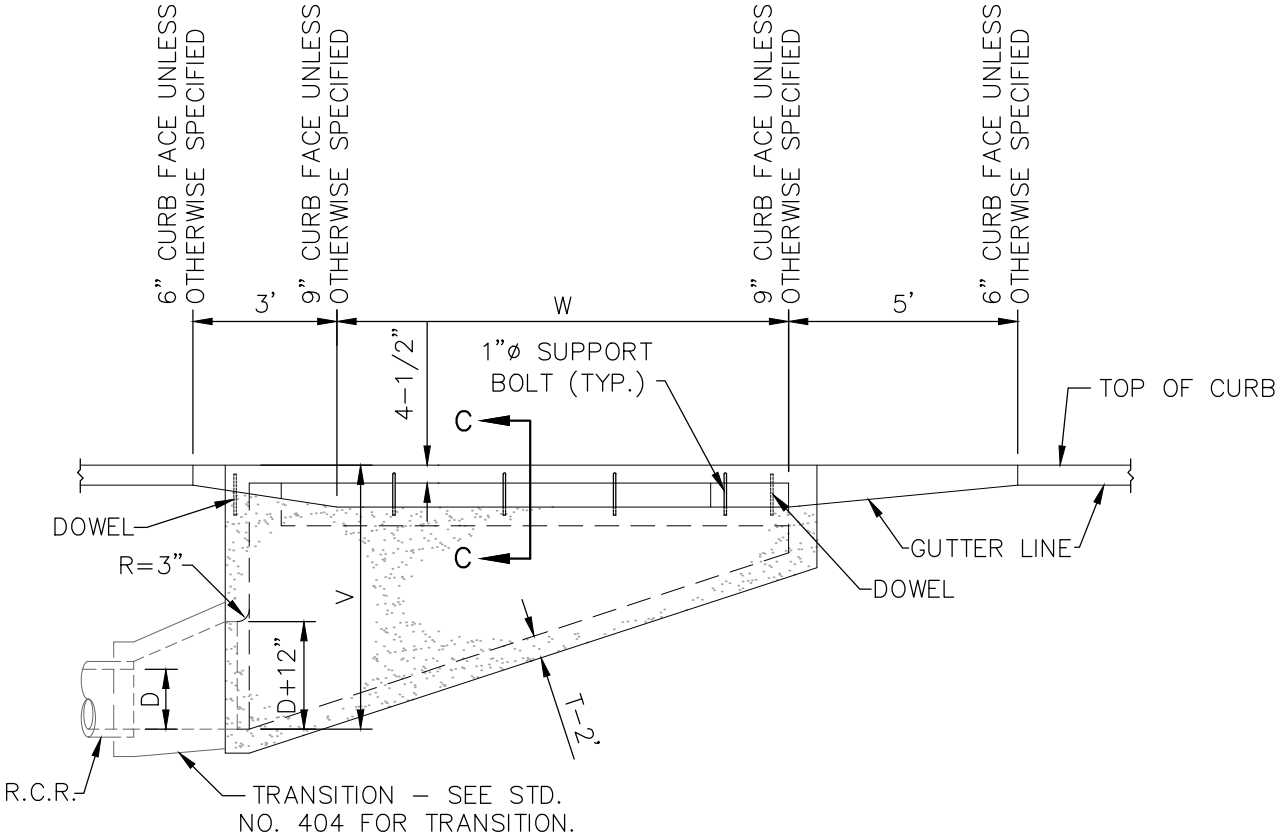
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STORM WATER CATCH BASIN TYPE 2

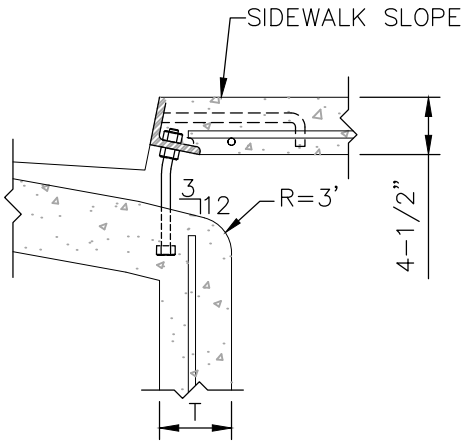
STANDARD DRAWING NO. 401

Sheet 1 of 3

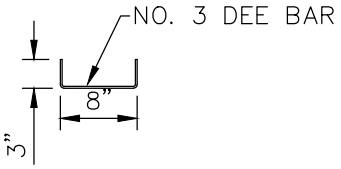
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SECTION A–A
N.T.S.



SECTION C–C
N.T.S.
REFERENCE –STD. DWG. NO. 402



DETAIL OF DOWEL
N.T.S.
TO BE USED WHEN TOP IS POURED SEPARATE, AS INDICATED

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STORM WATER CATCH BASIN TYPE 2

STANDARD DRAWING NO. 401

NOTE:

DIMENSIONS: T= 8 INCHES IF "V" IS LESS THAN 8 FEET
T= 10 INCHES IF "V" IS 8 FEET OR MORE.
V= 5.25 FEET UNLESS OTHERWISE SPECIFIED.
W= AS SPECIFIED ON PLAN (8 FOOT MIN.)
D= AS SPECIFIED ON PLAN (15 INCHES MIN.)
A= D PLUS 12 INCHES (38 INCHES MIN.)

CONCRETE: CONCRETE SHALL BE CLASS 560-C-3250

REINFORCING STEEL: SHALL BE NO. 3 BARS UNLESS OTHERWISE SPECIFIED. CLEARANCE SHALL BE 1-1/2" FROM BOTTOM OF SLAB.

SUPPORT BOLT: FOR DETAILS SEE STANDARD DRAWING NO. 402

TRANSITION: FOR DETAILS SEE STANDARD DRAWING NO. 404

FLOOR: OF BASIN SHALL BE GIVEN A STEEL TROWEL FINISH AND SHALL SLOPE FROM ALL DIRECTIONS TO THE OUTLET.

SURFACE: OF ALL EXPOSED CONCRETE SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH AND SCORING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN.

CURVATURE: OF THE LIP AND SIDEWALLS AT GUTTER OPENINGS SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE MADE BY PLASTERING.

MANHOLE: SHALL BE PLACE ALONG BLACK WALL NEAR OUTLET.

OUTLET: PIPE SHALL BE TRIMMED TO THE FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.

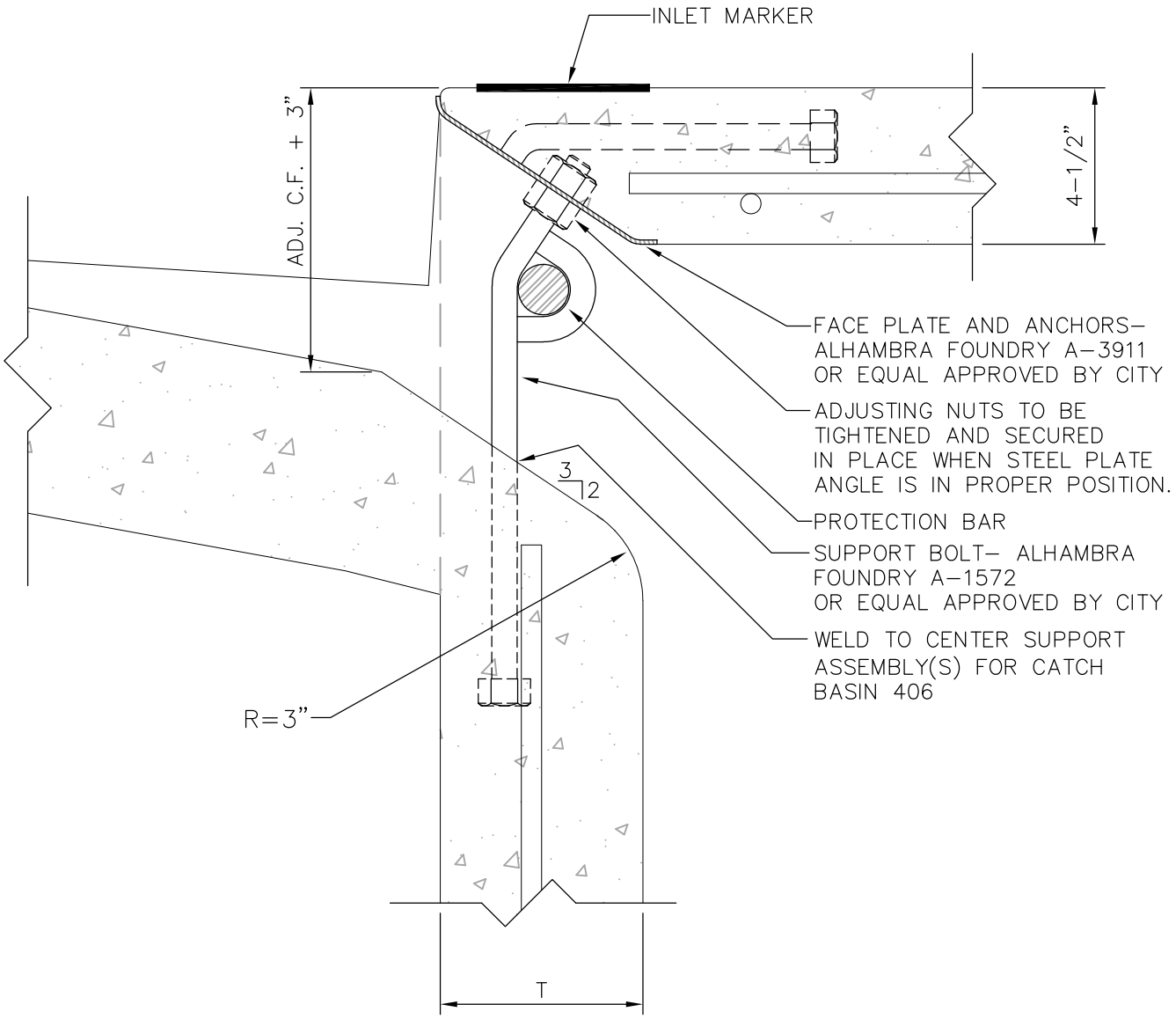
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STORM WATER CATCH BASIN TYPE 2

STANDARD DRAWING NO. 401



NOTES:

1. FACE PLATE SHALL BE EMBEDDED 4" IN ADJACENT CURB ON EACH SIDE OF OPENING.
2. PROTECTION BAR SHALL BE 1" DIA. PLAIN STEEL. EMBED 5" AT EACH END. CENTER IN OPENING WHEN SUPPORT BOLTS ARE NOT USED.
3. SUPPORT BOLTS ARE REQUIRED IF WIDTH OF OPENING EXCEEDS 5'. MAXIMUM SPACING OF BOLTS IS 4'.
4. ALL EXPOSED METAL PARTS SHALL BE GALVANIZED.

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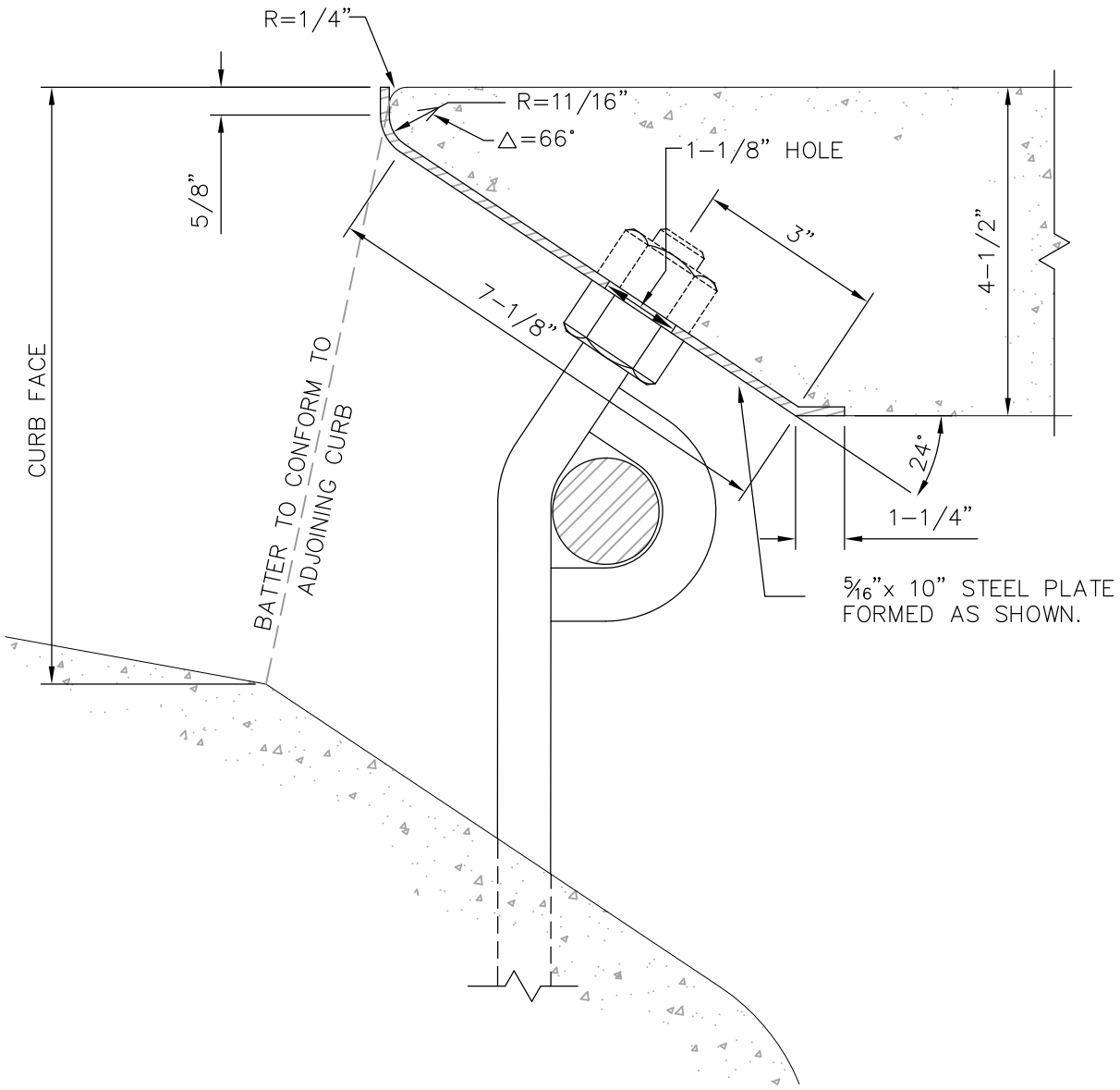
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CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

CATCH BASIN INLET

STANDARD DRAWING NO. 402

Sheet 1 of 1



NOTES:

1. THE STEEL PLATE ALTERNATE FOR CATCH BASIN INLETS SHALL BE FABRICATED FROM 5'–16"x10" UNIVERSAL MILL PLATES. THIS PLATE MAY BE USED AT THE CONTRACTORS OPTION IN LIEU OF THE 8"x3–1/2"x16" BULB ANGLE.
2. FOR ANCHORAGE AND OTHER DETAILS SEE STD. NO. 402
3. ALL EXPOSED METAL PARTS SHALL BE GALVANIZED.

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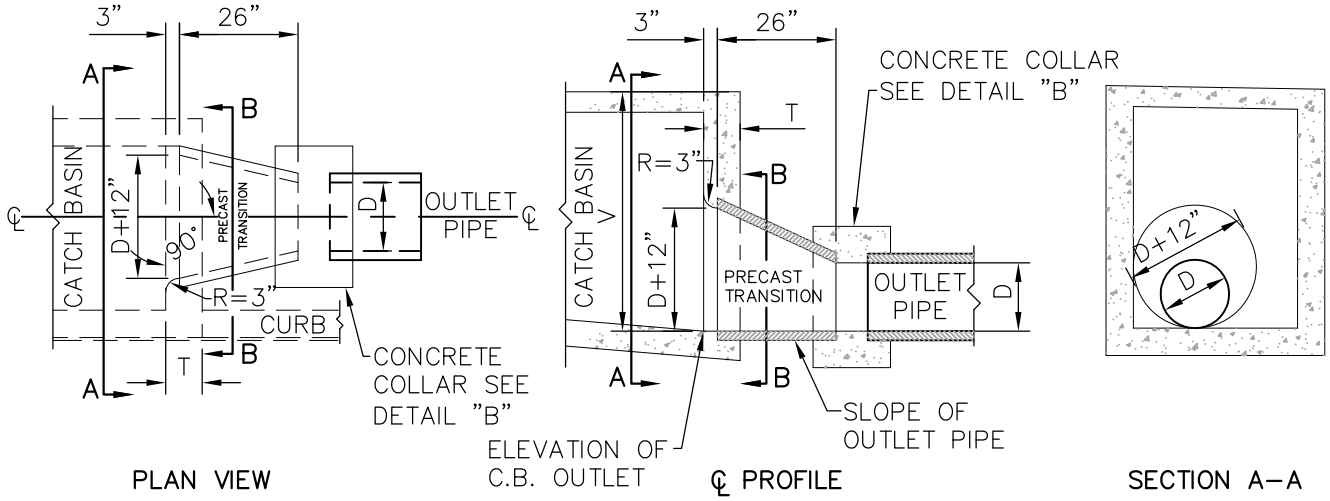
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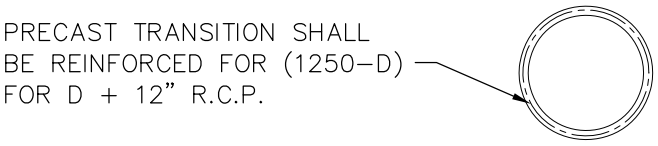
CATCH BASIN INLET
STEEL PLATE ALTERNATE

STANDARD DRAWING NO. 403

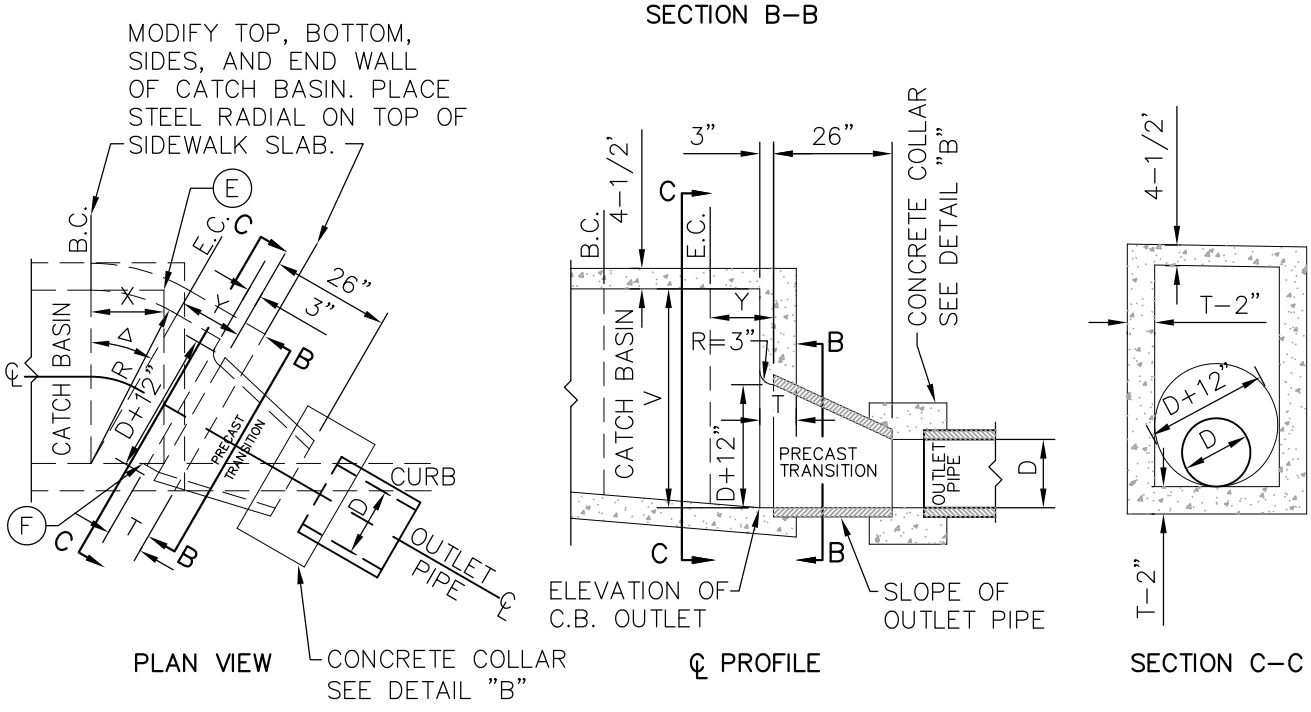
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CASE – 1



SECTION B–B



CASE – 2

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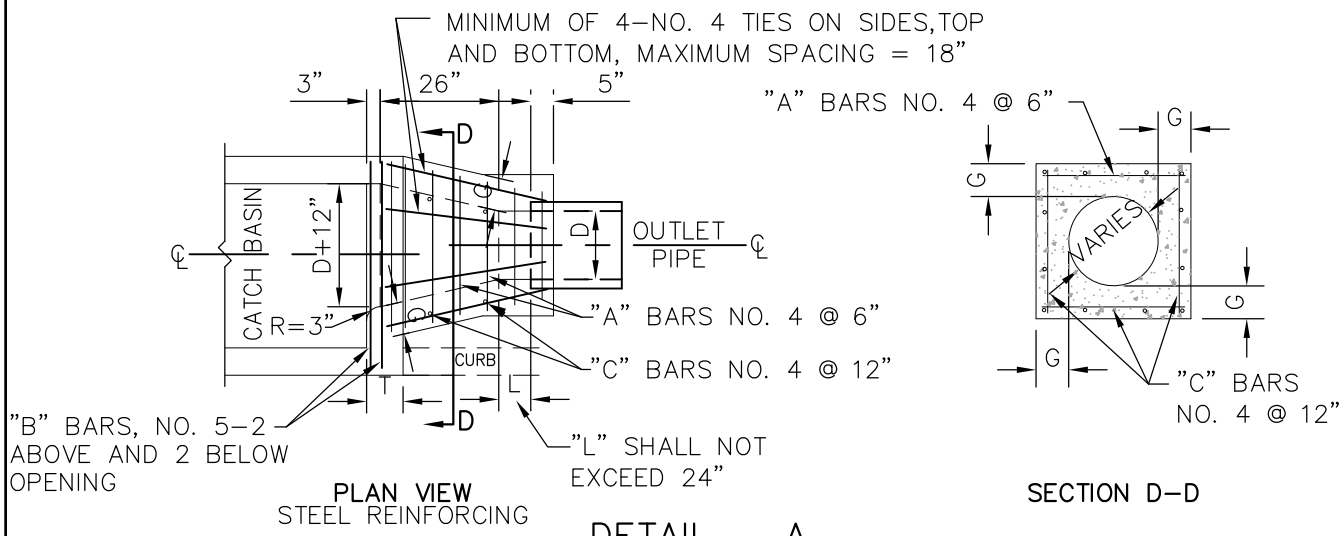
PUBLIC WORKS DEPARTMENT

CATCH BASIN OUTLET TRANSITION STRUCTURE

STANDARD DRAWING NO. 404

Sheet 1 of 3

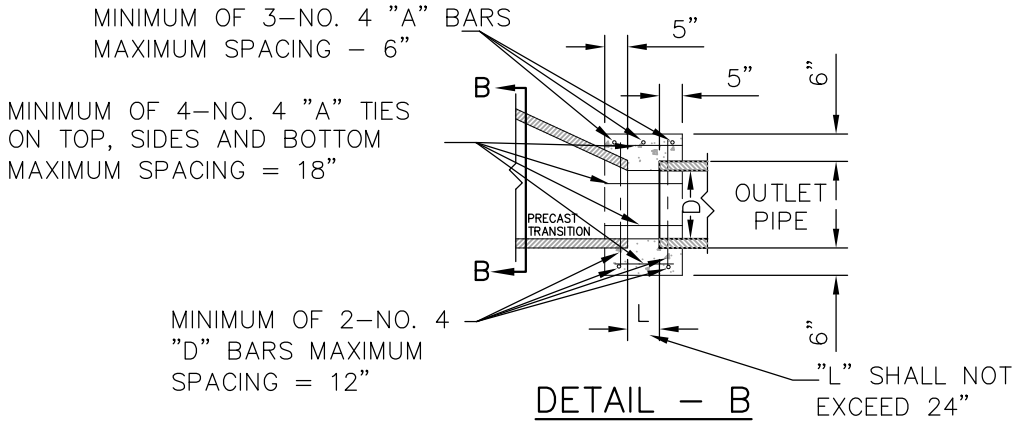
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PLAN VIEW
STEEL REINFORCING

SECTION D–D

DETAIL – A
MONOLITHIC TRANSITION



DETAIL – B
SQUARE CONCRETE COLLAR

TABLE – A

D	△	R	X	Y
15"–18"	30°	38"	16"	13–7/8"
15"–18"	45°	38"	11–3/8"	8"
21"	30°	38"	10"	8–5/8"
21"	45°	38"	7–1/8"	5"
24"	30°	38"	4"	3–1/2"
24"	45°	38"	2–7/8"	2"
27" OR MORE	30°	D+12"	0"	0"
	45°	D+12"	0"	0"

TABLE – B

D	15"	18"	21"	24"	27"	30"
G	7"	7"	7"	17–1/2"	8"	8"

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CATCH BASIN OUTLET TRANSITION STRUCTURE

STANDARD DRAWING NO. 404

Sheet 2 of 3

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NOTES FOR CATCH BASIN INLET TRANSITION STRUCTURE

1. TRANSITION – MAY BE EITHER PRECAST (SECTION B–B) OR MONOLITHIC (SECTION D–D) AT CONTRACTOR'S OPTION.

2. PRECAST TRANSITION – SHALL BE REINFORCED FOR 1250–D FOR D+12 INCH CONCRETE PIPE.

3. CONCRETE COLLAR – (DETAIL "B") SHALL BE USED ONLY TO JOIN THE PRECAST TRANSITION WITH THE OUTLET PIPE.

4. CONCRETE – SHALL BE OF THE SAME CLASS AS THE STRUCTURE WITH WHICH IT IS POURED.

5. CURVATURE – OF THE ROUNDED EDGE OF THE OUTLET AND SIDEWALLS SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE MADE BY PLASTERING.

6. INTERIOR SURFACE – OF STRUCTURE SHALL BE SMOOTH AND CLEAN, AND FREE FROM POCKETS OR PROTUBERANCES.

7. SURFACE – OF ALL EXPOSED CONCRETE SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH, AND SCORING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN.

8. DIMENSIONS – "T", "V" AND STEEL REINFORCEMENT DETAILS ARE SHOWN EITHER ON STD. DWG. NO. 401, SHEET 2 OR ON THE IMPROVEMENT PLAN FOR THE CATCH BASIN.

9. OUTLET PIPE – SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.

10. REINFORCING STEEL – SHALL BE 1–1/2" CLEAR FORM FACE OF CONCRETE UNLESS OTHERWISE SHOWN.

11. TRANSITION STRUCTURE – (CASE 2) MAY BE CONSTRUCTED IN ANY DIRECTION WITHIN THE LIMITS OF TABLE "A" AS SPECIFIED ON THE IMPROVEMENT PLAN, BY ROTATION IT ABOUT EITHER POINTS "E" OR "F".

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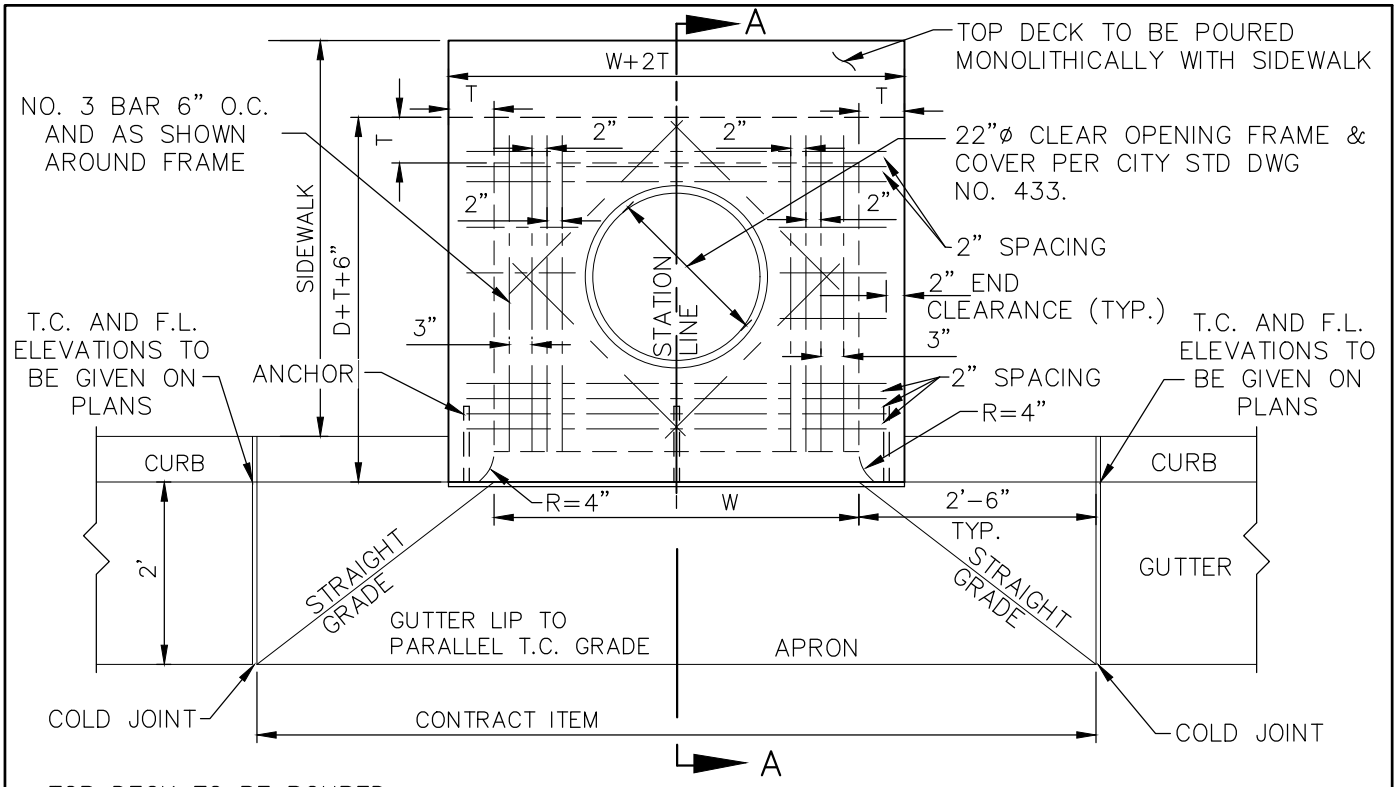
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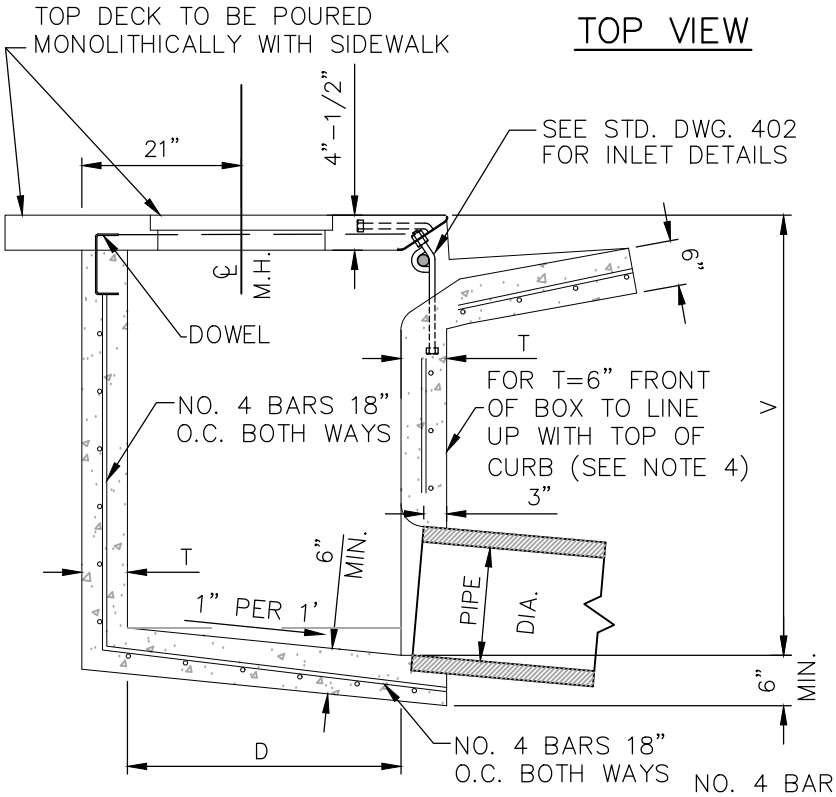
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CATCH BASIN OUTLET
TRANSITION STRUCTURE

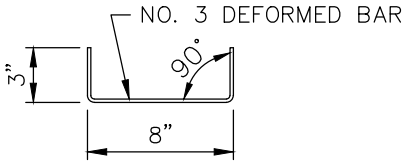
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TOP VIEW

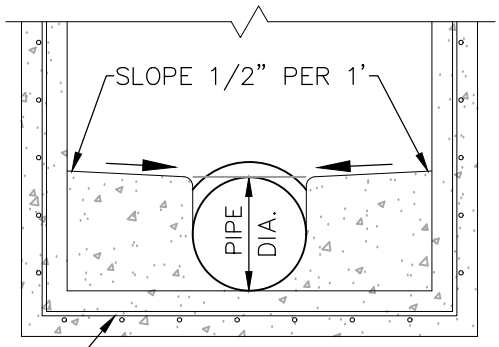


SECTION A–A



DOWEL DETAIL

TO BE USED WHEN TOP IS POURED SEPARATE, ONE AT EACH CORNER



CHANNEL DETAIL

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CATCH BASIN TYPE 3

STANDARD DRAWING NO. 405

Sheet 1 of 2

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NOTES:

1. **CONCRETE** SHALL BE 560-C-3250 PORTLAND CEMENT CONCRETE.

2. **CONNECTOR** PIPE SHALL BE HORIZONTALLY CENTERED ON THE WALL OF THE CATCH BASIN WHICH FACES THE CONNECTOR PIPE.

3. **CURVATURE** OF THE LIP AND SIDEWALL AT THE OPENING SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE MADE BY PLASTERING.

4. **DIMENSIONS:**
   "W" SHALL BE AS SPECIFIED ON THE PLAN (4' MIN.)
   "V" SHALL BE AS SPECIFIED ON THE PLAN.
   "D" = 3' UNLESS OTHERWISE SPECIFIED ON THE PLAN.
   "T" = 6" IF "V" IS 8' OR LESS.
   "T" = 8" IF "V" IS 8' OR MORE.
   THICKNESS OF THE WALL UNDER THE OPENING SHALL BE "T" + 2" WHEN "W" EXCEEDS 7'-0" "T" > 6", WIDENING OF WALL SHALL BE ON STREET SIDE.

5. **CHANNEL** SHALL BE CONSTRUCTED IN CATCH BASINS HAVING INLET PIPES. WHERE "V" MINUS SHELF HEIGHT IS LESS THAN 2-1/2' THE CHANNEL MAY BE OMITTED.

6. **PIPES** SHALL BE TRIMMED TO THE FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.

7. **SURFACE** OF ALL EXPOSED CONCRETE IN BASIN SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH AND SCORING TO THE EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN AND SHALL BE FREE FROM PROTRUDING WIRES AND NAILS. FLOOR OF CHANNEL SHALL BE GIVEN A STEEL-TROWELED FINISH.

8. **TOP OF BASIN** SHALL SLOPE 2% TOWARD THE CURB EXCEPT WHEN OTHERWISE SHOWN ON THE PLAN OR TO FIT EXISTING SIDEWALK. TOP OF BASIN SHALL BE POURED MONOLITHICALLY WITH SIDEWALK IF THE SIDEWALK IS IMMEDIATELY ADJACENT TO THE CURB.

9. **FRAME AND COVER** SHALL BE LOCATED AS SHOWN ON SHEET 1 UNLESS OTHERWISE SHOWN ON THE PLAN.

10. **A STAINLESS STEEL INLET MARKER** PER SPECIAL PROVISIONS SECTION 303-1.4.4.1 WITH THE WORDS "NO DUMPING DRAINS TO RIVERS" SHALL BE AFFIXED ON TOP OF THE INLET WITH SIKABOND ADHESIVE OR APPROVED EQUAL.

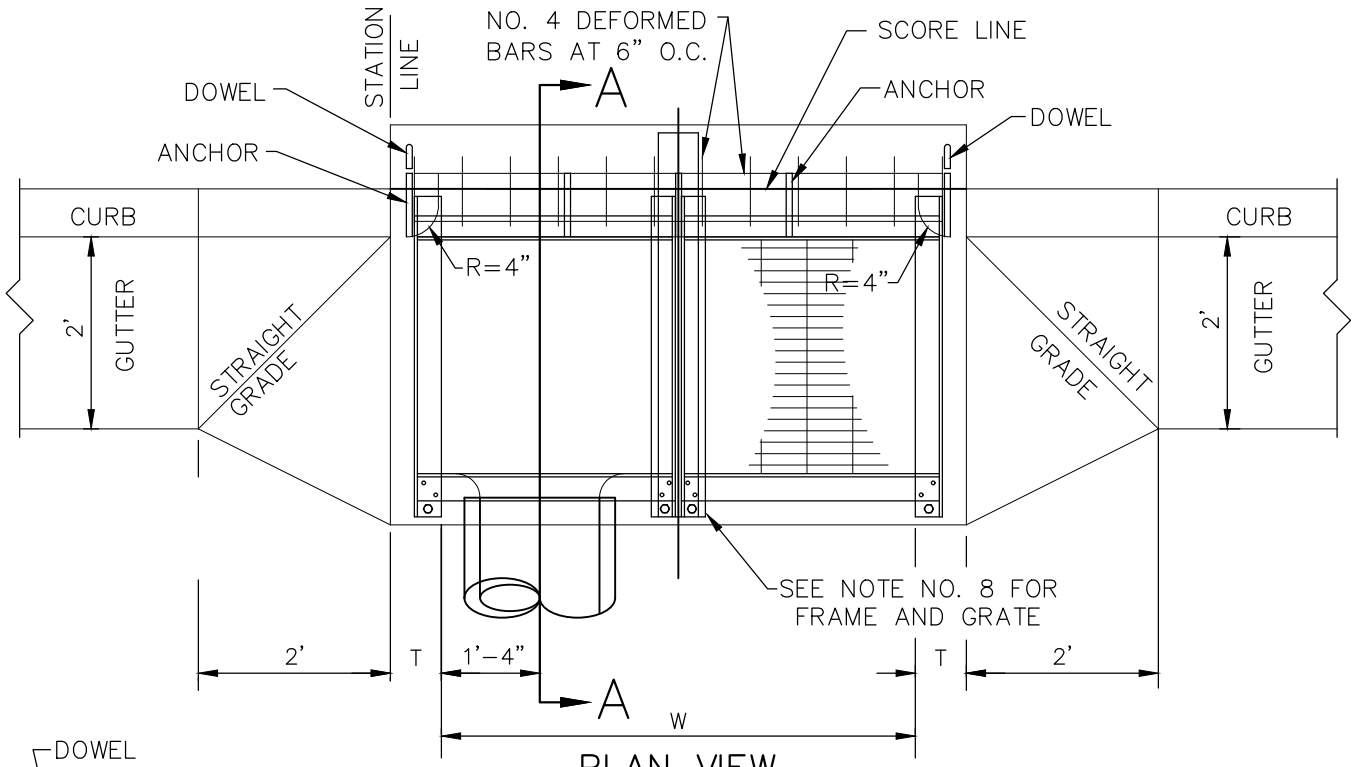
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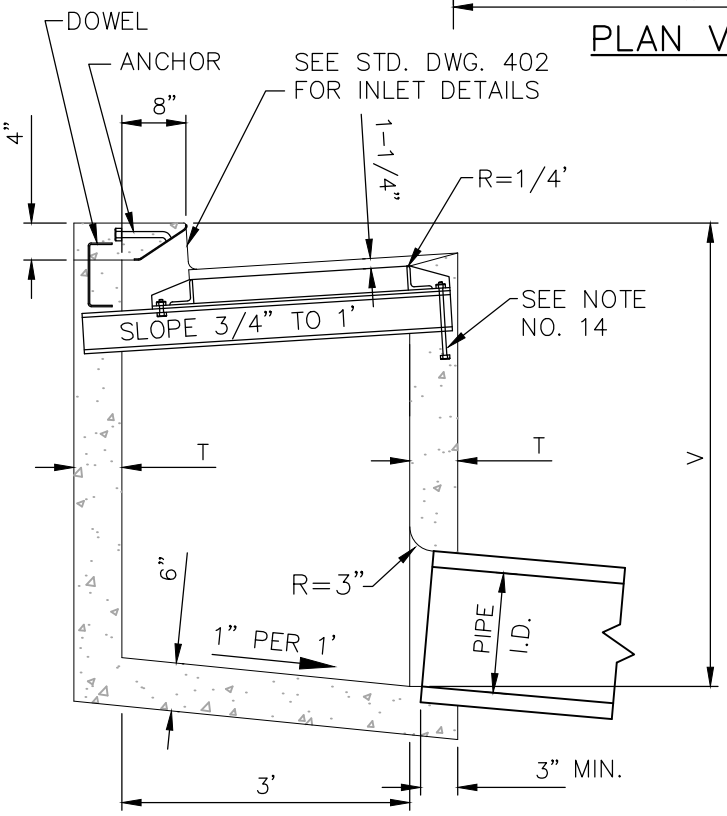
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PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 3

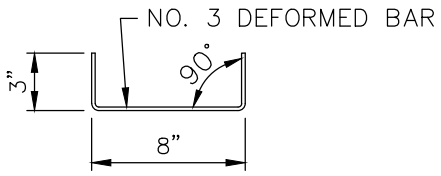
STANDARD DRAWING NO. 405



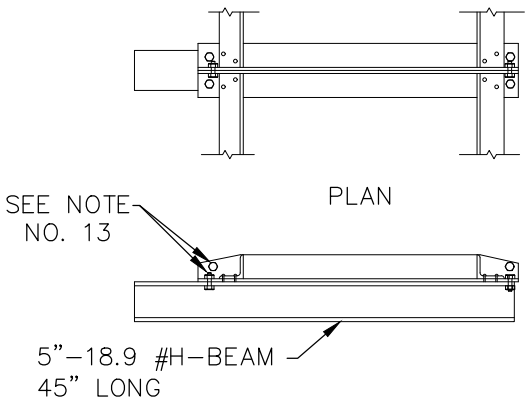
PLAN VIEW



SECTION A-A



DETAIL OF DOWEL



CENTER SUPPORT DETAIL

APPROVED BY:

CITY ENGINEER

06/06/2025
DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 4

STANDARD DRAWING NO. 406

Sheet 1 of 2

MARK	REVISIONS	APPR.	DATE

NOTES:

1. **CONCRETE** SHALL BE 560-C-3250 PORTLAND CEMENT CONCRETE.

2. **BASIN** SHALL HAVE ONE GRATING UNLESS OTHERWISE SPECIFIED ON PLANS.

3. **CURVATURE** OF THE END-WALLS AT THE CURB OPENING SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE MADE BY PLASTERING.

4. **DIMENSIONS**:
   "T" = 6" IF "V" IS 4' OR LESS
   "T" = 8" IF "V" IS BETWEEN 4' AND 8'
   "T" = 10" IF "V" IS 8' OR MORE
   "V" SHALL BE AS SPECIFIED ON PLANS
   "W" = 2' 11-3/8" FOR ONE GRATING. ADD 3' 5-3/8" PER ADDITIONAL GRATING (6" MIN.)

5. **PIPES** SHALL BE TRIMMED TO THE FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.

6. **CHANNEL** SHALL BE CONSTRUCTED IN CATCH BASINS HAVING INLET PIPES. WHERE "V" MINUS SHELF HEIGHT IS LESS THAN 2-1/2' THE CHANNEL MAY BE OMITTED. SEE STANDARD DRAWING NO. 405 FOR CHANNEL DETAIL.

7. **SURFACE** OF ALL EXPOSED CONCRETE IN BASIN SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH AND SCORING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN AND SHALL BE FREE FROM PROTRUDING WIRES AND NAILS. FLOOR OF CHANNEL SHALL BE GIVEN A STEEL-TROWLED FINISH,

8. **FRAME** SHALL BE ALHAMBRA FOUNDRY A-1540 OR APPROVED EQUAL BY CITY; GRATE SHALL BE A-1546 OR APPROVED EQUAL BY CITY.

9. **TOP OF BASIN** SHALL SLOPE 2% TOWARD THE CURB EXCEPT WHEN OTHERWISE SHOWN ON THE PLAN OR TO FIT EXISTING SIDEWALK. TOP OF BASIN SHALL BE POURED MONOLITHICALLY WITH SIDEWALK IF THE SIDEWALK IS IMMEDIATELY ADJACENT TO THE CURB.

10. **CENTER SUPPORT ASSEMBLY** SHALL BE USED WHEN TWO OR MORE GRATINGS ARE SPECIFIED.

11. **½" MACHINE BOLTS** SHALL BE USED TO JOIN TWO OR MORE FRAMES TOGETHER AND TO THE "H" BEAM.

12. **METAL PARTS** SHALL BE STRUCTURAL GRADE STEEL AND ALL EXPOSED METAL PARTS SHALL BE GALVANIZED.

13. **½" x 8" BOLTS** WITH SQUARE HEADS AND NUTS SHALL BE PLACED AT OUTSIDE CORNER OF BASIN.

14. **A STAINLESS STEEL INLET MARKER** PER SPECIAL PROVISIONS SECTION 303-1.4.4.1 WITH THE WORDS "NO DUMPING DRAINS TO RIVERS" SHALL BE AFFIXED ON TOP OF THE INLET WITH SIKABOND ADHESIVE OR APPROVED EQUAL.

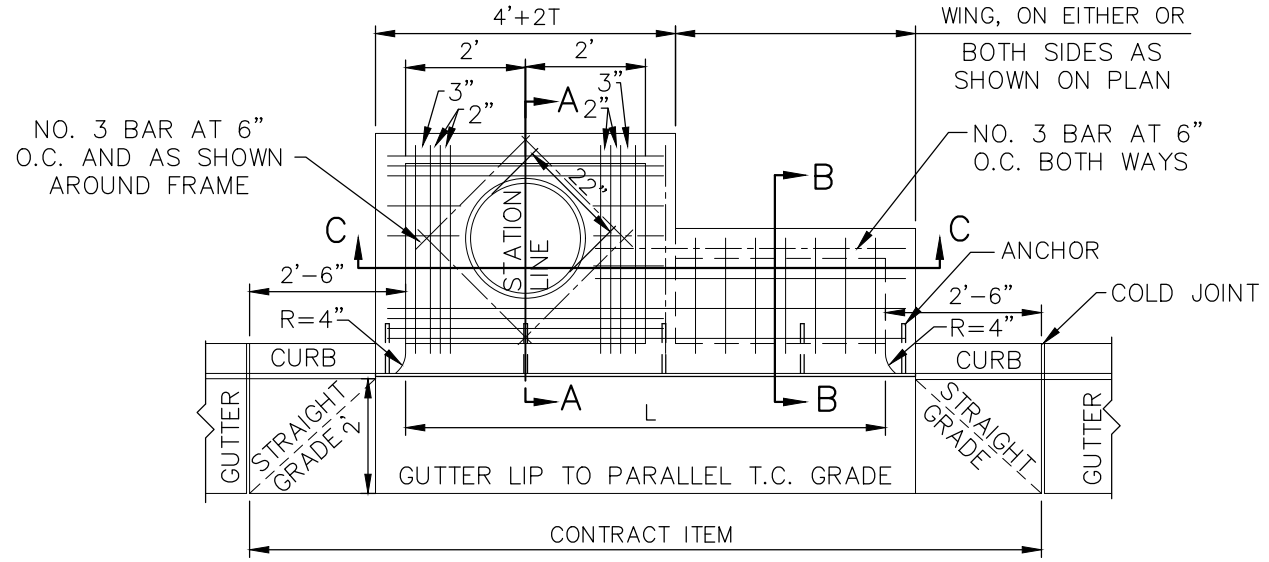
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CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

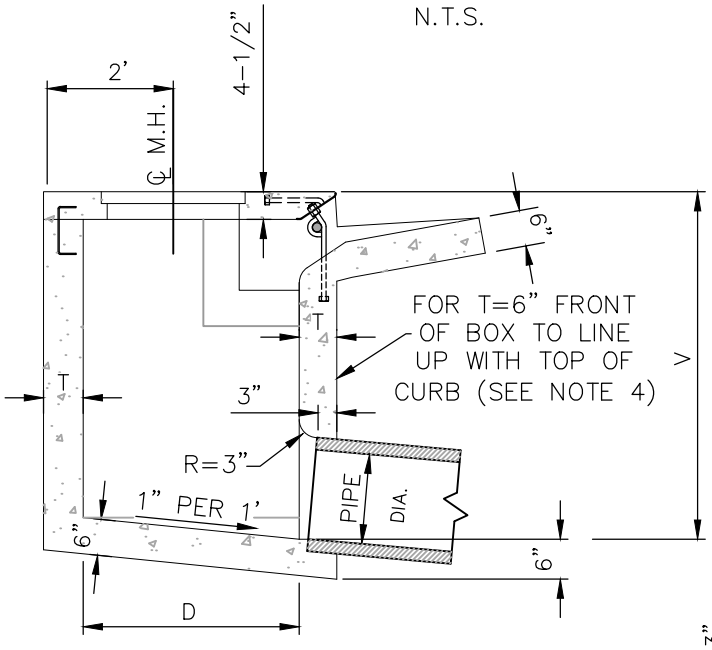
CATCH BASIN TYPE 4

STANDARD DRAWING NO. 406

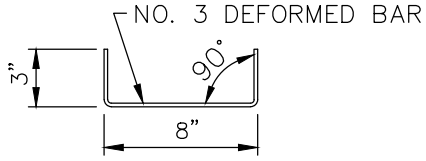


PLAN VIEW

N.T.S.



SECTION A-A



DETAIL OF DOWEL

N.T.S.

TO BY USED WHEN TOP IS POURED SEPARATE, ONE AT EACH CORNER

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CITY ENGINEER

06/06/2025
DATE

CITY OF RIVERSIDE

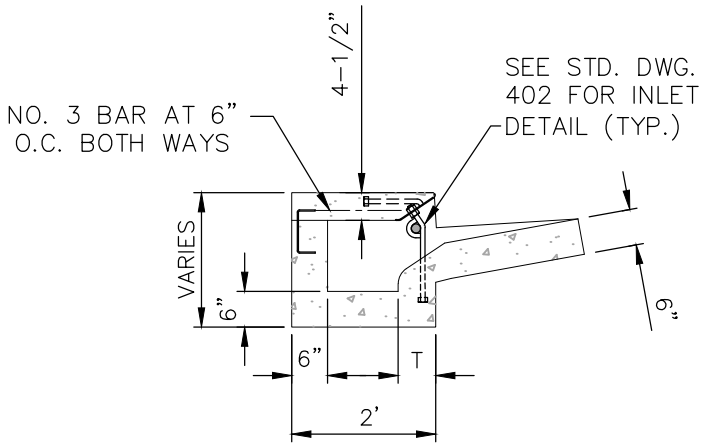
PUBLIC WORKS DEPARTMENT

MARK	REVISIONS	APPR.	DATE

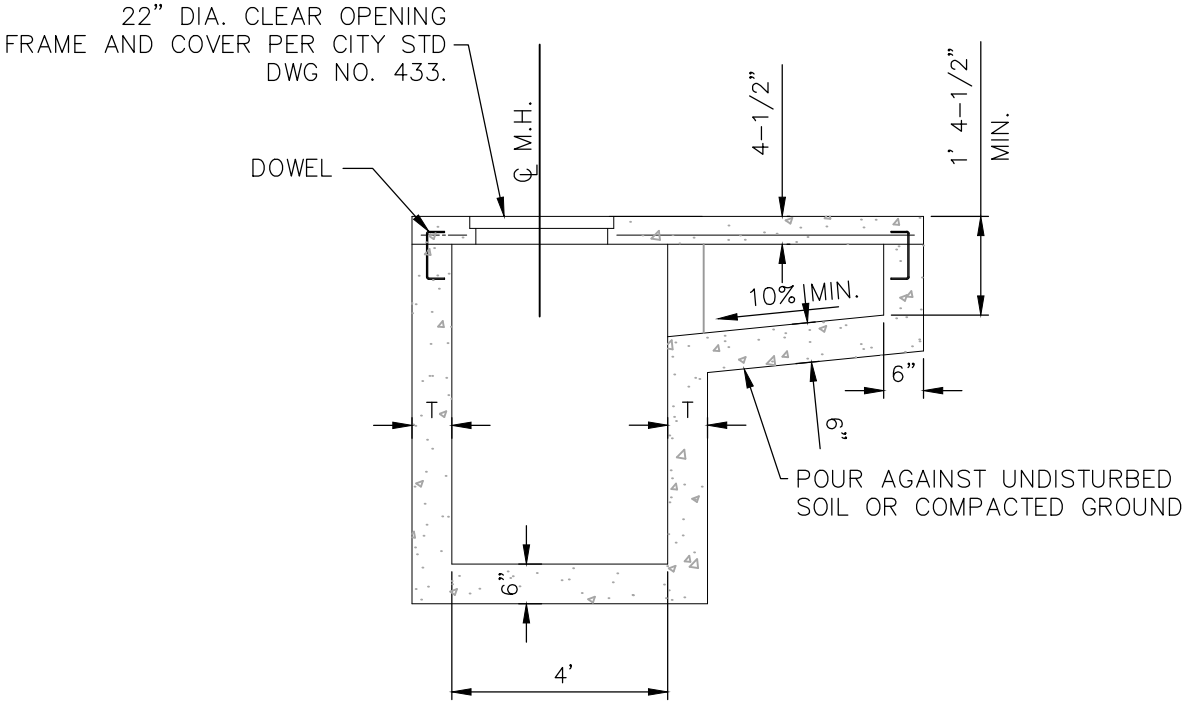
CATCH BASIN TYPE 5

STANDARD DRAWING NO. 407

Sheet 1 of 3



SECTION B–B



SECTION C–C

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06/06/2025
DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 5

STANDARD DRAWING NO. 407

Sheet 2 of 3

MARK	REVISIONS	APPR.	DATE

NOTES:

1. **CONCRETE** SHALL BE 560-C-3250 PORTLAND CEMENT CONCRETE.

2. **CONNECTOR PIPE** SHALL BE HORIZONTALLY CENTERED ON THE WALL OF THE DEEP PORTION OF THE CATCH BASIN WHICH FACES THE CONNECTOR PIPE.

3. **CURVATURE** OF THE LIP AND SIDEWALLS AT THE OPENING SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE MADE BY PLASTERING.

4. **DIMENSIONS:**
   "L" SHALL BE AS SPECIFIED ON THE PLAN (8' MIN.)
   "V" SHALL BE AS SPECIFIED ON THE PLAN.
   "D" = 3' UNLESS OTHERWISE SPECIFIED ON THE PLAN.
   "T" = 6" IF "V" IS 4' OR LESS
   "T" = 8" IF "V" IS BETWEEN 4' AND 8'
   "T" = 10" IF "V" IS 8' OR MORE
   "T" > 6", WIDENING OF WALL SHALL BE ON STREET SIDE.

5. **CHANNEL** SHALL BE CONSTRUCTED IN CATCH BASINS HAVING INLET PIPES. WHERE "V" MINUS SHELF HEIGHT IS LESS THAN 2-1/2' THE CHANNEL MAY BE OMITTED. SEE STANDARD DRAWING NO. 405 FOR CHANNEL DETAIL.

6. **PIPES** SHALL BE TRIMMED TO THE FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.

7. **SURFACE** OF ALL EXPOSED CONCRETE IN BASIN SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH AND SCORING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN AND SHALL BE FREE FROM PROTRUDING WIRES AND NAILS. FLOOR OF CHANNEL SHALL BE GIVEN A STEEL-TROWLED FINISH.

8. **TOP OF BASIN** SHALL SLOPE 2% TOWARD THE CURB EXCEPT WHEN OTHERWISE SHOWN ON THE PLAN OR TO FIT EXISTING SIDEWALK. TOP OF BASIN SHALL BE POURED MONOLITHICALLY WITH SIDEWALK IF THE SIDEWALK IS IMMEDIATELY ADJACENT TO THE CURB.

9. **FRAME AND COVER** SHALL BE LOCATED AS SHOWN ON SHEET 2 UNLESS OTHERWISE SHOW ON THE PLAN.

10. **A STAINLESS STEEL INLET MARKER** PER SPECIAL PROVISIONS SECTION 303-1.4.4.1 WITH THE WORDS "NO DUMPING DRAINS TO RIVERS" SHALL BE AFFIXED ON TOP OF THE INLET WITH SIKABOND ADHESIVE OR APPROVED EQUAL.

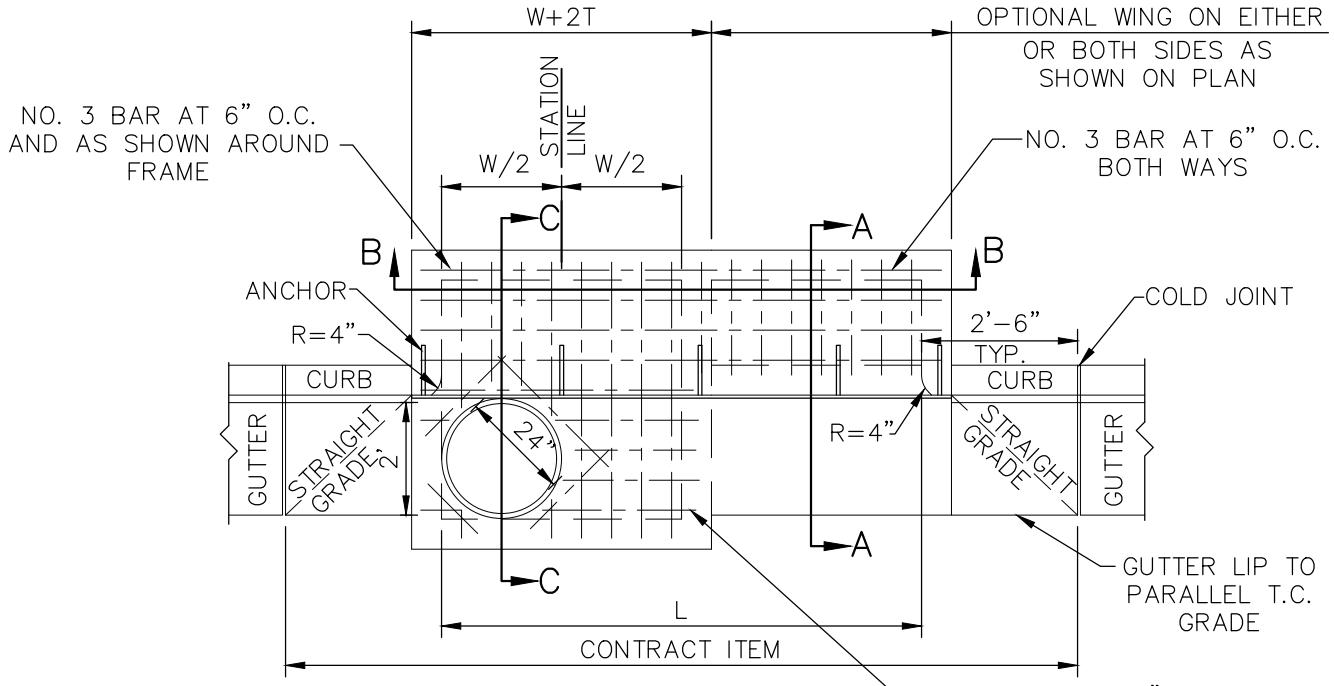
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CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

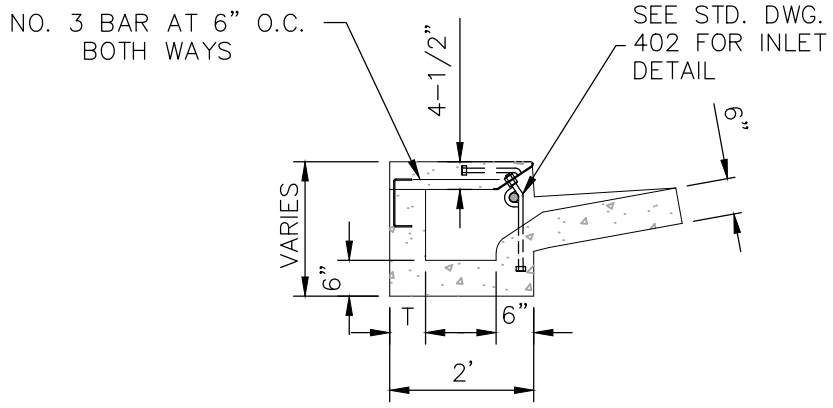
CATCH BASIN TYPE 5

STANDARD DRAWING NO. 407

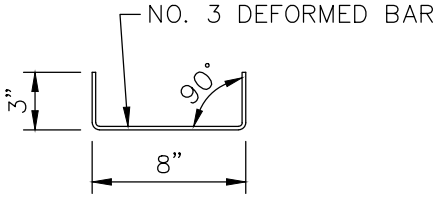


PLAN VIEW

N.T.S.



SECTION A-A



DETAIL OF DOWEL

N.T.S.

TO BE USED WHEN TOP IS POURED SEPARATE, ONE AT EACH CORNER

APPROVED BY:

CITY ENGINEER

06/06/2025

DATE

CITY OF RIVERSIDE

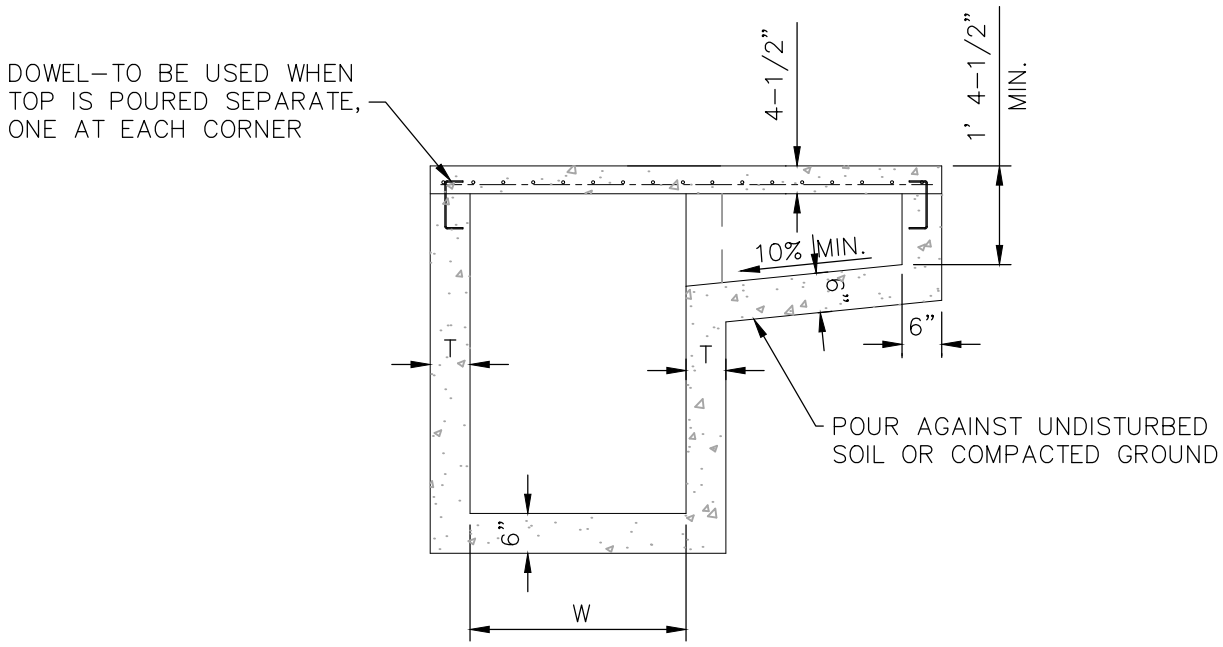
PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 6

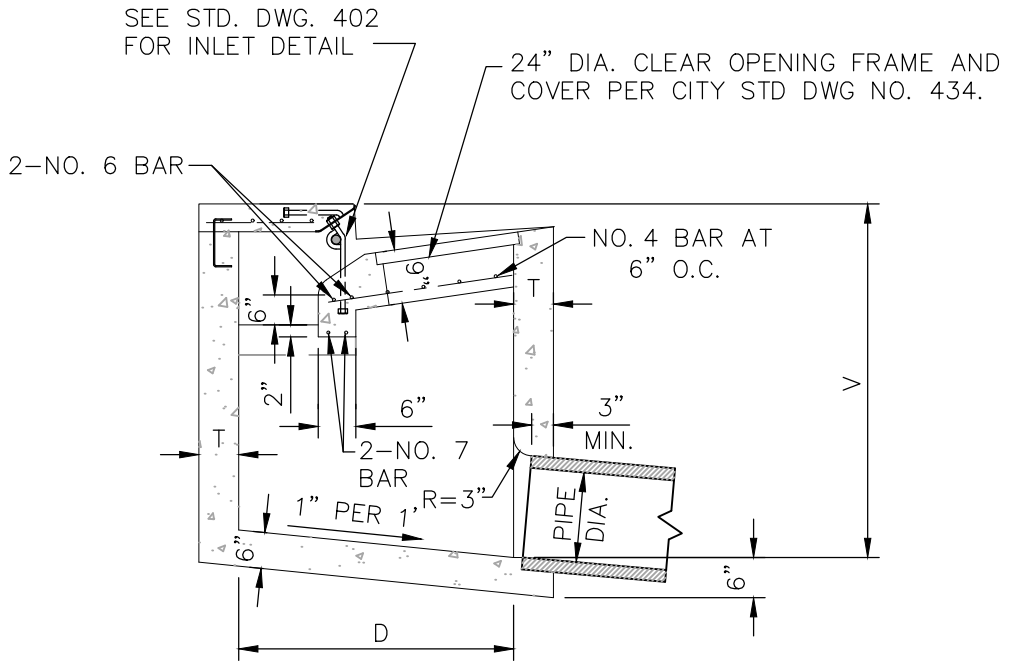
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Sheet 1 of 3

MARK	REVISIONS	APPR.	DATE



SECTION B–B



SECTION C–C

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CITY ENGINEER		DATE	
MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 6

STANDARD DRAWING NO. 408

NOTES:

1. **CONCRETE** SHALL BE CLASS 560-C-3250

2. **CURVATURE** OF THE LIP AND SIDEWALLS AT THE OPENING SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE MADE BY PLASTERING.

3. **DIMENSIONS:**
   "W" SHALL BE AS SPECIFIED ON THE PLAN. (7' MIN.)
   "L" SHALL BE AS SPECIFIED ON THE PLAN.
   "V" SHALL BE AS SPECIFIED ON THE PLAN.
   "D"= 4'-6" UNLESS OTHERWISE SPECIFIED ON THE PLAN.
   "T"= 6" IF "V" IS 4' OR LESS
   "T"= 8" IF "V" IS BETWEEN 4' AND 8'
   "T"= 10" IF "V" IS 8' OR MORE.

4. **CHANNEL** SHALL BE CONSTRUCTED IN CATCH BASINS HAVING INLET PIPES. WHERE "V" MINUS SHELF HEIGHT IS LESS THAN 2-1/2' THE CHANNEL MAY BE OMITTED. SEE STANDARD DRAWING NO. 405 CHANNEL DETAIL.

5. **PIPES** SHALL BE TRIMMED TO THE FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.

6. **SURFACE** OF ALL EXPOSED CONCRETE IN BASIN SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH AND SCORING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN AND SHALL BE FREE FROM PROTRUDING WIRES AND NAILS. FLOOR OF CHANNEL SHALL BE GIVEN A STEEL-TROWELED FINISH.

7. **TOP OF BASIN** SHALL SLOPE 2% TOWARD THE CURB EXCEPT WHEN OTHERWISE SHOWN ON THE PLAN OR TO FIT EXISTING SIDEWALK. TOP OF BASIN SHALL BE POURED MONOLITHICALLY WITH SIDEWALK IF THE SIDEWALK IS IMMEDIATELY ADJACENT TO THE CURB.

8. **FRAME AND COVER** SHALL BE LOCATED AS SHOWN ON SHEET 2 UNLESS OTHERWISE SHOWN ON THE PLAN.

9. **A STAINLESS STEEL INLET MARKER** PER SPECIAL PROVISIONS SECTION 303-1.4.4.1 WITH THE WORDS "NO DUMPING DRAINS TO RIVERS" SHALL BE AFFIXED ON TOP OF THE INLET WITH SIKABOND ADHESIVE OR APPROVED EQUAL.

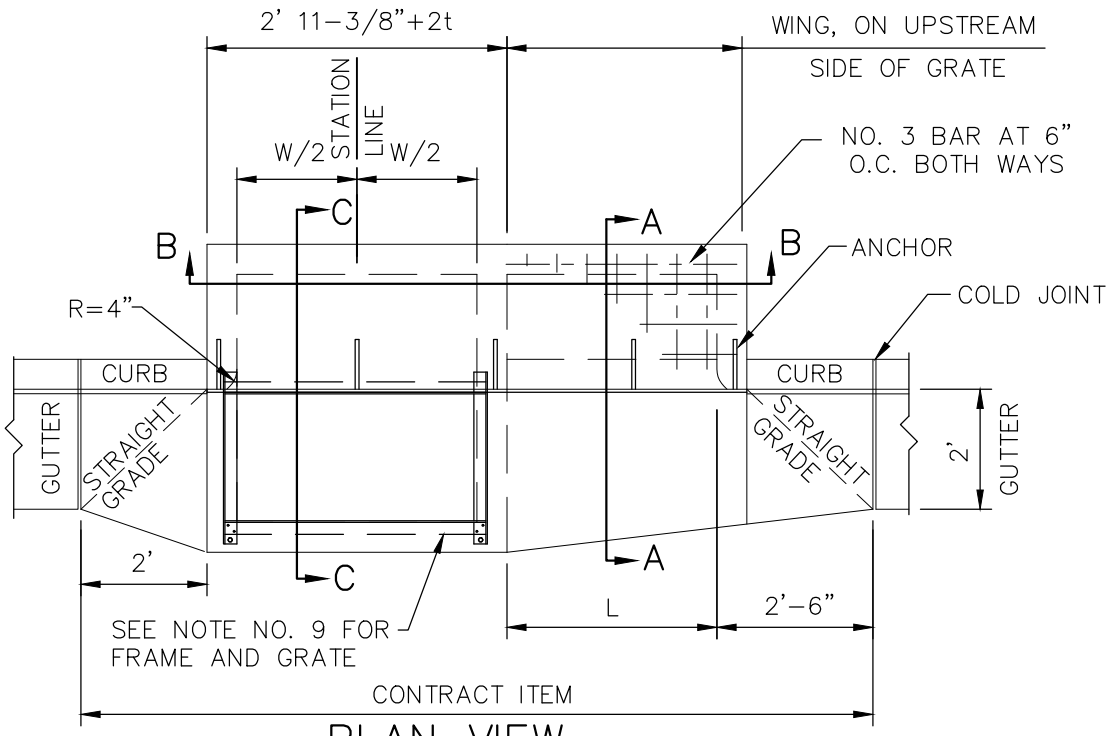
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CITY ENGINEER DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

MARK	REVISIONS	APPR.	DATE

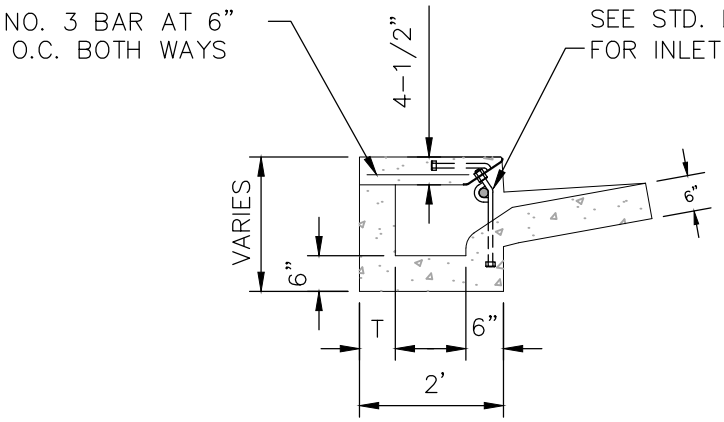
CATCH BASIN TYPE 6

STANDARD DRAWING NO. 408

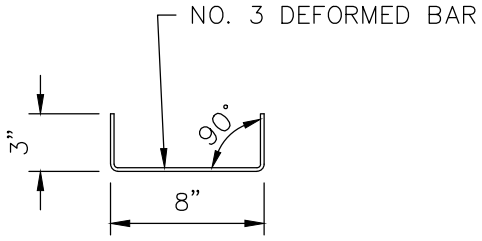


PLAN VIEW

N.T.S.



SECTION A–A



DETAIL OF DOWEL

N.T.S.

TO BE USED WHEN TOP IS POURED SEPARATE, ONE AT EACH CORNER

APPROVED BY:

CITY ENGINEER

06/06/2025

DATE

CITY OF RIVERSIDE

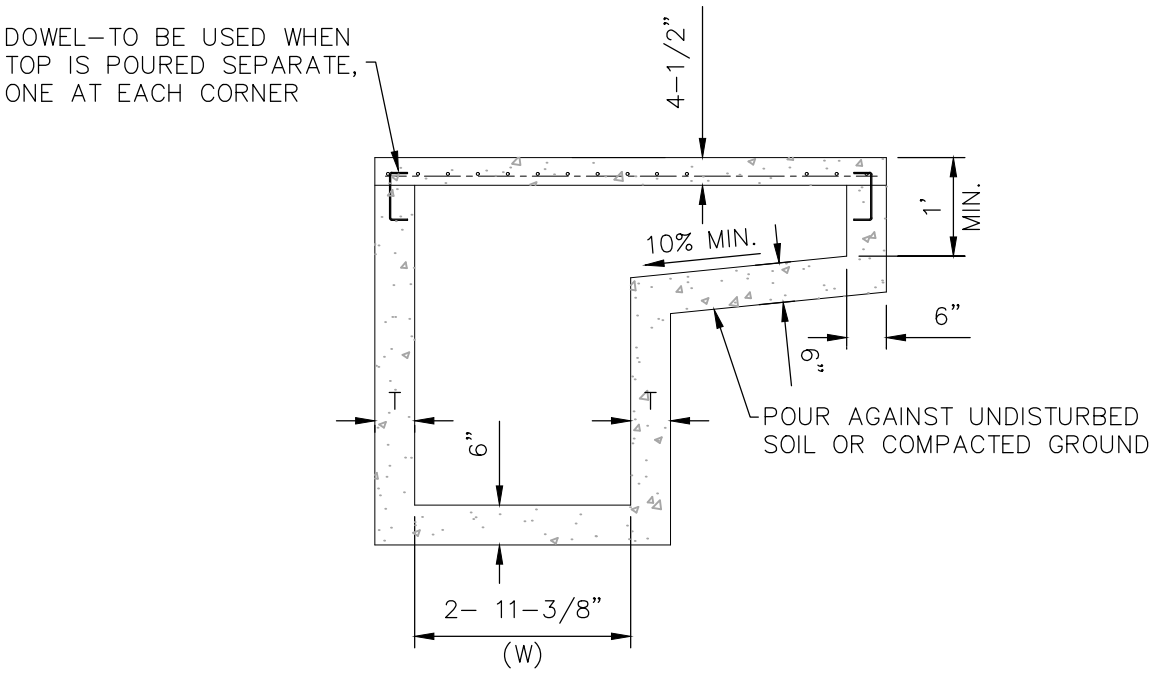
PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 7

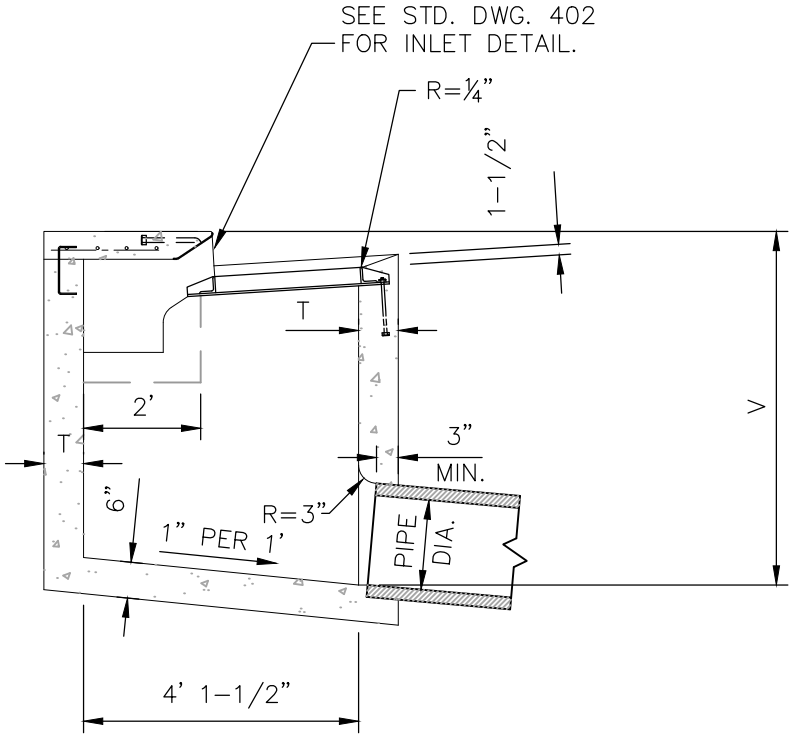
STANDARD DRAWING NO. 409

Sheet 1 of 3

MARK	REVISIONS	APPR.	DATE



SECTION B–B



SECTION C–C

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06/06/2025
DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 7

STANDARD DRAWING NO. 409

Sheet 2 of 3

MARK	REVISIONS	APPR.	DATE

NOTE:

1. **CONCRETE** SHALL BE CLASS 560-C-3250.

2. **CURVATURE** OF THE LIP AND SIDEWALLS AT THE OPENING SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE MADE BY PLASTERING.

3. **DIMENSIONS:**
   "L" SHALL BE AS SPECIFIED ON PLAN (4' MIN.)
   "V" SHALL BE AS SPECIFIED ON PLAN
   "T" = 6" IF "V" IS 4' OR LESS
   "T" = 8" IF "V" IS BETWEEN 4' AND 8'
   "T" = 10" IF "V" IS 8' OR MORE

4. **CHANNEL** SHALL BE CONSTRUCTED IN CATCH BASINS HAVING INLET PIPES. WHERE "V" MINUS SHELF HEIGHT IS LESS THAN 2-1/2' THE CHANNEL MAY BE OMITTED. SEE STANDARD DRAWING NO. 405 FOR CHANNEL DETAIL.

5. **PIPES** SHALL BE TRIMMED TO THE FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.

6. **SURFACE** OF ALL EXPOSED CONCRETE IN BASIN SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH AND SCORING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN AND SHALL BE FREE FROM PROTRUDING WIRES AND NAILS. FLOOR OF CHANNEL SHALL BE GIVEN A STEEL-TROWELED FINISH.

7. **TOP OF BASIN** SHALL SLOPE 2% TOWARD THE CURB EXCEPT WHEN OTHERWISE SHOWN ON THE PLAN OR TO FIT EXISTING SIDEWALK. TOP OF BASIN SHALL BE POURED MONOLITHICALLY WITH SIDEWALK IF THE SIDEWALK IS IMMEDIATELY ADJACENT TO THE CURB.

8. **FRAME** SHALL BE ALHAMBRA FOUNDRY A-1540 OR APPROVED EQUAL BY CITY; GRATE SHALL BE A-1546 OR APPROVED EQUAL BY CITY.

9. **METAL PARTS** SHALL BE STRUCTURAL GRADE STEEL AND ALL EXPOSED METAL PARTS SHALL BE GALVANIZED.

10. **A STAINLESS STEEL INLET MARKER** PER SPECIAL PROVISIONS SECTION 303-1.4.4.1 WITH THE WORDS "NO DUMPING DRAINS TO RIVERS" SHALL BE AFFIXED ON THE TOP OF THE INLET WITH SIKABOND ADHESIVE OR APPROVED EQUAL.

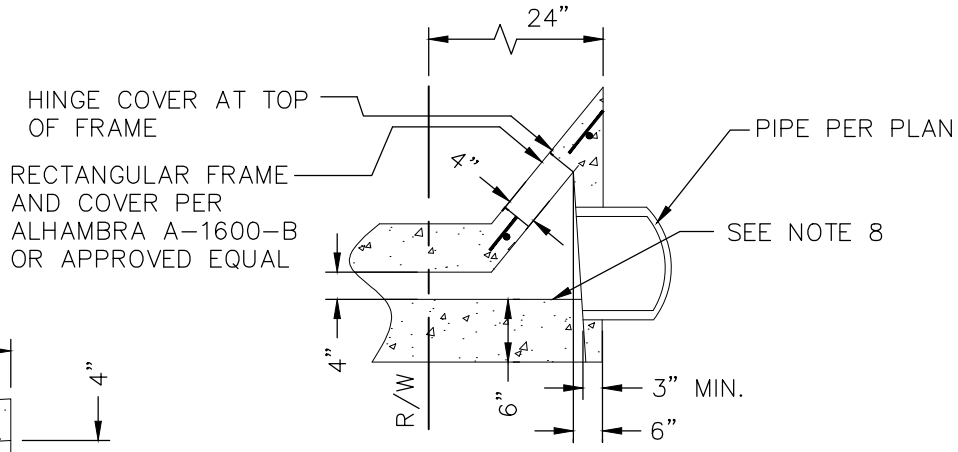
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CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

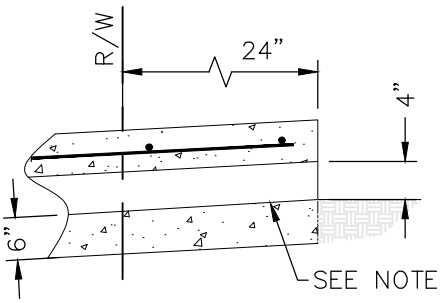
CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 7

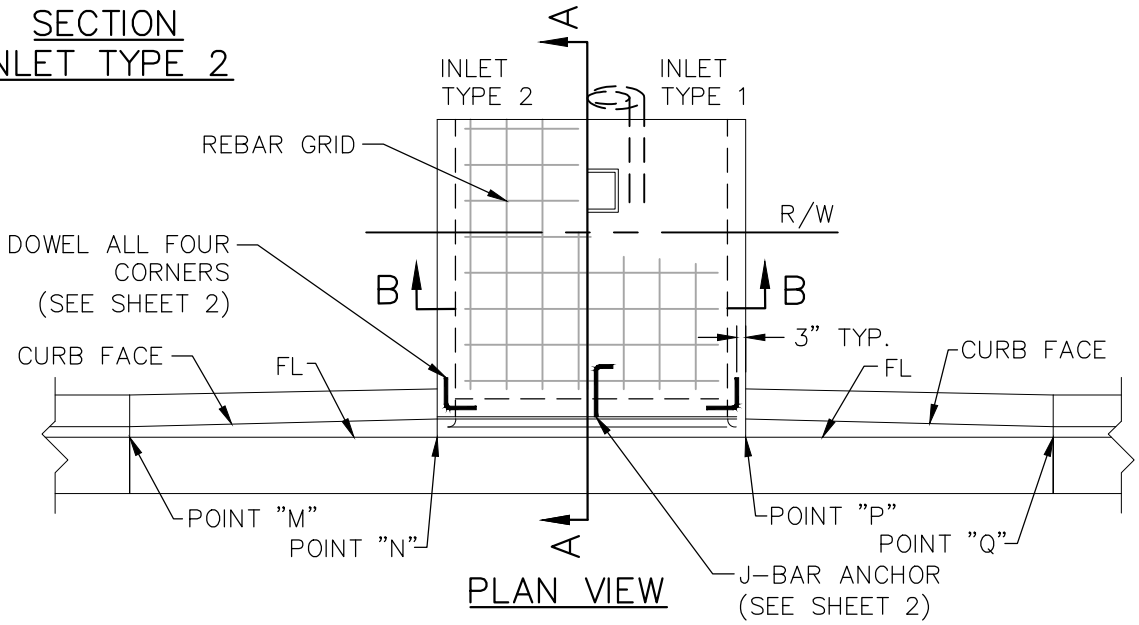
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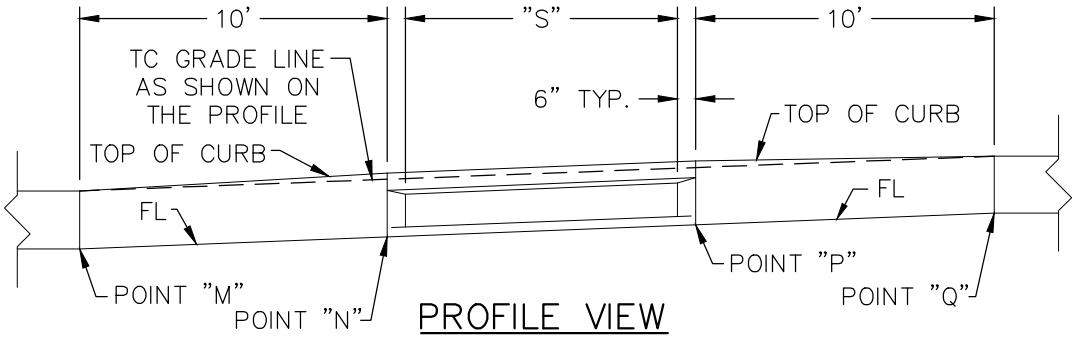
SECTION
INLET TYPE 1



SECTION
INLET TYPE 2



PLAN VIEW



PROFILE VIEW

APPROVED BY: _____ 03/01/2023
CITY ENGINEER DATE

CITY OF RIVERSIDE

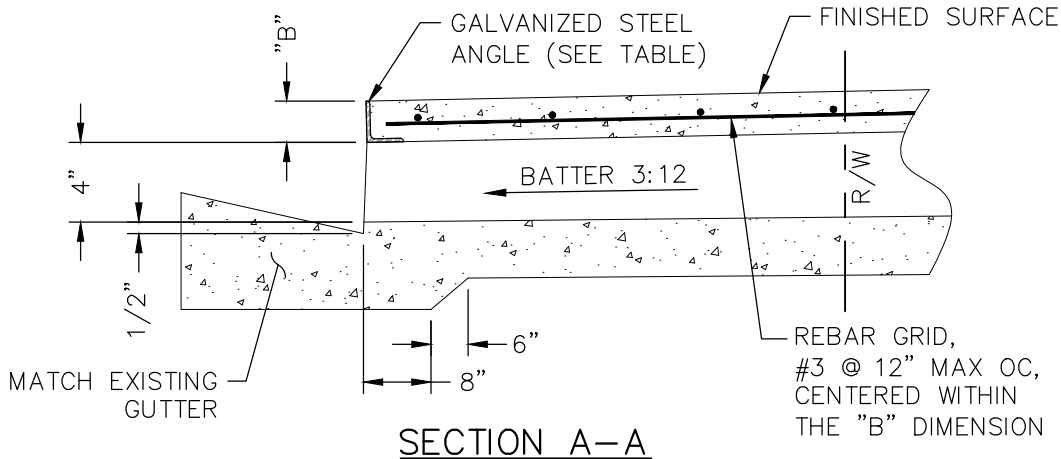
PUBLIC WORKS DEPARTMENT

PARKWAY DRAIN

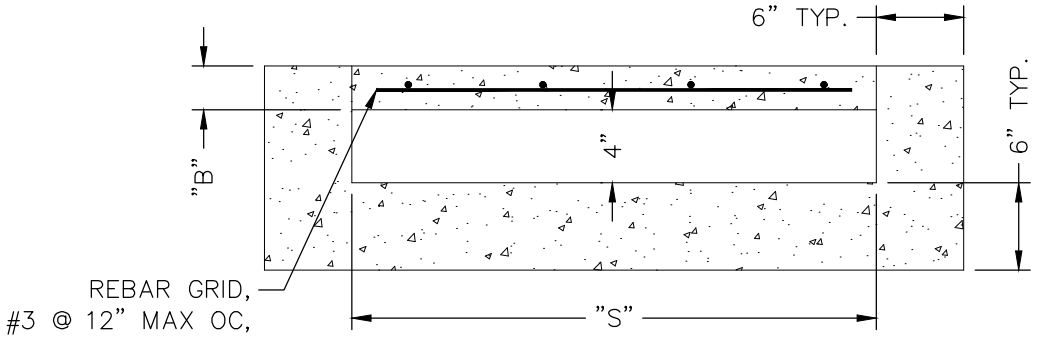
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Sheet 1 of 3

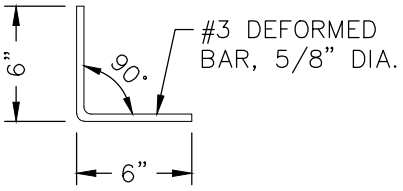
MARK	REVISIONS	APPR.	DATE



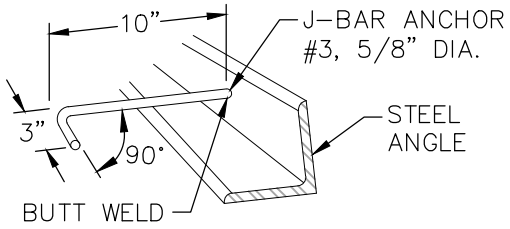
SECTION A–A



SECTION B–B



DOWEL DETAIL



J–BAR ANCHOR

"S"	J–BAR SPACING, (INCHES)
12"	7"
18"	7"
24"	7"
30"	7"
36"	7"
42"	6"
48"	5"
54"	5"
60"	5"
66"	4"
72"	3–1/2"

NOTE:
1. DOWELS TO BE POURED WITH THE DRAIN WALLS TO CONNECT WITH THE TOP OF THE DRAIN, ONE AT EACH CORNER.

"S" (INCHES)	"B" (INCHES)	J–BAR ANCHOR QUANTITY	GALVANIZED STEEL ANGLE (INCHES)
18" OR LESS	3"	2	2–1/2" x 2" x 3/8"
24"	4"	2	3–1/2" x 3" x 1/2"
30" OR GREATER	4"	3	3–1/2" x 3" x 1/2"

APPROVED BY:
CITY ENGINEER
03/01/2023
DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

PARKWAY DRAIN

STANDARD DRAWING NO. 410

GENERAL NOTES:

1. FLOOR OF DRAIN BOX SHALL BE TROWELED SMOOTH.
2. IF THE TOE OF SLOPE IS ALLOWED WITHIN THE R/W, INLET (TYPE 1) BEGINS AT THE TOE RATHER THAN AT THE R/W LINE.
3. FOR OPEN DITCH (TYPE 2), THE 24 INCH EXTENSION BEYOND THE R/W LINE IS NOT REQUIRED WHEN BACK OF WALK IS 24 INCHES OR MORE FROM THE R/W LINE IN ANY EVENT.
4. TOP OF INLET STRUCTURE (TYPE 1 AND 2) SHALL BE FLUSHED WITH ADJACENT SURFACE WHERE PRACTICAL.
5. A HEADED STEEL STUD 5/8" x 6-3/8", 1" HEAD, ATTACHED BY A FULL PENETRATION BUTT WELD MAY BE USED AS AN ALTERNATE ANCHOR.
6. CURB FACE TO MATCH EXISTING AT POINTS "M" AND "Q". CURB FACE "B" + 5 INCHES AT POINTS "N" AND "P".
7. THE 3 INCH LEG OF THE J-BAR ANCHORS SHALL BE PARALLEL TO THE TOP OF SIDEWALK.
8. SLOPE = 2%

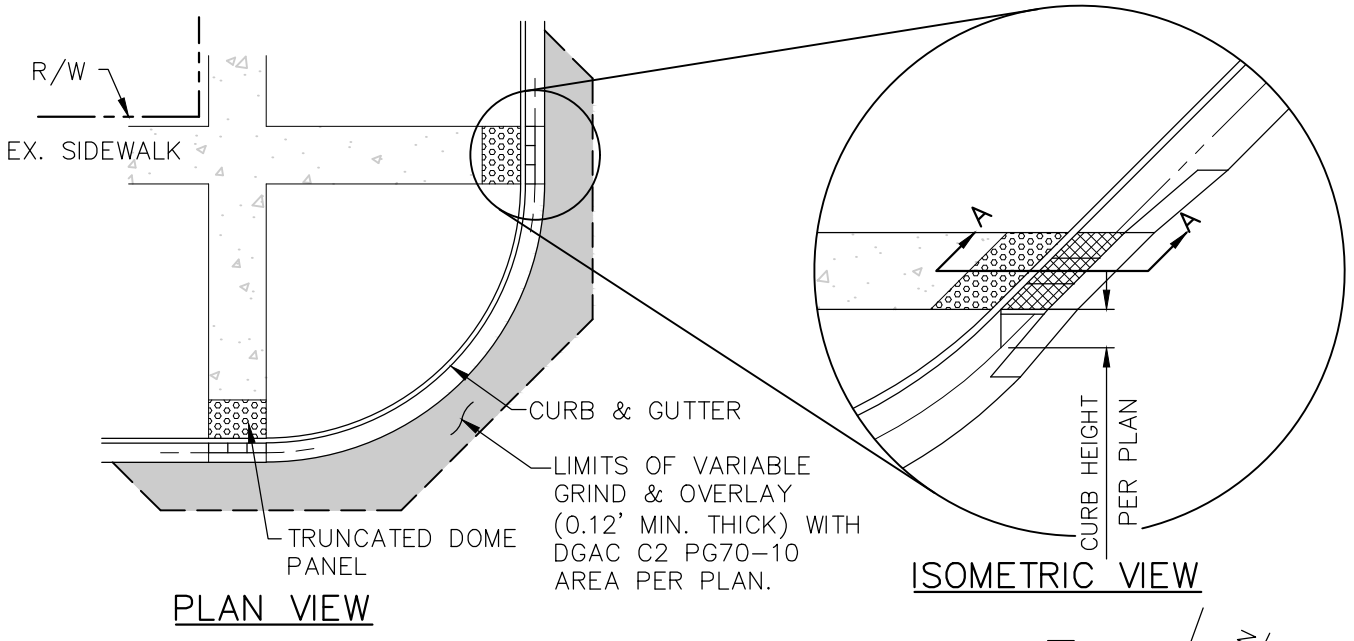
APPROVED BY: _____ 03/01/2023
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

PARKWAY DRAIN

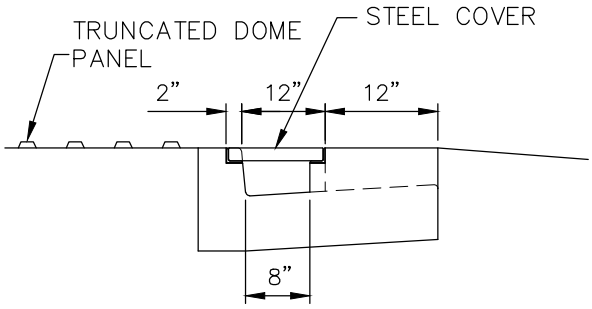
STANDARD DRAWING NO. 410



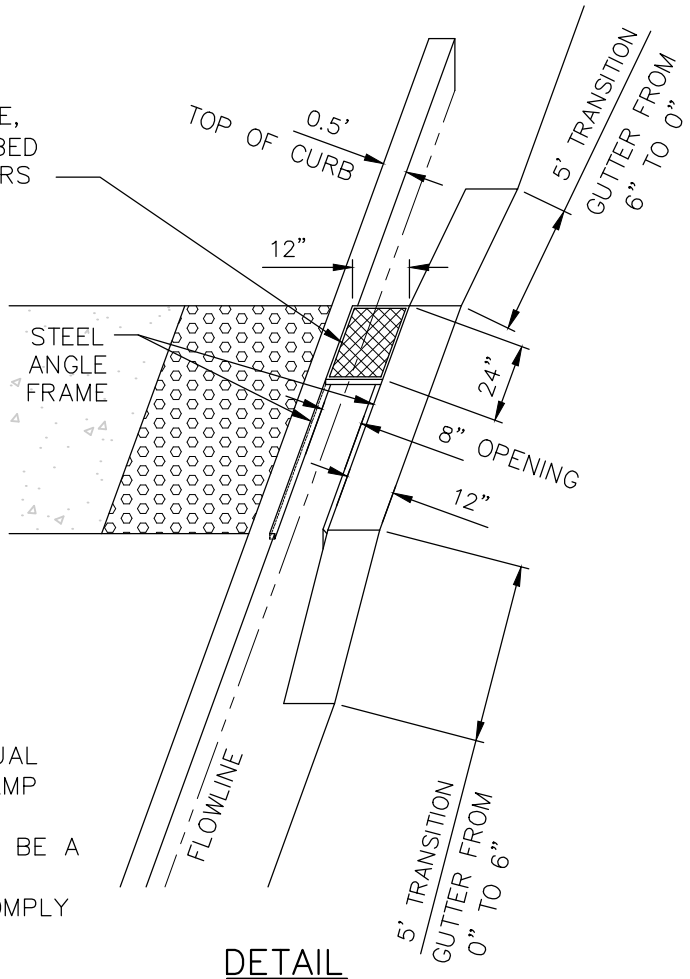
PLAN VIEW

ISOMETRIC VIEW

SOLID STEEL COVER WITH STEEL ANGLE FRAME, 3 COVERS (12" WIDE X 24" LONG EACH), EMBED ANGLE FRAME IN NEW CONCRETE, WELD COVERS TO ANGLE FRAME. ALHAMBRA FOUNDRY PART #A-2432 OR APPROVED EQUAL.



SECTION A-A



DETAIL

NOTES:

1. MODIFY DETAIL AS NECESSARY FOR ACTUAL FIELD CONDITIONS AT PROPOSED ADA RAMP LOCATION.
2. NEW CURB, GUTTER AND CULVERT SHALL BE A MONOLITHIC POUR.
3. ALL PROPOSED IMPROVEMENTS SHALL COMPLY WITH ALL APPLICABLE CITY OF RIVERSIDE STANDARD PLANS.

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

MARK	REVISIONS	APPR.	DATE

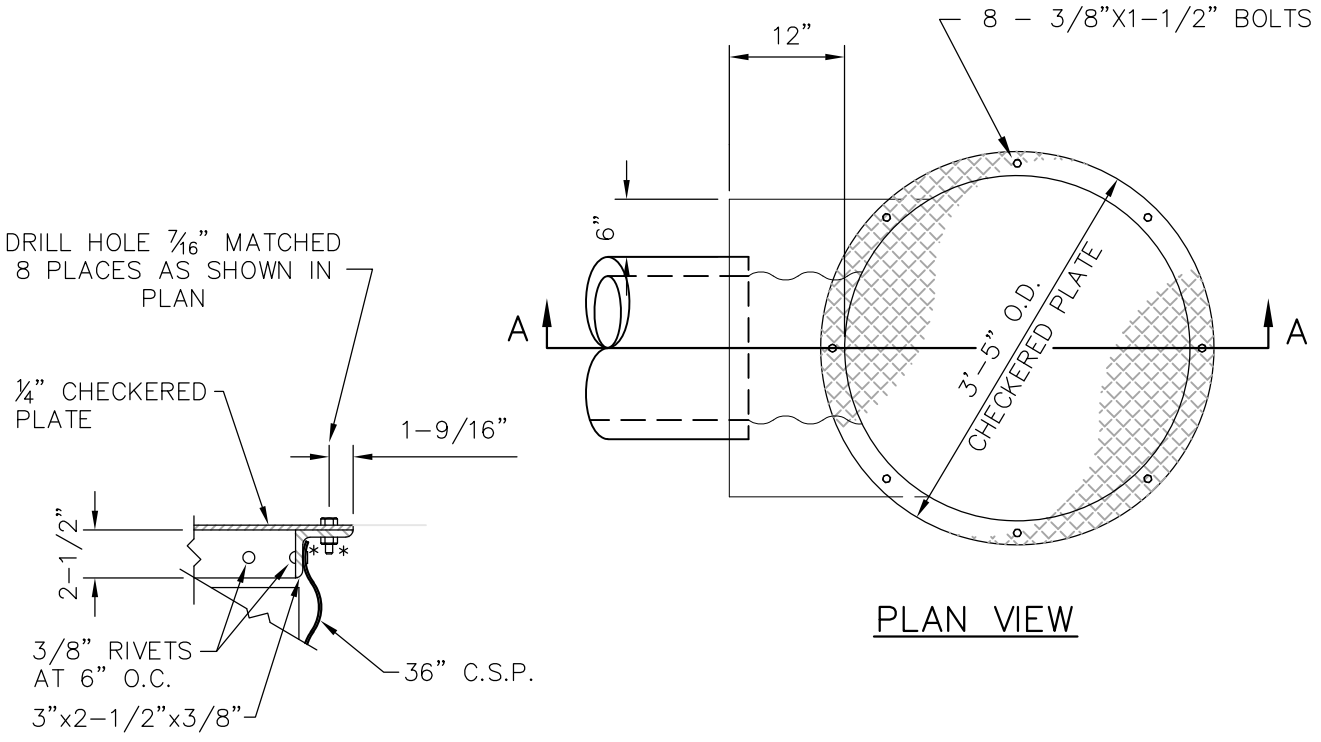
CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

CULVERT RAMP DETAIL

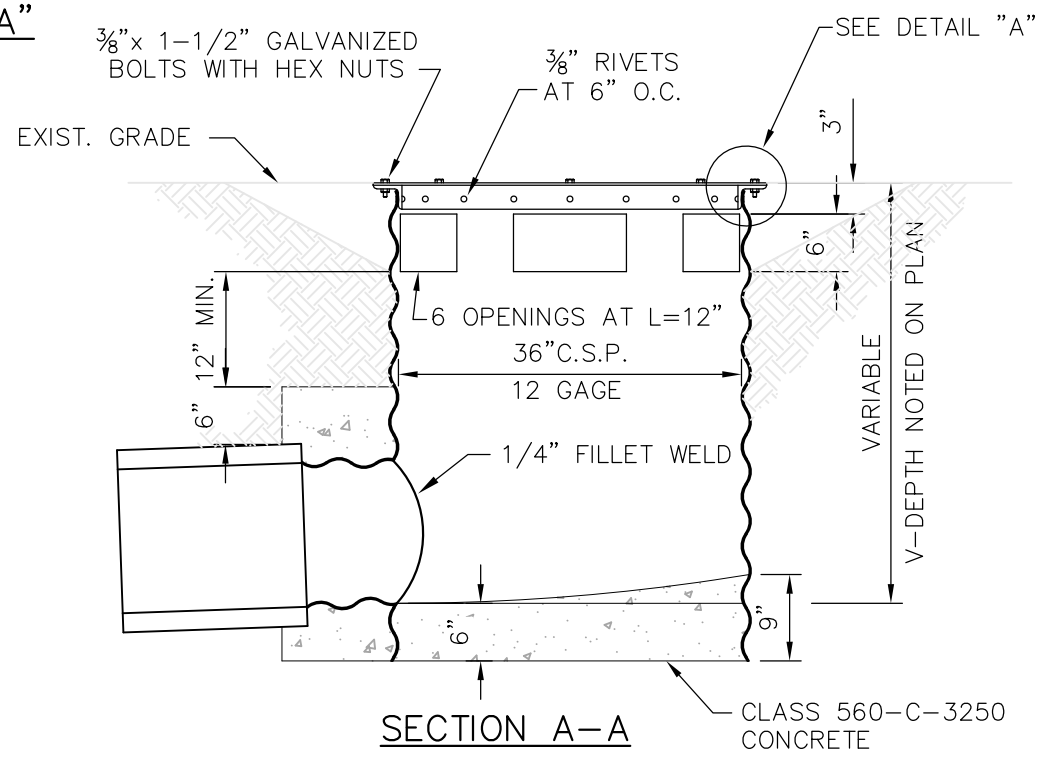
STANDARD DRAWING NO. 411

Sheet 1 of 1



PLAN VIEW

DETAIL "A"



SECTION A–A

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CITY OF RIVERSIDE

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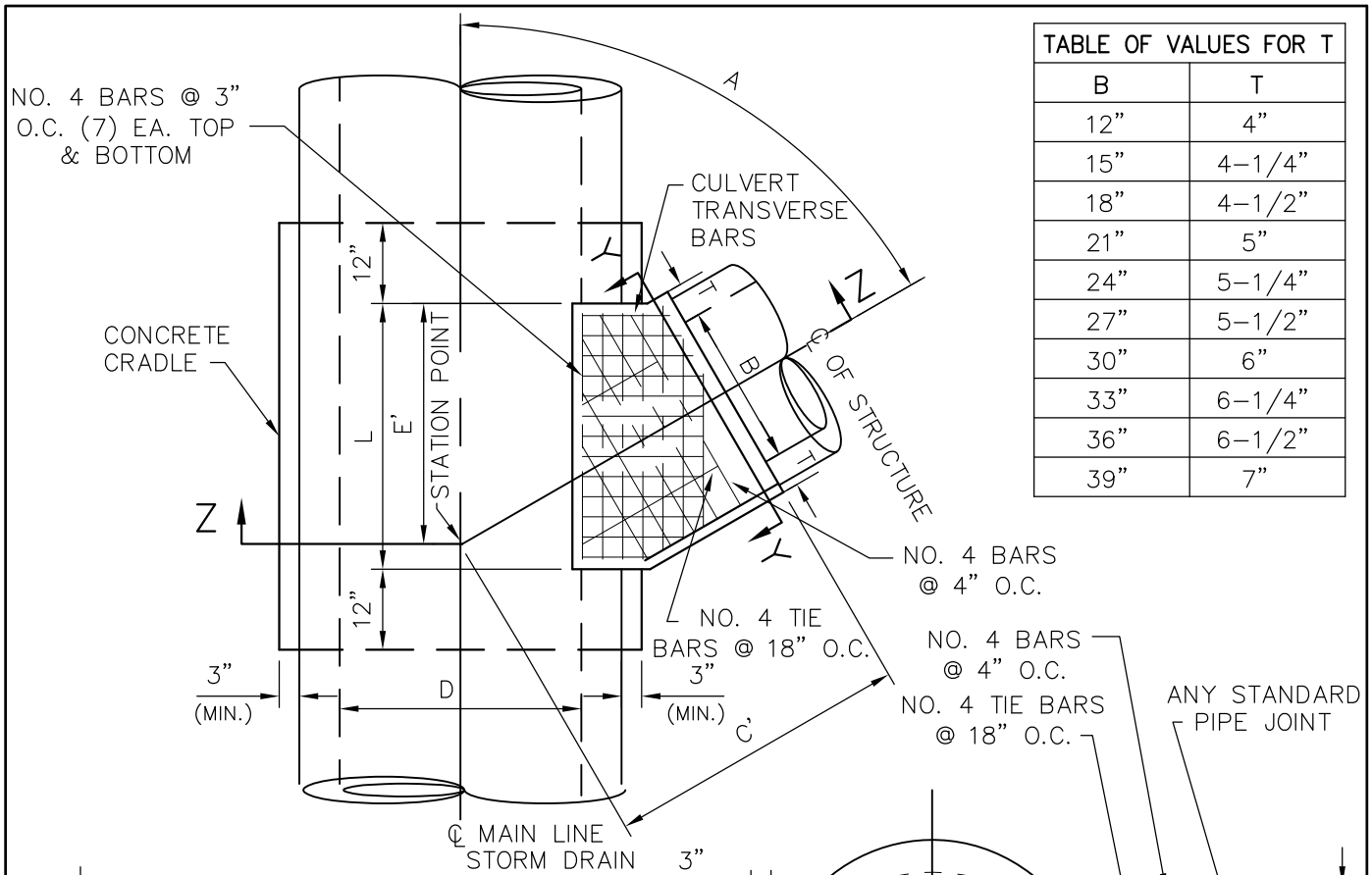
C.S.P. INLET

STANDARD DRAWING NO. 412

Sheet 1 of 1

MARK	REVISIONS	APPR.	DATE

TABLE OF VALUES FOR T	
B	T
12"	4"
15"	4–1/4"
18"	4–1/2"
21"	5"
24"	5–1/4"
27"	5–1/2"
30"	6"
33"	6–1/4"
36"	6–1/2"
39"	7"



NOTES:

1. VALUES FOR A, B, C', D, E', & L, ELEVATIONS "R" AND "S" SHOWN ON IMPROVEMENT PLAN. (SEE SHEET 2 OF 2).
2. CRADLE MAY BE OMITTED ON SIDE OPPOSITE LATERAL INLET WHEN CONNECTING WITH EXISTING STORM DRAIN PIPE.
3. TRANSVERSE REINFORCEMENT IN PIPE SHALL BE CUT IN CENTER OF OPENING AND BENT TO UNIFORM DISTANCE FROM TOP AND BOTTOM OF JUNCTION STRUCTURE.
4. CONCRETE SHALL BE CLASS 560–C–3250.
5. REINFORCING STEEL SHALL BE 1.5" CLEAR FROM FACE OF CONCRETE.
6. FLOOR OF STRUCTURE SHALL BE STEEL–TROWELED TO SPRING LINE.

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

JUNCTION STRUCTURE B

STANDARD DRAWING NO. 421

Sheet 1 of 2

MARK	REVISIONS	APPR.	DATE

STORM DRAIN MAIN

D/D2	ANGLE VALUE	30	40	50	60	70	80
12	C	2.2	1.8	1.6	1.5	1.4	1.3
	E	1.4	1.0	0.7	0.5	0.3	0.1
15	C	2.5	2.0	1.8	1.6	1.5	1.5
	E	1.7	1.2	0.8	0.6	0.4	0.2
18	C	2.8	2.3	2.0	1.8	1.7	1.6
	E	1.9	1.3	0.9	0.6	0.4	0.2
21	C	3.1	2.5	2.2	2.0	1.9	1.8
	E	2.2	1.5	1.1	0.7	0.5	0.2
24	C	3.4	2.7	2.4	2.2	2.0	2.0
	E	2.5	1.7	1.2	0.8	0.5	0.3
27	C	3.7	3.0	2.6	2.3	2.2	2.1
	E	2.7	1.9	1.3	0.9	0.6	0.3
30	C	4.0	3.2	2.8	2.5	2.4	2.3
	E	3.0	2.1	1.5	1.0	0.6	0.3
33	C	4.3	3.4	3.0	2.7	2.5	2.4
	E	3.3	2.3	1.6	1.1	0.7	0.3
36	C	4.6	3.7	3.2	2.9	2.7	2.6
	E	3.5	2.4	1.7	1.2	0.7	0.4
39	C	4.9	3.9	3.4	3.0	2.9	2.7
	E	3.8	2.6	1.9	1.3	0.8	0.4
42	C	5.3	4.2	3.6	3.2	3.0	2.9
	E	4.1	2.8	2.0	1.4	0.9	0.4
45	C	5.5	4.4	3.8	3.4	3.2	3.1
	E	4.4	3.0	2.1	1.5	0.9	0.4
48	C	5.8	4.6	4.0	3.6	3.3	3.2
	E	4.6	3.2	2.2	1.5	1.0	0.5
51	C	6.2	4.9	4.2	3.8	3.5	3.4
	E	4.9	3.4	2.4	1.6	1.0	0.5
54	C	6.5	5.2	4.4	4.0	3.7	3.5
	E	5.2	3.6	2.5	1.7	1.1	0.5
57	C	6.8	5.4	4.6	4.1	3.8	3.7
	E	5.4	3.7	2.6	1.8	1.1	0.6
60	C	7.1	5.6	4.8	4.3	4.0	3.8
	E	5.7	3.9	2.8	1.9	1.2	0.6
63	C	7.4	5.9	5.0	4.5	4.2	4.0
	E	6.0	4.1	2.9	2.0	1.3	0.6
66	C	7.7	6.1	5.2	4.7	4.3	4.2
	E	6.2	4.3	3.0	2.1	1.3	0.6
69	C	8.0	6.4	5.4	4.9	4.5	4.3
	E	6.5	4.5	3.2	2.2	1.4	0.7
72	C	8.3	6.6	5.6	5.0	4.7	4.5
	E	6.8	4.7	3.3	2.3	1.4	0.7
75	C	8.6	6.8	5.8	5.2	4.8	4.6
	E	7.0	4.8	3.4	2.3	1.5	0.7
78	C	9.0	7.1	6.0	5.4	5.0	4.8
	E	7.3	5.0	3.5	2.4	1.5	0.7
81	C	9.3	7.3	6.2	5.6	5.2	4.9
	E	7.6	5.2	3.7	2.5	1.6	0.8
84	C	9.6	7.6	6.4	5.7	5.3	5.1
	E	7.9	5.4	3.8	2.6	1.7	0.8
87	C	9.9	7.8	6.6	5.9	5.5	5.3
	E	8.1	5.6	3.9	2.7	1.7	0.8
90	C	10.2	8.1	6.8	6.1	5.7	5.4
	E	8.4	5.8	4.1	2.8	1.8	0.9
93	C	10.5	8.3	7.0	6.3	5.8	5.6
	E	8.7	6.0	4.2	2.9	1.8	0.9
96	C	10.8	8.5	7.2	6.5	6.0	5.7
	E	8.9	6.2	4.3	3.0	1.9	0.9

STORM DRAIN LATERAL

B	ANGLE VALUE	30	40	50	60	70	80
12	C	1.4	1.0	0.7	0.5	0.3	0.1
	E	1.7	1.3	1.1	1.0	0.9	0.8
	L	3.3	2.6	2.2	1.9	1.8	1.7
15	C	1.7	1.2	0.8	0.6	0.4	0.2
	E	2.0	1.5	1.3	1.1	1.0	1.0
	L	3.9	3.0	2.6	2.3	2.1	2.0
18	C	1.9	1.3	0.9	0.6	0.4	0.2
	E	2.3	1.8	1.5	1.3	1.2	1.0
	L	4.5	3.5	2.9	2.6	2.4	2.0
21	C	2.2	1.5	1.1	0.7	0.5	0.2
	E	2.6	2.0	1.7	1.5	1.4	1.3
	L	5.2	4.0	3.4	3.0	2.7	2.6
24	C	2.5	1.7	1.2	0.8	0.5	0.3
	E	2.9	2.2	1.9	1.7	1.5	1.5
	L	5.8	4.5	3.8	3.3	3.1	2.9
27	C	2.7	1.9	1.3	0.9	0.6	0.3
	E	3.2	2.5	2.1	1.8	1.7	1.6
	L	6.3	4.9	4.1	3.7	3.4	3.2
30	C	3.0	2.1	1.5	1.0	0.6	0.3
	E	3.5	2.7	2.3	2.0	1.9	1.8
	L	7.0	5.4	4.6	4.0	3.7	3.6
33	C	3.3	2.3	1.6	1.1	0.7	0.3
	E	3.8	2.9	2.5	2.2	2.0	1.9
	L	7.6	5.9	4.9	4.4	4.0	3.9
36	C	3.5	2.4	1.7	1.2	0.7	0.4
	E	4.1	3.2	2.7	2.4	2.2	2.1
	L	8.2	6.4	5.3	4.7	4.3	4.1
39	C	3.8	2.6	1.9	1.3	0.8	0.4
	E	4.4	3.4	2.9	2.5	2.4	2.2
	L	8.8	6.9	5.8	5.1	4.7	4.5
42	C	4.1	2.8	2.0	1.4	0.9	0.4
	E	4.8	3.7	3.1	2.7	2.5	2.4
	L	9.5	7.4	6.2	5.5	5.1	4.8

EXAMPLE:

GIVEN D = 36" A = 60° B = 27"
FIND L, C', E'

SOLUTION:

1. ENTER STORM DRAIN MAIN TABLE WITH THE GIVEN D & A:

   C_M = 2.9' E_M = 1.2'

2. ENTER STORM DRAIN LATERAL TABLE WITH THE GIVEN B & A:

   C_L = 0.9' E_L = 1.8' L = 3.7'

3. C' = C_M + C
   C' = 2.9 ft. + 0.9 ft. = 3.8 ft.

4. E' = E_M + E_L
   E' = 1.2 ft. + 1.8 ft. = 3.0 ft.

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CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

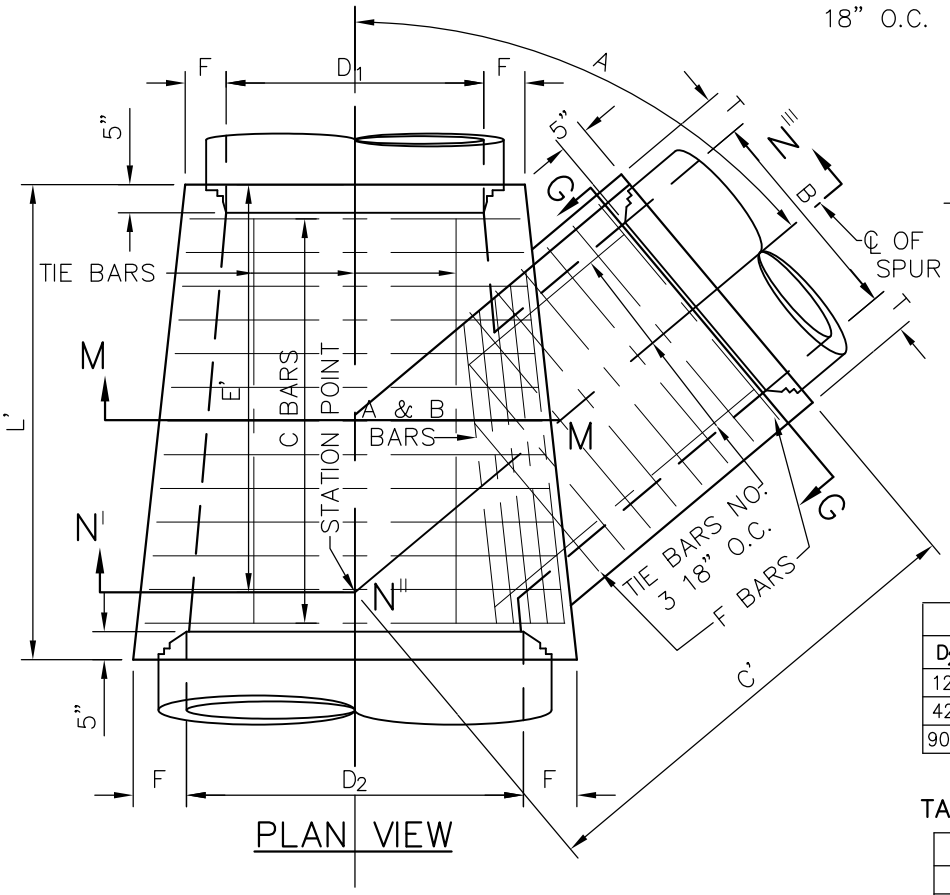
PUBLIC WORKS DEPARTMENT

JUNCTION STRUCTURE B

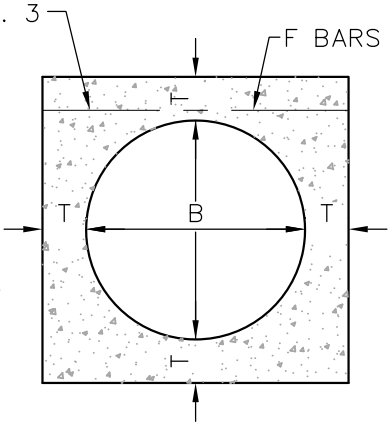
STANDARD DRAWING NO. 421

Sheet 2 of 2

MARK	REVISIONS	APPR.	DATE



PLAN VIEW



SECTION G–G

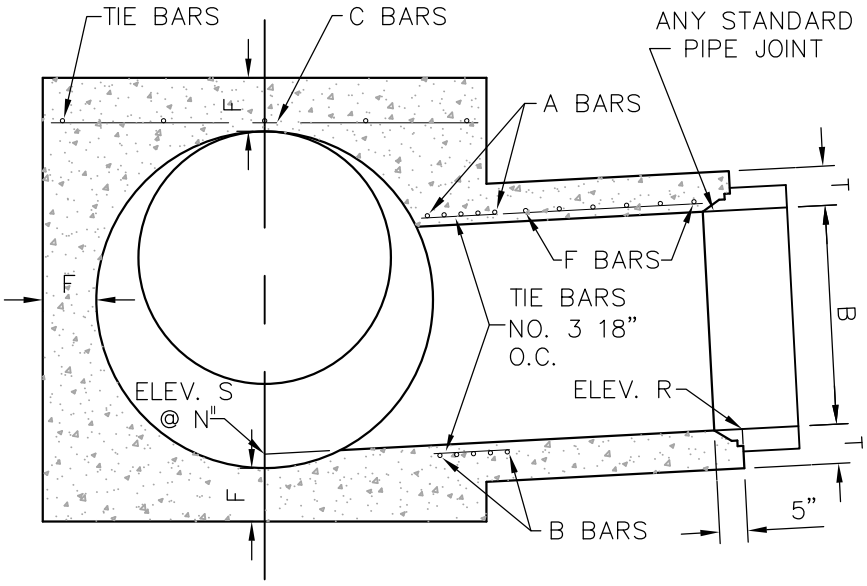
CONCRETE SPECS	
T	CONCRETE CLASS
4" – 9–1/2"	560–C–3250
10" – 11"	560–B–3250

TABLE OF BAR SIZES		
D_2 OR B	A & B BARS	C OR F BARS
12" – 39"	NO. 5 AT 3"	NO. 4 AT 6"
42" – 84"	NO. 6 AT 3"	NO. 5 AT 6"
90" – 144"	NO. 7 AT 3"	NO. 6 AT 6"

TABLE OF VALUES FOR F AND T

D_2	F
12"	4"
15"	4–1/4"
18"	4–1/2"
21"	5"
24"	5–1/4"
27"	5–1/2"
30"	6"
33"	6–1/4"
36"	6–1/2"
39"	7"
42"	7–1/2"
45"	7–3/4"
48"	8"
51"	8–1/2"
54"	9"
57"	9–1/4"
60"	9–1/2"
63"	10"
66"	10–1/4"
69"	10–3/4"
72"	11"
78"	11–3/4"
84"	12–1/2"
90"	13–1/4"
96"	14"

B	T
12"	4"
15"	4–1/4"
18"	4–1/2"
21"	5"
24"	5–1/4"
27"	5–1/2"
30"	6"
33"	6–1/4"
36"	6–1/2"
39"	7"
42"	7–1/2"
45"	7–3/4"
48"	8"
51"	8–1/2"
54"	9"
57"	9–1/4"
60"	9–1/2"
63"	10"
66"	10–1/4"
69"	10–3/4"
72"	11"



SECTION $N' - N'' - N'''$
PROJECT ON M–M–N'''

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

JUNCTION STRUCTURE C

STANDARD DRAWING NO. 422

Sheet 1 of 3

MARK	REVISIONS	APPR.	DATE

NOTES:

1. **VALUES** FOR A, B, C', D1, D2, E, L', ELEVATION "R", AND ELEVATION "S" ARE SHOWN ON IMPROVEMENT PLAN (SEE SHEET 3 OF 3). TABLE OF VALUES FOR "F" AND "T" SHOWN ON THIS STANDARD DRAWING, SHEET 1.

2. **OPTIONAL CONSTRUCTION:** WHEN JUNCTION STRUCTURE "B" IS SPECIFIED ON IMPROVEMENT PLAN, THE CONTRACTOR SHALL HAVE THE OPTION OF CONSTRUCTING JUNCTION STRUCTURE "C", IN WHICH CASE CONSTRUCTION DATA WILL BE FURNISHED BY THE CITY ENGINEER.

3. **CONCRETE** SHALL BE IN ACCORDANCE WITH THE TABLE ON SHEET 1.

4. **FLOOR** OF STRUCTURE SHALL BE STEEL-TROWELED TO SPRINGING LINE.

5. **REINFORCING STEEL** SHALL BE ROUND, DEFORMED, STRAIGHT BARS, 1-1/2" CLEAR FROM FACE OF CONCRETE UNLESS OTHERWISE SHOWN.

   TIE BARS SHALL BE NO. 3 AND SPACED 18" ON CENTER OR CLOSER.

   "A" AND "B" BARS NEED NOT BE LONGER THAN THE OUTSIDE DIAGONAL WIDTH OF THE LATERAL SPUR.

6. **STEEL SCHEDULE** DETAILED ON IMPROVEMENT PLAN.

7. **ELEVATION "S"** APPLIES AT CENTER OF MAIN LINE ON PROLONGATION OF INVERT OF SPUR.

8. **JUNCTION STRUCTURE** SHALL BE POURED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRINGING LINE A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY.

9. **LENGTH "L"** (SHOWN ON IMPROVEMENT PLAN) MAY BE INCREASED AT THE OPTION OF THE CONTRACTOR TO MEET PIPE ENDS, USING "C" BARS IN EXTENDED PORTION OF SAME DIAMETER MUST BE APPROVED BY THE CITY ENGINEER.

10. **STATIONS** OF MANHOLES SHOWN ON IMPROVEMENT PLAN APPLY AT INTERSECTION OF MAIN LINE AND SPUR. ELEVATION SHOWN AT THIS POINT REFER TO PROLONGED INVERT GRADE LINES, EXCEPT THAT WHEN INTERSECTION OF CENTER LINES FALLS OUTSIDE OF STRUCTURE, THE ELEVATIONS ARE SHOWN AND APPLY AT EXTREME LOWER END OF THE STRUCTURE.

11. **LATERALS** – WHERE LATERALS ENTER ON BOTH SIDES OF STRUCTURE, THEY SHALL BE DESIGNATED ON THE IMPROVEMENT PLAN AS RIGHT OR LEFT, FACING IN THE DIRECTION OF STATIONING.

(ADAPTED FROM THE CITY OF LOS ANGELES STD. PLAN NO. B-1832)

APPROVED BY: _____ 05/02/19
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

JUNCTION STRUCTURE C

STANDARD DRAWING NO. 422

STORM DRAIN MAIN							
	ANGLE	30	40	50	60	70	80
D/D2	VALUE						
12	C	2.2	1.8	1.6	1.5	1.4	1.3
	E	1.9	1.5	1.2	1.0	0.8	0.6
15	C	2.5	2.0	1.8	1.6	1.5	1.5
	E	2.2	1.7	1.3	1.1	0.9	0.7
18	C	2.8	2.3	2.0	1.8	1.7	1.6
	E	2.4	1.8	1.4	1.1	0.9	0.7
21	C	3.1	2.5	2.2	2.0	1.9	1.8
	E	2.7	2.0	1.6	1.2	1.0	0.7
24	C	3.4	2.7	2.4	2.2	2.0	2.0
	E	3.0	2.2	1.7	1.3	1.0	0.8
27	C	3.7	3.0	2.6	2.3	2.2	2.1
	E	3.2	2.4	1.8	1.4	1.1	0.8
30	C	4.0	3.2	2.8	2.5	2.4	2.3
	E	3.5	2.6	2.0	1.5	1.1	0.8
33	C	4.3	3.4	3.0	2.7	2.5	2.4
	E	3.8	2.8	2.1	1.6	1.2	0.8
36	C	4.6	3.7	3.2	2.9	2.7	2.6
	E	4.0	2.9	2.2	1.7	1.2	0.9
39	C	4.9	3.9	3.4	3.0	2.9	2.7
	E	4.3	3.1	2.4	1.8	1.3	0.9
42	C	5.3	4.2	3.6	3.2	3.0	2.9
	E	4.6	3.3	2.5	1.9	1.4	0.9
45	C	5.5	4.4	3.8	3.4	3.2	3.1
	E	4.9	3.5	2.6	2.0	1.4	0.9
48	C	5.8	4.6	4.0	3.6	3.3	3.2
	E	5.1	3.7	2.7	2.0	1.5	1.0
51	C	6.2	4.9	4.2	3.8	3.5	3.4
	E	5.4	3.9	2.9	2.1	1.5	1.0
54	C	6.5	5.2	4.4	4.0	3.7	3.5
	E	5.7	4.1	3.0	2.2	1.6	1.0
57	C	6.8	5.4	4.6	4.1	3.8	3.7
	E	5.9	4.2	3.1	2.3	1.6	1.1
60	C	7.1	5.6	4.8	4.3	4.0	3.8
	E	6.2	4.4	3.3	2.4	1.7	1.1
63	C	7.4	5.9	5.0	4.5	4.2	4.0
	E	6.5	4.6	3.4	2.5	1.8	1.1
66	C	7.7	6.1	5.2	4.7	4.3	4.2
	E	6.7	4.8	3.5	2.6	1.8	1.1
69	C	8.0	6.4	5.4	4.9	4.5	4.3
	E	7.0	5.0	3.7	2.7	1.9	1.2
72	C	8.3	6.6	5.6	5.0	4.7	4.5
	E	7.3	5.2	3.8	2.8	1.9	1.2
75	C	8.6	6.8	5.8	5.2	4.8	4.6
	E	7.5	5.3	3.9	2.8	2.0	1.2
78	C	9.0	7.1	6.0	5.4	5.0	4.8
	E	7.8	5.5	4.0	2.9	2.0	1.2
81	C	9.3	7.3	6.2	5.6	5.2	4.9
	E	8.1	5.7	4.2	3.0	2.1	1.3
84	C	9.6	7.6	6.4	5.7	5.3	5.1
	E	8.4	5.9	4.3	3.1	2.2	1.3
87	C	9.9	7.8	6.6	5.9	5.5	5.3
	E	8.6	6.1	4.4	3.2	2.2	1.3
90	C	10.2	8.1	6.8	6.1	5.7	5.4
	E	8.9	6.3	4.6	3.3	2.3	1.4
93	C	10.5	8.3	7.0	6.3	5.8	5.6
	E	9.2	6.5	4.7	3.4	2.3	1.4
96	C	10.8	8.5	7.2	6.5	6.0	5.7
	E	9.4	6.7	4.8	3.5	2.4	1.4

STORM DRAIN LATERAL							
	ANGLE	30	40	50	60	70	80
B	VALUE						
12	C	1.9	1.5	1.2	1.0	0.8	0.6
	E	2.2	1.8	1.6	1.5	1.4	1.3
15	C	2.2	1.7	1.3	1.1	0.9	0.7
	E	2.5	2.0	1.8	1.6	1.5	1.5
18	C	2.4	1.8	1.4	1.1	0.9	0.7
	E	2.8	2.3	2.0	1.8	1.7	1.6
21	C	2.7	2.0	1.6	1.2	1.0	0.7
	E	3.1	2.5	2.2	2.0	1.9	1.8
24	C	3.0	2.2	1.7	1.3	1.0	0.8
	E	3.4	2.7	2.4	2.2	2.0	2.0
27	C	3.2	2.4	1.8	1.4	1.1	0.8
	E	3.7	3.0	2.6	2.3	2.2	2.1
30	C	3.5	2.6	2.0	1.5	1.1	0.8
	E	4.0	3.2	2.8	2.5	2.4	2.3
33	C	3.8	2.8	2.1	1.6	1.2	0.8
	E	4.3	3.4	3.0	2.7	2.5	2.4
36	C	4.0	2.9	2.2	1.7	1.2	0.9
	E	4.6	3.7	3.2	2.9	2.7	2.6
39	C	4.3	3.1	2.4	1.8	1.3	0.9
	E	4.9	3.9	3.4	3.0	2.9	2.7
42	C	4.6	3.3	2.5	1.9	1.4	0.9
	E	5.3	4.2	3.6	3.2	3.0	2.9
45	C	4.9	3.5	2.6	2.0	1.4	0.9
	E	5.5	4.4	3.8	3.4	3.2	3.1
48	C	5.1	3.7	2.7	2.0	1.5	1.0
	E	5.8	4.6	4.0	3.6	3.3	3.2
51	C	5.4	3.9	2.9	2.1	1.5	1.0
	E	6.2	4.9	4.2	3.8	3.5	3.4
54	C	5.7	4.1	3.0	2.2	1.6	1.0
	E	6.5	5.2	4.4	4.0	3.7	3.5
57	C	5.9	4.2	3.1	2.3	1.6	1.1
	E	6.8	5.4	4.6	4.1	3.8	3.7
60	C	6.2	4.4	3.3	2.4	1.7	1.1
	E	7.1	5.6	4.8	4.3	4.0	3.8
63	C	6.5	4.6	3.4	2.5	1.8	1.1
	E	7.4	5.9	5.0	4.5	4.2	4.0
66	C	6.7	4.8	3.5	2.6	1.8	1.1
	E	7.7	6.1	5.2	4.7	4.3	4.2
69	C	7.0	5.0	3.7	2.7	1.9	1.2
	E	8.0	6.4	5.4	4.9	4.5	4.3
72	C	7.3	5.2	3.8	2.8	1.9	1.2
	E	8.3	6.6	5.6	5.0	4.7	4.5
75	C	7.5	5.3	3.9	2.8	2.0	1.2
	E	8.6	6.8	5.8	5.2	4.8	4.6
78	C	7.8	5.5	4.0	2.9	2.0	1.2
	E	9.0	7.1	6.0	5.4	5.0	4.8
81	C	8.1	5.7	4.2	3.0	2.1	1.3
	E	9.3	7.3	6.2	5.6	5.2	4.9
84	C	8.4	5.9	4.3	3.1	2.2	1.3
	E	9.6	7.6	6.4	5.7	5.3	5.1
87	C	8.6	6.1	4.4	3.2	2.2	1.3
	E	9.9	7.8	6.6	5.9	5.5	5.3

EXAMPLE:

GIVEN:

D_2 = 60" A = 50°

B = 39"

FIND: C', E', & L'

SOLUTION:

1. ENTER STORM DRAIN MAIN TABLE WITH THE GIVEN D_2 & A:

   C_M = 4.8ft. E_M = 3.3ft.

2. ENTER STORM DRAIN LATERAL TABLE WITH THE GIVEN B & A:

   C_L = 2.4ft. E_L = 3.4ft.

3. $C' = C_M + C_L$

   C' = 4.8 ft. + 2.4 ft. = 7.2 ft.

4. $E' = E_M + E_L$

   E' = 3.3 ft. + 3.4 ft. = 6.7 ft.

5. L' = E' + 1 ft. =

   6.7 ft. + 1 ft. = 7.7 ft.

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05/02/19

DATE

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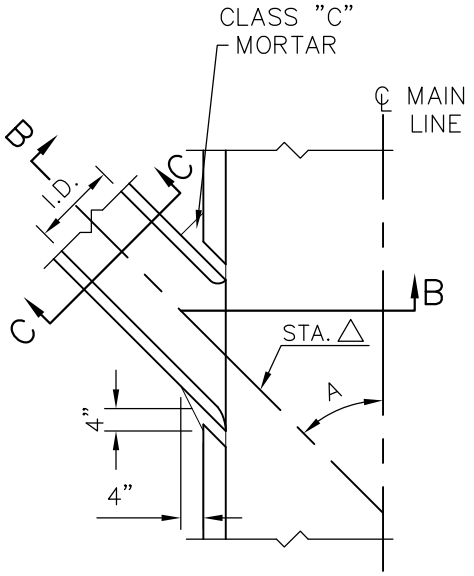
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JUNCTION STRUCTURE C

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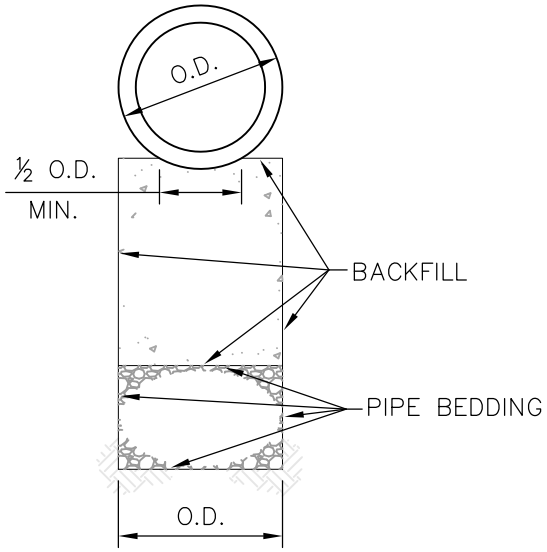
Sheet 3 of 3

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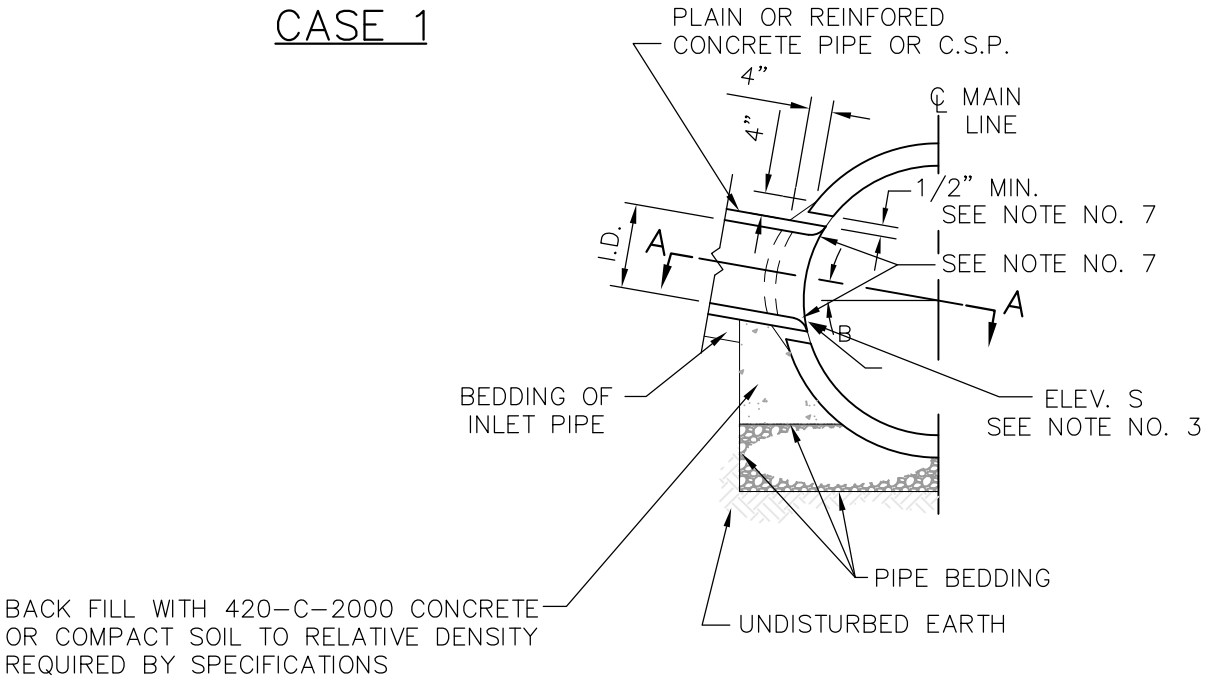


SECTION A–A

CASE 1



SECTION C–C



SECTION B–B

NOTE:

ALL CONNECTOR PIPES (WITHIN THE ANGLES SPECIFIED FOR CASE 2) SHALL BE ENCASED WHEN LAID WITHIN THE MAIN LINE EXCAVATED TRENCH, OR WHEN LAID ON FILL WHICH HAS NOT BEEN DENSIFIED.

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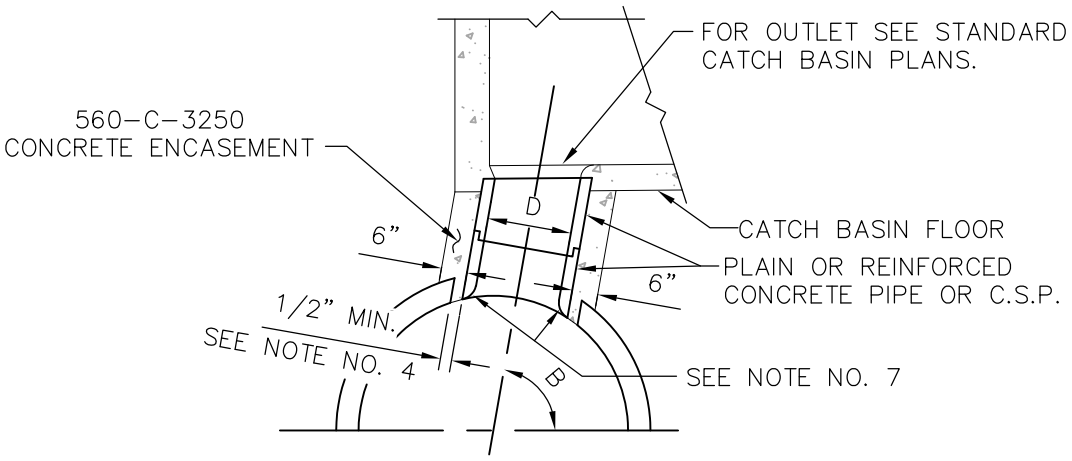
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JUNCTION STRUCTURE NO. 4

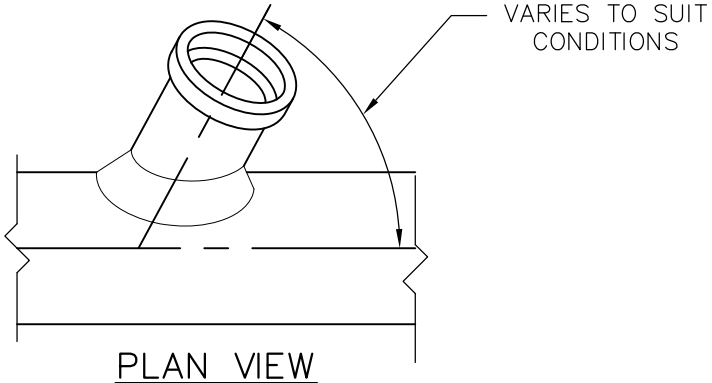
STANDARD DRAWING NO. 423

Sheet 1 of 3

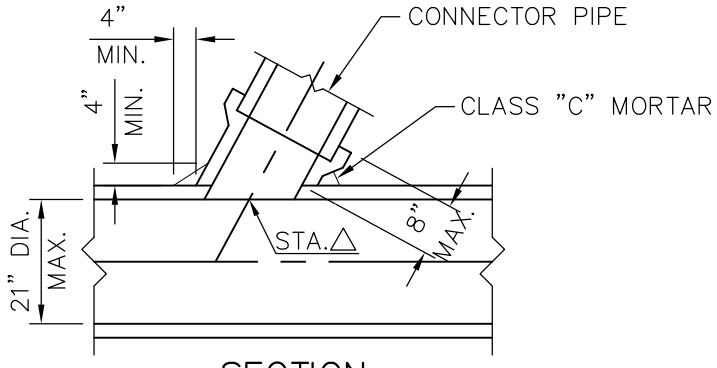
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CASE 2



PLAN VIEW



SECTION

CASE 3
SADDLE CONNECTION

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JUNCTION STRUCTURE NO. 4

STANDARD DRAWING NO. 423

NOTE: CASE 1 AND CASE 2

1. ANGLE "A" SHALL BE BETWEEN 45 DEGREES AND 90 DEGREE AND "D" SHALL BE 24" OR LESS. FOR SMALLER VALUES OF "A" AND LARGER VALUES OF "D", USE APPROPRIATE STANDARD STRUCTURE.
2. IN NO CASE SHALL THE OUTSIDE DIAMETER OF THE INLET PIPE EXCEED ½ THE INSIDE DIAMETER OF THE MAIN STORM DRAIN.
3. CENTER LINE OF INLET SHALL BE ON RADIUS OF MAIN STORM DRAIN EXCEPT WHERE ELEVATION "S" IS SHOWN ON PROJECT DRAWINGS.
4. THE OPENING INTO THE MAIN STORM DRAIN SHALL BE THE OUTSIDE DIAMETER OF THE INLET PIPE PLUS ONE INCH MINIMUM OR 3 INCH MAXIMUM.
5. ALL CORRUGATED METAL PIPE AND FITTINGS SHALL BE GALVANIZED.
6. IF ANGLE "B" IS 45 DEGREE OR LESS, USE CASE 1. IF ANGLE "B" IS GREATER THAN 45 DEGREE, USE CASE 2.
7. BURN OR CHIP END OF CONNECTOR PIPE FLUSH WITH INNER SURFACE OF MAINLINE PIPE. ROUND EDGE OF CONCRETE PIPE OR REINFORCED CONCRETE PIPE.
8. STATION SPECIFIED ON DRAWINGS APPLIES AT THE INTERSECTION OF INSIDE WALL OF MAIN STORM DRAIN AND CENTERLINE OF INLET PIPE.

NOTES: CASE 3

1. CONNECTIONS TO PIPES 21" OR LESS IN DIAMETER WITHOUT JUNCTION STRUCTURES OR PRECAST "Y" BRANCHES SHALL BE MADE WITH SADDLES.
2. TRIM OR CUT SADDLES TO FIT SNUGLY OVER THE OUTSIDE OF THE MAIN PIPE, AND SO ITS AXIS WILL BE ON THE LINE AND GRADE OF THE CONNECTING PIPE.
3. THE OPENING INTO THE PIPE SHALL BE CUT AND TRIMMED TO FIT THE SADDLE SO THAT NO PART WILL PROJECT WITHIN THE BORE OF THE SADDLE PIPE.
4. THE CONNECTING PIPE SHALL BE SUPPORTED AS SHOWN IN CASES 1 AND 2.

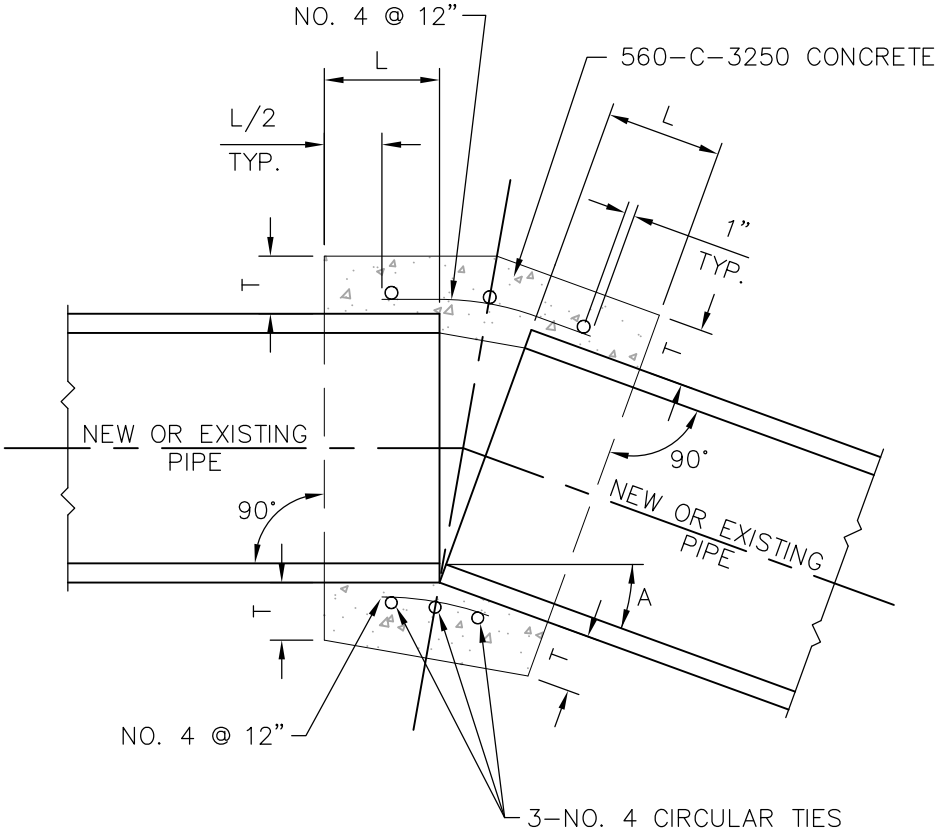
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JUNCTION STRUCTURE NO. 4

STANDARD DRAWING NO. 423



NOTES:

1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 0.10 FT. PER FOOT.
2. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGE.
3. OMIT REINFORCING ON PIPES 24" AND LESS IN DIAMETER AND ON ALL PIPE WHERE ANGLE "A" IS LESS THAN 10'.
4. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE THE PIPE DIAMETER + (2 x WALL THICKNESS) + 8".
5. PIPE MAY BE CONCRETE PIPE, REINFORCED CONCRETE PIPE, OR PLASTIC PIPE (PVC OR ABS)

PIPE DIA.	L	T
12"	1.0'	4"
18"	1.0'	5"
24"	1.0'	6"
36"	1.5'	8"
48"	1.5'	10"
57"	1.5'	10"
60"	1.75'	11"
66"	1.75'	11"

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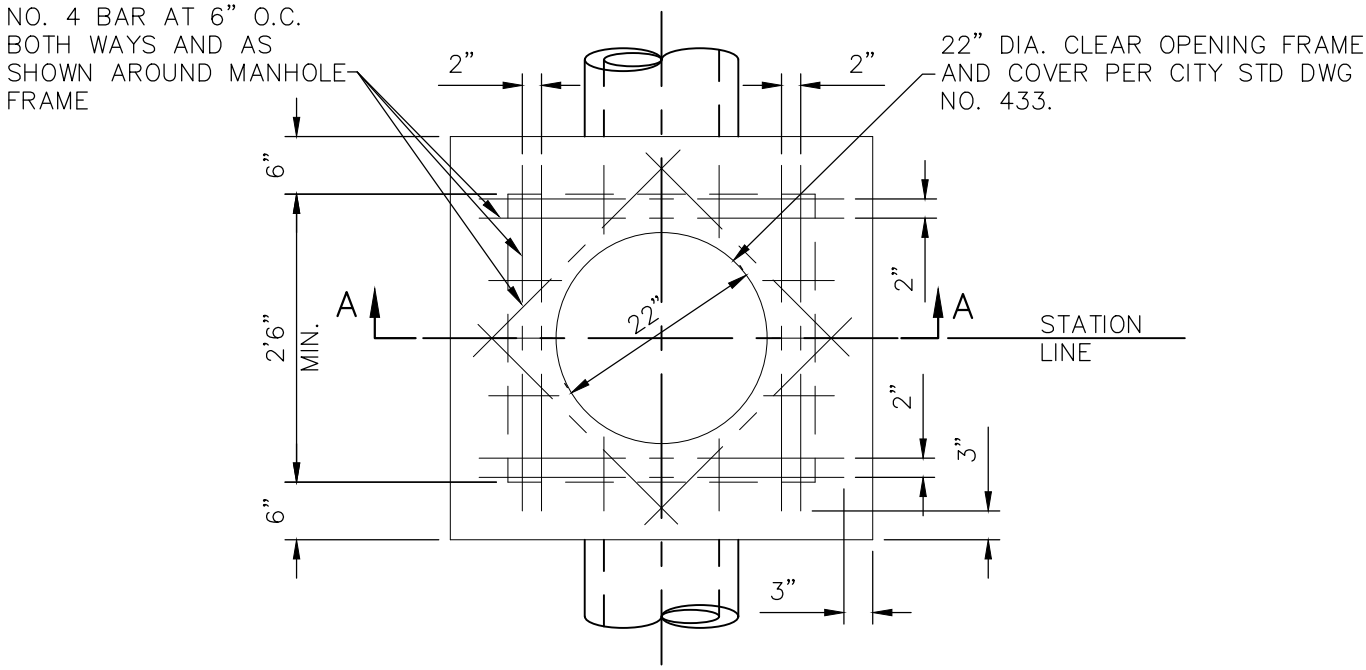
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CONCRETE COLLAR
(PIPE 12"-66")

STANDARD DRAWING NO. 424

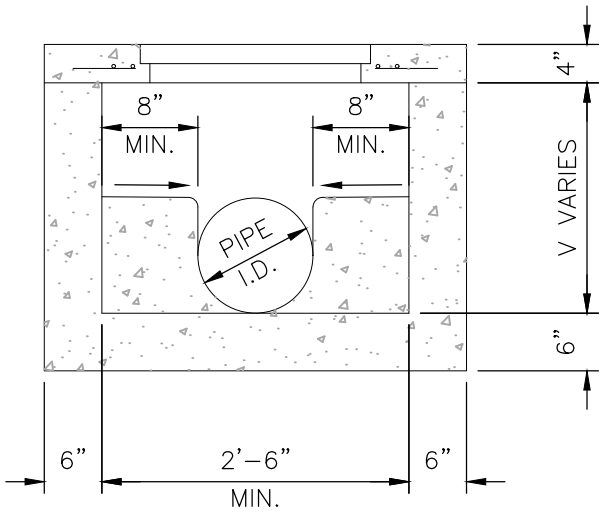
Sheet 1 of 1



PLAN VIEW

NOTES:

1. CLASS 560-C-3250 CONCRETE TO BE USED
2. PIPE SIZE AND INLET AND OUTLET FLOW LINE ELEVATIONS TO BE SHOWN ON IMPROVEMENT PLAN.
3. WHEN PIPE SIZES GREATER THAN 18" ARE USED A LARGER FRAME AND COVER MAY BE REQUIRED BY THE CITY ENGINEER.
4. "V" IS A MAXIMUM OF 4'. FOR DEPTHS GREATER THAN 4' OR FOR A VEHICULAR TRAFFIC SITUATION USE STD. DWGS. 430 OR 431.
5. BIKE PROOF GRATING SHALL BE USED INSTEAD OF SOLID COVER WHEN SHOWN ON PLANS.



SECTION A-A

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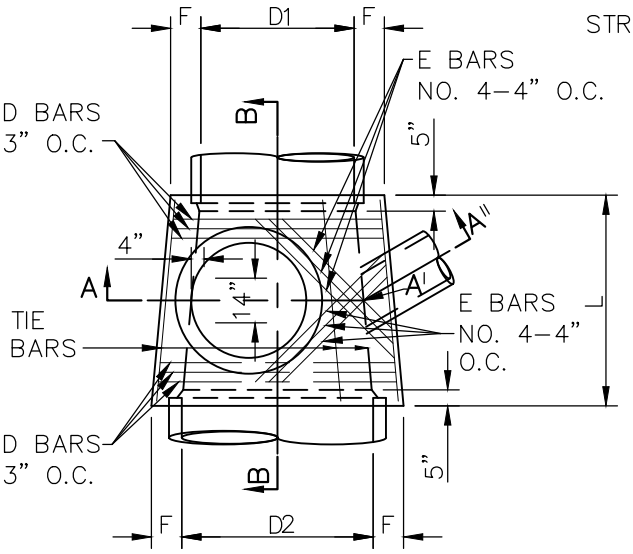
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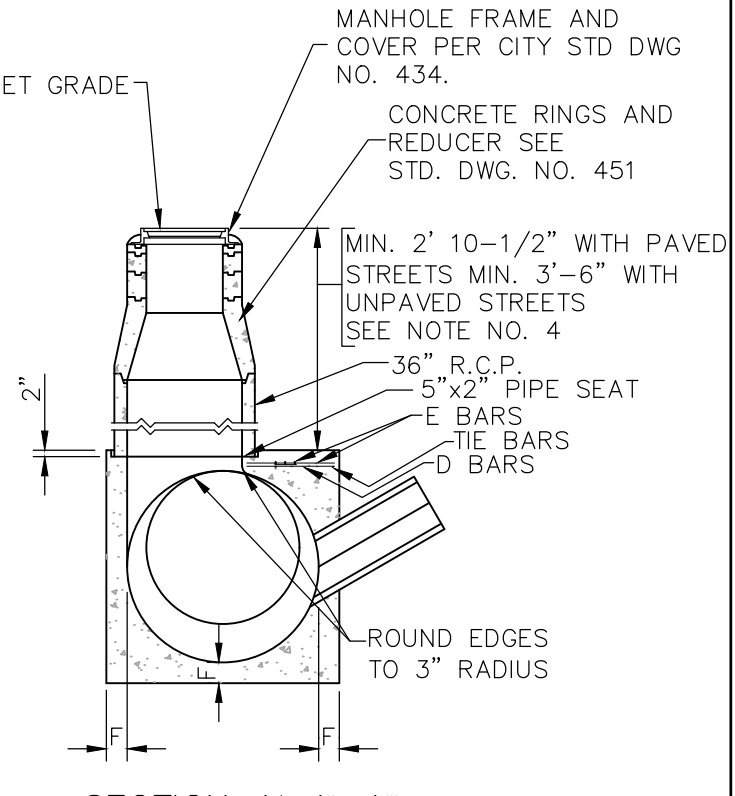
CLEANOUT BOX

STANDARD DRAWING NO. 425

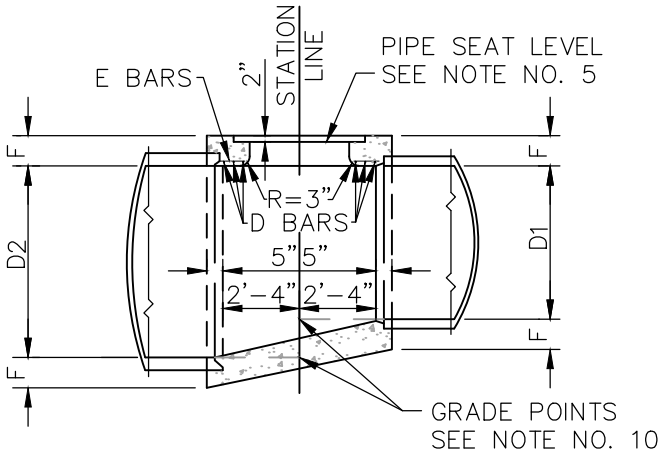
Sheet 1 of 1



PLAN VIEW
(SHAFT NOT SHOWN)



SECTION A'–A"–A"'



SECTION B–B

TABLE OF VALUES FOR F	
D_2	F
36"	6–1/2"
39"	7"
42"	7–1/2"
45"	7–3/4"
48"	8"
51"	8–1/2"
54"	9"
57"	9–1/4"
60"	9–1/2"
63"	10"
66"	10–1/4"
69"	10–3/4"
72"	11"
78"	11–3/4"
84"	12–1/2"
90"	13–1/4"
96"	14"

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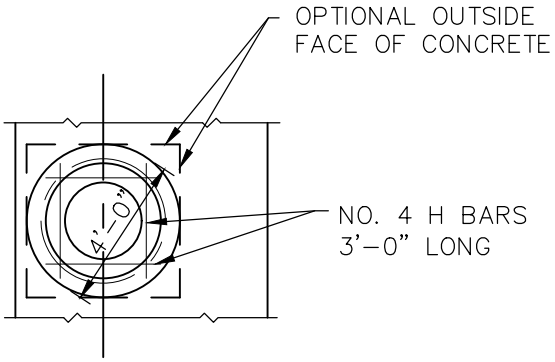
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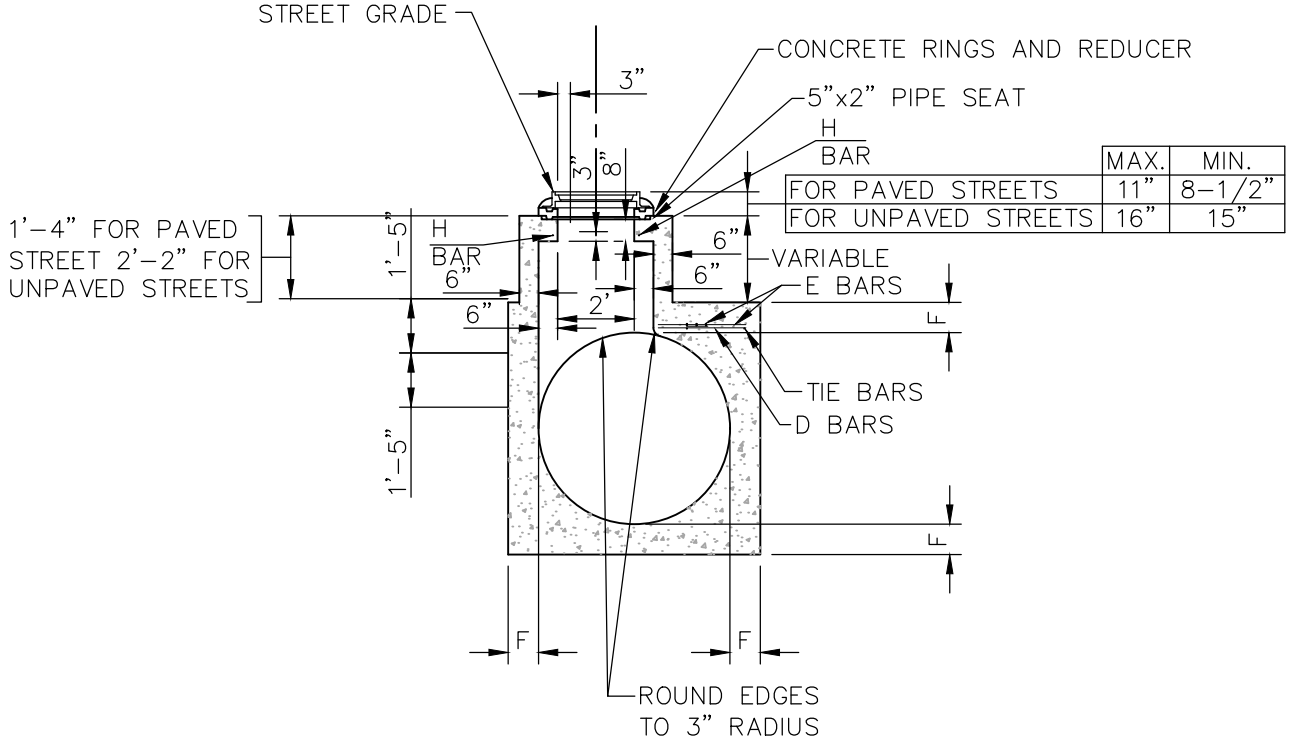
MANHOLE AX

STANDARD DRAWING NO. 430

Sheet 1 of 3



PLAN VIEW
(RINGS AND COVER NOT SHOWN)



	MAX.	MIN.
FOR PAVED STREETS	11"	8-1/2"
FOR UNPAVED STREETS	16"	15"

DETAIL M
(SEE NOTE 4)

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CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

MANHOLE AX

STANDARD DRAWING NO. 430

Sheet 2 of 3

MARK	REVISIONS	APPR.	DATE

NOTES:

1. **TABLES** OF VALUES FOR "F" ARE ON THIS STANDARD DRAWING, SHEET 1.
2. **CENTER OF MANHOLE SHAFT** SHALL BE LOCATED OVER CENTER OF LINE OF STORM DRAIN WHEN DIAMETER D1 IS 48" OR LESS, IN WHICH CASE PLACE "E" BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE.
3. **LENGTH "L"** SHALL BE 5'–6" UNLESS SHOWN OTHERWISE ON IMPROVEMENT PLAN. AT OPTION OF CONTRACTOR "L" MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS.
4. **DETAIL "M":** WHEN DEPTH OF MANHOLE FROM STREET GRADE TO TOP OF BOX IS LESS THAN 2' 10–1/2" OF PAVED STREETS OR 3'–6" FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT AS PER DETAIL "M". THE CONTRACTOR SHALL HAVE THE OPTION OF CONSTRUCTING SHAFT AS PER DETAIL "M" FOR ANY DEPTH OF MANHOLE. WHEN DIAMETER D1 IS 48" OR LESS, CENTER OF SHAFT SHALL BE LOCATED AS PER NOTE 2.
5. **THICKNESS OF DECK** SHALL VARY WHEN NECESSARY TO PROVIDE LEVEL PIPE SEAT, BUT SHALL NOT BE LESS THAN TABULAR VALUES OF "F" SHOWN ON THIS PLAN.
6. **REINFORCING STEEL** SHALL BE ROUND, DEFORMED BARS, 1–1/2" CLEAR FROM FACE OF CONCRETE UNLESS SHOWN OTHERWISE. SIZES AND LENGTHS ARE SHOWN IN TABLE BELOW.
7. **CONCRETE** SHALL BE IN ACCORDANCE WITH THE TABLE OF CONCRETE SPECIFICATIONS.
8. **RINGS, REDUCER, AND PIPE** FOR ACCESS SHAFT BE SEATED IN CEMENT MORTAR AND NEATLY POINT OR WIPED INSIDE THE SHAFT.
9. **STATIONS** OF MANHOLES SHOWN ON IMPROVEMENT PLAN APPLY AT CENTER OF SHAFT. ELEVATIONS SHOWN AT STATIONS REFER TO PROLONGED INVERT GRADE LINES.
10. **FLOOR** OF MANHOLE SHALL BE STEEL–TROWELED TO SPRINGING LINE.
11. **BODY** OF MANHOLE SHALL BE POURED IN ON CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRINGING LINE A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY.
12. **COVER** SHALL BE PER CITY STD DWG NO. 434.

STEEL TABLE FOR MANHOLE – AX

D BARS				E BARS		
DIA. D_2	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH
36"	6	No. 4	3'–10"	4	No. 4	2'–9"
39"	6	No. 4	4'–2"	4	No. 4	2'–11"
42"	6	No. 5	4'–6"	4	No. 4	3'–2"
45"	6	No. 5	4'–10"	4	No. 4	3'–5"
48"	6	No. 5	5'–1"	4	No. 4	3'–7"
51"	6	No. 5	5'–5"	6	No. 4	4'–9"
54"	6	No. 5	5'–9"	6	No. 4	5'–1"
57"	6	No. 5	6'–1"	6	No. 4	5'–6"
60"	6	No. 5	6'–4"	6	No. 4	5'–11"
63"	6	No. 5	6'–8"	6	No. 4	6'–3"
66"	6	No. 5	7'–0"	8	No. 4	6'–8"
69"	6	No. 5	7'–4"	8	No. 4	6'–8"
72"	6	No. 5	7'–7"	8	No. 4	6'–8"
78"	6	No. 5	8'–3"	8	No. 4	6'–8"
84"	6	No. 5	8'–10"	10	No. 4	6'–8"
90"	6	No. 6	9'–6"	10	No. 4	6'–8"
96"	6	No. 6	10'–1"	10	No. 4	6'–8"

CONCRETE SPECIFICATIONS

F	CONC. CLASS
6 1/2"–7 1/2"	560–C–3250
7 3/4"–9 1/2"	560–C–3250
10" – 14"	560–B–3250

"D" BARS SHALL BE SPACED 3" O.C. "E" BARS SHALL BE SPACED 4" O.C. TIE BARS SHALL BE NO. 3 SPACED 18" O.C. OR CLOSER.

WHEN "L" IS GREATER THAN 5'–6" IS SPECIFIED ON IMPROVEMENT PLAN, CONTINUE "D" BARS AT 6" O.C. LENGTHS SHOWN IN TABLE ARE FOR LONGEST BARS. WHERE SHORTER BARS ARE REQUIRED, BEND OR CUT TO MEET FIELD REQUIREMENTS.

(ADAPTED FROM THE CITY OF LOS ANGELES STD. PLAN NO. B–1700)

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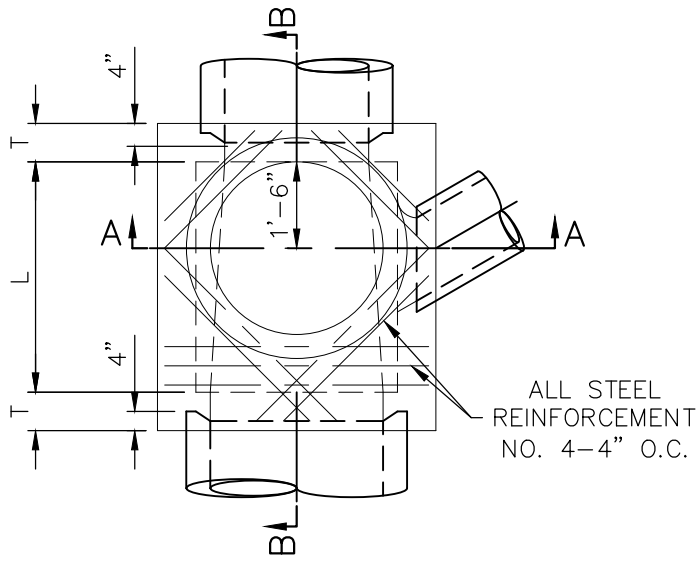
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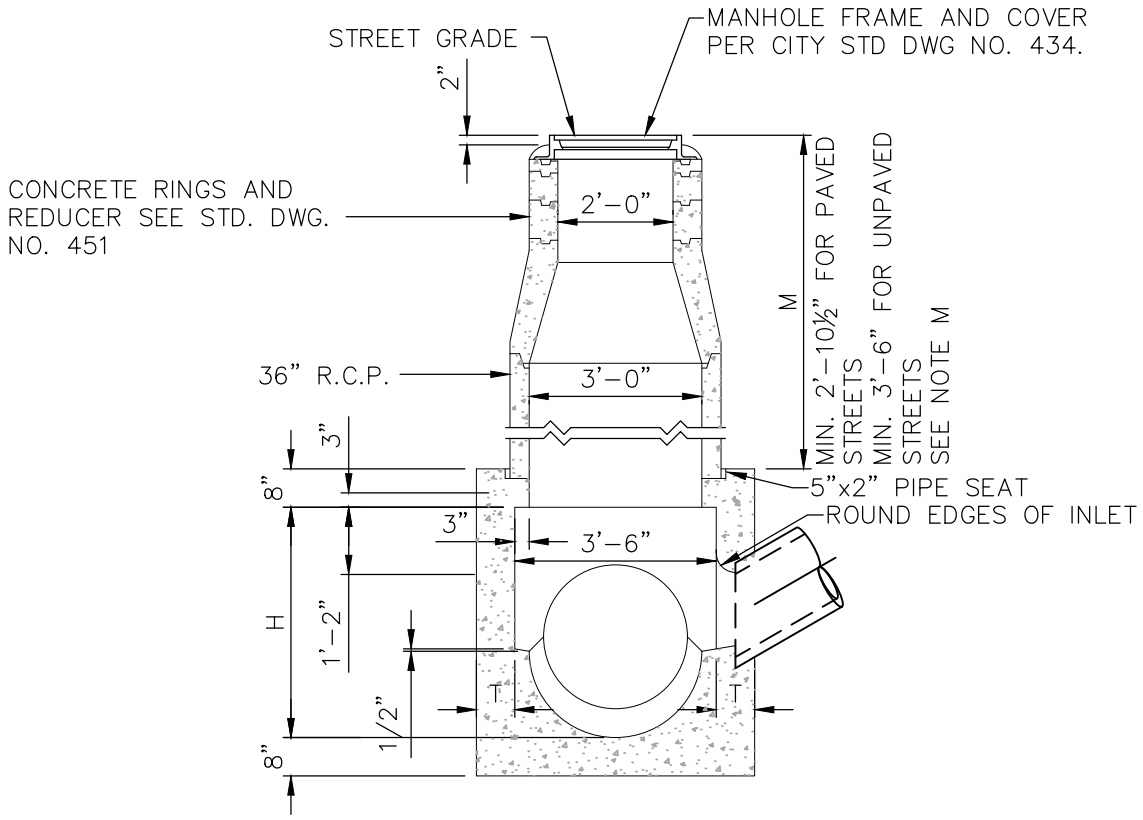
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MANHOLE AX

STANDARD DRAWING NO. 430



PLAN VIEW
(SHAFT NOT SHOWN)



SECTION A-A

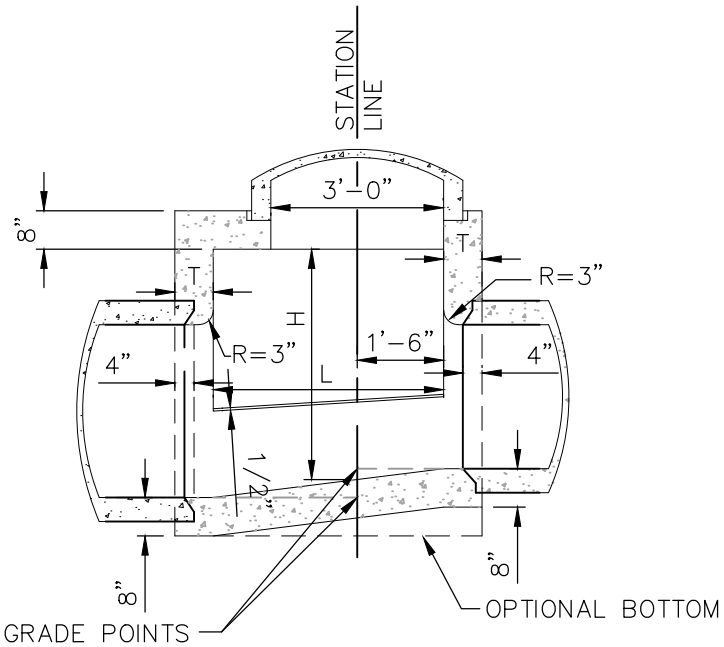
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CITY OF RIVERSIDE

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MANHOLE EZ

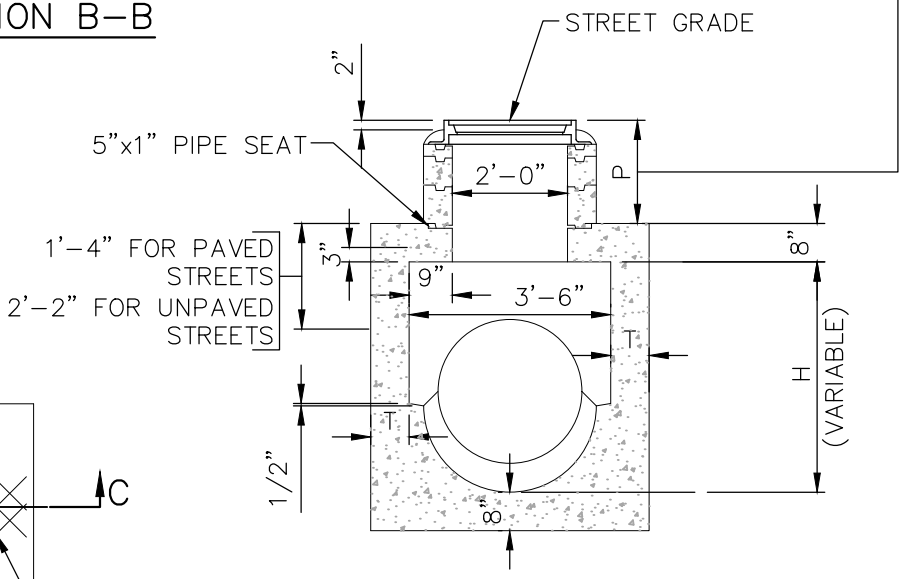
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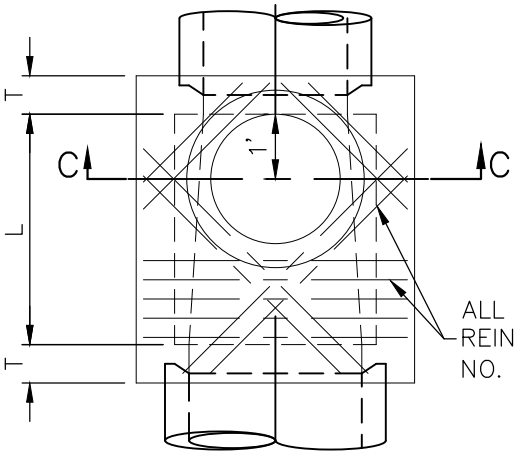
SECTION B–B

	MAX.	MIN.
FOR PAVED STREETS	11"	8-1/2"
FOR UNPAVED STREETS	16"	15"

(SEE NOTE P)



SECTION C–C



DETAIL N
PLAN VIEW
(SHAFT NOT SHOWN)
SEE NOTE M

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MANHOLE EZ

STANDARD DRAWING NO. 431

Sheet 2 of 3

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NOTES:

H–HEIGHT "H" (IN SECTION A–A AND SECTION B–B) SHALL NOT BE LESS THAN 4'–0", BUT MAY BE INCREASED AT OPTION OF CONTRACTOR, PROVIDED THAT THE VALUE OF "M" SHALL BE NOT LESS THAT THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR "H" IN SECTION C–C, SEE NOTE P.

L–LENGTH "L" SHALL BE 4' UNLESS OTHERWISE SHOWN ON IMPROVEMENT PLAN. "L" MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS, AT THE OPTION OF CONTRACTOR, EXCEPT THAT ANY CHANGE IN LOCATION OF MANHOLE MUST BE APPROVED BY THE CITY ENGINEER.

M–SHAFT SHALL BE CONSTRUCTED AS PER SECTION C–C AND DETAIL "N" WHEN DEPTH "M" FROM STREET GRADE TO TOP OF BOX IS LESS THAN 2'–10½" FOR PAVED STREETS OR 3'–6" FOR UNPAVED STREETS.

P–DEPTH "P" MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 6 INCHES WHEN LARGER VALUES OF "P" WOULD REDUCE "H" (IN SECTION C–C) TO 3'–6" OR LESS.

T– "T" SHALL BE 8" FOR VALUES "H" UP TO AND INCLUDING 8 FT.
"T" SHALL BE 10" FOR VALUES "H" OVER 8 FT.

1. **CONCRETE** SHALL BE 560–C–3250.
2. **REINFORCING STEEL** SHALL BE NO. 4 DEFORMED, STRAIGHT BARS 1–1/2" CLEAR FROM FACE OF CONCRETE.
3. **STATIONS** OF MANHOLES SHOWN ON IMPROVEMENT PLAN APPLY AT CENTER LINE OF SHAFT. ELEVATIONS ARE SHOWN AT SHAFT CENTER AND REFER TO THE PROLONGED INVERT GRADE LINE. SEE NOTE "L" FOR SHIFTING LOCATION.
4. **FLOOR** OF MANHOLE SHALL BE STEEL–TROWELED.
5. **RINGS, REDUCER, AND PIPE** FOR ACCESS SHAFT SHALL BE SEATED IN CEMENT MORTAR AND NEATLY POINTED OR WIPED INSIDE SHAFT.

COVER SHALL BE PER CITY STD DWG NO. 434.

(ADAPTED FROM THE CITY OF LOS ANGELES STD. PLAN NO. B–1532)

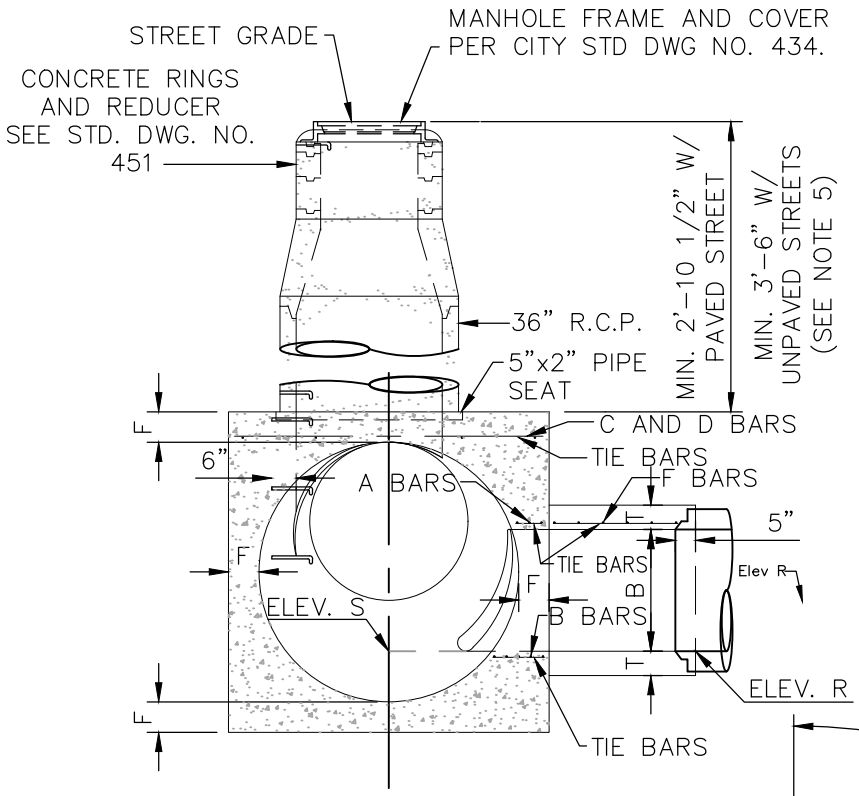
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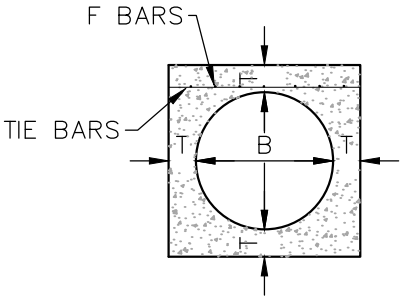
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MANHOLE EZ

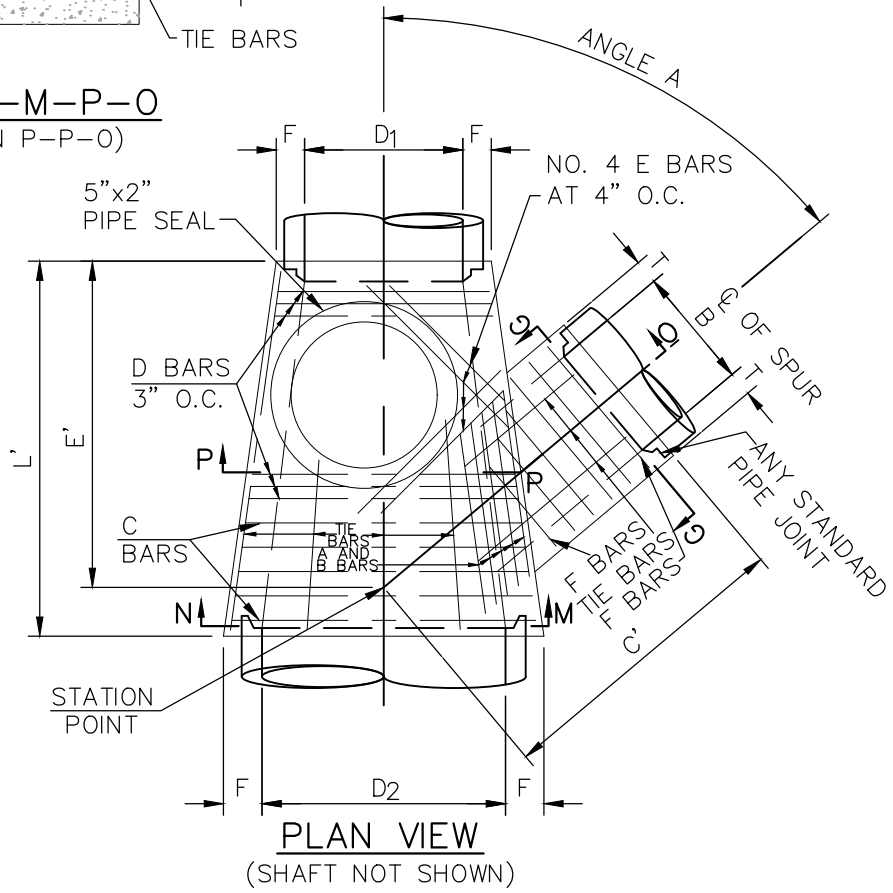
STANDARD DRAWING NO. 431



SECTION N–M–P–O
(PROJECT ON P–P–O)



SECTION G–G



PLAN VIEW
(SHAFT NOT SHOWN)

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CITY ENGINEER — DATE: 06/06/2025

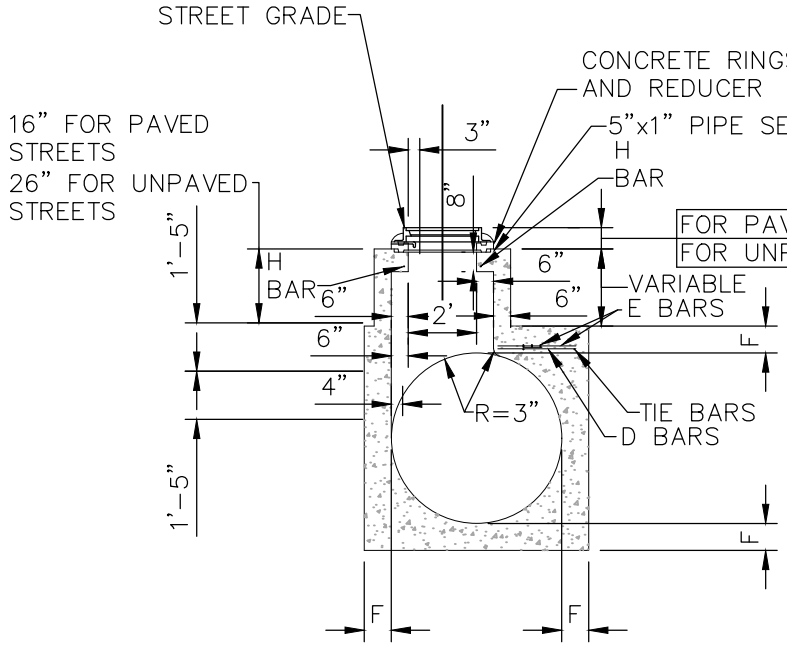
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CITY OF RIVERSIDE

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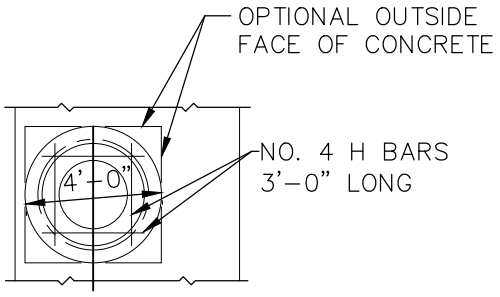
MANHOLE JM

STANDARD DRAWING NO. 432

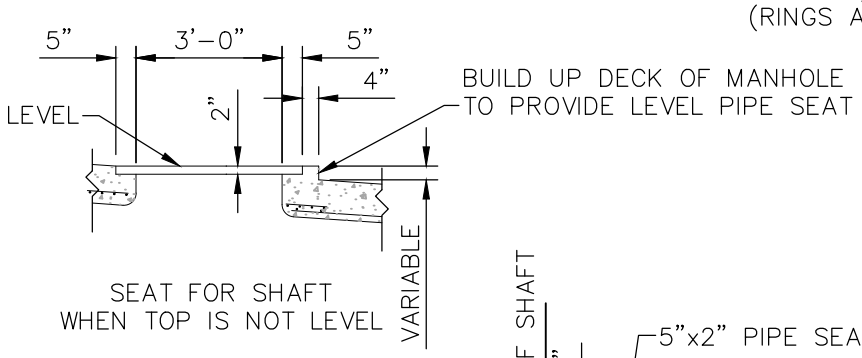


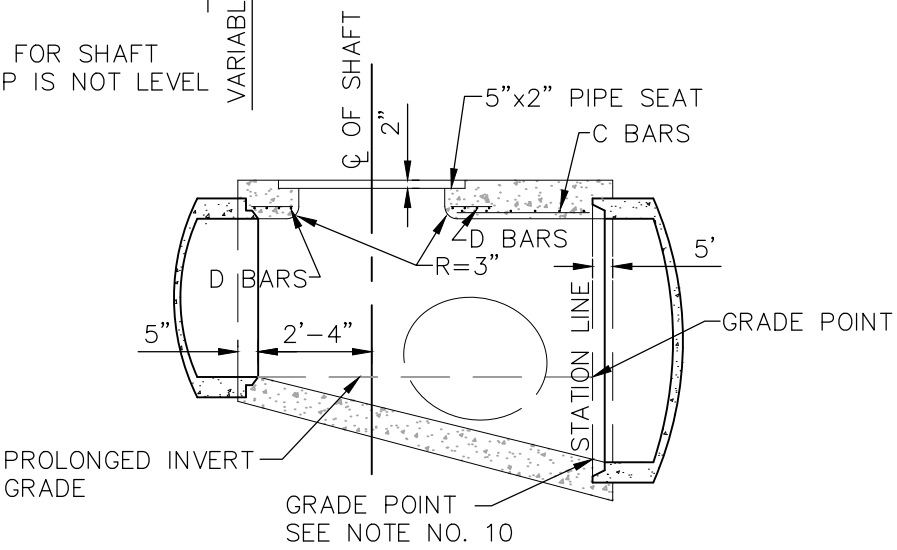
	MAX.	MIN.
FOR PAVED STREETS	11"	8-1/2"
FOR UNPAVED STREETS	16"	15"

DETAIL M
(SEE NOTE 5)



PLAN VIEW
(RINGS AND COVER NOT SHOWN)





LONGITUDINAL SECTION

APPROVED BY:

CITY ENGINEER

06/06/2025
DATE

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CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

MANHOLE JM

STANDARD DRAWING NO. 432

NOTES:

1. **VALUES** FOR A, B, C', D1, D2, E', L', ELEVATION "R", AND ELEVATION "S" ARE SHOWN ON THE ON THE IMPROVEMENT PLAN (SEE SHEET 4 OF 4). TABLE OF VALUES FOR "F" AND "T" HEREON.
2. **LATERALS**: IF LATERAL ENTER ON BOTH SIDE OF MANHOLE, ACCESS SHAFT SHALL BE LOCATED ON SIDE RECEIVING THE SMALLER LATERAL. LATERALS SHALL BE DESIGNATED ON IMPROVEMENT PLAN AS RIGHT OR LEFT, FACING IN THE DIRECTION OF STATIONING.
3. **CENTER OF MANHOLE SHAFT** SHALL BE LOCATED OVER CENTER LINE OF MAIN STORM DRAIN WHEN D1 IS 48" OR LESS, IN WHICH CASE PLACE 4 "E" BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTER LINE.
4. **LENGTH "L"** (SHOWN ON IMPROVEMENT PLAN) MAY BE INCREASED AT OPTION OF CONTRACTOR TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION OF SPUR MUST BE APPROVED BY THE CITY ENGINEER.
5. **DETAIL "M":** WHEN DEPTH OF MANHOLE FROM STREET GRADE TO TOP OF BOX IS LESS THAN 2'–10½" FOR PAVED STREETS OR 3'–6" FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT AS PER DETAIL "M". THE CONTRACTOR SHALL HAVE THE OPTION OF CONSTRUCTING SHAFT AS PER DEPTH OF MANHOLE. WHEN DIAMETER D1 IS 48" OR LESS CENTER OF SHAFT SHALL BE LOCATED AS PER NOTE 3.
6. **REINFORCING STEEL** SHALL BE ROUND, DEFORMED, STRAIGHT BARS, 1–1/2" CLEAR FROM FACE OF CONCRETE UNLESS SHOWN OTHERWISE. TIE BARS SHALL BE NO. 3 AND SPACED 18" ON CENTERS OF CLOSER. STEEL SCHEDULE DETAILED ON IMPROVEMENT PLAN.
7. **CONCRETE** SHALL BE IN ACCORDANCE WITH THE TABLE OF CONCRETE SPECIFICATIONS.
8. **RINGS, REDUCER, AND PIPE** FOR ACCESS SHAFT SHALL BE SEATED IN CEMENT MORTAR AND NEATLY POINTED OR WIPED INSIDE SHAFT.
9. **STATIONS** OF MANHOLES SHOWN ON IMPROVEMENT PLAN APPLY AT INTERSECTION OF CENTER LINES OF MAIN LINE AND SPUR. ELEVATIONS SHOWN AT STATIONS REFER TO PROLONGED INVERT GRADE LINES.
10. **FLOOR** OF MANHOLES SHALL BE STEEL TROWELED TO SPRINGING LINE.
11. **BODY** OF MANHOLE, INCLUDING SPUR, SHALL BE POURED IN ON CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRINGING LINE A CONSTRUCTION JOINT WITH LONGITUDINAL KEYWAY.
12. **ELEVATION "S"** APPLIES AT CENTER OF MAIN LINE ON PROLONGATION OF INVERT OF SPUR.
13. **COVER** SHALL BE PER CITY STD DWG NO. 434.

TABLE OF VALUES FOR F AND T

D_2	F
12"	4"
15"	4–1/4"
18"	4–1/2"
21"	5"
24"	5–1/4"
27"	5–1/2"
30"	6"
33"	6–1/4"
36"	6–1/2"
39"	7"
42"	7–1/2"
45"	7–3/4"
48"	8"

D_2	F
51"	8–1/2"
54"	9"
57"	9–1/4"
60"	9–1/2"
63"	10"
66"	10–1/4"
69"	10–3/4"
72"	11"
78"	11–3/4"
84"	12–1/2"
90"	13–1/4"
96"	14"

B	T
12"	4"
15"	4–1/4"
18"	4–1/2"
21"	5"
24"	5–1/4"
27"	5–1/2"
30"	6"
33"	6–1/4"
36"	6–1/2"
39"	7"
42"	7–1/2"

B	T
45"	7–3/4"
48"	8"
51"	8–1/2"
54"	9"
57"	9–1/4"
60"	9–1/2"
63"	10"
66"	10–1/4"
69"	10–3/4"
72"	11"

TABLE OF BAR SIZES

D_2 OR B	A & B BARS	C OR F BARS
12" – 39"	NO. 5 AT 3"	NO. 4 AT 6"
42" – 84"	NO. 6 AT 3"	NO. 5 AT 6"
90" – 144"	NO. 7 AT 3"	NO. 6 AT 6"

CONCRETE SPECS

T	CONCRETE CLASS
4" – 7"	560–C–3250
7 1/2" – 9 1/2"	560–C–3250
10" – 14"	560–B–3250

APPROVED BY: _____ 06/06/2025
CITY ENGINEER DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

MANHOLE JM

STANDARD DRAWING NO. 432

Sheet 3 of 4

MARK	REVISIONS	APPR.	DATE

STORM DRAIN MAIN

D/D2	ANGLE VALUE	30	40	50	60	70	80
12	C	2.2	1.8	1.6	1.5	1.4	1.3
	E	1.9	1.5	1.2	1.0	0.8	0.6
15	C	2.5	2.0	1.8	1.6	1.5	1.5
	E	2.2	1.7	1.3	1.1	0.9	0.7
18	C	2.8	2.3	2.0	1.8	1.7	1.6
	E	2.4	1.8	1.4	1.1	0.9	0.7
21	C	3.1	2.5	2.2	2.0	1.9	1.8
	E	2.7	2.0	1.6	1.2	1.0	0.7
24	C	3.4	2.7	2.4	2.2	2.0	2.0
	E	3.0	2.2	1.7	1.3	1.0	0.8
27	C	3.7	3.0	2.6	2.3	2.2	2.1
	E	3.2	2.4	1.8	1.4	1.1	0.8
30	C	4.0	3.2	2.8	2.5	2.4	2.3
	E	3.5	2.6	2.0	1.5	1.1	0.8
33	C	4.3	3.4	3.0	2.7	2.5	2.4
	E	3.8	2.8	2.1	1.6	1.2	0.8
36	C	4.6	3.7	3.2	2.9	2.7	2.6
	E	4.0	2.9	2.2	1.7	1.2	0.9
39	C	4.9	3.9	3.4	3.0	2.9	2.7
	E	4.3	3.1	2.4	1.8	1.3	0.9
42	C	5.3	4.2	3.6	3.2	3.0	2.9
	E	4.6	3.3	2.5	1.9	1.4	0.9
45	C	5.5	4.4	3.8	3.4	3.2	3.1
	E	4.9	3.5	2.6	2.0	1.4	0.9
48	C	5.8	4.6	4.0	3.6	3.3	3.2
	E	5.1	3.7	2.7	2.0	1.5	1.0
51	C	6.2	4.9	4.2	3.8	3.5	3.4
	E	5.4	3.9	2.9	2.1	1.5	1.0
54	C	6.5	5.2	4.4	4.0	3.7	3.5
	E	5.7	4.1	3.0	2.2	1.6	1.0
57	C	6.8	5.4	4.6	4.1	3.8	3.7
	E	5.9	4.2	3.1	2.3	1.6	1.1
60	C	7.1	5.6	4.8	4.3	4.0	3.8
	E	6.2	4.4	3.3	2.4	1.7	1.1
63	C	7.4	5.9	5.0	4.5	4.2	4.0
	E	6.5	4.6	3.4	2.5	1.8	1.1
66	C	7.7	6.1	5.2	4.7	4.3	4.2
	E	6.7	4.8	3.5	2.6	1.8	1.1
69	C	8.0	6.4	5.4	4.9	4.5	4.3
	E	7.0	5.0	3.7	2.7	1.9	1.2
72	C	8.3	6.6	5.6	5.0	4.7	4.5
	E	7.3	5.2	3.8	2.8	1.9	1.2
75	C	8.6	6.8	5.8	5.2	4.8	4.6
	E	7.5	5.3	3.9	2.8	2.0	1.2
78	C	9.0	7.1	6.0	5.4	5.0	4.8
	E	7.8	5.5	4.0	2.9	2.0	1.2
81	C	9.3	7.3	6.2	5.6	5.2	4.9
	E	8.1	5.7	4.2	3.0	2.1	1.3
84	C	9.6	7.6	6.4	5.7	5.3	5.1
	E	8.4	5.9	4.3	3.1	2.2	1.3
87	C	9.9	7.8	6.6	5.9	5.5	5.3
	E	8.6	6.1	4.4	3.2	2.2	1.3
90	C	10.2	8.1	6.8	6.1	5.7	5.4
	E	8.9	6.3	4.6	3.3	2.3	1.4
93	C	10.5	8.3	7.0	6.3	5.8	5.6
	E	9.2	6.5	4.7	3.4	2.3	1.4
96	C	10.8	8.5	7.2	6.5	6.0	5.7
	E	9.4	6.7	4.8	3.5	2.4	1.4

STORM DRAIN LATERAL

B	ANGLE VALUE	30	40	50	60	70	80
12	C	1.9	1.5	1.2	1.0	0.8	0.6
	E	2.2	1.8	1.6	1.5	1.4	1.3
15	C	2.2	1.7	1.3	1.1	0.9	0.7
	E	2.5	2.0	1.8	1.6	1.5	1.5
18	C	2.4	1.8	1.4	1.1	0.9	0.7
	E	2.8	2.3	2.0	1.8	1.7	1.6
21	C	2.7	2.0	1.6	1.2	1.0	0.7
	E	3.1	2.5	2.2	2.0	1.9	1.8
24	C	3.0	2.2	1.7	1.3	1.0	0.8
	E	3.4	2.7	2.4	2.2	2.0	2.0
27	C	3.2	2.4	1.8	1.4	1.1	0.8
	E	3.7	3.0	2.6	2.3	2.2	2.1
30	C	3.5	2.6	2.0	1.5	1.1	0.8
	E	4.0	3.2	2.8	2.5	2.4	2.3
33	C	3.8	2.8	2.1	1.6	1.2	0.8
	E	4.3	3.4	3.0	2.7	2.5	2.4
36	C	4.0	2.9	2.2	1.7	1.2	0.9
	E	4.6	3.7	3.2	2.9	2.7	2.6
39	C	4.3	3.1	2.4	1.8	1.3	0.9
	E	4.9	3.9	3.4	3.0	2.9	2.7
42	C	4.6	3.3	2.5	1.9	1.4	0.9
	E	5.3	4.2	3.6	3.2	3.0	2.9
45	C	4.9	3.5	2.6	2.0	1.4	0.9
	E	5.5	4.4	3.8	3.4	3.2	3.1
48	C	5.1	3.7	2.7	2.0	1.5	1.0
	E	5.8	4.6	4.0	3.6	3.3	3.2
51	C	5.4	3.9	2.9	2.1	1.5	1.0
	E	6.2	4.9	4.2	3.8	3.5	3.4
54	C	5.7	4.1	3.0	2.2	1.6	1.0
	E	6.5	5.2	4.4	4.0	3.7	3.5
57	C	5.9	4.2	3.1	2.3	1.6	1.1
	E	6.8	5.4	4.6	4.1	3.8	3.7
60	C	6.2	4.4	3.3	2.4	1.7	1.1
	E	7.1	5.6	4.8	4.3	4.0	3.8
63	C	6.5	4.6	3.4	2.5	1.8	1.1
	E	7.4	5.9	5.0	4.5	4.2	4.0
66	C	6.7	4.8	3.5	2.6	1.8	1.1
	E	7.7	6.1	5.2	4.7	4.3	4.2
69	C	7.0	5.0	3.7	2.7	1.9	1.2
	E	8.0	6.4	5.4	4.9	4.5	4.3
72	C	7.3	5.2	3.8	2.8	1.9	1.2
	E	8.3	6.6	5.6	5.0	4.7	4.5
75	C	7.5	5.3	3.9	2.8	2.0	1.2
	E	8.6	6.8	5.8	5.2	4.8	4.6
78	C	7.8	5.5	4.0	2.9	2.0	1.2
	E	9.0	7.1	6.0	5.4	5.0	4.8
81	C	8.1	5.7	4.2	3.0	2.1	1.3
	E	9.3	7.3	6.2	5.6	5.2	4.9
84	C	8.4	5.9	4.3	3.1	2.2	1.3
	E	9.6	7.6	6.4	5.7	5.3	5.1
87	C	8.6	6.1	4.4	3.2	2.2	1.3
	E	9.9	7.8	6.6	5.9	5.5	5.3

EXAMPLE:

GIVEN:

D_2 = 60" A = 50°

B = 39"

FIND: C', E', & L'

SOLUTION:

1. ENTER STORM DRAIN MAIN TABLE WITH THE GIVEN D_2 & A:

   C_M = 4.8ft. E_M = 3.3ft.

2. ENTER STORM DRAIN LATERAL TABLE WITH THE GIVEN B & A:

   C_L = 2.4ft. E_L = 3.4ft.

3. $C' = C_M + C_L$

   C' = 4.8 ft. + 2.4 ft. = 7.2 ft.

4. $E' = E_M + E_L$

   E' = 3.3 ft. + 3.4 ft. = 6.7 ft.

5. L' = E' + 1 ft. =

   6.7 ft. + 1 ft. = 7.7 ft.

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CITY ENGINEER

06/06/2025

DATE

CITY OF RIVERSIDE

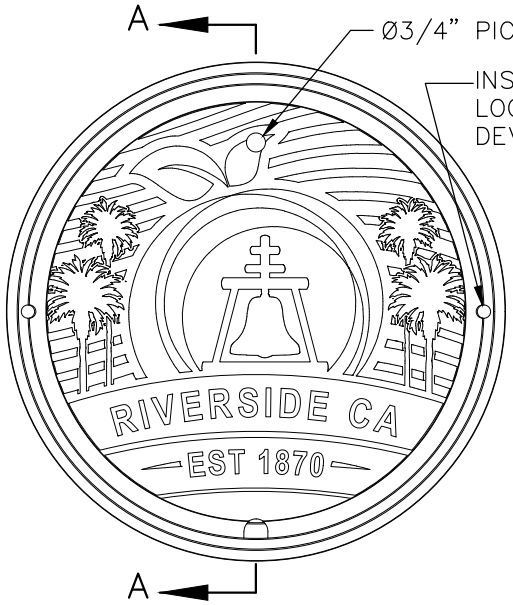
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MANHOLE JM

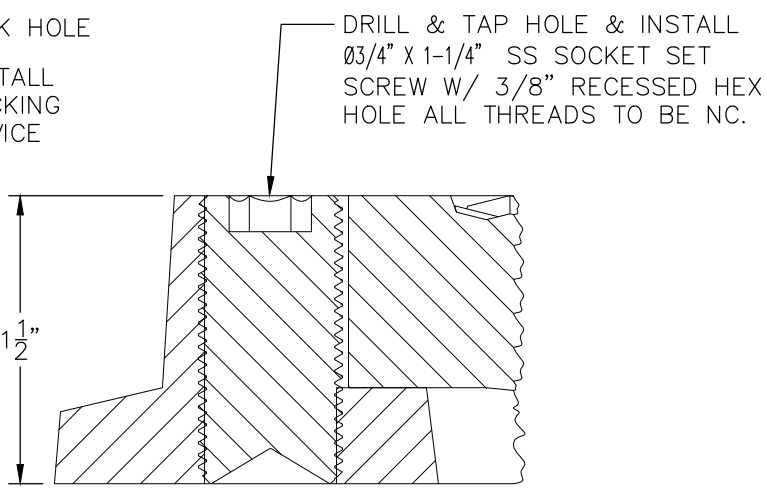
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Sheet 4 of 4

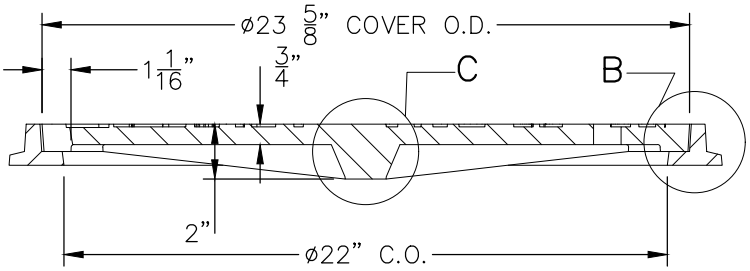
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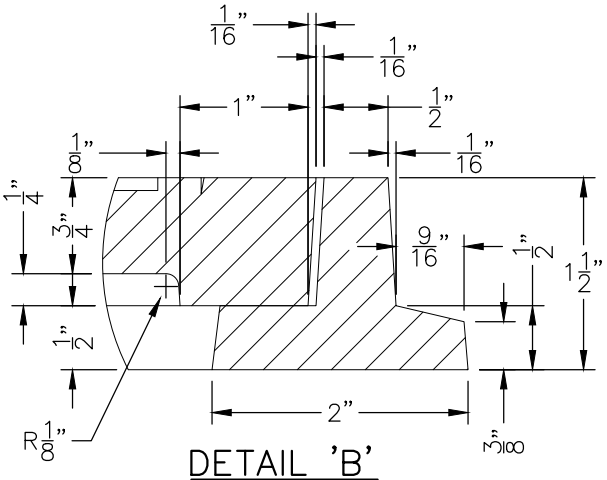
PLAN VIEW



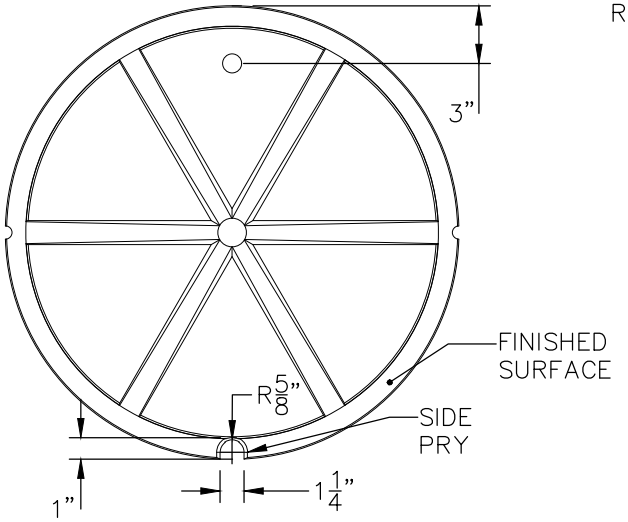
LOCKING DEVICE



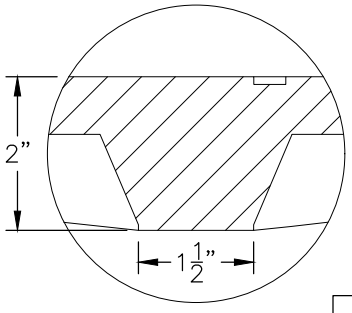
SECTION A–A



DETAIL 'B'



BOTTOM OF MANHOLE COVER



DETAIL 'C'

ITEM	WEIGHT
COVER	90 LBS
FRAME	30 LBS
TOTAL	120 LBS

MANHOLE FRAME A1530–R4B & COVER ARE AVAILABLE FROM SOUTH BAY FOUNDRY, BUT A CITY APPROVED EQUAL WILL BE ACCEPTED.

APPROVED BY:

CITY ENGINEER

06/06/2025
DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE

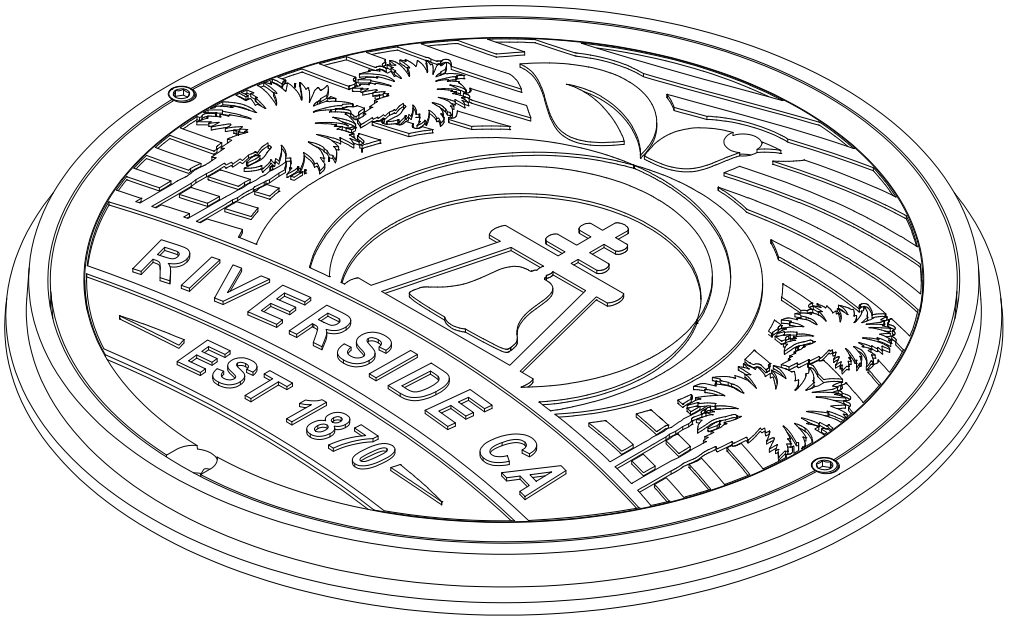
PUBLIC WORKS DEPARTMENT

22" MANHOLE FRAME & COVER

STANDARD DRAWING NO. 433

NOTES:

1. THE CAST IRON USED SHALL CONFORM TO ASTM A48 (A48M) CLASS 35B.
2. FINISH – GALVANIZED. A123 FINISH.
3. LOAD RATING – COVER PROOF – LOAD TESTED TO 28,600 LBS. PER TEST METHOD B PER STANDARD SPECIFICATIONS.
4. FOUNDRY I.D. MARK, HEAT, AND DATE CASTED ON BOTTOM OF COVER AND ON INSIDE OF FRAME.
5. IMPORTED COVERS AND FRAMES SHALL HAVE THE COUNTRY OF ORIGIN MARKING IN COMPLIANCE WITH FEDERAL REGULATIONS.



ITEM	WEIGHT
COVER	90 LBS
FRAME	30 LBS
TOTAL	120 LBS

APPROVED BY:

CITY ENGINEER

06/06/2025
DATE

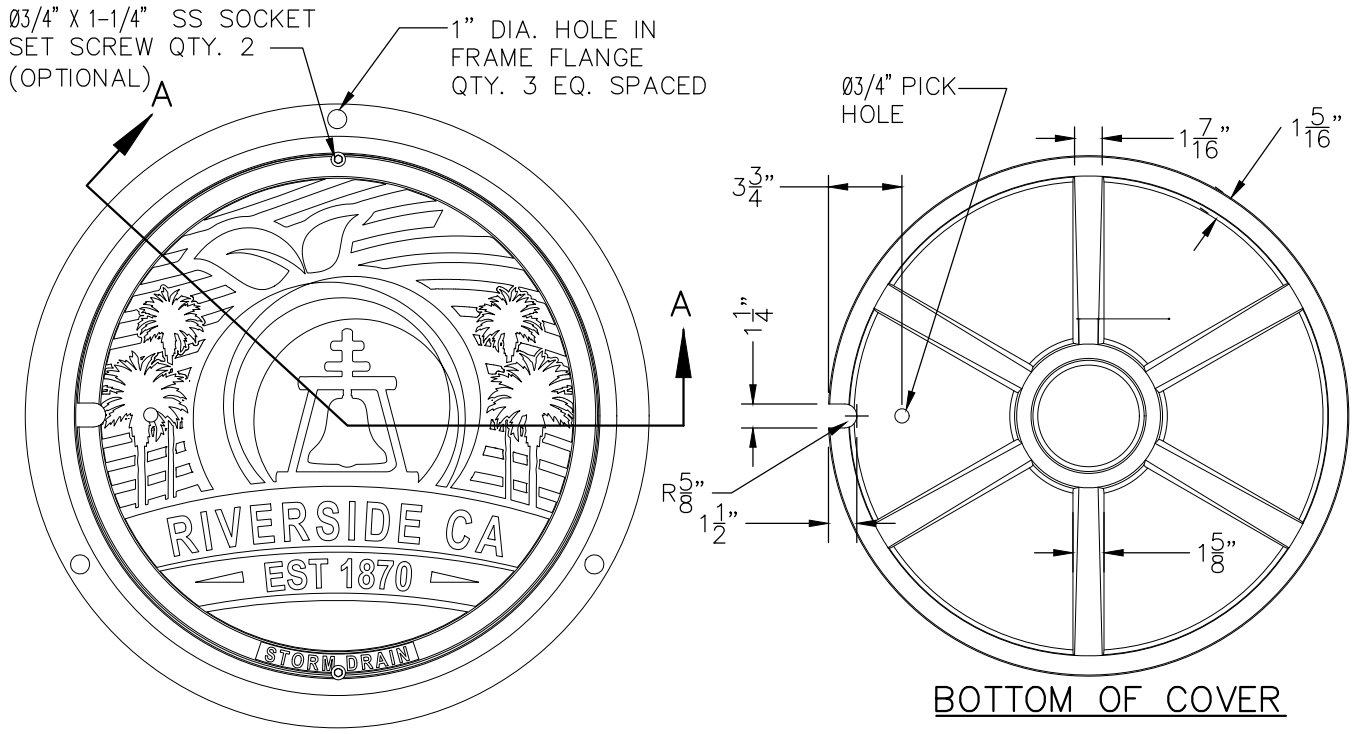
MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

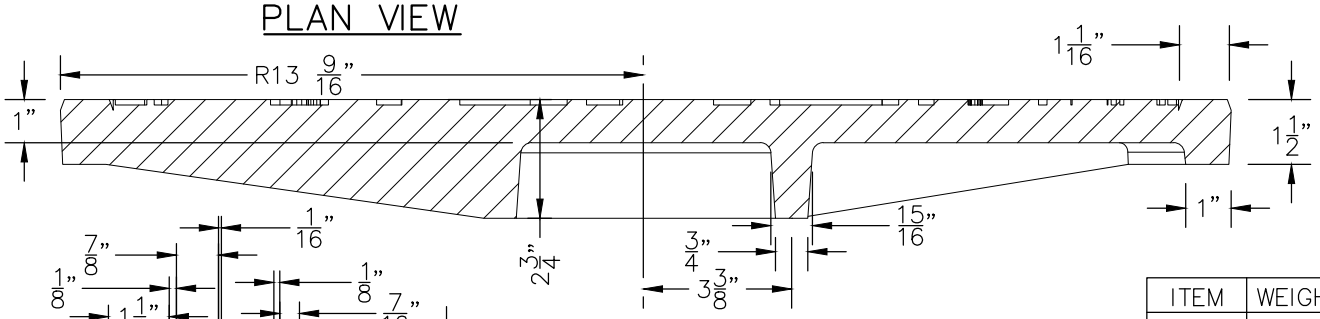
22" MANHOLE FRAME & COVER

STANDARD DRAWING NO. 433



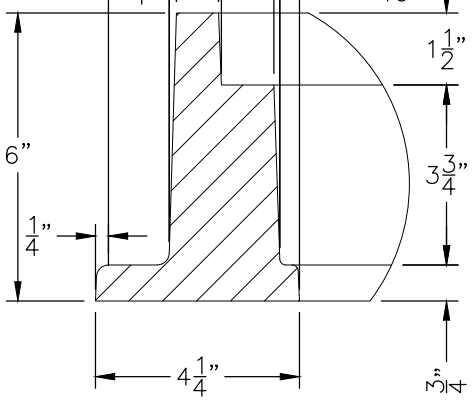
PLAN VIEW

BOTTOM OF COVER

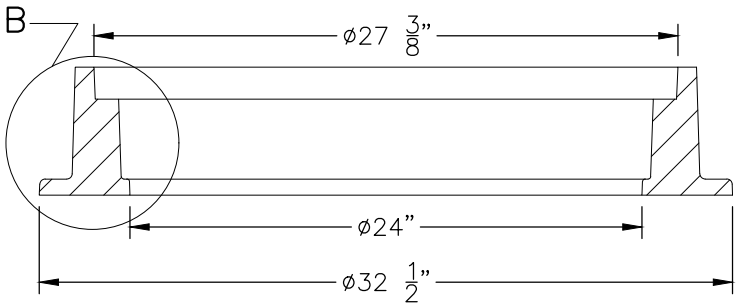


SECTION A–A THRU COVER

ITEM	WEIGHT
COVER	175 LBS
FRAME	255 LBS
TOTAL	430 LBS



DETAIL 'B'



SECTION A–A THRU FRAME

MANHOLE FRAME A1495–R1 & COVER ARE AVAILABLE FROM SOUTH BAY FOUNDRY, BUT A CITY APPROVED EQUAL WILL BE ACCEPTED.

APPROVED BY:

CITY ENGINEER

06/06/2025
DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE

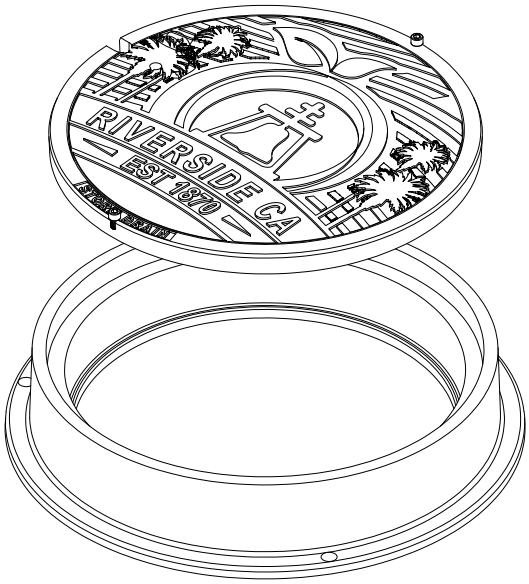
PUBLIC WORKS DEPARTMENT

24" MANHOLE FRAME & COVER

STANDARD DRAWING NO. 434

NOTES:

1. THE CAST IRON USED SHALL CONFORM TO ASTM A48 (A48M) CLASS 35B.
2. FINISH – DIPPED IN BLACK BITUMINOUS PAINT.
3. FOUNDRY I.D. MARK, HEAT, AND DATE CASTED ON BOTTOM OF COVER AND ON INSIDE OF FRAME.
4. FRAME AND COVER BEARING SURFACES MACHINED FOR CLOSE, QUIET FIT.
5. FRAME AND COVER EXCEEDS H–20 WHEEL LOADING.
6. IMPORTED COVERS AND FRAMES SHALL HAVE THE COUNTRY OF ORIGIN MARKING IN COMPLIANCE WITH FEDERAL REGULATIONS.
7. ALL HOLES IN CAST IRON SHALL BE DRILLED AFTER CASTING OR PLUGGED PRIOR TO CASTING, THEY SHALL NOT BE PUNCHED.
8. THE MANHOLE FRAME & COVER SHALL BE TESTED FOR ACCURATED FIT & MARKED IN SETS PRIOR TO DELIVERY TO THE JOB SITE.
9. COVERS FOR MANHOLES LOCATED IN EASEMENTS, ALLEYS, PARKWAYS & ALL PLACES OTHER THAN PAVED STREETS SHALL BE PROVIDED W/SOCKET–SETSCREW LOCKING DEVISE. DRILL & TAP TWO HOLES TO A DEPTH OF 1" AT 90° TO PICK HOLE AND INSTALL 3/4" X 3/4" STAINLESS STEEL SOCKET–SETSCREWS W/3/8" RECESSED HEX HEAD. ALL THREADS SHALL BE UNIFIED COARSE (UNC).



ITEM	WEIGHT
COVER	175 LBS
FRAME	255 LBS
TOTAL	430 LBS

APPROVED BY:

CITY ENGINEER

06/06/2025
DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE

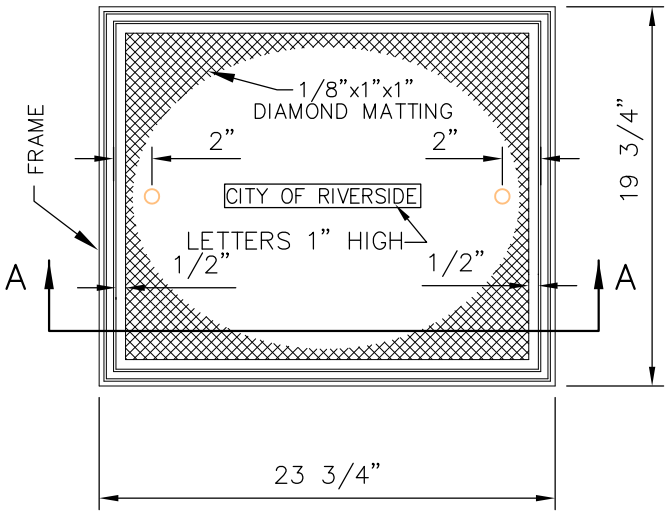
PUBLIC WORKS DEPARTMENT

24" MANHOLE FRAME & COVER

STANDARD DRAWING NO. 434

NOTES:

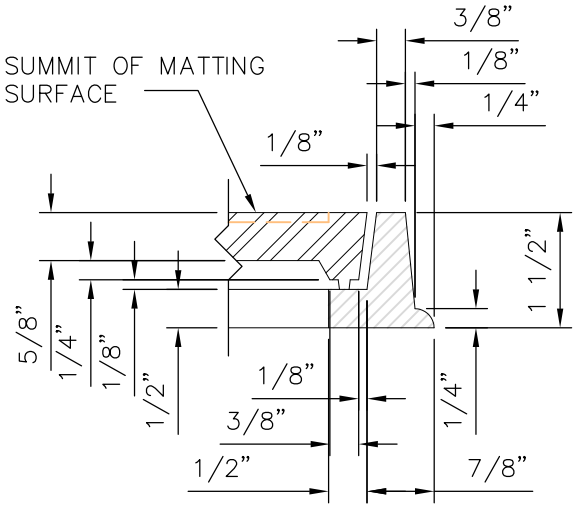
1. THE MATERIAL AND FINISH SHALL CONFORM TO THE SPECIFICATIONS APPLICABLE THERETO.
2. COVER SHALL FIT IN EITHER POSITION.
3. FRAME AND COVER SHALL BE SET TO SIDEWALK ELEVATIONS.
4. WEIGHTS: FRAME – 25 POUNDS
   COVER – 55 POUNDS
5. THIS SQUARE FRAME AND COVER IS FOR REPLACEMENT USE ONLY
6. FRAME AND COVER SHALL BE FITTED WITH TWO ⅜" DIA. STAINLESS STEEL ALLEN BOLTS FOR LOCKING PURPOSES. BOLT HEADS SHALL BE SET FLUSH WITH TOP OF FRAME AND COVER.



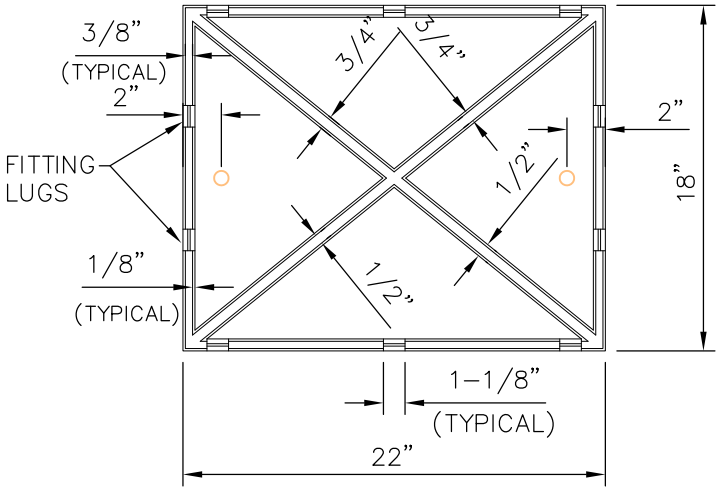
FRAME AND COVER PLAN



SECTION A–A



DETAIL OF FRAME AND COVER CONNECTION



BOTTOM PLAN OF COVER

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

MARK	REVISIONS	APPR.	DATE

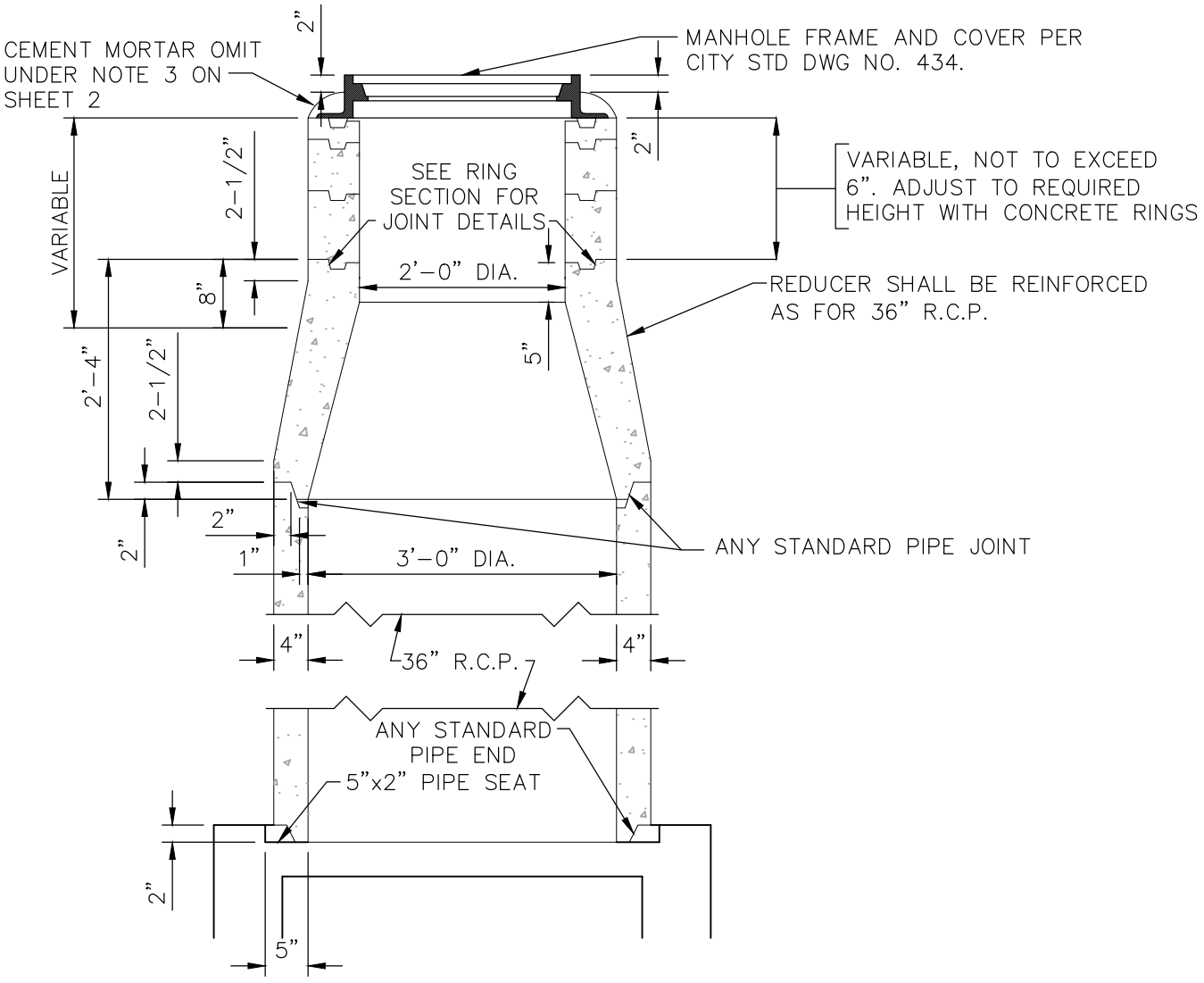
CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

CATCH BASIN
FRAME AND COVER

STANDARD DRAWING NO. 450

Sheet 1 of 1



VERTICAL SECTION
OF
MANHOLE SHAFT

APPROVED BY: _____ 06/06/2025
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

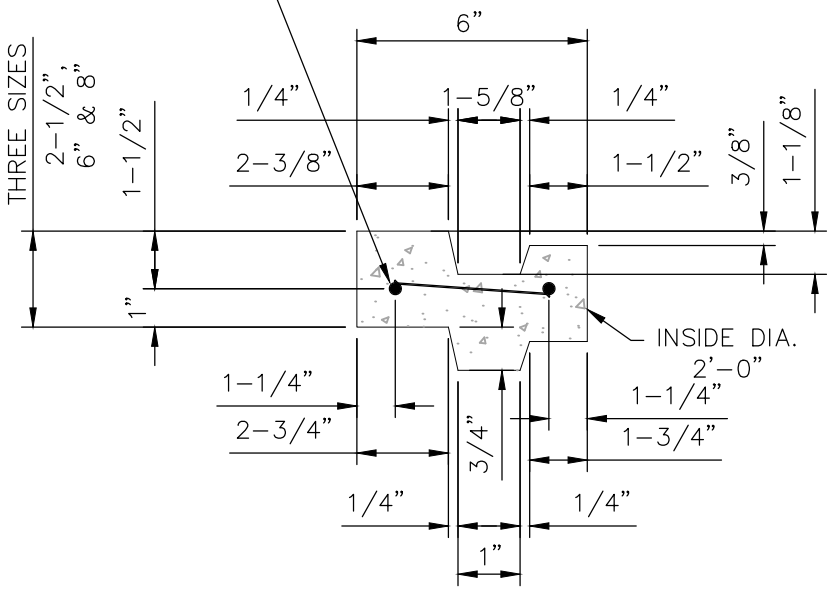
CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

CONCRETE RINGS, REDUCER,
& PIPE FOR MANHOLE SHAFT

STANDARD DRAWING NO. 451

2–1/2" RINGS SHALL BE REINFORCED WITH TWO NO. 2 STEEL HOOPS, 6" & 8" RINGS SHALL BE REINFORCED WITH FOUR AND SIX HOOPS TIED WITH NO. 14 A.S.&W GAGE WIRE 8" O.C.



CROSS SECTION
OF
CONCRETE RING

NOTES:

1. **CONCRETE** FOR POURED UNITS SHALL BE 560–C–3250
2. **JOINTS** SHALL BE FILL WITH CEMENT MORTAR AND NEATLY POINTED OR WIPED ON INSIDE OF SHAFT.
3. **COLLAR** OF CEMENT MORTAR AROUND COVER FRAME SHALL BE OMITTED IN ROCK AND OIL STREET AND IN PAVED STREETS.
4. **CONCRETE RINGS** SHALL BE OF THE DIMENSIONS SHOWN AND REINFORCED AS SHOWN HEREON.
5. **STEPS** SHALL BE ¾" ROUND GALVANIZED STEEL. TOP STEP SHALL BE PLACED DIRECTLY BENEATH THE MANHOLE COVER FROM WITH LEGS EXTENDING INTO WALL OF SHAFT ON RADIAL LINES. WIDTH OF ALL STEPS IN SHAFT SHALL BE 1'–2" BETWEEN LEG CENTERS. EXCEPT WHERE SHOWN OTHERWISE, SPACING OF STEPS IN SHAFT SHALL BE 1'–5" BETWEEN CENTERS. (ALHAMBRA FOUNDRY A–3320 OR APPROVED EQUAL BY CITY).
6. **CENTRIFUGALLY SPUN UNITS** MAY BE USED AT THE OPTION OF THE CONTRACTOR, CONFORMING TO SPECIFICATIONS FOR CENTRIFUGAL CONCRETE PIPE AND TO DETAIL "C" ON SHEET 2.
7. **LENGTH** OF SECTIONS OF 36" R.C.P. FOR MANHOLE SHAFT MAY BE 1'–0", 2'–0", 3'–0" OR 4'–0" AT THE OPTION OF THE CONTRACTOR.
8. **COVER** SHALL BE PER CITY STD DWG. NO. 434

APPROVED BY: _____ 06/06/2025
CITY ENGINEER DATE

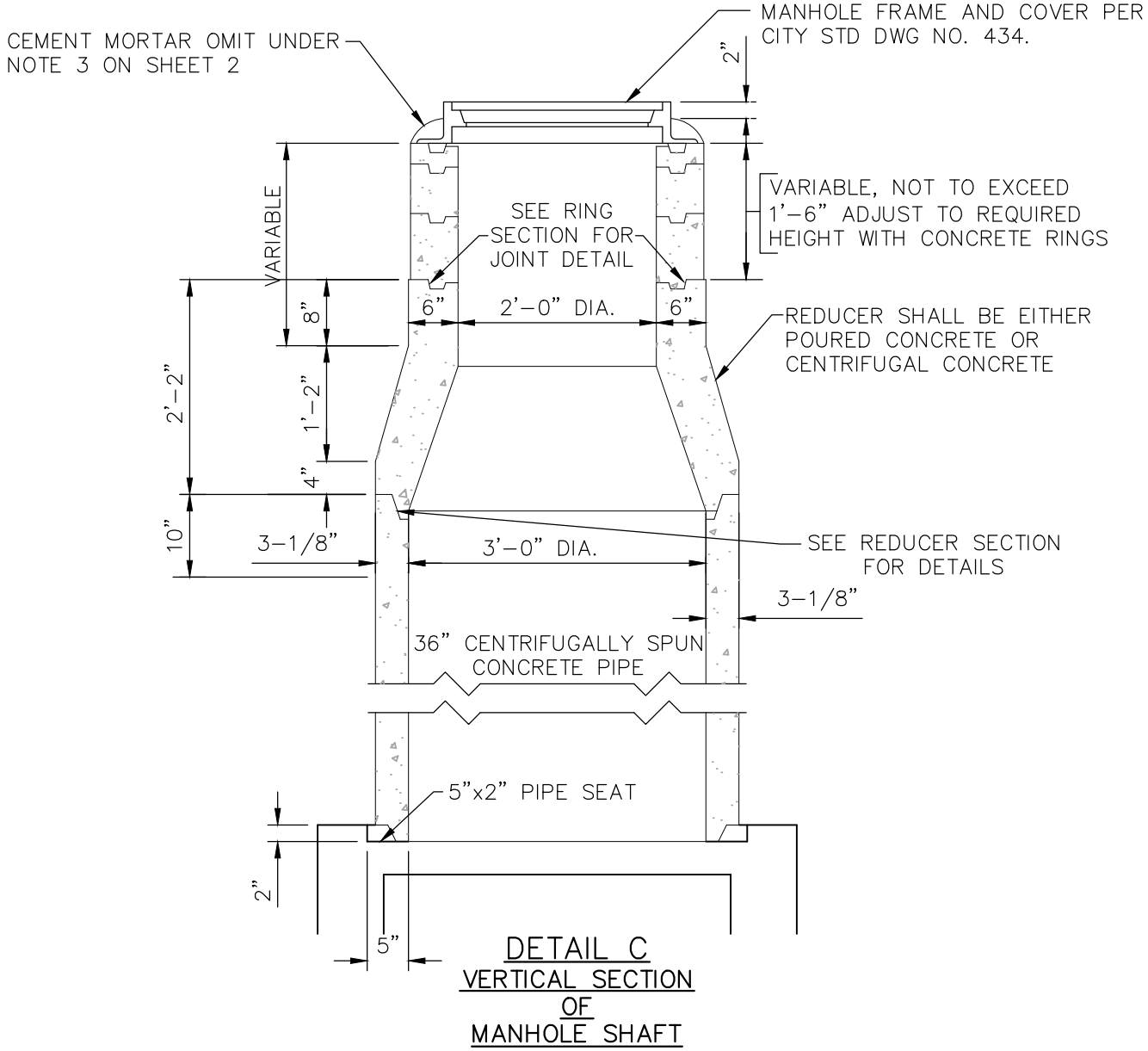
MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

CONCRETE RINGS, REDUCER,
& PIPE FOR MANHOLE SHAFT

STANDARD DRAWING NO. 451



DETAIL C
VERTICAL SECTION OF MANHOLE SHAFT

(FOR USE WITH CENTRIFUGALLY SPUN CONCRETE PIPE)

NOTES:

DETAIL "C" SHALL APPLY WHEN CENTRIFUGALLY SPUN CONCRETE PIPE AND RINGS ARE USED IN MANHOLE SHAFT, AS PER NOTE 6 ON SHEET 1.

TRANSVERSE REINFORCING STEEL FOR 36" CENTRIFUGALLY SPUN CONCRETE PIPE SHALL CONSIST OF COIL OF NO. 2 RODS SPACED 4" O.C. OR CLOSER.

LOADING TEST IS NOT REQUIRED FOR CENTRIFUGALLY SPUN CONCRETE PIPE USED FOR MANHOLE SHAFT.

LENGTH OF PIPE SECTIONS FOR MANHOLE SHAFT MAY BE 1'-2", 2'-6", OR 3'-10 ¾" AT THE OPTION OF THE CONTRACTOR.

ADDITIONAL NOTES FOR DETAIL "C" ARE SHOWN ON SHEET 1 OF 2.

COVER SHALL BE PER CITY STD DWG NO. 434.

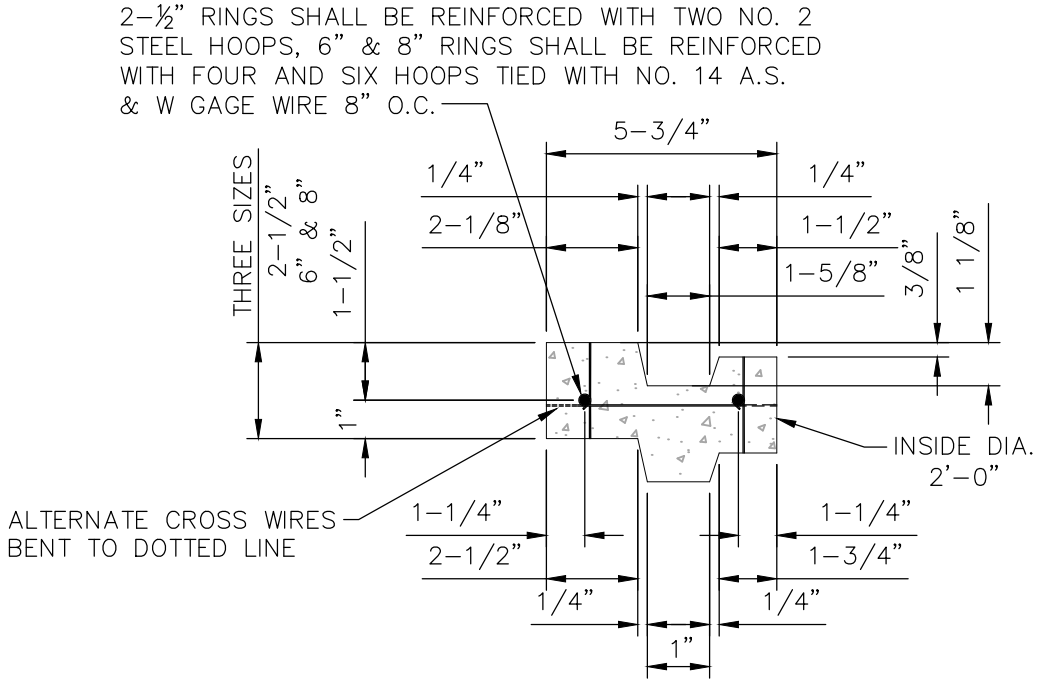
APPROVED BY: _____ 06/06/2025
CITY ENGINEER DATE

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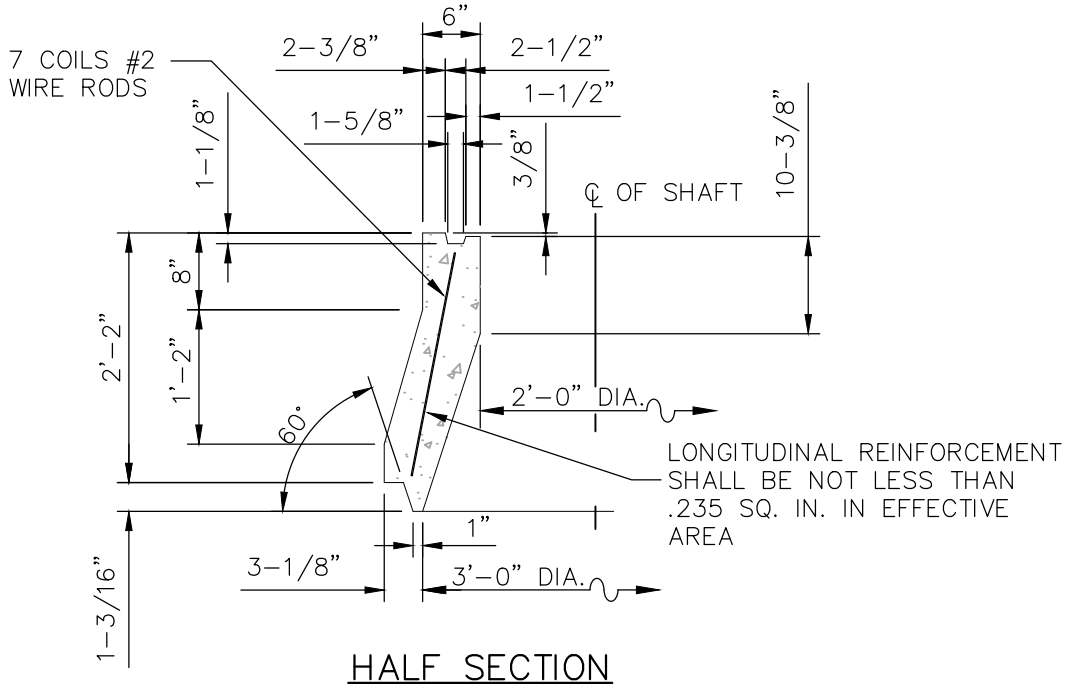
CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

CONCRETE RINGS, REDUCER, & PIPE FOR MANHOLE SHAFT

STANDARD DRAWING NO. 451



CROSS SECTION
OF
CONCRETE RING



HALF SECTION
OF REDUCER

APPROVED BY:

CITY ENGINEER

06/06/2025
DATE

CITY OF RIVERSIDE

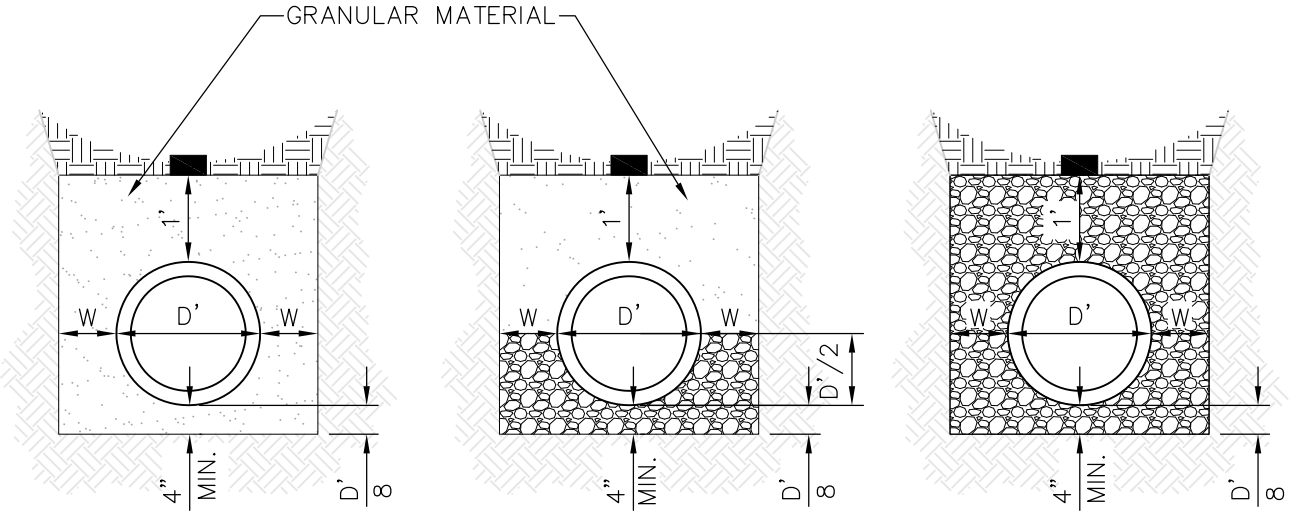
PUBLIC WORKS DEPARTMENT

CONCRETE RINGS, REDUCER,
& PIPE FOR MANHOLE SHAFT

MARK	REVISIONS	APPR.	DATE

STANDARD DRAWING NO. 451

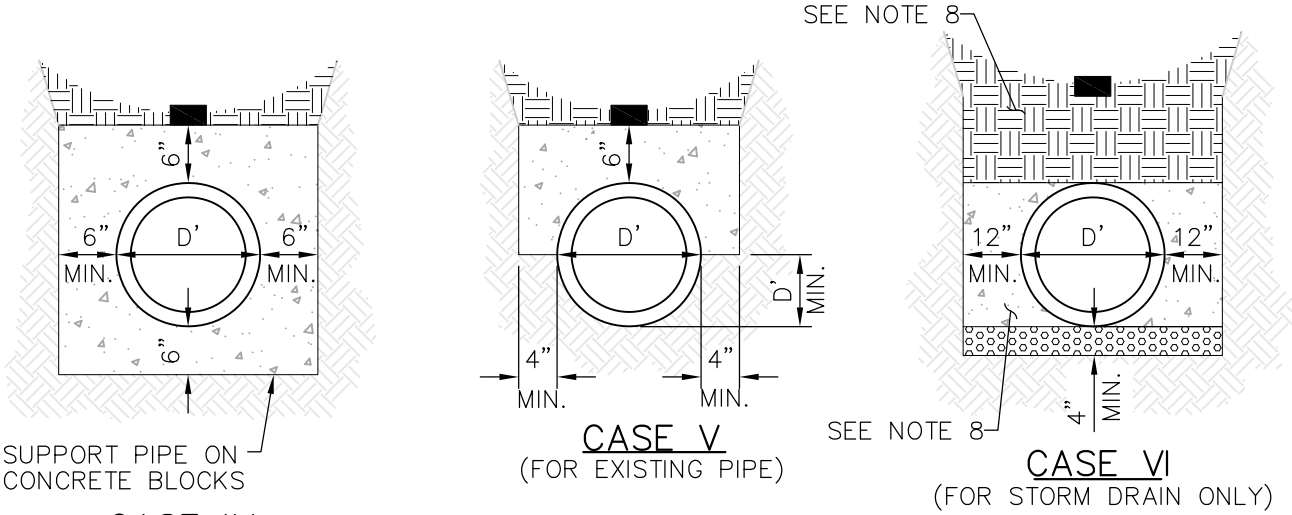
Sheet 4 of 4



CASE I

CASE II

CASE III



CASE IV

CASE V
(FOR EXISTING PIPE)

CASE VI
(FOR STORM DRAIN ONLY)

PIPE	COVER	W	
		MAX	MIN
VCP 12" & UNDER	> 8'	8"	6"
VCP 15" & OVER	> 8'	12"	6"
RCP 12" & OVER	> 2'	12"	
OTHER	> 8'	10"	6"
ALL	< 8'	12"	6"

LEGEND

- PCC BEDDING (CONTROLLED LOW STRENGTH MATERIAL)
- GRANULAR MATERIAL (95% RELATIVE COMPACTION)
- 1/2" – (MINUS) CRUSHED ROCK PER SECTION 200-1.2 OF THE STANDARD SPEC. (95% RELATIVE COMPACTION)
- BACKFILL (95% RELATIVE COMPACTION)
- NATIVE SOIL
- SEWER BURIED BELOW OR STORM DRAIN BURIED BELOW TAPE
- FILTER MATERIAL (95% RELATIVE COMPACTION)

CASE	LOAD FACTOR
I	1.5
II	1.9
III	2.2
IV	4.5
V	2.6*

RIGID PIPE DESIGN DATA
*SEE NOTE 5

APPROVED BY: _____ 9/29/2026
CITY ENGINEER DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

MARK	REVISIONS	APPR.	DATE

PIPE BEDDING

STANDARD DRAWING NO. 452

NOTES FOR PIPE BEDDING

1. CASE VI PIPE BEDDING SHALL BE THE DEFAULT BEDDING MATERIAL FOR ALL PIPES, EXCEPT HDPE PIPES, WHERE CASE III IS TO BE USED. ALTERNATE BEDDING CASES SHALL ONLY BE USED WHEN REQUIRED BY SPECIFIC DESIGN OR SITE CONDITIONS AND APPROVED BY CITY.

2. GRANULAR MATERIAL SHALL BE GRAVEL OR CRUSHED AGGREGATE WITH A SAND EQUIVALENT OF NOT LESS THEN 30. FOR ALL RCP (REINFORCED CONCRETE PIPE) AND PVC COMPOSITE PIPE, BEDDING MATERIAL SHALL BE 1/2–INCH CRUSHED ROCK AS PER SECTION 200–1.2 OF THE STANDARD SPECIFICATIONS.

3. WHERE GROUND WATER IS ENCOUNTERED IN THE TRENCH, THE CONTRACTOR SHALL, AT THE DIRECTION OF THE CITY ENGINEER, EXCAVATE TO A DEPTH OF 6–INCHES BELOW THE PROPOSED PIPE AND PLACE A BEDDING OF 1/2–INCH CRUSHED ROCK. IF THE GROUND WATER IS MORE THAN 3–INCHES ABOVE THE FLOW LINE OF PIPE, THE CONTRACTOR SHALL CONSTRUCT CONCRETE BARRIERS AT 3–FEET WIDE IN 25–FOOT INTERVALS UNDER THE PIPE TO PREVENT THE FLOW OF WATER THROUGH THE CRUSHED BEDDING MATERIAL.

4. CONCRETE SHALL CONFORM TO SECTION 201–1.1.2 OF THE LATEST EDITION OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTIONS.

5. THE LOAD FACTOR MAY BE INCREASED FOR CASE IV BY THE USE OF REINFORCING STEEL. THE LOAD FACTOR IS 3.2 FOR P=0.4%, 4.6 FOR P=1.0% IN WHICH P IS THE RATIO OF THE AREA OF STEEL TO THE AREA OF CONCRETE ABOVE THE CROWN OF THE PIPE.

6. TRENCH WALLS SHALL BE VERTICAL WITHIN THE BEDDING AREA. UNLESS OTHER BEDDING IS USED, AS APPROVED BY THE CITY ENGINEER.

7. FOR PIPES WITH DEPTH OF COVER OF 3' OR LESS, PIPES SHALL BE ENCASED IN CONCRETE PER CITY STANDARD 455.

8. FOR RCP WITH COVER LESS THAN OR EQUAL TO 2 FEET, THE CLSM AND BACKFILL SHALL BE REPLACED WITH CONCRETE SLURRY (F'C=2,000 PSI MINIMUM) TO A MINIMUM OF 4 INCHES AND A MAXIMUM OF 12 INCHES ABOVE THE TOP OF THE PIPE.

9. FILTER MATERIAL SHALL MEET THE REQUIREMENTS FOR 1/2–INCH CRUSHED ROCK AS PER SECTION 200, TABLE 200–1.2.1 (A) OF THE STANDARD SPECIFICATIONS.

10. THE LOAD FACTOR TABLE DOES NOT APPLY FOR STORM DRAIN PIPES.

APPROVED BY: _____ 9/29/2026
CITY ENGINEER DATE

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CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

PIPE BEDDING

STANDARD DRAWING NO. 452

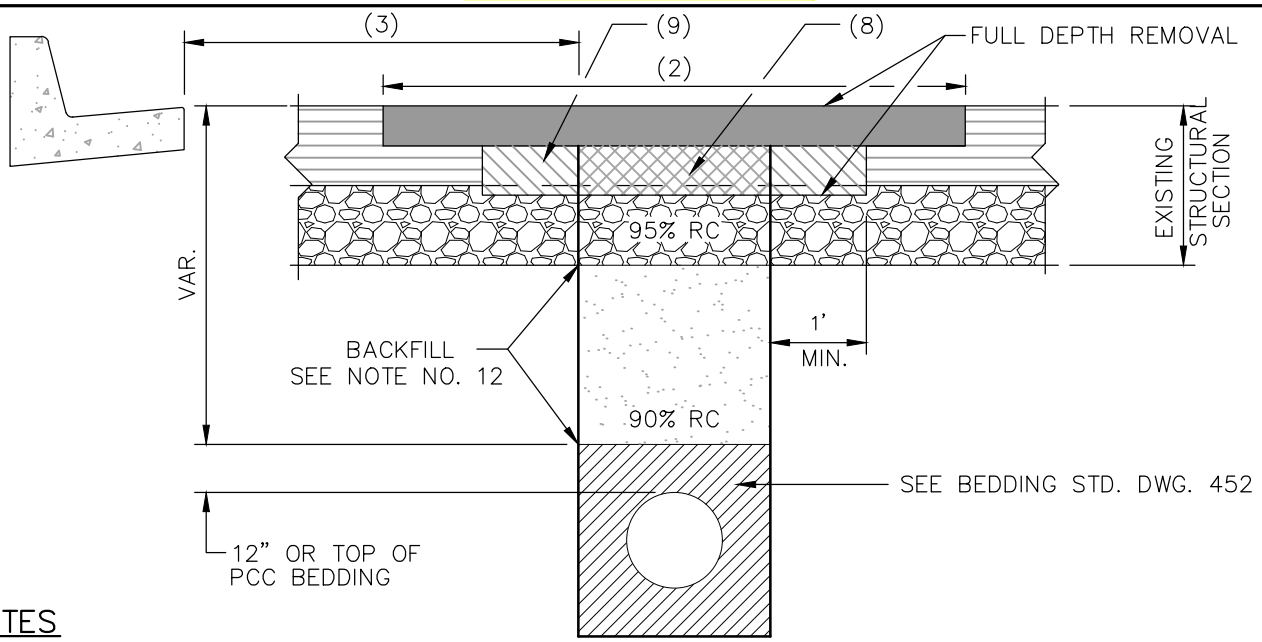
PAVEMENT MORATORIUM

FIVE (5) YEAR MORATORIUM FOR NEW PAVEMENT AND ONE (1) YEAR FOR SLURRY SEAL.
MORATORIUM PERIOD BEGINS AFTER NOTICE OF COMPLETION (NOC) HAS BEEN FILED.

TRENCHING IN STREETS UNDER MORATORIUM REQUIRES PRIOR WRITTEN APPROVAL FROM THE CITY ENGINEER.
THE LIMITS OF RESURFACING WILL BE MORE EXTENSIVE FOR STREETS UNDER MORATORIUM AS INDICATED HEREIN.
CONTRACTORS SHALL VERIFY MORATORIUM STATUS PRIOR TO COMMENCING WORK.

CLICK HIGHLIGHTED LINK BELOW OR VISIT THE PUBLIC WORKS WEBPAGE TO CHECK MORATORIUM STATUS

.....



NOTES

1. NO TRENCHING, CUTTING, POTHOLING, GRADING OR CORING SHALL BE ALLOWED ON STREETS UNDER MORATORIUM UNLESS WRITTEN AUTHORIZATION FROM THE ENGINEER IS PROVIDED, INCLUDING EMERGENCY WORK AND/OR SERVICE CONNECTIONS.
2. WHEN TRENCHING OR CUTTING INTO A STREET, FULL LANE WIDTH (10 FEET WIDE MINIMUM) OF ASPHALT CONCRETE (A.C.) PAVEMENT REPLACEMENT–A.C. COLD MILLING (0.12 FEET THICK MINIMUM) AND A.C. OVERLAY IS REQUIRED. REPLACEMENT OF MULTIPLE LANES IS REQUIRED WHEN WORK AFFECTS MORE THAN ONE LANE. ALTERNATELY, AT THE DISCRETION OF THE ENGINEER, COLD MILL OR GRIND EXISTING A.C. PAVEMENT TO A DEPTH OF 0.12 FEET WITHIN THE TRENCH AREA TO A LEAST 1 FOOT BEYOND THE EDGES OF THE TRENCH, AND SLURRY SEAL THE ENTIRE STREET WIDTH FROM GUTTER LIP TO GUTTER LIP (OR EDGE OF PAVEMENT). **SEE NOTE 25 FOR ADDITIONAL PAVEMENT REQUIREMENTS WHEN AN ARAM INTERLAYER IS IMPACTED.**
3. IF THE TRENCH EDGE IS 4 FEET OR LESS FROM THE EDGE OF PAVEMENT, GUTTER LIP, OR CURB FACE, THE PAVEMENT SECTION (4 FEET IN WIDTH OR LESS) SHALL BE REMOVED AND REPLACED AS PART OF THE TRENCH BACKFILL OR AS DIRECTED BY THE ENGINEER.
4. IF A VEHICULAR LANE IMPACTED BY THE TRENCH IS ADJACENT TO A BICYCLE OR A PARKING LANE, THE PAVEMENT SECTION WITHIN THE BICYCLE OR PARKING LANE SHALL BE COLD MILLED AND RESURFACED WITH 0.12 FEET OF A.C. TO THE EDGE OF THE GUTTER (SEE CASE I OR V ON SHEETS 3 AND 4).
5. FOR TRANSVERSE (PERPENDICULAR) TRENCHES, GRINDING AND RESURFACING WITH 0.12 FEET OF A.C. SHALL EXTEND 15 FEET BEYOND LIMITS OF EACH SIDE OF THE TRENCH, SEE SHEETS No. 3 AND No. 4.
6. GRIND AND RESURFACE A MINIMUM OF 3 INCHES FOR FULL WIDTH OF ANY TRAVEL LANE WITHIN 50 FEET OF INTERSECTIONS (APPROACHES ONLY)
7. SIGNIFICANT TRENCH CUTS DUE TO UTILITY LATERALS REQUIRE GRINDING AND RESURFACING WITH 0.12 FEET OF A.C. (SEE CASE IV, SHEET 3).

APPROVED BY: _____ 03/08/2023
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

TRENCH BACKFILL

STANDARD DRAWING NO. 453

NOTES:

8. REPLACEMENT A.C. PAVEMENT THICKNESS WITHIN THE TRENCH LIMITS SHALL BE 1 INCH GREATER THAN EXISTING A.C. PAVEMENT THICKNESS OR 5 INCHES THICK WHICHEVER IS GREATER.
9. ADDITIONAL REPLACEMENT OF A.C. STRUCTURAL SECTION, WITH THE SAME MINIMUM THICKNESS REQUIREMENTS INDICATED IN NOTE 8 ABOVE, WILL BE REQUIRED FOR A MINIMUM OF ONE FOOT OUTSIDE THE TRENCH LIMITS WHERE THE EXISTING A.C. THICKNESS IS LESS THAN 3 INCHES.
10. THE DENSE GRADED ASPHALT CONCRETE (DGAC) USED FOR PERMANENT RESURFACING SHALL BE TYPE B–PG 70–10 FOR THE BASE COURSE AND C2–PG 70–10 FOR THE FINISHED COURSE. WHERE RUBBERIZED ASPHALT IS REQUIRED, THE ASHALT MIX SHALL BE ARHM–GG–C OR ARHM–GG–B. ALL ASPHALT MIXES ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
11. ALL ASPHALT PAVEMENT REPLACEMENT SHALL HAVE SQUARE AND UNIFORM EDGE(S) THROUGHOUT AS DIRECTED BY THE ENGINEER. TRACKLESS TACK MATERIAL WILL ONLY BE PERMITTED.
12. BACKFILL REQUIREMENTS SHALL BE AS SPECIFIED IN SECTION 306 OF THE MOST CURRENT EDITION OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS STANDARDS". CONTRACTOR SHALL PROVIDE TO THE ENGINEER COMPACTION TEST RESULTS CERTIFIED BY AN APPROVED CIVIL OR SOILS ENGINEER FOR ALL WORK DONE INCLUDING ASPHALT PAVEMENT. WHERE NO SURFACE IMPROVEMENTS EXIST, THE TOP OF BACKFILL SHALL BE FLUSH WITH THE EXISTING SURFACE AND 90% RELATIVE COMPACTION SHALL EXTEND TO THE SURFACE. CONTROLLED LOW STRENGTH MATERIAL (CLSM) MAY BE ALLOWED FOR SUB–GRADE BACKFILL IF APPROVED BY THE ENGINEER. ALL COSTS FOR TESTING SHALL BE BORNE BY THE CONTRACTOR.
13. TRENCHES SHALL BE PAVED WITH TEMPORARY A.C. PAVEMENT IMMEDIATELY FOLLOWING WORK. ALL TEMPORARY ASPHALT SHALL BE A MINIMUM 3 INCHES THICK AND SHALL BE PROPERLY COMPACTED FLUSH WITH EXISTING PAVING USING A VIBRATORY ROLLER OR VIBRATORY PLATE. ALL TEMPORARY ASPHALT MUST BE KEPT UP DAILY AT THE CONTRACTOR'S EXPENSE. PERMANENT PAVING IS REQUIRED WITHIN 2 WEEKS OF EXCAVATION. TRAFFIC LOOPS SHALL BE INSTALLED WITHIN 1 WEEK OF PERMANENT PAVING AND STRIPING WORK SHALL COMMENCE WITHIN 2 WORKING DAYS OF LOOP INSTALL COMPLETION.
14. ALL USA OR OTHER MARKINGS MUST BE COMPLETELY REMOVED WITHOUT DAMAGING ANY SURFACES THAT HAVE BEEN MARKED. AREAS OF REMOVAL SHALL BE MARKED BY THE CITY INSPECTOR.
15. ALL REQUIREMENTS IN THIS DRAWING APPLY TO TRENCHES AND EXCAVATIONS IN PUBLIC EASEMENTS, RIGHTS OF ENTRY, CITY PROPERTY AS WELL AS THOSE WITHIN STREET RIGHTS–OF–WAY.
16. SPOT REPAIRS AND/OR POTHOLING REPAIRS SHALL BE COMPLETED PER CITY PUBLIC WORKS STANDARD 454.
17. ANY OTHER TRENCH AND/OR PATCH REPAIR METHODS SHALL BE APPROVED BY THE CITY ENGINEER.
18. NO WORK WILL BE ALLOWED IN THE DOWNTOWN RIVERSIDE AREA BETWEEN THE DATES NOVEMBER 1 AND JANUARY 3. THE DOWNTOWN AREA WILL BE BOUNDED BY FIRST STREET, FIFTEENTH STREET, SR–91, AND BROCKTON AVENUE. NO WORK WILL BE ALLOWED WITHIN 1000 FEET OF THE THE GALLERIA AT TYLER OR THE RIVERSIDE PLAZA DURING THE SAME DATES. ANY EXCEPTIONS SHALL BE APPROVED BY THE ENGINEER.
19. THE CITY MAY REQUIRE FULL DEPTH AC SECTION REPLACEMENT BASED ON STREET CONDITIONS.
20. ALL DAMAGED OR REMOVED STRIPING, PAVEMENT LEGENDS, MARKERS, AND TRAFFIC SIGNAL LOOPS SHALL BE REPLACED IN–KIND. PARTIALLY IMPACTED FACILITIES SHALL BE FULLY REPLACED.
21. MANHOLES, VALVES OR VAULTS IMPACTED BY THE A.C. IMPROVEMENTS SHALL BE LOWERED AND RAISED PER GREENBOOK.
22. CONSTRUCT NEW CRUSHED MISC. BASE MAX 3/4" PARTICLE SIZE, TO A MIN. OF 4" THICK UP TO EXISTING ASPHALT BASE SECTION THICKNESS, WHICHEVER IS GREATER. COMPACT TO 95% OF RELATIVE DENSITY. NO CRUSHED MISC. BASE REQUIRED IF 1–SACK SAND/CEMENT SLURRY BACKFILL IS USED.
23. SAWCUTTING IS REQUIRED AROUND THE PERMITER OF THE FINAL EDGE OF ALL EXCAVATIONS TO PROVIDE CLEAN SIDES. STREETS HAVING MULTIPLE TRANSVERSE (PERPENDICULAR) TRENCHES SHALL ADHERE TO CASE III, IV, OR VII ON SHEETS No. 3 AND No. 4, RESPECTIVELY.
24. FOR STREETS NOT UNDER MORATORIUM, THE CONTRACTOR SHALL NOT BE REQUIRED TO PAVE BETWEEN TRANSVERSE TRENCHES IF THE DISTANCE BETWEEN THE SIDES OF THE TRENCHES IS 60–FEET OR MORE.
25. ON STREETS THAT CONTAIN AN ASPHALT RUBBER AGGREGATE MEMBRANE (ARAM) INTERLAYER, THE CONTRACTOR SHALL EITHER REPLACE THE ARAM INTERLAYER OR PROVIDE COLD MILLING TO A DEPTH OF 0.15 FEET MINIMUM TO REMOVE THE EXISTING ARAM AND REPLACE WITH 0.15 FEET OF NEW ASPHALT WITH A HYBRID GEOSYNTHETIC PAVING MAT SIMILAR TO GLASPAVE®, OR A CITY APPROVED EQUAL, WITHIN THE REQUIRED RESURFACING LIMITS INDICATED IN ALL CASES. CONTRACTORS ARE RESPONSIBLE TO DETERMINE THE PRESENCE OF ARAM.
26. PRIOR TO TRENCHING WORK, THE CONTRACTOR SHALL LOCATE ALL ACTIVE GRAVITY UTILITY PIPES AND THEIR SERVICE LATERALS (I.E. STORM DRAIN PIPES, SEWER PIPES, AND SEWER LATERALS) USING VIDEO TECHNOLOGY. TABULATION OF THE GRAVITY UTILITY PIPES AND THE SERVICE LATERALS LOCATIONS WITHIN THE LIMITS OF EXCAVATION SHALL BE PROVIDED TO THE ENGINEER PRIOR TO THE START OF ANY WORK.

APPROVED BY: _____ 03/08/2023

CITY ENGINEER DATE

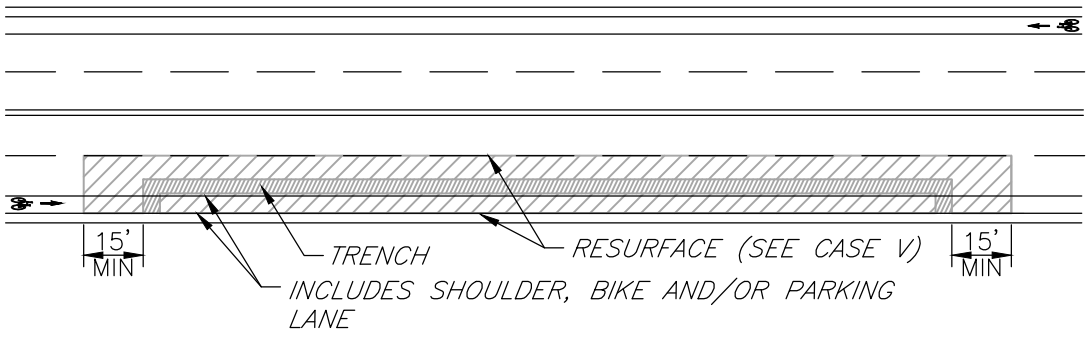
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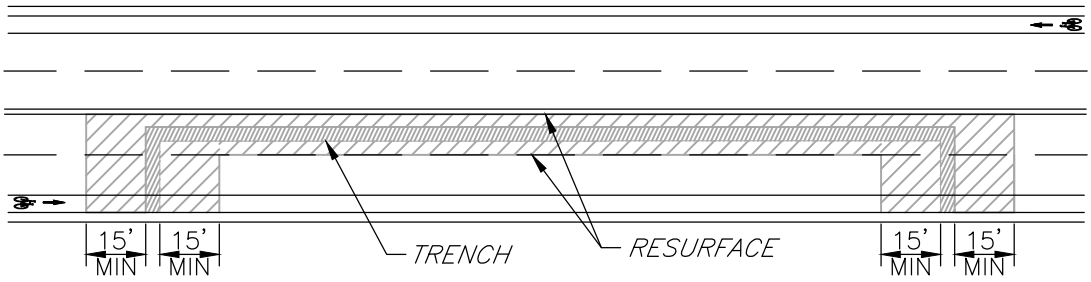
TRENCH BACKFILL

STANDARD DRAWING NO. 453

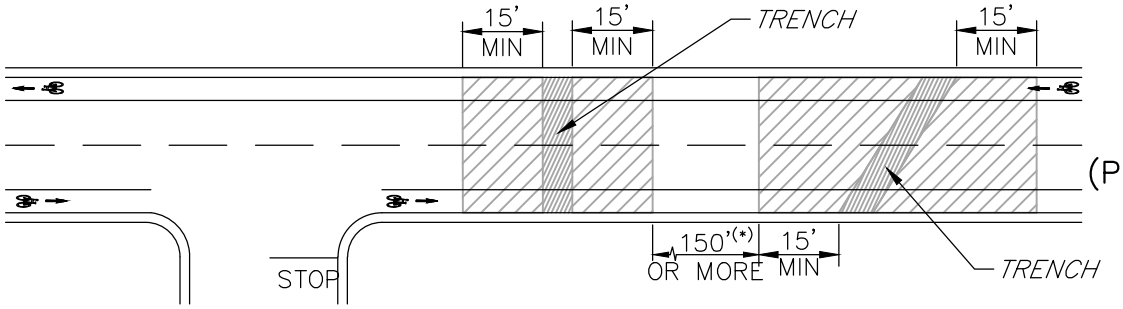
LEGEND: TRENCH
GRIND 0.12' AND REPLACE WITH 0.12' AC.



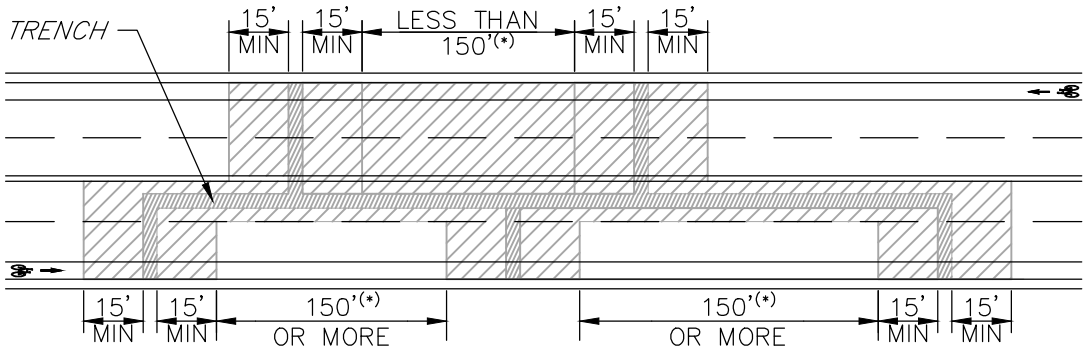
CASE I
LONGITUDINAL (PARALLEL) TRENCH CUT OUTSIDE LANES



CASE II
LONGITUDINAL (PARALLEL) TRENCH CUT INSIDE LANE



CASE III
TRANSVERSE (PERPENDICULAR) TRENCH CUT



CASE IV
SIGNIFICANT TRENCH CUTS

(*) SEE NOTE 24 FOR STREETS NOT UNDER MORATORIUM

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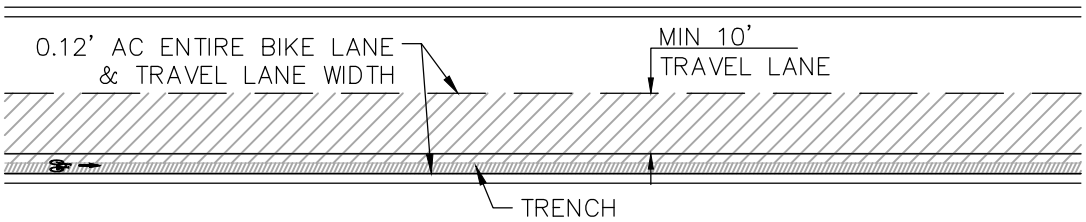
TRENCH BACKFILL

STANDARD DRAWING NO. 453

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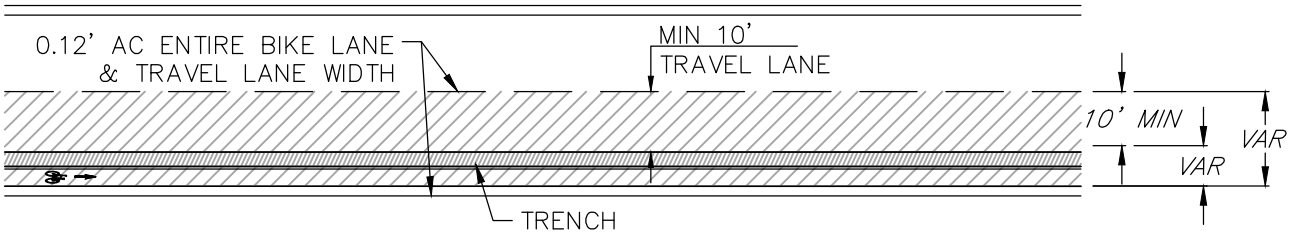
TRENCH

GRIND 0.12' AND REPLACE WITH 0.12' AC.

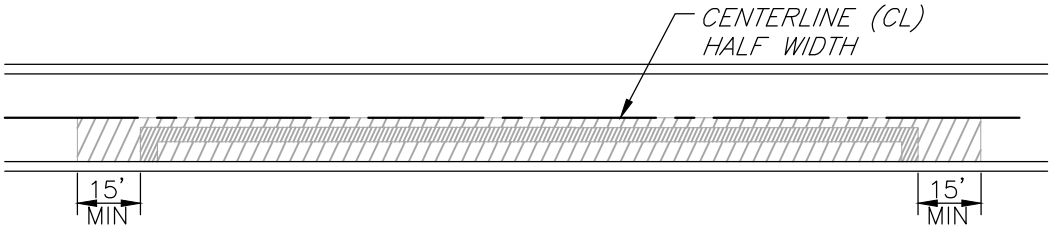


TRENCH LIMITS WITHIN BIKE LANE

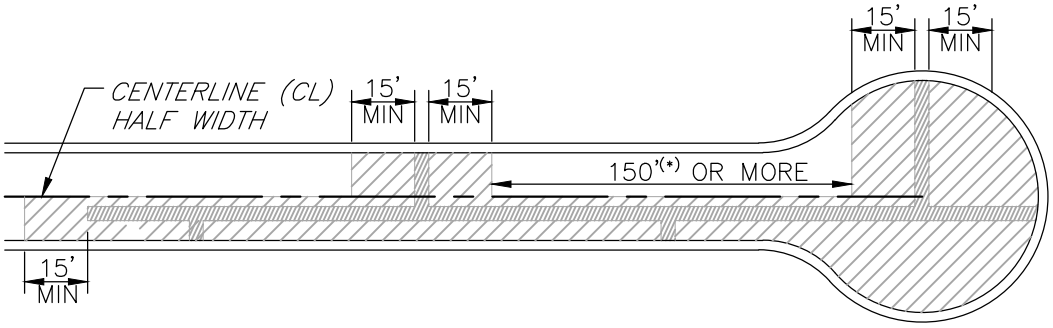
CASE V
TRENCH CUT NEAR GUTTER



TRENCH LIMITS ADJACENT TO BIKE/PARKING LANE



CASE VI
TRENCH CUT LOCAL STREETS



CASE VII
TRENCH CUT IN CUL DE SAC

(*) SEE NOTE 24 FOR STREETS NOT UNDER MORATORIUM

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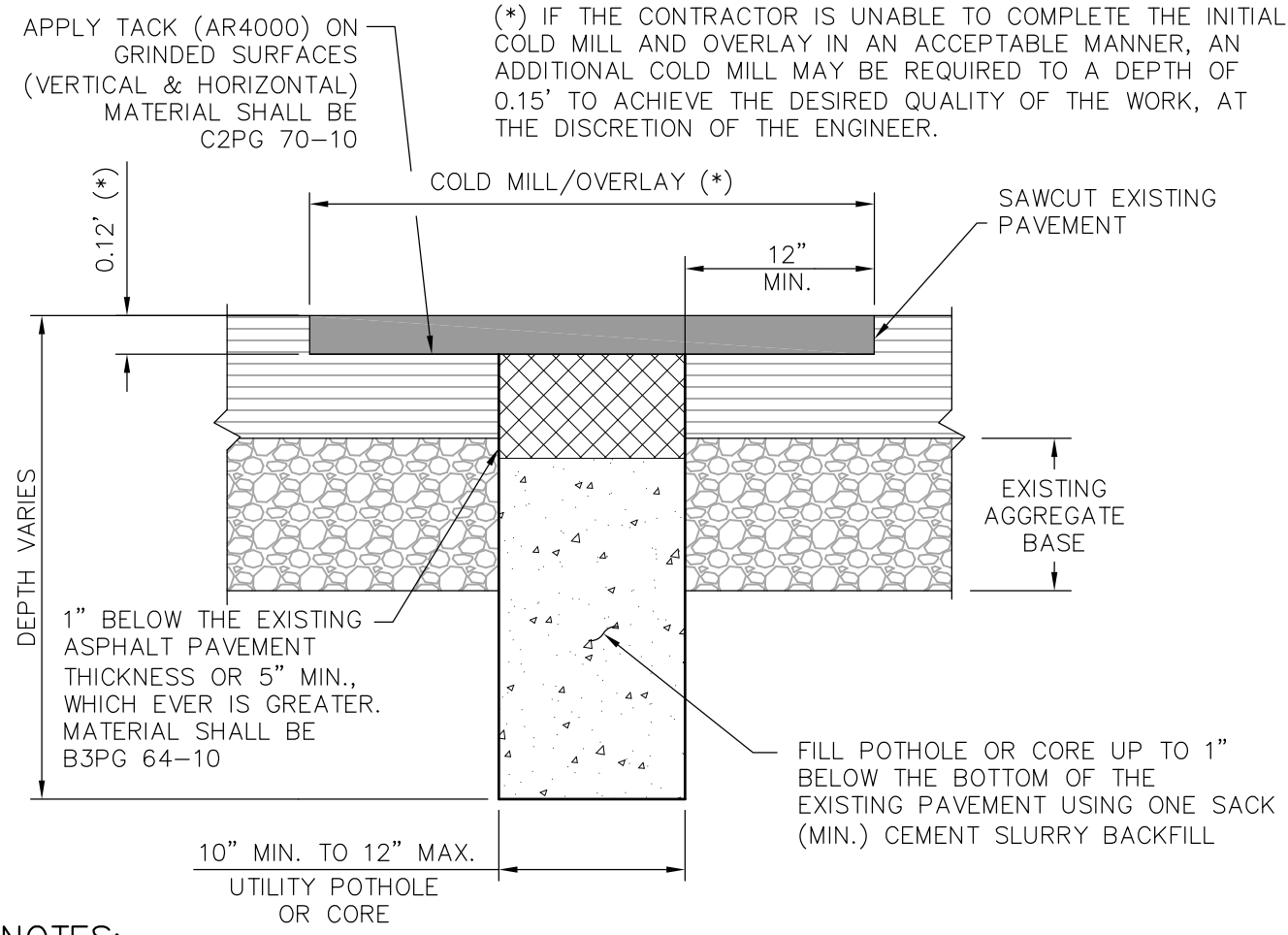
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TRENCH BACKFILL

STANDARD DRAWING NO. 453



NOTES:

1. UTILITY POTHOLE WORK SHALL BE COMPLETED UTILIZING SAWCUT OR CORE DRILLING METHODS. WHEN SAWCUTTING METHODS ARE USED, REFER TO CITY STANDARD 453 FOR DETERMINATION OF ASPHALT REFURBISHMENT LIMITS OR AS DIRECTED BY THE CITY ENGINEER.
2. IF POTHOLE/CORE WORK REMOVES/DAMAGES EXISTING TRAFFIC STRIPING, REPLACEMENT STRIPING SHALL BE REPLACED IN KIND.
3. WHEN UTILITY POTHOLE/CORE WORK IS COMPLETED WITHIN CONCRETE AREAS, THE CONTRACTOR SHALL BE RESPONSIBLE TO REPLACE FULL CONCRETE PANELS OR SECTIONS PER THE ASSOCIATED CITY STANDARD.
4. WHEN TRENCH BACKFILL AND ROADWAY REPAIR WORK IS PERFORMED, REFER TO THE NOTES INDICATED IN CITY STANDARD 453.
5. WHEN MULTIPLE POTHOLES ARE COMPLETED PARALLEL TO THE TRAFFIC LANE WITH A SPACING OF 24' OR LESS, COLDMILL AND OVERLAY REQUIREMENTS SHALL ADHERE TO CITY STANDARD 453 OR AS DIRECTED BY THE CITY ENGINEER.
6. NO UTILITY POTHOLE/CORE WORK WILL BE ALLOWED ON STREETS THAT HAVE BEEN PAVED/RESURFACED WITHIN THREE YEARS, EXCEPT FOR EMERGENCY SITUATIONS OR IN CONJUNCTION WITH PROVIDING UTILITY SERVICE CONNECTIONS, OR APPROVED BY THE CITY ENGINEER.

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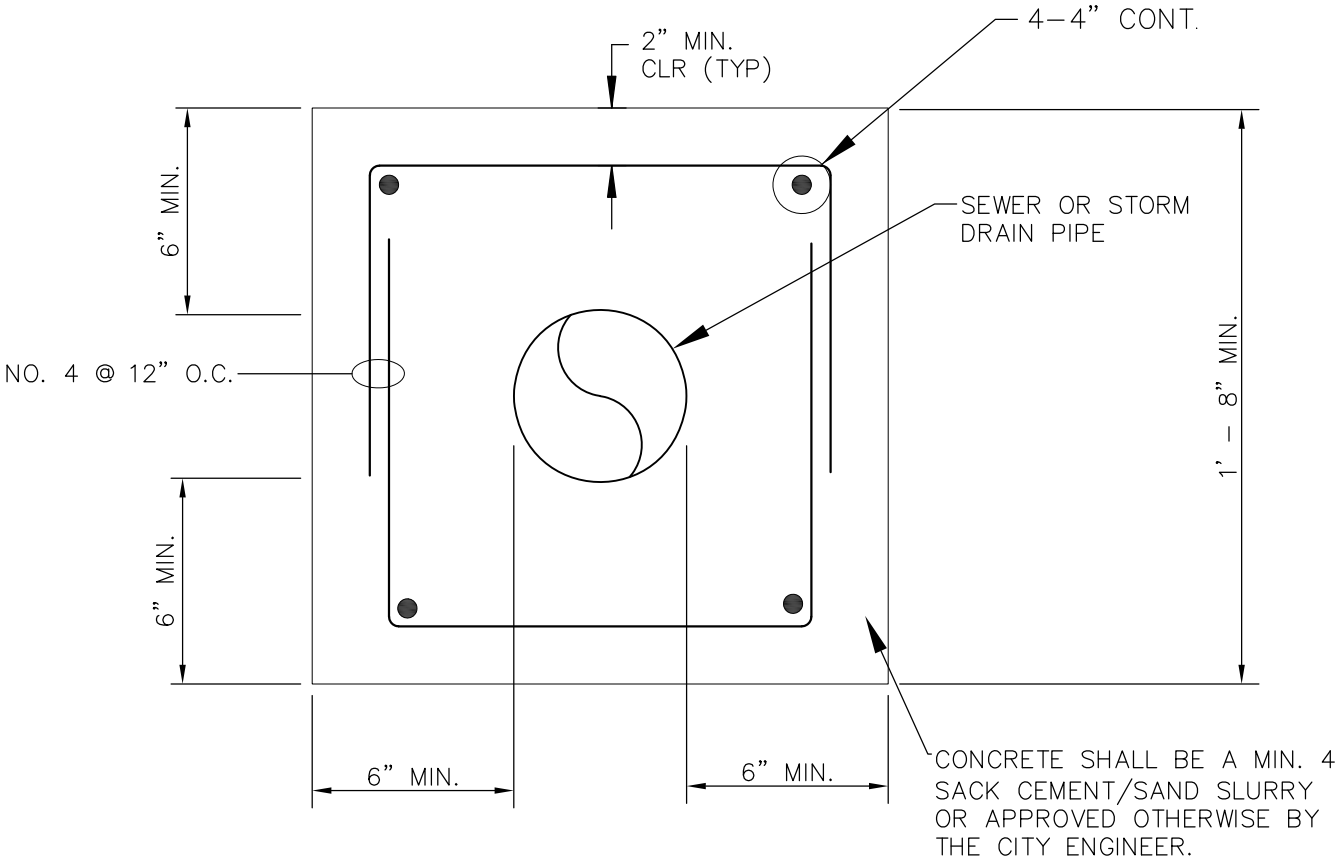
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UTILITY POTHOLE/CORE REPAIR

STANDARD DRAWING NO. 454

Sheet 1 of 1



NOTE:

1. CONCRETE ENCASEMENT SHALL BE USED WHEN STORM DRAIN AND/ OR SEWER PIPES HAVE LESS THAN 3 FEET OF COVER

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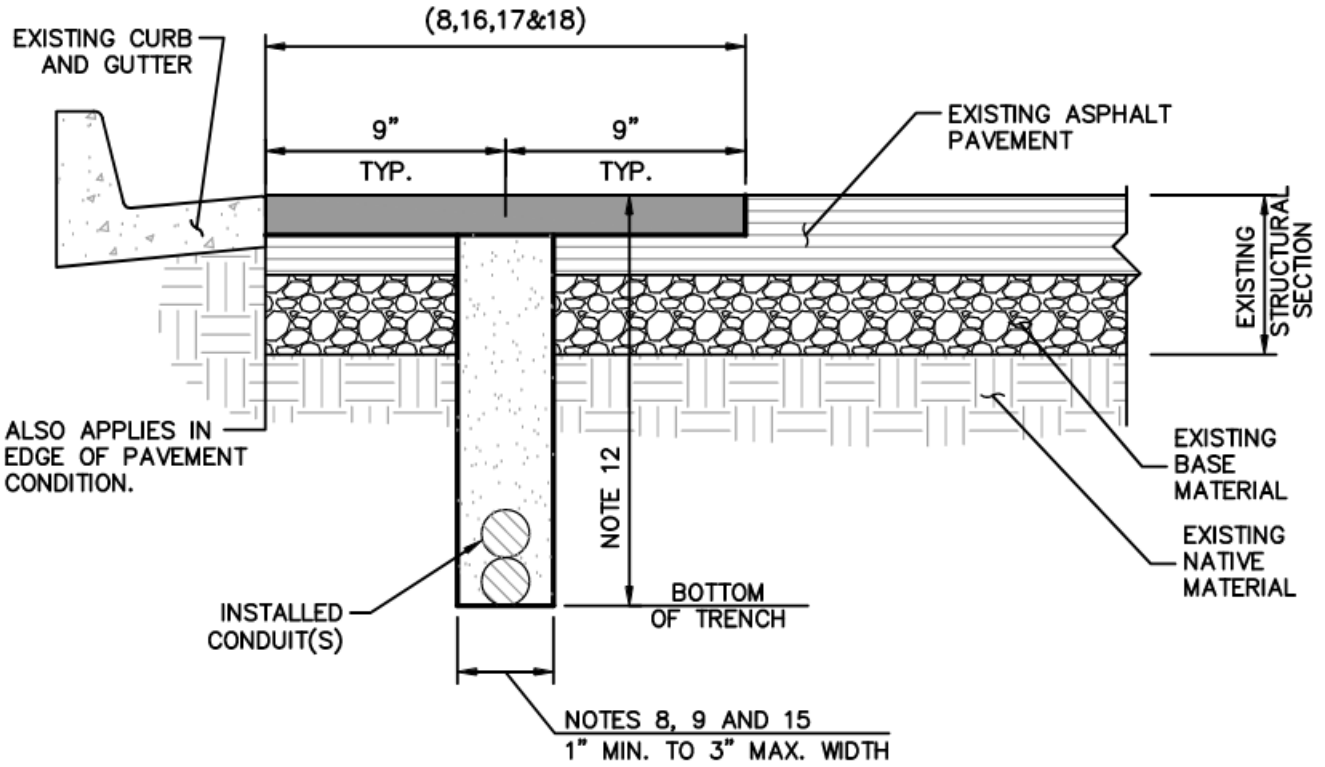
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CONCRETE ENCASEMENT

STANDARD DRAWING NO. 455

Sheet 1 of 1



TYPICAL MICROTRENCH SECTION
NOT TO SCALE

NOTES:

ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST CITY OF RIVERSIDE STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION INCLUDING ALL SPECIAL PROVISIONS IDENTIFIED THEREIN.

GENERAL

1. MICROTRENCHING SHALL ONLY BE USED TO INSTALL TELECOMMUNICATION CONDUITS/CABLES AS APPROVED BY THE ENGINEER.
2. MICROTRENCHING SHALL NOT BE ALLOWED IN CONCRETE PAVED STREETS, SIDEWALKS, PARKWAYS, CROSS GUTTERS, CURBS AND GUTTERS WITHOUT APPROVAL FROM THE ENGINEER. THE USE OF HYDRO-JETTING IS NOT PERMITTED. OTHER TRENCHLESS METHODS FOR LATERALS SHALL ONLY BE ALLOWED BENEATH CURB AND GUTTER. SIDEWALK PANELS AND CROSS GUTTERS SHALL BE REMOVED AND REPLACED.
3. THE CONTRACTOR SHALL IDENTIFY ALL EXISTING UTILITIES, INCLUDING SERVICE CONNECTIONS IN THE FIELD. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (U.S.A.) AT LEAST 48 HOURS PRIOR TO START OF WORK AT 8-1-1, OR TOLL-FREE AT 1-800-422-4133. THE CONTRACTOR SHALL FURTHER SUPPLEMENT THE FINDINGS OF U.S.A. TO DETERMINE THE EXACT LOCATIONS AND DEPTHS OF ALL UTILITIES BY USING A MOBILE GROUND PENETRATING RADAR SYSTEM. THE CONTRACTOR SHALL POTHOLE ALL CROSSING UTILITIES AND PARALLEL UTILITIES WITHIN 18-INCHES OF THE PROPOSED ALIGNMENT TO A DEPTH OF 6-INCHES BELOW THE BOTTOM OF THE MICROTRENCH, TO DETERMINE THE EXISTING UTILITY ALIGNMENT AND ELEVATION. POTHOLES SHALL BE IMMEDIATELY BACKFILLED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS OR RESTORED AS DIRECTED BY THE ENGINEER.

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MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

MICROTRENCHING

STANDARD DRAWING NO. 456

4. IF EXISTING UTILITIES ARE DAMAGED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE INSPECTOR, ENGINEER, AND UTILITY OWNER TO PERFORM THE REPAIRS PROMPTLY ACCORDING TO THEIR REQUIREMENTS AND PER THE ASSOCIATED PERMITS. A SEPARATE PERMIT IS REQUIRED FOR EACH UTILITY REPAIR WORK.

5. THE FOLLOWING ITEMS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR APPROVAL:

   A. PROVIDE A DETAILED SITE PLAN AS REQUIRED.

   B. A STREET CROSS-SECTION THAT INCLUDES THE FOLLOWING INFORMATION:

      (1) THE CURB AND GUTTER, ASPHALT CONCRETE (AC) ROADWAY APPROXIMATE THICKNESS, BASE, DEPTH AND WIDTH OF MICROTRENCH, DEPTH OF CONDUIT(S), DISTANCES OF MICROTRENCH TO FACE OF GUTTER, CURB, CONCRETE PAVEMENT OR STRUCTURE AS APPLICABLE, AND BACKFILL MATERIAL.

      (2) AC REINSTATEMENT INCLUDING WIDTH AND DEPTH OF GRIND AND CAP, STARTING FROM GUTTER FACE, CURB, SLAB OR STRUCTURE AS APPLICABLE.

   C. DETAIL SHOWING CONDUIT FROM MAIN MICROTRENCH ALIGNMENT TO LATERAL SURFACE CONNECTIONS INCLUDING TO ANY JUNCTION/PULL BOX. INCLUDE SPECIFIC INFORMATION OF DEPTH, SIZE, AND METHOD OF EXCAVATION BELOW EXISTING CURB AND GUTTER.

   D. CUT SHEETS OF THE PROPOSED EQUIPMENT PARTICULARLY SUITABLE FOR MICROTRENCHING, INCLUDING:

      (1) MICROTRENCHER CAPABLE OF MEETING TARGET DEPTH AND WIDTH IN A SINGLE PASS WITH AN INTEGRAL HOOD AND ASSOCIATED VACUUM SYSTEM. SELECTION OF CUTTING WHEEL SHALL BE SUCH THAT IT MINIMIZES DAMAGE TO THE ADJACENT AC SURFACE.

      (2) MOBILE CONCRETE/SLURRY PLACEMENT WITH AN ON-BOARD VIBRATOR AND NARROW TROUGH TO MATCH MICROTRENCH WIDTH.

      (3) MOBILE GROUND PENETRATING RADAR SYSTEM THAT IS CAPABLE OF LOCATING BOTH METALLIC AND NON-METALLIC PIPES AND CABLES TO A DEPTH OF 24-INCHES.

   E. OTHER SITE SPECIFIC ITEMS AS REQUIRED BY THE ENGINEER.

LIMITS OF REMOVALS, TRENCH WIDTH, AND LOCATION

6. THE MICROTRENCH SHALL BE CONSTRUCTED WITH CONTINUOUS UNIFORM STRAIGHT/NEAT EDGES.

7. MICROTRENCH ALIGNMENTS SHALL CONSIST OF RUNS PARALLEL TO THE CENTERLINE OF THE STREET. STREET CROSSING MAY BE DONE PROVIDED THE ALIGNMENT IS PERPENDICULAR TO THE STREET CENTERLINE TO THE EXTENT POSSIBLE.

8. IF THE EXISTING ASPHALT SECTION IS LESS THAN 3 INCHES THICK, THE CONTRACTOR SHALL REMOVE AND REPLACE THE PAVEMENT BETWEEN THE NEW TRENCH AND THE EXISTING EDGE OF PAVEMENT. ADDITIONALLY, IF THE EXISTNG PAVEMENT EXHIBITS EXCESSIVE DISTRESSES AND DOES NOT REMAIN INTACT DURING THE MILLING OPERATIONS, THE CONTRACTOR SHALL REMOVE AND REPLACE THE EXISTING ASPHALT AS NECESSARY OR AS DIRECTED BY THE ENGINEER.

9. THE MICROTRENCH WIDTH SHALL BE A MINIMUM OF 1-INCH AND A MAXIMUM OF 3-INCHES.

10. MICROTRENCHING MAY BE PERMITTED UPON THE ENGINEER'S DISCRETION ON SPECIAL PAVEMENTS SUCH AS DECORATIVE ASPHALT PAVING, AND THROUGH EXISTING IMPROVEMENTS SUCH AS PERPENDICULAR TO SPEED BUMPS. SPECIAL PAVEMENTS AND EXISTING IMPROVEMENTS SHALL BE RESTORED IN KIND AS APPROVED BY THE ENGINEER. HOWEVER, MICROTRENCHING THROUGH EXISTING CURB, GUTTER, CROSS GUTTER, BUS PAD, SIDEWALK, FLOATING CURB EXTENSION, BULB OUTS, TRUCK PILLOW, RAISED CROSSWALK, ISLAND, MINI-ROUNDABOUT, OR SIMILAR ELEMENTS IS NOT PERMITTED.

11. UP TO TWO (2) VERTICALLY STACKED CONDUITS CAN BE PLACED WITHIN A MICROTRENCH UPON APPROVAL FROM THE ENGINEER.

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CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

MICROTRENCHING

STANDARD DRAWING NO. 456

12. THE DEPTH TO THE BOTTOM OF CONDUIT(S) SHALL BE 18".

13. ANCHORS/SPACERS SHALL BE PLACED AT A MAXIMUM OF 10-FEET APART ALONG THE ALIGNMENT TO ENSURE THE CONDUIT DOES NOT RISE FROM THE BOTTOM OF THE MICROTRENCH AND DOES NOT TOUCH THE WALLS, INCLUDING BOTTOM, OF THE MICROTRENCH DURING INSTALLATION.

14. THE CONTRACTOR SHALL NOT SAW-CUT THROUGH A SIDEWALK PANEL. IF SIDEWALK REMOVAL IS REQUIRED TO INSTALL OR REPAIR LATERAL SERVICES, THE CONTRACTOR SHALL REMOVE AND REPLACE THE ENTIRE SIDEWALK PANEL FROM CONSTRUCTION JOINT TO CONSTRUCTION JOINT IN ACCORDANCE WITH CITY STANDARDS.

BACKFILL

15. ALL MICROTRENCHES SHALL BE COMPLETELY BACKFILLED WITH A 6-SACK CEMENT SAND SLURRY TO FINISH GRADE BY THE END OF EACH WORK DAY. BACKFILL SHALL BE DYED BLACK TO MATCH THE EXISTING PAVEMENT COLOR. BACKFILL SHALL BE LEVEL WITH ADJACENT ROADWAY ELEVATIONS ON EACH SIDE AND SHALL PROVIDE A SMOOTH SURFACE AND WORK SHALL BE SUBJECT TO ACCEPTANCE BY THE ENGINEER. CONTRACTOR IS RESPONSIBLE TO MAINTAIN THE INTEGRITY OF THE ADJACENT ROADWAY SECTION AND SUBGRADE, AS WELL AS MAKING ANY REPAIRS AS NECESSARY. CONTRACTOR SHALL PROVIDE COMPACTION TEST RESULTS CERTIFIED BY A GEOTECHNICAL ENGINEER.

GRIND AND RESURFACE SECTION

16. COMMENCEMENT OF SURFACE PREPARATION SUCH AS GRINDING/CHIPPING FOR ASPHALT CONCRETE PAVING REPLACEMENT WILL OCCUR NO SOONER THAN 48 HOURS AFTER BACKFILL OF TRENCH. FIELD CONDITIONS OR MATERIAL USED MAY NECESSITATE A LONGER WAIT AS DETERMINED BY THE ENGINEER.

17. CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN TRENCH BACKFILL. AS SOON AS BACKFILL HAS CURED, NOT TO EXCEED 30 CALENDAR DAYS, AC SHALL BE GROUND AND CAPPED AS FOLLOWS:
    A. EXISTING AC AND SLURRY BACKFILL SHALL BE GROUND DOWN 2" (MINIMUM), FOR A WIDTH OF AT LEAST 18 INCHES AND RESURFACED WITH C2-PG 70-10 ASPHALT.
    B. TACK COAT ALL EDGES IMMEDIATELY BEFORE THE ADJOINING ASPHALT CONCRETE IS PLACED. TACK COAT SHALL BE AS SPECIFIED IN GREENBOOK SECTION 302-5.4.
    C. WHERE ANGULAR CROSSING OR ANY LENGTH-WISE CUTS OF A BIKE LANE OCCUR BY MICROTRENCHING, THE CAPPING LIMITS SHALL EXTEND THE FULL WIDTH OF THE BIKE LANE. PERPENDICULAR CROSSINGS MAY RECEIVE TYPICAL CAPPING WIDTH PER NOTE 16.A. ABOVE. PAVEMENT MARKINGS SHALL BE RESTORED IN KIND. WHERE NO BIKE LANE MARKINGS EXIST, CONTRACTOR SHALL CONSULT WITH ENGINEER TO DETERMINE LOCATION OF ANY PLANNED BIKE LANES SO THAT IMPACT OF PAVEMENT SURFACE MAY BE AVOIDED.

18. FINISHED PAVED SURFACE SHALL BE LEVEL WITH ADJACENT ROADWAY ELEVATIONS AND SHALL PROVIDE A SMOOTH SURFACE AND WORK SHALL BE SUBJECT TO ACCEPTANCE BY THE ENGINEER.

VAULTS AND SERVICE CONNECTIONS

19. CONNECTION TO SERVICE LATERALS, JUNCTION BOXES, ETC., SHALL BE DONE SUCH THAT CURB AND GUTTER IS NOT DISTURBED, SETTLED OR DAMAGED. REMOVAL LIMITS OF SIDEWALK SHALL FOLLOW APPLICABLE STANDARDS AND REQUIREMENTS AS APPROVED BY THE ENGINEER.

20. TRENCHLESS METHODS SHALL NOT CREATE A VOID TWO TIMES GREATER THAN CONDUIT. VOID SHALL BE COMPACTED AND BACKFILLED WITH APPROVED CONTROLLED LOW-STRENGTH MATERIAL (CLSM).

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				MICROTRENCHING
MARK	REVISIONS	APPR.	DATE	STANDARD DRAWING NO. 456
				Sheet 3 of 4

IDENTIFICATION

21. EACH MICROTRENCH SHALL BE IDENTIFIED WITH A METAL IDENTIFICATION TAG LISTING THE OWNER, YEAR OF CONSTRUCTION, AND INCLUDE THE WORDS "NOT A SURVEY POINT". IF THE WORK IS MORE THAN 50 FEET IN LENGTH, PLACE THE TAG NEAR EACH END OF THE MICROTRENCH AND AT INTERVALS NOT TO EXCEED 50 FEET.
22. PROVIDE A GIS LAYER OF DEPLOYED FIBER LINE.

STREET TREES

23. PRIOR TO ANY OPEN TRENCHING OR BORE PIT EXCAVATION WITHIN 10 FEET OF ANY TREE, THE CITY LANDSCAPE INSPECTOR SHALL BE NOTIFIED AND MUST BE PRESENT BEFORE ANY TRENCHING OR DIGGING BEGINS. THE INSPECTOR SHALL ALSO BE PRESENT DURING TRENCHING AND DIGGING OPERATIONS.

TRAFFIC

24. ALL DAMAGED AND/OR REMOVED STRIPING, PAVEMENT LEGENDS, MARKERS, AND TRAFFIC SIGNAL LOOPS SHALL BE REPLACED PER CITY STANDARDS AND SPECIFICATIONS.

25. WHEREVER EXCAVATION 2 INCHES OR MORE IN DEPTH EXISTS OR IS MADE WITHIN 2 FEET OF THE TRAVEL WAY, INCLUDING BIKE LANES OR SHOULDERS, THE CONTRACTOR SHALL INSTALL APPROPRIATE ADVANCE WARNING SIGNS, INCLUDING "UNEVEN PAVEMENT" OR "OPEN TRENCH" SIGNS, IN ACCORDANCE WITH THE APPROVED TRAFFIC CONTROL PLAN, WATCH MANUAL, OR MUTCD.

26. ADDITIONAL WARNING SIGNS SHALL BE PLACED BEYOND EVERY INTERSECTING STREET AS REQUIRED BY THE CITY INSPECTOR, AND SHALL REMAIN IN PLACE UNTIL THE PAVEMENT SURFACE IS RESTORED FLUSH AND SAFE FOR VEHICULAR, BICYCLE AND PEDESTRIAN TRAFFIC.

PAVING MORATORIUM

27. THE CITY OF RIVERSIDE HAS A FIVE-YEAR PAVING MORATORIUM ON ALL RESURFACED STREETS. TRENCHING ON STREETS UNDER MORATORIUM WILL NOT BE ALLOWED EXCEPT FOR EMERGENCY REPAIRS AND MUST BE APPROVED IN WRITING BY THE CITY ENGINEER. ADDITIONAL RESTORATION REQUIREMENTS MAY BE ASSESSED ON A CASE-BY-CASE BASIS.

ADDITIONAL REQUIREMENTS

27. THE CITY SHALL APPROVE THE LOCATION OF ALL EQUIPMENT (I.E., CABINETS, PULL BOXES, ETC.) WITHIN THE PUBLIC RIGHT-OF-WAY.

28. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE CITY OR ANY OTHER APPLICABLE AGENCY FOR WORK WITHIN CALTRANS, FLOOD CONTROL, OR RAILROAD RIGHTS-OF-WAY.

29. A PRE-CONSTRUCTION MEETING IS REQUIRED PRIOR TO THE START OF CONSTRUCTION.

30. CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR ANY DAMAGED CONCRETE OR ASPHALT CAUSED ADJACENT TO THE 18" TRENCH REPAIR LIMITS AS DETERMINED BY THE ENGINEER.

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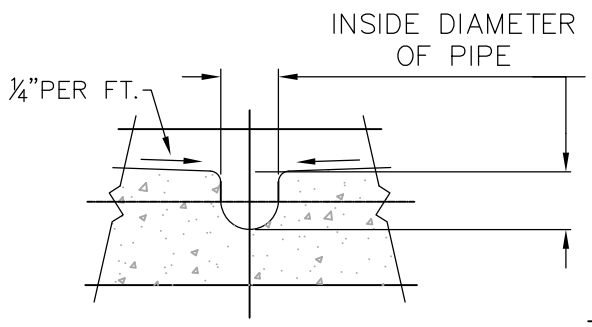
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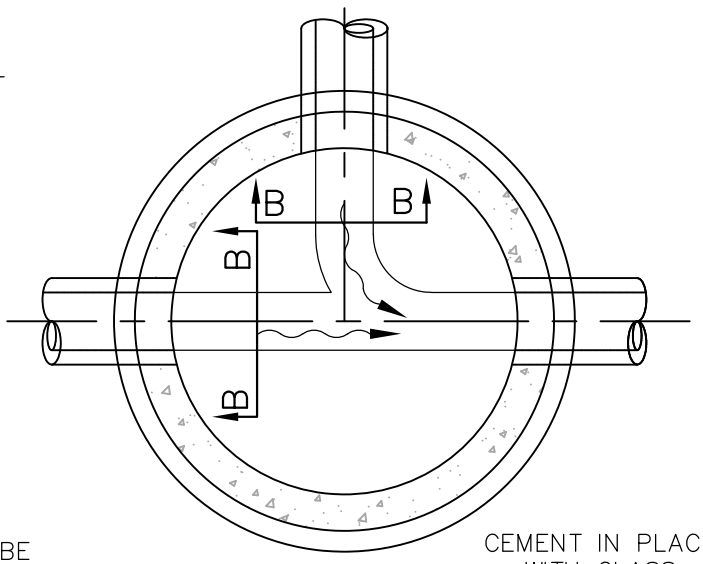
MICROTRENCHING

STANDARD DRAWING NO. 456

Sheet 4 of 4



SECTION B–B



SECTION A–A

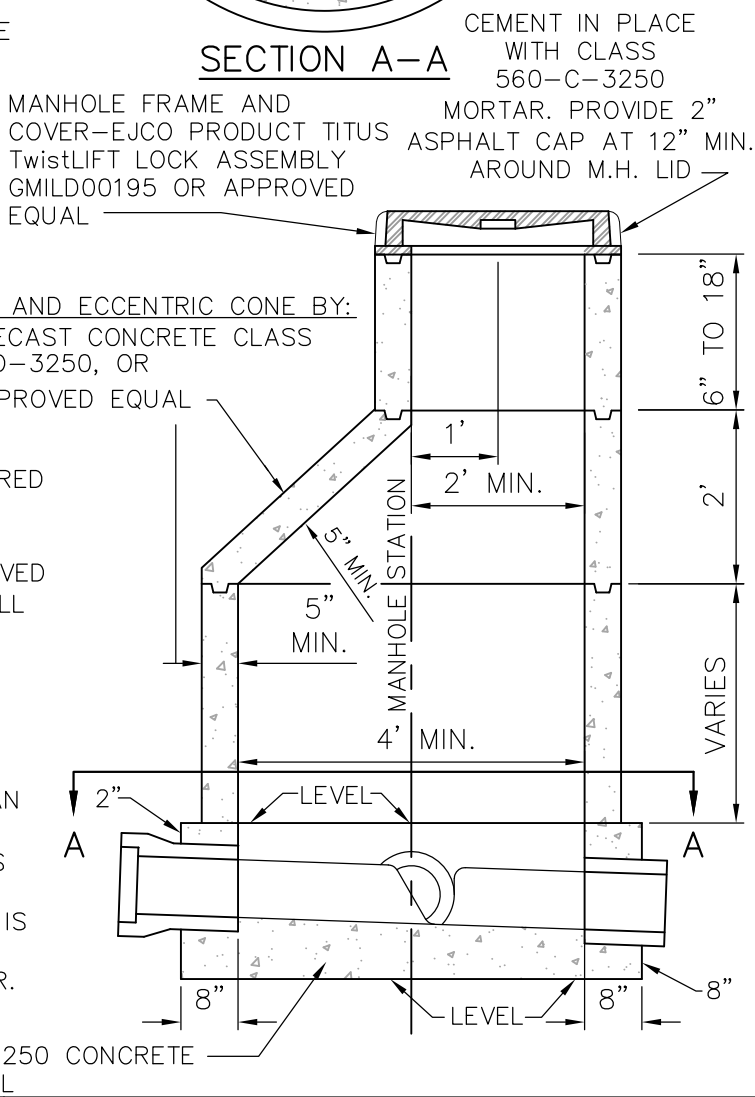
NOTES:

1. ALL JOINTS SHALL BE SET IN CLASS C PORTLAND CEMENT MORTAR AND SHALL BE SOCK FINISHED.
2. RINGS AND CONES SHALL BE REINFORCED PER ASTM C487.
3. VERTICAL WALL OF CONE SHALL BE ON DOWNSTREAM SIDE OF MANHOLE.
4. THE LOWER PORTION OF THE MANHOLE SHALL BE:

MINIMUM DIAMETER	DEPTH (SHELF TO COVER)
4'	< 15'
5'	> 15' and < 25'
6'	> 25' and < 30'

A SPECIAL DESIGNED MANHOLE MEETING CAL–OSHA SPECIFICATIONS WILL BE REQUIRED FOR DEPTHS GREATER THAN 30'. THE FRAME AND COVER SHALL BE 3' DIA. (ALHAMBRA FOUNDRY A1251–6 OR APPROVED EQUAL BY CITY) A 1' MINIMUM SHELF SHALL BE MAINTAINED.

5. WHEN MANHOLE IS IN A STREET TO BE PAVED, MANHOLE FRAME SHALL BE SET AFTER ADJACENT PAVEMENT HAS BEEN PLACED. TOP SHALL BE FLUSH WITH PAVEMENT.
6. FIRST PIPE JOINT SHALL BE NO MORE THAN 1' FROM MANHOLE FOR RIGID PIPE.
7. AT THE CONTRACTOR'S OPTION, THICKNESS OF MANHOLE WALL MAY BE 4–1/8" PROVIDED CLASS 560–D–4000 CONCRETE IS USED.
8. COVER SHALL HAVE LETTER "S" IN CENTER.



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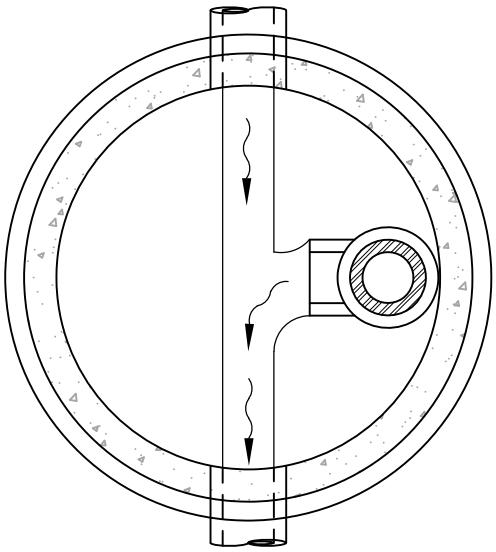
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PRECAST CONCRETE SEWER MANHOLE

STANDARD DRAWING NO. 500

Sheet 1 of 1

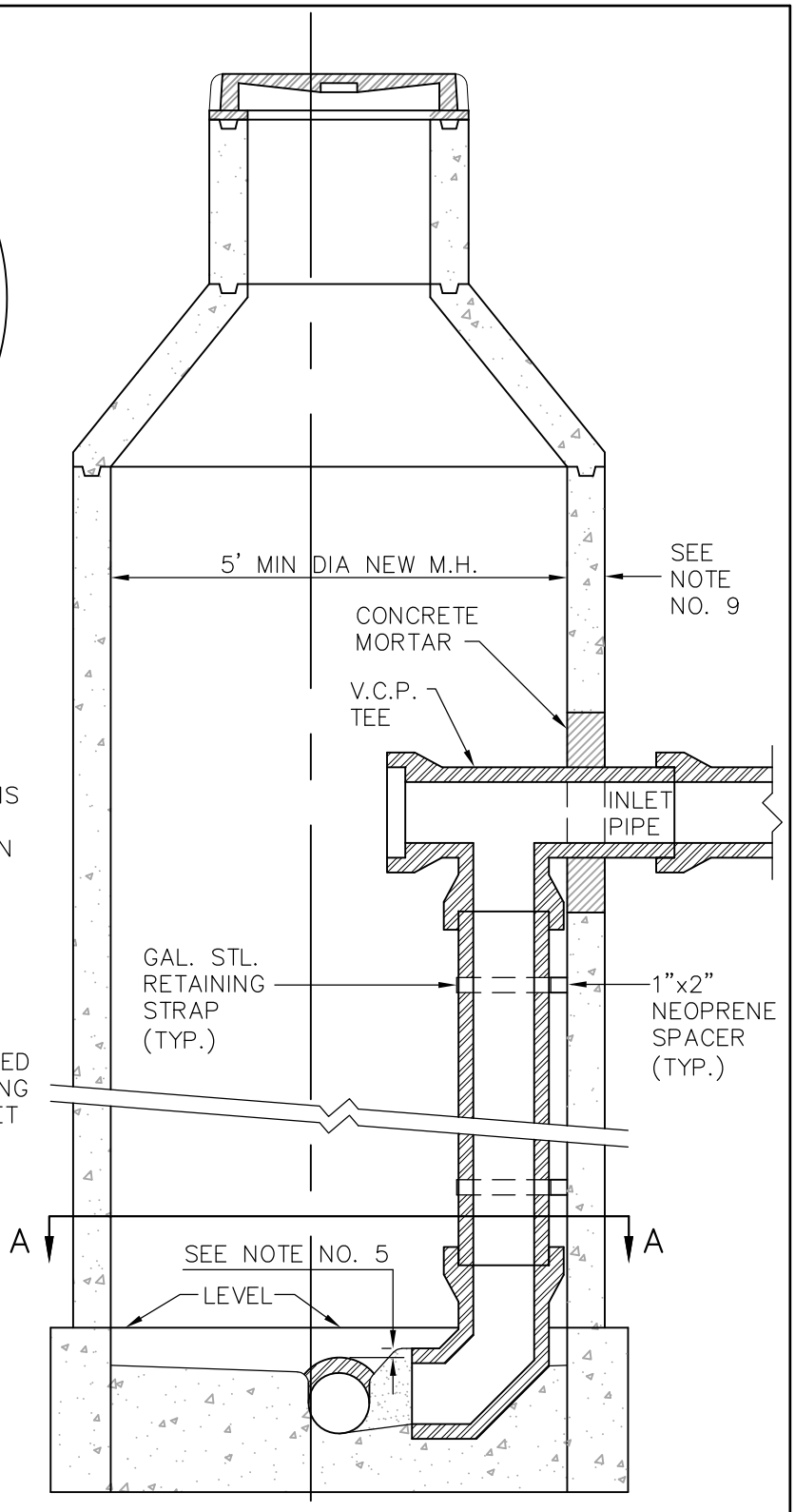
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SECTION A–A

NOTES:

1. CLASS 560–C–3250 CONCRETE TO USED.
2. PIPE AND FITTINGS TO BE 8" MIN. INSIDE DIAMETER.
3. IF NO STUBS EXIST, THE MANHOLE IS TO BE BROKEN THROUGH AND THE STUBS ARE TO BE SET TO GRADE IN CONCRETE.
4. FORM A CONCRETE MORTAR ARCH AROUND EVERY PIPE OPENING INTO MANHOLE.
5. CROWN OF INLET TO BE 0.10 FT. HIGHER THAN CROWN OF STRAIGHT–THRU SEWER UNLESS OTHERWISE NOTED. CONCRETE FORMED INVERT TO BE SHAPED THRU EXISTING SHELF IN A SMOOTH CURVE TO MEET EXISTING STRAIGHT–THRU INVERT.
6. 3.0 FT. DESIRABLE MINIMUM DROP. 1.82 FT. ABSOLUTE MINIMUM.
7. INSTALL NEOPRENE SPACERS AT RETAINING STRAPS, BELLS, AND BETWEEN CONCRETE MORTAR AND INLET PIPE.
8. INSTALL TWO (2) 1"x⅜" GALV. STL. RETAINING STRAPS PER JOINT OF PIPE. ANCHOR STRAPS TO M.H. SHAFT WITH 1–1/2"x¼" GALV. STL. LAG SCREWS AND LEAD ANCHORS.
9. SEE STD. DWG. 500 FOR MANHOLE CONSTRUCTION DETAILS.



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CITY ENGINEER

05/02/19
DATE

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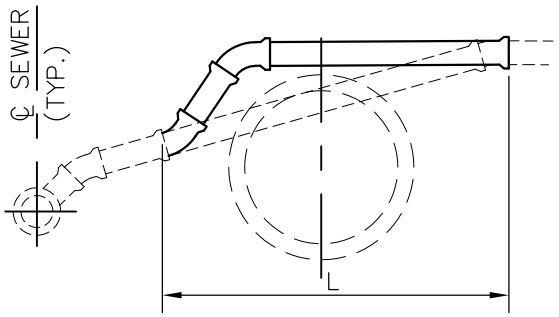
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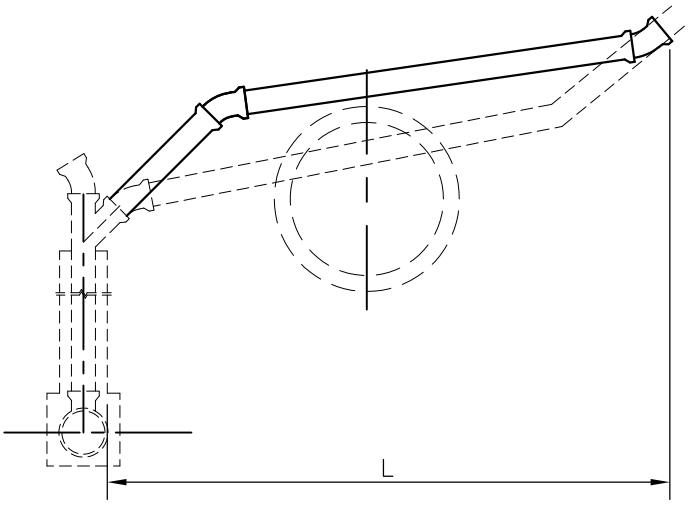
DROP MANHOLE

STANDARD DRAWING NO. 503

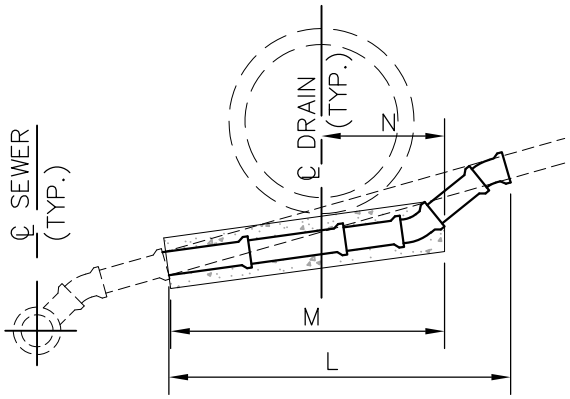
Sheet 1 of 1



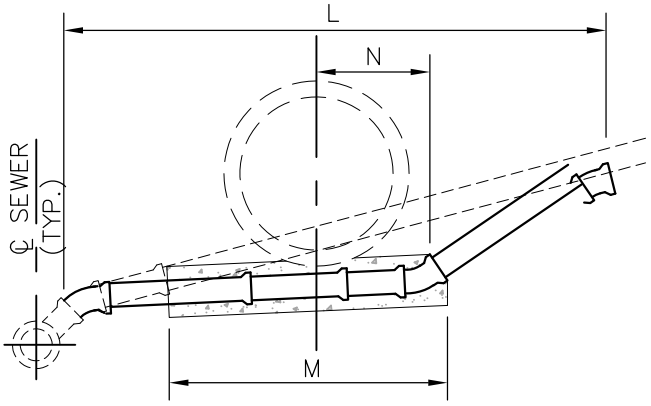
CASE – A



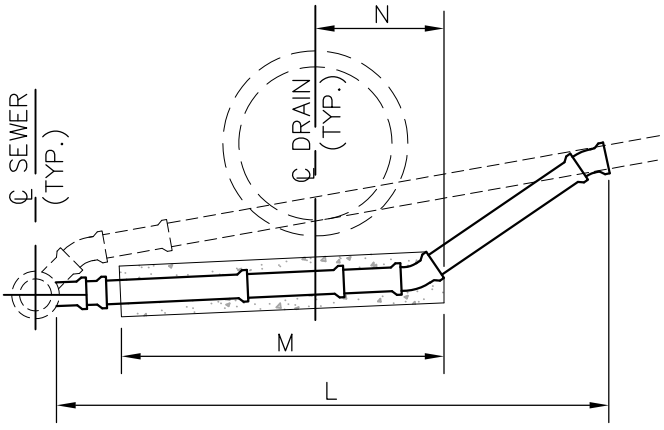
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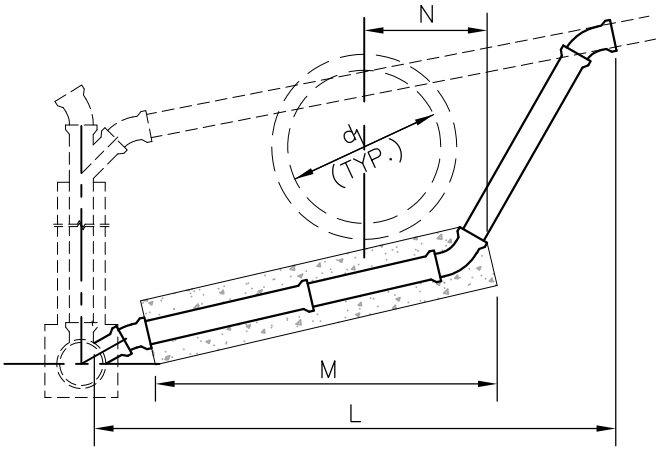
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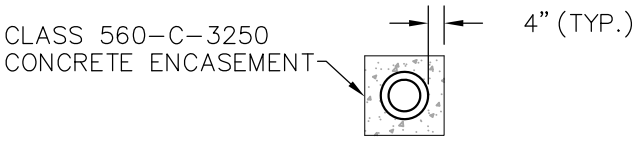
CASE – D



CASE – E



CASE – F



CROSS SECTION OF CONCRETE REINFORCEMENT FOR PIPE.

SEE SHEET 2 FOR NOTES AND DESCRIPTION OF CASES.

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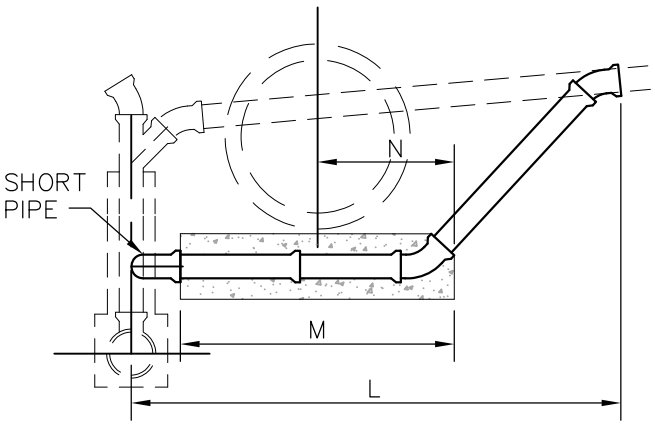
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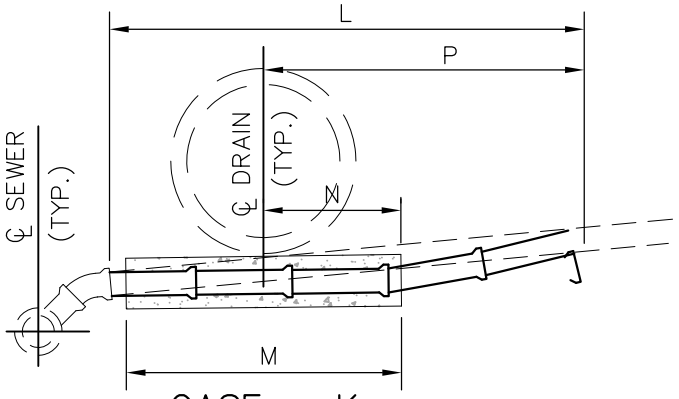
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REMODELING DETAILS FOR SEWER LATERALS

STANDARD DRAWING NO. 554



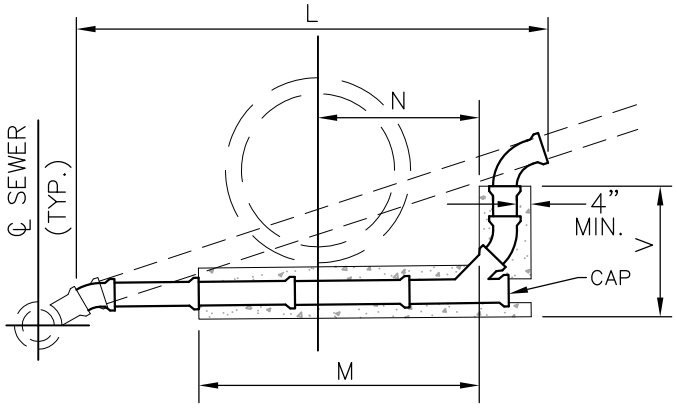
CASE – G



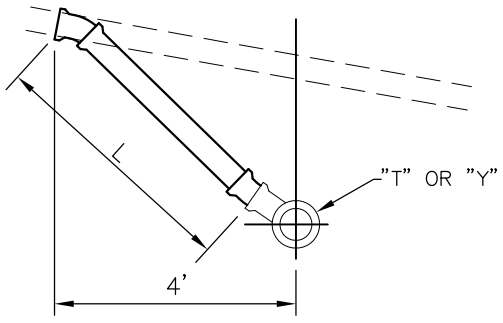
CASE – K

CASES:

A. ABOVE DRAIN TO HOUSE CONNECTION– SPECIALS REQUIRED: 2–1/8 BENDS.
B. ABOVE DRAIN TO CHIMNEY – 2–1/8 BENDS.
C. BELOW DRAIN TO HOUSE CONNECTION – 2–1/8 BENDS
D. BELOW DRAIN TO "Y" – 3–1/8 BENDS
E. BELOW DRAIN TO FLAT SADDLE – 3–1/8 BENDS, 1 SADDLE.
F. BELOW DRAIN TO SADDLE – 3–1/8 BENDS, 1 SADDLE.
G. BELOW DRAIN TO CHIMNEY – 2–1/8 BENDS.
H. BELOW DRAIN TO "Y" – 3–1/8 BENDS, 1 "Y".
K. BELOW DRAIN TO HOUSE CONNECTION, SLOPE SLIGHTLY MODIFIED.
R. CONNECTION WITH NEW SEWER –2–1/8 BENDS WITH "Y" –1–4" 1/8 BEND WITH "T".



CASE – H



CASE – R

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REMODELING DETAILS FOR SEWER LATERALS

STANDARD DRAWING NO. 554

Sheet 2 of 3

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NOTES:

1. THESE DETAILS DO NOT APPLY TO CONFLICTS BETWEEN SEWER LATERALS AND WATER LINES.
2. EXISTING PIPES ARE INDICATED BY BROKEN LINES.
3. PIPES TO BE CONSTRUCTED ARE INDICATED BY SOLID LINES.
4. ALL PIPES DIAMETERS AND MATERIAL SHALL MATCH EXISTING LATERAL.
5. ALL BENDS SHALL BE ⅛ BENDS UNLESS SPECIFIED OTHERWISE.
6. CONCRETE REINFORCEMENT, CROSS SECTION SHOWN ON SHEET 1, SHALL BE USED ON ALL PIPES TO BE CONSTRUCTED UNDER STORM DRAIN, TOP PORTION WITHIN 1" OF STORM DRAIN TO BE OMITTED.
7. DIMENSIONS:
   L IS SPECIFIED ON PLANS AS THE AVERAGE TOTAL LENGTH.

   M=(d1+24") LESS ENOUGH TO AVOID A FRACTION OF A FOOT.

   N ½M, EXCEPT WHERE SPECIFIED OTHERWISE ON PLAN.

   P1 (CASE K) IS SPECIFIED WHERE L DOES NOT EXTEND TO THE BEND.

   V1 (CASE H) IS SPECIFIED TO THE NEAREST FOOT AND IN SUMMARY, IS ITEMIZED AS CONCRETE REINFORCEMENT FOR 6" PIPE.
8. NEW CONNECTION TO MAIN LINE SHALL CONFORM TO STANDARD DRAWING NO. 562.
9. JOINTS SHALL BE TYPE G PER THE LATEST APPROVED EDITION OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
10. MATERIAL USED FOR REPLACEMENT SEGMENT SHALL BE THE SAME AS THE MATERIAL USED FOR THE EXISTING LATERAL.

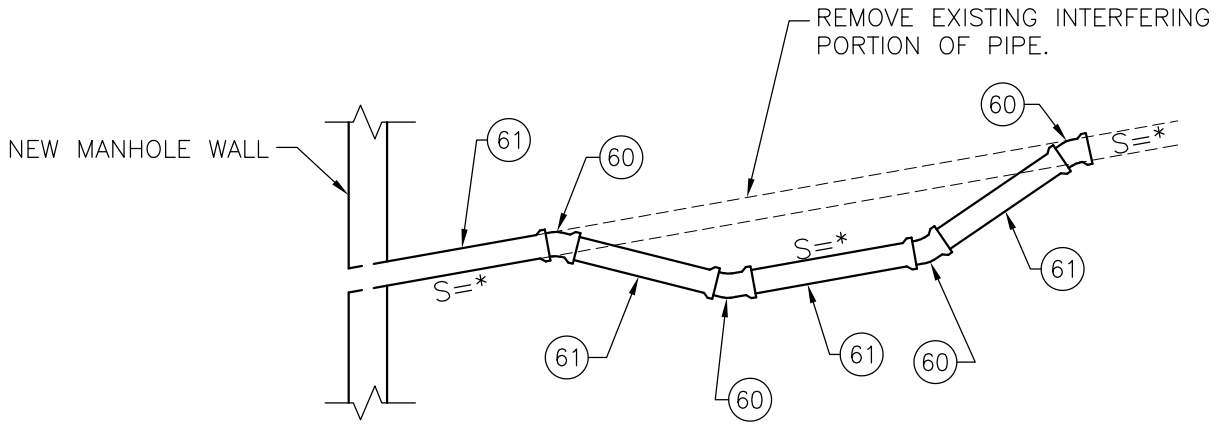
APPROVED BY: _____ 05/02/19
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REMODELING DETAILS FOR SEWER LATERALS

STANDARD DRAWING NO. 554



* MAINTAIN SIMILAR SLOPE TO THE EXISTING PIPE

"P" TRAP DETAIL

NTS

NOTES:

(60) 45° ELBOW, PIPE MATERIAL AND SIZE TO MATCH EXISTING SEWER MAIN

(61) PIPE SPOOL, PIPE MATERIAL AND SIZE TO MATCH EXISTING SEWER MAIN

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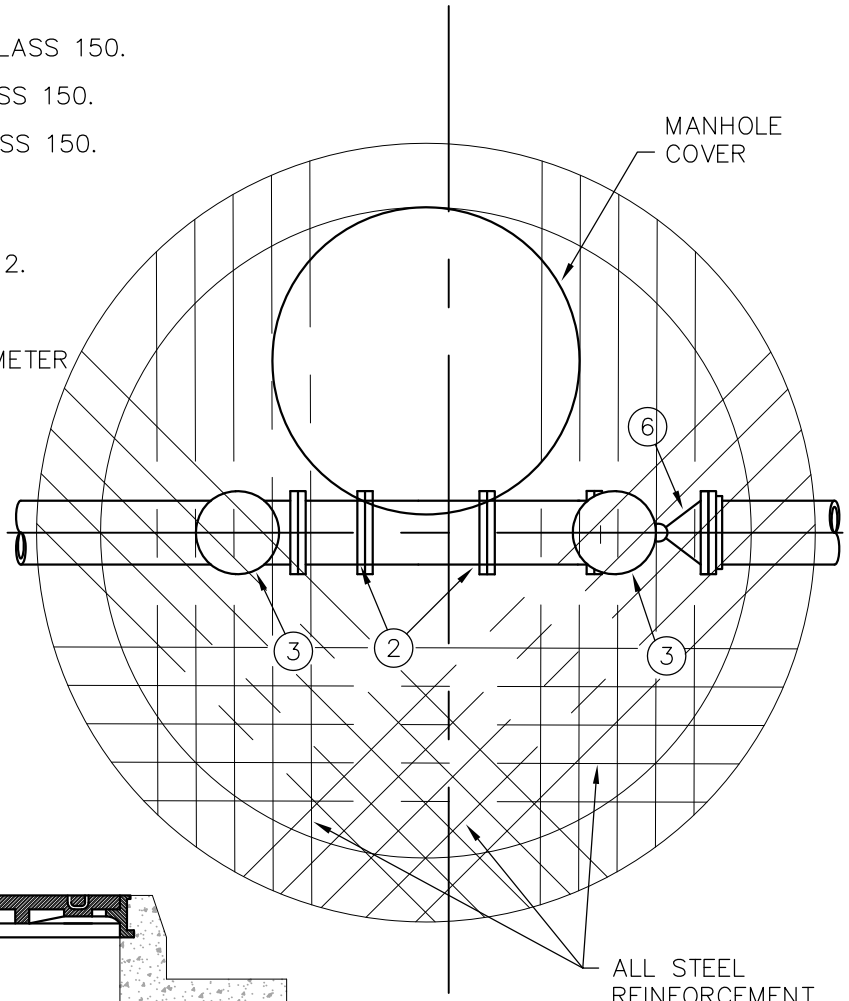
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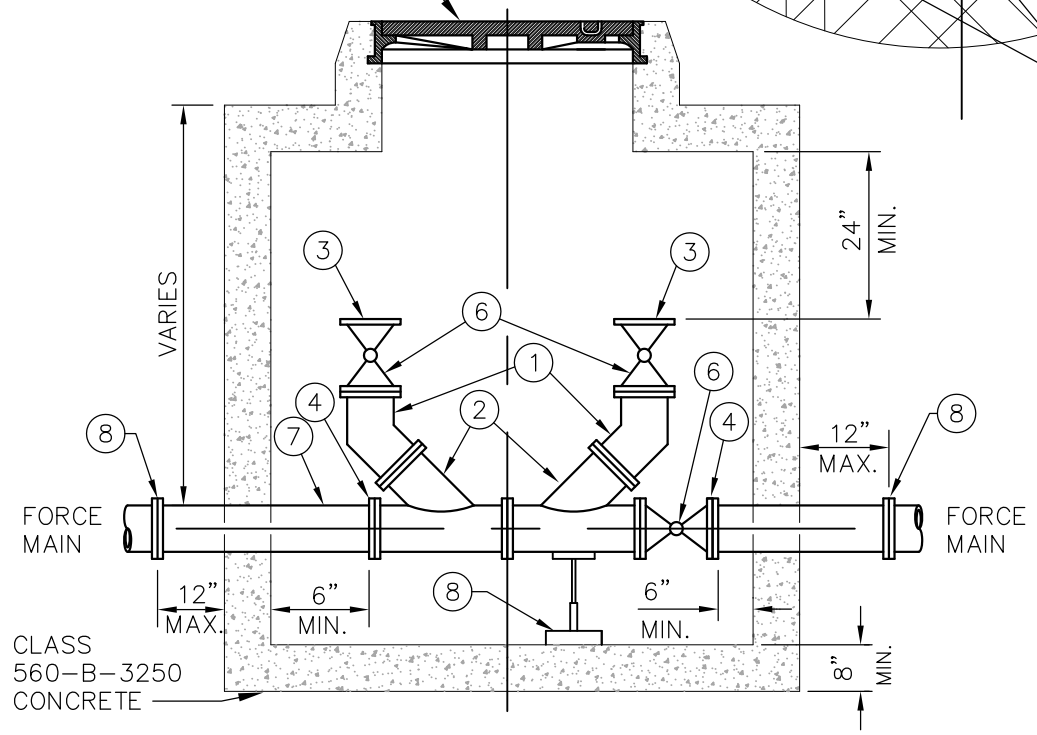
SEWER MAINLINE "P" TRAP DETAIL

STANDARD DRAWING NO. 555

Sheet 1 of 1

1. FLANGED CAST IRON 48° ELBOW. CLASS 150.
2. FLANGED CAST IRON 48° WYE. CLASS 150.
3. CAST IRON REDUCING FLANGE. CLASS 150. W/2" THREADED PLUG.
4. THREADED CLASS 150 FLANGE.
5. PIPE SUPPORT. SEE DETAIL SHEET 2.
6. FLANGED PLUG VALVE. CLASS 150
7. DUCTILE IRON PIPE TO MATCH DIAMETER OF FORCE MAIN.
8. DRESSER STYLE 253 COUPLING.





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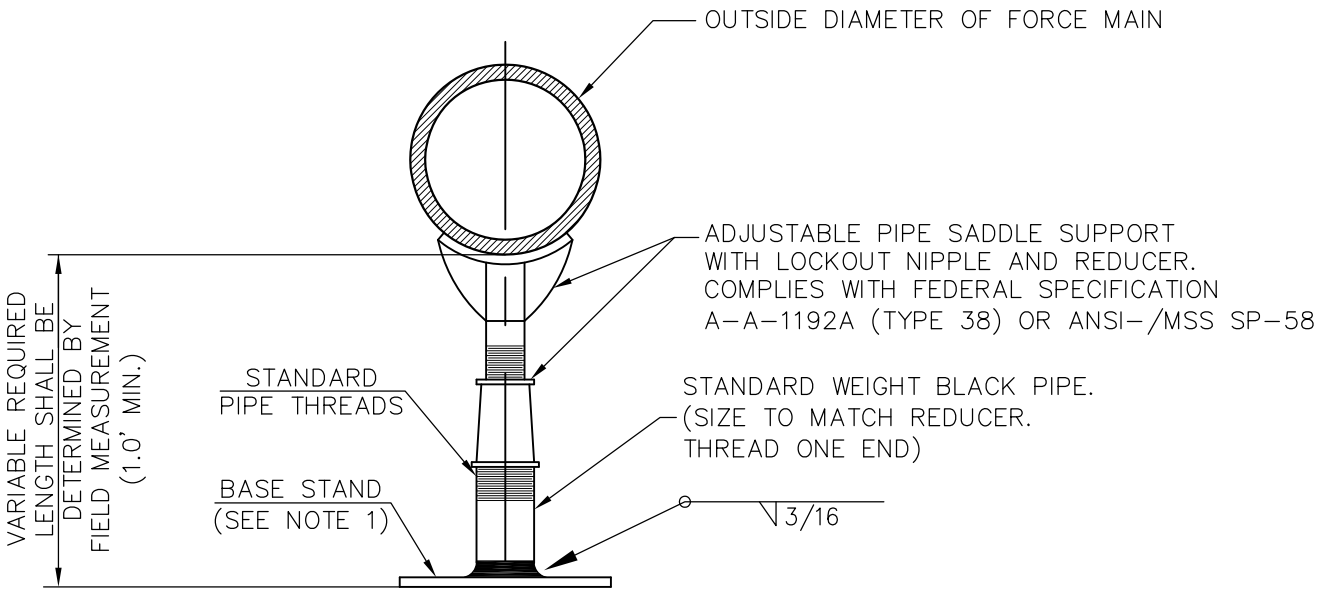
PUBLIC WORKS DEPARTMENT

PRECAST CONCRETE FORCE MAIN CLEANOUT

STANDARD DRAWING NO. 559

Sheet 1 of 2

MARK	REVISIONS	APPR.	DATE



PIPE SUPPORT DETAIL

NTS

GENERAL NOTES:

1. ALL FITTINGS SHALL BE SAME SIZE AS THE FORCE MAIN.
2. DIAMETER OF FORCE MAIN CLEANOUT SHALL BE DETERMINED BY FORCE MAIN SIZE AS IN THE FOLLOWING TABLE:

FORCE MAIN	MANHOLE SIZE
4"	72"
6"	72"
8"	78"
10"	84"

TABLE 1

FORCE MAIN	STEEL PLATE SIZE
4"	1/2" x 12" x 12"
6"	1/2" x 18" x 18"
8"	5/8" x 18" x 18"
10"	3/4" x 24" x 24"

3. WHEN FORCE MAIN CLEANOUT IS IN A STREET TO BE PAVED MANHOLE FRAME SHALL BE SET AFTER ADJACENT PAVEMENT HAS BEEN PLACED. TOP SHALL BE FLUSH WITH PAVEMENT.
4. AT THE CONTRACTOR'S OPTION, THICKNESS OF MANHOLE WALL MAY BE 4-1/8" PROVIDED CLASS 560-D-4000 CONCRETE IS USED.
5. COVER SHALL HAVE LETTER "S" IN CENTER.

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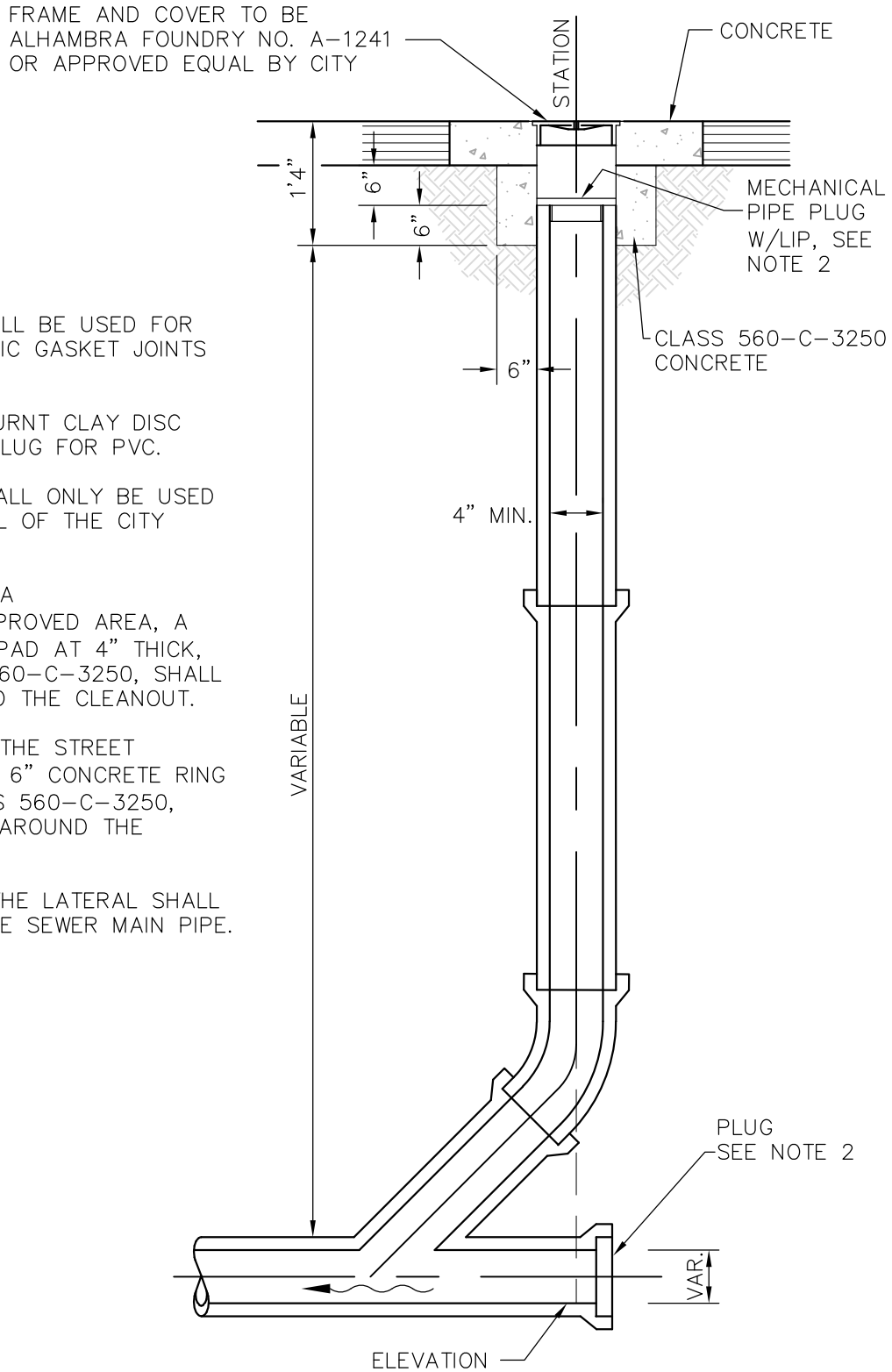
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PRECAST CONCRETE FORCE MAIN CLEANOUT

STANDARD DRAWING NO. 559



NOTES:

1. TYPE G JOINTS SHALL BE USED FOR VCP OR ELASTOMERIC GASKET JOINTS FOR PVC.
2. PLUG STUB WITH BURNT CLAY DISC FOR VCP OR PVC PLUG FOR PVC.
3. THIS STANDARD SHALL ONLY BE USED WITH THE APPROVAL OF THE CITY ENGINEER.
4. IF CLEANOUT IS IN A LANDSCAPING/UNIMPROVED AREA, A 5' X 5' CONCRETE PAD AT 4" THICK, CONCRETE CLASS 560-C-3250, SHALL BE POURED AROUND THE CLEANOUT.
5. IF CLEANOUT IS IN THE STREET PAVEMENT AREA, A 6" CONCRETE RING AT 6" THICK, CLASS 560-C-3250, SHALL BE POURED AROUND THE CLEANOUT.
6. THE MATERIAL OF THE LATERAL SHALL MATCH THAT OF THE SEWER MAIN PIPE.

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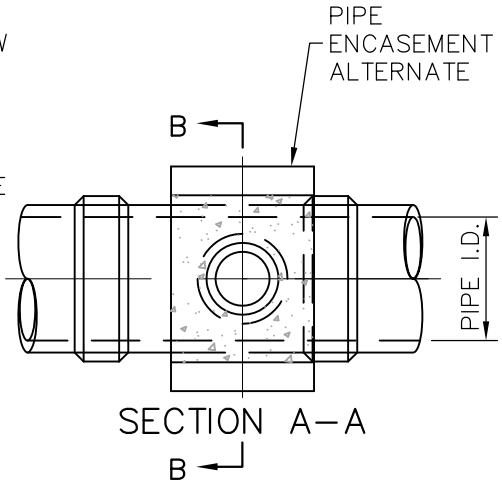
SEWER MAIN CLEANOUT

STANDARD DRAWING NO. 560

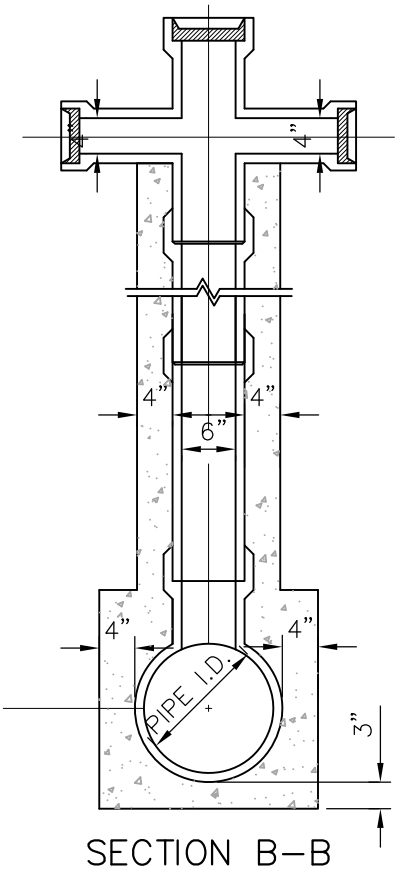
Sheet 1 of 1

NOTES:

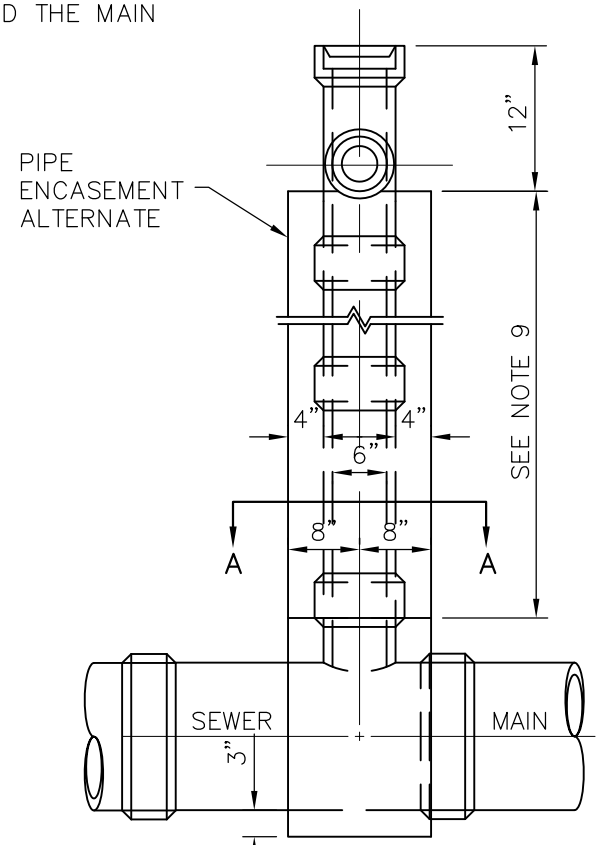
1. THIS STANDARD SHALL ONLY BE USED WITH THE APPROVAL OF THE CITY ENGINEER.
2. THE UPPER END OF THE CHIMNEY PIPE SHALL BE 5' BELOW THE GRADE OF THE LOWER CURB, UNLESS OTHERWISE SPECIFIED.
3. WHERE ONE OR TWO HOUSE CONNECTIONS ARE TO BE JOINED TO THE CHIMNEY PIPE USE A DOUBLE "T" BRANCH. WHERE THREE HOUSE CONNECTIONS ARE TO BE JOINED USE A DOUBLE "T" BRANCH AND ONE SINGLE TEE.
4. FACE "T" TOWARD PROPERTY TO BE SERVED.
5. WHEN THERE IS MATERIAL DIFFERENCE IN ELEVATION OF PROPERTY ON EITHER SIDE OF THE MAIN LINE SEWER, DISREGARD NOTE 3 AND FACE "T" BRANCH TOWARD THE LOWER SIDE OF THE STREET.
6. 16" IRRIGATION TYPE PIPE OR CIRCULAR ENCASEMENT WITH A MINIMUM DIAMETER OF 16" MAY BE USED IN LIEU OF CONCRETE ENCASEMENT SHOWN HERE. PIPE ENCASEMENT SHALL BE FILLED WITH CONCRETE.
7. POUR BASE AGAINST FIRM UNDISTURBED SOIL.
8. TOP OF CHIMNEY AND "T's" NOT USED SHALL BE PLUGGED MANUFACTURED PLUG.
9. CLASS 560-C-3250 CONCRETE TO BE USED.
10. IN LIEU OF ENCASED V.C.P. CONTRACTOR MAY INSTALL CAST IRON PIPE WITH ENCASEMENT ONLY AROUND THE MAIN LINE TEE.



SECTION A–A



SECTION B–B



ELEVATION

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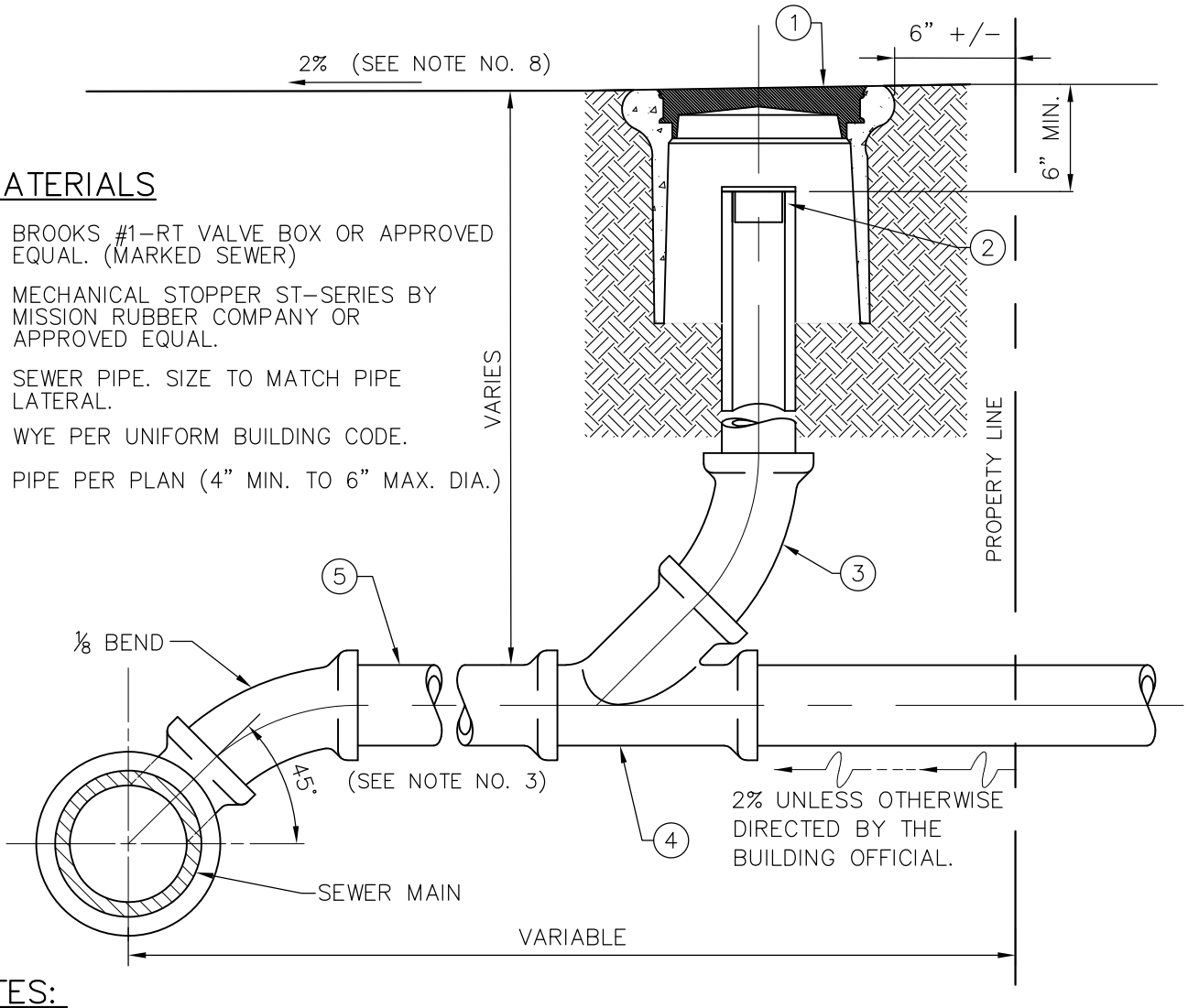
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STANDARD CHIMNEY PIPE

STANDARD DRAWING NO. 561

Sheet 1 of 1



MATERIALS

1. BROOKS #1-RT VALVE BOX OR APPROVED EQUAL. (MARKED SEWER)
2. MECHANICAL STOPPER ST-SERIES BY MISSION RUBBER COMPANY OR APPROVED EQUAL.
3. SEWER PIPE. SIZE TO MATCH PIPE LATERAL.
4. WYE PER UNIFORM BUILDING CODE.
5. PIPE PER PLAN (4" MIN. TO 6" MAX. DIA.)

NOTES:

1. LID MUST BE CAST IRON MARKED SEWER AND TRAFFIC RATED WHEN INSTALLING WITH IN DRIVEWAY
2. MINIMUM DEPTH OF LATERAL AT CURB LINE AND PROPERTY LINE SHALL BE DETERMINED IN THE FIELD.
3. BACKFILL OVER LATERALS TO BE COMPACTED BY TAMPING ONLY.
4. FOR CONNECTION TO SEWER MAIN WHERE THE SEWER LATERAL I.D. IS LESS THAN OR EQUAL TO $\frac{1}{2}$ OF THE SEWER MAIN I.D. (LATERAL I.D. $\leq \frac{1}{2}$ SEWER MAIN I.D.), THE CONNECTION CAN BE MADE WITH A MANUFACTURED WYE, A TWISTEE, OR APPROVED EQUAL.
5. FOR CONNECTION TO SEWER MAIN WHERE THE SEWER LATERAL ID IS LARGER THAN $\frac{1}{2}$ OF THE SEWER MAIN I.D. (LATERAL I.D. $> \frac{1}{2}$ SEWER MAIN I.D.), THE CONNECTION SHALL BE MADE WITH A MANUFACTURED WYE, A MANUFACTURED TEE, OR APPROVED EQUAL.
6. GRADE PARKWAY AT 2% TOWARDS CURB OR BACK OF SIDEWALK OR AS DIRECTED BY THE ENGINEER.
7. WHERE LATERAL IS CONSTRUCTED UNDER AN EXISTING CURB, THE CONTRACTOR SHALL CHISEL THE LETTER "S" AT 2" HIGH AND $\frac{3}{16}$" DEEP INTO THE CURB FACE DIRECTLY ABOVE THE LATERAL.
8. IF CLEANOUT IS IN THE LANDSCAPING AREA, CONTRACTOR SHALL CONSTRUCT A 6" CONCRETE RING AT 4" THICK AROUND THE CLEANOUT BOX, CONCRETE CLASS 560-C-3250.
9. THE MATERIAL OF THE LATERAL SHALL MATCH THAT OF THE SEWER MAIN PIPE.

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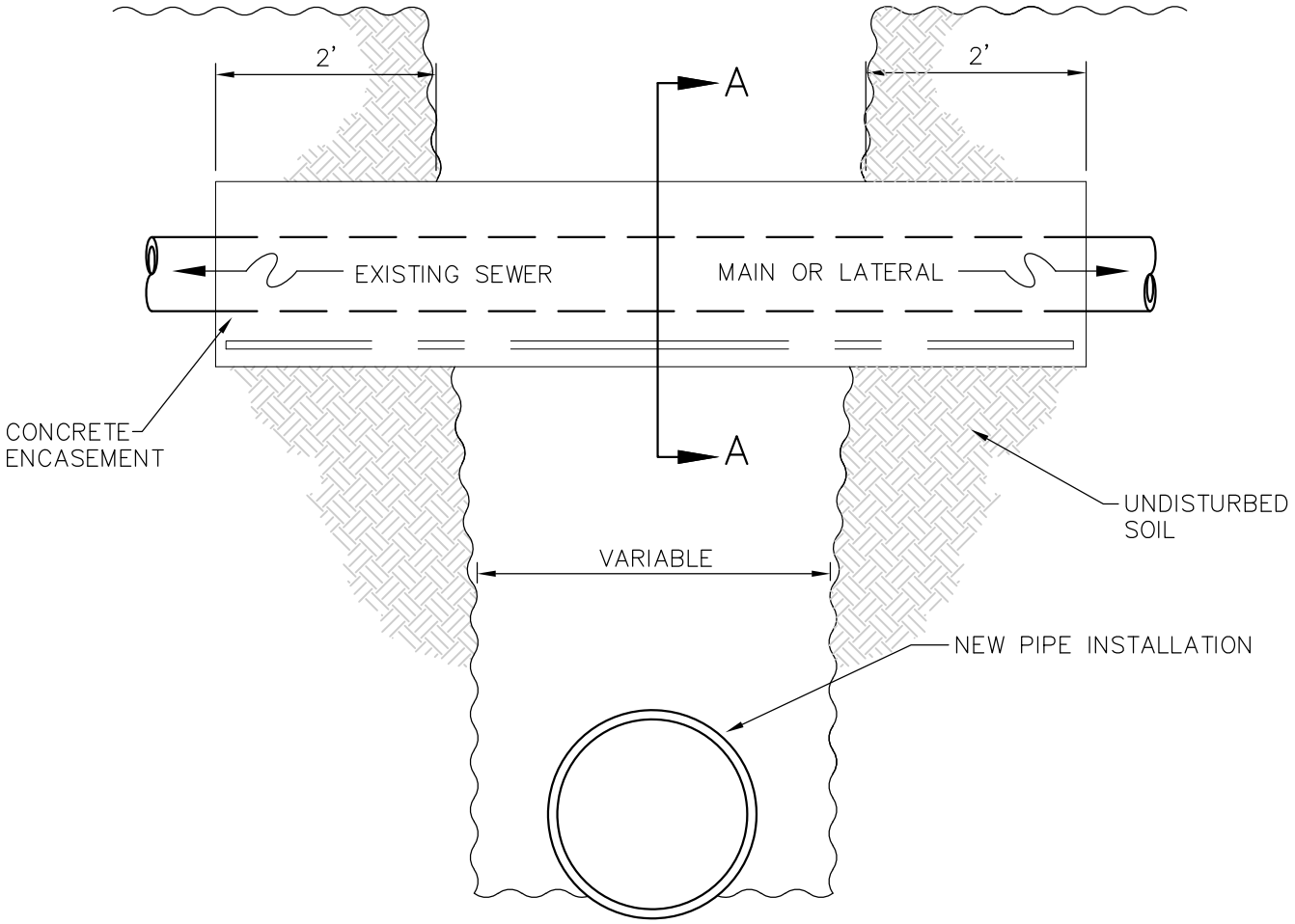
CITY OF RIVERSIDE

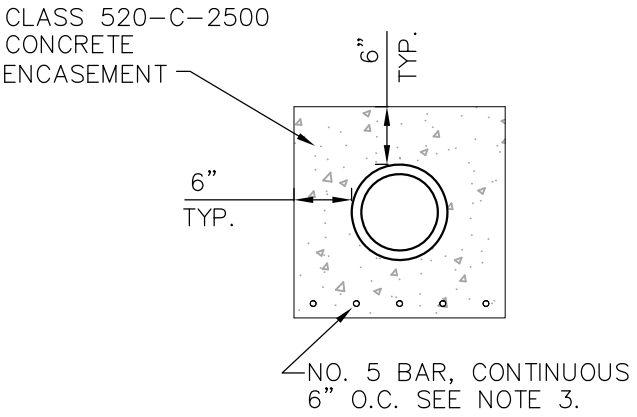
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SEWER LATERAL WITH PL C.O.

STANDARD DRAWING NO. 562

Sheet 1 of 1





SECTION A–A

NOTES:

1. ENCASEMENT SHALL BE REQUIRED FOR TRENCH WIDTH 2' OR GREATER.
2. A SEWER LATERAL MAY BE REPLACED WITH CAST IRON PIPE IN LIEU OF ENCASEMENT. THE CAST IRON PIPE SHALL HAVE THE SAME DIAMETER AS THE EXISTING LATERAL AND THE LENGTH SHALL BE THE SAME AS WOULD HAVE BEEN REQUIRED FOR ENCASEMENT. CAST IRON PIPE SHALL NOT BE USED ON SEWER MAINS.
3. REINFORCING STEEL MAY BE OMITTED IF TRENCH WIDTH IS LESS THAN 3'
4. FOR SEWER PIPE CROSSINGS OF LESS THAN 3' OVER A WATER MAIN SEE RIVERSIDE PUBLIC UTILITIES–WATER DIVISION (R.P.U.–WATER) STD. DWG. NO. CWD–015–1.

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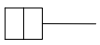
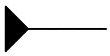
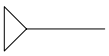
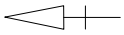
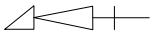
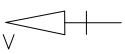
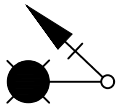
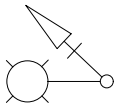
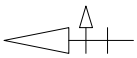
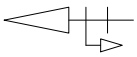
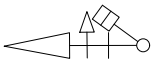
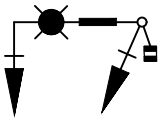
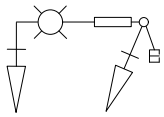
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MARK	REVISIONS	APPR.	DATE

SEWER PIPE ENCASEMENT ACROSS TRENCHES

STANDARD DRAWING NO. 564

Sheet 1 of 1

PROPOSED	EXISTING	
		PEDESTRIAN SIGNAL INDICATION
		PEDESTRIAN PUSH BUTTON POST
		EMERGENCY VEHICLE PRE-EMPTION (EVP)
		VEHICLE SIGNAL INDICATION (WITH BACKPLATE, 3-SECTION: RED, YELLOW AND GREEN)
		VEHICLE SIGNAL INDICATION WITH ANGLE VISORS, R OR L CUTOFF
 PV	 PV	MODIFICATIONS OF BASIC SYMBOLS: "L" – ALL NON-ARROW SECTIONS LOUVERED "LG" – LOUVERED GREEN SECTION ONLY "PV" – PROGRAMMABLE VISIBILITY SECTIONS
		TYPE 15TS STANDARD WITH VEHICLE SIGNAL INDICATION
		VEHICLE SIGNAL INDICATION WITH RED, YELLOW AND GREEN LEFT ARROW SECTIONS
		VEHICLE SIGNAL INDICATION WITH RED, YELLOW AND GREEN UP ARROWS
		TYPE 1A STANDARD WITH VEHICLE SIGNAL INDICATION AND PEDESTRIAN INDICATION
		STANDARD WITH SIGNAL MAST ARM, VEHICLE SIGNAL INDICATIONS, LUMINAIRE, PEDESTRIAN SIGNAL INDICATION AND STREET NAME SIGN (ILLUMINATED OR NON-ILLUMINATED)
		ELECTRIC SERVICE (120/240V)
		TYPE 15-FBS STANDARD WITH TWO VEHICLE SIGNAL INDICATIONS WITH LENSES, BACKPLATE AND VISOR WITH TRAFFIC SIGN
 R	 Y	FLASHING BEACON. ONE VEHICLE SIGNAL INDICATION WITH LENS, BACKPLATE AND VISOR. "R" INDICATES RED INDICATION, "Y" INDICATES YELLOW INDICATION
		TRAFFIC SIGNAL CONTROLLER CABINET ASSEMBLY
		TYPE "E" LOOP DETECTOR (6' DIAMETER)
		TYPE "D" MODIFIED LOOP DETECTOR (6' DIAMETER)
		TYPE "C" BICYCLE LOOP DETECTOR (3'X6' TYPICAL)

NOTE: SOME PLANS MAY SHOW EXISTING FACILITIES INCLUDING LOOP DETECTORS AS SOLID OR DASHED LINE TYPES

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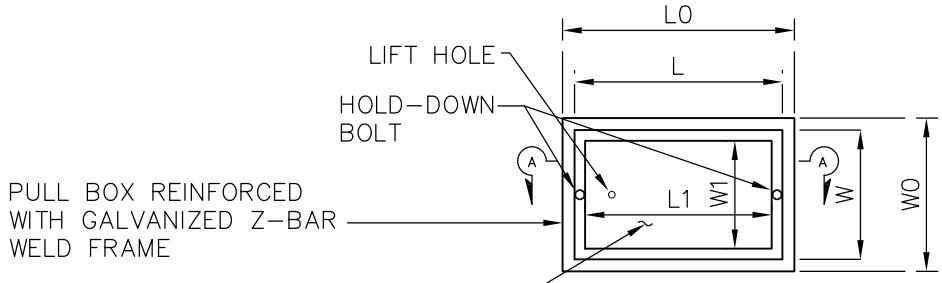
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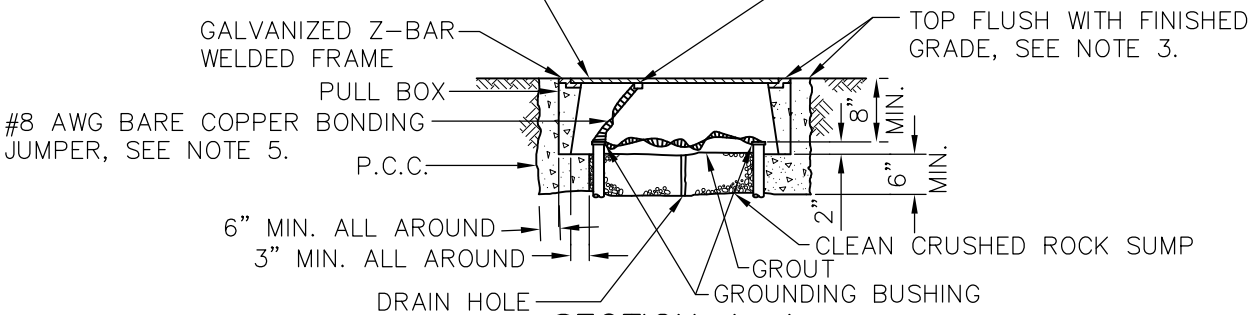
TRAFFIC SIGNAL & LIGHTING STANDARD SYMBOLS

STANDARD DRAWING NO. 600

Sheet 1 of 1

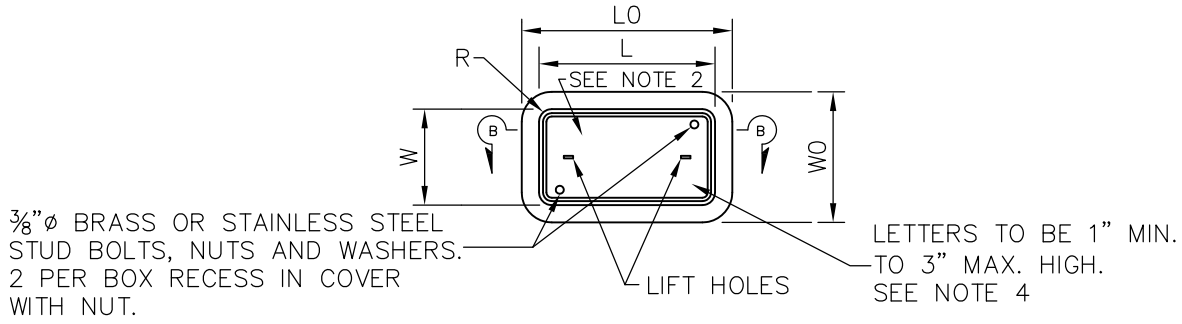


TOP VIEW

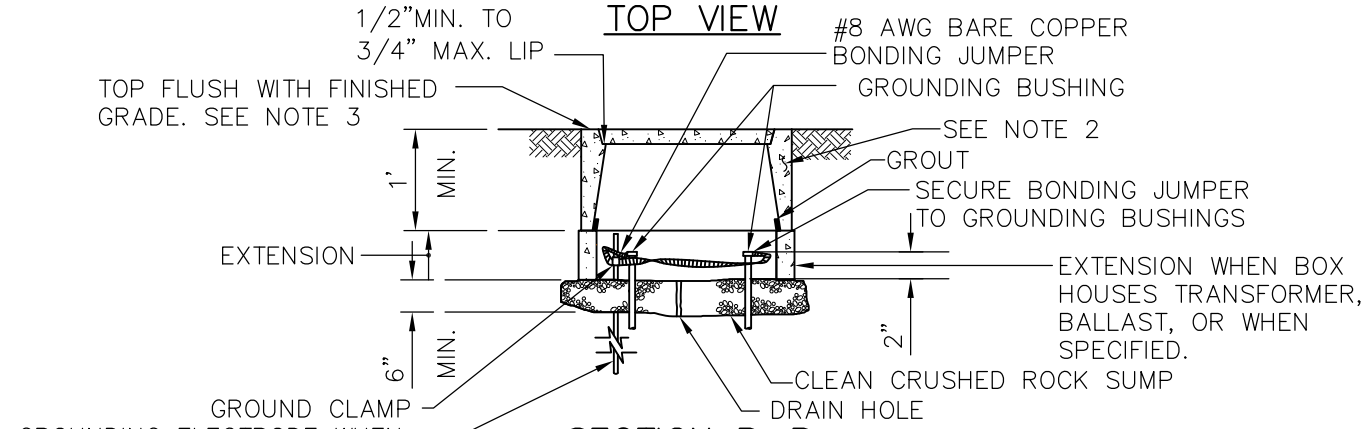


SECTION A–A

NO. 5(T) AND NO. 6(T)
TRAFFIC PULL BOX



TOP VIEW



SECTION B–B

INSTALLATION DETAILS

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TRAFFIC SIGNAL PULL BOX

STANDARD DRAWING NO. 606

Sheet 1 of 2

MARK	REVISIONS	APPR.	DATE

NOTES ON PULL BOXES:

1. ALL PULL BOXES SHALL BE OF "FIBRELYTE" MATERIAL. PULL BOXES SHALL HAVE A SKID RESISTANCE COVER.
2. CONCRETE PULL BOXES SHALL INCLUDE STEEL REINFORCING AS SPECIFIED BY THE MANUFACTURE.
3. TOP OF PULL BOXES SHALL BE FLUSH WITH SURROUNDING GRADE OR TOP OF ADJACENT CURB. IN UNPAVED AREAS WHERE PULL BOX IS UNPROTECTED, THE BOX SHALL BE PLACED WITH ITS TOP 1–1/4" ABOVE SURROUNDING GRADE. WHERE PRACTICABLE, PULL BOXES SHALL BE PLACED ADJACENT TO THE BACK OF CURB AND PULL BOXES SHOWN ADJACENT TO STANDARDS SHALL BE PLACED ON SIDE OF FOUNDATION FACING AWAY FROM TRAFFIC, UNLESS OTHERWISE NOTED. IN UNIMPROVED AREAS SHALL HAVE A 6" WIDE x 4" DEEP CONCRETE BORDER.
4. PULL BOX COVERS SHALL BE MARKED "TRAFFIC SIGNAL" IF SERVICE TRAFFIC SIGNAL CONDUCTORS. PULL BOX SHALL BE MARKED "COMMUNICATIONS" IF ONLY SERVICING TRAFFIC SIGNAL INTERCONNECT CABLES (FIBER OPTIC OR HARD WIRE).
5. DIMENSIONS ARE NORMAL VALUES. THE DIMENSIONS OF THE OPENING IN WHICH THE COVER SETS IN SHALL BE ⅛" GREATER THAN THE DIMENSIONS OF THE COVER.
6. BONDING JUMPER FOR METAL COVERS SHALL BE 3' LONG MINIMUM.
7. COVERS AND BOXES SHALL BE INTERCHANGEABLE WITH CALIFORNIA STANDARD MALE AND FEMALE GAGES. WHEN INTERCHANGEABLE WITH A STANDARD MALE AND FEMALE GAGE, THE TOP SURFACES SHALL BE FLUSH WITHIN ⅛". TOP OUTSIDE EDGE OF CONCRETE COVERS AND PULL BOXES SHALL HAVE A ¼" MINIMUM.
8. PULL BOXES SHALL NOT BE INSTALLED WITHIN THE BOUNDARIES OF THE NEW OR EXISTING CURB RAMPS.
9. PULL BOXES FOR THE LUMINAIRES, POST AND SIGNAL STANDARDS SHALL BE LOCATED WITHIN 5' FROM THE STATION OF THE ADJACENT LUMINAIRE, POST OF SIGNAL STANDARD. PULL BOXES SHALL BE PLACED ADJACENT TO BACK OF CURB OR EDGE OF SHOULDER EXCEPT WHERE THIS IS IMPRACTICAL, A BOX MAY BE PLACED IN ANOTHER SUITABLE PROTECTED AND ACCESSIBLE LOCATION.
10. PULL BOXES SHALL BE NO. 6 UNLESS OTHERWISE SPECIFIED ON PLAN.
11. PULL BOXES SUBJECT TO TRAFFIC LOADS SHALL BE TRAFFIC RATED AND DENOTED AS TYPE (T).

DIMENSION TABLE

PULL BOX	CONCRETE BOX				CONCRETE OR NON–PCC COVERS				
	MIN. * THICKNESS	MIN. DEPTH BOX AND EXTENSION	W0	L0	L **	W **	R	EDGE THICKNESS	EDGE TAPER
NO. 5	1"	1'–10"	1'–4¾"	2'–2¼"	1'–11¼"	1'–1¾"	1¼"	2"	⅛"
NO. 6	1½"	2'–0"	1'–8⅝"	2'–9⅝"	2'–6½"	1'–5½"	1¼"	2"	⅛"

* EXCLUDING CONDUIT WEB ** TOP DIMENSION

DIMENSION TABLE

PULL BOX	CONCRETE BOX						CONCRETE OR NON–PCC COVERS				
	MIN. * THICKNESS	MIN DEPTH BOX AND EXTENSION	W0	L0	L1	W1	L **	W **	R	EDGE THICKNESS	EDGE TAPER
No. 5(T)	1¾"	1'–0"	1'–11½"+/–	2'–5½"+/–	1'–7"+/–	1'–1"+/– 1"	2'–3"+/–	1'–4"+/–	0"	½"	NONE
No. 6(T)	2"	1'–0"	2'–6"+/– 1"	2'–11½"+/–	1'–11½"+/–	1'–5"+/– 1"	2'–9"+/–	1'–8"+/–	0"	½"	NONE

* EXCLUDING CONDUIT WEB ** TOP DIMENSION

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TRAFFIC SIGNAL PULL BOX

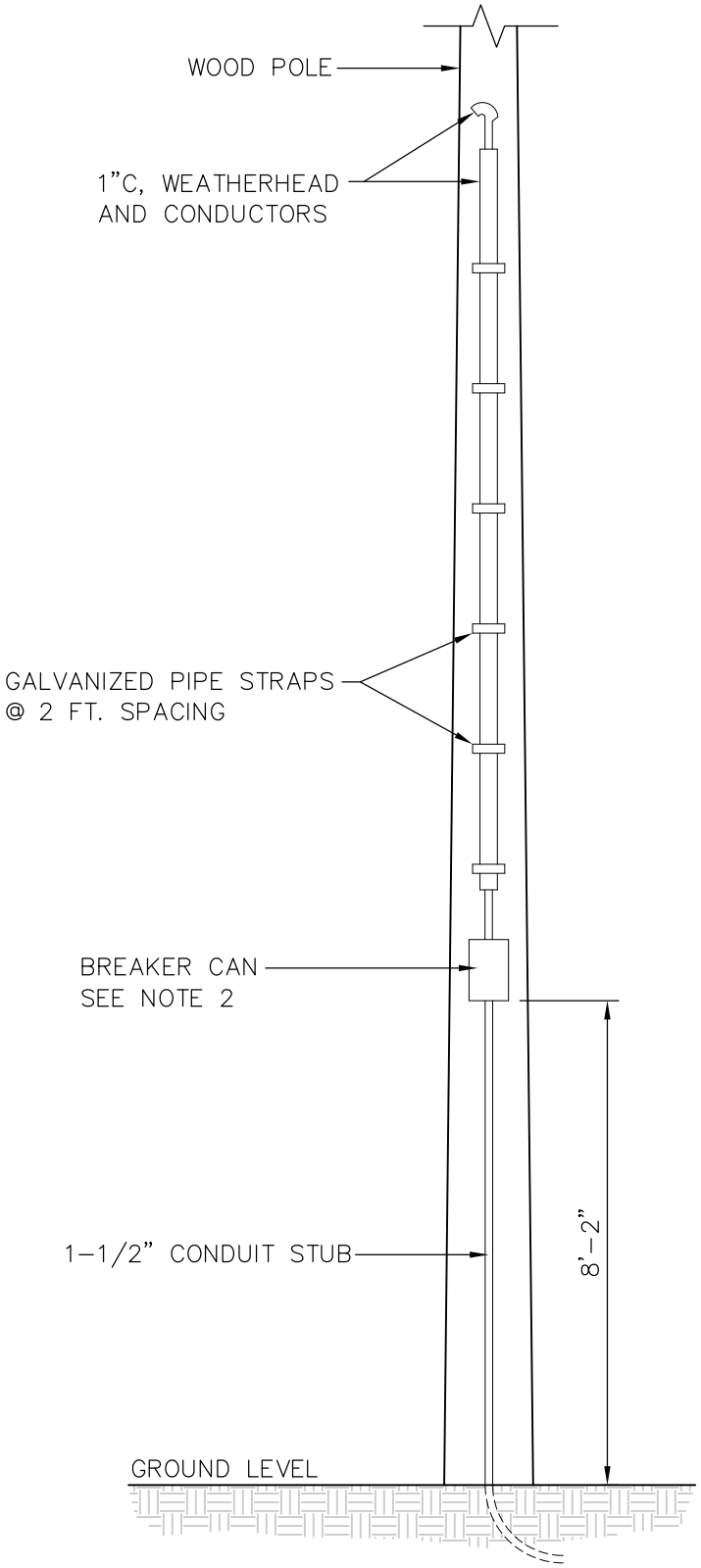
STANDARD DRAWING NO. 606

Sheet 2 of 2

MARK	REVISIONS	APPR.	DATE

NOTES:

1. ALL JOINTS IN CONDUIT, PULL BOXES, ETC. SHALL BE THREADED WEATHERPROOF CONNECTIONS.
2. FOR ALL SERVICE POLE: THE CONTRACTOR SHALL STUB 1½" CONDUIT UP POLE 8'–2" FROM FINISHED GRADE TO BOTTOM OF BREAKER CAN.
3. EXACT QUADRANT LOCATION OF THE 1½" CONDUIT STUB SHALL BE SHOWN ON PLAN.
4. COMBINED SERVICE FOR SIGNALS AND LIGHTING SHALL BE AS INDICATED FOR SINGLE SERVICE AS DESCRIBED IN NOTE 2 ABOVE, EXCEPT CONTRACTOR SHALL INSTALL (4) #8, (1) BLACK AND (1) WHITE FOR 120V MULTIPLE LIGHTING, (2) BLACK FOR 240V MULTIPLE LIGHTING, (1) RED AND (1) WHITE FOR 120V SIGNAL SERVICE. THE WEATHERPROOF BREAKER CAN SHALL BE SQUARE–D PART #Q0612L100RB TO HOLD (1) S.P. 50A 120V BREAKER FOR SIGNAL LIGHTING AND (1) S.P. 15A 240V BREAKER FOR IISNS, UNLESS OTHERWISE NOTED.
5. PULL BOXES FOR UNDERGROUND SERVICE SHALL BE INSTALLED AS PER STANDARD DRAWING NO. 606 NEAR POLE BASE IF INDICATED ON PLAN.
6. FOR ADDITIONAL SERVICE DETAILS AND NOTES, SEE STANDARD DRAWING NO. 667



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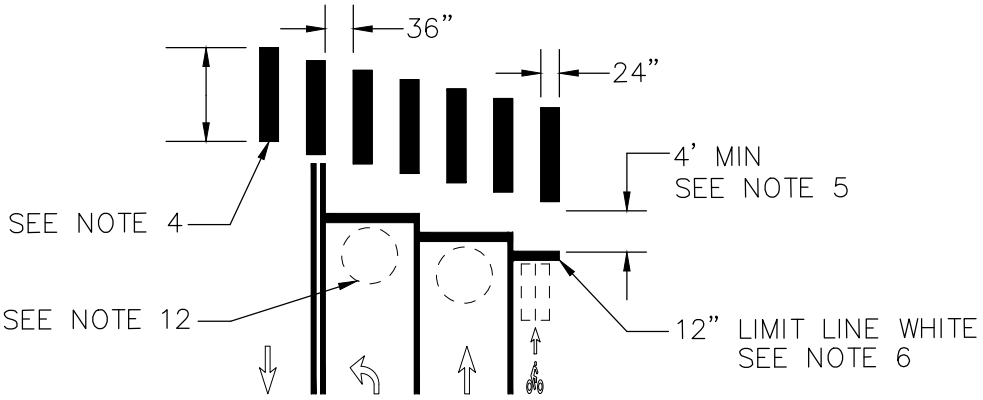
TRAFFIC SIGNAL OVERHEAD ELECTRICAL SERVICE

STANDARD DRAWING NO. 612

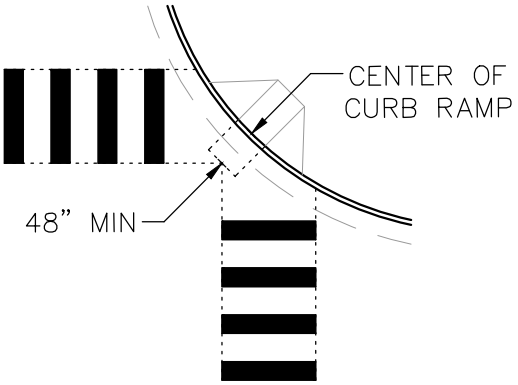
Sheet 1 of 1

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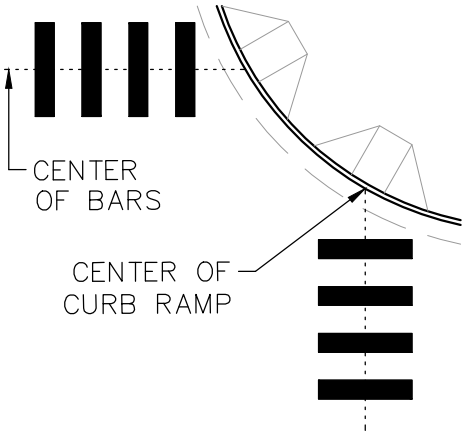
CONTINENTAL CROSSWALK

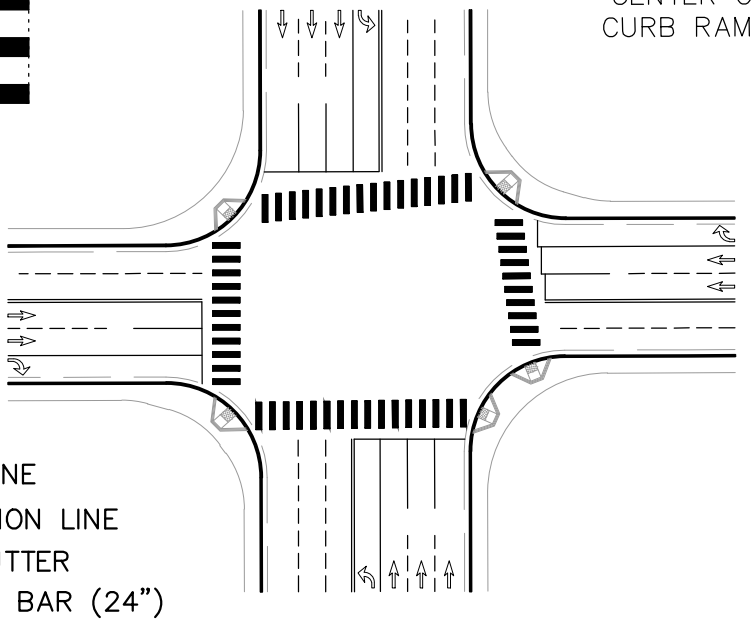


SINGLE RAMP CORNER



DUAL RAMP CORNER





LEGEND

- 12" LIMIT LINE
- CONSTRUCTION LINE
- CURB & GUTTER
- CROSSWALK BAR (24")

APPROVED BY:

CITY ENGINEER

2/22/2024
DATE

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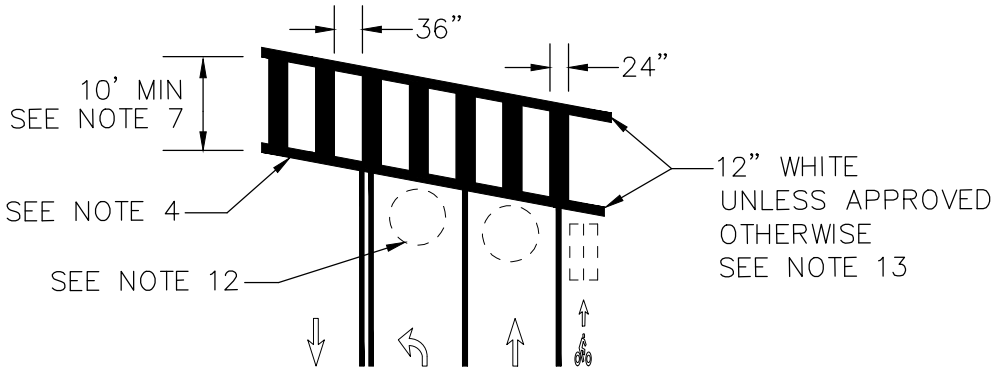
CITY OF RIVERSIDE

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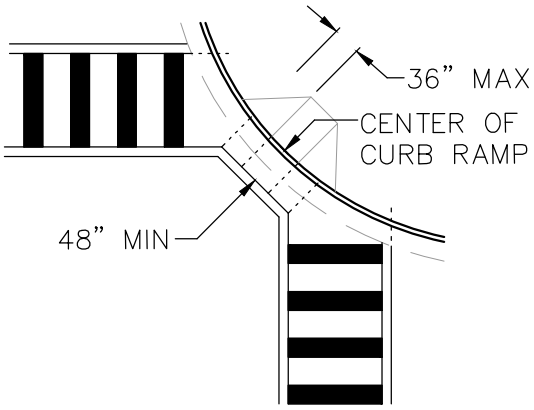
HIGH VISIBILITY CROSSWALK

STANDARD DRAWING NO. 640

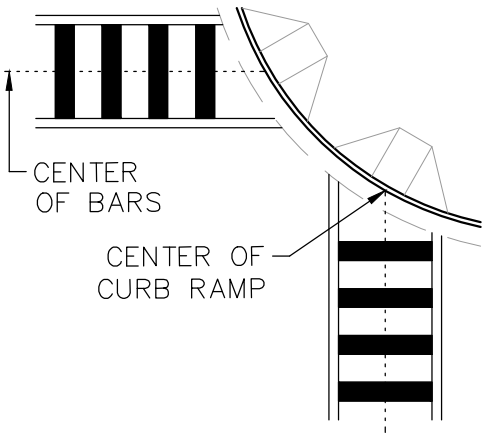
LADDER CROSSWALK

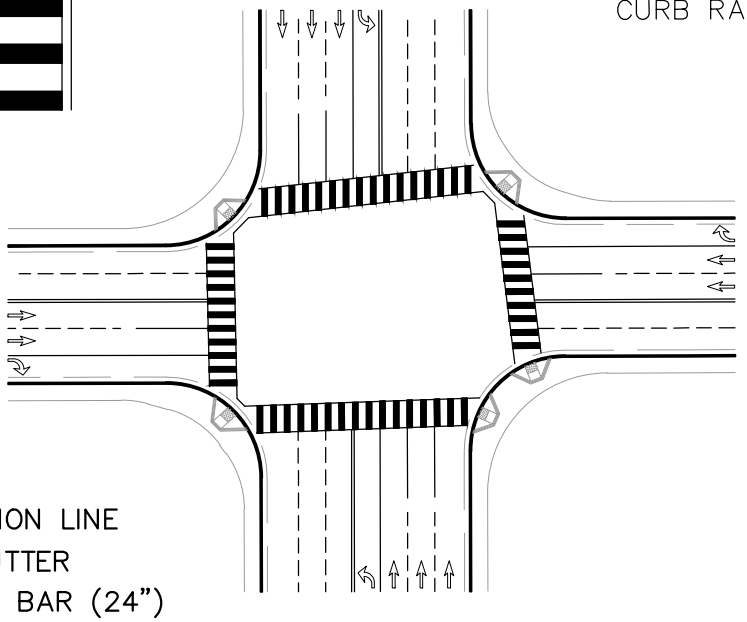


SINGLE RAMP CORNER



DUAL RAMP CORNER





LEGEND

- 12" WHITE
- CONSTRUCTION LINE
- CURB & GUTTER
- CROSSWALK BAR (24")

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CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

HIGH VISIBILITY CROSSWALK

STANDARD DRAWING NO. 640

GENERAL NOTES:

1. ALL MARKED CROSSWALKS SHALL BE DESIGNED WITH HIGH VISIBILITY CROSSWALK MARKINGS UNLESS APPROVED OTHERWISE. IF MORE THAN HALF OF AN EXISTING CROSSWALK OF ANY TYPE IS REMOVED OR MODIFIED, THE ENTIRE CROSSWALK SHALL BE REPLACED WITH A HIGH VISIBILITY CROSSWALK IN CONFORMANCE WITH THIS STANDARD.

2. MARKED CROSSWALK LOCATIONS CONSISTING OF BRICK PAVERS OR OTHER DECORATIVE PAVING SHALL BE PROVIDED WITH LIMIT LINE ONLY OR AS SPECIFIED ON PLANS.

3. SIGNALIZED INTERSECTIONS SHALL BE PROVIDED WITH A HIGH VISIBILITY CROSSWALK ACROSS EACH LEG WHERE PEDESTRIANS ARE PERMITTED TO CROSS.

4. HIGH VISIBILITY CROSSWALK MARKINGS SHALL BE ALIGNED PARALLEL TO THE DIRECTION OF VEHICULAR TRAVEL, SPACES BETWEEN MARKINGS MUST BE PLACED IN WHEEL TRACKS OF EACH LANE TO THE EXTENT FEASIBLE.

5. LIMIT LINES SHALL BE INSTALLED A MINIMUM OF 4 FEET IN ADVANCE OF CONTINENTAL CROSSWALK FOR THE APPROACH LANES AT ALL CONTROLLED CROSSINGS.

6. LIMIT LINES SHALL BE INSTALLED AT A 90 DEGREE ANGLE FROM ADJACENT CURB AND A "STEP" LAYOUT MAY BE USED AT SKEWED CROSSINGS. OFFSET LIMIT LINES SHALL ALWAYS BE WHITE.

7. HIGH VISIBILITY CROSSWALKS SHALL BE A MINIMUM OF 10 FEET IN WIDTH AND SHALL NOT EXCEED 15 FEET MAXIMUM WIDTH.

8. HIGH VISIBILITY CROSSWALK BARS SHALL BE UNIFORM WITHIN THE SAME CROSSING, NO PARTIAL BARS SHALL BE INSTALLED TO THE EXTENT FEASIBLE.

9. A CROSSWALK BAR SHALL BE CENTERED IN THE CENTER OF THE CROSSING AND SHALL BE SOLID WHITE, EXCEPT WHEN DESIGNATED AS A SCHOOL CROSSING WHICH SHALL BE SOLID YELLOW.

10. HIGH VISIBILITY CROSSWALK MARKINGS SHALL BE COMPLIANT WITH THE CITY OF RIVERSIDE SPECIFICATIONS AND GENERAL NOTES FOR THERMOPLASTIC STRIPING.

11. HIGH VISIBILITY CROSSWALK MARKINGS SHALL BE 2 FEET WIDE BARS WITH 3 FEET WIDE GAPS PATTERN.

12. NEW LOOPS SHALL BE INSTALLED BEHIND THE PROPOSED HIGH VISIBILITY CROSSWALK OR LIMIT LINE PER CITY OF RIVERSIDE STANDARD DRAWING NO. 670 OR AS OTHERWISE SPECIFIED. WHERE EXISTING VEHICLE DETECTOR LOOPS ARE TO REMAIN IN PLACE, EXISTING BASIC TRANSVERSE CROSSWALK MAY BE RETROFITTED TO LADDER CROSSWALK.

13. IF RETROFITTING EXISTING BASIC TRANSVERSE CROSSWALK, REMOVE INTERFERING PORTIONS OF CROSSWALK BY WET SANDBLASTING PROCESS OR GRINDING METHOD AND THEN FOG SEALED TO ACCOMMODATE LADDER CROSSWALK LAYOUT.

14. THE PROLONGATION OF THE CONTINENTAL CROSSWALK SHOULD BE WITHIN MAXIMUM 5 FEET PERPENDICULAR TO PEDESTRIAN PUSHBUTTON LOCATION.

15. THE CONTRACTOR MUST OBTAIN WRITTEN APPROVAL FROM THE CITY TRAFFIC ENGINEER PRIOR TO VARIANCES FROM THE ABOVE STANDARDS.

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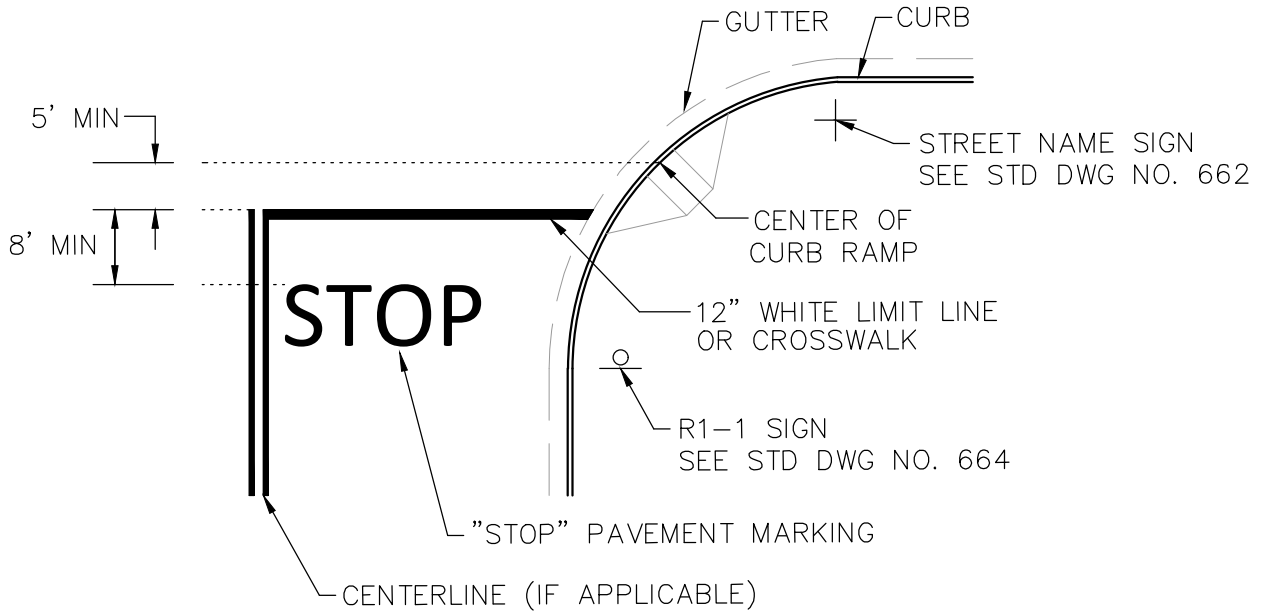
CITY OF RIVERSIDE

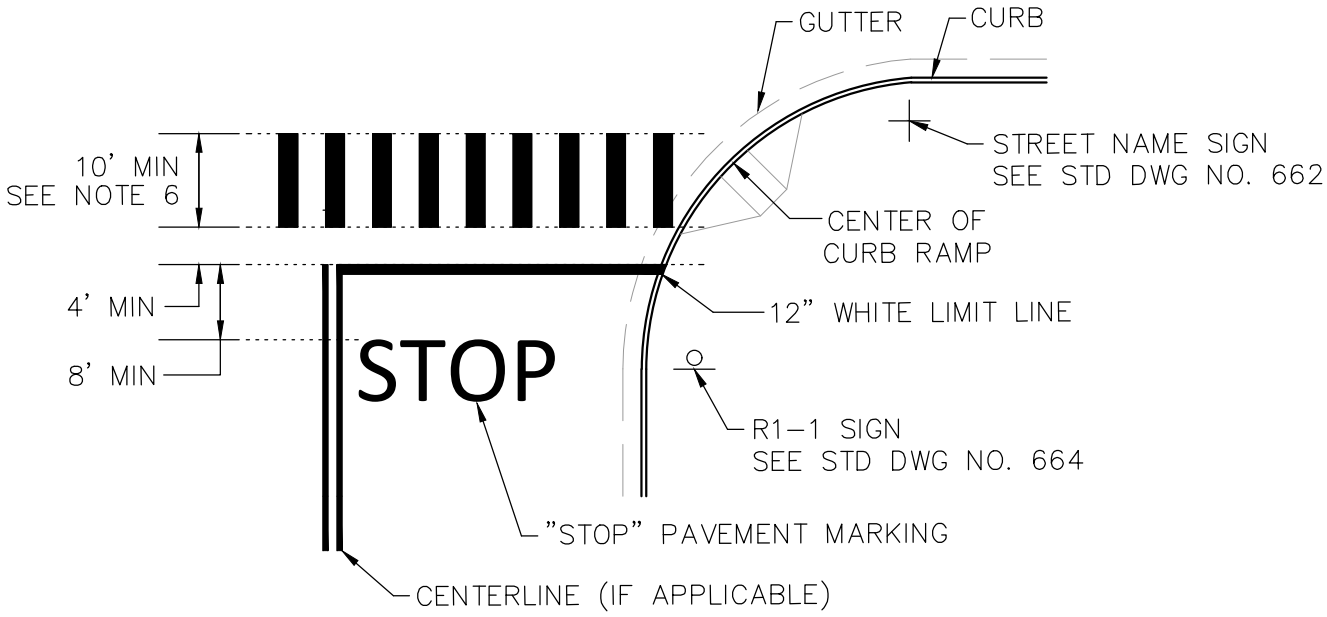
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HIGH VISIBILITY CROSSWALK

STANDARD DRAWING NO. 640

TYPICAL STOP APPROACH





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CITY OF RIVERSIDE
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STOP APPROACH LAYOUT

STANDARD DRAWING NO. 650

TYPICAL STOP APPROACH

GENERAL NOTES:

1. ALL NEW STRIPING SHALL BE THERMOPLASTIC, UNLESS APPROVED OTHERWISE.
2. ALL NEW STRIPING SHALL BE "CAT TRACKED" AND APPROVED BY THE CITY TRAFFIC ENGINEER PRIOR TO FINAL INSTALLATION.
3. LIMIT LINE SHALL BE 12" SOLID WHITE AND PLACED PARALLEL TO THE ADJACENT ROADWAY.
4. IF APPLICABLE, CENTERLINE SHALL BE MINIMUM 50' IN LENGTH TO THE THE LIMIT LINE AND PER DETAIL 22 OF CALTRANS STANDARD PLANS, UNLESS OTHERWISE SHOWN ON PLAN.
5. THE CONTRACTOR MUST OBTAIN WRITTEN APPROVAL FROM THE CITY TRAFFIC ENGINEER PRIOR TO VARIANCES FROM THE ABOVE STANDARDS.
6. REFER TO STANDARD DRAWING NO. XXX FOR ADDITIONAL DETAIL REGARDING INSTALLATION OF HIGH VISIBILITY CROSSWALK.

LEGEND

- 12" LIMIT LINE
- CONSTRUCTION LINE
- CURB & GUTTER
- CROSSWALK BAR (24")

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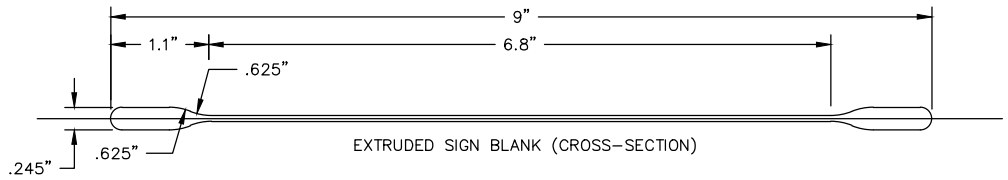
MARK	REVISIONS	APPR.	DATE

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STOP APPROACH LAYOUT

STANDARD DRAWING NO. 650



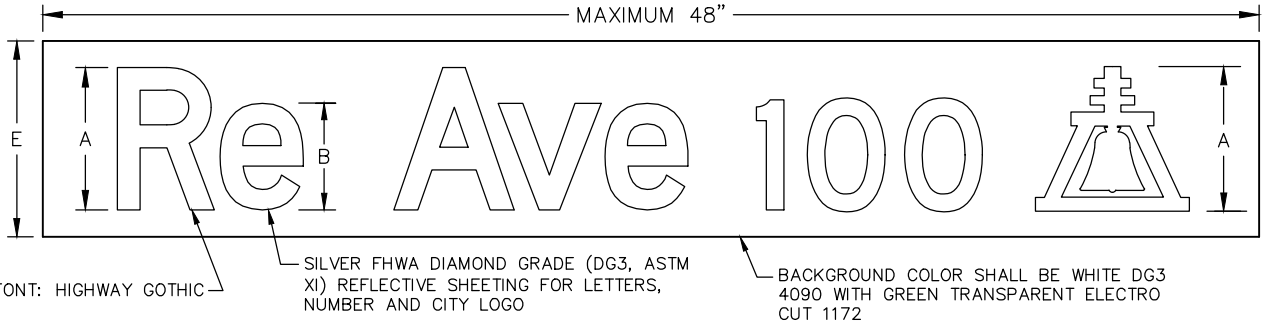
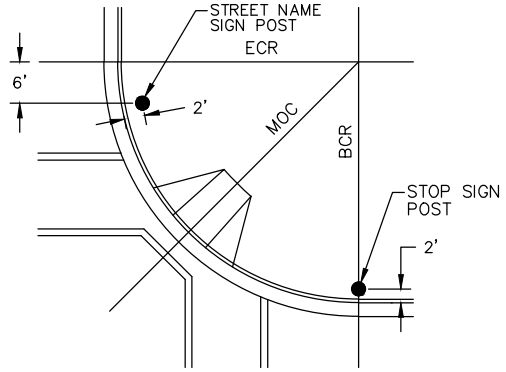


TABLE 1: LETTER & BLADE SIZE

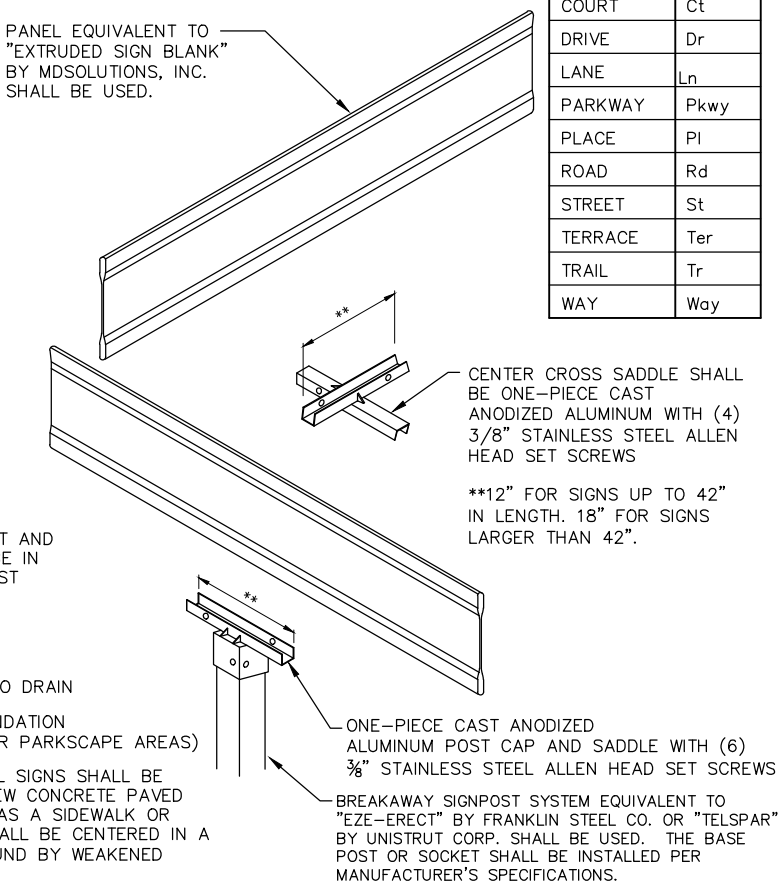
MOUNTING TYPE	SPEED LIMIT	MINIMUM LETTER HEIGHT		BLOCK NUMBER	BLADE SIZE (E)
		INITIAL UPPER-CASE (A)	LOWER CASE (B)		
POST-MOUNTED	40 MPH OR LESS	6 INCHES	4.5 INCHES	4.5 INCHES	9 INCHES
POST-MOUNTED	MORE THAN 40 MPH	8 INCHES	6 INCHES	6 INCHES	12 INCHES

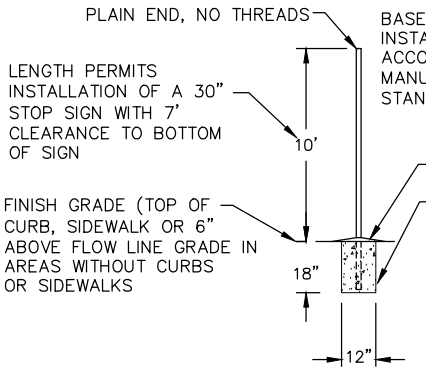
TABLE 2: STD SUFFIXES

SUFFIX	ABBREV
AVENUE	Ave
BOULEVARD	Blvd
CIRCLE	Cir
COURT	Ct
DRIVE	Dr
LANE	Ln
PARKWAY	Pkwy
PLACE	Pl
ROAD	Rd
STREET	St
TERRACE	Ter
TRAIL	Tr
WAY	Way



TYPICAL LOCATION OF STREET NAME AND STOP SIGNS





BASE POST OR SOCKET AND INSTALLATION SHALL BE IN ACCORDANCE WITH POST MANUFACTURER'S STANDARDS

SLOPE ½" MIN. TO DRAIN

CONCRETE FOUNDATION (UNIMPROVED OR PARKSCAPE AREAS)

THE POST OF ALL SIGNS SHALL BE ERECTED IN A NEW CONCRETE PAVED SURFACE, SUCH AS A SIDEWALK OR MEDIAN AND SHALL BE CENTERED IN A 12" SQUARE, BOUND BY WEAKENED PLANE JOINT

INSTALLATION DETAILS

APPROVED BY:

CITY ENGINEER

05/02/19
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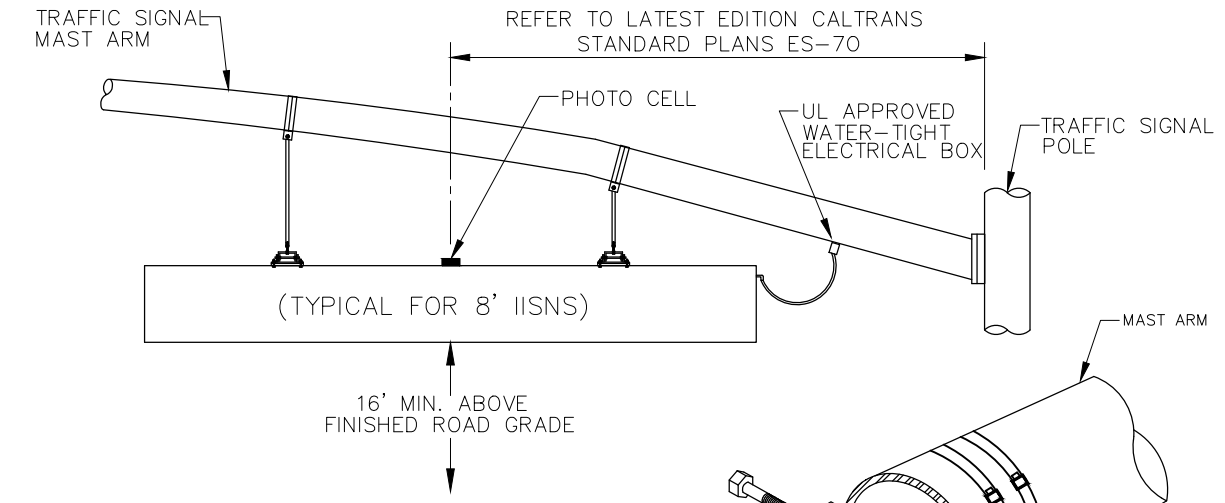
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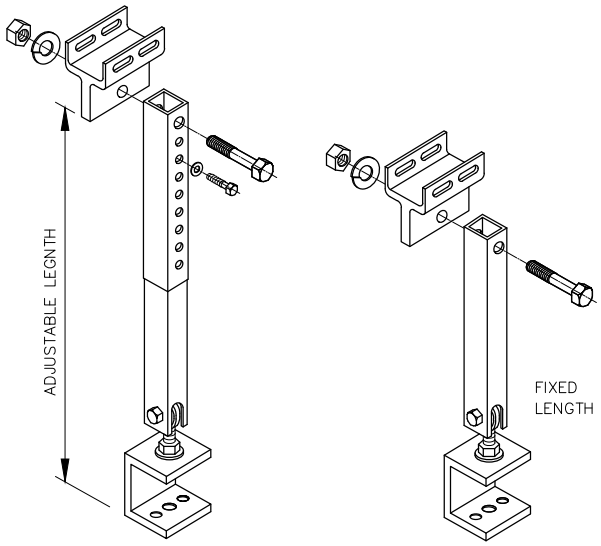
STREET NAME SIGNS (MAJOR & MINOR STREETS)

STANDARD DRAWING NO. 662

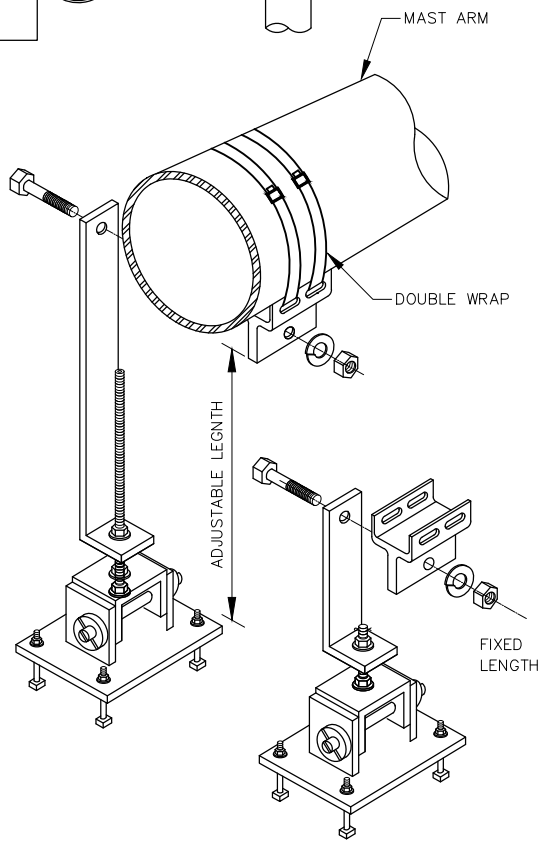
Sheet 1 of 1

MARK	REVISIONS	APPR.	DATE





NON ILLUMINATED PANEL MAST ARM MOUNTING DETAIL



IISNS (TYPE "A" FRAME) MAST ARM MOUNTING DETAIL

GENERAL NOTES:

1. EACH IISNS ASSEMBLY SHALL INCLUDE INDIVIDUAL PHOTO CELL.
2. IISNS ASSEMBLIES SHALL BE TYPE "A".
3. MESSAGE SHALL BE DISPLAYED ON BOTH SIDES UNLESS OTHERWISE SPECIFIED ON PLAN, SEE SHEET 2 FOR LEGEND LAYOUT.
4. SEE SPECIAL PROVISIONS AND/OR PLANS FOR STREET NAMES, SUFFIXES AND BLOCK NUMBERS.
5. PANEL COLOR: 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING, 4090T TRANSLUCENT WHITE. PANELS FOR DECORATIVE SIGNS SHALL BE SUPPLIED TO THE SIGN SHOP FOR FABRICATION.
6. ALL IISNS SHALL HAVE LED LIGHTING ASSEMBLIES.
7. EACH MAST ARM MOUNTED REFLECTORIZED SNS BLADE SHALL HAVE (1) EACH OF SAFEWAY SIGN COMPANY MOUNTING BRACKETS AS SHOWN WITH ALL NECESSARY HARDWARE OR CITY APPROVED EQUAL. REFER TO SHEET 3 FOR ORDERING INFORMATION.
8. BRACKETS SHALL BE DOUBLE STRAPPED TO SIGNAL MAST ARM.
9. FOR FURTHER DETAILS SEE CALTRANS STANDARD PLAN ES-7P OR LATEST STANDARD..
10. DOUBLE WRAP BANDING AT MAST ARM.
11. TYPE "A" FRAME SHALL USE "TYPE 1 OPTION" MOUNTING BRACKET.
12. DECORATIVE SIGN FRAME SHALL USE "TYPE 2 OPTION" MOUNTING BRACKET WITH STABILIZER SPRINGS.

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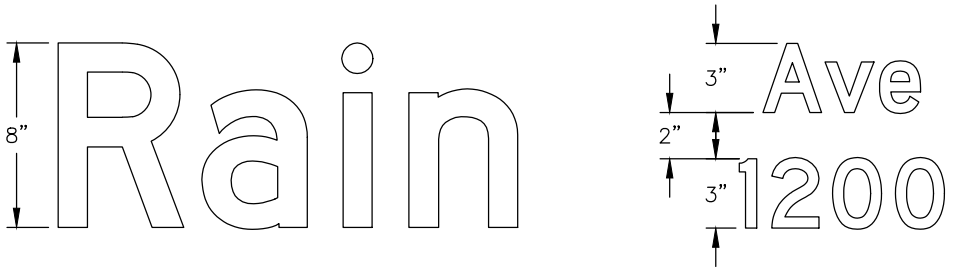
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TRAFFIC SIGNAL STREET NAME SIGNS

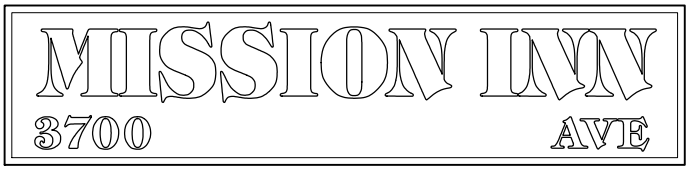
STANDARD DRAWING NO. 663

Sheet 1 of 3



TYPICAL LEGEND LAYOUT

FONT: HIGHWAY GOTHIC
JUSTIFIED – CENTER



PANEL SIZE: APPROX. 16.5" X 70.5"
LETTERS CUT IN REVERSE IN 3M 1175 BLUE TRANPARENT ELECTROCUT FILM WHICH IS LAID OVER 3M DG3 4090 WHITE WITH ¾" BORDER ALL AROUND.
FONT: MISSION INN: TIFFANY HEAVY, 8" LETTERS
3700 AVE: TIFFANY BOLD, 3" LETTERS

MISSION INN AVENUE LEGEND LAYOUT



PANEL SIZE: APPROX. 16.5" X 72"
LETTERS CUT IN REVERSE IN 3M 1177 GREEN TRANSPARENT ELECTROCUT FILM WHICH IS LAID OVER 3M DG3 4090T WHITE.
FONT: VAN BUREN: BASKERVILLE BOLD, 6.75" LETTERS
6300 BLVD: BASKERVILLE BOLD, 3.5" LETTERS
VETERENS MEMORIAL HIGHWAY: BASKERVILLE, 2.25" LETTERS

VAN BUREN BOULEVARD LEGEND LAYOUT

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05/02/19
DATE

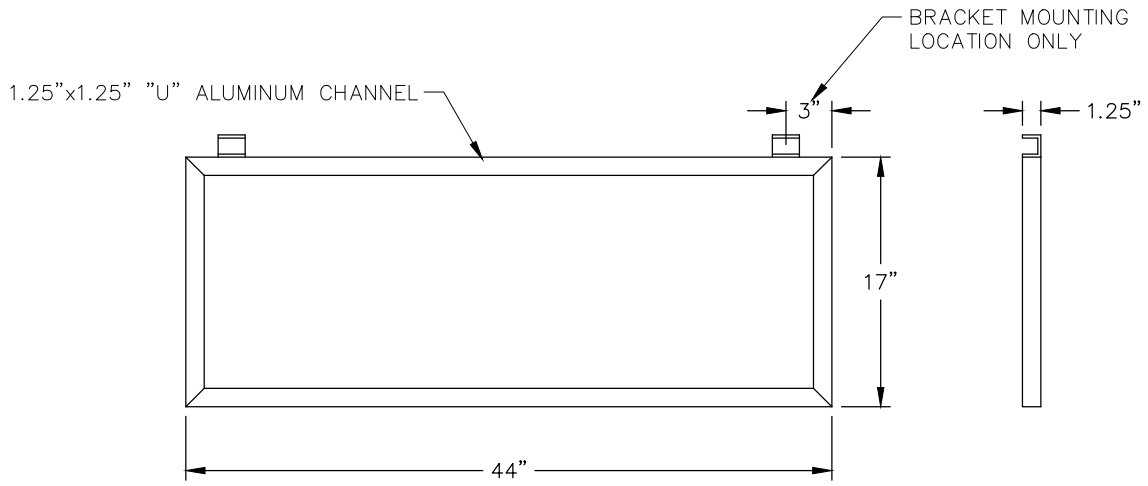
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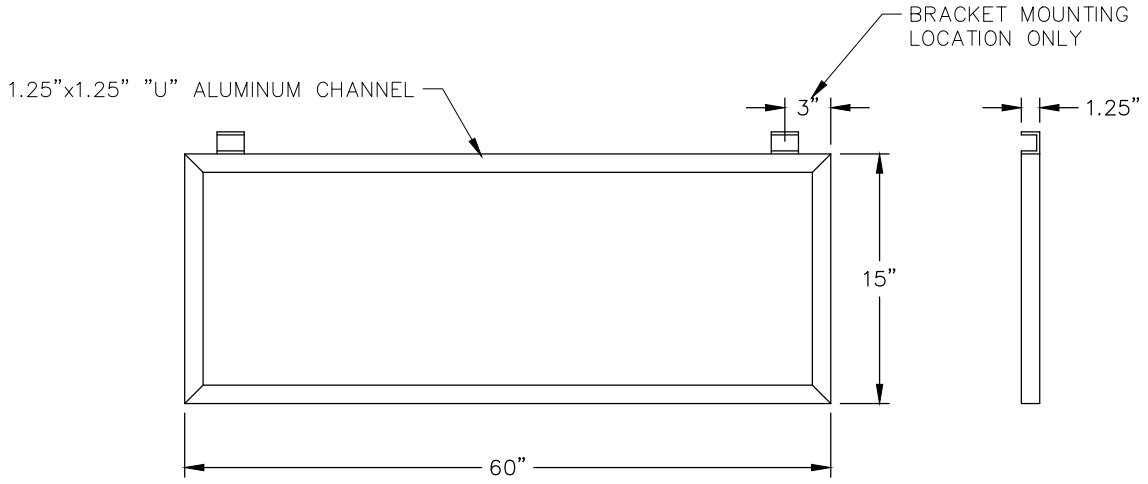
PUBLIC WORKS DEPARTMENT

TRAFFIC SIGNAL STREET NAME SIGNS

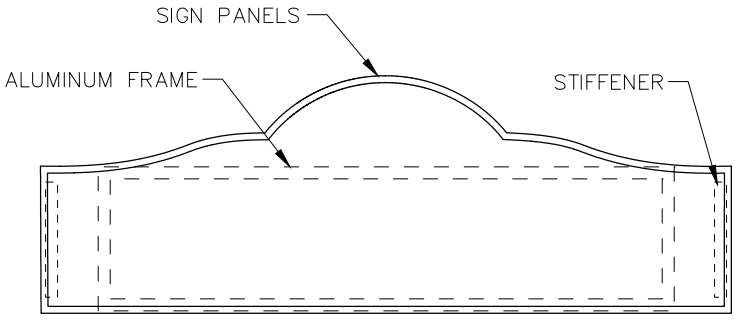
STANDARD DRAWING NO. 663



ALUMINUM FRAME (MAGNOLIA AVE & MARKET ST) SIDE VIEW



ALUMINUM FRAME (VICTORIA AVE) SIDE VIEW



ASSEMBLY EXAMPLE

ORDERING INFORMATION:

SAFEWAY SIGN COMPANY OR APPROVED EQUAL
PHONE: (800) 637-7233
FAX: (760) 246-5512

GENERAL NOTES:

1. FRAME / HARDWARE ONLY, AND (2) 1.25" X 1.25" X 12"L ALUMINUM "U" CHANNEL STIFFENERS – SHIPPED LOOSE

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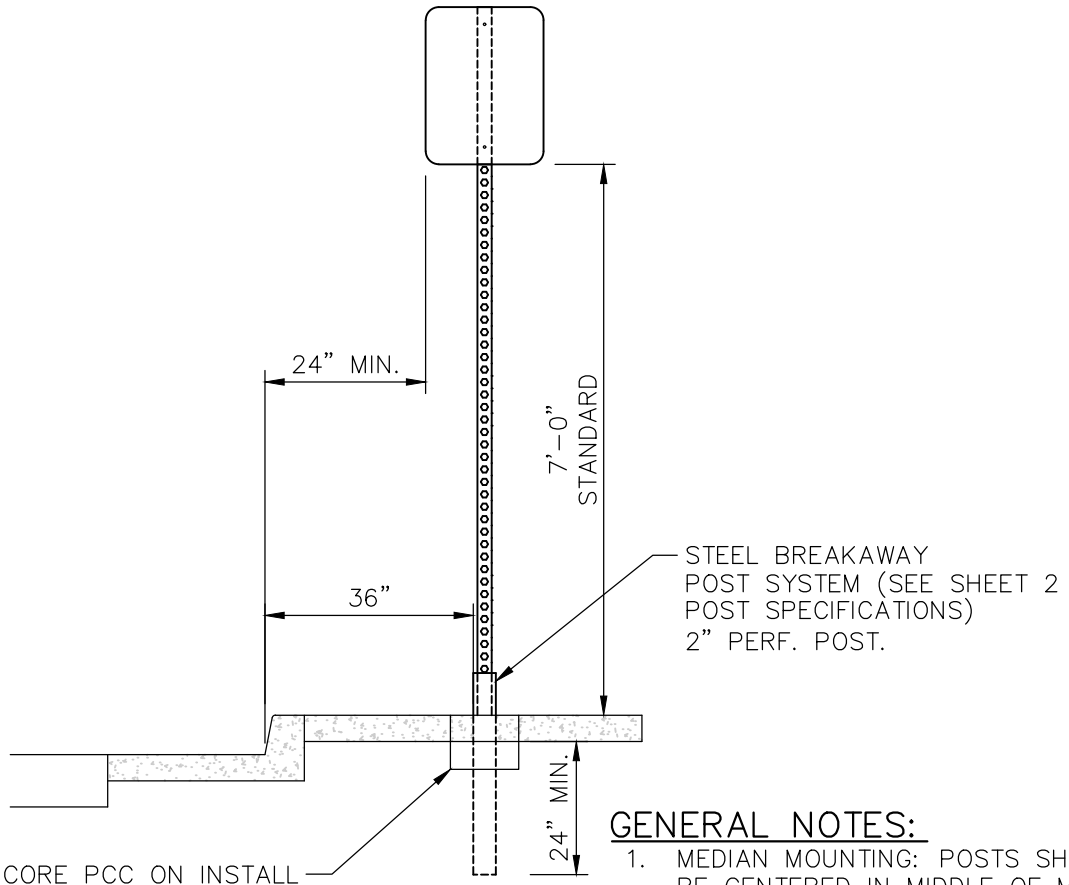
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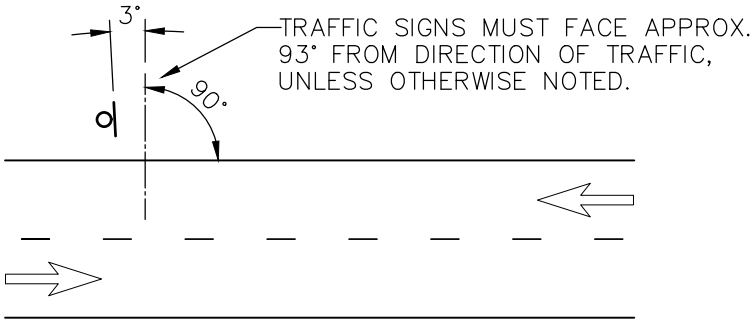
STANDARD DRAWING NO. 663

Sheet 3 of 3

MARK	REVISIONS	APPR.	DATE

SIDEWALK AND SHOULDER
MOUNTING HEIGHT AND LATERAL POSITIONS





GENERAL NOTES:

1. MEDIAN MOUNTING: POSTS SHALL BE CENTERED IN MIDDLE OF MEDIAN, A MIN. OF 5' BEHIND THE MEDIAN NOSE.
2. REFER TO CITY STANDARD DWG. NO. 662 FOR THE MOUNTING LOCATION FOR SIGNS AT CURB RETURNS.
3. ANY VARIATIONS FROM THIS CITY STANDARD SHALL BE APPROVED BY THE CITY TRAFFIC ENGINEER.
4. STOP SIGNS SHALL BE 30" IN LOCAL STREETS AND 36" IN COLLECTOR AND ARTERIAL STREETS. R4-7 SIGNS SHALL BE SYMBOL TYPE AND SHALL BE 24"x30".
5. ADDITIONAL SIDEWALK SHALL BE CONSTRUCTED AT THE BACK OF WALK TO ENSURE 36" WIDE MINIMUM WALKWAY BEHIND THE PROPOSED POST. SEE STANDARD DRAWING NO. 325 FOR SIDEWALK CONSTRUCTION.

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CITY ENGINEER DATE

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CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

SIGN STANDARDS

STANDARD DRAWING NO. 664

THE CONTRACTOR SHALL FURNISH ALL TRAFFIC CONTROL SIGNS, HARDWARE, POSTS AND APPURTENANCES TO ERECT THE SIGNS AS SHOWN ON THE CONSTRUCTION PLANS AND/OR AS SPECIFIED. THESE SIGNS SHALL CONFORM TO THE LATEST EDITION OF THE CALIFORNIA UNIFORM SIGN CHART AS ADOPTED BY THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION.

SIGN BLANKS: BLANK MATERIAL SHALL BE MADE OF ALODINE 1200 TREATED ALUMINUM ALLOY 6061–T6 OR 5136–H36 MINIMUM GAUGE OF 0.080.

SIGN BACKGROUND, LEGENDS & SYMBOLS: 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING (TYPE ASTM XI) MATERIAL SHALL BE USED FOR THE BACKGROUND OF TRAFFIC SIGNS. LEGEND AND BACKGROUND COLOR OF SIGNS SHALL CONFORM TO THE UNIFORM SIGN CHART. LEGENDS AND/OR SYMBOLS AND BORDERS SHALL BE APPLIED TO THE REFLECTIVE SHEETING MATERIAL EITHER THROUGH THE PROCESS OF SILK SCREENING OR CUT–OUT LETTERS, SYMBOLS AND BORDERS.

SIZE AND STROKE OF LEGEND: LETTERS, NUMBERS, SYMBOLS, BORDERS, SIZE AND STROKE SHALL CONFORM TO THE LATEST CALTRANS SIGN SPECIFICATIONS.

HARDWARE: ALL SIGNS ERECTED SHALL BE AFFIXED TO POSTS WITH EITHER GALVANIZED OR ALUMINUM HARDWARE NORMALLY AVAILABLE FROM VENDORS OF TRAFFIC SIGNS. THE FACE OF ALL SIGNS SHALL BE PROTECTED BY PLACING EITHER A FIBER OR NEOPRENE WASHER BETWEEN A METAL WASHER NEXT TO THE BOLT HEAD AND THE SIGN FACE. SIGN BACK BRACE SHALL BE USED ON ANY SIGN 36" X 36" OR LARGER.

POST: STEEL POST SHALL BE PROVIDED, UNLESS OTHERWISE INDICATED ON PLANS. 2" SQ. 12 GAUGE PERFORATED POST.

POST SPECIFICATION: BREAKAWAY SIGNPOST SYSTEM SHALL BE "TELSPAR" BY UNISTRUT CORP. OR CITY APPROVED EQUAL. THE BASE POST OR SOCKET SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

NOTE: THE BASE POST OR SOCKET OF ALL SIGNS TO BE ERECTED IN A NEW CONCRETE PAVED SURFACE, SUCH AS A SIDEWALK OR MEDIAN SHALL BE CENTERED IN A 12" SQUARE BOUND BY A WEAKENED PLANE JOINT.

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CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

SIGN STANDARDS

STANDARD DRAWING NO. 664

SIGN STANDARDS

ALL TRAFFIC CONTROL SIGNS SHALL CONFORM TO THE LATEST EDITION OF THE STATE OF CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

SIGN BLANK: BLANK MATERIAL SHALL BE MADE OF ALUMINUM.

SIGN SHEETING: DIAMOND GRADE (ASTM XI, DG3)

SIGN COLOR: ALL SIGN COLORS SHALL BE REFLECTORIZED, CONFORMING TO THE FOLLOWING REQUIREMENTS:

YELLOW & ORANGE SIGNS: REFLECTIVE SHEETING MATERIAL SHALL BE USED FOR BACKGROUND COLOR. LEGEND COLOR SHALL BE BLACK AND AFFIXED TO SHEETING MATERIAL EITHER THROUGH THE PROCESS OF SILK SCREENING OR NON-REFLECTIVE CUT-OUT LETTERS, SYMBOLS AND BORDERS.

SILVER SIGNS: REFLECTIVE SILVER (WHITE) SHEETING MATERIAL SHALL BE USED FOR BACKGROUND COLOR. LEGEND COLOR SHALL BE BLACK AND AFFIXED TO BACKGROUND AS DESCRIBED ABOVE FOR YELLOW SIGNS.

RED SIGNS: REFLECTIVE RED SHEETING SHALL BE USED FOR BACKGROUND COLOR IF REFLECTORIZED SILVER (WHITE) CUT-OUT LETTER AND BORDERS ARE UTILIZED. SILVER (WHITE) REFLECTIVE SHEETING SHALL BE USED FOR SILK SCREENING IN WHICH THE PROCESS WILL BE REVERSED TO PRODUCE A RED BACKGROUND WITH SILVER (WHITE) LEGEND.

BLACK SIGNS: NON-REFLECTIVE BLACK BACKGROUND COLOR. LEGEND COLOR SHALL BE REFLECTIVE SILVER (WHITE) AND AFFIXED TO BACKGROUND EITHER THROUGH THE PROCESS OF SILK SCREENING OR REFLECTIVE CUT-OUT LETTERS, NUMBERS, SYMBOLS AND BORDERS. NON-REFLECTIVE BORDERS MAY BE USED ONLY IF SIGN IS LARGER THAN 4' X 5' OR (20 SQ. FT.).

GREEN SIGNS: NON-REFLECTIVE GREEN BACKGROUND. LEGEND COLOR SHALL BE REFLECTIVE SILVER (WHITE) AND AFFIXED TO BACKGROUND AS DESCRIBED ABOVE FOR BLACK SIGNS.

LEGEND: LETTERS, NUMBERS, SYMBOLS, BORDERS, SIZE AND STROKE SHALL CONFORM TO THE LATEST EDITION OF THE STATE OF CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

** THE CONTRACTOR MUST OBTAIN WRITTEN APPROVAL FROM THE TRAFFIC ENGINEER PRIOR TO VARIANCES FROM THE ABOVE STANDARDS. **

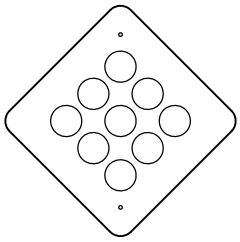
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CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

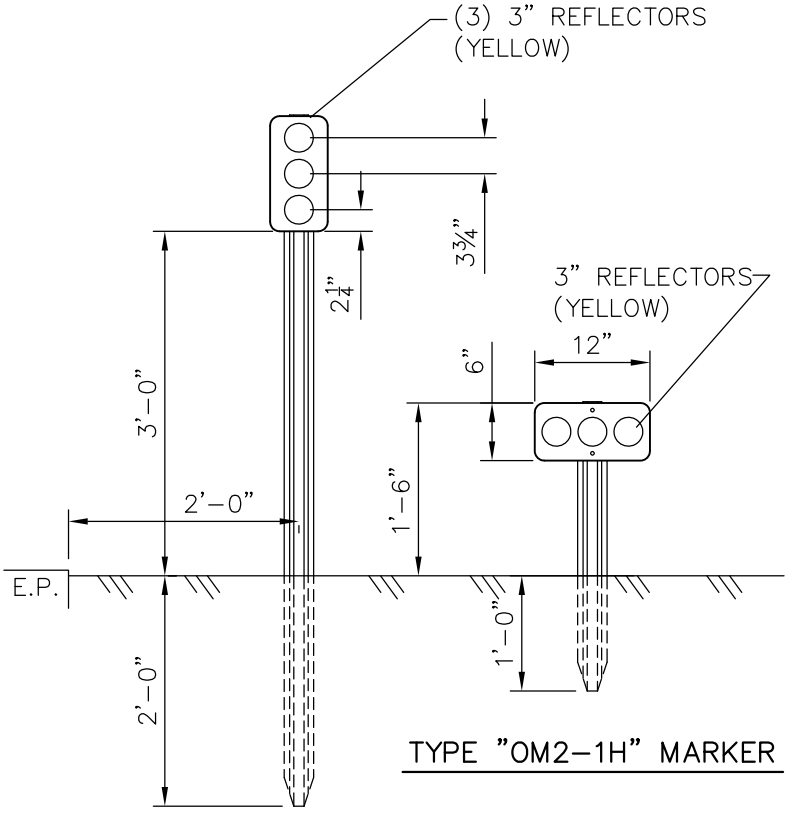
SIGN STANDARDS

STANDARD DRAWING NO. 664



TYPE "N–4(CA)" MARKER

REFER TO CALTRANS SIGN SPECIFICATIONS FOR DIMENSIONS



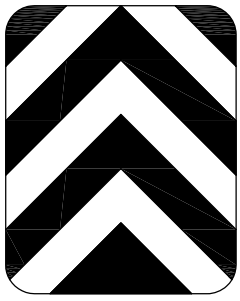
TYPE "OM2–1H" MARKER



TYPE "OM2–1V" MARKER

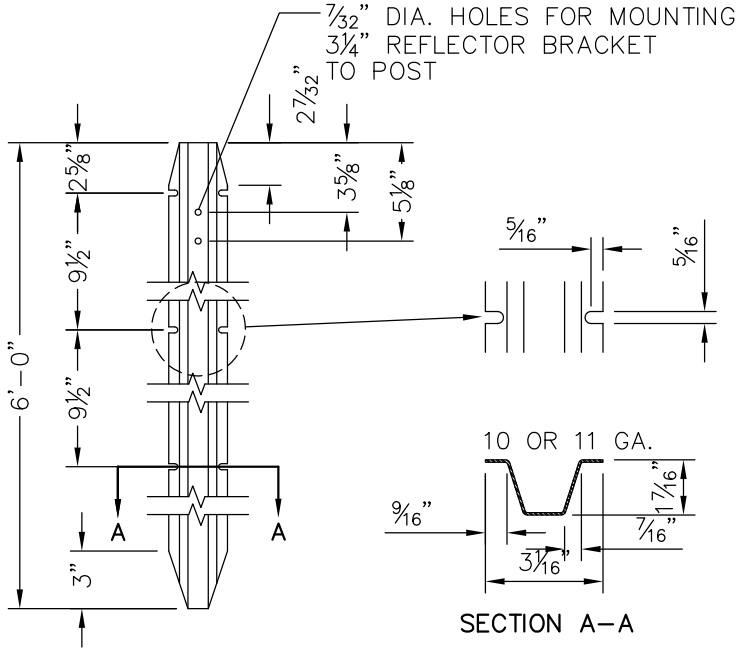
TYPE "P" MARKERS

REFER TO CALTRANS SIGN SPECIFICATIONS FOR DIMENSIONS



TYPE "R" MARKER

REFER TO CALTRANS SIGN SPECIFICATIONS FOR DIMENSIONS



SECTION A–A

METAL MARKER POST

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CITY ENGINEER DATE

CITY OF RIVERSIDE

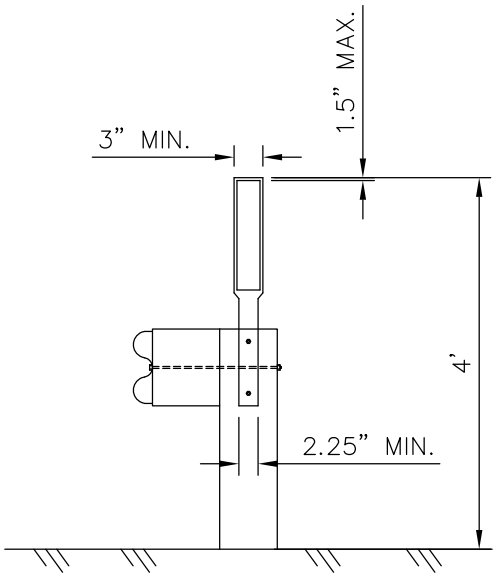
PUBLIC WORKS DEPARTMENT

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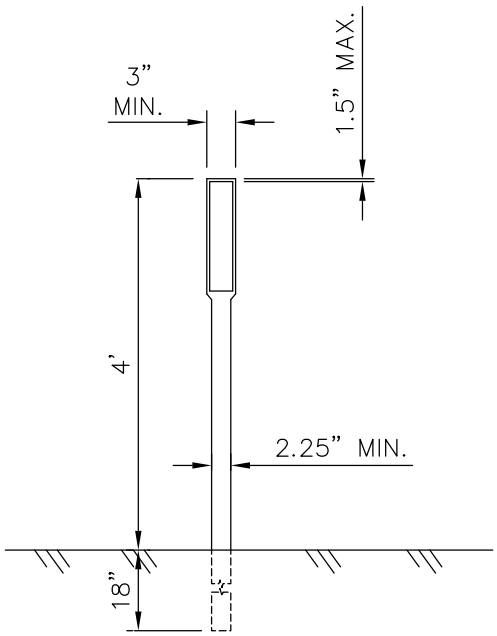
SIGN MARKERS

STANDARD DRAWING NO. 665

Sheet 1 of 2



GUARDRAIL DELINEATOR
(FLEXIBLE POST)



TYPE F CLASS 1 FLEXIBLE POST

NOTES:

1. CLASS 1 (FLEXIBLE POST) DELINEATORS ARE STANDARD ON STATE HIGHWAY, EXCEPT FOR CERTAIN LOCATIONS, e.g., SNOW OR PROTECTION AREAS BEHIND GUARDRAIL, ETC. THE COLOR OF THE POST IS WHITE.

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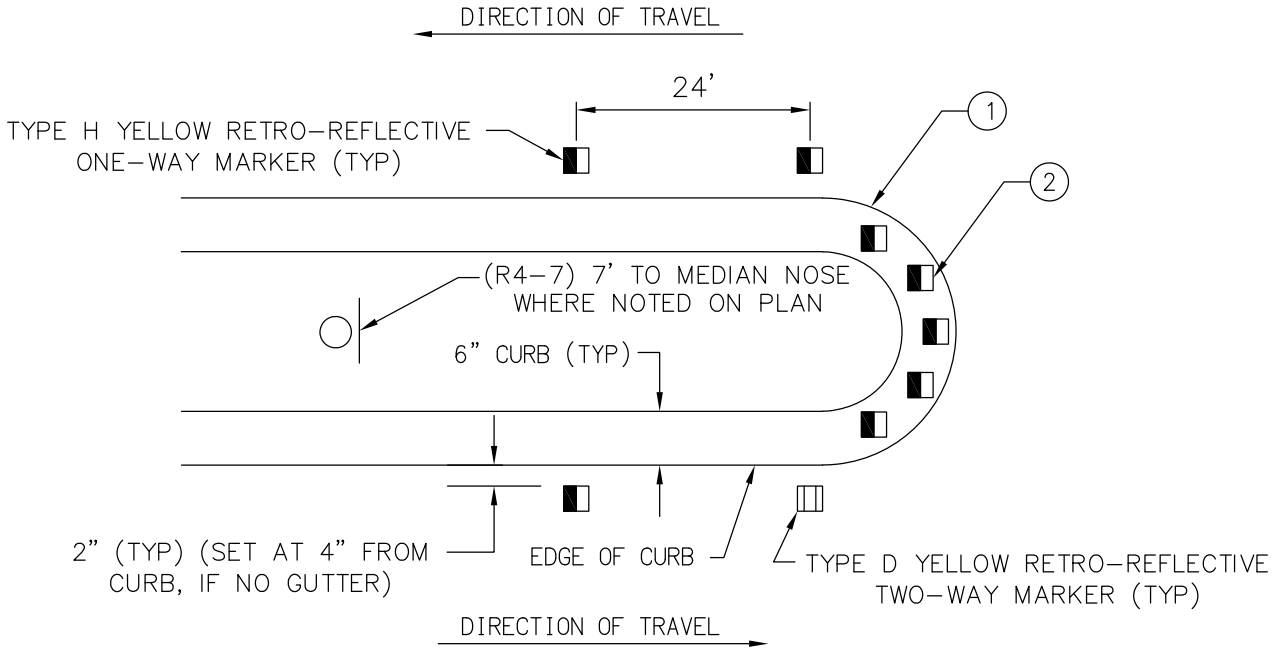
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SIGN MARKERS

STANDARD DRAWING NO. 665



PLAN
NTS

1. PAINT MEDIAN NOSE WITH HIGHLY REFLECTIVE REMIXED TRAFFIC YELLOW PAINT WITH GLASS BEADS
2. INSTALL TYPE H RETRO-REFLECTIVE PAVEMENT MARKERS ON TOP OF MEDIAN CURB NOSE AT 2' CENTER SPACING (MINIMUM 5 MARKERS). PLACE REFLECTIVE SURFACE OF MARKERS PARALLEL TO CENTERLINE OF ROADWAY.

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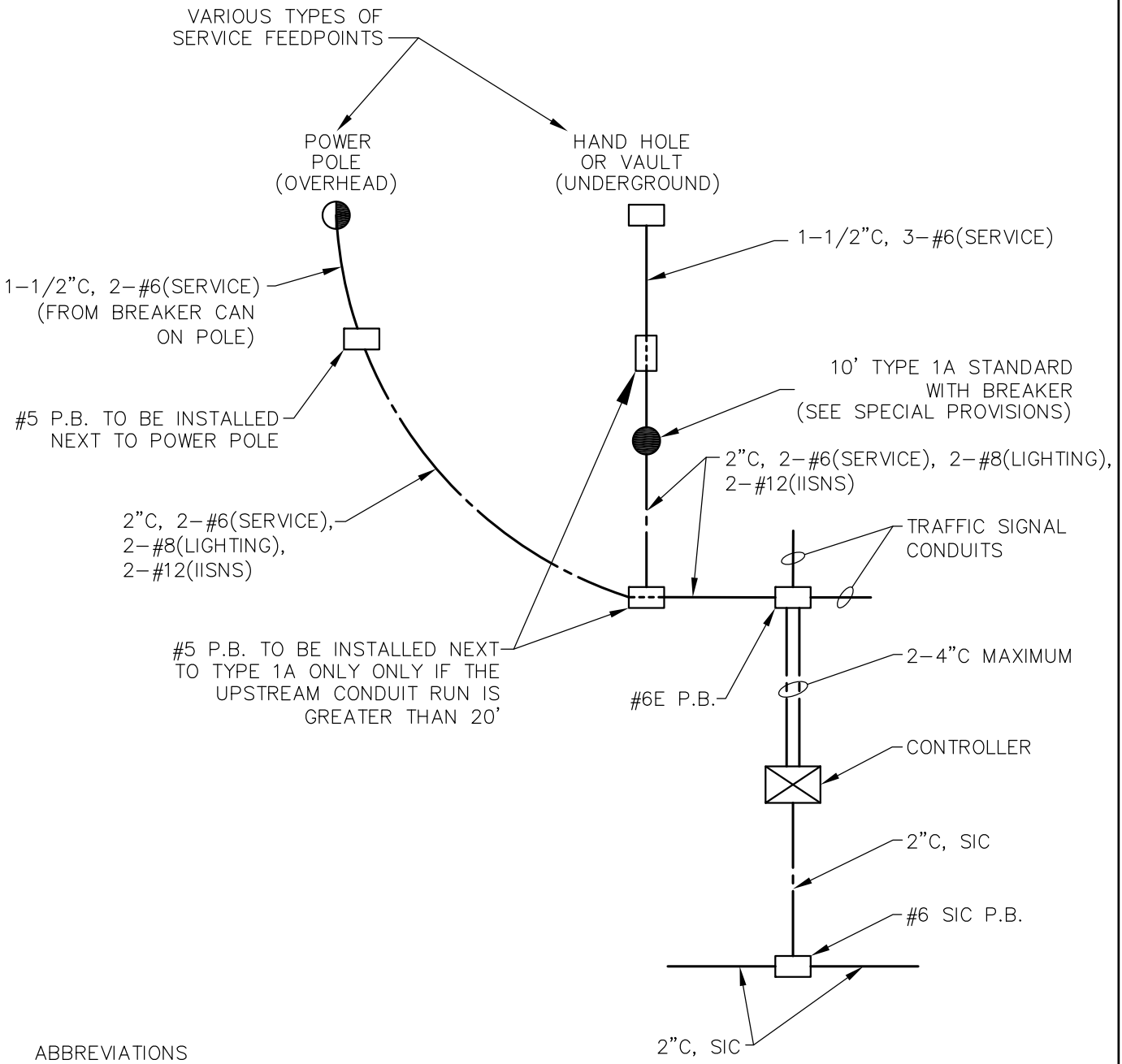
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MEDIAN NOSE DETAIL

STANDARD DRAWING NO. 666

Sheet 1 of 1



ABBREVIATIONS

C – CONDUIT
P.B. – PULLBOX
IISNS – INTERNALLY ILLUMINATED STREET NAME SIGN
SIC – SIGNAL INTERCONNECT

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09/28/2020
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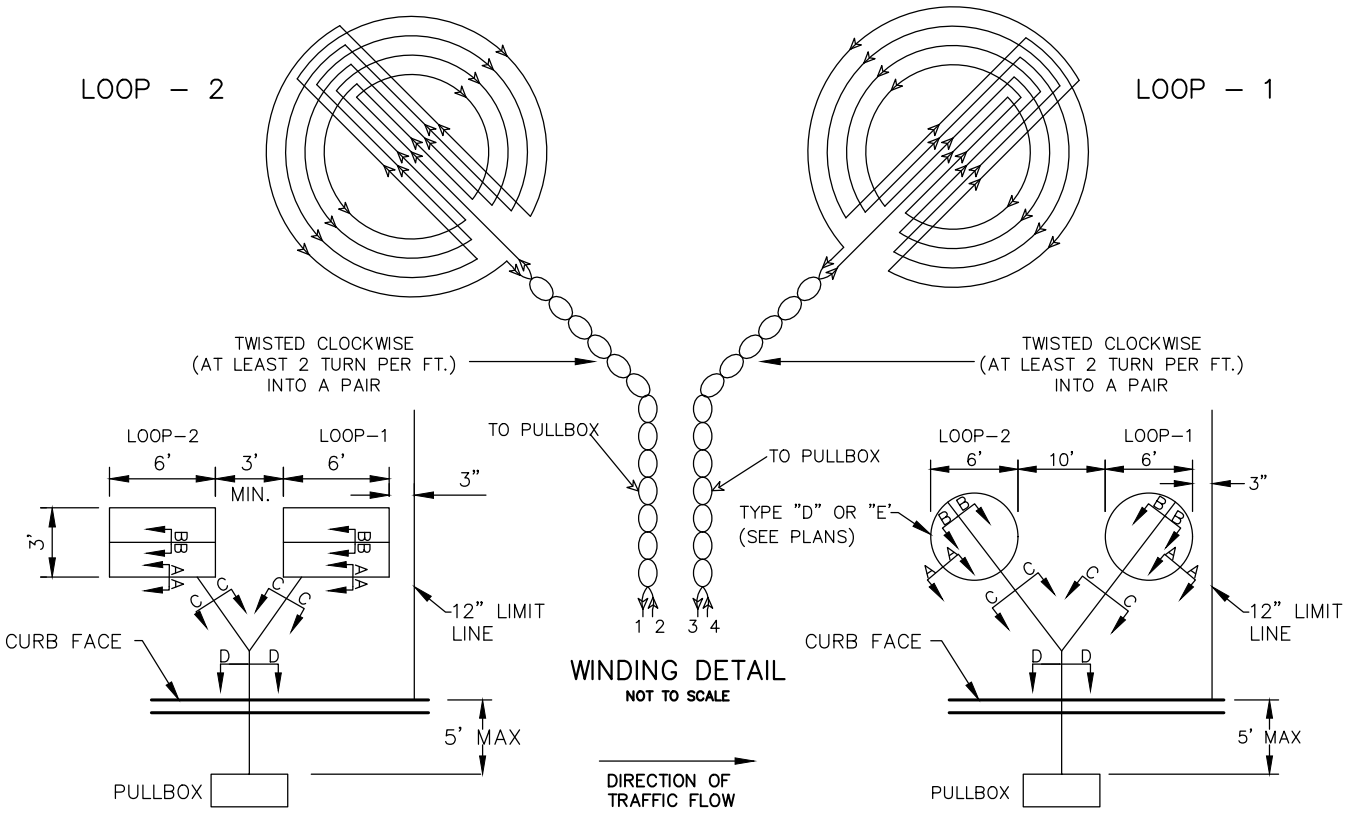
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ELECTRICAL SERVICE DETAILS TO TRAFFIC CONTROLLER

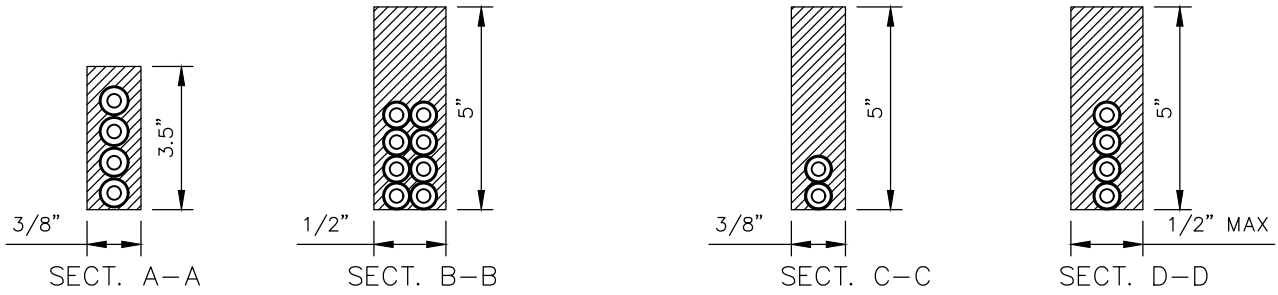
STANDARD DRAWING NO. 667

Sheet 1 of 1



CASE I, TYPE "C"
(BICYCLE ONLY)

CASE II, TYPE "D"
(BICYCLE & VEHICLE)



* DEPTH OF SLOT NOT TO EXCEED DEPTH OF PAVEMENT

NOTES:

1. INSTALL FOUR (4) COMPLETE ALTERNATING TURNS OF LOOP CONDUCTORS, UNLESS OTHERWISE SPECIFIED.
2. USE CASE I LOOPS FOR BIKE LANE INSTALLATIONS. USE CASE II LOOPS AT LIMIT LINES, EXCLUDING RIGHT–TURN LANES.
3. AN OCTAGONAL SHAPED LOOP OR OTHER NON–ROUND SHAPED LOOP MAY BE USED INSTEAD OF THE ROUND–LOOP WITH PRIOR ENGINEER'S APPROVAL
4. SAME WINDING PATTERN TO BE USED IN BOTH LOOPS WITH ONE (1) PAIR FROM EACH LOOP LEADING TO THE PULL BOX.
5. LOOPS INSTALLED IN BIKE LANES WITH PARKING SHALL BE PLACED WITH THE NEAR EDGE OF THE LOOP ONE (1) FOOT TO THE RIGHT OF THE BIKE LANE DELINEATION LINE UNLESS OTHERWISE NOTED.
6. LOOPS INSTALLED IN BIKE LANES ADJACENT TO THE ROADSIDE WITHOUT PARKING SHALL BE CENTERED IN THE BIKE LANE, OR BETWEEN THE GUTTER AND THE BIKE LANE DELINEATION LINE, UNLESS OTHERWISE NOTED.
7. ANY APPROVED NON–ROUND SHAPED LOOPS SHALL CONFORM TO ALL OTHER SPECIFICATIONS SHOWN ON THIS STANDARD DRAWING.
8. LOOP #2 IN VEHICULAR LANE MAY BE A TYPE "D" MODIFIED OR TYPE "E" LOOP DETECTOR. CONTRACTOR SHALL REFER TO PLAN OR COORDINATE WITH ENGINEER TO DETERMINE TYPE.
9. UNLESS SHOWN OTHERWISE, INDUCTIVE LOOPS FOR VEHICULAR TRAVEL LANES SHALL BE TYPE "D" AND "E" WITH 10', 15' AND 30' SPACING IN THE DIRECTION OF THE TRAVEL. LOOPS SHALL BE SEALED WITH HOT MELT SEALANT.

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TYPE "C" AND "D" DETECTOR

STANDARD DRAWING NO. 670

Sheet 1 of 1

MARK	REVISIONS	APPR.	DATE

TRAFFIC CONTROL GENERAL NOTES:

1. ALL TRAFFIC CONTROL FOR CONSTRUCTION SHALL CONFORM TO THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD) ADOPTED LATEST, CALTRANS SPECIFICATIONS AND STANDARD PLANS, AND THE SPECIAL PROVISIONS.

2. LANE CLOSURES SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. ANY PAVEMENT MARKINGS AND STRIPING DAMAGED AND/OR BADLY WORN DURING CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR.

3. ALL EXISTING FACILITIES INCLUDING SIGNING, STRIPING, MARKINGS, MARKERS AND SIGNAL SHALL BE RESTORED TO THE ORIGINAL CONDITION AND/OR LOCATION AT THE END OF EACH CONSTRUCTION PERIOD FOR EACH STAGE.

4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING WORK ON A PUBLIC STREET TO INSTALL AND MAINTAIN TRAFFIC CONTROL DEVICES AS SHOWN HEREON, AS WELL AS ANY SUCH ADDITIONAL DEVICES AS MAY BE REQUIRED TO INSURE THE SAFE MOVEMENT OF TRAFFIC AND PEDESTRIANS THROUGH OR AROUND THE WORK AREA. ALL TRAFFIC CONTROL DEVICES SHALL BE KEPT IN THEIR PROPER POSITION AT ALL TIMES, AND SHALL BE REPAIRED, REPLACED OR CLEANED AS NECESSARY TO PRESERVE THEIR APPEARANCE AND CONTINUITY.

5. A MINIMUM OF FIVE FEET OF CLEARANCE SHALL BE MAINTAINED BETWEEN ANY OPEN EXCAVATION AND THE ADJACENT MOVING TRAFFIC LANE. NO OPEN TRENCH ADJACENT TO A TRAFFIC LANE SHALL EXCEED 300 FEET. TEMPORARY CONCRETE BARRIER (TYPE K PER CALTRANS STANDARD PLAN T-3) SHALL BE USED WHENEVER SHOWN ON THE PLANS. THE C27(CA) "OPEN TRENCH" SIGN SHALL BE UTILIZED WHENEVER AN OPEN EXCAVATION AREA EXISTS ADJACENT TO THE TRAVEL WAY.

6. THE CONTRACTOR SHALL COORDINATE THE RELOCATION OF THE BUS ROUTES AND BUS STOPS WITH RIVERSIDE TRANSIT AGENCY (RTA) AT (951) 565-5122 THREE WEEKS IN ADVANCE OF CONSTRUCTION ACTIVITY AFFECTING BUS STOPS.

7. THE CONTRACTOR SHALL PROVIDE A SAFE AND CONTINUOUS PASSAGE OF LOCAL PEDESTRIAN AND VEHICULAR TRAFFIC AT ALL TIMES.

8. EXACT LOCATION AND TYPE OF CONSTRUCTION SIGNS(S) SHALL BE AS DIRECTED BY THE ENGINEER BASED ON TRAFFIC CONDITIONS.

9. CONSTRUCTION TRUCK TRAFFIC MERGING INTO TRAFFIC LANES SHALL BE BY USE OF FLAGGER AND APPROPRIATE SIGNAGE AS DIRECTED BY THE ENGINEER.

10. TRAFFIC CONES FOR NIGHTTIME USE SHALL HAVE 6/4 RETROREFLECTIVE SLEEVES.

11. WHERE PRACTICAL, CONTRACTOR SHALL REMOVE ALL TRAFFIC CONTROL AND TEMPORARY SIGNING UPON COMPLETION OF DAILY CONSTRUCTION, AND RESTORE SIGNING AND STRIPING, TO CONDITIONS SHOWN AS EXISTING.

12. SEE CALTRANS STANDARD PLANS A20A THRU A20D & A24A THRU A24E FOR STRIPING DETAILS. SEE CALTRANS STANDARD PLANS T1A, T1B, & T2 FOR TEMPORARY CRASH CUSHION ARRAYS.

13. TRAFFIC CONTROL CHANNELIZERS SHALL BE EPOXIED TO THE PAVEMENT. TRAFFIC CONTROL CONES WITH DOUBLE BASES MAY BE USED IN LIEU 13. OF CHANNELIZERS FOR DAILY SHORT TERM (ONE WEEK MAXIMUM) CONSTRUCTION ACTIVITIES.

14. A TRAFFIC CONTROL PERMIT MUST BE OBTAINED BY THE CONTRACTOR AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.

15. CONSTRUCTION ACTIVITY WITHIN THE TRAVEL WAY SHALL BE LIMITED TO THE HOURS BETWEEN 8:30 AM AND 3:30 PM. ALL EXCAVATIONS WITHIN THIS AREA SHALL BE COVERED WITH STEEL PLATES FROM 3:30 PM TO 8:30 AM. SEE SPECIAL PROVISIONS FOR THE MINIMUM NUMBER OF LANES TO BE MAINTAINED OPEN. LEFT TURNS MAY BE PROHIBITED DURING INTERSECTION CONSTRUCTION AS DIRECTED BY THE ENGINEER.

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CITY ENGINEER

05/02/19
DATE

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CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

TRAFFIC CONTROL GENERAL NOTES

STANDARD DRAWING NO. 675

16. THESE TRAFFIC CONTROL PLANS SHOW TRAFFIC CONTROL DEVICES FOR LONG TERM TRAFFIC CONTROL FOR CONSTRUCTION LIMITS SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFORM TO SHORT TERM TRAFFIC CONTROL REQUIREMENTS IN ACCORDANCE WITH CALTRANS "MANUAL OF UNIFORM TRAFFIC CONTROLS". SHORT TERM TRAFFIC CONTROL AND CHANGES TO THESE PLANS DURING CONSTRUCTION SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE CITY OF RIVERSIDE TRAFFIC ENGINEERING DIVISION.

17. USE AND PLACEMENT OF FLASHING ARROW BOARD SIGN(S) SHALL BE AS DIRECTED BY THE ENGINEER. ALL TRAFFIC TRANSITIONS SHALL UTILIZE ARROW BOARDS.

18. FLASHING BEACONS AND/OR WARNING LIGHTS SHALL BE USED WHERE DIRECTED BY THE ENGINEER.

19. CONTRACTOR MAY USE PREFABRICATED REMOVABLE DETOUR STRIPING TAPE, PAVEMENT MARKINGS AND RAISED MARKERS WHERE SHORT TERM USE WILL OCCUR (24 HOURS OR LESS), OR AS SHOWN ON THE PLANS.

20. ALL TRAFFIC SIGNAL MODIFICATION WORK SHALL CONFORM TO CALTRANS STANDARD SPECIFICATIONS AND PLANS, DATED 2015, AND THE SPECIAL PROVISIONS.

21. STEEL PLATES FLUSHED WITH THE SURFACE OR A MINIMUM OF 4:1 SLOPE SHALL BE MAINTAINED FOR OPEN EXCAVATIONS DURING NON-WORKING HOURS. FOR STEEL PLATE INSTALLATION REFER TO LATEST EDITION OF CITY "STANDARD DRAWINGS FOR CONSTRUCTION". "STEEL PLATES AHEAD" SIGNS SHALL BE PROVIDED AT ALL TIMES.

22. ALL CONFLICTING STRIPING, PAVEMENT MARKINGS, AND CURB PAINT SHALL BE REMOVED BY SANDBLASTING, BLACK-OUT METHOD IS NOT PERMITTED. ALL CONFLICTING RAISED PAVEMENT MARKERS SHALL BE REMOVED.

23. CONTRACTOR SHALL MAINTAIN ROADWAY SURFACE IN OPERABLE DRIVING CONDITION AT ALL TIMES. TEMPORARY A.C. PAVEMENT MAY BE REQUIRED IN ORDER TO MAINTAIN TEMPORARY LANES IN ACCEPTABLE CONDITION.

24. TYPE II BARRICADE MOUNTED FLASHING YELLOW LIGHTS SHALL BE PLACED ON TYPE II BARRICADES AT 200' SPACING AS SHOWN ON THE "TYPICAL CHANNELIZER DETAIL" OR AS DIRECTED BY THE ENGINEER.

25. CONTRACTOR SHALL REMOVE OR COVER ALL CONFLICTING SIGNS INCLUDING SIGNS ON THE TRAFFIC SIGNAL MAST ARMS. ONLY ONE STAGE MAY BE DONE AT A TIME. COMPLETE ONE STAGE BEFORE STARTING THE NEXT.

26. CONTRACTOR SHALL COORDINATE WITH THE CITY OF RIVERSIDE TRAFFIC ENGINEERING DEPARTMENT AT (951) 826-6098 A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO WORK AFFECTING ANY TRAFFIC SIGNAL WITHIN CONSTRUCTION AREA. CONTACT CITY OF RIVERSIDE TRAFFIC ENGINEERING DEPARTMENT FOR TRAFFIC SIGNAL OPERATIONAL CHANGES WHEN TRAFFIC LOOPS ARE DAMAGED OR FOR TRAFFIC CONTROL CONDITIONS NOTED ON THE PLANS.

27. CONTRACTOR SHALL REPLACE ALL CONTRACTOR DAMAGED TRAFFIC FACILITIES INCLUDING CONDUIT, CONDUCTORS, PULL BOXES AND LOOP DETECTORS. AT LOCATIONS WHERE THE EXISTING LOOP DETECTORS WILL BE AFFECTED OR DAMAGED BY THE PROPOSED WORK. LOOPS SHALL BE REPLACED WITHIN FIVE (5) WORKING DAYS OR AS DETERMINED BY THE ENGINEER. IN LIEU OF INSTALLING TEMPORARY LOOP DETECTORS, CONTRACTOR MAY PROVIDE AND INSTALL TEMPORARY VIDEO DETECTION SYSTEM FOR THE DURATION OF CONSTRUCTION. VIDEO DETECTION SYSTEM SHALL BE COMPATIBLE WITH THE CITY'S TRAFFIC SIGNAL SYSTEM.

28. WHEN UPON VISUAL INSPECTION, THE REMAINING PORTION OF AN EXISTING THERMOPLASTIC CROSSWALK IS FOUND TO BE IN DISREPAIR, OR IF THE REMAINING PORTION OF CROSSWALK IS INSTALLED IN PAINT, THE REMAINING PORTION OF CROSSWALK SHALL BE REFRESHED OR REPAIRED WITH NEW THERMOPLASTIC. IF THE REMAINING PORTION OF CROSSWALK IS CURRENTLY INSTALLED USING THERMOPLASTIC AND IN GOOD CONDITION, IT CAN BE LEFT IN PLACE AT THE DISCRETION OF THE ENGINEER.

APPROVED BY: _____ 6/23/21
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

TRAFFIC CONTROL GENERAL NOTES

STANDARD DRAWING NO. 675

LEGENDS AND CONSTRUCTION NOTES:

E	EXISTING TO REMAIN.
1	PROVIDE TEMPORARY STRIPING, CONSTRUCTION SIGNS, BARRICADES, CONES, FLASHING ARROW SIGNS, TEMPORARY K–RAIL, OR TEMPORARY CRASH CUSHION MODULES (ARRAY PER PLAN).
2	CONSTRUCTION WITHIN THE TRAVEL LANE SHALL BE COMPLETED ON A DAILY BASIS. ACCESS SHALL BE MAINTAINED AT ALL TIMES UNLESS APPROVED OTHERWISE.
3	ONE TRAFFIC LANE (12' MIN.) SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION, UNLESS OTHERWISE NOTED.
4	MAINTAIN PEDESTRIAN ACCESS UNLESS APPROVED OTHERWISE BY ENGINEER.
5	PROVIDE ACCESS FOR PEDESTRIAN CROSSING.
PM	INSTALL PAVEMENT MARKING OR ARROW AS NOTED.
RP	REMOVE ALL EXISTING CONFLICTING TRAFFIC STRIPING AND MARKINGS AS NOTED, INCLUDING RAISED PAVEMENT MARKERS.
RS	REMOVE AND SALVAGE SIGN(S) AND/OR POST(S) (IF APPLICABLE) AS NOTED.
TO / RL / FROM	RELOCATE EXISTING SIGN(S) TO NEW POST (IF APPLICABLE) AS NOTED.
#	INSTALL CALTRANS STRIPING DETAIL PER NUMBER NOTED, INCLUDING INSTALLATION OF RAISED PAVEMENT MARKERS.
S	EXISTING SIGNALIZED INTERSECTION
	TYPE II BARRICADE WITH FLASHING YELLOW BARRICADE LIGHT AND SIGN AS NOTED ON PLAN
	TYPE III BARRICADE WITH SIGN AS NOTED ON PLAN
	TYPE K RAILING OR WATER FILLED BARRIER, PER PLAN
	CRASH CUSHION ARRAY WITH SIGN AS NOTED ON PLAN
	SIGN AS NOTED ON PLAN
	CHANNELIZER OR CONSTRUCTION CONE
	SOLAR/BATTERY POWERED FLASHING ARROW SIGN
	DIRECTION OF TRAVEL
12'	CONSTRUCTION LANE DIMENSION
	ANGLE POINT
	ROADWAY CONSTRUCTION AREA

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

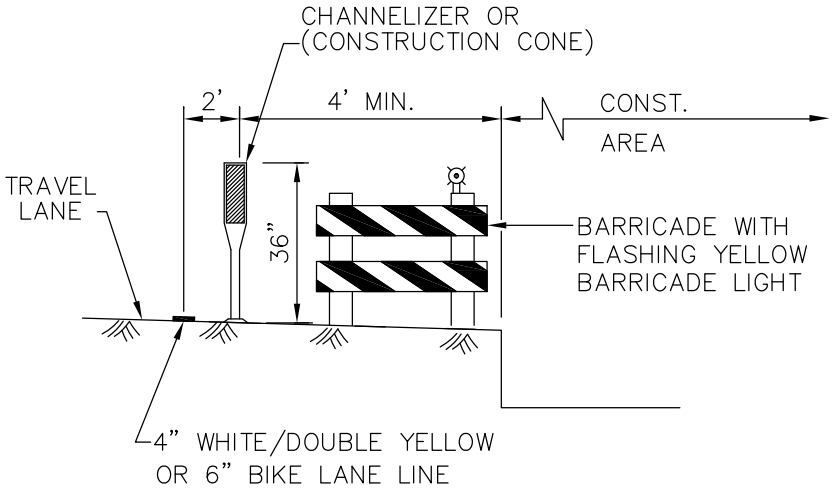
PUBLIC WORKS DEPARTMENT

TRAFFIC CONTROL LEGEND AND CONSTRUCTION NOTES

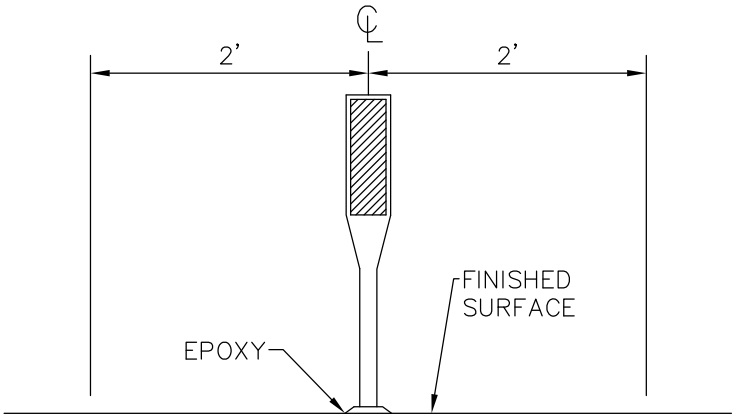
STANDARD DRAWING NO. 675

Sheet 3 of 4

MARK	REVISIONS	APPR.	DATE



TYPICAL
CHANNELIZER DETAIL



CHANNELIZER (SURFACE MOUNTED)
TYPICAL LEFT & RIGHT SHOULDER INSTALLATION
NO SCALE

EPOXIED
CHANNELIZER DETAIL

APPROVED BY:
CITY ENGINEER
05/02/19
DATE

MARK	REVISIONS	APPR.	DATE

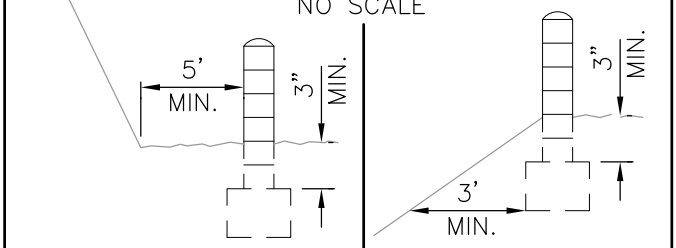
CITY OF RIVERSIDE
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CHANNELIZER DETAILS

STANDARD DRAWING NO. 675

TYPICAL LOCATION DETAIL
SLOPE AND DISTANCE PER UNIFORM BUILDING CODE CH. 70

NO SCALE

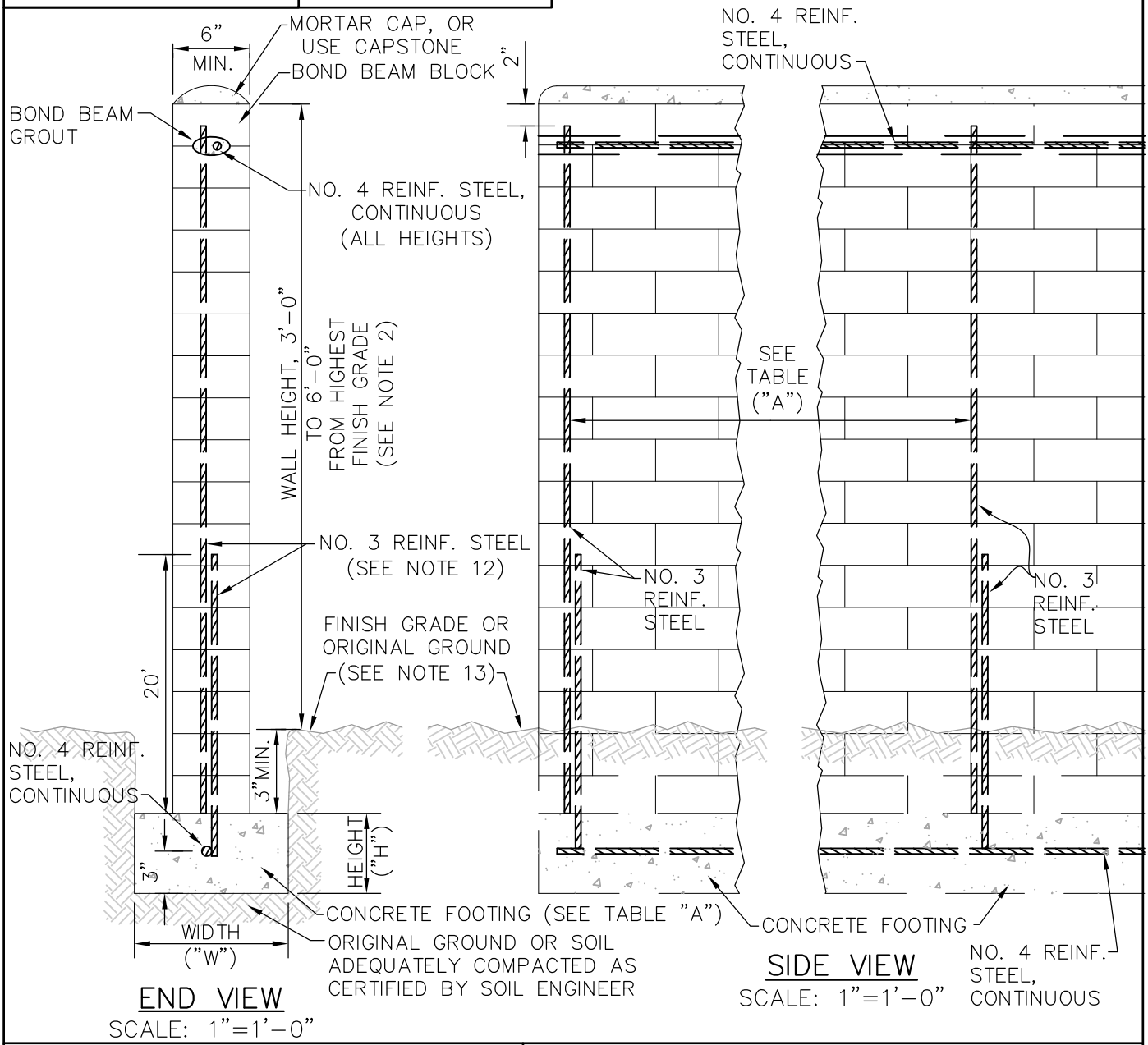


THIS WALL IS NOT TO BE USED AS A RETAINING WALL

TABLE "A"

WALL HEIGHT	VERTICAL BAR SPACING "A"	FOOTING	
		WIDTH "W"	HEIGHT "H"
LESS THAN 3'	NO REINFORCING REQUIRED	12"	6"
3'	48"	12"	6"
4'	48"	12"	9"
5'	32"	14"	12"
6'	24"*	16"	12"

* ALTERNATE BARS CAN BE CUT OFF AT MID-HEIGHT.



END VIEW
SCALE: 1"=1'-0"

SIDE VIEW
SCALE: 1"=1'-0"

APPROVED BY:

CITY ENGINEER

05/02/19
DATE

CITY OF RIVERSIDE

PUBLIC WORKS DEPARTMENT

MARK	REVISIONS	APPR.	DATE

CONCRETE BLOCK WALL (FREESTANDING)

STANDARD DRAWING NO. 704

NOTES:

1. WALL HEIGHT, 3'–0" MAX. FRONT SETBACK AREA; 6'–0" MAX. SIDE AND REAR AREA.
2. GROUT ALL CELLS CONTAINING REINFORCING STEEL.
3. CONSTRUCTION SHALL BE OF THE BEST QUALITY WORKMANSHIP AND ALL WALLS SHALL BE LAID TRUE AND PLUMB.
4. FOOTING CONCRETE SHALL BE A 6–SACK MIX WITH A 28–DAY STRENGTH OF 3,250 PSI. MAX. AGGREGATE SIZE 1½", WITH 5" SLUMP. (GREEN BOOK CONCRETE CLASS 560–C–3250)
5. REINFORCING STEEL SHALL BE DEFORMED CONFORMING TO UNIFORM BUILDING CODE STANDARDS, SECTION 2607, A.S.T.M. SPECIFICATIONS A615–75, OR "GREEN BOOK" SECTION 201–2.2
6. MORTAR JOINTS SHALL BE APPROPRIATE TO THE BLOCK, AT 3/8–INCH OR 1/2–INCH. MORTAR SHALL BE FRESHLY PREPARED AND UNIFORMLY MIXED IN RATIO ONE PART CEMENT, ¼ PART LINE PUTTY, 3½ PARTS SAND, AND SHALL CONFORM TO A.S.T.M. SPECS. 476–71, UNIFORM BUILDING CODE SEC. 2403, TYPE M MORTAR (1976), OR "GREEN BOOK" SPECS. TYPE F MORTAR, SEC. 202–2.1.2.
7. GROUT SHALL BE OF FLUID CONSISTENCY AND MIXED IN A RATIO OF ONE PART CEMENT, 3 PARTS SAND; OR ONE PART CEMENT, 2 PARTS SAND, 2 PARTS PEA GRAVEL. AGGREGATE SHALL CONFORM TO A.S.T.M. SPECS. C 144–70; GROUT SHALL CONFORM TO A.S.T.M. C 404–70 (1975); UNIFORM BUILDING CODE SECTION 2043, OR "GREEN BOOK" SECTION 202.1.2.
8. FOOTING WIDTH DESIGN FOR WALLS 4' TO 6' IN HEIGHT IS BASED UPON 2,000 LBS. SQ. FT. ALLOWABLE SOIL PRESSURE. FOOTING WIDTH MUST BE DESIGNED BY A REGISTERED CIVIL ENGINEER WHERE REQUIRED BY SPECIAL SOIL CONDITIONS.
9. SPLICES IN HORIZONTAL REINFORCING BARS SHALL BE LAPPED AT 40 DIAMETERS AND WIRED TOGETHER.
10. NO. 3 REINFORCING STEEL IS ⅜" DIA., NO. 4 IS ½" DIA.
11. CONCRETE BLOCKS FOR WALLS SHOWN ON PLANS TO BE APPROVED BY THE CITY SHALL BE IN A STYLE AS APPROVED BY THE PLANNING DEPARTMENT AND CONFORM TO GRADE N–1, A.S.T.M. C 90 SPECS. LATEST EDITION; UNIFORM BUILDING CODE SECTION 2403; OR "GREEN BOOK" SPECS., SECTION 202–2.1.1.
12. TWO (2) BARS WITH SPLICE IS OPTIONAL; CAN USE ONE (1) CONTINUOUS BAR FOR REINFORCEMENT. BARS SHALL BE CENTERED IN CELLS.
13. THE NEAR BOTTOM EDGE OF THE FOOTING SHALL BE 3' FROM THE FACE OF A FILL SLOPE. SEE TYPICAL LOCATION DETAIL ON SHEET 1.
14. GREEN BOOK REFERENCES REFER TO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", LATEST EDITION.

APPROVED BY: _____ 05/02/19
CITY ENGINEER DATE

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

CONCRETE BLOCK WALL
(FREESTANDING)

STANDARD DRAWING NO. 704