



JANUARY 2017
AMENDMENTS
TO
CITY OF ROSEVILLE
DESIGN AND CONSTRUCTION STANDARDS
JANUARY 2016
EFFECTIVE JANUARY, 2017

The following highlighted amendments represent minor revision to the “January 2016 Design & Construction Standards”. These amendments supersede the prior document and will be formally edited and incorporated into the “2016 Design & Construction Standards”. Therefore, it is recommended all standards plan holders insert this packet into the front of the “January 2016 Design & Construction Standards” and refer to them as necessary.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Marc Stout".

Marc Stout
City Engineer

January 1, 2017

Date

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SECTION 1

PURPOSE AND DEFINITIONS

- 1-1 PURPOSE** - The purpose of City Design Standards is to provide direction in the application of improvements which are to be dedicated to the public and accepted by the City for maintenance or operation, and to provide for coordinated development of those facilities to be used by and for the protection of the public. This includes certain private works, as well as improvements to be installed within existing City rights-of-way and easements. Whereas it is the intent of these Standards to govern all new construction, City staff shall interpret and apply the Standards in a manner which achieves their intent, while encouraging and enabling the redevelopment of infill and vacant parcels especially within the City's Redevelopment Project Area.

These Standards shall apply to, regulate, and guide preparation of traffic impact studies and the design and preparation of plans for construction of streets, highways, alleys, drainage, sewerage, traffic signals, site access, water supply facilities and related public improvements, and shall set guidelines for all private works which involve drainage, grading, trees, and related improvements. The Design Standards have been adopted by the Roseville City Council, and shall be administered by the Development Services, Public Works and Environmental Utility Departments of the City of Roseville.

- 1-2 DESIGN PRACTICE** - Because it is virtually impossible to anticipate all situations that may arise or to prescribe standards applicable to every situation, any items or situations not included in these Design Standards shall be designed in accordance with accepted engineering practice, the City of Roseville Construction Standards, the State of California "Highway Design Manual", [the State Standard Plans, the State Standard Specifications](#), and the "California Manual on Uniform Traffic Control Devices", and as specified by the City Engineer.

The City Engineer may require additional standards and/or regulations not inconsistent herewith when deemed necessary to protect the health, safety, and welfare of the public. Questions regarding the Design Standards should be directed to the appropriate engineering staff of the Development Services, Public Works or Environmental Utilities Departments. The City Engineer, Public Works Director or Environmental Utilities Director shall make all interpretations of the Standards. Appeals to the direction of the City Engineer shall be made to the Development Services Director and the City Council.

1-3 DEFINITIONS - Whenever the following terms or titles are used in these standards or in any document or instrument where these standards govern, the intent and meaning shall be as herein defined:

- A. Applicant** - Shall mean the same as the Developer or his Consulting Engineer working on his behalf.
- B. Building Division** - Shall mean the Building Division of the City of Roseville.
- C. City** - Shall mean the City of Roseville and its applicable Departments
- D. City Engineer** - Shall mean the City Engineer, Public Works Director, or Environmental Utilities Director of the City of Roseville, or their designees.~~acting either directly or through the staff of the appropriate Divisions of the Public Works Department, Environmental Utilities Department and the Development Services Department or their authorized representatives.~~
- E. Community Design Guidelines** - Shall mean the latest edition of the “Community Design Guidelines” adopted by the Roseville City Council, as may be supplemented by Design Guidelines for a given Specific Plan Area.
- F. Construction Standards** - Shall mean the latest edition of the “Design & Construction Standards” adopted by the Roseville City Council and any amendments thereto governing the construction of roads, streets, sanitary sewers, storm drainage, concrete structures, water supply, traffic signals, street lighting and other facilities within the City of Roseville.
- G. Consulting Engineer** - Shall mean any person or persons, firm, partnerships or corporation legally authorized to practice civil, mechanical, or electrical engineering in the State of California who prepares or submits improvement plans and specifications to the Development Services Department of the City of Roseville for approval.
- H. Contractor** - Shall mean any person or persons, firm partnership, corporation, or combination thereof, licensed to perform the type of work involved, who has entered into a contract with any person, corporation or company, or his or their legal representatives, for the construction of any improvement or portions of any improvement within the City of Roseville.

Section 2

General Requirements

2-1 PLANS BY AN APPROPRIATE ENGINEER - All plans and specifications for improvements, private and public, which are to be accepted for maintenance by the City, and plans and specifications for private on-site drainage, [sewer, water](#), and grading, shall be prepared by an engineer licensed in the State of California, of the appropriate branch of engineering covering the work submitted.

2-2 ACCEPTED PLANS - Complete plans and specifications for all proposed streets, street names, bikeways, grading, drainage facilities, sewerage, traffic signals, water distribution systems, industrial developments, commercial developments, and subdivisions, including any necessary dedications, easements, and rights of entry, shall be submitted to the Development Services Engineering Division for approval. This approval shall be substantiated by the signature of the required City representatives and issuance of a permit and to the beginning of construction of any such improvements. The City Engineer shall order any contractor to cease work on any project if said contractor does not have properly approved plans in possession.

The public roadway infrastructure improvements shall be designed and constructed in accordance with these Design and Construction Standards and the latest edition of the City's American Disabilities Act (ADA) Transitions Plan. Should there be any discrepancy between these Standards and the ADA Transition Plan with respect to accessibility, the ADA Transition Plan shall have precedence.

2-3 REFERENCE TO CITY SPECIFICATIONS AND STANDARDS – The following note shall be included on all Improvement Plans:

“All construction and materials shall be in accordance with the latest edition and amendments of the City of Roseville Design & Construction Standards.”

2-4 WORK IN CITY RIGHT OF WAY AND EASEMENTS - The following shall govern work done within City right of way and easements:

A. No work shall be performed within the City rights of way and easements without approved plans and/or an encroachment permit issued by the Development Services Engineering Division. All necessary bonds and insurances shall be approved prior to the approval of the plans or the issuance of an encroachment permit.

B. In lieu of obtaining an encroachment permit, work may also be performed under the conditions of subdivision agreement.

2-5 SUBMISSION OF IMPROVEMENT PLANS - The following are the

procedures and requirements when submitting Improvement Plans to the City of Roseville for review. Incomplete submittals will not be accepted.

Improvement Plans will be accepted only after the following conditions are met:

- A. Development Projects** - The projects, which have been approved by the appropriate City Commission and are not proceeding under appeal or normal process to the City Council, may be submitted after the meeting of Commission which approved the project and after the Conditions of Approval are available from the Planning Division.
- B. Subdivision** - Rough Grading Plans or Improvement Plans, and Parcel Maps or Subdivision Maps may be submitted after approval of the Tentative Map by the approving body and after the Conditions of Approval are available.

The Engineering Division shall act as the lead agency in the submittal process for Improvement Plans. Upon approval of a Tentative Map, initial submittal packages shall be submitted directly to the Engineering Division:

The submittal package shall be submitted as a whole directly to the Engineering Division, per the requirements of the [Development Civil Improvement Plan Review/Permit](#) Application Form.

New street names, if any, shall be approved by Development Services Business Services Division. Approved street names shall be shown on the plans and a copy of the Approved Street Name Exhibit will be included no later than the second submittal of improvement plans. Failure to submit the approved Street Name Exhibit by the second submittal may delay final plan approval. The street naming process and Street Name Application may be found at: <https://www.roseville.ca.us/addressing>

Once the submittal has been deemed complete by Engineering, the packets will be distributed by the Engineering Division to the appropriate departments. Each department will then review the Improvement Plans and forward comments to the Engineering Division. The time required for each department's review of the plans is dependent on the department's work load at the time of the submittal.

The Developer or his Engineer shall respond directly to the Engineering Division to address each department's comments. The City Engineer will not ~~approve~~ [accept](#) the plans [as complete](#) until all other departments have ~~approved~~ [accepted](#) the plans [as complete](#), and not until this occurs will construction be permitted to begin.

2-6 SUBMISSION OF DEVELOPMENT PLANS - The following are the Engineering Division's requirements for the submittal of Development Plans for residential subdivision, commercial, industrial, and multi-family projects. These plans shall be submitted to the Building Division at the time the applications made for a building permit.

- A. Five (5) sets of Improvement Plans prepared per the Design & Construction Standards (Including Landscape Plans for non-residential projects).
- B. One (1) electronic copy of the plan set of the proposed Improvement Plan in .pdf format on a disc or thumb drive. Each subsequent submittal shall include an updated .pdf file for review.
- C. One (1) copy of the Soils Report for the project (see Section 2-10) and one (1) electronic copy in .pdf format on a disc or thumb drive. Each subsequent submittal shall include an updated .pdf file for review.
- D. An itemized Engineer's cost estimate for all improvements to be constructed within public rights of way or easements, or any other improvements for which the Development Services Departments or Environmental Utilities Department provides plan check and inspection services (i.e. grading & Stormwater quality). All cost estimates shall include a ten (10) percent contingency. The cost estimate shall also include all public landscaping improvements.
- E. Payment of fifty (50) percent of plan check and inspection fee deposit, plus the Technology Fee. Fees are based on the engineer's cost estimate in accordance with the Development Services Department Engineering Division's established fee schedule. The fee schedule may be found at: <http://www.roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=2947>
- F. Two (2) copies of the drainage report indicating method of calculation; two (2) copies of the Stormwater Quality Design and Maintenance Plan; two (2) copies of the site water shed map; and, two (2) copies of the 10 and 100 year storm drain calculations based on Placer County's Storm Drain Manual and the City of Roseville Design and Construction Standards.
- G. Two (2) copies of the Clerk's Notice of approval for the Use Permit and list of the Conditions of Approval.
- H. Two (2) copies of the approved Tentative Map.
- I. For projects with a total disturbed area of less than one (1) acre; submit two (2) copies of an erosion and sedimentation control plan in accordance with Section 11 of these Design & Construction Standards. In lieu of providing a separate plan, this information may be shown on the

Improvement Plan.

- J.** For projects with a total disturbed area equal to or greater than one (1) acre; submit the WDID associated with the project's Storm Water Pollution Prevention Plan (SWPPP). Ensure the WDID status is active and accessible within the State Water Resources Control Board's SMARTS system.
- K.** One (1) AutoCAD file of the project improvements submitted per the ["Digital Submission of Utility Composites"](#)

The initial submittal of the AutoCAD file will occur during the 2nd plan check submittal. The file will be reviewed for content and format. Each subsequent submittal shall include an updated AutoCAD file for review.

The final submittal of the AutoCAD file will occur after the final plan check, prior to Environmental Utilities signing of approved plans.

Failure to submit the AutoCAD file per the submission document may delay final plan approval.

For tenant improvement projects, plans shall be routed through the Building Division. Any improvements within the public right of way or easements, or any construction that would require temporary placement of equipment or material within the public right of way or easements shall require the Developer or his Contractor to obtain an encroachment permit from the Development Services Department.

2-7 **SUBMISSION OF ROUGH GRADING PLANS** – ~~The following are the Engineering Division's requirements for the submittal of Rough Grading Plans: Rough grade plans shall be submitted similar to the submission of Development Plans, see Section 2-6 for submittal requirements.~~

- ~~**A.** Five (5) sets of the proposed Rough Grading Plan conforming to the requirements of these Improvement Standards.~~
- ~~**B.** One (1) electronic copy of the plan set of the proposed Rough Grading Plan in .pdf format on a disc or thumb drive.~~
- ~~**C.** One (1) copy of the Soils Report for the project (see Section 2-10), or and one (1) electronic copy in .pdf format on a disc or thumb drive.~~
- ~~**D.** Two (2) sets of approved Conditions of Approval for the project.~~
- ~~**E.** Two (2) copies of the approved Tentative Map.~~
- ~~**F.** For projects with a total disturbed area of less than one (1) acre; submit two (2) copies of an erosion and sedimentation control plan in accordance with Section 11 of these Design & Construction Standards. In~~

~~lieu of providing a separate plan, this information may be shown on the Rough Grading Plan.~~

~~G. For projects with a total disturbed area equal to or greater than one (1) acre; submit the WDID associated with the project's Storm Water Pollution Prevention Plan (SWPPP). Ensure the WDID status is active and accessible within the State Water Resources Control Board's SMARTS system.~~

~~H. Payment of fifty (50) percent of plan check and inspection fee deposit, plus the Technology Fee. Fees are based on the engineer's cost estimate in accordance with the Development Services Department Engineering Division's established fee schedule. The fee schedule may be found at: <http://www.roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=2947>~~

2-8 SUBMISSION OF ELECTRICAL DESIGN, LANDSCAPING AND IRRIGATION PLANS –

A. Five (5) sets of the electrical design plans and one (1) electronic set in *.pdf format on a disc or thumb drive shall be submitted with the first submittal of the improvement plans for non-residential projects and shall be submitted prior to underground only approval for residential projects. The Engineering Division will distribute the plans to all reviewing departments. Each department will then forward comments directly to the Development Services Engineering Division.

The approved electrical design plans shall be considered as part of the approved improvement plans and it is the responsibility of the Consulting Engineer to insure that the design of the improvements shown on both plans are consistent and compatible.

B. Five (5) sets of landscaping and irrigation plans and one (1) electronic set in *.pdf format on a disc or thumb drive shall be submitted with the first submittal of the improvement plans for non-residential projects and shall be submitted prior to underground only approval for residential projects. The Engineering Division will distribute the plans to all reviewing departments. Each department will then forward comments directly to the Development Services Engineering Division.

The approved landscaping and irrigation plans shall be considered as part of the approved improvement plans and it is the responsibility of the Consulting Engineer to insure that the design of the improvements shown on both plans are consistent and compatible.

2-9 SUBMISSION OF FINAL AND PARCEL MAPS - Final and Parcel maps may be submitted for review upon the approval of the tentative map by the City and only after the Conditions of Approval are available. Maps conditioned to construct improvements requiring civil design cannot be

an 8-1/2 x 11 bound folder. The analysis shall, as a minimum, include a map of the subject area showing proposed and existing streets, contours and location of type of soils obtained. The results of all field data and laboratory tests shall be included. Design for street sections shall be a part of the report. Street structural section design shall include recommendations for natural sub grade, geotextile fabric, sub base, base and pavement compaction and thickness to achieve design strength. For commercial, industrial and multi-family projects, the report shall contain recommendations for on-site pavement sections. Traffic Index values (TI) shall be in accordance with Section 7-4 and Table 7-2 of these Design & Construction Standards.

2-11 RESUBMITTAL REQUIREMENTS - All resubmittals shall be sent directly to the Development Services Engineering Division. All resubmittals shall include the following:

- A. Previous check prints indicating any requested modifications;
- B. Responses to comment sheets; All comments shall be either addressed on the plans along with acknowledgement of the correction, or if a comment is not specifically addressed on the plans, a written explanation shall be provided stating why the comment was not addressed.
- C. Any additional materials or documentation as requested in the current plan review comment letter.
- D. Any materials which were previously returned to the Consulting Engineer as a result of the plan check.
- E. An electronic copy of the latest plan submittal in .pdf format. Each subsequent submittal shall include an updated pdf file for review. The number of plans required shall be ~~four~~ five (4_5) unless otherwise specified in the previous plan check.
- F. One (1) AutoCAD file of the project improvements submitted per the [“Digital Submission of Utility Composites”](#). The file will be reviewed for content and format. Each subsequent submittal shall include an updated AutoCAD file for review.

Plans being resubmitted that contain alterations or revisions other than those required by the City shall require the Consulting Engineer to bring those revisions or alterations to the attention of the City. [Failure to do so may cause delays in the review of the plans.](#)

2-12 PLAN CHECK AND INSPECTION FEES - When Improvement Plans are initially submitted to the Department of Development Services, Engineering Division for review, an initial plan review and inspection fee deposit is required to initiate City plan review (see Section 2-6.E). Prior to approval of the plans, payment of the remaining balance of the fees shall be made.

For subdivisions and certain site development projects where conditioned, the Developer shall be responsible for payment of actual costs incurred by the City in providing plan check and inspection services, as determined by the City Engineer. Actual costs will be determined prior to acceptance of the improvements by the City Engineer and additional payment by the Developer shall be made if actual costs exceed the deposit, or a refund will be provided by the City if actual costs are less than the deposit. The Developer shall notify the Development Services Engineering Division in writing of any change of billing address.

- 2-13 PLAN ~~APPROVAL ACCEPTANCE~~- Approval Acceptance for construction** will be given to a plan set after the Consulting Engineer preparing the plans has made the necessary changes, corrections, or additions required by the City, all required Departments have signed the plans, the Owner/Developer has paid the remainder of the total plan check and inspection fee, and posted all required bonds and insurances, and the permit has been issued.

The Consulting Engineer shall deliver to the Development Services Engineering Division a minimum of ~~nine seven (9.7)~~ sets of 24x36 and one (1) set of 11x17 prints from the approved accepted plans for construction stamp and permit issuance prior to scheduling a pre-construction meeting. Additional sets may be required depending on the limits or types of improvements being constructed with the plans. Concurrent with plan approval acceptance, a .pdf file and utility composite in .dwg format of the approved design shall also be submitted. For complete approval process see “Residential Design Process” and “Commercial Design Process” charts at the end of Section 2.

No plans will be consider approved nor will construction be authorized until the plan set has received the City construction stamp and is accompanied by an appropriate permit.

- 2-14 EXPIRATION OF PLANS** - Every permit issued under therequirements of these Standards shall, at the discretion of the City Engineer, become null and void if the construction of work authorized by such permit is not commenced within six (6) months from the date of such permit, or if the construction of work authorized by such permit is suspended or abandoned for a period of six (6) months at any time after the work is commenced. At such time, the plans shall be subject to review by City staff to determine conformance with current City Standards.

Plan reviews that remain inactive for six (6) months may be deemed expired by the Engineering Division. A notice letter will be sent to the applicant and owner/developer after six (6) months of inactivity, requesting a status of the project. The project may, at the discretion of the City Engineer, be granted a six (6) month extension or deemed expired. A maximum of one (1) extension may be granted. Any project that was inactive for a twelve (12) month period shall be deemed expired and will need to be resubmitted per Section 2-6.

- 2-15 IMPROVEMENT PLAN REVISIONS DURING CONSTRUCTION -**
Should changes to the Improvement Plans become necessary during construction; such changes shall be subject to approval by Development Services Department Engineering Division, the Environmental Utilities Department, or other affected departments.

The procedure for obtaining approval shall be as follows:

- A.** The consulting Engineer shall submit bond sheets showing the proposed change(s) with clouded notation or denoted by delta revision symbol(s). The Engineering Division shall route the proposed revision to all applicable City Departments for review.
- B.** Following review and approval of the proposed change by the appropriate departments, the Consulting Engineer shall submit the current approved plan in reproducible form showing the proposed change.
- C.** If determined acceptable, the Development Services Engineering Division will indicate approval for the change by initialing the plans in the revision box.
- D.** Following return of the reproducible plan to the Consulting Engineer, the Consulting Engineer shall provide ~~nine-seven (9-7)~~ 24x36 and one (1) set of 11x17, bond sets of revised sheets. Additional sets may be required depending on the limits or types of improvements being constructed with the plans.

After receiving approval, actual revisions shall be made in accordance with the following:

- A.** The original design shall not be eradicated from the plans but shall be lined out.
- B.** In the event that eradicating the original design is necessary to maintain clarity of the plans, approval must first be obtained from the Development Services Department.
- C.** The changes shall be clearly shown on the plans with the changes and approval noted on a revision signature block.
- D.** The changes shall be identified by the revision number in a triangle delineated on the plans adjacent to the change and on the revision signature block.

Minor changes during construction which do not affect the basic design of the improvements may be made upon authorization of the Development Services Engineering Division without formally revising the plans. These changes shall appear in the record drawings.

The City Engineer may order changes in the plans in order to complete the

1

Approved Entitlement

Discretionary approval must first be obtained prior to the submittal of improvement plans for plan check.

Discretionary approvals include subdivision and parcel maps.

2

Permit Center

The Permit Center receives all initial submittals of improvement plans. The application (www.roseville.ca.us/developmentapp) for plan review of improvement plans states the materials required at submittal. The materials and information required is noted below:

Improvement Plans

- 5 sets of plans
- 2 copies of the engineer's cost estimate
- Plan Check & Inspection Fee Deposit = 2.5% of engineer's cost estimate
- 2 copies of the storm drain calculations
- 2 copies of the drainage shed map
- 2 copies of the soils report
- 3 copies each of the Clerk's or Planning Dept. Notice of Approval w/conditions of Approval (not staff report)
- 3 copies of the Approved Tentative Map
- 2 copies of Stormwater Quality Maintenance Plan and completed SWQ Management Permit (if applicable)

Landscape plans for residential subdivision are not required at the initial submittal

3

Plan Distribution

Upon receipt of the improvement plans by the Permit Center the improvement plans are distributed to City departments for review comment and ultimately approval. City departments receiving plans for review include: Engineering, Planning, Roseville Electric, Environmental Utilities, Parks and Recreation and Fire. The project applicant will receive a consolidated comment letter from Engineering. All subsequent responses should be made directly to Engineering.

4

Rough Grade

Once each department's requirements have been met relative to the grading sheets they will approve the plans for rough grading. Once all departments have approved the rough grading a "Rough Grade Only Permit" can be issued. Approved rough grade plans shall be identified as being for grading purposes only on the face of the Improvement Plans and grading sheets shall be copied on green paper. An applicant is not required to pull a rough grading only permit.

5

Underground water, sewer, storm

Underground improvements include potable water, recycled water, fire service water, sewer and storm drain improvements. Once each department's requirements have been met relative to the underground improvements they will approve the plans for underground work. Once all departments have approved the underground improvements an "Underground Improvement Permit" can be issued. Prior to release of the Underground Improvement Permit the applicant shall submit an electronic copy of the improvement plans and shall have submitted landscape plans. Approved underground improvement plans shall be identified as being for underground improvement purposes only on the face of the Improvement Plans and underground sheets shall be copied on pink paper. An applicant is not required to pull an underground only permit.

6

Electric Design to begin

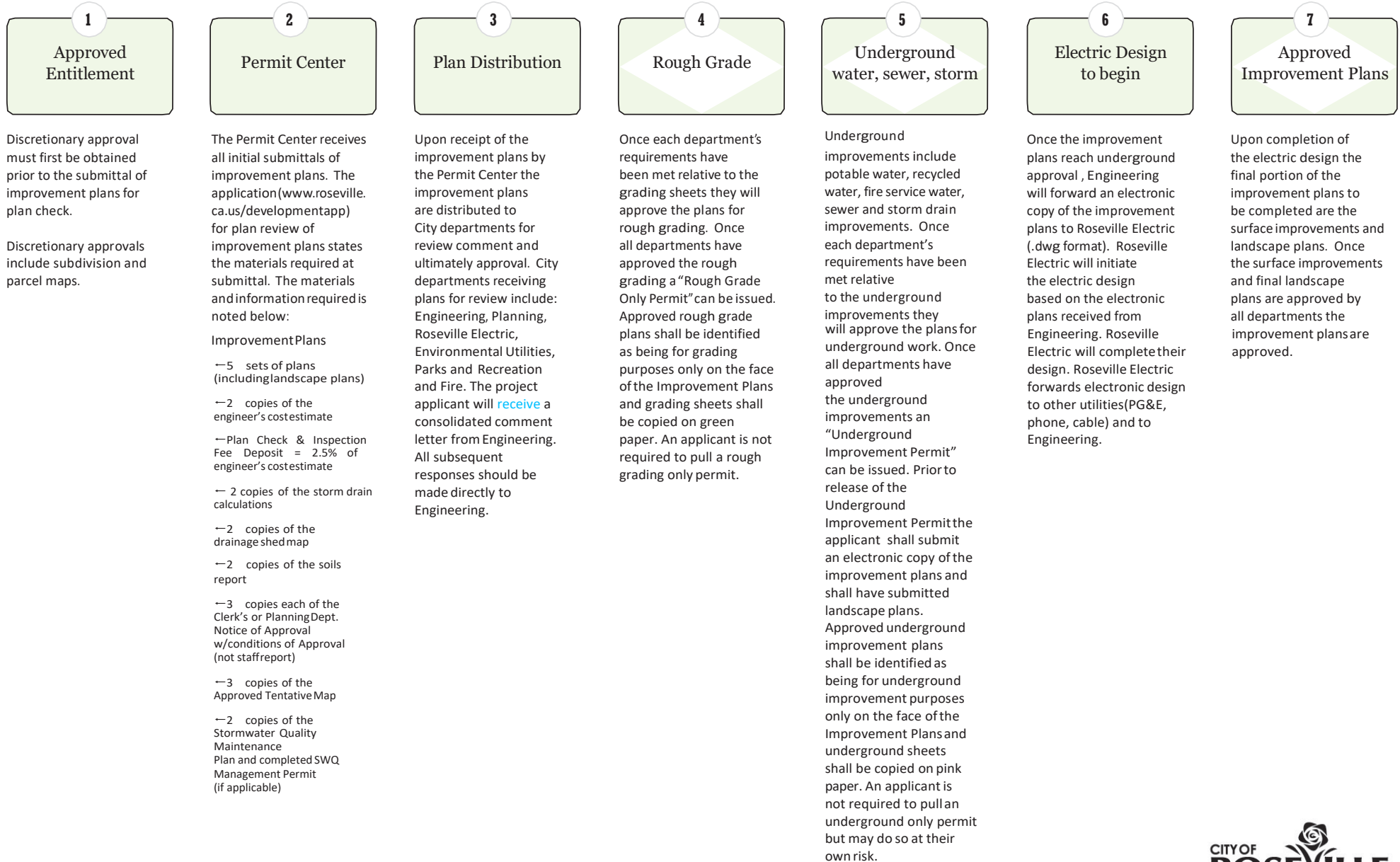
Once the improvement plans reach underground approval Engineering will forward an electronic copy of the improvement plans to Roseville Electric (.dwg format). Roseville Electric will initiate the electric design based on the electronic plans received from Engineering. Roseville Electric will complete their design. Roseville Electric forwards design to other utilities (PG&E, phone, cable) and to Engineering.

7

Approved Improvement Plans

Upon completion of the electric design the final portion of the improvement plans to be completed are the surface improvements and landscape plans. Once the surface improvements and final landscape plans are approved by all departments the improvement plans are approved.

Commercial Design Process 2017



SECTION 6

TRAFFIC SIGNALS, SIGNS, AND STRIPING

6-1 TRAFFIC SIGNAL NEEDS ASSESSMENT – The need for new traffic signals shall be based on warrants contained in the latest edition of the California Manual on Uniform Traffic Control Devices (CAMUTCD). For a more detailed description of a traffic signal needs assessment, refer to Section 4-2H of these Design Standards.

6-2 DESIGN STANDARDS - Traffic signals, striping, and signage shall be designed and constructed in accordance with these Design Standards and the latest editions (English units) of the following listed in order of precedence:

- * City of Roseville Standard Notes as published on the City's Web site at: http://www.roseville.ca.us/gov/development_services/engineering_land_development/plan_review/standard_notes.asp.
- * City of Roseville Design & Construction Standards.
- * Caltrans Standard Specifications and Caltrans State Standard Plans, including all standard symbols contained therein.
- * California Manual on Uniform Traffic Control Devices (CAMUTCD).
- * Attention is directed to the following from the CAMUTCD:
 1. Table 4D-101. Suggested Detector Setbacks from Limitline.
 2. Tables 4D-108 and 4D-109 for conduit sizing. The 26% fill limit shall apply to new installations.
- * A copy of the Traffic Signal Inspection Check list is included on Detail TS-22 as a reference of required inspections during construction.

4. For the stem of a “tee” intersection, each left turn lane shall have four loops with the first and second loops spaced 8 feet apart, the second and third loops spaced 9 feet apart, and the third and fourth loops spaced 10 feet apart. The fourth loop shall have counting ability. The other three loops can share one input. No intermediate or advanced loops will be required on “tee” stems.
5. For split phase signals with a shared through/left turn lane, the shared lane shall have four loops with the first and second loops spaced 8 feet apart, the second and third loops spaced 9 feet apart, and the third and fourth loops spaced 10 feet apart. The fourth loop shall have counting ability. There shall also be one advanced loop placed per the CMUTCD.

Front vehicle loops shall be Type D or a “Quadra Circle”. Vehicle count and extension loops shall be Type A. The loops nearest the stop bar shall be placed 1 foot from the stop bar. Where a loop is designated to have counting ability as discussed above, the loop shall not share an input with any other loop. Loop wire shall terminate in the nearest pull box and not the hand hole.

Bicycle detection loops shall be Type D or a “Quadra Circle” except that their size shall be modified as follows:

- The loop size shall be decreased such that it is 1 foot narrower than the bike lane. A 6 foot bike lane shall have a 5 x 5 foot loop, a 5 foot bike lane shall have a 4 x 4 foot loop, etc.
- The [front of the loop shall be centered in the lane 6” back of the stop bar.](#)
- The center of the loop shall be 3 feet back of the crosswalk/stop bar.
- Each bicycle loop shall have its own detector lead-in cable and shall be spliced in the pull box not the handhole.
- Each loop shall consist of five turns of 14 AWG with XLLP insulation.

Detector lead-in cables shall be Type B and shall not be spliced between the termination point (pull box adjacent to detector loop) and the controller cabinet terminals. Tinned copper shall be permitted. [There shall be a spare DLC in each advance loop pull box with 20’ of spare cable.](#)

Type GO5 detector hand holes shall be placed so they line up with roadway stripes to minimize the frequency of vehicle tires driving over the handhole covers. A sufficient number of handholes shall be placed so that detector loop saw cuts shall not cross adjacent lanes of travel.

Signal loops installed in new pavement shall be placed in the lift of asphalt concrete (AC) immediately below the final lift. The new bottom

lift of AC shall be a minimum of 0.2'2" thick where the traffic signal loops will be installed. New loops that will be buried under AC shall be installed in a 1³/₄" slot in the bottom lift. Loops installed in existing pavement shall be surface cut per the State of California Standard Plans unless other wise directed by the Engineer.

Existing buried loops damaged by construction shall be reinstalled as if in new pavement per the above paragraph. The contractor shall grind 1¹/₂ inches of pavement from lane line to lane line and at least 1 foot outside the limits of work required to install the entire loop wire. The loops shall then be covered by an asphalt concrete overlay per City Standards. Should the AC thickness be insufficient to install the loops as specified above, the contractor shall complete any additional grinding, excavating, or paving necessary to install the loops.

Loop Home Run slots shall be double cut to accommodate the twisted pair (3-turns/foot), or as directed by the Engineer. Sealant for filling slots shall be Hot Melt Rubberized Asphaltic Sealant or equivalent as approved by the Engineer. All excess sealant shall be squeegeed off after application.

Where the approved plans call for preformed detector loops, the following shall apply:

1. The conduit shall be sealed to prevent the entrance of water and the movement of wires within the conduit.
2. The loop wires from the performed loop to the adjacent pull box or hand hole shall be twisted together into a pair (at least two turns per foot) and encased in Schedule 40 or Schedule 80 PVC or polypropylene conduit (³/₈ inches minimum diameter). The lead-in conduit shall be sealed to prevent the entrance of water at the pull box or hand hole end.
3. The performed loop and lead-in conduits shall be placed prior to pouring final concrete. The top of the conduit shall be between 2 and 3 inches below top of finished surface. Where the concrete is steel reinforced, the preformed loops may rest on the steel.
4. All detector loop shields shall not be grounded to the ground bus in the controller cabinet. 6" of the shield wire will be wound around the DLC'S then insulated with heat shrink tubing.

Adjacent loops on the same sensor unit channel shall be wound in opposite directions (refer to details TS-9 and TS-10 for further information). All loops shall be wound in a manner such that any adjacent loop will be wound in the opposite direction. The loop at the limit line, closest to the center median (lane 1), shall be wound in a clockwise direction. The next loop back in the same lane shall be

- a. Conductors shall be pulled into conduits by hand
- b. Only Polymer Based pulling compounds such as Aqua-Gel by Ideal or equivalent shall be used
- c. Lubricants shall be forcefully injected into the conduit system
- d. Only fiberglass fish tape or polyester measure tape may be used
- e. When pulling in multi conductor cable there shall be three spare conductors to each pole. When pulling individual conductors there shall be three spares at each pull box tied to a signal crossing.

It is assumed that all existing conductors and cables are undamaged unless inspected, documented, and reported to the inspector prior to the contractor starting that section of the work. Otherwise, any damage to City facilities shall be repaired by the contractor at the contractor's cost in conformance with City standards.

Conductor installation in new conduits shall be limited to 26 percent fill of the conduit maximum.

~~Three-Two (32)~~ category 5E cables (Mohawk) Lan-Trak OSP, part number M58790), or City approved equivalent, and one (1) power cable (IMSA 14-3/20-1 STR 600V, ~~Beldem-Belden~~ part number 601195) or City approved equivalent to top of designated pole with 10 feet of slack for each cable at the top of the pole and 30' of slack in the pull box at the base of the pole.

In order to reduce strain on the CAT5 cabling, all cables shall be adequately supported by feeding them through a Kellems grip which is attached to and suspended from the pole cap.

The hole drilled for the CAT5 cabling shall be drilled on the back side of the pole three feet from the top in order to minimize the camera view obstructed by the cable and shall be threaded for a straight 3/4" strain relief cord connector. At least four feet of cable shall be pulled through and secured by the strain relief cord connector. The cables shall be looped together, adequately secured to the pole to prevent movement, and sealed on the ends to prevent moisture exposure.

All new and replacement traffic signal phase wiring shall be multiple circuit conductors. Unique color coding shall be provided for each wire within the cable. The number of wires per cable shall be the next common size up from that required to provide the necessary wires as specified on the plans.

Existing copper SIC damaged during construction shall be replaced at the contractor's cost from controller cabinet to controller cabinet on either end of the damage. Splicing of copper SIC is not allowed. Damaged copper SIC shall be replaced with **fiber optic** SIC, including cable, conduit, splices, terminations, patch panels, and pull boxes conforming to current City standards. The contractor shall also be responsible, at the contractor's cost, to make any additional repairs needed to install the new cable from controller to controller.

Existing fiber optic SIC damaged during construction shall be repaired.

Damage

1. Fiber Optic Cable and related facilities damaged during construction shall be replaced/repared to current City standards and as specified below at the contractor's cost. This work shall include fiber optic cable, conduit, pull boxes/vaults, trenches, concrete, asphalt, traffic control, pull tape, splices, splice enclosures, terminations, labor, etc, as required.
2. Damage is described as a breach in the fiber optic cable jacket, a kink, a break of the cable, or any other condition that causes a reduction in the capacity of the cable.
3. Should fiber optic cable facilities be damaged during construction without visible damage to the cable, the cable shall be tested by a certified fiber optic technician provided by the contractor at the contractor's cost to ensure that there is no internal damage. Should the test show internal damage, the cable shall be replaced as specified below. Otherwise, the cable shall be protected and the facilities repaired to current City standards.

Repair

1. Fiber optic cable running between and terminating at adjacent traffic signals or devices shall be replaced from termination to termination:
 - i. All new cable and terminations shall be acceptance tested as required elsewhere in the City standards.
 - ii. If the new cable must be pulled through conduits that contain traffic signal phase wiring, then a "MAX CELL" or equivalent sleeve, per City standards, shall be installed in the conduit prior to the installation of the new fiber optic cable.
 - a. Pull box adjacent to the damage to controller cabinet.
 - iii. No more than 5 feet of slack may be used out of any one pull box.
 - iv. Pull boxes where new splices shall occur will be replaced with ~~C48 or PL48~~ Fiberlyte FL36 24" deep vaults as specified in the City standards

- v. At least 50 feet of slack must be provided in the new splice vault.
 - vi. The slack shall be provided in even amounts on either side of the splice enclosure.
 - vii. Only fusion splicing meeting City standards by a certified fiber optic technician will be allowed.
 - viii. All new cable, splices, and terminations shall be acceptance tested as required elsewhere in the City standards.
 - ix. The average optical loss of each splice shall not exceed 0.10 dB. The average is determined by measuring the splice loss in both directions with an OTDR, adding the two readings, and dividing by two. Testing should be performed for both the 1310 and 1550 nm wavelengths.
 - x. Splicing will not be allowed in pull boxes or vaults shared with non signal interconnect cables.
 - xi. If the new cable must be pulled through conduits that contain traffic signal phase wiring, then a "MAX CELL" or equivalent sleeve, per City standards, shall be installed in the conduit prior to the installation of the new fiber optic cable.
- 2.** Fiber optic cable running continuously past multiple traffic signals or devices may be repaired by splicing at adjacent pull box locations.
- a.** A single splice location may be appropriate if the damage is close enough to the adjacent pull box that the repair may be accomplished by using some of the slack in the existing cable.
 - i. No more than 5 feet of slack may be used out of any one pull box.
 - ii. Pull boxes where new splices shall occur will be replaced with ~~C48 or PL48~~ [Fiberlyte FL36 24" deep](#) vaults as specified in the City standards
 - iii. At least 50 feet of slack must be provided in the new splice vault.
 - iv. The slack shall be provided in even amounts on either side of the splice enclosure.
 - v. Only fusion splicing meeting City standards by a certified fiber optic technician will be allowed.
 - vi. All new cable, splices, and terminations shall be acceptance tested as required elsewhere in the City standards.
 - vii. The average optical loss of each splice shall not exceed 0.10 dB. The average is determined by measuring the splice loss in both directions with an OTDR, adding the two readings, and dividing by two. Testing should be performed for both the 1310 and 1550 nm wavelengths.
 - viii. Splicing will not be allowed in pull boxes or vaults shared with non signal interconnect cables.

- b. Two splices may be necessary if the damage is not near an existing pull box. In this case, a splice shall be provided on either side of the damage and a new length of cable meeting City standards shall be installed between the splices.
 - i. Pull boxes where new splices shall occur will be replaced with ~~C48 or PL48~~ Fiberlyte FL36 24" deep vaults as specified in the City standards.
 - ii. At least 100 feet of slack must be provided in each vault.
 - iii. The slack shall be provided in even amounts on either side of the splice enclosure.
 - iv. Only fusion splicing meeting City standards by a certified fiber optic technician will be allowed.
 - v. All new cable, splices, and terminations shall be acceptance tested as required elsewhere in the City standards.
 - vi. The average optical loss of each splice shall not exceed 0.10 dB. The average is determined by measuring the splice loss in both directions with an OTDR, adding the two readings, and dividing by two. Testing should be performed for both the 1310 and 1550 nm wavelengths.
 - vii. Splicing will not be allowed in pull boxes or vaults shared with non signal interconnect cables.
 - viii. If the new cable must be pulled through conduits that contain traffic signal phase wiring, then a "MAX CELL" or equivalent sleeve, per City standards, shall be installed in the conduit prior to the installation of the new fiber optic cable.
3. Repair work must **begin within 24 hours** and be **completed within 48 hours** of the damage occurring irrespective of weekends and holidays.
4. Should the contractor be unable to make the repairs within this time frame, the City will complete temporary repairs and bill the contractor for their time and materials at the City's billable rate. The temporary repair shall be treated with the same restrictions, requirements, and care as the original cable. The contractor will still be required to make the permanent repairs prior to completion of the project.

Temporary copper SIC repairs must be made within 48 hours of the damage and provide sufficient bandwidth and reliability for the intended purpose of the copper SIC. Permanent Repairs shall be completed within 30 days of the damage. The City may make the repairs and bill the contractor for the work should the contractor be unwilling or unable to meet these requirements.

Should copper SIC installation be required by the city, the contractor shall test all copper SIC prior to installation:

1. For continuity of each wire pair. Resistance shall be consistent.
2. For high resistance (meggar) testing (250v setting):
 - a. Each wire pair to ground
 - b. Each wire pair to the cable shielding
 - c. Each wire pair to wire pair
3. The test may be in the field or shop
4. A city technician does not need to be present
5. The contractor shall be liable for all inspection costs related to the removal and re-installation of new cable if the untested cable is found to be faulty after installation.

Fiber optic cable shall be acceptance tested, every strand, both before and after installation at both 1310 and 1550 nm wavelengths. All testing shall be documented on OTDR Acceptance Test and Splice Loss Record forms. Losses shall not exceed 1.85 dB per mile of cable including patch panels and splices.

- J. Traffic Signal Conduit** – All new conduit placed in existing roadways shall be buried at a minimum depth of 15” for double conduits and 18” for single conduits below finished grade. All new conduit placed in new roadways shall be installed prior to any paving operations and be buried at a minimum of 18” below finished subgrade with the exception of conduit between detector handholds and the first pull box which shall be buried a minimum of 18” below finished grade. New conduit installed outside of the roadway and sidewalk shall be installed at a minimum depth of 36” below finished grade.

Unless otherwise specified, all signal interconnect (SIC) conduit shall be 2-3” schedule 40 gray PVC conduit with 3 foot radius 90 degree sweeps into each number 6 pull box.

All traffic signal and SIC conduit shall have a ~~Fiber-Tek part number WPTT1250 or approved equivalent pull tape installed along with the conductors/fibers. Approved pull tapes shall consist of a 22-AWG solid copper wire with HDPE Jacket. DLC taped with a 5” green band and labeled with “locate”.~~

Signal conduit diameter sizes shall be 2 inches minimum and 3 inches maximum except conduit runs to pedestrian push button posts shall be one (1) inch.

Existing conduits not to be reused shall be removed from existing pull boxes and the ends shall be plugged solid with grout. Existing conductors shall be removed from said conduits prior to plugging.

Abandoned conduits deemed reusable shall have the line blown out, existing conductors removed, No. 10 green pull wire installed, and the ends of the conduits sealed.

All pull tape shall be a minimum of 250 feet in length without splicing where possible. All pull tape splices shall have the ends knotted together in the pull box and all splices shall be made using 3M scotchlok connectors (models UR or UY) or approved equal to insure a continuous connection from signal controller to signal controller. Once pull tape is installed and all splices are completed, the City signal technician shall ground the tracer wires in the signal cabinet and test the wires for continuity before accepting the work. Should the pull tape tracer wire fail the continuity test, the Contractor shall repair or replace as necessary to achieve continuity.

K. Traffic Signal Pull Boxes – All pull boxes shall be No. 6 [Fiberlyte FL36](#) per the City’s Construction Standards except as modified by the plans or the provisions below:

1. Advance loop pull boxes shall be No. 6 and shall have a minimum of 20 feet of detector lead-in cable (DLC) and 20 feet of extra loop cable spooled in the pull box.
2. The “Home Run” and “Communication Home Run” pull boxes (typically adjacent to the controller) shall be [Fiberlyte FL36 24” deep](#)~~C48E~~ boxes with 12 inch extensions (double stack). Detector loop splicing is not allowed in the “Home Run” pull boxes. The “Home Run” pull box shall be located a minimum of eight (8’) from the service and controller pad ground rods (See Detail TS-25).
3. Fiberlyte (FL36) + 24 in extension vaults shall be installed at all new locations and at every fiber optic cable splice point [unless otherwise specified on the plans](#). ~~Vaults shall be installed within the controller pad whenever possible. Where a traffic rated box is required, the C48 (concrete) vault shall be used with a steel checker plate bolt down lid. See Detail TS-14 for additional installation details.~~
4. Pull boxes shall not be placed within the area of an access ramp unless directed by the Engineer. Pull boxes should be installed a minimum offset of 1’ from, back of walk when within the sidewalk, and from any score or expansion joint. The bottoms of pull boxes shall be bedded in 6 inches of clean crushed rock. Grout in the bottom of pull boxes is not required. The pull box rim and lid shall be flush with surrounding surface. In unpaved areas, the pull box rim and lid shall be 1 inch above the finish grade. Pull boxes located

outside of the sidewalk or planter area behind a sidewalk shall be of the Caltrans traffic rated pull box design.

~~5. An N48 Vault shall be installed near (as directed by the City) the controller cabinet for fiber.~~

All pull boxes and lids shall be #6 Fiberlyte (FL36) boxes unless otherwise directed by the Engineer. If an “in planter” type box is used, it must have a concrete collar.

All pull boxes to be abandoned shall have conductors removed from the pull boxes and conduits and the pull box shall be removed. The remaining hole shall be backfilled and compacted with similar material as the surrounding material. If within a sidewalk, the entire square of sidewalk shall be removed and replace.

Pull box covers shall read “TRAFFIC SIGNAL”, except for pull boxes and vaults used solely for traffic signal interconnect. Pull boxes and vaults used solely for copper traffic signal interconnect shall read “SIGNAL INTERCONNECT”. Should the signal interconnect pull box or vault contain any fiber optic cable, the cover shall read “TRAFFIC SIGNAL FIBER OPTICS” instead.

L. Pedestrian Push Button (PPB) - Pedestrian push buttons shall be aluminum Type “B” with metal international symbol signs. Push buttons shall meet all Americans with Disabilities Act guidelines and be placed 36 inches above the grade of the closest edge of sidewalk and shall require a reach of no more than 18 inches outside the closest edge of sidewalk. Pedestrian push buttons shall be within five (5) feet of the edge of the crosswalk line (extended) farthest from the center of the intersection (CMUTCD Figure 4E-3). Audible pedestrian signals shall be installed at all new and modified traffic signals in commercial and high pedestrian areas or as directed by the City. The contractor shall provide a city approved wave file. All other buttons shall be solid state, two tone audible, momentary LED type. ~~Audible Ped APS shall be on separate posts at least 10 feet apart as directed by the City.~~ See the City’s website for a list of approved models.

M. Intersection Safety Lighting – Illumination provided by intersection safety lighting at signalized intersections shall meet the following criteria:

1. A minimum of .15 footcandles throughout the crosswalks.
2. A minimum of .6 footcandles at the center of intersection.

Luminaries shall be 250 and/or 400 watt equivalent LED and labeled as such. See the City's website for a current list of approved materials. The luminaire equivalent wattage shall be called out on the plan sheet.

Luminaries shall be medium cutoff, Type II or III lighting distribution (MSII or MSIII)

For 400 watt luminaries, two separate 120 volt circuits shall be provided to equally split the power load.

Photoelectric controls shall be Type II and pole top mounted. Wiring from the photoelectric cell assembly to the electrical service shall be #14.

- N. Controller/Service Pad** – There shall be a minimum 6-inch high curb around the signal controller/service pad, excluding the sidewalk/roadway side of the pad. The minimum curb height shall increase as necessary to ensure no steeper than a 2:1 slope of the native material around the pad. Masonry blocks (not gravity type blocks) may be utilized to achieve the required 2:1 slope. The Contractor shall be responsible for acquiring engineering for retaining walls if the wall is greater than four feet from base of footing to top of wall. Refer to Detail TS-4 through TS-8 for further details.

The service pedestal shall be installed a minimum of six (6) feet from the controller cabinet.

A City of Roseville Encroachment Permit is required for every traffic signal installation and/or modification. The project address for the permit shall be the service pedestal address. This address should be noted on the plans but is obtainable from the City in its absence. Minor modifications by City forces not involving the service pedestal are exempt from the encroachment permit requirement. Should a traffic signal be a part of a larger project, there may be an encroachment permit for the entire larger project and one or more permits for each and every signal installation/modification.

On 332 cabinets, the field wire entrance section of the controller shall face the intersection or as directed by the Engineer.

- O. Traffic Signs** – Sign codes shall be per the CMUTCD unless denoted otherwise. Typical signs include the R-73 (CA) series mast arm mounted signs, R3-18 mast arm mounted signs, R9-3a and R9-3b signs (where crossing the street is restricted), W3-3 Signal Ahead roadside signs (pavement markings are only necessary where visibility of the signal is limited or where the signal may be unexpected by motorists), and R3 series roadside signs on the stem of a “tee” intersection.

As a minimum, all signs shall be the common size as shown in the Standard Highway Signs manual. On collector and arterial streets, the minimum size of type R1 stop signs shall be 36 inches. Type R1 stop signs on other streets shall be 30 inches. Type R1 stop signs installed on bike trails may be either 24 inches or 18 inches as approved by the Engineer.

Fluorescent Yellow Green (FYG) background colored signs shall be installed for the following sign types: S1-1, S3-1, S4-3, W11-1, W11-2, and W16-7p and W16-9p when used with one of the previously listed signs.

Where crossing the street is restricted at signalized intersections, R9-3a and R9-3b signs shall be installed on the signal pole in the place of the pedestrian signal indication.

In the case of R73 (CA) series of mast arm mounted signs, a common question is whether or not to allow u-turns. This determination is a function of whether or not there is sufficient room for turning radius. The guideline used by the City is that U-turns shall be restricted where less than 44 feet exists between the right lane line of the left turn lane and the face of curb for the opposing direction of travel for single left turn lanes, where less than 36 feet exists between the left edge of the inside left turn lane to the face of curb for the opposing direction of travel for dual left turn lanes, or as required by the Engineer (Detail TS-15). If u-turns are to be restricted at permissive or no left turn intersections, R3-4 or R3-18 signs shall be installed on the mast arm.

A bicycle signal actuation sign, R10-22, shall be installed in conjunction with bicycle detection. The sign shall be placed adjacent to the bicycle loop on the nearest signal pole or on a sign post per City standards as directed by the Engineer.

W3-3 Signal Ahead signs shall be installed on all approaches to a signalized intersection on the day of signal activation and before the signal is activated. The signs shall be installed prior to the left or right turn pocket bay tapers at a minimum and shall be mounted on street light poles when possible. Please see Detail TS-16 for additional placement information. Immediately prior to the activation of a new traffic signal. The contractor shall install two (2) orange flags on the "Signal Ahead" signs. The flags shall remain in place for two weeks prior to removal by the contractor.

All existing traffic signs, which are in conflict with the proposed work as shown on the plans, shall be removed by the Contractor and returned to the City. The Engineer shall make the final decision if a question arises as to what represents said conflict.

Efforts shall be made to ensure that all signs in the center median or shoulder areas are not installed next to landscaping or other objects which may impair visibility of the sign nor shall they impair the visibility of the traffic signal.

Internally Illuminated Street Name Signs (IISNS) shall require a City Traffic Engineering accepted stamp for all approved proofs matching existing City LED IISNS's prior to ordering. Only products with prior approval from the City shall be allowed.

1. Refer to City of Roseville Construction Standards Section 56 "Signs".
2. Internally Illuminated Street Name Signs (IISNS)
 - a. All proofs require a City approved layout matching existing City LED IISNS's prior to ordering.
 - b. IISNS name panels shall be manufactured as follows:
 - i. Sign panel material shall be clear (not opaque) poly. Thickness of the panel shall be 3.5 mm /6.0 mm maximum.
 - ii. Sign panels background sheeting shall be: 3M DG₃ (Diamond Grade) series 4090. Color (White).
 - iii. Etched sheeting (Street name and City of Roseville logo) shall be 3M EC 1177c material. Color (Green).
 - iv. Manufacturer shall warranty, no chemical reaction, shall be exhibited between the background sheeting and etched sheeting components.
 - v. The IISNS shall be double sided with street names on both sides.

3. Courts

- Install a type W53 "Not a Through Street" sign at the entrance to all Courts or Cul-de-Sac's when you cannot see the end of the roadway from the last intersection. Place the sign on the nearest street light pole when possible.

4. Intersections Within-within Subdivisions

- All four-way intersections shall have right-of-way controls established on the minor street. ~~On roadways with minor traffic volumes expected, install type R1-2 "Yield" signs and bars. At intersections with heavier expected traffic volumes and/or pass through traffic, install~~ Install type R1-1 "Stop" signs, bars and legends on the minor street.
- Install R26 (CA) "No Parking Anytime" signs at the entrance to subdivisions that have a median island just off an arterial or collector.

2. A bicycle detector pavement marking shall be installed in conjunction with each bicycle detector per CMUTCD Figure 9C-7 and shall be placed starting 6 inches back of the crosswalk/stop bar.
3. Unless otherwise specified on the plans, crosswalks shall be eleven (11) feet wide, measured from the centerline of the stripe.
4. Traffic stripes and pavement marking shall not be placed over utility covers including, but not limited to, manhole covers, utility boxes, hand holes, or water valve covers.
5. STOP legend pavement marking and limit lines are required with stop signs. YIELD legend pavement marking are required with yield signs. The yield limit line shall be per the CMUTCD (24" by 26" triangles).
6. Pavement arrows shall be one of the following types unless otherwise directed by the Engineer: Type II (L, R or B), Type III (L, R, or B), Type VI, or Bike Lane Arrow.
7. At signalized intersections with left turn lanes longer than 150 feet the Type II, or Type III arrows shall be placed 20 feet behind the limit line. Where there are dual left turn lanes with staggered limit lines, the arrows in the number 1 left turn lane (closest to the median) shall be placed 15 feet behind the limit line, and the arrow in the number 2 left turn lane shall be placed 20 feet behind the limit line. The intent is to have the two arrows line up side by side, even though the limit lines are staggered.
8. All turn lanes shall have a Type II or Type III arrow at the beginning of the turn lane such that the tail of the arrow lines up with the beginning of the Detail 38 striping. All turn lanes 150 feet or longer shall have a minimum of two Type II or Type III arrows (one arrow for every 150 feet of turn lane).
9. All traffic lane striping shall be discontinued through any four way public intersection from crosswalk, marked or unmarked. Striping shall be continuous through private intersections unless there is a striped left turn lane and/or traffic signal. For [non-signalized](#) public "T" intersections, the through and bike lane striping shall be continuous for the non-intersection direction, i.e. "across the top of the T". However, there shall be no striping within the limits of the crosswalks.
10. At locations where bike lane striping is parallel striping used to channelize traffic, right turn acceleration/deceleration lanes and bus turnouts, both stripes shall be detail 38. Reflective pavement markers shall be placed to the outside of the bike lane.

R. City Supplied Equipment – City supplied equipment shall be picked up by the contractor at the City’s corporation yard (2005 Hilltop Circle, Roseville) upon 10 calendar days notice to the City’s inspector. The contractor is responsible to provide all labor and equipment necessary to load, transport, and install the equipment. Equipment provided by the City typically includes:

1. NEMA Type P or Caltrans 332 cabinet (fully equipped)
2. Type 27-22 electrical service with battery backup system
3. 2070L controller
4. Communications equipment
5. EVP equipment with the exception of the cable from the detector to the discriminator
6. CCTV camera
7. WiFi communications equipment

S. Contractor Supplied Equipment – Attention is drawn to the following contractor supplied and installed materials:

1. Equipment grounding conductors shall be AWG #8 bare solid copper wire minimum.
2. Three (3) category 5E cables (Mohawk Lan-Trak OSP, part number M58790), or City approved equivalent, and one (1) power cable (IMSA 14-3/20-1-STR 600V, Belden part number 601195) or City approved equivalent to top of designated pole with ten (10) feet of slack for each cable at the top of the pole.
3. 16” countdown pedestrian heads. Contact the City for approved vendors and models.
4. Audible pedestrian or solid state, two tone audible, momentary LED pedestrian push buttons. See the City’s website for a list of approved models.
5. Internally Illuminated Street Name Sign (IISNS) Mast Arms shall be per TS-11 and TS-12 and have a permanent name plate identifying compatible pole model number. The loading of the mast arms and the signal pole to which the sign mast arm is attached shall be approved in writing by the manufacturer or a licensed Structural Engineer.

6. Slim profile, LED IISNS's with City Logo. Contact the City for approved vendors and models. Sign proofs must be approved by the City prior to ordering equipment.

T. Salvaged Equipment – Salvaged equipment shall become property of the City and shall be delivered by the Contractor upon 24 hours notice. The Contractor shall deliver salvaged equipment to the City's Corporation Yard located at 2005 Hilltop Circle, Roseville, following at least 48 hours advance notice of delivery.

Where signals are being modified or relocated, existing emergency preemption equipment shall be relocated to the new signal poles.

Damaged conduits deemed to not be reusable shall be removed from existing pull boxes and ends plugged solid with grout. Existing conductors shall be removed from said conduits prior to plugging. Contractor shall dispose of said conductors.

Abandoned conduits deemed reusable shall have the line blown out, existing conductors shall be removed, a number 10 green locate wire shall be installed, and the ends of the conduits shall be sealed.

U. Traffic Control – Construction area traffic control shall be installed in accordance with the City accepted projects specific traffic control plan, the approved improvement plans and specifications, the Construction Standards, the City Design Standards, The [current](#) California Manual on Uniform Traffic Control Devices (CAMUTCD), The State of California Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the Cal Trans Standard Specs and as follows:

1. Construction that inhibits free flow traffic shall not occur between the hours of 4 p.m. to 6 p.m. on Monday through Friday without prior written approval of the Engineer. Traffic control lasting more than one hour will be subject to additional time restrictions set by the City's Traffic Section in order to minimize the impact to the public.
2. At least one lane in each direction shall remain open to traffic unless otherwise approved by the Engineer.
3. Turning movement restrictions require prior approval of the City. A changeable message sign (CMS) shall be posted in the direction of travel affected by the restriction a minimum of three days prior to the implementation of the traffic control at the contractor's expense. Wording and placement of the CMS shall be "ACCEPTED" by the City's Traffic Section prior to installation.

4. Traffic control hours are subject to limitation by the City.
5. Lane closures that affect traffic flow may require night work, changeable message signs, and/or certified flaggers at the contractor's expense. The contractor should consider traffic control included in their cost of work and may contact the City's Traffic Section for requirements prior to bidding a job.
6. Approved road closures require 72 hour advance notification to the City, the public and emergency services. Changeable message signs (CMS's) shall be posted in the directions of travel affected by the closure a minimum of 1 week prior to the implementation of the traffic control at the contractor's expense. Wording and placement of the CMS's shall be "ACCEPTED" by the City's Traffic Section prior to installation.
7. A Red Flash Request form must be submitted 48 hours prior to the time the red flash is needed. Allowable hours of flashing operation will be set by the City's Traffic Section and will require early morning, evening, or night work unless otherwise approved in writing by the City's Traffic Section. The Red Flash Request form is on Detail TS-21.
8. Special events shall go through the City's special event process (Contact the City of Roseville's Parks & Recreation Dept. for a Special Events packet). Changeable message signs placed in advance of the event may be required depending upon the size of the event and its impact on traffic movement. Contact the City's Traffic Section for requirements.
9. Special holiday traffic control restrictions are in place from one week prior to the Thanksgiving holiday through January 3rd each year for various roads throughout the City (Detail TS-23).

TRAFFIC CONTROL PLANS:

All traffic control plans (including signage) shall be per [the current CAMUTCD](#) (California Manual on Uniform Traffic Control Devices).

The City's Construction Inspector or Engineer shall determine the necessity of a formal traffic control plan (TCP) submittal based upon the following guidelines:

A TCP submittal will be required if the TCP is anyone of the following:

1. Complicated (to be determined by the City's Construction Inspector)
2. Involves a signalized intersection
3. Longer than 12 hours

4. Not detailed in the CAMUTCD
5. Involves road closure or detours

If significant detours, lanes closures, and/or signal modifications (including but not limited to loop disruption, the need for a temporary signal, etc.) are needed, a separate Traffic Handling Plan from that of the Traffic Control Plan may be required. The Traffic Handling Plan will require review and approval by Traffic Engineering and will require additional review time for submittals.

Traffic Control Plans require responsible party contact information, hours of operation (which may be restricted by the City), and duration of work.

TCP submittals require the following minimum review times **per** submittal:

Type of TCP	Min. Review Time
Lane Closure	2 days
Intersection Signal Flash	2 days
One-way traffic control	2-4 days
Detour/Road Closure	3-4 weeks

Note that complicated TCP's may require more review time. Traffic control review time should be included in the contractor's work schedule.

The traffic control plan submittal process is as follows:

1. Three copies of the TCP must be submitted to the inspector.
2. The TCP is reviewed by the City Traffic Section and corrections/modifications are made by the contractor as necessary.
3. The City Traffic Section will stamp the TCP as "ACCEPTED" once the plans are to the City's satisfaction.
4. Two copies of the "ACCEPTED" TCP are returned to the inspector – one copy each for the inspector and contractor.
5. The contractor must have a copy of the "ACCEPTED" TCP on site during the entire time the TCP is in place.

Any deviation from the "ACCEPTED" TCP shall be approved by the inspector and may require re-submittal of the TCP for City review. Failure to maintain the TCP may result in shutdown of the project, suspension of inspection services, correction by the City at the contractors expense, or any combination of the before mentioned.

7. Phasing for emergency vehicle preemption. Typically, protected left turn phases are combined with the concurrent through movement during EV preemption.

C. Interconnect Sheet - The interconnect sheet may be drawn at a scale of 1 inch equals 20 feet or 1 inch equals 40 feet and shall include a north arrow.

D. Signing and Striping Sheet – The signing and striping sheet shall be drawn at 1 inch equals 40 feet, and shall include the following:

1. A north arrow.
2. Existing signing and striping – dashed or screened.
3. Proposed signing and striping where line types shall closely approximate striping proposed.
4. Centerline stationing with either begin and end modification stationing or lineal feet of modification specified along with the detail.

E. Intersection Lighting Sheet – The Intersection Lighting sheet shall be drawn at 1 inch equals 40 feet, and shall include the luminaire diagrams, luminaire wattage equivalent, and min, max, and average illuminance.

SECTION 7

STREETS

7-1 STREET CLASSES AND DESIGN WIDTHS – For purposes of geometric and structural design of all new public streets, streets shall be classified according to the following requirements, the appropriate Standard Drawings, and Table 7-1. Under certain circumstances, particularly within the infill areas of the City, changes to the standards can be made at the discretion of the City Engineer.

A. 20-Foot Street (Alley) – A Street depressed in the center with a right-of-way and surface width of 20 feet. Alleys are not permitted unless specifically approved by the City Council. STD DWG #ST-1A

B. Residential Streets – Where residential streets serve Low Density Residential (LDR) and Medium Density Residential (MDR) subdivisions, the following standards apply. In the case of High Density Residential (HDR) and (MDR) condominium development, please refer to City of Roseville Fire Department for minimum street sections.

LDR	MDR		HDR
	Fee Lot	Condo Style	
Design & Construction Public Works Standards	Design & Construction Public Works Standards	Fire Department Standards	Fire Department Standards

1. Minor Residential with Attached Sidewalks – A residential street servicing 100 or fewer lots shall be classified as a minor residential street. Minor residential streets shall have a right-of-way width of 42 feet, and back of curb to back of curb width of 34 feet. STD DWG #ST-2

2. Minor Residential with Detached Sidewalks – A residential street servicing 100 or fewer lots shall be classified as a minor residential street. Minor residential streets shall have a right-of-way width of 54 feet and a back-of-curb to back-of-curb width of 34 feet. STD DWG #ST-3

3. Primary Residential with Attached Sidewalks – A residential street servicing more than 100 lots or along which schools or parks are proposed to front, shall be classified as a primary residential street. Primary residential streets shall have a right-of-way width of 46 feet, and back of curb to back of curb width of 38 feet. STD DWG #ST-4

- 7-2 RIGHT-OF-WAY WIDTH** - Right-of-way widths shall be in accordance with these standards for the street classification under consideration or as determined by the City Engineer. In no instance, without approval of the City Engineer, shall a street have a right-of-way width that is less than the street of which it is a continuation. Right-of-way requirements for widening at intersections shall be as specified by the City Engineer.

Building setbacks, landscaping requirements, and parking requirements shall be based on the ultimate right-of-way, regardless of the location of public street improvements.

A minimum 12.5-foot public utility easement (P.U.E.) shall be dedicated adjacent to all public and private streets and shall include traffic control appurtenances. Additional easement for sewer, water, storm drainage, landscaping, fencing, and all other public utilities shall be provided as required by the utility companies, these Design Standards, and as specified by the City Engineer.

Along the frontage of collector and arterial roadways, the right-of-way dedication shall include the landscape corridor adjacent to parcels zoned single-family residential (SFR).

- 7-3 ROADWAY SIGNAGE AND STRIPING** - Signing and striping shall conform to the latest edition of the California Manual of Uniform Traffic Control Devices, (CMUTCD), unless modified by these standards, the Construction Standards, or in writing by City Engineer.

- 7-4 STRUCTURAL SECTION** – All roads, both public and private, to be constructed within the City of Roseville shall be asphalt concrete over aggregate base and, if necessary, aggregate sub-base. It's desirable to the City to have all arterial roadways designed and constructed with the two-inch top lift of asphalt concrete, rubberized asphalt concrete material. Collector, residential and alley ways shall be designed and constructed with Type A, 1/2 –inch maximum medium asphalt concrete mix as described in the City's Construction Standards.

All pavement sections shall be designed on the basis of the resistance R-value as determined in accordance with the State of California, Department of Transportation design method and appropriate traffic indices (TI). If the subgrade has an "R" value of 10 or less, a geotextile fabric or other approved product shall be installed on subgrade prior to placement of AB or ASB material. In addition, the City Engineer may require the installation of edge drains in soils where the "R" value of the subgrade is 10 or less. The Geotechnical Engineer may submit for treatment of the subgrade material, with lime or cement or other approved product if suitable soils exist. This may be considered in lieu of geotextile fabric and base material with approval of the City Engineer. [The resulting structural section shall be no less than City standards from Table 7-2.](#)

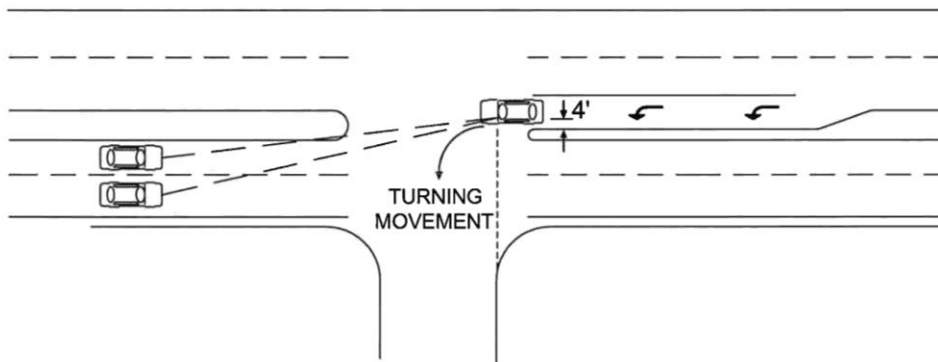
**TABLE 7-5
 SIGHT DISTANCE FOR CARS ENTERING
 STREETS/ DRIVEWAYS BY LEFT TURN**

Street Classification	Required Sight Distance
Industrial/Collector	440 410 feet
Minor Arterial	605 530 feet
Major Arterial	785 695 feet

Taken from the 2004 AASHTO Geometric Design of Highways and Streets

**EXHIBIT 7-1
 LEFT TURN SIGHT DISTANCE:**

SIGHT DISTANCE FOR CARS ENTERING SIDE STREETS OR DRIVEWAYS VIA LEFT TURNS.



Sight Distance is based on a 3.5 foot height at the location of the driver and a ~~4.25~~ 3.5 foot object height in the center of the approaching lane of the major road. The left turn driver measurement is taken 4 feet from the left edge of the turn lane at the projected edge of the curb return (as shown above). If the major road is a multi-lane road, the controlling measurement for sight distance shall be based on the approach lane that is the worst case scenario.

C. Corner Sight Distances for Cars Exiting at Intersections and Driveways – The design of all public streets, private streets, and major non-residential driveways (as shown in Exhibit 7-2) shall

required on street centerlines and located such that there will be a clear line of sight distance between the two monuments within the street right-of-way. These will normally be located at points of curvature not exceed 1000 feet.

4. Lot corners shall have a 1/2 inch rebar at rear corners. Front corner and side lot lines shall be projected and marked twelve six inches to center from the back of sidewalk (or 3" from back of curb to center of marker when no sidewalk is present), with a permanent disc survey marker between 3/4"-1 1/4" diameter with a minimum of one-inch deep knurl shank anchor drilled and epoxied into sidewalk or curb with expansion plug, flush with concrete surface. Survey markers shall be stamped as specified in the Professional Land Surveyors Act, Article 5, Section 8772, on the back of sidewalk with a sawcut score mark 4 inches long and 1/4 inches deep or 1 inch brass marker. Use Berntsen BP2-BP copper disc with expansion anchor with countersink drill bit, or approved equal. Epoxy as specified in Section 71-5.G.2. Where survey markers cannot be installed as described above, surveyor to recommend alternate method of placement to City Engineer prior to placement.
5. Permanent survey monuments shall be placed by the Consulting Engineer at all section and quarter corners within the development. The section corner monuments shall be Class "B" Minor C-concrete, Per Caltrans Section 90-2, poured in place, with minimum dimensions of 6" diameter x 24" deep, with a brass cap in accordance with Bureau of Land Management Standards.

All such monuments shall be referenced to permanent objects located nearby and all ties shall be furnished to the City Engineer for general public use. Final acceptance of the public improvements will not be made until such ties have furnished to the City Engineer.

The Consulting Engineer shall also place a note on all construction plans stating that the Contractor is responsible for the protection of all existing monuments and other survey markers.

- 7-20 BENCHMARKS** – In locations where a new benchmark will be required, as determined by the City Engineer, the Consulting Engineer's Land Surveyor (L.S.) will set in concrete a 3 1/4 inch brass cap, provided by the City Engineer. The L.S. shall then run a second order, class two closed loop survey from an approved City of Roseville benchmark to establish the U.S.G.S. elevation of the cap. The level notes shall include the new benchmark elevation in North American Vertical Datum of 1988 (NAVD 88) and National Geodetic Vertical Datum of 1929 (NGVD) vertical datum. The L.S. shall also include the California II State Plane Coordinate values if the new benchmark in North American Datum (NAD 83). All new benchmarks shall have a

SECTION 8

DOMESTIC WATER SUPPLY SYSTEM DESIGN

8-11 TRANSMISSION SYSTEM DESIGN – Transmission mains are 16 inches in diameter or larger. Standard transmission main sizes are 16-, 24-, 30-, 36-, 42-, 48- and 54- inches in diameter. Sizing and layout of transmission mains shall conform to the Master Water Supply Plans of the City of Roseville Environmental Utilities Department. Technical specifications for water transmission mains shall be a requirement of the proposed improvements plans. Under no circumstances shall fire hydrants or water services be directly connected to a transmission main, with the exception of hydrants that are acting as blow-offs.

D. Insulating Flange Test Station - An insulating flange test station shall be used between dissimilar metals per the standard details.

8-12 DISTRIBUTION SYSTEM DESIGN – Standard distribution main sizes are 6-, 8-, and 12- inches in diameter. Sizes of mains shall be such that the stated normal pressures, as specified in Section 8-5, and the minimum requirements for main spacing, specified below, are maintained. The distribution system shall be designed in grid form to provide equalized pressures throughout the system equalized under varying rates and location of demand. The minimum pressures and flows specified in these design standards shall govern the design. The following shall be considered during system design:

C. Stubs – Stubs for future developments shall be a minimum 18' fully restrained ductile iron pipe originating from the water main.

8-16 WATER SERVICE – Water services shall be installed at the time the water main is constructed. Service stubs 2 inches and smaller shall be copper. Service stubs 3 inches and larger shall be fully restrained ductile iron pipes. Services from mains installed in private roads shall be extended 1-foot beyond the edge of pavement. Water services shall also conform to the following requirements:

A. Location – Water services for residential subdivisions shall be located 42-54 inches from the property line per these Construction Standards. The building service shall be located to provide the most direct connection to the main. Every effort shall be made to pair services.

SECTION 9

SANITARY SEWER DESIGN

9-5 SEWER LOCATION AND ALIGNMENT REQUIREMENTS – Location and alignment criteria are as follows:

E. Easement Sewer Lines – Easement sewer lines outside of the public right-of-way, or within a narrow right-of-way shall require an easement dedication to the City. Sewer lines shall be centered within their easement. Easements shall be completely on one side of the property line of fence. The easement shall be clear of permanent structures, building eaves, roof lines, and the future trunk of large tree species. Temporary construction easements of adequate size shall also be provided. The proposed easement shall be the greater of the following:

[3. No trees or permanent structures are allowed within the sewer easement except with the approval of the Environmental Utilities Director.](#)

9-10 SEWER SERVICE DESIGN – The design criteria for sewer services are as follows:

B. Sizing – The minimum size service for single-family developments shall be 4 inches in diameter. Services greater than 100 feet in length shall be 6 inches in diameter. Schools, commercial, industrial and multiple residential properties shall be served by a minimum 6-inch diameter service.

5. Location - A sewer service shall be constructed to each lot. In new subdivisions or developed areas, unless specifically requested otherwise in writing, sewer services shall be placed on the low side of a typical subdivision lot or similar parcel with 2 percent or greater slope across the front, or shall be placed in the center of lots of lesser slope. [Under no circumstances shall a sewer service be placed less than 14' from the property line.](#) Trees, improvements, etc., are to maintain a minimum of 5' from the sewer service, including the cleanout and where the sewer service is extended to service the house.

If the property is located such that service is available both to a line located in an easement and also in a right-of-way, service shall be at the latter location unless otherwise approved by the Environmental Utilities Director. No sewer service shall be located such that future on-site construction will result in the line being in such proximity to

a water well or water main or service that applicable health standards will be violated.

G. Grease Interceptor – A grease interceptor shall be required for any business having the potential of producing grease as specified in the Roseville Municipal Code. Minimum size of the interceptor shall be 1000 gallons. Sizing of the interceptor shall be based on the ~~2007~~ 2010 California Plumbing Code.

H. Oil/Sand Interceptor – An oil/sand interceptor shall be installed for any business having the potential of producing oil and sand waste resulting from routine maintenance as specified in the Roseville Municipal code. Minimum size shall be 450 gallons. Sizing of the interceptor shall be based on the ~~2007~~ 2010 California Plumbing Code.

I. Automatic Car Wash – An oil/sand interceptor or an approved clarifier shall be installed for an automatic car wash as specified in the Roseville Municipal Code. The car wash shall recycle a minimum of 75% of the water used prior to discharging into the City’s sewer system. Minimum size of oil/sand interceptor shall be 450 gallons. Sizing of the oil/sand interceptor shall be based on the ~~2007~~ 2010 California Plumbing Code

9-13 PUMP STATION AND FORCE MAIN REQUIREMENTS – Every phase of pump station design, including force main design, shall be closely coordinated under the direction of the Environmental Utilities Director. The pump station and force main shall be designed and submitted concurrently. The plan sheets will show the general layout and control system required for a typical acceptable sewage pump station. The plans shall call out the testing required for acceptance of the pump station.

Table 3 – Planning Level Criteria for Pump Stations and Force Mains

Pump Stations	
Capacity	PWWF (hydraulic modeling required for pipes 18 inches and larger)
Storage	4 hours
Operation	Lead/lag for duty pump(s), plus 1 standby pump
Maximum Pump Cycles	6 cycles/hour (<u>3 cycles per pump</u>)
Force Mains	
Headloss	Hazen-Williams roughness coefficient (C-factor) of 120
Maximum Velocity	7-10 feet per second
Minimum Velocity	3.0 feet per second

- C. Wet Well** – The wet well design and detention time shall be such that the deposition of solids is minimized and the sewage does not become septic. Provisions for 4 hour storage capacity shall be provided. An interior protective coating shall be required for the prevention of hydrogen sulfide corrosion of the structure. Maximum depth of wet well shall not exceed 35’.
- 9-16** ~~Detail Drawings~~ — ~~Details not covered by the Construction Standard Detail sheets shall be shown on the plans.~~ **RECORD (AS-BUILT) PLANS** – The Contractor/Developer shall keep an accurate record of all approved deviations from plans and shall provide a PDF electronic, full size bond and 11 x 17 copy of the as-built plans prior to final acceptance of the complete improvements. Each sheet of the plans shall be marked “AS-BUILT” or “RECORD DRAWING”. “AS-BUILT” or “RECORD DRAWING” of signal plans, water, sewer and storm drain composite in plan view only, and parcel and final maps shall also be submitted on computer disk in DXF or DWG format.

SECTION 10

DRAINAGE

- 10-1 GENERAL** – This Section is formulated to clearly define acceptable drainage analysis and design criteria for development in the City of Roseville. Drainage facets not covered in this Section shall conform to the Placer County Flood Control and Water Conservation District “Stormwater Management Manual” (SWMM), latest edition, and good engineering practice.

The City of Roseville has adopted storm water quality design standards to reduce water pollution generated by urban runoff. These design standards are detailed in the ~~Stormwater Quality Design Manual for the Sacramento and South Placer Regions~~ [West Placer Storm Water Quality Design Manual](#). This Manual is available on-line at the ~~Sacramento Stormwater Management Partnership City of Roseville’s~~ www.roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=35989 ~~www.roseville.ca.us/civica/filebank/blobdload.asp?BlobID=19385~~. ~~The Manual can also be purchased at the City’s Permit Center located on the first floor of the Civic Center Building at 311 Vernon Street downtown Roseville.~~ [Storm water design calculations and an operations and maintenance plan shall be made a part of the drainage report.](#)

- 10-2 CITY POLICIES AND REQUIREMENTS** – All residential lots shall have minimum pad elevations of one foot above the 100 year water surface elevation and all commercial sites shall have minimum finished floor elevations of one foot above the 100 year surface elevation assuming failure of the drainage system. This requires the Consulting Engineer to provide an overland release for all projects or provide storage for the 100-year storm frequency.

The overland release path shall be constructed in a manner to transport the peak rate runoff from the 100-year storm frequency through the site assuming all storm drains are inoperative, all upstream areas are fully developed, and that antecedent rainfall has saturated the tributary watershed. Streets, parking lots, playgrounds, pedestrian areas, pedestrian walkways, utility easements, and other open space areas may be considered compatible uses within the overland release path.

Except for single family or duplex residential lots, site drainage shall be collected on-site and conveyed via an underground storm drain system to approved existing storm drainage system without flowing into existing street gutters or existing roadside ditches.

SECTION 11

PURPOSE AND DEFINITIONS

11-1 PURPOSE - The purpose of these Construction Standards is to provide minimum standards to be applied to improvements which are to be dedicated to the public and accepted by the City for maintenance or operation and certain private works, as well as improvements to be installed within existing rights-of-way and easements. This is necessary in order to provide for coordinated development of required facilities to be used by and for the protection of the public. These Construction Standards shall apply to, regulate, and guide construction of streets, highways, alleys, drainage, sewerage, traffic signals, site access, water supply facilities and related public improvements, and shall set guidelines for all private works which involve drainage, grading, and related improvements.

11-2 CONSTRUCTION PRACTICE - Because it is virtually impossible to anticipate all situations that may arise or to proscribe specifications applicable to every situation, any items or situations not included in these Construction Standards shall be constructed in accordance with the latest edition of the State of California Department of Transportation Standard Specifications [and Standard Plans](#), hereinafter referred to as the Caltrans Standards Specification. Caltrans Standard Specifications shall apply where not superseded by these Construction Standards. The Contractor shall follow all applicable City, County, State and Federal laws and regulations relating to construction of the improvements or as directed by the City Engineer.

Should conflicts arise between documents, specifications in these Construction Standards and the approved improvement plans shall take precedence over the State of California Department of Transportation Standard Specifications.

The City Engineer may require additional specifications and/or regulations consistent herewith when deemed necessary to protect the health, safety and welfare of the public.

11-3 DEFINITIONS - Whenever the following terms or titles are used in these specifications, or in any document or instrument where these specification govern, the intent and meaning shall be as herein defined:

- A. Applicant** - Shall mean the same as the Developer or his/her consulting engineer working on his/her behalf.
- B. Approved Plans** - Shall mean all plans prepared for construction of improvements, reviewed, approved and signed by the necessary Departments within the City of Roseville.

SECTION 14

RECYCLED WATER INFRASTRUCTURE DESIGN

14-8 TRANSMISSION SYSTEM DESIGN - Sizing and layout of transmission mains shall conform to the Recycled Water Master Plan of the City of Roseville and as outlined herein.

E. Recycled Water Transmission Main and Appurtenances

- 1. Valves** - The distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in isolating a transmission main. Valves shall also be spaced at intervals no greater than 2,500 feet for pipe 16" and larger. Valves shall be spaced no greater than 500' for pipe sizes of 12" or less. Valves shall be located such that any section of main can be shut down without going to more than three locations to close valves. All tees shall have three valves and all crosses shall have four valves. A valve shall be installed on services immediately off the main and on the transmission main immediately downstream of the service.

F. Corrosion Protection – A corrosion protection study shall be included with improvement plan submittals. Corrosion protection facilities shall be identified from the roadway with the curb stamp “CP-RW”

F.G. Insulating Flange Test Station - An insulating flange test station shall be used between dissimilar metals per the standard details.

G.H. Warranty Inspection of Recycled Water Stubs: As a requirement, recycled water stubs are provided to subdivision, existing lots, or parcels, as a courtesy by developers during the construction of backbone infrastructures in streets to prevent cutting up the newly paved streets when the subdivisions are ready to develop. These stubs become an integral part of the recycled water system of the subdivisions, existing lots, or parcels, and subsequently the responsibility of the developers of the subdivisions, existing lots, or parcels, and are therefore imperiled to both construction and warranty inspections. This practice saves future developers construction time and cost that would have otherwise been spent on tie-ins and street repairs and in some instances prevents delays in the event a street has a moratorium. Since these stubs are provided at no cost to future developers, it is our position, hence our policy, that it is the responsibility of contractors to test and repair these stubs, if found damage, prior to tie-ins. A note to this effect shall be placed on the improvement plans.

- G. Working Hours** - In accordance with the City of Roseville's noise ordinance, the hours of project construction shall be limited to the following:

7:00AM to 7:00PM, Monday through Friday
8:00AM to 8:00PM, Saturday, Sunday and Holidays

There may be additional limitations placed on working hours specified in the project's approved plans, conditions of approval, special provisions, or encroachment permit.

- H. Emergency Contact person** - Prior to the commencement of project construction, the City's Construction Inspector shall be furnished with the name and telephone number of a contact person who can be reached 24 hours per day regarding problems or emergencies at the site.
- I. Traffic Control** - A traffic control plan (TCP) shall be submitted whenever required by the City's Construction Inspector.

Traffic control plans may not be required, when in the opinion of the City's Construction Inspector, the situation is adequately covered by the State of California Manual on Uniform Traffic Control Devices (latest edition). When the City's Construction Inspector has determined a TCP is required, the Contractor shall submit the plan to the City's Construction Inspector in accordance with Section 12 of these Standards for acceptance by the City's Traffic Engineering Section. The plan shall include: The project title, the encroachment permit number if applicable, the requested traffic alteration specifics and the requested working hours. Upon the Traffic Engineering Section's acceptance of the plan, the Contractor shall obtain it directly from the Traffic Engineering Section. Upon issuance, the TCP shall be available at the site at all times during the work. The Contractor shall assure that the traffic control equipment is erected prior to the work beginning and that it is removed immediately when appropriate.

If significant detours, lanes closures, and/or signal modifications (including but not limited to loop disruption, the need for a temporary signal, etc.) are needed, a separate Traffic Handling Plan from that of the Traffic Control Plan may be required. The Traffic Handling Plan will require review and approval by Traffic Engineering and will require additional review time for submittals.

SECTION 31

TRENCH BACKFILL

- 31-1 GENERAL** - All trench backfill shall be mechanically compacted native soil, mechanically compacted imported fill, mechanically compacted aggregate base or slurry material, as required on the Construction Standard Details. All trenching within City Streets shall conform to the City's Trench Cut Ordinance Numbers 3524 and 3602. These ordinances represent a comprehensive pavement protection program incorporating a trench cut cost recovery fee. The trench cut fee provides funds to repair the actual accelerated street damage caused by trenching and is an incentive to promote better trench cut coordination among utility companies.
- 31-2 TRENCH BACKFILL** - Trench backfill within the City of Roseville street rights-of-way shall conform to Construction Standard Details TB-1, TB-2, TB-3, TB-4 and TB-5. Moisture content shall be controlled to obtain the optimum density for the native soil type encountered. All compaction testing shall conform to ASTM D1557-78 test methods. Trench backfill compaction shall be tested and certified by a licensed geotechnical engineer at the Developer's expense. Certification shall be provided to the City Engineer prior to the construction of surface improvements.

Backfill for joint utility trench shall be sand compacted 85% relative compaction (TYP), above the 4 utilities occupying the joint trench. Then backfill with native material free of all deleterious materials, rocks or boulders compacted to 90% within one (1) foot of final grade and 95% the last foot. Sand Shading material to be, screened free, No. 4 sieve, 4mm maximum particle size, free of sharp edges, and approved by each utility trench inspector. (DG will not be approved).

Following paving operations and where water utility valve clusters are present, standard mechanical compaction efforts and equipment may have limited access to achieve adequate compaction per these Standards. In these cases, it is authorized that 2-sack flowable concrete slurry backfill material ([Per Section 71-5.K](#)) may be used within the water valve excavation area to just below the required concrete collar height. Once cured, placement of concrete collar and/or HMA paving operations may progress.

- A. Existing Streets** - Trench backfill in existing streets shall conform to Construction Standard Detail TB-1, TB-2, TB-3, TB-4 and TB-5 the City's Trench Cut Ordinance. Longitudinal trenches for dry utilities (CATV, telephone, gas, electric, traffic signal and signal interconnect cable) shall be excavated six inches clear from the gutter lip, conforming to Details TB-1 or TB-3. (For Detail TB-3, the 18 inch key nearest the gutter for the asphalt concrete patch shall be modified to

six inches.) Following the patching of the trench with asphalt concrete, the street surface shall be slurry sealed from the gutter lip to the edge of the bike lane stripe (usually four feet wide). If the bike lane stripe is obliterated in any manner by the construction process, it shall be replaced with thermoplastic per these Construction Standards.

B. Jetting - Compaction of trench backfill by jetting methods is **NOT** allowed in City of Roseville right-of-way areas or over dedicated reclaimed water, storm, sewer or water easements and mains. Jetting of joint utility trenches behind the right-of-way and within public Utility easements may be allowed under specific conditions and upon the written approval of the City's Construction Inspector and the Geotechnical Engineer.

C. Material - Material for backfilled trenches shall contain no organic material and no rocks or soil lumps exceeding four inches in diameter with the following qualifications:

1. Cobbles in the initial backfill (the first one foot above the pipe bedding covering the pipe) shall be three inch maximum diameter.
2. An exception to the four inch maximum diameter cobble is where cobbles exceed four inches in diameter and are predominant (as determined by the City's Construction Inspector and Geotechnical Engineer). In this condition, eight inches in diameter is the maximum size cobble allowed.
3. The maximum cobble size shall not be greater than that of the depth of the maximum compaction lift, for the type of equipment used.

Slurry cement backfill, controlled low-strength material or dry mix "Popcorn" ~~Controlled Density Fill (CDF)~~ may be used on a case by case basis. The Contractor shall submit a proposed ~~CDF~~ design mix to the PWD City Construction Inspector for review and approval prior to placement. See Section 71-5.K.

Native soil shall not be used for bedding for utility conduits or chases within the City right-of-way, but only select bedding materials such as sand, pea gravel, and 1/2 inch (minus) crushed rock or two sack cement slurry.

D. Placement of Material - Equipment shall be a size and type satisfactory to the on-site geotechnical engineer or City's Construction Inspector. Impact-type pavement breakers or compactors (hydrahammers) shall not be used within 5 feet of the top of any type pipe. Material for mechanically compacted backfill shall be placed in

SECTION 56

SIGNS

56-1.01 GENERAL - Signs shall be constructed/installed in accordance with the approved improvement plans and specifications, these Construction Standards, the City Design Standards, The California Manual on Uniform Traffic Control Devices (CAMUTCD), and the Standard Highway Signs manual.

All sign materials shall be produced by same manufacturer to eliminate incompatibility issues associated with indifferent materials, (i.e. 3M high intensity prismatic sheeting and 3M electronic cut-films shall be similar material). Prior to City acceptance of new sign improvements, Contractor shall submit to City Construction Inspector either letter of authenticity by manufacturer or certification from 3M or approved equal, indicating like materials were used.

As a minimum, all signs shall be the common size as shown in the Standard Highway Signs manual. On collector and arterial streets, the minimum size of type R1 stop signs shall be 36 inches. Type R1 stop signs on other streets shall be 30 inches. Type R1 stop signs installed on bike trails may be either 24 inches or 18 inches as approved by the Engineer. Type R1 stop signs installed on alleys may be 24" as approved.

All signs shall be fabricated using HIP sheeting, except, Fluorescent Yellow Green (FYG) background colored signs shall be diamond grade sheeting and installed for the following sign types: S1-1, S3-1, S4-3, W11-1, W11-2, and W16-7p and W16-9p when used with one of the previously listed signs.

Advance D3 Guide signs shall have a 1" inch white reflective border around the perimeter of the sign as shown in Detail 17-B of these standards.

All Overhead Signs (Signal Mounted) and advance D3 Guide signs shall have a 1.25 inch white reflective border around the perimeter of the sign as shown in Code 67-1 of the CalTrans Sign Specifications.

All sign panels, except as otherwise directed in these standards, shall be fabricated using reflective high intensity prismatic (HIP) sheeting or equivalent. Message and sheeting shall be on one side of the panel only. No mixing of diamond, high intensity, or engineering grade sheeting on the same panel shall be allowed.

Overhead Signs (Signal Mounted) shall be fabricated using high intensity sheeting. All Fluorescent Yellow Green (FYG) background colored signs shall be fabricated using diamond grade sheeting. All type D3 (street name and advance street name) signs along arterials and collectors shall be high intensity grading meeting FHWA MUTCD Table 2A-3.

Where crossing the street is restricted at signalized intersections, R9-3 and R9-3bP signs shall be installed on the signal pole in the place of the pedestrian signal indication.

U-turns shall be restricted where less than 44 feet exists between the right lane line of the left turn lane and the face of curb for the opposing direction of travel for single left turn lanes, where less than 36 feet exists between the left edge of the inside left turn lane to the face of curb for the opposing direction of travel for dual turn lanes, or as required by the Engineer (TS-15).

W3-3 Signal Ahead signs shall be installed on all approaches to a signalized intersection on the day of signal activation and prior to signal turn on. The signs shall be installed prior to the left or right turn pocket bay tapers at a minimum and shall be mounted on street light poles when possible. Please see Detail TS-16 for additional placement information. Immediately prior to the activation of a new traffic signal, the contractor shall install two (2) orange flags on the "Signal Ahead" signs. The flags shall remain in place for two weeks prior to removal by the contractor.

A bicycle signal actuation sign, R10-22, shall be installed in conjunction with bicycle detection. The sign shall be placed adjacent to the bicycle loop on the nearest signal pole or on a sign post per City standards as directed by the Engineer.

Subdivision Signage Requirements:

1. Subdivision Entrances

- At all entrances to a subdivision off a collector or arterial, install a type R2-1 "25 mph Speed Limit" sign.
- At the first 4-way intersection entering a subdivision, coming off a collector or arterial with a separation of less than 200 ft., install type R1-1 "Stop" signs, bars and legends on the residential minor streets.
- At the first Tee intersection entering a subdivision, coming off a collector or arterial, install type R1-2 "Yield" sign on the stem of the intersection.

- Install type R26 (CA) “No Parking Anytime” signs at the entrance to subdivision that have a small median/island just off an arterial or collector.

2. Courts

- Install a type W14-2 “NO OUTLET” sign at the entrance to all Courts or Cul-de-Sac’s when you cannot see the end of the roadway from the last intersection. Place the sign on the nearest street light pole when possible.

3. Intersections within Subdivisions

- All four-way intersections shall have right-of-way controls established on the minor street. ~~On roadways with minor traffic volumes expected, install type R1-2 “Yield” signs. At intersections with heavier expected traffic volumes and/or pass through traffic, install~~ Install type R1-1 “Stop” signs, bars and legends on the minor street.

All existing traffic signs, which are in conflict with the proposed work as shown on the plans, shall be removed by the Contractor and returned to the City. The Engineer shall make the final decision if a question arises as to what represents said conflict.

OVERHEAD SIGN STRUCTURES (Signal Mounted)

56-1.02 MATERIAL - D3 and G-8 (CA) street sign lettering shall be white high intensity prismatic (HIP) or equivalent Series C, with eight inch upper case and six inch lower case lettering. When the text is too long for a single line, lettering other than Series C, but not smaller than Series B, may be used with the approval of the Engineer.

D-3 and G-8 (CA) Signs with one line of text shall be 24 inches tall. Signs with two lines of text shall be 36 inches tall.

All white symbols and arrows on G-8 (CA) signs shall be reflectorized.

Internally Illuminated Street Name Signs (IISNS) shall require a City approved layout proof matching existing City LED IISNI’s prior to ordering. Only products with prior approval from the City shall be allowed.

56-1.06 SIGN PANELS & FASTENING HARDWARE - Overhead sign structures shall be attached to signal mast arms per CalTrans Standard Detail ES-7N, or as directed by the Engineer.

- c. Complete construction of curb, gutter and sidewalk after approval of the subgrade by the City's Construction Inspector.
- d. In addition to Section 90-8 Protecting Concrete, the Contractor shall protect newly placed concrete finish from rainy conditions, graffiti, and weather related damage. In addition, all Contractor wheeled equipment shall not travel within one foot of the lip of gutter in the first 24 hours following concrete placement. Contractor's vibratory compaction equipment may not operate within 72 hours and until all adjacent sidewalk, curb and gutter concrete has reached a minimum of 1400 psi compressive strength.
- e. Complete finish grading of subgrade for asphaltic concrete pavement, conduct proof rolling test and begin placement of aggregate subbase and/or aggregate base after approval of the finished subgrade by the City's Construction Inspector.

B. Aggregate Base and Subbase - Roadway aggregate base and subbase, lime/cement treated base and sidewalk, curb and gutter shall not be placed until the following items of construction within the City street right-of-way and Public Utility Easement (PUE) are completed:

1. Installation of underground sewer and water systems and testing or televising, and approval of same by the EUD Inspector.

Completion of testing for the presence of bacteria and the water system tie-in shall not be requirements for the approval of commencement of surface improvement construction. However, the water main tie-in shall be completed prior to asphalt concrete paving. The Contractor shall schedule operations such that the curb, gutter and sidewalk pour shall not be conducted on the same day as the water tie-in.

2. Installation and mandrelling of the non-rigid underground storm drain pipe and approval of same by the City's Construction Inspector.

~~2.~~ **3.** Installation of electric, natural gas, telephone, traffic signal (including interconnect) and cable TV, including mandrelling and testing of all conduits, installation of 4x4 markers a minimum of two feet high, painted red, buried at the crossing ends (if conduit ends do not extend up from finish grade). This includes all dry utility crossing and longitudinal trenches.

4. Backfill and compaction testing of all trenches related to the above and approval of same by the City's Construction Inspector.

All aggregate base and subbase (AB and ASB) shall be installed per provisions in Sections 25 and 26 of the Caltrans Standard Specifications. AB and ASB shall be compacted to 95% relative compaction. An oil seal is not required on the AB surface. If required by the City's Construction Inspector, AB and ASB shall be tested for compaction and approved by geotechnical engineer, licensed in California. It shall be proof rolled as specified in Section 71-4A.1 above if requested by the City's Construction Inspector. Written certification of compliance to these requirements shall be provided to the City's Construction Inspector.

Aggregate base shall be installed as a base for asphalt concrete paving where specified on the approved plans including over lime and fly ash or cement treatment is used [to stabilize the ASB](#).

Aggregate base in any thickness determined by the contractor may be used for meandering sidewalk wherever that sidewalk is not connected to the back of curb, or as a base for A-7 driveways outside the sidewalk at the curb returns. All aggregate base shall be compacted to 95%.

Where lone valley gutters are placed within the City pavement as in an alley, the aggregate base section for the gutter shall extend to the same depth as the aggregate base section for the adjacent asphalt concrete pavement.

Prior to paving, deflection in the compacted [AB aggregate base](#) shall be eliminated. Paving shall not commence without the approval of the City's Construction Inspector.

Lime/fly ash or other ~~base~~ stabilizers may be [substituted for aggregate base as permitted for subbase stabilization as recommended by the geotechnical engineer and shall not be used as a substitute for structural section components. in Section 71-5 D, Materials, provided a sacrificial two \(2\) inch thick layer of aggregate base is placed beneath the base lift of asphalt concrete, and compacted to 95% relative compaction.](#) The City, following addition and processing of lime/fly ash or cement shall require mandrelling of all non-rigid and shallow rigid underground utilities at the discretion of the Environmental Utilities or City's Construction Inspector. All utility systems shall be cleaned as appropriate. In the event a dig up and repair is required following lime/cement treatment [of ASB](#); the entire excavation shall be backfilled [with either with two-sack cement slurry, or dry native material compacted and conforming to the Construction Standards. Subgrade stability for roadway and/or concrete curb, gutter & sidewalk shall be](#)

reload tested by proof rolling with a loaded 3,000 gallon water truck and approved by the City Construction Inspector prior to the placement of aggregate base.

C. Concrete - All concrete curbs, curb & gutters, sidewalks, curb ramps, driveways, bus stop pads and turnouts shall be installed per provisions in Section 73 of the Caltrans Standard Specifications, Construction Standard Details ST-17 through ST-30 and ST-35 and ST-37 including the following provisions:

1. Thickness - All residential and commercial sidewalks shall be either six" thick, or 4" thick with 4" of compacted aggregate base. Across commercial driveways, and round-a-bout centers the concrete section shall be eight (8") inches with grade 60, #4 rebar, and 18 inches on center each way, conforming to the Construction Standard Details.

All commercial driveways and bus turnouts shall be eight (8") inches thick, with number 4, grade 60 rebar, on 18-inch centers each way. Rebar shall be set on 3 inch concrete dobies/rebar supports at three foot maximum spacing each way. The dobies shall include wire ties. See the Construction Standard Details.

Base for commercial driveways may be processed native subgrade or 3/4 -inch aggregate base compacted to 95% relative compaction.

2. Finishing - Concrete shall not be placed or finished in the rain. It shall be the Contractor's responsibility to schedule construction operations accordingly.

All gutters shall be flow tested with water during the pour to assure proper drainage. Following concrete finishing, no water shall pond in the gutter pan.

All concrete surfaces shall be completed with a medium broom finish unless otherwise specified. A heavy broom finish is not allowed. A concrete finish not conforming to the Caltrans Standard Specifications with regard to blemishes and alignment tolerances shall be cause for rejection of the work.

No stamps advertising construction companies or other private concerns shall be placed in the concrete.

A detectable warning (truncated dome) panel shall be placed at the back of curb line, immediately behind the curb and gutter, centered in the opening to the street (regardless of slope) at every curb ramp. (And shall not be sized as shown on the Case C ramp on Caltrans

concrete and a similar finish shall be maintained. The City's Construction Inspector shall determine if the damage to the concrete warrants patching. Generally, any conspicuous damage shall be patched.

- 11. Dowelling New Concrete to Existing** - When pouring combinations of sidewalk or curb and gutter contiguous to existing, the existing concrete vertical face shall be doweled three feet on center with 16 inch long, grade 60, #4 rebar penetrating four inches into the existing curb, four inches below top of curb. The dowel hole shall be 5/8-inch diameter at a slight angle horizontally. The penetrating portion of the dowel and the entire cleaned vertical surface of the adjoining existing concrete shall be 95% coated with two-part epoxy. All abutting sidewalk shall be doweled mid-section with two dowels for four through six-foot wide sidewalk and three dowels for wider sidewalk. Abutting curb and gutter ends shall be doweled twice, 18 inches apart, centered on the curb and gutter section. See Section 71-5 (Materials) for epoxy.

Where the street side of the meandering sidewalk meets the back of Curb at less than a 90 degree angle, the return to the back of curb shall be a minimum 18 inch radius or 18 inch space shall be provided between the front face of sidewalk and the back of curb.

Replaced sections shall be removed back to score marks, expansion joints or deep tool joints; or at the discretion of the City's Construction Inspector.

If the existing edge is damaged during removal, the concrete shall be sawcut again at the City's Construction Inspector's discretion.

- 12. Sidewalk, curb and Gutter Replacement** - Where sidewalk and/or curb and gutter is being replaced, the maximum length of sidewalk that may be replaced non-monolithically (without the attached curb and gutter) is 20 feet. If more than 20 feet is damaged continuous, the total sidewalk, curb and gutter section shall be removed and replaced monolithically. Where sidewalk, curb and gutter or curb ramps and driveways with sidewalk, curb and gutter as portions thereof are replaced, all replacement shall conform to the latest Construction Standards. [In the case where concrete sidewalk replacement is necessary where either the brass disc or property line score mark is removed, the developer shall be responsible to re-establishment of the surveyor's permanent marker in kind as identified on the Final Map.](#)

- 13. Median Islands** - All new roadway median infill areas shall have basket weave pattern stamped concrete with brick red #1117 per

made and not part of a subsequent coverage. Each coverage shall be completed before subsequent coverage is started.

Rolling shall commence at the lower edge and shall progress toward the highest portion, except that when compacting layers which exceed 0.25-foot in compacted thickness, and if directed by the Inspector, rolling shall commence at the center and shall progress outwards.

Rolling shall be performed so that cracking, shoving, or displacement does not occur.

When placing asphalt concrete, large aggregate that migrated to the surface during any handwork shall be returned to the pave box, rather than scattered over the surface of the mat.

Finish rolling or final compaction shall be completed while the temperature of the mixture is at or above 150° F. A vibratory roller may be used as the finish roller provided it is operated with the vibratory unit turned off.

Upon completion of rolling operations, if ordered by the City Construction Inspector, the asphalt concrete shall be cooled by applying water. Applying water shall conform to the provisions in Section 17, "Watering in the Caltrans Standard Specifications".

Asphalt concrete shall be compacted to not less than 92 percent or more than 96 percent of the theoretical maximum density as determined by CTM 309 and shall be finished to the lines, grades, and cross section shown on the Project Plans.

The City Inspector reserves the right to gather samples for material testing at random for the hot mix asphalt (HMA) material from behind the paving machine in accordance with CTM 125 to determine the maximum theoretical density of the HMA mixture in accordance with CTM 309. The theoretical maximum density results derived from the samples shall be averaged and used to determine the relative density achieved for the shift.

The pavement will be accepted for density on a lot basis. A lot will consist of ~~750±,000~~ tons or portions thereof. Cores for determining the density of the compacted pavement will be taken on a lot basis. A minimum of three (3) cores shall be taken per lot. The density of each core shall be determined in accordance with CTM 308.

The Contractor shall provide daily laboratory results of CTM 308 and CTM 309 to the City's Construction Inspector.

In-place pavement density will be determined by comparing the density of cores taken from the compacted pavement to the theoretical maximum density as determined by CTM 309. Pavement cores shall be collected using a 4 to 6 inch diameter core barrel when the pavement has cooled sufficiently to minimize disturbance to the cores at the discretion of the City's Construction Inspector. Cores shall be taken by either the developer's geotechnical engineer, as proposed at the start of construction, or the City's geotechnical consultant. No third party geotechnical engineer vendor hired by a contractor for quality control purposes shall be considered.

Finish, compacted pavement height shall be 1/4-inch above and over the gutter lip, except for six (6) feet at the curb ramp opening, where it shall be flush with the top surface of the gutter lip. Corrective operations for recently placed pavement more than 1/4-inch above the gutter lip may include reheat, knead and re-compact with pneumatic tired rollers, in order to bring the improvements into compliance.

The horizontal surface of AC paved against an existing AC surface shall be flush with the existing surface.

The completed surfacing shall be thoroughly compacted, smooth and free from ruts, humps, depressions or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other means approved by the Inspector. The use of any equipment that leaves ridges, indentions or other objectionable marks in the asphalt concrete shall be discontinued, and the Contractor shall furnish acceptable equipment.

Asphalt concrete placed in layers less than 0.15-foot in compacted thickness or widths of less than 5 feet shall be spread and compacted with equipment and by the methods specified in Section 39 of the CALTRANS Standard Specifications.

- 4) Miscellaneous Paving Requirements** - When a straightedge 12 feet long is laid on the finished surface and parallel with the centerline, the surface shall not vary more than 0.01-feet from the lower edge of the straightedge. The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 0.02-feet are present when tested with a straightedge 12 feet long laid in a direction transverse to the center line and extending from edge to edge of a 12-foot traffic lane.

- C. Asphalt Concrete** - Shall comply with the provisions of Section 39 of the California State Standard Specifications and as modified herewith. The requirements provided within these provisions shall supersede State Specifications where conflicts or other disparities exist.

Asphalt binder shall be performance grade 64-10 paving asphalt conforming to Section 92, "Asphalt," of the Caltrans Standard Specifications.

Asphalt concrete for alley's residential and collector roadways shall be Type A, 1/2-inch Maximum Medium Gradation, conforming to the requirements of Section 39-2 of the State Standard Specifications.

Reclaimed Asphalt Pavement (RAP) up to 15% of aggregate blend may be substituted as part of the virgin aggregate for hot mixed asphalt and shall meet the State's quality specifications. RAP not permitted in OGFC or RHMA-G.

Asphalt concrete shall be hot plant mixed and shall be furnished from the plant at a temperature not to exceed 325 degrees F.

- D. Lime/Fly Ash or Cement Treated Subbase** - On a case-by-case basis, lime/fly ash or cement treated subbase may be ~~an acceptable substitute for placement of compacted aggregate base material~~ permitted use in subbase stabilization. Prior to ~~plan~~ approval, the Developer shall submit to the City Engineer for review and approval, a proposal for lime/fly ash or cement treatment sections and compaction procedures, accompanied by recommendations from a California licensed, geotechnical engineer. In no case shall asphalt concrete be placed directly on lime/fly or cement treated bases ~~or shall~~ the recommended structural section be less than the City standard structural section from Table 7-2.

- E. Truncated Domes** - Truncated dome panels shall be of vitrified polymer composite construction, embedded type, or (surface applied for retrofit applications) manufactured by Armor Tile Tactile Systems, Buffalo, New York, ADA Solutions, N. Billerica, MA, or approved equal. The dimensions and interval of the truncated domes within the panel—shall conform to Caltrans Standard Plan RNSP A88 and Division of the State Architect Accessibility Reference Manual, Figure No. 31-23A. The orientation of the dome pattern for all panels shall be parallel with the panel edges.

- F. Graffiti Coating** –Blok Guard® (Prosoco), Acryli-Master (Graffiti Master), GCP 1000 (Genesis Coatings Inc.), Prmakote 333, by Visual Pollution Technologies or approved equal, non-sacrificial type only.

G. Epoxies, Patching Material - Following are products specified for the indicated applications.

- 1. Bonding extruded curb to asphalt concrete pavement; bonding concrete to existing during pour; bonding the top course of loose block, sound/retaining wall:** Burke Epoxy Binder 2104 Type 1 (Supplier: Whitecap), Rezi-Weld 1000, (Supplier: Spec-West), Sealtight Rezi-Weld ER-43 Type I, (Supplier: Spec-West) or approved equal.
- 2. Anchor Bolts:** Seal Tight Resi-Weld Gel Paste Unitized Cartridge Epoxy (Supplier: Spec West), Covert Operations CIA Gel 7000 (Supplier: White Cap) or Rebar SETXP (Supplier: White Cap, Home Depot), SpecPoxy 2000 by SpecChem or approved equal.
- 3. Patching:** Patchcrete (Supplier: Spec-West), Emaco R350CI Repair Mortar (Supplier: White Cap), Ardex CP (Supplier: Spec-West) or approved equal.

H. Reinforcement Bar - Rebar shall be grade 60 steel, deformed type. Smooth bar shall not be allowed. All rebar shall be number four (4) unless otherwise specified on the plans.

I. Concrete Curing Compound - Curing compound shall conform to ASTM C-309. Type 1-D and Class B, resin base, clear with fugitive red dye. Approved products include Burke Aqua Resin Cure (with dye), W.R. Meadows 1100- Clear Series (with dye) or approved equal.

J. Slurry Seal - Slurry seal shall conform to Caltrans Specifications, Section 37-2, and Type 2. A design mix shall be submitted to the Development Section for approval prior to commencing work.

K. Slurry Cement Backfill – The backfill must contain at least 188 pounds of cement per cubic yard and enough water to produce a fluid workable mix that flows and can be pumped without segregation during placement. When authorized by the City Construction Inspector, controlled low-strength material or dry mix “popcorn” backfill may be used with pre-approval, with similar cement content to the slurry cement backfill. A design mix shall be submitted to the City Inspector for approval prior to commencing work.

SECTION 81

DOMESTIC WATER SUPPLY SYSTEM CONSTRUCTION

81-12 APPURTENANCES INSTALLATION- All appurtenances, including fire protection, blow-offs, sample stations, air release valves and fire hydrants shall be installed in accordance with manufacturer's recommendations, these Construction Standards and the following provisions:

- B.** Gate valves shall be centered in a one-piece 8" riser stock. Riser stock shall be blue PVC C-900. An operator nut extension shall be installed on valves where the operation nut exceeds 40 inches in depth from final grade. Valve extensions shall be continuous and within 24 inches of finished grade.

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- E. Water Main-** Unless noted on the approved plans, all water mains shall be either Polyvinyl Chloride Pressure Pipe (PVC) or Ductile Iron Pipe (DIP).

- 3.** Concrete Cylinder Pipe- (CCP) shall be manufactured to conform to the standards AWWA C-303:

- 3a.** Approved CCP manufacturers include: Ameron or approved equals.

- G. Appurtenances** -In compliance with California State Assembly Bill 1953 and any amendments thereto, all brass components and pipe in contact with potable water intended to convey or dispense water for human consumption through drinking or cooking shall contain a maximum of 0.25% lead by weight. Compliant brass product shall be marked indicating the product is manufactured from a low-lead alloy. Non-compliant product shall be immediately removed from the construction site.

- 11.** Gaskets-Gaskets shall conform to the following specifications:

- 11d.** Insulating Flange Gaskets-Insulating flange gaskets shall be USSO Standard B.16.21 insulation flange kits, Type E Full Face Gasket with two-side insulation as manufactured by Calpico, or approved equal as per Detail W-21.

20. Meter Setters – A listing of approved meter setter manufacturers include: Ford, Jones, Mueller, or approved equal. Part reference numbers are shown below:

	Mueller	Part #
20d.		
i.	3/4" to 1"	B-24118-2N
ii.	1"	390 B-24118-6A
–iii.	1.5" to 2"	B-2423-99000N

31. Riser Stock For Main Line Valves - Riser stock shall be 8-inch diameter PVC C-900 for all main line valves.

a. Riser insert/main line valve lock out shall be used where the valve is located in the gutter pan. See Section 81-16.G.16

33. Service Boxes and Lids - All box lids are to be permanently marked with the appropriate label (i.e., Water, ARV, Blow-Off, CPT, etc.). Lids shall have a 1-7/8" hole offset at upper 1/3 portion of lid measured along the long axis. In commercial project, meter lids shall be stenciled with the number address it serves. The numbers shall be painted using white enamel paint and 2-inch stenciling. A list of approved box manufacturers include: Christy, BES, Armorcast, CDR, Placer Water Works, or approved equal. Part reference numbers are shown below:

CDR	Part #
3/4 "to 1" services	WBO3-1121-12 Box
	WCO0-1121-02RR Lid (10k load)
1" services	(For Tiers 15 & 22)*
<u>Quazite Lid</u>	<u>(For Tiers 15 & 22)*</u>

*Tiers 15 22: Driveways, parking lot, and off-roadway applications subject to occasional non-deliberate heavy vehicular traffic.

39. Valves

39a. Butterfly Valves- Butterfly valves to be used on pipe diameters ranging from 16" to 72". A list of approved valves include: Standard Pratt Ground Hog (Holiday free epoxy, interior lining and standard black asphalt varnish exterior) with MDT Traveling Nut Actuator, Mueller Linesal III (Holiday free epoxy, interior lining and standard black asphalt varnish exterior), Dezurik butterfly valve with square nut actuator, LA series (Holiday free epoxy, interior lining and standard black asphalt varnish exterior) or approved equal. Certification shall be provided by the valve manufacturer stating the epoxy lining

is holiday free. The epoxy coating shall be spark tested and approved for installation by the Environmental Utilities Department inspector.

H. **CONDITIONALLY APPROVED**

The following products are conditionally approved in the City for a period of 2 years conditional acceptance period, the product may be granted approved equal status and be added to the list of approved products in the City of Roseville Standards.

1. 1" Water Service
 - a. FlowGuard Bendable PVC Pipes
2. Old Castle Precast (Formerly U.S. Concrete Precast)
 - a. Sewer Manholes and Appurtenances
 - b. Grease Interceptors

~~3. Traffic Boxes and Lids
a. CDR 1" services Part# (For Tiers 15 & 22)*~~

~~*Tiers 15-22: Driveways, parking lot, and off roadway applications subject to occasional non-deliberate heavy vehicular traffic.~~

- ~~3. SIP Industries DIP
 - a. C153 Compact MJ Ductile Iron Fittings
 - b. C110 Full Body Flanged Joint Ductile Iron Fittings
 - c. Ductile Iron MJ Restraints for Ductile Iron and PVC Pipes~~

SECTION 84

TRAFFIC STRIPES & PAVEMENT MARKINGS

84-1.01 DESCRIPTION - Traffic stripes and pavement markings shall be installed in accordance with the approved improvement plans and specifications, these Construction Standards, the City Design Standards, The California Manual on Uniform Traffic Control Devices (CAMUTCD), The State of California Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the CalTrans Standard Specs.

Sandblasting of traffic stripes shall not be permitted. Removal of traffic stripes shall be by grinding, or by other methods approved in writing by the Engineer. Drain inlets adjacent to areas to be ground shall be protected from grindings entering the storm drain system. For removal of pavement markings, a rectangular area shall be ground to prevent ghosting of the original marking and be covered with rectangular area of Type II slurry. Conflicting striping shall be removed completely. Type II slurry of conflicting striping is required when it crosses the new traveled lane. When this occurs, the entire lane shall be slurried from lane line to lane line over the entire length of the conflicting striping. This requirement will not apply to ceramic markers unless specified on the plans.

All striping or pavement markings damaged during construction shall be repaired at the contractor's expense. Repairs shall consist of complete replacement of markings or legends, replacement of sections of thermoplastic striping, and replacement of damaged or missing markers as directed by the Engineer.

All pavement markings on concrete surfaces (unless otherwise noted) shall be 3M tape or equivalent in place of thermoplastic material.

84-1.03 TOLERANCES & APPEARANCES - The following clarifications or modifications shall be applied when installing traffic stripes and pavement markings:

1. In addition to locations as shown on the plans, bike lane signs and pavement markings shall be installed at no more than one half-mile intervals and following every break in the bike lane striping. The BIKE LANE legend shall be centered in the lane to ensure the legend does not run into the lane striping.
2. A bicycle detector pavement marking shall be installed in conjunction with each bicycle detector loop at signalized intersections per

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CAMUTCD Figure 9C-7 and shall be placed starting 6 inches back of the crosswalk/stop bar.

3. Unless otherwise specified on the plans, crosswalks shall be eleven (11) feet wide, measured from the centerline of the stripe.
4. Traffic stripes and pavement markings shall not be placed over utility covers including, but not limited to, manhole covers, utility boxes, hand holes, or water valve covers.
5. STOP legend pavement markings and limit lines are required with stop signs. YIELD legend pavement markings are not required with yield signs. The yield limit line shall be per the CAMUTCD with CS (24" by 26" triangles).
6. Pavement arrows shall be one of the following types unless otherwise directed by the Engineer: Type II (L, R or B), Type III (L, R, or B), Type VI or Bike Lane Arrow.
7. At signalized intersections with left turn lanes longer than 150 feet, an additional Type II, or Type III arrow shall be placed 20 feet behind the limit line. Where there are dual left turn lanes with staggered limit lines, the arrows in the number 1 left turn lane (closest to the median) shall be placed 15 feet behind the limit line, and the arrow in the number 2 left turn lane shall be placed 20 feet behind the limit line. The intent is to have the two arrows line up side by side, even though the limit lines are staggered.
8. All turn lanes shall have a Type II or Type III arrow at the beginning of the turn lane such that the tail of the arrow lines up with the beginning of the Detail 38 striping. All turn lanes 150 feet or longer shall have a minimum of two Type II or Type III arrows (one arrow for every 150 feet of turn lane).
9. All traffic lane striping shall be discontinued through any four way public intersection from crosswalk to crosswalk, marked or unmarked. Striping shall be continuous through private intersections unless there is a striped left turn lane and/or traffic signal. For non-signalized public "T" intersections, the through and bike lane striping shall be continuous for the non-intersection direction, i.e. "across the top of the T". However, there shall be no striping within the limits of the crosswalk.
10. At locations where bike lane striping is used to channelize traffic, right turn acceleration/deceleration lanes and bus turnouts, both strips shall be detail 38. Reflective pavement markers shall be placed to the vehicle travel lane side of both stripes.

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11. Bike lane striping shall be continuous except at right turn bay tapers, intersections with City streets, and driveways where the centerline/median is broken. See TS-18 for examples.
12. Lanes designated by the Engineer as auxiliary shall be striped as directed by the Engineer. Examples of typical auxiliary lane striping can be seen on TS-19. Bike lane striping along auxiliary lanes shall be a modified Detail 38 with 4 foot stripes at 10 feet on center.
13. Left turn arrows shall not be placed in Two Way Left Turn Lanes unless otherwise directed by the Engineer.
14. Stop and yield bars shall be 7 feet back from the center of the pedestrian access ramp unless directed otherwise by the Engineer. Where the stop sign is installed with a yellow school crosswalk, a supplemental white stop bar shall be installed 4 feet back from the crosswalk line.
15. Lane line extensions for dual turning lanes ([right and left](#)) shall be placed on a continuous arc as appropriate for a turning 40 foot bus. Triple turning lanes shall be placed to accommodate the turning of a 65 foot total length (California legal) tractor truck-semitrailer (-TS-20).

THERMOPLASTIC TRAFFIC STRIPES & PAVEMENT MARKINGS

84-2.0203 MATERIAL - THERMOPLASTIC TRAFFIC STRIPES & PAVEMENT MARKINGS The thermoplastic material shall conform to State Specification ~~8010-19~~[APTH-02ALKYD](#),

Thermoplastic Traffic Striping Material, Alkyd Binder, White and Yellow. [All thermoplastic must be applied per Section 84-2.03C\(2\)\(b\) Extruded Thermoplastic Traffic Stripes and Pavement Markings](#)

84-2.041. APPLICATION

The Contractor shall apply an adhesive primer base coat prior to the application of any thermoplastic material on treated pavement, stamped pavement, colored pavement, concrete surfaces, or pavement older than 30 days.

As shown on the plans, the following permanent traffic lane striping shall be thermoplastic, and placed as one of the following types: Detail 25, 27B, 38, 39, 39A and Detail 40. Pavement Markers are also required for placement of Detail 25 and 38.

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SECTION 85

PAVEMENT MARKERS

85-1.01 DESCRIPTION - Pavement markers shall be installed in accordance with the approved improvement plans and specifications, these Construction Standards, the City Design Standards, The California Manual on Uniform Traffic Control Devices (CAMUTCD), The State of California Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the Cal Trans Standard Specs.

85-1.04 NON-REFLECTIVE PAVEMENT MARKERS - All non-reflective pavement markers shall be ceramic.

85-1.05 RETROREFLECTIVE PAVEMENT MARKERS - All lane line pavement markers of two and three lane arterials shall be type C Red-Clear retroreflective markers [and shall be placed between through lanes](#).

85-1.06 PLACEMENT - As shown on the plans, the following permanent traffic lane striping shall be raised pavement markings, and placed as one of the following types: Detail 4, 7, 10, 13, 17, 20, 23, 25, 26, 30, 33, 37C, or Detail 38. Thermoplastic striping is also required for placement of Detail 25 and 38.

Detail 26 markers shall be placed 2 inches from the face of the median curb.

At all fire hydrant locations, a blue reflective pavement marker shall be installed one foot off paved centerline or median on the hydrant side of the roadway.

All traffic lane striping shall be discontinued through any four way public intersection from crosswalk to crosswalk, marked or unmarked. Striping shall be continuous through private intersections unless there is a striped left turn lane and/or traffic signal. For [non-signalized](#) public "T" intersections, the through and bike lane striping shall be continuous for the non-intersection direction, i.e. "across the top of the T". However, there shall be no striping within the limits of the crosswalk.

At locations where bike lane striping is used to channelize traffic, right turn acceleration/deceleration lanes and bus turnouts, both strips shall be detail 38. Reflective pavement markers shall be placed to the outside of the bike lane along both stripes

SECTION 86

SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS

86-1.01 GENERAL - Signals, lighting, electrical systems shall be constructed/installed in accordance with the following standards listed in priority - the approved improvement plans and specifications, these Construction Standards and the City Design Standards, The California Manual on Uniform Traffic Control Devices (CAMUTCD), The State of California Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the CalTrans Standard Specs. Note that the more recent of either the City of Roseville Construction or Design Standards shall govern the older of the two.

Signal phasing shall start with phase 2 northbound and proceed in a clockwise direction unless directed otherwise due to coordinated corridor restrictions.

A copy of the Traffic Signal Inspection Check List is included on TS-22 as a reference of required inspections during construction.

86-1.04.1 EQUIPMENT LIST AND DRAWINGS - The City shall provide as discussed in these Standards, the following traffic signal equipment and materials listed below unless otherwise specified in the plans. (For signals being installed as a developer obligation, the City shall supply equipment as outlined in the City Standards at the developer's cost. Full payment is required prior to the release of the equipment. The Contractor shall identify the cost of the City furnished equipment as a bid item):

Upon ten calendar day notice to the City's Construction Inspector, the equipment and materials to be provided by the City will be available for pick-up by the Contractor at the City's Corporation Yard located at 2005 Hilltop Circle, Roseville. The Contractor shall provide all labor and equipment necessary to load, transport, and install the City-provided equipment and materials.

Traffic signal standards, posts, and mast arms shall be of the types listed below:

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and existing roadways shall be located along the centerline of the bike lane stripe or stop bar/crosswalk striping whenever possible. The trench cut will be hidden by the stripe where applicable. Pre-existing improvements requiring deviation from the centerline of the stripe shall be accomplished within 20 feet from the beginning to the end of deviation. Deviations along bike lane lines shall be to the curb side of the stripe unless directed otherwise by the City. Deviations greater than 20 feet shall require asphalt concrete repair per Item 4 below.

4. Rock wheel trenching parallel to the roadway centerline across acceleration, deceleration, or bus turn out openings that cannot be completed per TS-13 upon the same day shall be filled with concrete to the top of the trench and the Contractor shall return to complete an 18-inch "T" grind and overlay per – Detail TB-3.
5. Saw cutting in the street other than rock wheel trenching will require pavement repair per TB-1 or TB-3 and/or grinding between lane lines per City Standards found elsewhere in this document.
6. Should the contractor fail to install the conduits in new roadways prior to the bottom lift of asphalt concrete, the City will require the installation of Tensar a Glas Grid 8502 or equivalent mat prior to the final lift of pavement.

The contractor is solely responsible to provide all labor and equipment necessary to locate existing underground facilities beyond the information provided by the U.S.A. markings including, but not limited to, metal detectors, wire locating equipment, and potholing.

86-2.06A PULL BOXES - Pull boxes shall not be placed within the area of an access ramp unless directed by the Engineer. Pull boxes should be installed a minimum offset of 1' from back of walk of walk when within the sidewalk, and from any score or expansion joint. The bottoms of pull boxes shall be bedded in 6 inches of clean crushed rock. Grout in the bottom of pull boxes is not required. The pull box rim and lid shall be flush with surrounding surface. In planter areas, the pull box rim and lid shall be 1 inch above the finish grade. Pull boxes located outside of the sidewalk or planter area behind a sidewalk shall be of the Caltrans traffic rated pull box design.

Conduit termination in the pull box shall be a minimum of 2" from the sides of the pull box, 2" above the crushed rock, and at least 8" below the bottom of the pull box cover. Conduits shall enter and exit pull box quadrants relative to the direction of the run.

All pull boxes and lids shall be [precast reinforced concrete Fiberlyte FL36](#) unless otherwise directed by the Engineer.

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All pull boxes shall be No. 6 except as modified by the plans or the provisions below:

1. Advance loop pull boxes shall be No. 6 and shall have a minimum of 20 feet of detector lead-in cable (DLC) and 20 feet of extra loop cable spooled in the pull box.
2. The “Home Run” and “Communication Home Run” pull boxes (typically adjacent to the controller) shall be No. 6, ~~C48E-Fiberlyte FL36 24” deep boxes vaults with 12 inch extensions (double stack).~~ Detector loop splicing is not allowed in the “Home Run” pull boxes.
3. ~~Fiberlyte (FL36) +24” inch deep extension vaults shall be installed at the fiber hub locations as designated by the City and at every fiber optic cable splice point. Vaults shall be installed within the controller pad whenever possible. Where a traffic rated box is required the C48 (Concrete) vault shall be used with a steel checker plate bolt down lid. See TS-14 for additional installation details.~~
4. ~~An N48 Vault shall be installed near (as directed by the City) the controller cabinet for fiber.~~

All pull boxes to be abandoned shall have conductors removed from the pull boxes and conduits and the pull box shall be removed. The remaining hole shall be backfilled and compacted with similar material as the surrounding material. If within a sidewalk, the entire square of sidewalk shall be removed and replaced.

86-2.06B COVER MARKING - ~~Strips shall be fastened with 1/4 inch stainless steel rivets.~~

Pull box covers shall read “TRAFFIC SIGNAL”, except covers for pull boxes used solely for traffic signal interconnect. Should the signal interconnect pull box or vault contain any communication cable, the cover shall read “TRAFFIC SIGNAL FIBER OPTICS” instead.

86-2.08 CONDUCTORS - Conductor installation in new conduits shall be limited to 26 percent fill of the conduit maximum. Conductors installed in existing conduits shall be limited to 40 percent fill of the conduit maximum.

A ~~Fiber-Tek part number WPT1250~~DLC taped with a 5” green band and labeled with “locate” or approved equivalent pull tape shall be installed in all conduits.

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Equipment grounding conductors shall be #6 stranded copper with insulation.

At new and remodeled traffic signals, a three inch, two cell “MAX CELL” or equivalent product shall be provided in all street crossing traffic signal conduits and from #1 Home run box to controller cabinet and must be installed using swivels

~~Three-Two~~ (32) category 5E cables (Mohawk Lan-Trak OSP, part number M58790), or City approved equivalent, and one (1) power cable (IMSA 14-3/20-1-STR 600V, Belden part number 601195) or City approved equivalent to top of designated pole with 10 feet of slack for each cable at the top of the pole and 30' of slack in the pull box adjacent to the pole.

In order to reduce strain on the Cat5 cabling, all cables shall be adequately supported by feeding them through a Kellems grip which is attached to and suspended from the pole cap. The hole drilled for the cabling shall be drilled on the back side of the pole three feet from the top in order to minimize the camera view obstructed by the cable and shall be threaded for a straight 3/4” strain relief cord connector. At least four feet of cable shall be pulled through and secured by the strain relief cord connector. The cables shall be looped together, adequately secured to the pole to prevent movement, and sealed on the ends to prevent moisture exposure.

The contractor shall install new wire and/or cable in conformance with guidelines below. It is assumed that all existing conductors and cables are undamaged unless inspected, documented, and reported to the inspector prior to the contractor starting that section of the work. Otherwise, any damage to City facilities shall be repaired by the contractor at the contractor’s cost in conformance with City standards.

New traffic signal and SIC conductors shall be installed per the following guidelines:

1. New wire may be pulled through existing conduits without removing conductors if based on common conditions:
 - a. There are a maximum number of four, ninety degree by twenty-four inch radius bends in one conduit run between pull boxes or termination points, and
 - b. Conductors, conduit, number of bends and length of the pull are within reasonable limits (under 175 feet for signal wiring and under 400 feet for signal interconnect wiring), and

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The sealant shall be 35 year rated. There shall be no substitution for the silicone sealant.

Where no vehicle or pedestrian displays are to be installed on the side of a signal pole, a terminal compartment only shall be installed on the signal pole at the vehicle display position. All signal display wiring from the signal mast arm shall terminate at this location.

Pedestrian head mounts shall be clam shell type with bronze mounting hardware. Mounting shall include one Allen head screw for opening and all wiring shall be quick connect type (plug in).

86-5.01A(4) VEHICLE DETECTORS CONSTRUCTION MATERIALS - The first front call loops shall be Type D or a "Quadra Circle". All other vehicle loops shall be type A. Refer to details TS-9 and TS-10 for further information. The loops nearest the stop bar shall be placed 1 foot from the stop bar. Where a loop is designated to have counting ability as discussed above, the loop shall not share an input with any other loop. Loop wire shall terminate in the nearest pull box and not the hand hole.

Vehicle loop wire shall be Caltrans Type 1 or Type 2, RHW USE, neoprene jacketed, cross linked polyethylene insulated, # 12 stranded copper.

All loops placed in concrete shall be City approved performed loops (See City approved equipment list).

Bicycle detection loops shall be Type D modified as follows:

- The loop size shall be decreased such that it is 1 foot narrower than the bike lane. A 6 foot bike lane shall have a 5 x 5 foot loop, a 5 foot bike lane shall have a 4 x 4 foot loop, etc.
- The loop shall be centered in the lane.
- The center front of the loop shall be 3 feet back of the crosswalk/6" back of the stop bar.
- Each bicycle loop shall have its own detector lead-in cable and shall be spliced in the pull box not the handhole.
- Each loop shall consist of five turns of 14 AWG with XLLP insulation.

Lead-in cable shall be Type B copper. Tinned copper shall not be permitted. Lead-in cable shall not be spliced between the termination point (pull box adjacent to the detector loop) and the controller cabinet terminals. A spare DLC shall be pulled to each advance loop pull box with 20' of slack.

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pavement shall be resurfaced with the resurfacing material used in the previous resurfacing project or as otherwise approved by the City Engineer.

Loop wires shall be labeled in the following manner:

lane 1-black	lane 5 -yellow
lane 2-red	right turn lane - orange
lane 3-blue	
lane 4-white	

1. Labels shall consist of banded colored tape visible in the pull boxes, where the loop wire is spliced to the detector lead-in cable.
2. Loop detectors shall be clearly marked to reference their location in relation to the limit line and lane. The loop closest to the crosswalk in the left most lane shall be labeled as loop number 1-1. The second loop in the same lane shall be labeled 1-2, and so on. Refer to details TS-9 and TS-10 for further information.
3. The start and end leads of a loop detector shall be clearly marked by a means of plastic tie wrap labels.

Loop Home Run slots shall be double cut to accommodate the twisted pair (3-turns/foot), or as directed by the Engineer. Sealant for filling slots shall be Hot Melt Rubberized Asphaltic Sealant or equivalent as approved by the Engineer. All excess sealant shall be squeegeed off after application if under the top lift. If surface cut lift, must be neatly applied (not squeegeed).

During loop installation, the Contractor shall in the presence of ~~the Engineer~~Signal Technician, perform a high resistance test and an inductive reactance test. The Contractor shall notify the Engineer at least 48 hour prior to loop installation.

All wires for each detector loop shall terminate in the nearest pull box, not the hand hole.

Lead-in cables shall not be spliced between the termination point (the pull box adjacent to loop detectors) and the controller cabinet terminals.

Where the approved plans call for preformed detector loops, the following shall apply:

1. The conduit shall be sealed to prevent the entrance of water and the movement of wires within the conduit.

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2. The loop wires from the preformed loop to the adjacent pull box or hand hole shall be twisted together into a pair (at least three (3) turns per foot) and encased in Schedule 40 or Schedule 80 PVC or polypropylene conduit (3/8 inches minimum diameter). The lead-in conduit shall be sealed to prevent the entrance of water at the pull box and hand hole end.
3. The preformed loop and lead-in conduits shall be placed prior to pouring final concrete. The top of the conduit shall be between 2 and 3 inches below top of finished surface. Where the concrete is steel reinforced, the preformed loops may rest on the steel.
4. All detector loop shields shall be left 6" in length and wrapped around the DLC and secured with shrink wrap.

Typical vehicle detector layout and inputs shall be as follows (see details TS-9 and TS-10):

1. For permissive or protected left turn situations, the left turn lane shall have four loops with the first and second loops spaced 8 feet apart, the second and third loops spaced 9 feet apart, and the third and fourth loops spaced 10 feet apart. The fourth loop shall have counting ability. The other three loops can share one input.
2. Each through lane shall have two call loops spaced 8 feet apart with one count loop spaced 9 feet behind the second call loop and one advanced loop placed per the CAMUTCD.
3. Each right turn only lane shall have one loop placed 30 feet behind the stop bar in line with the through lane count loops. The loop shall be used for counting and may be used for detection following a 10 second minimum delay.
4. For the stem of a "tee" intersection, each left turn lane shall have four loops with the first and second loops spaced 8 feet apart, the second and third loops spaced 9 feet apart, and the third and fourth loops spaced 10 feet apart. The fourth loop shall have counting ability. The other three loops can share one input. No intermediate or advanced loops will be required on "tee" stems.
5. For split phase signals with a shared through/left turn lane, the shared lane shall have four loops with the first and second loops spaced 8 feet apart, the second and third loops spaced 9 feet apart, and the third and fourth loops spaced 10 feet apart. The fourth loop shall have counting ability. There shall also be one advanced loop placed per the CAMUTCD.

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6. ~~Any loop installed where the associated DLC has a run length greater than 250 feet, the~~All loops installation shall have 4 wraps.

86-5.01E DETECTOR LOOP CIRCUITRY - Adjacent loops on the same sensor unit channel shall be wound in opposite directions (refer to details TS-9 and TS-10 for further information). All loops shall be wound in a manner such that any adjacent loop will be wound in the opposite direction. The loop at the limit line, closest to the center median (lane 1), shall be wound in a clockwise direction. The next loop back in the same lane shall be wound in a counter-clockwise direction and so on. The loop detector in lane 2 closest to the limit line, shall be wound in a counterclockwise direction.

86-5.02 PEDESTRIAN PUSH BUTTON ASSEMBLIES - Pedestrian push buttons shall be aluminum Type “B” with metal international symbol signs. Push buttons shall meet all Americans with Disabilities Act guidelines and be placed 36 inches above the grade of the closest edge of sidewalk and require a horizontal reach of no more than 18 inches outside the closest edge of sidewalk. Buttons shall be solid state, two tone audible, momentary LED type. Contact the City for approved vendors and models. ~~Audible Ped APS shall be on separate posts as directed by the City.~~ The Contractor shall provide a City approved wave file.

Pedestrian push buttons shall be within five (5) feet from the edge of the access ramp pan (CAMUTCD Figure 4E-2).

86-6.01 HIGH PRESSURE SODIUM LUMINAIRES - All traffic signal luminaires shall be 400 watt equivalent LED unless directed otherwise by the City. See the City’s website for a list of approved equipment. Two (2) separate 120 volt circuits shall be provided to equally split the powerload.

86-6.065 INTERNALLY ILLUMINATED STREET NAME SIGNS - Internally illuminated street name signs shall be slim profile, LED with City logo. Contact the City for approved vendors and models. Sign proofs must be approved by the City prior to ordering equipment.

Internally Illuminated Street Name Signs (IISNS) shall require a City Traffic Engineering accepted stamp for all layout proof matching existing City LED IISNS’s prior to ordering. Only products with prior approval from the City shall be allowed.

1. Refer to City of Roseville Construction Standards Section 56 “Signs”.
2. Internally Illuminated Street Name Signs (IISNS)
 - a. All proof require a City approved layout matching existing

SECTION 91

SANITARY SEWER SYSTEM CONSTRUCTION

91-9 PIPE INSTALLATION – The sewer system outfall(s) shall be mechanically plugged and grouted, and shall remain plugged until final acceptance. Sewer pipe (gravity and pressure) shall be installed in accordance with the following provisions:

J. Ductile Iron Pipe (DIP) Installation – DIP for sewer applications shall have an interior coating with “~~Protecto-401~~ [Permathield 431](#)” (or approved equal) unless otherwise specified on the approved plans. The pipe shall be exothermically welded, electrically continuous as described herein. DIP shall be encased in polyethylene as specified in Section 81, Domestic Water Supply System Construction, of these Construction Standards. DIP sewer systems shall be constructed per the manufacture’s recommendations and the following:

2. Force Main Installations – The force main shall be constructed and tested in accordance with the water pressure pipe standards established in Section 81, Domestic Water Supply System Construction, of these Construction Standards, with the following deviations:

2d. When it is necessary to cut a “~~Protecto-401~~ [Permathield 431](#)” treated pipe, the City’s Wastewater Division shall make all repairs prior to installation. Coordinate through the Environmental Utilities Department inspector.

2e. All DIP fittings for wastewater use shall have an interior coating with “~~Protecto-Permathield-401-431-~~ [Permathield-401-431-](#)” or approved equal.

4. Placing Pipe in Casing – Conducted pipe shall be fully restrained ductile iron with ~~Protecto-401~~ [Permathield 431](#) interior coating, supported by a minimum of three sets of Calpico or equal synthetic skids per stick of pipe, or as required by the Environmental Utilities Department. Pipe sections shall be joined outside of the casing. The skids and casing entrance shall be lubricated prior to sliding the conducted pipe into place. The height of the skids may be adjusted to meet specified grades.

The space between the conducted pipe and casing shall be completely filled with clean, dry silica sand, blown into place. Both ends of the casing shall be plugged with non-shrink grout a minimum of 12 inches into the casing. Both ends shall have a pipe of sufficient diameter placed through the mortar plug and parallel with the conducted pipe. One pipe shall be used for blowing the sand into the annular space. The other pipe shall remain open for venting. Prior to starting, the method of placing sand in the void shall be approved by the Environmental Utilities Department.

91-10 MANHOLE INSTALLATION – Manholes shall be installed in accordance with the Construction Standard Details and as specified herein:

J. Frame and Lid – The manhole frame and lid shall be sealed with an approved rubber gasket. Manholes constructed in streets shall have the lid bolt holes filled with silicone. Manholes constructed outside of the street or paved area shall be bolted down or closed by other locking mechanism.

91-12 TESTING OF INSTALLED IMPROVEMENTS – Sewer mains, services, manholes and appurtenances shall be tested by the following procedures:

D. Inspection Criteria for Coated Ductile Iron Pipe – All ductile iron sewer will have the following additional inspection requirements:

1. The condition of the barrel section of pipe as well as 360° at each joint shall be recorded to a DVD or portable drive. Once completed, and the inspection demonstrates the pipe meets the City's construction standards, the contractor may proceed with the backfill of the trench. The Contractor shall provide the DVD and a map of the section inspected, to the Wastewater Collection Division for review prior to the City's acceptance inspection.
2. Upon finding any deficiency in the pipe which does not meet the Design and Construction Standards of the City of Roseville, it is strongly encouraged that the contractor make the necessary corrections at that time. If deficiencies aren't corrected City forces at time of acceptance CCTV will identify these deficiencies and require the contractor to dig and replace, there will be on exceptions.
3. The observation data on the DVD provided to the City shall include the following:

- a. City wide job number
- b. Project name
- c. Location (street name)
- d. Manhole numbers (based on approved plan set or city asset numbers if applicable)
- e. Direction of inspection (upstream or downstream)
- f. Date of inspection

4. The speed of travel shall be slow enough to inspect each pipe joint, wye connection, coating integrity, and potential sags. Camera speed should travel at a rate of no more than 30 feet per minute. The camera speed should be steady or slower when recording features and defects.

DE. Manholes – Sewer manholes shall pass a vacuum test consisting of the following criteria and procedures:

EF. Manholes – Topside Improvements – When all water, recycled water and sewer infrastructures have passed air, vacuum, pressure and continuity test as well as CCTV inspection the EU inspector shall send a memo to the Development Services Inspector indicating that the project is ready for road bases and top side improvements only. This does not constitute approval for use of the infrastructure.

FG. Tying Into the City System – A tie-in procedure shall be submitted and approved by the Environmental Utilities Department prior to the proposed work. The contractor shall allow for up to seven days for review of the procedures by the Environmental Utilities Department. The sewer system shall be tied into the City system within 10 working days upon completing and passing all the testing procedures. Tie-ins shall be conducted as specified in Section 91-2 of these Construction Standards.

91-16 MATERIALS

D. Sewer Main and Services – Unless noted on the approved plans, all gravity pipe shall be Vitrified Clay Pipe Bell and Spigot (VCP), conforming to ASTM C700-C301, C828 Standards manufactured by Gladding McBean or approved equal. The VCP shall be Extra Strength and shall not be dipped in solution or glazed to enhance air pressure tests.

All force main pressure pipe will be Ductile Iron Pipe (DIP) manufactured by Pacific States Company, US Pipe, Griffin, [Electrosteel USA](#) or approved equal. The interior of the DIP shall be coated with ~~Protecto-Permashield 401-431~~, or approved equal, from bell gasket seat to 8 inches of spigot end exterior. The ~~Protecto-401~~ coated DIP shall be manufactured with an exothermic weld (cadweld) plate installed on the spigot end.

101-3 DROP INLET INSTALLATION - Drop inlet installations shall conform to Construction Standard Details DR-1, DR-2 and DR-3 and to provisions in Sections 51 and 52 of the Caltrans Standard Specifications. The interior of the drop inlet shall have a troweled finish; rock pockets shall be grouted and brushed; exposed top surfaces shall have a Class I Surface Finish. Within all City streets and easements and within all commercial sites and private residential subdivisions, a fish stamp conforming to Construction Standard Detail DR 20 shall be placed adjacent to all drop inlets. If the storm drain system is active and open to discharges, then immediately following installation, all storm drain inlets shall be protected with sediment control protection until construction no longer poses a risk of sediment discharges.

101-4 MANHOLE INSTALLATION

A. Bases -

- 1. Precast-** Precast concrete structures shall be of approved design and sufficient strength to withstand the loads to be imposed upon them. Precast concrete walls for catch basins shall be 6-inch thickness except at knockouts where the minimum thickness shall be 2-inches. Precast bases shall be placed on a foundation of 1/2 inch minus crushed rock, a minimum of 4 inches thick, compacted to 90-Percent relative compaction. Elevation differentials of inlets and outlets shall conform to the approved improvement plans. Openings in the base shall align true with all inlet and outlet pipes. Stub-out or couplings provided in precast bases shall be of the same material as the pipe to which they connect, unless otherwise approved by the City's Construction Inspector. Precast bases shall be furnished with cutouts or knockouts. Unused knockouts need to be grouted solid to wall thickness dimension if wall is left intact. Pipes shall be installed only in factory knockouts unless otherwise approved by the City Engineer. Maximum Knockout or cutout hole-size shall not be greater than the sum of the outer pipe diameter plus the catch basin wall thickness.
- 2. Cast-in-Place Base** - The cast-in-place base portion shall not be placed higher than 6 inches above the outside tops of the main incoming and outgoing pipes.

The wall thicknesses for the top of the cast-in-place base sections shall conform to the following table:

Manhole Diameter	Minimum Wall Thickness
48"	5"
60"	6"

12" through 15"	D3034, SDR 35
18" through 27"	F794, F2241, SDR 51
30" through 48"	F794

All PVC pipe joints shall be integral wall bell and spigot configuration, factory formed. All rubber rings shall conform to ASTM Designation F477.

- 4. Precast Reinforced Concrete Pipe (RCP)** - RCP shall conform to ASTM Designation C76 for Class I, II, III, IV or V. The class of pipe shall be based on the designation conforming to the approved plans.

Joints for RCP shall be bell and spigot with rubber gasket. The gasket shall conform to Section 65 of the Caltrans Standard Specifications.

- 5. Steel Reinforced High Density Polyethylene Pipe (SRHDPE)** – SRHDPE shall be manufactured in accordance with ASTM F2562 “Standard Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage”. SRHDPE shall be manufactured from high density polyethylene stress rated resins conforming to the minimum requirements of cell classification 345464 C per ASTM D3350 “Standard Specification for Polyethylene Plastic Pipes and Fittings Material”. Joints shall be watertight to an internal water pressure of 15 psi when tested in accordance with ASTM D3212 “Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals”. SRHDPE shall be CONTECH (DuroMaxx) or approved equal.

- 5-6. Polypropylene Pipe - N-12 HP Pipe 12” – 60” Diameter –** Shall conform to ASTM F2736 (12-30 inch diameters) and ASTM F2881 (36-60 inch diameters). Joints must be watertight in accordance to ASTM D3212 with gaskets meeting the requirements ASTM F477. Minimum cover shall be 36” cover from top of pipe bell to bottom of roadway structural section. Maximum cover exceeding 20-feet and unpaved surfaces will be approved on a case-by-case basis at the discretion of the City Engineer.

- E. Stormwater Treatment Devices** - Devices to be used in conjunction with treatment train configurations shall demonstrate removal rates of urban pollutants, measured as Total Suspended Solids (TSS), in the order of 80% reductions. All devices shall be pre-approved by the City Engineer, and identified in the projects Stormwater Pollution Prevention Plan, (SWPPP).

- F. Outlet and Inlet Structures** - All outlet structures shall conform to Construction Standard Details DR-9 through DR-14 inclusive.

Standard Details

RECYCLED WATER

<u>Recycled Water 2" Inch Blowoff Assembly (All Brass)</u>	<u>RW-1</u>
<u>Recycled Water Inline 2" Blowoff Assembly (All Brass)</u>	<u>RW-2</u>
<u>Recycled Water 3" & Larger Service</u>	<u>RW-4</u>
<u>1" and 2" Air Release Valve Assembly</u>	<u>RW-5</u>
<u>¾" & 1" Service Line</u>	<u>RW-6</u>
<u>Recycled Water #88-V Eclipse Sampling Station For Warm Climates</u>	<u>RW-7</u>
<u>1-1/2" & 2" Recycled Water Service</u>	<u>RW-8</u>

SANITARY SEWER

<u>Sewer Service</u>	<u>SS-4</u>
<u>Grease Interceptor (TYP.)</u>	<u>SS-6</u>
<u>Sand/Oil Interceptor</u>	<u>SS-7</u>

STREETS

<u>Type 1 and 2 Curb and Gutter with Sidewalk</u>	<u>ST-17</u>
<u>Typical Traffic Control Lane Closure/Transition</u>	<u>ST-40</u>

TRAFFIC SIGNALS

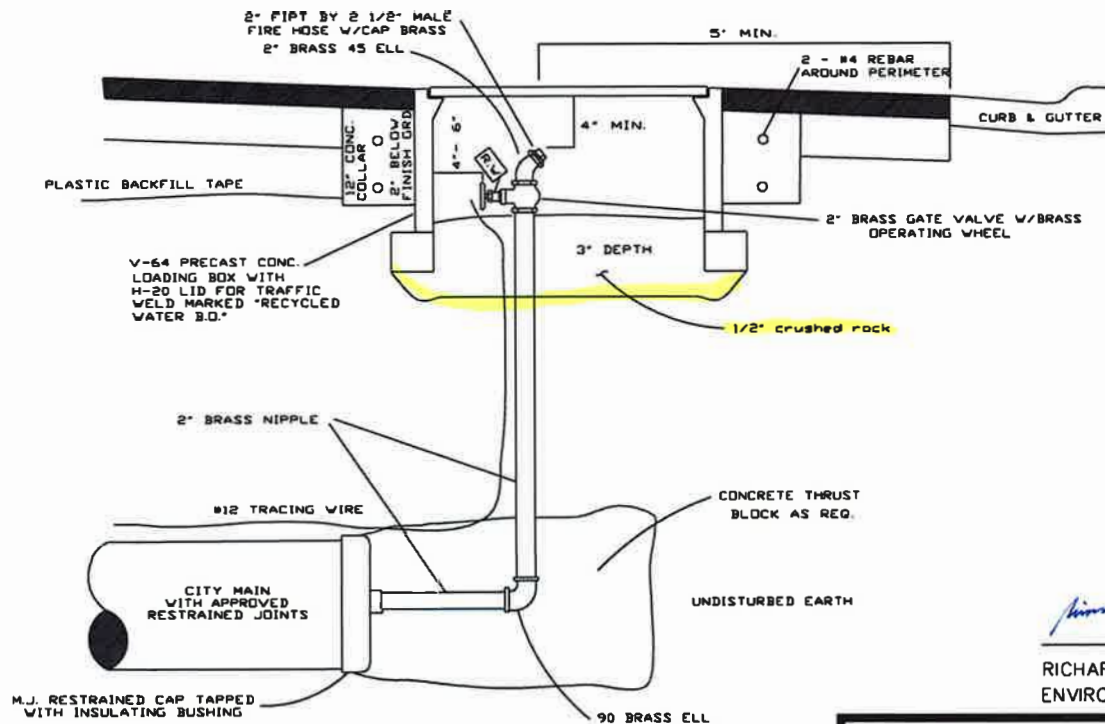
<u>Typical Pole and Equipment Schedule</u>	<u>TS-2</u>
<u>Typical Conductor Schedule</u>	<u>TS-3</u>
<u>Encasement for PL 48 Boxes in City Sidewalk</u>	<u>TS-14</u>
<u>Roadway Signs</u>	<u>TS-17A</u>
<u>Bike Lane Striping A</u>	<u>TS-18</u>
<u>Bike Lane Striping B</u>	<u>TS-19</u>
<u>Intersection Red Flash Approval Form</u>	<u>TS-21</u>
<u>Holiday Traffic Control Restrictions</u>	<u>TS-23</u>

WATER

<u>Fire Protection Assembly</u>	<u>W-2</u>
<u>Onsite Fire Protection</u>	<u>W-3</u>
<u>2" Blowoff Hydrant Assembly</u>	<u>W-4</u>
<u>Residential 1" Service Line</u>	<u>W-5</u>
<u>Commercial ¾" & 1" Service Line</u>	<u>W-6</u>
<u>Commercial 3" & Larger Service</u>	<u>W-8</u>
<u>1" and 2" Air Release Valve Assembly</u>	<u>W-12</u>
<u>Fire Hydrant Assembly</u>	<u>W-13</u>
<u>Construction Water Detail</u>	<u>W-14</u>
<u>Gate Valve & Box</u>	<u>W-16</u>
<u>Insulating Flange Test Station</u>	<u>W-19</u>
<u>Shallow Water Mains</u>	<u>W-23</u>
<u>36" Manhole Ring and Cover</u>	<u>W-25</u>
<u>Dual Water Use (Potable) ¾" & 1" Service Line</u>	<u>W-27</u>
<u>1-1/2", 2", 3", 4", 6" Compound &</u>	

WATER

<u>Turbo Meter with Bypass</u>	<u>W-29</u>
<u>Transmission Main Subsurface Blow Off</u>	<u>W-31</u>
<u>Transmission Main Hydrant Blow Off</u>	<u>W-32</u>
<u>3" Through 6" ARV</u>	<u>W-33</u>
<u>16" Mainline valve Enclosure</u>	<u>W-34</u>
<u>24" & Larger Mainline Valve</u>	<u>W-35</u>



Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

NOTE: ALL PIPING INCLUDING BRASS TO BE 8 MIL POLY SEALED.
WRAP BRASS SPOOLS WITH RECYCLED WATER ID TAPE. TAPE TO BE PLACED OUTSIDE OF POLY SEAL.
INSTALL RECYCLED WATER TAG TO VALVE STEM.

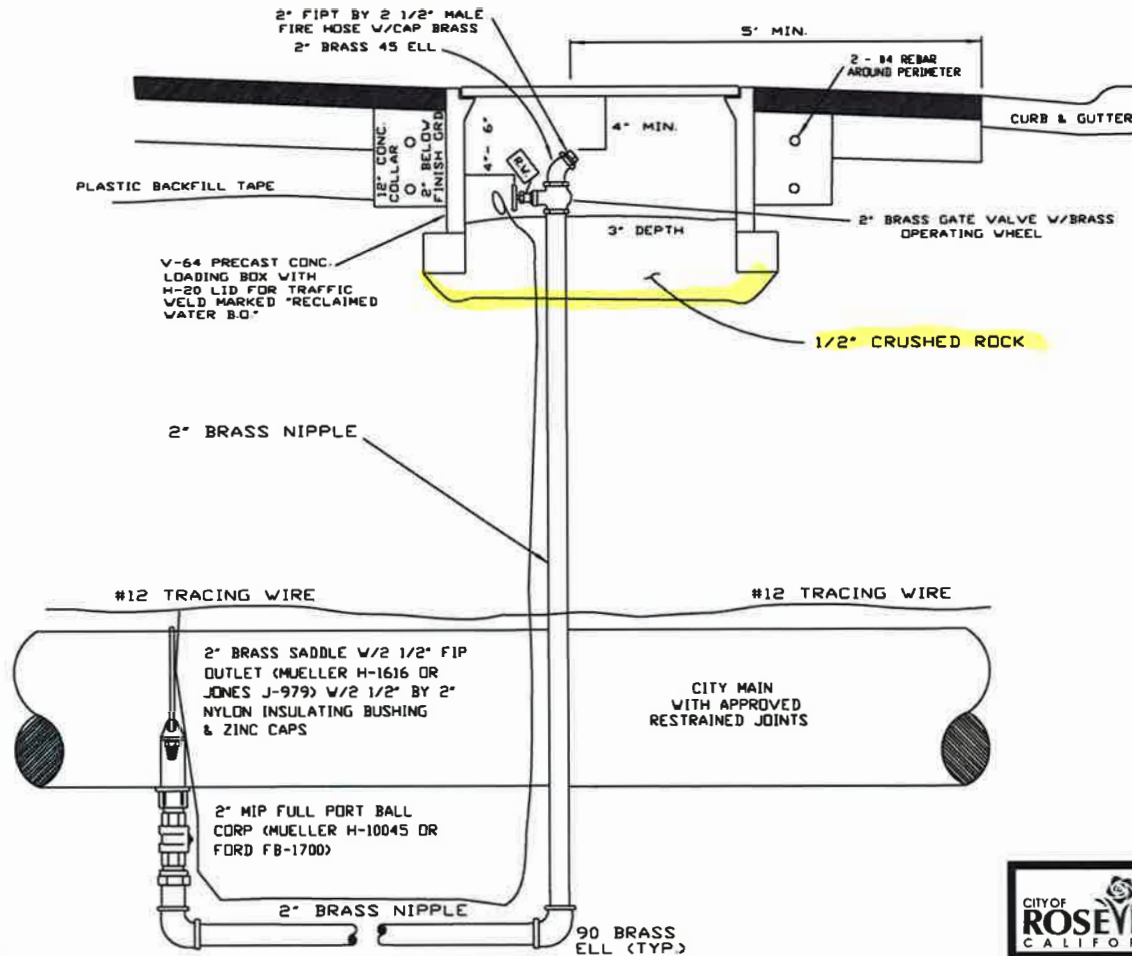
BLOWOFFS OUTSIDE OF PAVED AREAS SHALL BE A MINIMUM OF 6" ABOVE GRADE AND MARKED WITH A CARSONITE MARKER.

CITY OF ROSEVILLE CALIFORNIA ENVIRONMENTAL UTILITIES DEPARTMENT

RECYCLED WATER 2" INCH BLOWOFF ASSEMBLY (ALL BRASS)


SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

RW-1



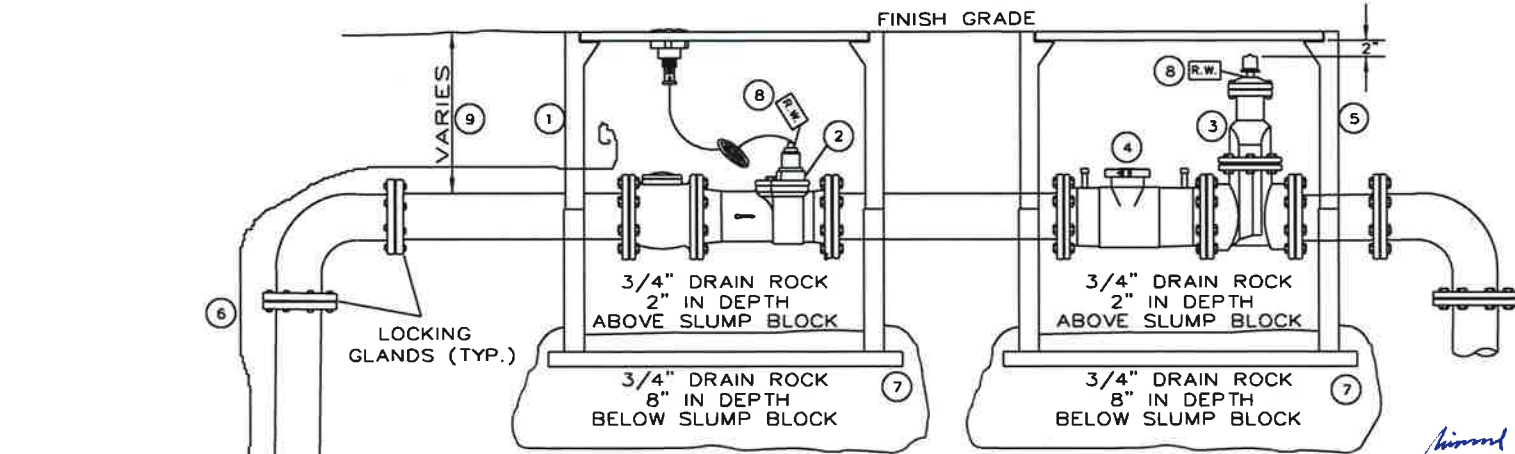
NOTES: ALL PIPING INCLUDING BRASS TO BE 8 MIL POLY SEALED. WRAP BRASS WITH RECYCLED WATER ID TAPE. TAPE TO BE PLACED OUTSIDE OF POLY SEAL. INSTALL RECYCLED WATER TAG TO VALVE OPERATOR STEM. POUR (1) FOOT DEEP BY 6" WIDE CONCRETE COLLAR AROUND UTILITY BOX IF OUTSIDE PAVEMENT AREA. BLOWOFFS OUTSIDE OF PAVED AREAS SHALL BE A MINIMUM OF 6" ABOVE GRADE AND MARKED WITH A CARSONITE MARKER.

Richard D. Plecker
 RICHARD PLECKER
 ENVIRONMENTAL UTILITIES DIRECTOR

	ENVIRONMENTAL UTILITIES DEPARTMENT
	RECYCLED WATER INLINE 2" BLOWOFF ASSEMBLY (ALL BRASS)
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	RW-2

NOTES:

- NO WATER IS TO BE DRAWN THROUGH THE BACKFLOW DEVICE UNTIL IT HAS BEEN TESTED BY THE ENVIRONMENTAL UTILITIES DEPT.
- PIPE SHALL BE DUCTILE IRON.
- SPOOLS UPSTREAM & DOWNSTREAM OF METER SHALL BE 5X THE PIPE DIAMETER
- PIPE AND FITTINGS SHALL BE WRAPPED 8 MIL POLYETHYLENE
- USE CITY APPROVED RESTRAINED JOINTS OR FLANGED SPOOLS
- WATER METER SHALL BE PURCHASED THROUGH THE CITY. PURCHASE INCLUDES INSTALLATION.
- BOXES SHALL HAVE METAL LIDS MARKED "RECYCLED WATER" WITH 2" LETTERS



Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

SEE DETAILS
W-15 AND W-16

MATERIALS:

- 1) B48 BOX WITH 10" EXTENSION. MORTAR JOINTS INSIDE & OUT
- 2) METER WITH STRAINER (PURCHASED THROUGH CITY)
INSTALL IDLER SPOOL DURING INSTALLATION OF METER BOX.
- 3) RESILIENT SEAT GATE VALVE (NRS)
- 4) SINGLE CHECK BACKFLOW DEVICE, AMES 1000SS. (STAINLESS) OR
AMERICAN FLOW CONTROL 2100 (EPOXY)
- 5) B48 BOX WITH 10" EXTENSION. MORTAR JOINTS INSIDE & OUT
- 6) CITY APPROVED TRACING WIRE
- 7) INSTALL CONCRETE BRICK (3" X 5")
UNDER ENTIRE PERIMETER OF BOXES
- 8) RECYCLED WATER ID TAG
- 9) 3"-6" PIPE SHALL BE 16" MIN. TO 20" MAX.
8" OR 10" PIPE SHALL BE 22" MIN. TO 26" MAX.



ENVIRONMENTAL UTILITIES
DEPARTMENT

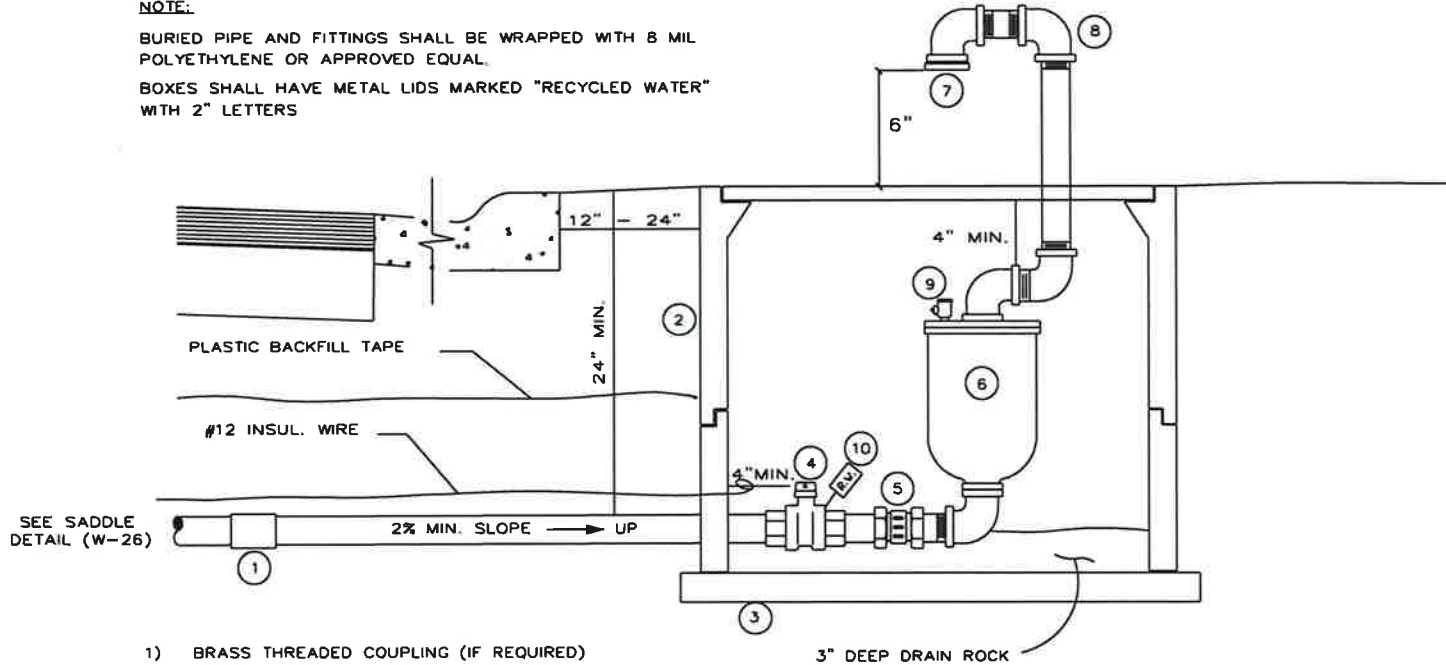
**RECYCLED WATER
3" & LARGER SERVICE**

SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

RW-4

NOTE:


BURIED PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE OR APPROVED EQUAL.
 BOXES SHALL HAVE METAL LIDS MARKED "RECYCLED WATER" WITH 2" LETTERS



- 1) BRASS THREADED COUPLING (IF REQUIRED)
- 2) B-40 UTILITY BOX W/TRAFFIC COVER MARKED, "RECYCLED WATER ARV". IF EXTENSION IS REQ. MORTAR EXTENSION JOINT INSIDE & OUT.
- 3) CONCRETE BRICK (3"x5") UNDER ENTIRE PERIMETER OF UTILITY BOX.
- 4) CURB STOP
- 5) BRASS UNION
- 6) COMBINATION AIR / VACUUM VALVE CRISPIN UL-20, APCO 145C OR APPROVED EQUAL.
- 7) BRASS CAP WITH 9 DRILLED 1/16" HOLES OR APPROVED EQUAL.
- 8) USE GALVANIZED PIPE AND FITTINGS ABOVE GROUND
- 9) 1/4" TEST COCK
- 10) RECYCLED WATER I.D. TAG

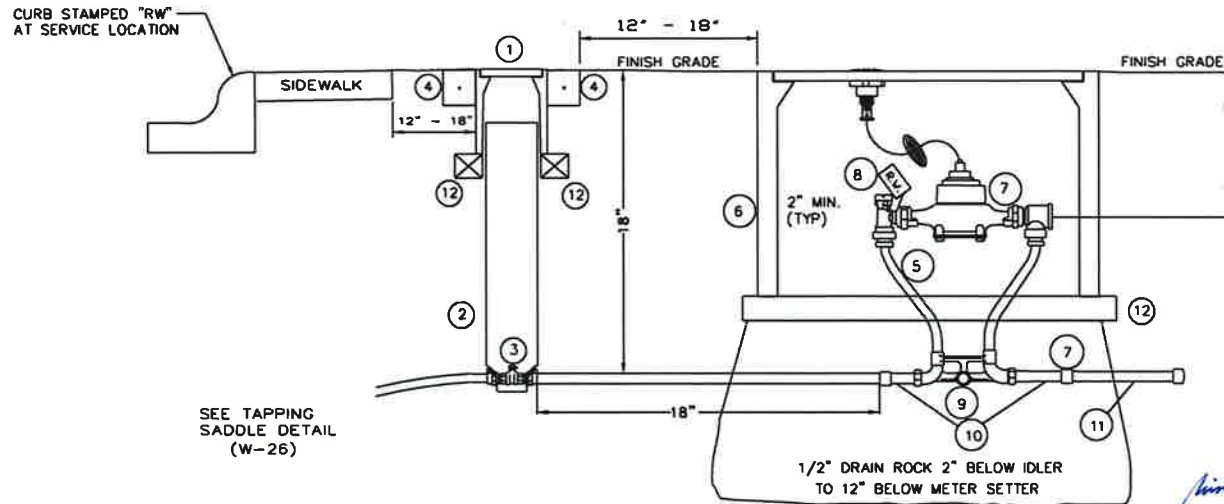
Richard D. Plecker

RICHARD PLECKER
 ENVIRONMENTAL UTILITIES DIRECTOR

	ENVIRONMENTAL UTILITIES DEPARTMENT
	1" AND 2" AIR RELEASE VALVE ASSEMBLY
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	
RW-5	

- 1) CONCRETE VALVE BOX (G-5 PER DETAIL W-16)
BOX LID SHALL BE MARKED "RECYCLED WATER"
- 2) 6" CONTINUOUS RISER (NOTCHED OVER
PIPE AT BASE)
- 3) CURB STOP (COMPRESSION X FIPT)
- 4) CONCRETE COLLAR (SEE DETAIL W-16)
- 5) METER SETTER WITH IDLER
- 6) N-16 UTILITY BOX OR APPROVED EQUAL

- 7) METER (PURCHASED THROUGH CITY)
- 8) RECYCLED WATER I.D. TAG
- 9) SCH. 40 PVC THROUGH PIPE EYE
- 10) METER SPUD
- 11) 18" BRASS NIPPLE WITH END CAP
- 12) INSTALL CONCRETE BLOCKING
(4" X 4" X 15 1/2")
UNDER ENTIRE PERIMETER OF BOXES



RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

NOTES:

ALL FITTINGS AND PIPING SHALL BE BRASS BEGINNING AT THE CURB STOP

WATER METERS SHALL BE PURCHASED THROUGH THE CITY
PURCHASE INCLUDES INSTALLATION.

BURIED PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL
POLYETHYLENE OR APPROVED EQUAL.

BOXES SHALL HAVE METAL LIDS AND WILL BE MARKED
"RECYCLED WATER" WITH 2" LETTERS



ENVIRONMENTAL UTILITIES
DEPARTMENT

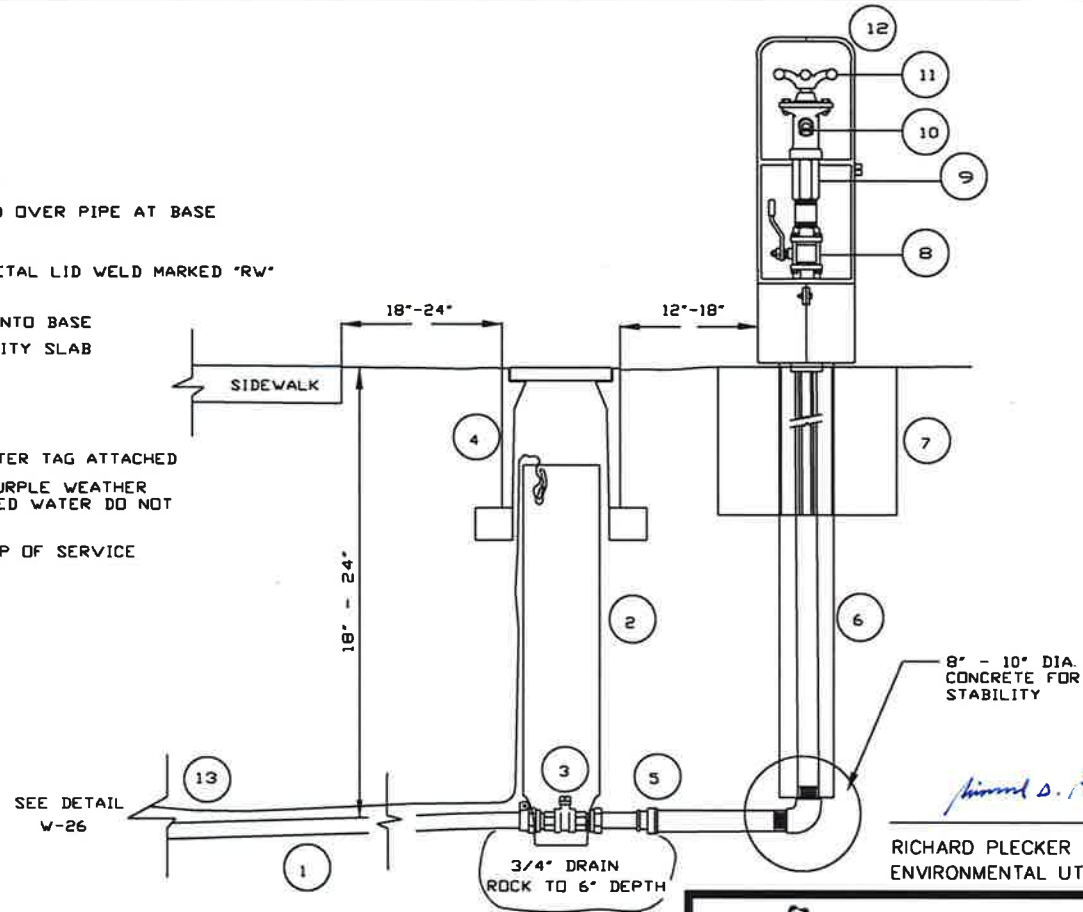
**3/4" & 1"
SERVICE LINE**

SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

RW-6

MATERIALS:

- 1) 3/4" COPPER SERVICE LINE - TYPE K
- 2) 6" DIA. SCHEDULE 40 RISER NOTCHED OVER PIPE AT BASE
- 3) CURB STOP
- 4) CHRISTY G-5 TRAFFIC BOX W/ ALL METAL LID WELD MARKED "RW"
- 5) 3/4" TO 1" REDUCER ALL BRASS
- 6) 4" LIGHT WELL STEEL PIPE BOLTED INTO BASE
- 7) 12" BY 12" BY 12" CONCRETE STABILITY SLAB
- 8) 1" BRASS BALL VALVE
- 9) HYDRANT STYLE BRASS VALVE
- 10) UNTHREADED BRASS NOZZLE
- 11) HANDLE OPERATOR WITH RECYCLED WATER TAG ATTACHED
- 12) ALUMINUM CAST BOX PAINTED WITH PURPLE WEATHER PROOF PAINT. STENCIL MARK "RECYCLED WATER DO NOT DRINK" ON MINIMUM OF (2) SIDES
- 13) LAY RECYCLED WATER ID TAPE ON TOP OF SERVICE



Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

NOTES:

- INSTALL CONCRETE BRICK (3" X 5") UNDER ENTIRE PERIMETER OF THE BOX.
- ALL PIPING FROM REDUCER THROUGH TEST STATION TO BE 1" BRASS
- ALL FITTINGS TO BE BRASS



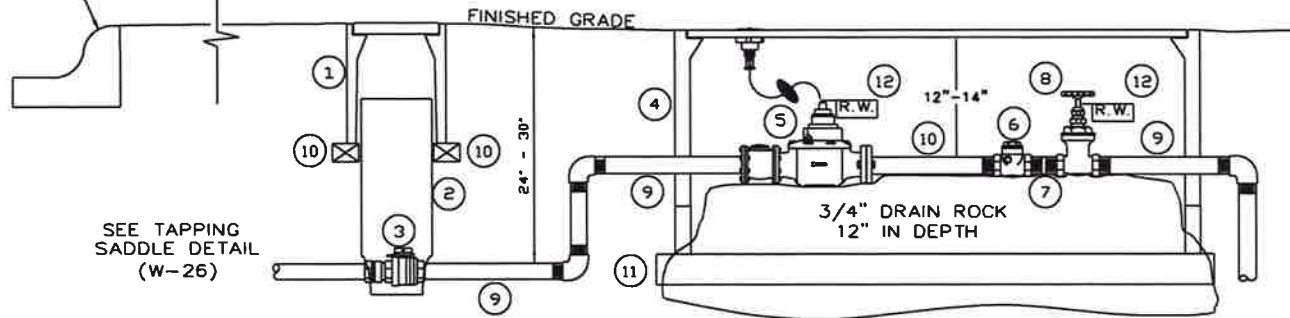
ENVIRONMENTAL UTILITIES
DEPARTMENT

RECYCLED WATER #88-V ECLIPSE
SAMPLING STATION FOR WARM CLIMATES

SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

RW-7

CURB STAMPED "RW"
AT SERVICE LOCATION



SEE TAPPING
SADDLE DETAIL
(W-26)

NOTES:

NO WATER SHALL BE DRAWN THROUGH THE BACKFLOW DEVICE UNTIL IT HAS BEEN TESTED BY THE ENVIRONMENTAL UTILITIES DEPT.

CONTRACTOR SHALL LAY 3/4" DRAIN ROCK TO 12" DEPTH UNDER CONCRETE BLOCKING AT METER

WATER METERS SHALL BE PURCHASED THROUGH THE CITY. PURCHASE INCLUDES INSTALLATION.

THERE SHALL BE NO FLOW ALTERING DEVICES 5X THE PIPE DIAMETER UPSTREAM AND DOWNSTREAM OF THE METER.

CURBSTOP SHALL BE BETWEEN 12" & 18" OF EASEMENT.

BURIED PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE OR APPROVED EQUAL.

SINGLE CHECK BACKFLOWS: WATTS CVY (BRONZE), WATTS WCV -2 (BRASS W/RUBBER DISK SEALS) WATTS 806 (316 STAINLESS STL.), MATCO/NORCA MODEL 530 (BRONZE)

BOXES SHALL HAVE METAL LIDS MARKED "RECYCLED WATER" WITH 2" LETTERS.

Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

- | | |
|--|--|
| 1) G-5 VALVE BOX (PER DETAIL W-16) | 7) 3" BRASS NIPPLE |
| 2) 6" CONTINUOUS RISER (NOTCHED OVER PIPE AT BASE) | 8) ALL BRASS GATE VALVE (FIPT X FIPT) |
| 3) CURB STOP COMPRESSION X FIPT | 9) 12" BRASS NIPPLE |
| 4) B-4B UTILITY BOX W/ EXTENSION (MORTAR JOINTS INSIDE & OUT) | 10) 6" BRASS NIPPLE |
| 5) TURBO METER WITH STRAINER (PURCHASED THROUGH CITY). INSTALL IDLER SPOOL DURING INSTALLATION OF METER BOX. | 11) INSTALL CONCRETE BRICK (3" X 5") UNDER ENTIRE PERIMETER OF UTILITY BOXES |
| 6) SINGLE CHECK (SEE NOTES) | 12) RECYCLED WATER ID TAG |



ENVIRONMENTAL UTILITIES
DEPARTMENT

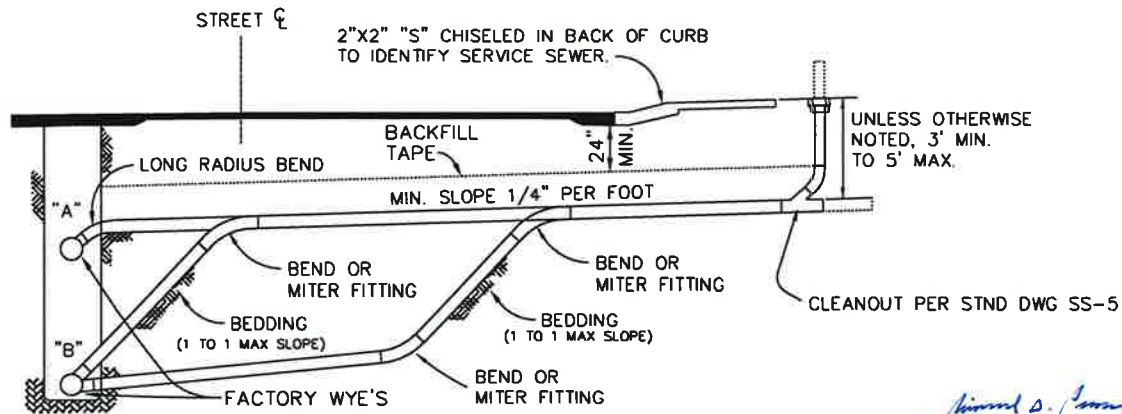
1 1/2" & 2"
RECYCLED WATER SERVICE

SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

RW-8

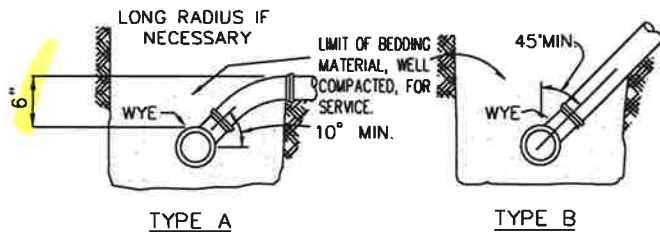
GENERAL NOTES:

1. ALL SERVICE LINES SHALL BE 4" FOR RESIDENTIAL AND 6" FOR COMMERCIAL UNLESS OTHERWISE NOTED.
2. SERVICES SHALL HAVE SAME BEDDING AND BACKFILL AS LATERAL SEWER.
3. CONTRACTOR SHALL USE THE MOST APPROPRIATE TYPE CONNECTION (A OR B) FOR THE PARTICULAR SITUATION ENCOUNTERED.
4. SERVICE SEWER SHALL HAVE MINIMUM 3'-0" COVER AT PROPERTY LINE WHENEVER LATERAL DEPTH AND SERVICE SEWER SLOPE OF 1/4" PER FOOT (MINIMUM) PERMIT. SEE NOTE 10.
5. WHEN THE LATERAL SEWER DEPTH IS SUCH THAT MINIMUM COVER AT PROPERTY LINE CANNOT BE MET, THE MINIMUM SLOPE OF 1/4" PER FOOT SHALL GOVERN THE COVER.
6. MIN. SPECIFIED COVER AT THE PROPERTY LINE SHALL BE MEASURED FROM EXISTING GROUND SURFACE OR EDGE OF ADJACENT ROADWAY, WHICHEVER IS LOWER.
7. A SPECIFIC ELEVATION AT THE PROPERTY LINE, WHEN SHOWN ON THE PLANS OR DESIGNATED BY THE ENGINEER, SHALL GOVERN.
8. MITER FITTING SHALL BE MAX. 45°.
9. MINIMUM DEPTH OF COVER SHALL BE INCREASED TO 4'-6" WHERE A WATER MAIN IS TO BE INSTALLED AT BACK OF SIDEWALK AS PART OF THE SUBDIVISION IMPROVEMENTS. IN SUCH CASES, THE SERVICE SHALL BE EXTENDED TO A MINIMUM OF 7' BACK OF SIDEWALK; CLEANOUT TO GRADE SHALL REMAIN WITHIN 3' OF BACK OF SIDEWALK.
10. SEWER SERVICES ORIGINATING FROM SEWER MAINS 14 FT AND GREATER IN DEPTH SHALL HAVE THE CROUCH OF THE VCP "WYE" FITTING FILLED WITH CONCRETE.
11. UNDERGROUND CONTRACTOR SHALL END SEWER SERVICE 2-3' UPSTREAM OF SEWER CLEANOUT. SEE STANDARD DETAIL SS-5.




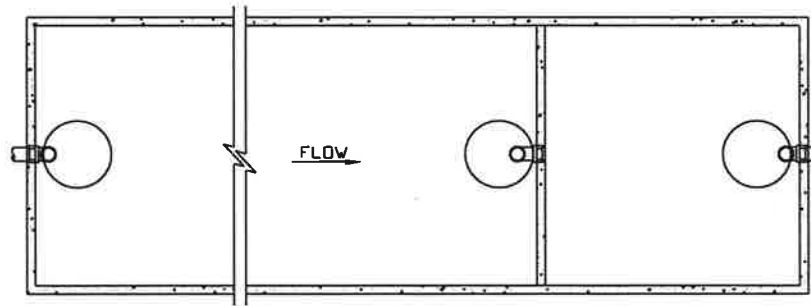
ELEVATION

Richard S. Plecker
 RICHARD PLECKER
 ENVIRONMENTAL UTILITIES DIRECTOR

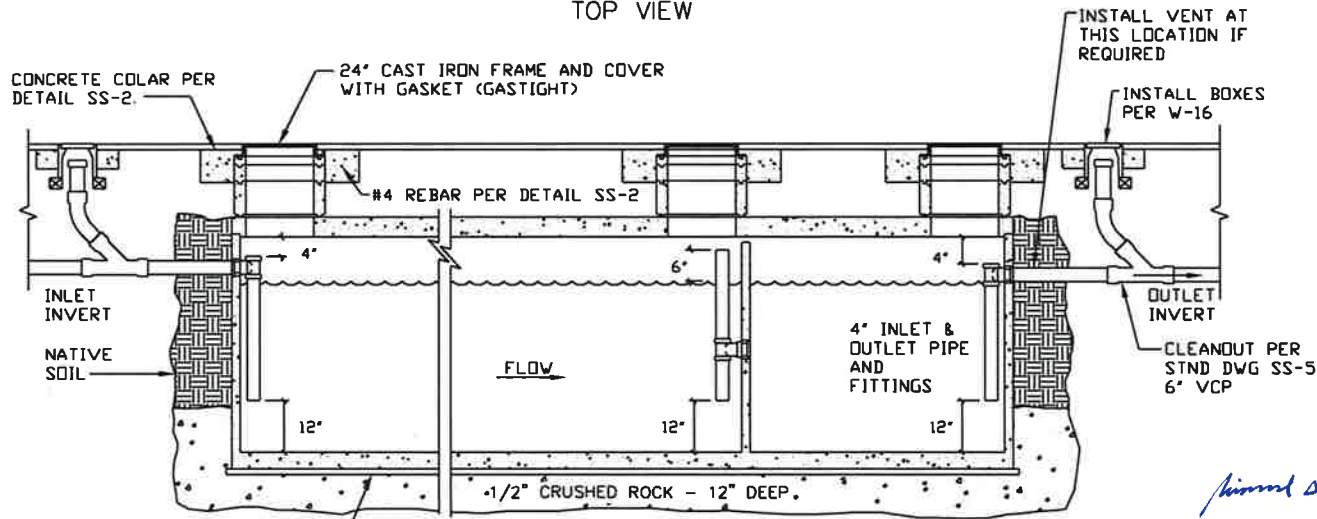


CONNECTION DETAILS

 CITY OF ROSEVILLE CALIFORNIA	ENVIRONMENTAL UTILITIES DEPARTMENT
SEWER SERVICE	
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	
SS-4	



TOP VIEW



SIDE VIEW (CUT AWAY)

MIN. BOX DESIGN LOAD: H-20 TRAFFIC

Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

*NOTE: THE PRECAST CONCRETE UNITS SHALL BE PLACED ON LEVEL UNDISTURBED SOIL, W/1/2" CRUSHED ROCK 12" DEEP. TWO 2x6 REDWOOD GRADE BOARDS SHALL BE PLACED BELOW THE TANK SIDE WALLS ALONG THE LONG DIMENSION PER THE MANUFACTURERS GUIDELINES.

SIZING SHALL BE BASED ON THE CALIFORNIA PLUMBING CODE

*NOTE: PRIOR TO BACKFILL, INTERCEPTOR SHALL BE FILLED WITH WATER AND HELD FOR 24HRS WITH NO VISIBLE LEAKAGE.



ENVIRONMENTAL UTILITIES
DEPARTMENT

GREASE INTERECEPTOR (TYP.)

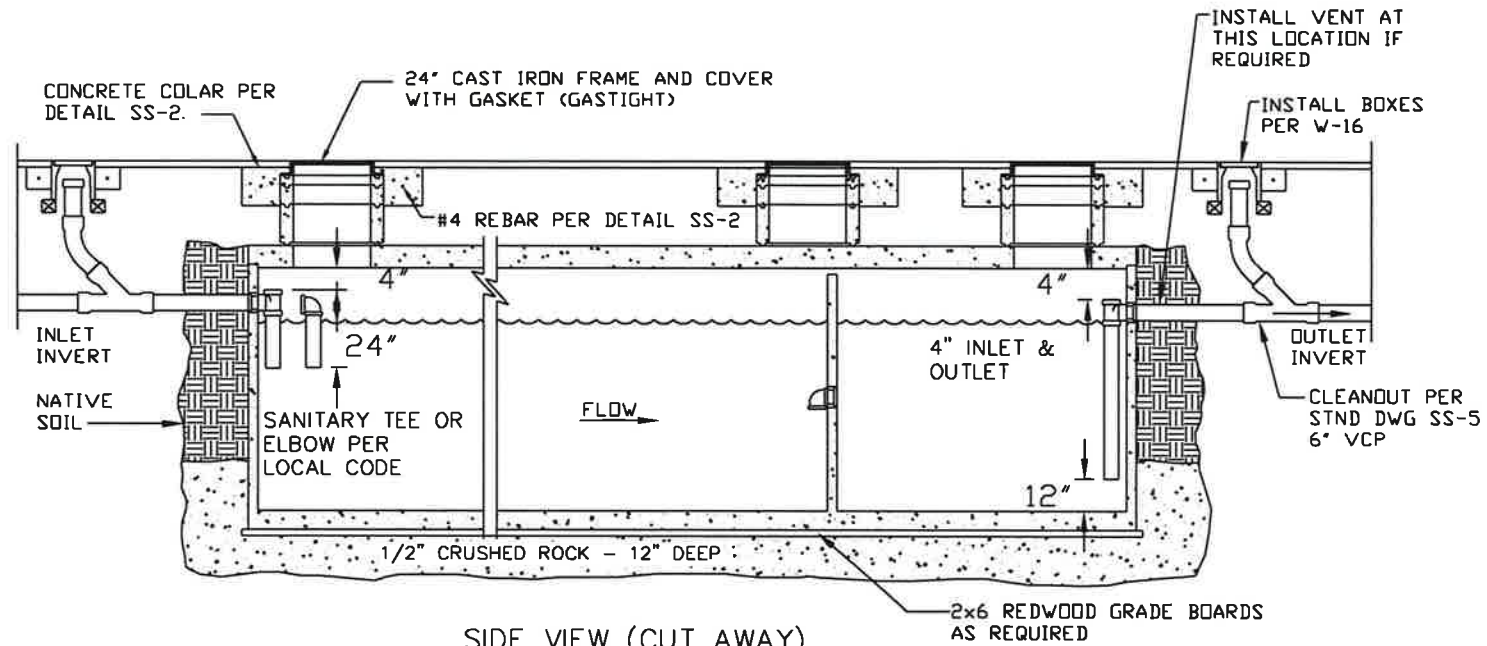
SCALE: NONE

REVISED: JANUARY 2017

DRAWN BY: R. VAN NESS

APPROVED BY: RICHARD PLECKER

SS-6



SIDE VIEW (CUT AWAY)

MIN. BOX DESIGN LOAD: H-20 TRAFFIC


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 RICHARD PLECKER
 ENVIRONMENTAL UTILITIES DIRECTOR

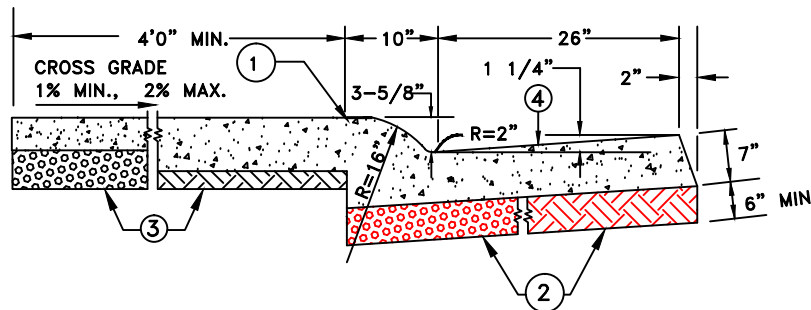
*NOTE: THE PRECAST CONCRETE UNITS SHALL BE PLACED ON LEVEL UNDISTURBED SOIL, W/1/2" CRUSHED ROCK 12" DEEP. TWO 2x6 REDWOOD GRADE BOARDS SHALL BE PLACED BELOW THE TANK SIDE WALLS ALONG THE LONG DIMENSION PER THE MANUFACTURERS GUIDELINES.

SIZING SHALL BE BASED ON CALIFORNIA PLUMBING CODE

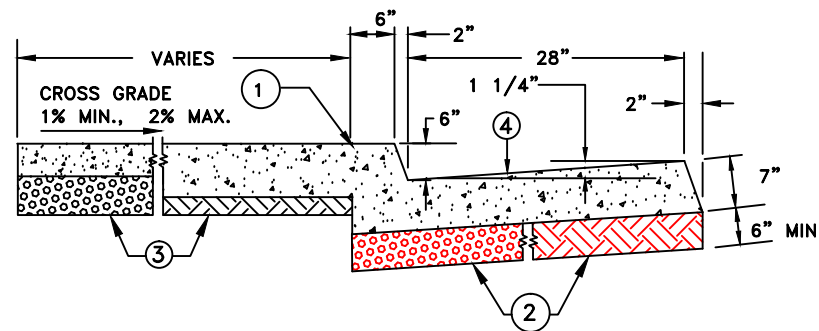
*NOTE: PRIOR TO BACKFILL, INTERCEPTOR SHALL BE FILLED WITH WATER AND HELD FOR 24HRS WITH NO VISIBLE LEAKAGE.

*NOTE: IF SIZE IS <1000 GAL, INTERCEPTOR DOES NOT HAVE MIDDLE MANHOLE

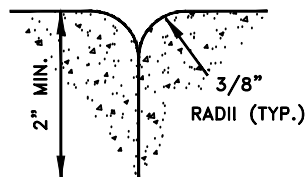
	ENVIRONMENTAL UTILITIES DEPARTMENT	
	<h3>SAND/OIL INTERCEPTOR</h3>	
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	<h2>SS-7</h2>	



TYPE 1
ROLLED CURB & GUTTER



TYPE 2
VERTICAL CURB & GUTTER
(OPTION 1)



TOOL JOINT
(TYP.)

SEE SECTION 71-4.C.3.
(CONSTRUCTION STANDARDS)

LEGEND:

1. SCORE MARK, 1/8" DEEP
2. SUBGRADE PROCESSED TO 95% RELATIVE COMPACTION. **OPTION: SIX INCH MINIMUM THICKNESS OF CLASS II AB.**
3. ALL SIDEWALK HAS OPTION OF 4" CONCRETE ON 4" AGGREGATE BASE, IN LIEU OF 6" CONCRETE ON NATIVE. **95% RELATIVE COMPACTION REQUIRED IN BOTH OPTIONS.**
4. GUTTER PAN CROSS SLOPE NOT TO EXCEED 5% MAX, OR BE LESS THAN 4%.

NOTES:

- A. ALL CONCRETE SHALL BE "MINOR CONCRETE" AS DEFINED IN SECTION 71-5B OF THESE STANDARDS.
- B. SEE SECTION 71-4 C OF THE CITY CONSTRUCTION STANDARDS FOR FINISH AND JOINTS.
- C. ALL ADJOINING SIDEWALK, CURB AND GUTTER SHALL BE POURED MONOLITHIC.

MARC STOUT
CITY ENGINEER

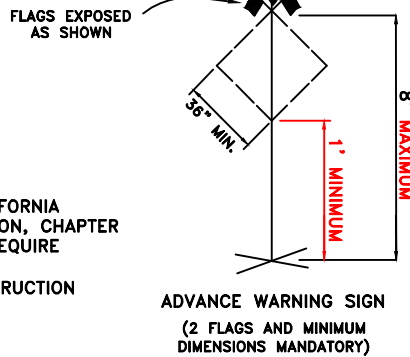
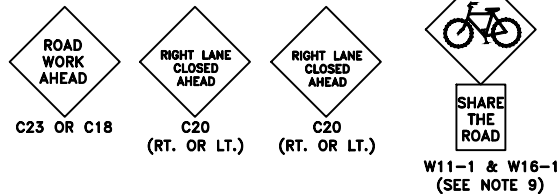
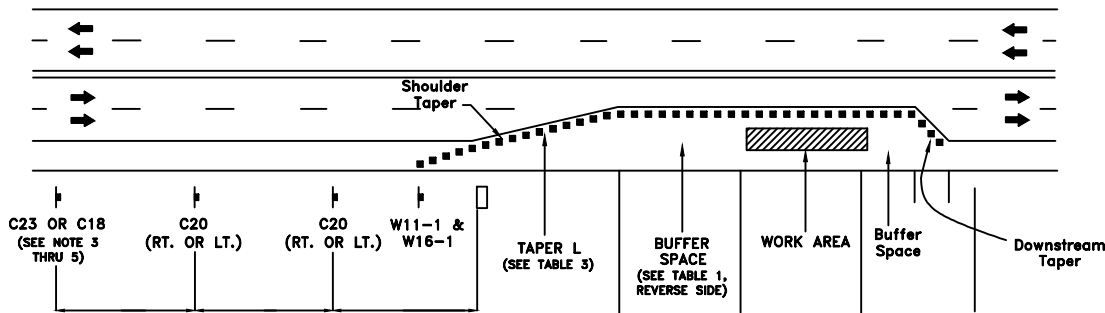
CITY OF
ROSEVILLE
CALIFORNIA

DEVELOPMENT SERVICES
DEPARTMENT

TYPE 1 AND 2 CURB AND
GUTTER WITH SIDEWALK

SCALE: NONE
REVISED: DECEMBER 16, 2016
DRAWN BY: J HENDRIX
APPROVED BY: MARC STOUT

ST-17



SPECIAL NOTES:

THIS DETAIL IS REPRODUCED FROM FIGURE 6C-1 OF THE CALIFORNIA MANUAL ON UNIFORMED TRAFFIC CONTROL DEVICES 2012 EDITION, CHAPTER 6-TEMPORARY TRAFFIC CONTROL. FIELD CONDITIONS COULD REQUIRE DEVIATIONS FROM THESE PLANS AND ACCOMPANYING NOTES. SEE SECTION 21-2 OF THE CITY OF ROSEVILLE DESIGN/CONSTRUCTION STANDARDS FOR CONES AND DELINEATORS.

NOTES:

1. THIS PLAN DOES NOT APPLY WHERE THERE ARE EMERGENCY CONDITIONS. UNDER EMERGENCY CONDITIONS, EQUIPMENT AND PERSONNEL WHICH ARE AVAILABLE SHOULD BE UTILIZED TO IMPLEMENT A CLOSURE, EVEN THOUGH SUCH CLOSURE DOES NOT MEET THE STANDARDS CONTAINED IN THIS PLAN. AS EQUIPMENT OR PERSONNEL BECOME AVAILABLE, AN IMMEDIATE EFFORT SHOULD THEN BE MADE TO IMPLEMENT THE STANDARDS SHOWN ON THIS PLAN.
2. ALL ADVANCE WARNING SIGNS SHALL BE 36" X 36" MINIMUM. (SEE NOTE 5)
3. ALL WARNING SIGNS FOR NIGHT CLOSURES SHALL BE EITHER ILLUMINATED OR RETROREFLECTORIZED.
4. A "C18 ROAD CONSTRUCTION AHEAD" SIGN MAY BE USED IN LIEU OF THE C23. (SEE NOTE 3)
5. WARNING (W) SERIES SIGNS USED IN WORK ZONES SHALL BE BLACK ON ORANGE. EXISTING YELLOW WARNING SIGNS ALREADY IN PLACE WITHIN THESE AREAS MAY REMAIN IN USE.
6. PAVEMENT MARKINGS FOR CLOSURES SHALL CONFORM TO SECTION 6 OF THE CALIFORNIA MUTCD 2006 EDITION AND CALTRANS STANDARD PLANS.
7. ALL CONES SHALL BE INTERNALLY ILLUMINATED OR FITTED WITH RETROREFLECTIVE WHITE SLEEVES FOR NIGHT CLOSURES. (SEE SECTION 6-6F.59 OF THE CALIFORNIA MUTCD MANUAL)
8. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL TO THE SPEED LIMIT.
9. W11-1 AND W16-1 REQUIRED ONLY WHEN TAPER CROSSES A MARKED BICYCLE LANE.

LEGEND:

- ⊩ SIGN
- CONE OR PORTABLE DELINEATOR
- ➔ DIRECTION OF TRAFFIC
- ◻ FLASHING ARROW SIGN

NOTES:

TAPER FORMULA:

$L = WS^2/60$ FOR SPEEDS OF 40 MPH OR LESS

$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE

WHERE:

L = MINIMUM LENGTH OF TAPER

S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85th PERCENTILE SPEED

W = WIDTH OF OFFSET

TABLE 3

Speed in Miles per Hour	Length of Taper in Feet	
	11 Feet	12 Feet
25	115	125
30	165	180
35	225	245
40	293	320
45	495	540
50	550	600
55	605	660
60	660	720
65	715	780
70+	770	1000

TABLE 2

Advance Warning Sign Spacing	
Speed Limits	Distance Between Signs in Feet
25 mph or less	100
30 or more	350
Rural	500
Expressway	1000

RHON HERNDON
PUBLIC WORKS DIRECTOR



DEPARTMENT OF
PUBLIC WORKS

**TYPICAL TRAFFIC CONTROL
LANE CLOSURE/TRANSITION**

SCALE: NONE
REVISED: DECEMBER 16, 2016
DRAWN BY: J MCKINNEY
APPROVED BY: RHON HERNDON

ST-40

EQUIPMENT SCHEDULE

STANDARD		SIG. MA (FEET)	LUM. MA (FEET)	VEHICLE SIGNAL MOUNTING		PEDESTRIAN SIGNAL MOUNTING	PPB Ø	ARROW	HPS LUMINAIRE WATTAGE	LED EQUIV. WATTAGE (250 OR 400)	REMARKS
LOC	TYPE			MAST ARM	POLE						
(A)	61-5-129 *	65'	15'	MAT MAS MAS	SV-1-T	SP-1-CS	-	-	400W	INSTALL EVD AND R73-5 ON SMA. INSTALL IISNS MAST ARM AND CITY SUPPLIED IISNS (Fiddymnt Rd) ON POLE AT 25'.	
(B)	PPB POST	-	-	-	-	-	Ø6 Ø8	LEFT RIGHT	-		
(C)	1-B	-	-	-	TV-2-T	SP-1-CS	-	-	-		
(D)	61-5-129 *	65'	15'	MAT MAS	SV-1-T	SP-1-CS	-	-	400W	INSTALL EVA AND R73-5 ON SMA. INSTALL IISNS MAST ARM AND CITY SUPPLIED IISNS (Blue Oaks Blvd) ON POLE AT 25'.	
(E)	PPB POST	-	-	-	-	-	Ø2 Ø8	RIGHT LEFT	-		
(F)	1-B	-	-	-	TV-2-T	SP-1-CS	-	-	-		
(G)	61-5-129 *	65'	15'	MAT MAS MAS	SV-1-T	SP-1-CS	-	-	400W	INSTALL EVB AND R73-5 ON SMA. INSTALL IISNS MAST ARM AND CITY SUPPLIED IISNS (Fiddymnt Rd) ON POLE AT 25' MIN. INSTALL WIFI CABLE AND PAN, TILT, ZOOM (PTZ) CAMERA CABLES TO TOP OF POLE WITH 10' SLACK. CITY WILL INSTALL PTZ CAMERA. PEU ATOP THIS POLE.	
(H)	PPB POST	-	-	-	-	-	Ø2 Ø4	LEFT RIGHT	-		
(I)	1-B	-	-	-	TV-2-T	SP-1-CS	-	-	-		
(J)	61-5-129 *	65'	15'	MAT MAS	SV-1-T	SP-1-CS	-	-	400W	INSTALL EVC AND R73-5 ON SMA. INSTALL IISNS MAST ARM AND CITY SUPPLIED IISNS (Blue Oaks Blvd) ON POLE AT 25'.	
(K)	PPB POST	-	-	-	-	-	Ø4 Ø6	LEFT RIGHT	-		
(L)	1-B	-	-	-	TV-2-T	SP-1-CS	-	-	-		

* CONTRACTOR SHALL PROVIDE TO THE CITY, ENGINEERING CALCULATIONS FROM THE POLE MANUFACTURER FOR LOADING CONDITIONS IF NOT ALREADY ON FILE WITH THE CITY.



RHON HERNDON
PUBLIC WORKS DIRECTOR



DEPARTMENT OF
PUBLIC WORKS

TYPICAL POLE
AND
~~EQUIPMENT~~ SCHEDULE
~~EQUIPMENT~~

SCALE: NONE
REVISED: NOVEMBER 15, 2016
DRAWN BY: J PASTOR
APPROVED BY: J CERVANTES

TS-2

CONDUCTOR SCHEDULE																							
CONDUCTOR DESIGNATION			NUMBER OF CONDUCTORS																				
CABLE TYPE	STD	PHASE	RUN NUMBER																				
			1	2	3	4	5	6	7	8	9	10	11										
VEH-PED 12CSC	(A)	1,6,4,4P,6P / 4P,6P					2	2					2	2									
	(B)	5,4,0LA,4P,6P / 4P,6P			2	2	2	2				2	2										
	(C)	1,4,2P,4P / 2P		2	1							2	1	2	1								
	(D)	/ 4P		1																			
	(E)	2,5,2P /		2										2	2								
	(F)	/ 2P,4P				2						2			2								
	PPB 3CSC	(G)	4,0LA,4P /		2		2			2	2					2							
		(H)	2,5,2P / 2P		2	1			2	1			2	1		2	1						
TOTAL CABLES 12/3 CONDUCTORS			2	1	6	2	4	2	2	6	8	2	2	2	1	4	4	4	2	4	1	6	5
#14	PEU							3	3	3	3												
#12	IISNS		2	2	2	2	2	2	2	2	2				2								
#8	LUMINAIRES		2	2	2	2	2	2	4	4	4				2								
	GROUND +		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	TRACER TAPE ++		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	MAXCELL INNERDUCT +++		1	1		1			1	1	1				1	1				1	1		
DLC	ø1				4	4	4	4	4	4	4	4	4										
	ø2														4	5							
	ø3						4	4	4	4	4	4	4										
	ø4									7	7	7	7	7	7	7							
	ø5										4	4	4	4									
	ø6				5	5	5	5	5	5	5	5	5	5									
	ø7									4	4	4	4	4	4	4							
	ø8						7	7	7	7	7	7	7	7									
	TOTAL		-	9	9	20	20	20	31	35	39	40	40	11	11								
EVP			1	1	2	2	3	4	4	4	4	4	1										
PTZ CCTV CABLE ⊙								2	2	2	2	2											
PTZ CCTV POWER CABLE *								1	1	1	1	1											
	CONDUIT SIZE		2"	3"	2-3"	2-3"	2-3"	3-3"	3-3"	3-3"	3-3"	3-3"	3"	3"									
	PERCENT FILL		25	22	15	21	26	25	27	28	26	26	24	15									

+ = PROVIDE 1 #8 AWG STRANDED COPPER WIRE WITH GREEN THW INSULATION IN EACH CONDUIT.

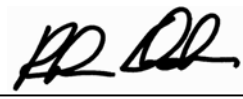
++ = ~~PROVIDE ORANGE NEPTCO TRACE SAFE TRACE WIRE IN EACH CONDUIT.~~
 PROVIDE A DLC TAPED WITH A 5" GREEN BAND AND LABELED WITH "LOCATE" IN EACH CONDUIT.

+++ = FURNISH AND INSTALL MAXCELL FABRIC INNER-DUCT (3 CELL) IN CONDUITS THAT CROSS THE ROADWAY.


⊙ = FURNISH AND INSTALL MOHAWK LAN-TRAK OSP CAT5E CABLES (PART NUMBER M58790 OR CITY APPROVED EQUIVALENT). COIL 10 FEET OF SLACK AT TOP OF POLE.

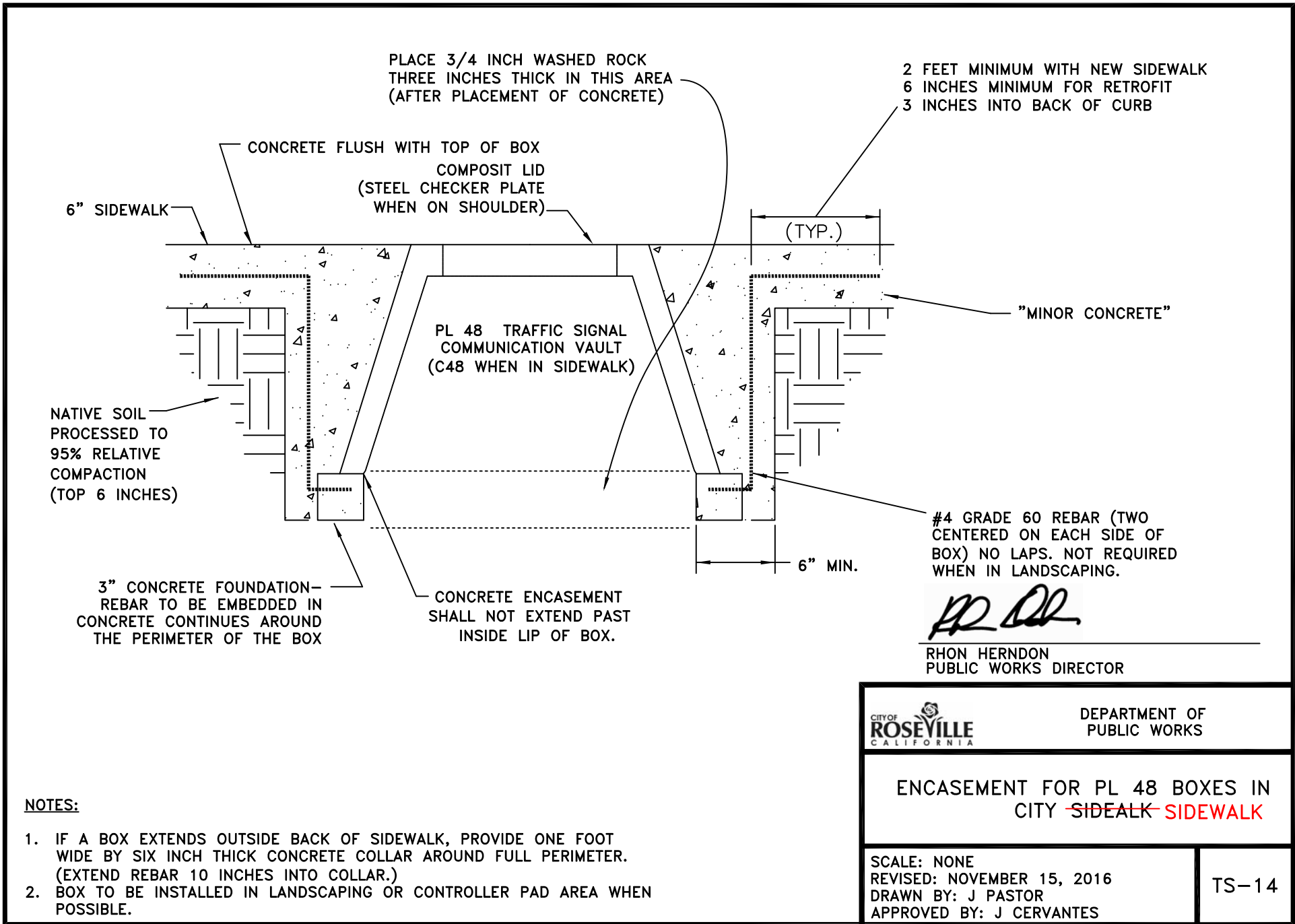
* = FURNISH AND INSTALL IMSA 14-3/20-1-STR 600V POWER CABLE, COLOR CODE 3/C (BELDEN PART NUMBER 601195 OR CITY APPROVED EQUIVALENT). COIL 10 FEET OF SLACK AT TOP OF POLE.

ALL FIELD WIRING SHALL BE COMPRISED OF MULTIPLE CIRCUIT CONDUCTORS PER THE "CONDUCTOR SIGNAL CABLE REQUIREMENTS" TABLE IN SECTION 86-2.08D OF THE CALTRANS STANDARD SPECIFICATIONS. **THERE SHALL BE 3 SPARE CONDUCTORS AT EACH POLE.**



RHON HERNDON
PUBLIC WORKS DIRECTOR

 CITY OF ROSEVILLE CALIFORNIA	DEPARTMENT OF PUBLIC WORKS
<h3>TYPICAL CONDUCTOR SCHEDULE</h3>	
SCALE: NONE REVISED: NOVEMBER 20, 2016 DRAWN BY: J PASTOR APPROVED BY: J CERVANTES	
TS-3	



PLACE 3/4 INCH WASHED ROCK
THREE INCHES THICK IN THIS AREA
(AFTER PLACEMENT OF CONCRETE)

2 FEET MINIMUM WITH NEW SIDEWALK
6 INCHES MINIMUM FOR RETROFIT
3 INCHES INTO BACK OF CURB

CONCRETE FLUSH WITH TOP OF BOX
COMPOSIT LID
(STEEL CHECKER PLATE
WHEN ON SHOULDER)

6" SIDEWALK

(TYP.)

PL 48 TRAFFIC SIGNAL
COMMUNICATION VAULT
(C48 WHEN IN SIDEWALK)

"MINOR CONCRETE"

NATIVE SOIL
PROCESSED TO
95% RELATIVE
COMPACTION
(TOP 6 INCHES)

#4 GRADE 60 REBAR (TWO
CENTERED ON EACH SIDE OF
BOX) NO LAPS. NOT REQUIRED
WHEN IN LANDSCAPING.

3" CONCRETE FOUNDATION—
REBAR TO BE EMBEDDED IN
CONCRETE CONTINUES AROUND
THE PERIMETER OF THE BOX

CONCRETE ENCASEMENT
SHALL NOT EXTEND PAST
INSIDE LIP OF BOX.

6" MIN.

RH Herndon

RHON HERNDON
PUBLIC WORKS DIRECTOR



DEPARTMENT OF
PUBLIC WORKS

ENCASEMENT FOR PL 48 BOXES IN
CITY ~~SIDEWALK~~ SIDEWALK

SCALE: NONE
REVISED: NOVEMBER 15, 2016
DRAWN BY: J PASTOR
APPROVED BY: J CERVANTES

TS-14

NOTES:

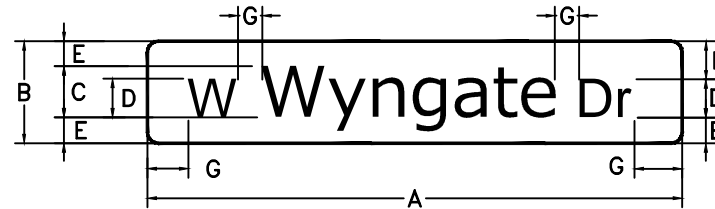
1. IF A BOX EXTENDS OUTSIDE BACK OF SIDEWALK, PROVIDE ONE FOOT WIDE BY SIX INCH THICK CONCRETE COLLAR AROUND FULL PERIMETER. (EXTEND REBAR 10 INCHES INTO COLLAR.)
2. BOX TO BE INSTALLED IN LANDSCAPING OR CONTROLLER PAD AREA WHEN POSSIBLE.

LEGEND:

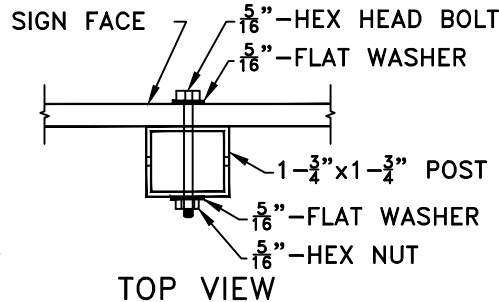
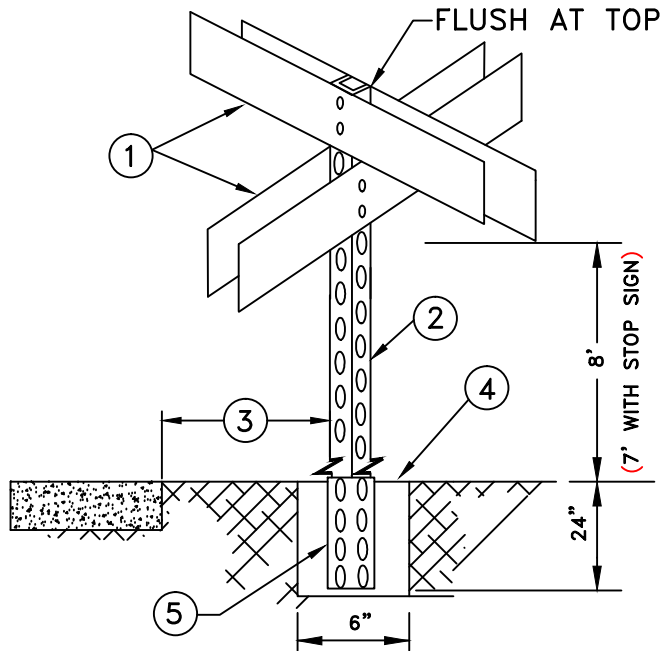
1. STREET NAME SIGNS.
2. SIGN POST SHALL BE SQUARE METAL WHITE POWDER COATED 12 GAUGE POSTS. REFER TO SECTION 56.02A.
3. EDGE OF STREET NAME SIGN SHALL BE A MINIMUM OF 2' FROM FACE OF CURB OR AT BACK OF SIDEWALK.
4. POST HOLE FOOTING SHALL BE 24" DEEP AND $\phi 6"$ IN DIAMETER AND BACKFILLED WITH MINOR CONCRETE.
5. 24" GALVANIZED ANCHOR SLEEVE SHALL BE INSTALLED IN POST FOOTING. TOP TWO HOLES OF ANCHOR SLEEVE SHALL REMAIN ABOVE FINISH GRADE OF CONCRETE, HOLES BELOW FISH GRADE SHALL BE TAPED CLOSED. NO MATERIAL OTHER THAN SQUARE POST SHALL INTRUDE INTO SLEEVE. THE SQUARE POST SHALL MOVE FREELY IN THE SLEEVE IN A VERTICAL DIRECTION UPON INSTALLATION.
6. SIGN PLATE ATTACHMENT SHALL USE $\frac{5}{16}" \times 2\frac{1}{2}"$ ZINC PLATED HEX HEAD BOLTS AND NUTS. $\frac{5}{16}"$ ZINC PLATED WASHERS SHALL BE USED INSIDE OF BOLT AND NUT PER TOP VIEW DETAIL BELOW.

SIGN PLATE SPECIFICATIONS:

- A. SIGN PLATES SHALL BE 8" OR 12" TALL AND 24" TO 48" LONG IN 6" INCREMENTS.
- B. SIGN PLATES SHALL BE 0.080 GAUGE ALUMINUM.
- C. SIGN PLATE FINISH SHALL BE 3M HIGH INTENSITY PRISMATIC GRADE RETRO REFLECTIVE BACKGROUND WITH 3M ELECTRONIC CUTTABLE GREEN FILM SHEETING OR APPROVED EQUIVALENT. LETTER OF AUTHENTICITY IS REQUIRED. FOR SIGN REQUIREMENTS SEE CONSTRUCTION STANDARDS SEC. 56 - SIGNS 56-1.01.
- D. FONT FOR STREET NAME SIGNS SHALL BE FHWA SERIES "D" 2000EX. IF STREET NAME TEXT IS TOO LONG FOR 48" SIGN PLATE, SERIES "C" FHwy FONT MAY BE USED UPON APPROVAL FROM PUBLIC WORKS DIRECTOR.



SIGN DIMENSIONS							
MPH	A	B	C	D	E	F	G
25	VARIABLE	8"	4"	3"	2"	3"	3"
≥30	VARIABLE	12"	6"	4"	3"	5"	4.5"



MARC STOUT
CITY ENGINEER

CITY OF
ROSEVILLE
CALIFORNIA

DEVELOPMENT SERVICES
DEPARTMENT

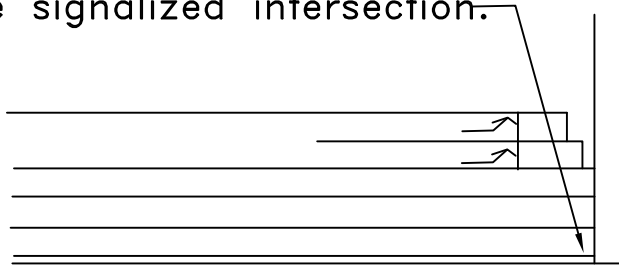
ROADWAY SIGNS

SCALE: NONE
REVISED: DECEMBER 16, 2016
DRAWN BY: J HENDRIX
APPROVED BY: MARC STOUT

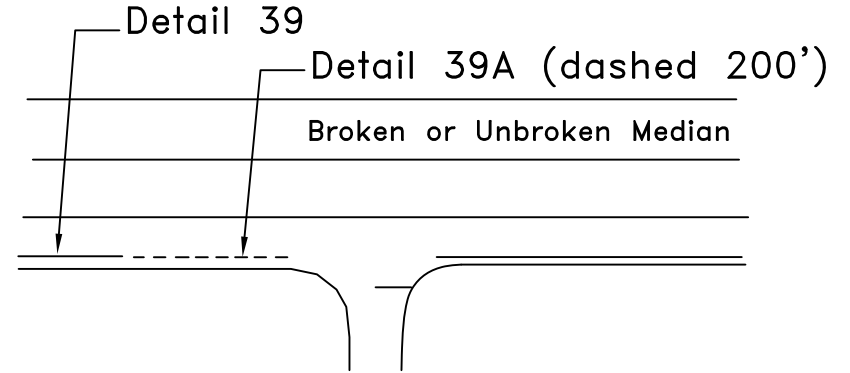
TS-17A

SIGNALIZED INTERSECTIONS

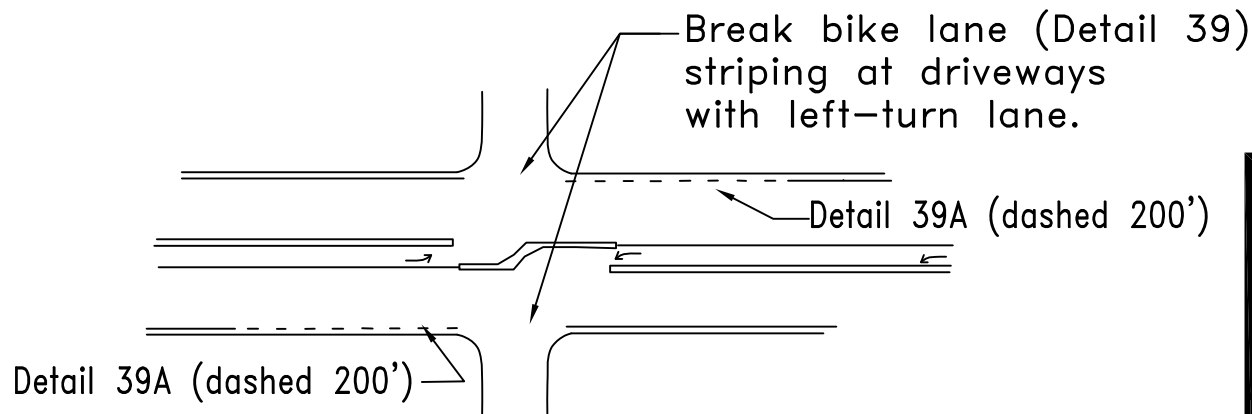
Extend bike lane (Detail 39) to the signalized intersection.



PUBLIC ROADWAYS



PRIVATE DRIVEWAYS WITH A LEFT-TURN LANE



RHON HERNDON

RHON HERNDON
PUBLIC WORKS DIRECTOR



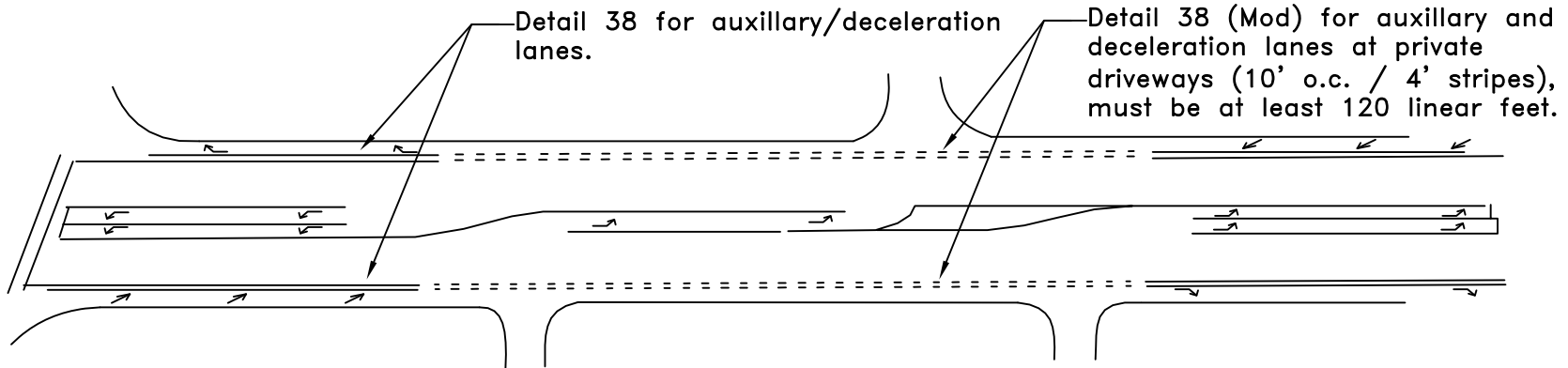
DEPARTMENT OF
PUBLIC WORKS

~~STREET NAME SIGNS~~
BIKE LANE STRIPING A

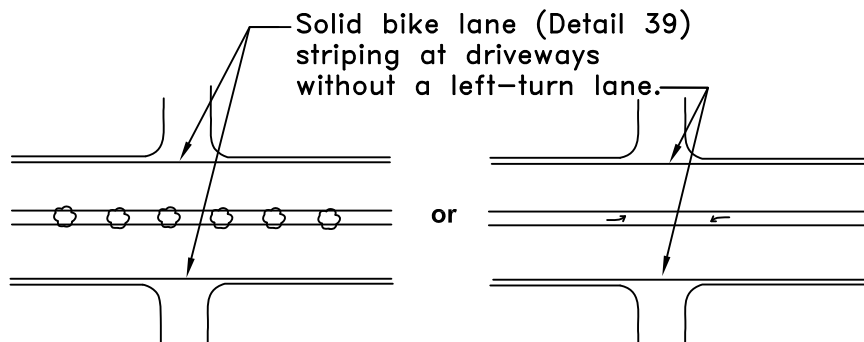
SCALE: NONE
REVISED: NOVEMBER 15, 2016
DRAWN BY: J PASTOR
APPROVED BY: J CERVANTES

TS-18

AUXILLARY LANES



PRIVATE DRIVEWAYS WITHOUT A LEFT-TURN LANE



RH Herndon

RHON HERNDON
PUBLIC WORKS DIRECTOR



DEPARTMENT OF
PUBLIC WORKS

BIKE LANE STRIPING **B**

SCALE: NONE
REVISED: NOVEMBER 20, 2016
DRAWN BY: J PASTOR
APPROVED BY: J CERVANTES

TS-19



INTERSECTION RED FLASH APPROVAL

With stamped approval of this letter by the Traffic Section, Red Flash/Dark Signal is approved for the following intersection as specified below:

LOCATION: _____

PROJECT ACCOUNT NUMBER: _____

DATE: _____

TIME/DURATION: _____

RED FLASH APPROVED:

- 1. Contractor shall contact the City Inspector 48 hours prior to needing the intersection in red flash. Signal shutdown shall be performed only by City personnel, unless otherwise directed by the Engineer.
2. The contractor shall contact the Traffic Signal Technician either by telephone at (916)746-1760 or by email or text message at pagesignaltechnicians@roseville.ca.us one hour prior to needing the traffic signal placed into or removed from red flash.
3. Contractor shall notify City Police and Fire at 774-5118 one hour prior to placing signal in red flash and 10 minutes after removing signal from red flash. The traffic signal will not be permitted to be placed in red flash during rain, lightning, or inclement weather conditions (including wet pavement conditions).
4. The Contractor shall reimburse the City for the actual cost of all inspection, including City Traffic Signal Technician time as required.
5. Road Work Ahead Signs required at all approaches to intersection when in red flash.

DARK SIGNAL APPROVED - ADDITIONAL REQUIREMENTS

- 1. The Contractor shall place Stop Ahead C-W17 and Stop R-1 signs to direct vehicle and pedestrian traffic through the intersection during traffic signal system shutdown. Temporary Stop Ahead and Stop signs shall be removed when the system is turned on.
2. Stop Ahead and Stop signs shall be furnished by the Contractor. Minimum size of Stop signs shall be 36 for single sign placements and 24 for dual sign placements. Signs shall be mounted at a height of 84.
3. One Stop Ahead sign and one Stop sign shall be placed for each direction of traffic. For approaches with two or more through or left turn lanes, two Stop signs shall be placed. Typical sign placement should be between the left turn and through lanes. Additional Stop signs should be placed on the shoulder. No Stop signs shall be placed in a manner that blocks bike lanes.
4. Stop Ahead and Stop signs shall be in place in each direction immediately prior to the intersection going dark and removed immediately after the intersection is placed back into red flash.
5. Red flashing beacons or flares shall be placed and maintained at each Stop sign during nighttime (dark) hours.
6. Traffic control must be verified by the Public Works Construction Inspector prior to the signal being deactivated.

I have read the above Intersection Red Flash Approval requirements.

REQUESTOR INFO: Name of Company _____

Print Name of Requestor _____ Contact Phone Number _____

SIGNATURE: X _____ / / Date

INSPECTOR NAME: _____ Inspector. Phone #: _____

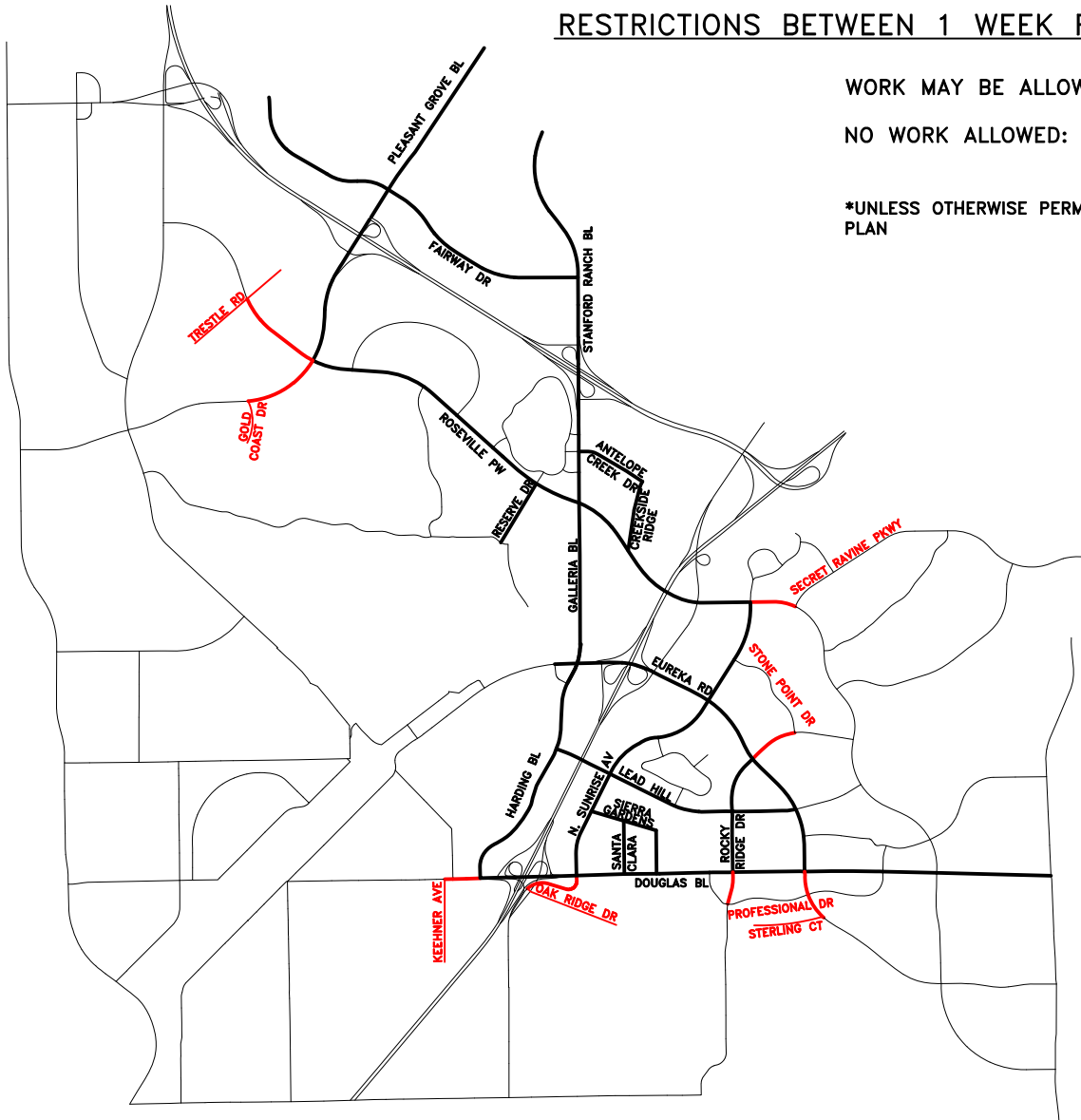
Copy To: Contractor, Public Works Inspector, Signal Technicians, File

NOTE: Contractor is required to follow all requirements of this letter and keep a signed and stamped copy at job site.

RESTRICTIONS BETWEEN 1 WEEK PRIOR TO THANKSGIVING & JANUARY 3RD

WORK MAY BE ALLOWED: WEEKDAYS 9PM TO 11AM
 NO WORK ALLOWED: WEEKDAYS 11AM TO 9PM
 WEEKENDS/HOLIDAYS

*UNLESS OTHERWISE PERMITTED BY AN APPROVED TRAFFIC CONTROL PLAN



LEGEND

— RESTRICTED ROADWAYS

RHON HERNDON
 PUBLIC WORKS DIRECTOR

	DEPARTMENT OF PUBLIC WORKS
HOLIDAY TRAFFIC CONTROL RESTRICTIONS (IN ADDITIONS TO CITY STANDARDS WORKING HOUR RESTRICTIONS)	
SCALE: NONE REVISED: NOVEMBER 15, 2016 DRAWN BY: J PASTOR APPROVED BY: J CERVANTES	TS-23

NOTES:

NO WATER SHALL BE DRAWN THROUGH THE BACKFLOW DEVICE UNTIL IT HAS BEEN TESTED BY THE ENVIRONMENTAL UTILITIES DEPT.

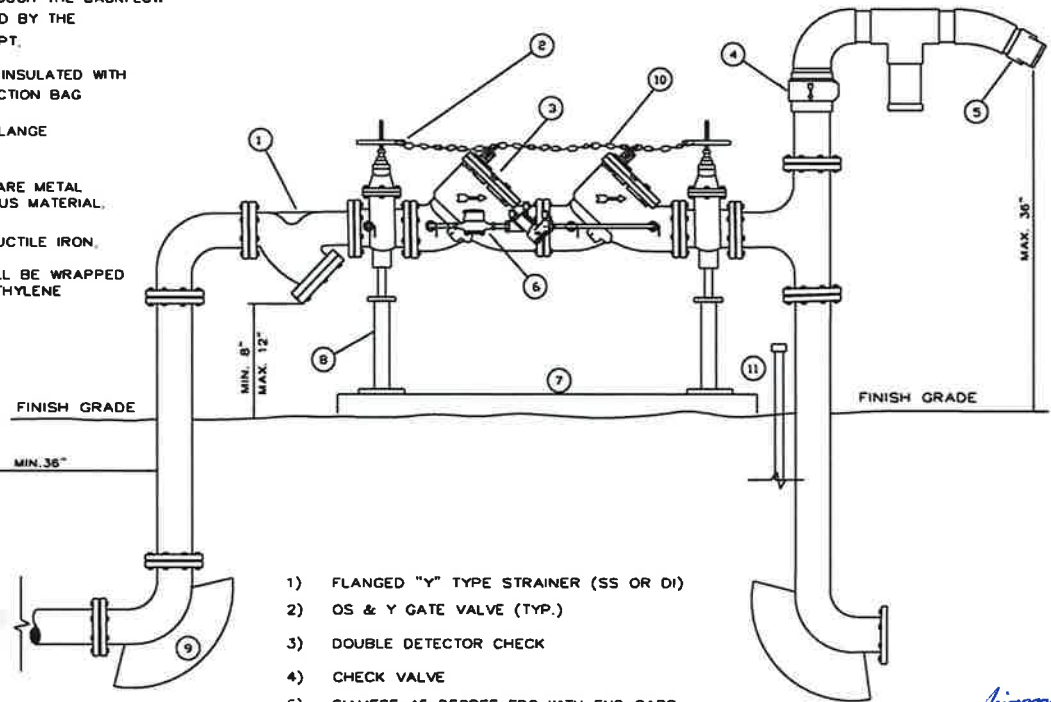
THE BACKFLOW DEVICE SHALL BE INSULATED WITH A CITY APPROVED FREEZE PROTECTION BAG

FITTINGS SHALL BE FLANGE BY FLANGE OR RESTRAINED.

BURIED NUTS AND BOLTS, AND BARE METAL SHALL BE COATED WITH BITUMINOUS MATERIAL.

PIPE AND FITTINGS SHALL BE DUCTILE IRON.

BURIED PIPE AND FITTINGS SHALL BE WRAPPED AND SEALED WITH 8 MIL POLYETHYLENE AND VINYL TAPE.




SEE DETAILS
W-15 AND W-16
FOR VALVE

- 1) FLANGED "Y" TYPE STRAINER (SS OR DI)
- 2) OS & Y GATE VALVE (TYP.)
- 3) DOUBLE DETECTOR CHECK
- 4) CHECK VALVE
- 5) SIAMESE 45 DEGREE FDC WITH END CAPS
- 6) WATER METER
- 7) 3 1/2" THICK REINFORCED CONCRETE SLAB, WITH #4 REBAR 12" ON CENTER
- 8) SUPPORTS 2-TYP. SHALL BE BOLTED DOWN WITH A MINIMUM OF TWO BOLTS EACH
- 9) THRUST BLOCK (TYP.)
- 10) 1/4" NON CASE HARDENED CHAIN WITH BREAKAWAY LOCK BETWEEN VALVES.
- 11) VALVE TAMPER SWITCH CONDUIT TO BUILDING FIRE CONTROL ROOM

Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

	ENVIRONMENTAL UTILITIES DEPARTMENT
	FIRE PROTECTION ASSEMBLY
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	W-2

NOTES:

NO WATER SHALL BE DRAWN THROUGH THE BACKFLOW DEVICE UNTIL IT HAS BEEN TESTED BY THE ENVIRONMENTAL UTILITIES DEPT.

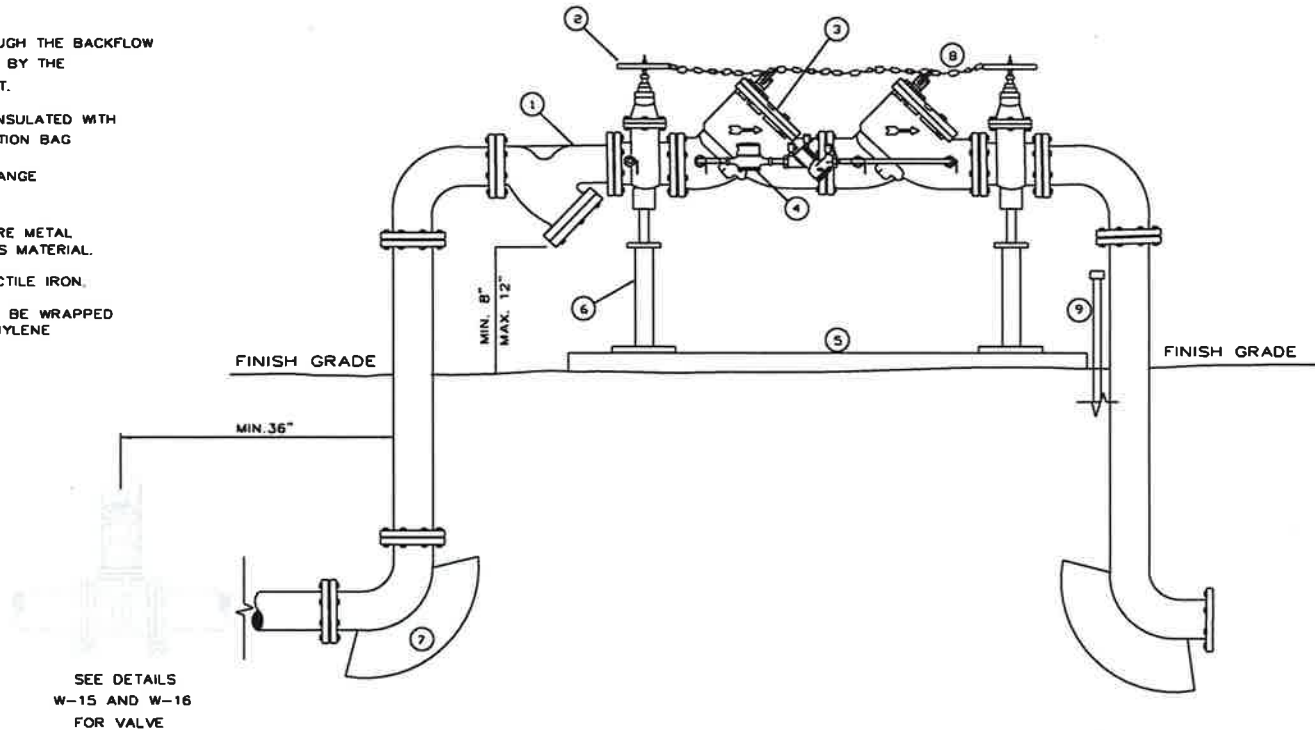
THE BACKFLOW DEVICE SHALL BE INSULATED WITH A CITY APPROVED FREEZE PROTECTION BAG

FITTINGS SHALL BE FLANGE BY FLANGE OR RESTRAINED.

BURIED NUTS AND BOLTS, AND BARE METAL SHALL BE COATED WITH BITUMINOUS MATERIAL.

PIPE AND FITTINGS SHALL BE DUCTILE IRON.

BURIED PIPE AND FITTINGS SHALL BE WRAPPED AND SEALED WITH 8 MIL POLYETHYLENE AND VINYL TAPE.



SEE DETAILS
W-15 AND W-16
FOR VALVE

Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

- 1) FLANGED "Y" TYPE STRAINER
- 2) OS & Y GATE VALVE (TYP.)
- 3) DOUBLE DETECTOR CHECK
- 4) WATER METER
- 5) 3 1/2" THICK REINFORCED CONCRETE SLAB W/#4 REBAR 12" ON CENTER.
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- 9) VALVE TAMPER SWITCH CONDUIT TO BUILDING FIRE CONTROL ROOM.

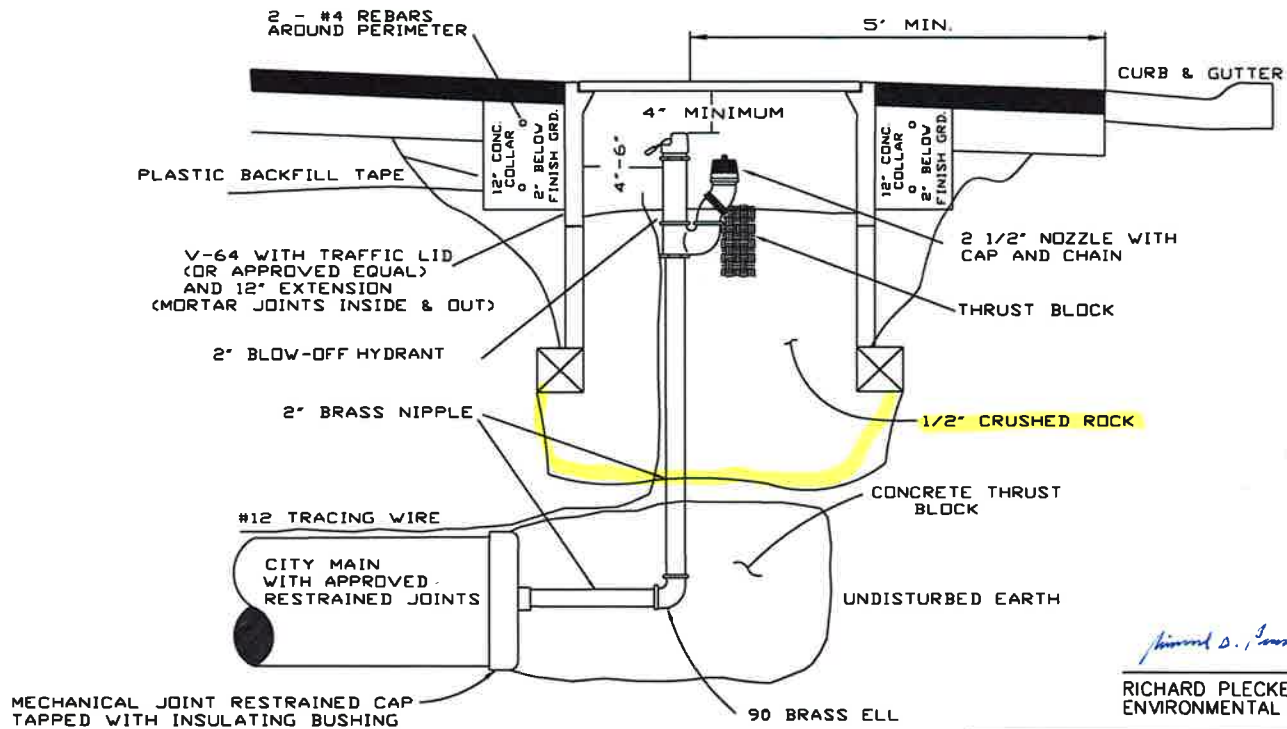


ENVIRONMENTAL UTILITIES
DEPARTMENT

**ONSITE FIRE
PROTECTION**

SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

W-3




Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

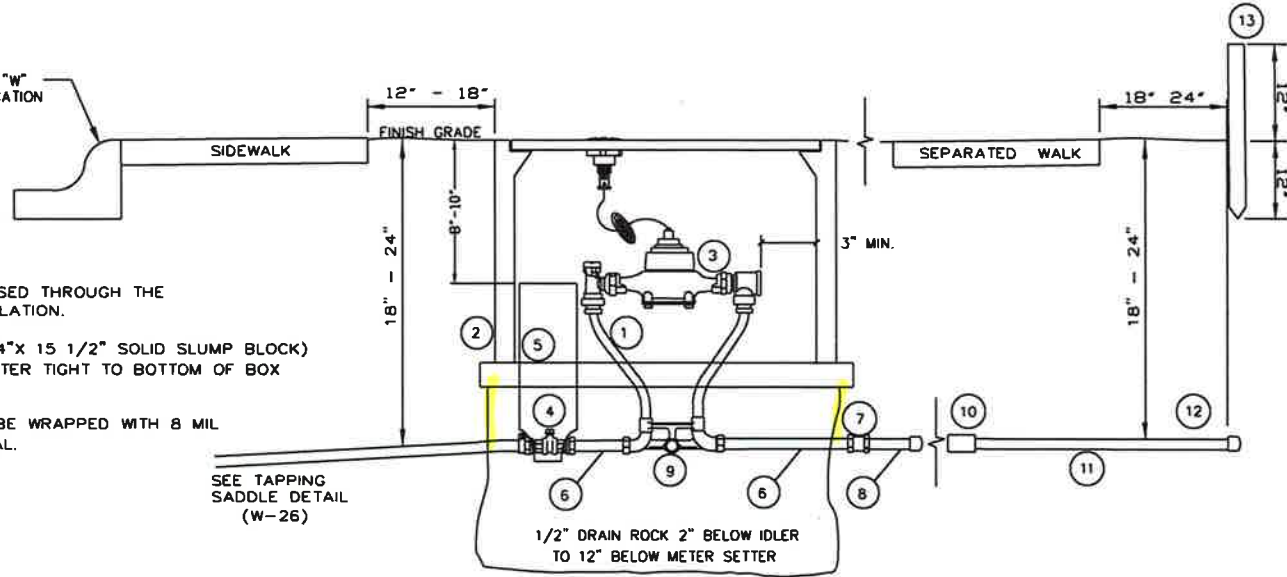
NOTE:

BURIED BRASS PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE OR APPROVED EQUAL.

BLOWOFFS OUTSIDE OF PAVED AREAS SHALL BE A MINIMUM OF 6" ABOVE GRADE AND MARKED WITH A CARSONITE MARKER.

	ENVIRONMENTAL UTILITIES DEPARTMENT	
	2" BLOWOFF HYDRANT ASSEMBLY	
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER		W-4

CURB STAMPED "W"
AT SERVICE LOCATION



NOTES:

WATER METERS SHALL BE PURCHASED THROUGH THE CITY. PURCHASE INCLUDES INSTALLATION.

INSTALL CONCRETE BLOCKING (4"x4"x 15 1/2" SOLID SLUMP BLOCK) UNDER ENTIRE UTILITY BOX PERIMETER TIGHT TO BOTTOM OF BOX NO GAPS ALLOWED

BURIED PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE OR APPROVED EQUAL.

SEE TAPPING
SADDLE DETAIL
(W-26)

1/2" DRAIN ROCK 2" BELOW IDLER
TO 12" BELOW METER SETTER

- 1) METER SETTER WITH IDLER
 - 2)* N-30 UTILITY BOX WITH FL 30 METER LID FOR 1" SERVICE
 - 3) WATER METER (PURCHASED THROUGH CITY)
 - 4) CURB STOP (COMPRESSION X FIPT)
 - 5) 4" DIA. BLUE SCHEDULE 40 RISER (NOTCHED OVER PIPE AT BASE)
 - 6) 4" METER SPUD
 - 7) BRASS COUPLING (FIPT X FIPT)
 - 8) 18" BRASS NIPPLE WITH END CAP (FOR ATTACHED SIDEWALK)
 - 9) SCH. 40 PVC THROUGH PIPE EYE
 - 10) BRASS-PVC ADAPTER
 - 11) 1 1/2" PVC
 - 12) PVC END CAP
 - 13) 2"x2" RDWD. STAKE PAINTED BLUE
- * IF LOCATED IN THE DRIVEWAY USE A B1324 BOX W/STEEL CHECKER COVER #B1324-51JH OR APPROVED EQUAL.

Richard D. Plecker
RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR



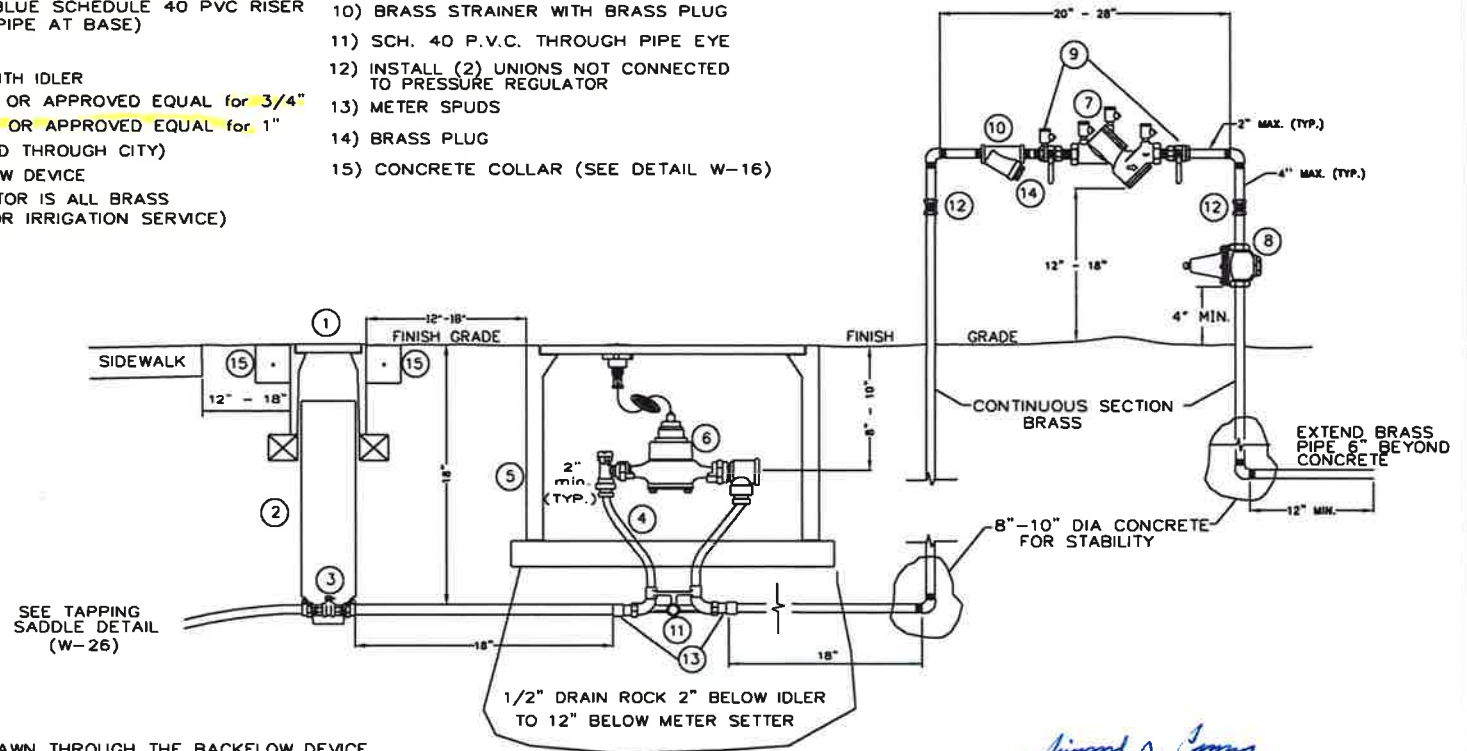
ENVIRONMENTAL UTILITIES
DEPARTMENT

**RESIDENTIAL 1"
SERVICE LINE**

SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

W-5

- | | |
|--|--|
| 1) CONCRETE VALVE BOX (G-5 PER DETAIL W-16) | 9) BALL VALVES |
| 2) 6" CONTINUOUS BLUE SCHEDULE 40 PVC RISER (NOTCHED OVER PIPE AT BASE) | 10) BRASS STRAINER WITH BRASS PLUG |
| 3) CURB STOP | 11) SCH. 40 P.V.C. THROUGH PIPE EYE |
| 4) METER RESETTER WITH IDLER | 12) INSTALL (2) UNIONS NOT CONNECTED TO PRESSURE REGULATOR |
| 5) N-16 UTILITY BOX OR APPROVED EQUAL for 3/4" | 13) METER SPUDS |
| N-30 UTILITY BOX OR APPROVED EQUAL for 1" | 14) BRASS PLUG |
| 6) METER (PURCHASED THROUGH CITY) | 15) CONCRETE COLLAR (SEE DETAIL W-16) |
| 7) R.P TYPE BACKFLOW DEVICE | |
| 8) PRESSURE REGULATOR IS ALL BRASS (NOT REQUIRED FOR IRRIGATION SERVICE) | |



NOTES:

NO WATER SHALL BE DRAWN THROUGH THE BACKFLOW DEVICE UNTIL IT HAS BEEN TESTED BY THE ENVIRONMENTAL UTILITIES DEPT.

ALL FITTINGS AND PIPING SHALL BE BRASS BEGINNING AT CURB STOP

IF USED FOR IRRIGATION DO NOT INCLUDE PRESSURE REGULATOR.

INSTALL (3" X 5") CONCRETE BRICK UNDER PERIMETER OF UTILITY BOXES.

WATER METERS SHALL BE PURCHASED THROUGH THE CITY. PURCHASE INCLUDES INSTALLATION.

THE BACKFLOW DEVICE SHALL BE INSULATED WITH A CITY APPROVED FREEZE PROTECTION BAG.

BURIED PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE OR APPROVED EQUAL.

Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR



ENVIRONMENTAL UTILITIES
DEPARTMENT

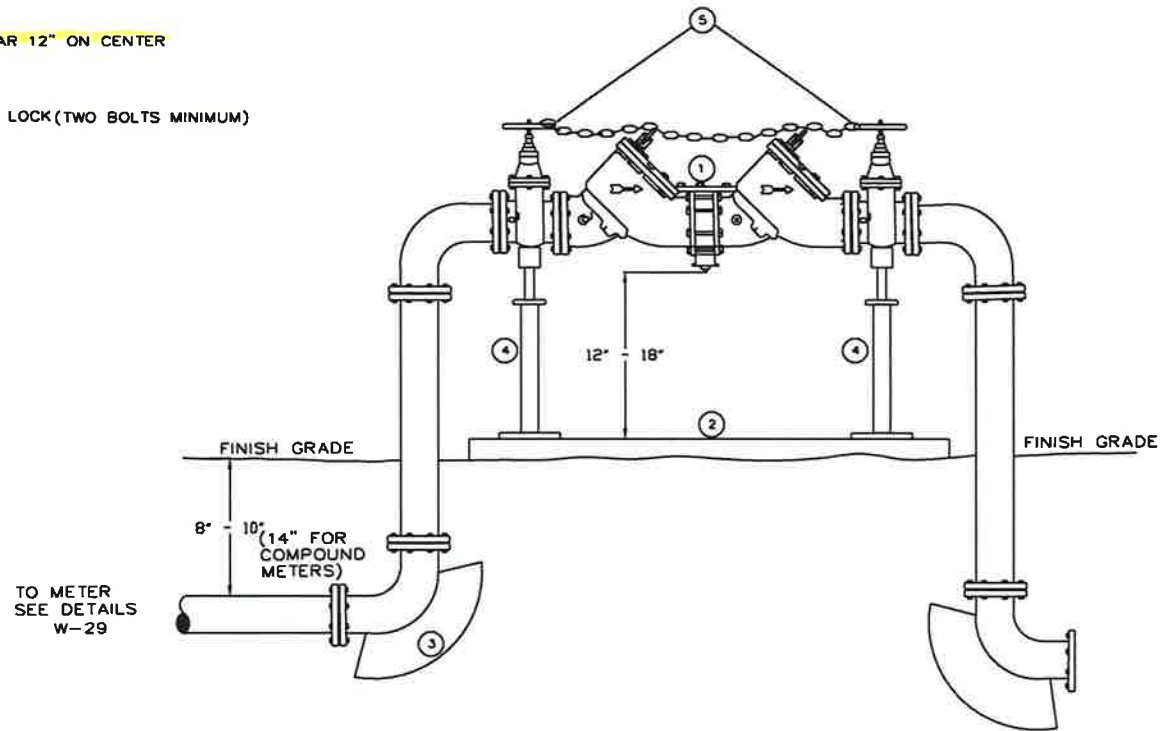
COMMERCIAL 3/4" & 1"
SERVICE LINE

SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

W-6

MATERIALS:

- 1) R.P. TYPE BACKFLOW DEVICE (CITY APPROVED)
- 2) 4" THICK REINFORCED CONCRETE SLAB WITH #4 REBAR 12" ON CENTER
- 3) THRUST BLOCKS (TYP.)
- 4) SUPPORT STANDS BOLTED INTO CONCRETE
- 5) 1/4" NON-CASE HARDENED CHAIN WITH BREAKAWAY LOCK (TWO BOLTS MINIMUM)



NOTES:

NO WATER IS TO BE DRAWN THROUGH THE BACKFLOW DEVICE UNTIL IT HAS BEEN TESTED BY THE ENVIRONMENTAL UTILITIES DEPT.

PIPE SHALL BE DUCTILE IRON.

PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL. POLYETHYLENE

USE CITY APPROVED RESTRAINED JOINTS OR FLANGED SPOOLS

THE BACKFLOW DEVICE SHALL BE INSULATED WITH A CITY APPROVED FREEZE PROTECTION BAG.

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RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

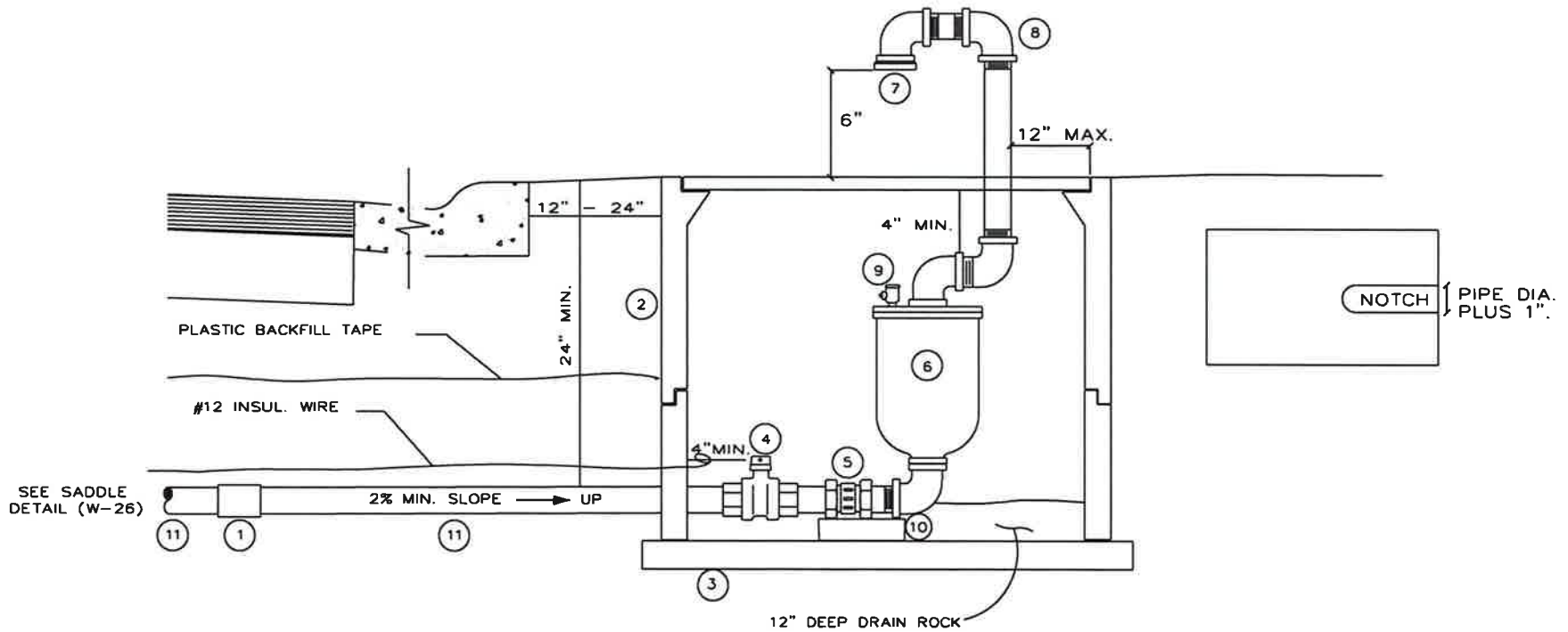


ENVIRONMENTAL UTILITIES
DEPARTMENT

COMMERCIAL 3" & LARGER
SERVICE

SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER


W-8



- 1) BRASS THREADED COUPLING (IF REQUIRED)
- 2) B-40 UTILITY BOX W/TRAFFIC COVER MARKED, "RSVL ARV" IF EXTENSION IS REQ. MOTAR EXTENSION JOINT INSIDE & OUT.
- 3) 3" x 5" CONCRETE BRICK UNDER ENTIRE PERIMETER OF UTILITY BOX.
- 4) CURB STOP
- 5) BRASS UNION
- 6) COMBINATION AIR / VACUUM VALVE
- 7) BRASS CAP WITH 9 DRILLED 1/16" HOLES OR APPROVED EQUAL.
- 8) USE GALVANIZED PIPE AND FITTINGS ABOVE GROUND
- 9) 1/4" TEST COCK
- 10) CONCRETE BLOCK FOR SUPPORT
- 11) THREADED BRASS PIPE

NOTE:
 BURIED PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE OR APPROVED EQUAL.

Richard A. Plecker
 RICHARD PLECKER
 ENVIRONMENTAL UTILITIES DIRECTOR

	ENVIRONMENTAL UTILITIES DEPARTMENT
	1" AND 2" AIR RELEASE VALVE ASSEMBLY
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	W-12

NOTES:

FITTINGS SHALL BE DUCTILE IRON
 VALVES AND FITTINGS SHALL BE WRAPPED
 IN 8 MIL. OR THICKER POLYETHYLENE.
 BURIED NUTS AND BOLTS SHALL BE COATED WITH A
 BITUMINOUS MATERIAL. "T" BOLT HEADS DO NOT
 REQUIRE COATING.
 HYDRANT BOLTS SHALL BE BREAK AWAY TYPE
 INSTALLED NUT SIDE UP AND FILLED
 WITH 25 YEAR SILICONE CAULK.
 VALVE SHALL BE A MINIMUM OF 15' FROM HYDRANT.
 USE APPROVED RESTRAINING JOINTS FROM
 VALVE TO HYDRANT BURY.

MARK THE LOCATION OF THE HYDRANT WITH A BLUE
 REFLECTOR PLACED 1' OFF STREET CENTERLINE.
 HYDRANTS LOCATED AT INTERSECTIONS SHALL BE MARKED
 ON BOTH STREETS, PER PROVISIONS IN SECTION 84
 OF THE CALTRANS SPECIFICATIONS.

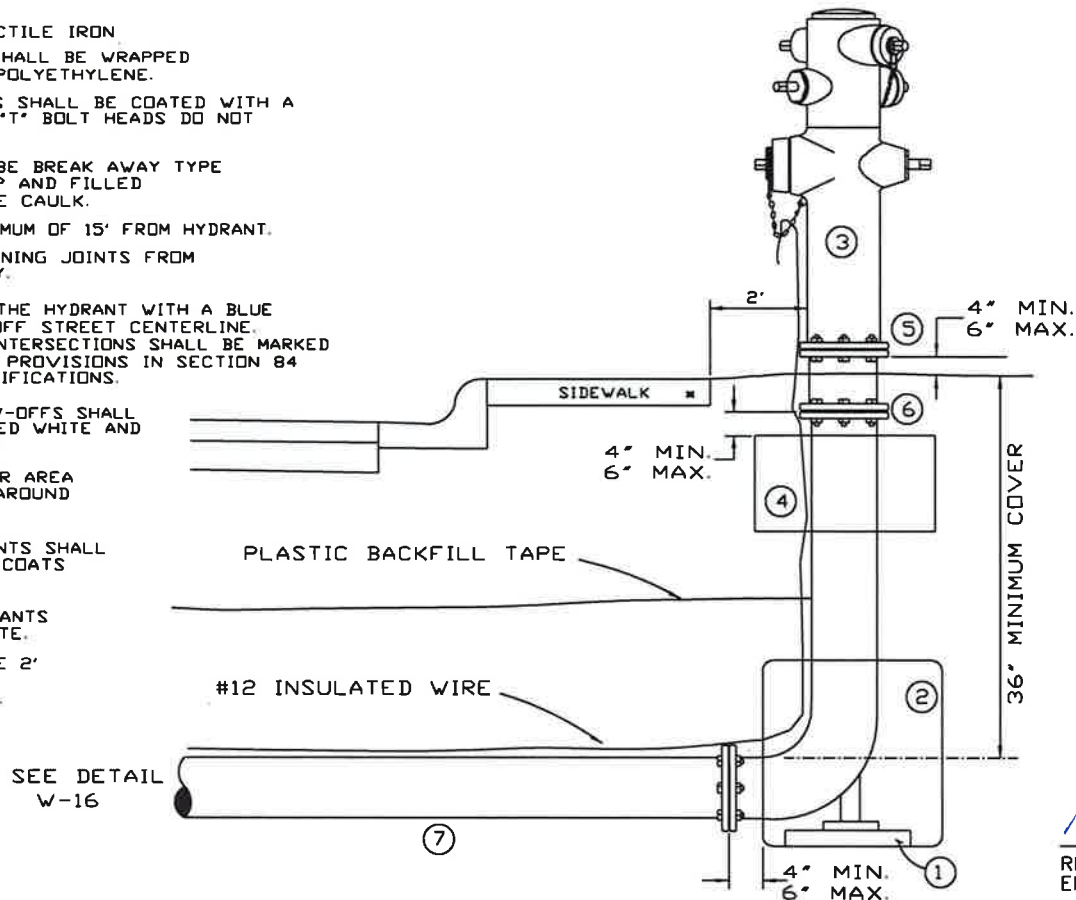
HYDRANTS USED AS BLOW-OFFS SHALL
 HAVE THE TOP 2' PAINTED WHITE AND
 BE MARKED WITH AN "X".

A MINIMUM 3 FOOT CLEAR AREA
 SHALL BE MAINTAINED AROUND
 THE FIRE HYDRANT.

CITY MAINTAINED HYDRANTS SHALL
 BE PAINTED WITH TWO COATS
 SAFTEY-YELLOW.

PRIVATELY OWNED HYDRANTS
 SHALL BE PAINTED WHITE.

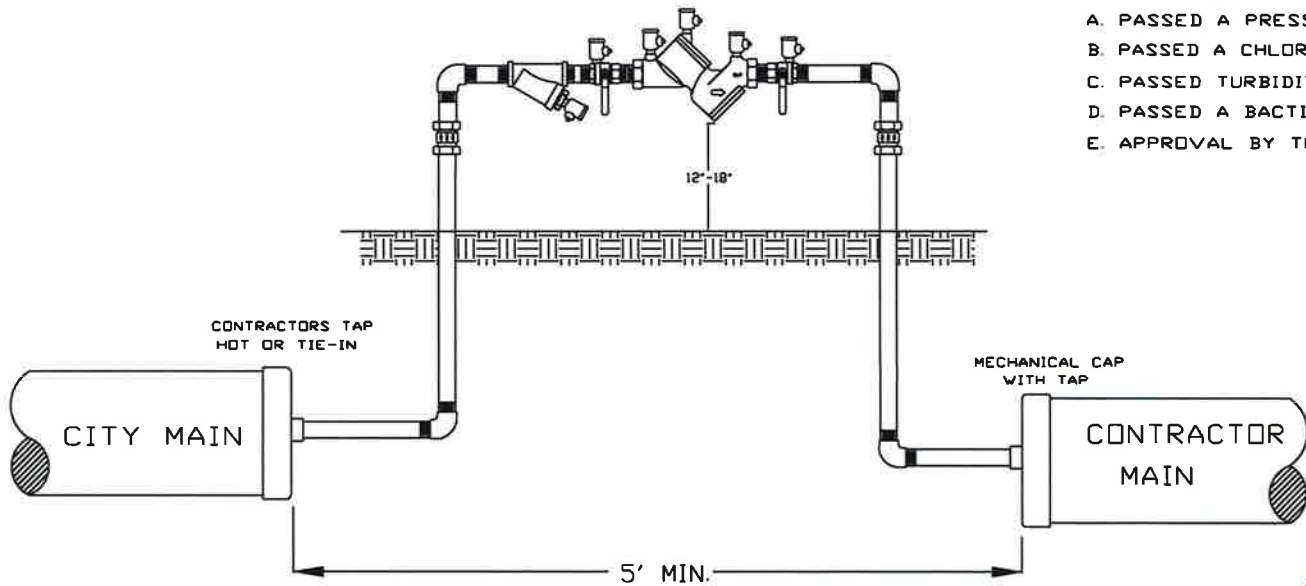
■ - HYDRANTS SHALL BE 2'
 BEHIND CURB WHEN THE
 SIDEWALK IS DETACHED.



MATERIALS:

- 1) CONCRETE BLOCKING
- 2) CONCRETE SUPPORT AGAINST UNDISTURBED SOIL
- 3) FIRE HYDRANT (LEAD FREE)
- 4) 12" X 12" X 12" CONCRETE COLLAR FOR STABILITY
- 5) BREAK AWAY SPOOL WITH BREAK AWAY BOLTS ON HYDRANT FLANGE ONLY
- 6) NON-BREAKAWAY BOLTS
- 7) FULLY RESTRAINED DUCTILE IRON PIPE ENTIRE LENGTH

	ENVIRONMENTAL UTILITIES DEPARTMENT
	FIRE HYDRANT ASSEMBLY
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	W-13



PRIOR TO CONNECTION TO THE CITY MAIN,
THE FOLLOWING CONDITIONS SHALL BE MET:

- A. PASSED A PRESSURE TEST
- B. PASSED A CHLORINE TEST
- C. PASSED TURBIDITY TEST
- D. PASSED A BACTII TEST
- E. APPROVAL BY THE EUD INSPECTOR

Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

NOTES:

WATER SHALL ONLY BE DRAWN INTO THE CONTRACTORS MAIN THROUGH A CITY APPROVED RP TYPE BACKFLOW DEVICE WHICH HAS BEEN TESTED AND TAGGED BY THE ENVIRONMENTAL UTILITIES DEPARTMENT.

FINAL SYSTEM COMPONENTS NECESSARY FOR TIE-IN SHALL BE PRE-CHLORINATED AND PRE-FLUSHED IN THE PRESENCE OF AN ENVIRONMENTAL UTILITIES DEPARTMENT INSPECTOR.

UPON COMPLETION OF THE CONDITIONS NOTED ABOVE AND WITH THE APPROVAL OF THE EUD INSPECTOR, CONNECTION TO THE CITY SYSTEM MAY BE MADE. THE EUD INSPECTOR SHALL BE NOTIFIED 48 HOURS PRIOR TO THE START OF WORK.

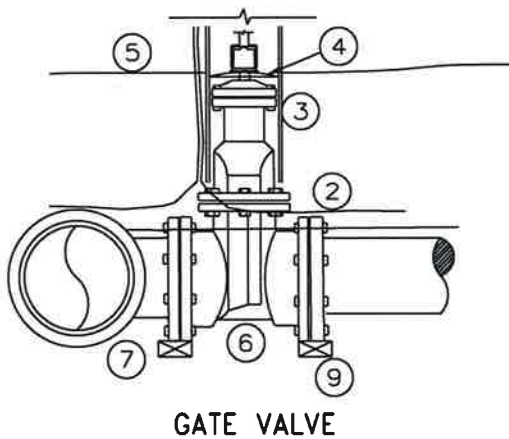
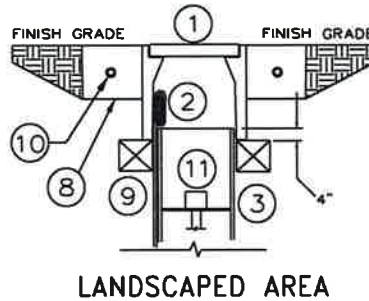
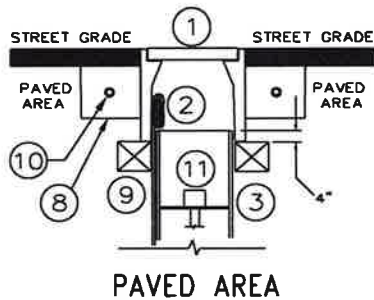
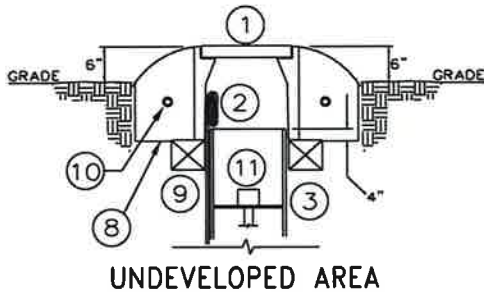
CONTRACTOR IS TO SIZE JUMPER ADEQUATELY FOR FLUSHING PURPOSES.

	CITY OF ROSEVILLE ENVIRONMENTAL UTILITIES DEPT.
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CONSTRUCTION WATER DETAIL

SCALE: NONE
 REVISED: JANUARY 2017
 DRAWN BY: R. VAN NESS
 APPROVED BY: RICHARD PLECKER

W-14



MATERIALS

- 1) CONCRETE VALVE BOX
- 2) #12 INSULATED TRACING WIRE OUTSIDE RISER
- 3) 8" RISER STOCK
- 4) RISER ALIGNER
- 5) PLASTIC BACKFILL TAPE
- 6) GATE VALVE
- 7) DUCTILE IRON TEE
- 8) CONCRETE COLLAR (SEE NOTES)
- 9) CONCRETE BRICK (SEE NOTES)
- 10) #4 REBAR AROUND CIRCUM. (TYP.)
- 11) VALVE EXTENSION PER SECTION 81-12.B

NOTES:

TRACING WIRE THROUGH VALVE BOXES SHALL BE PLACED OUTSIDE OF RISER BUT INSIDE OF BOX.

TRACING WIRE SHALL BE SPLICED INSIDE THE VALVE BOX PER (W-17) AND SHALL LOOP WITHIN THE VALVE BOX WITH 18" OF SLACK WIRE

ALL GATE VALVES SHALL BE CENTERED IN A ONE PIECE RISER STOCK WITH THE USE OF A RISER ALIGNER

OPERATOR NUTS DEEPER THAN 40 INCHES FROM FINISH GRADE SHALL REQUIRE A VALVE NUT EXTENSION 2 FEET MINIMUM IN LENGTH.

VALVE BOXES LOCATED IN A PAVED AREA SHALL BE PLACED IN A 6" X 6" CONCRETE COLLAR A MINIMUM OF 3" BELOW PAVEMENT

VALVE BOXES LOCATED IN A LANDSCAPED AREA SHALL BE PLACED IN A 6" X 6" CONCRETE COLLAR AT FINISHED GRADE.

VALVE BOXES LOCATED IN AN UNDEVELOPED AREA SHALL BE PLACED IN A 12" DEEP BY 6" WIDE CONCRETE COLLAR 6 INCHES ABOVE GRADE.

INSTALL (3" X 5" CONCRETE BRICK) UNDER ENTIRE PERIMETER OF BOX.

VALVES AND FITTINGS SHALL BE WRAPPED AND SEALED IN 8 MIL POLYETHYLENE

VALVE RISOR STOCK SHALL BE A MINIMUM OF 4" INSIDE VALVE BOX

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ENVIRONMENTAL UTILITIES DIRECTOR

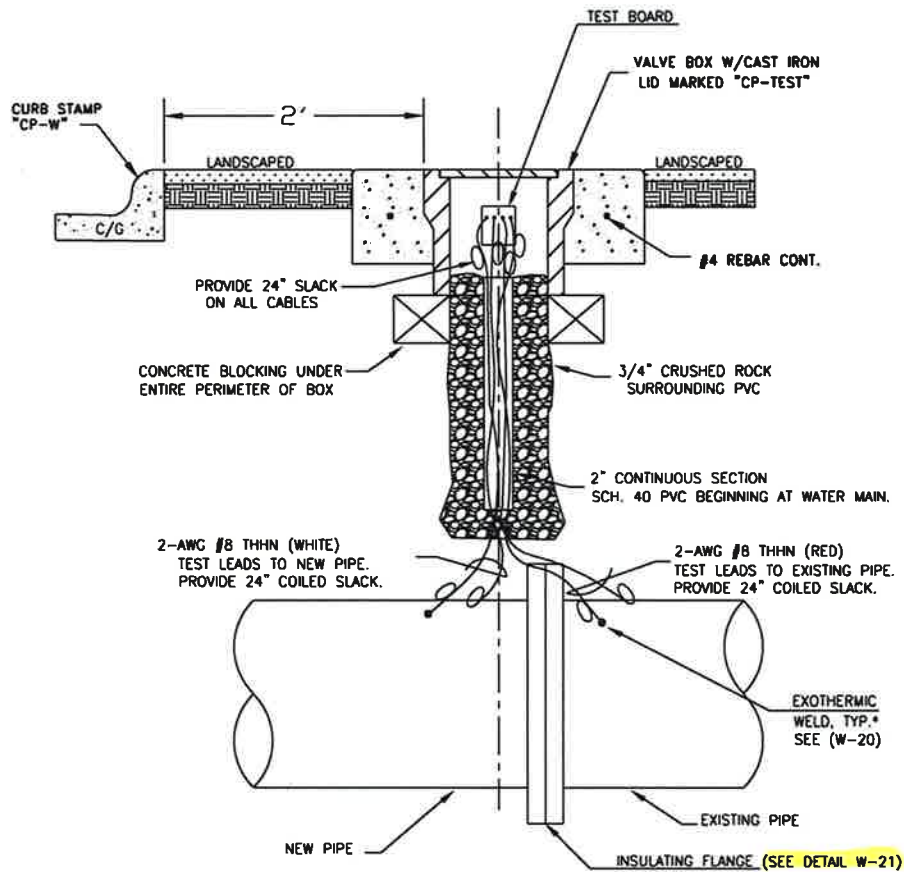
CITY OF
ROSEVILLE
CALIFORNIA

ENVIRONMENTAL UTILITIES
DEPARTMENT

GATE VALVE & BOX

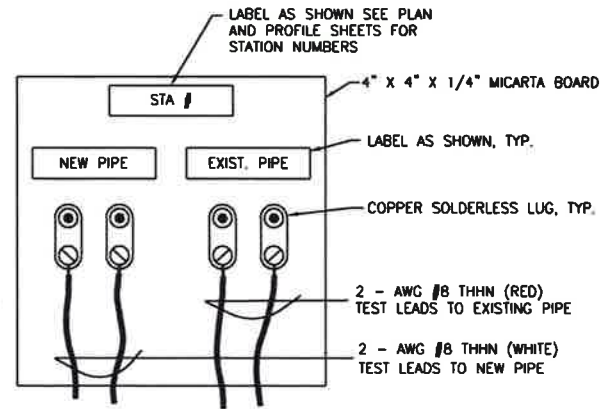
SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

W-16



TEST STATION (TYPICAL)

*FOR VALVES WELD ON FLANGE



TEST STATION BOARD (TYPICAL)

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ENVIRONMENTAL UTILITIES DIRECTOR

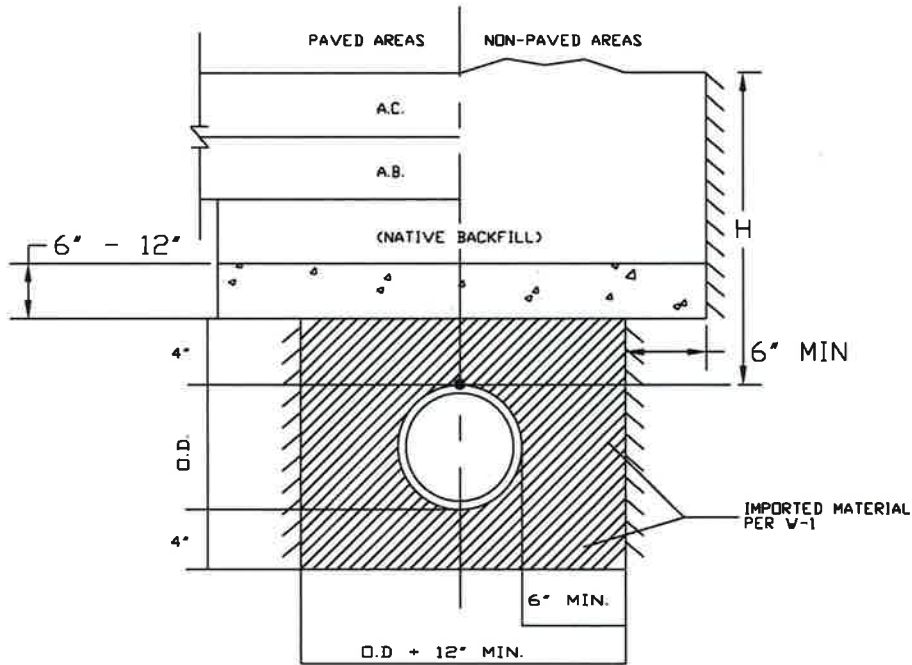


ENVIRONMENTAL UTILITIES
DEPARTMENT

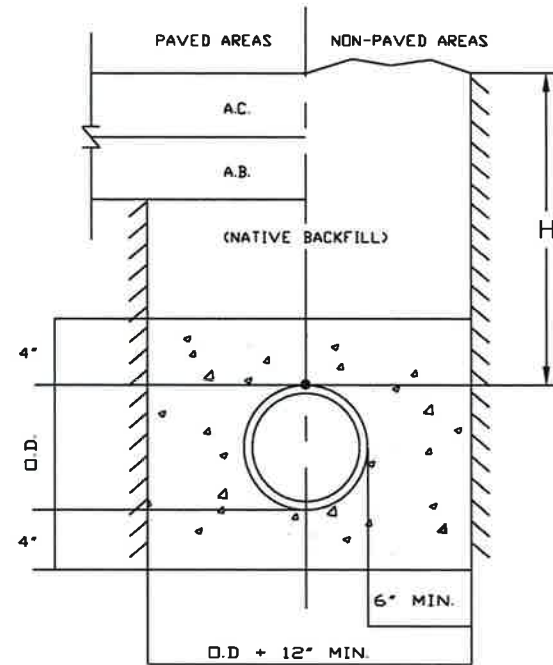
INSULATING FLANGE TEST STATION

SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

W-19



CONCRETE CAP



CONCRETE ENCASEMENT

APPLICATION:

- WHERE $30'' < H < 36''$, USE DIP ONLY
- WHERE $20'' < H < 30''$
 - WITH SERVICES, USE DIP AND CONCRETE CAP
 - WITHOUT SERVICES, USE DIP AND CONCRETE ENCASE (WRAP DIP IN 1/2" CLOSED CELL FOAM PRIOR TO ENCASEMENT)
- WHERE $H < 20''$, REDESIGN WATERLINE

NOTE:

THIS DETAIL SHALL BE USED ON A CASE-BY-CASE BASIS WITH THE APPROVAL OF THE EUD DIRECTOR. IN MOST CASES, THE 36" MINIMUM COVER SHALL PREVAIL.

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ENVIRONMENTAL UTILITIES DIRECTOR



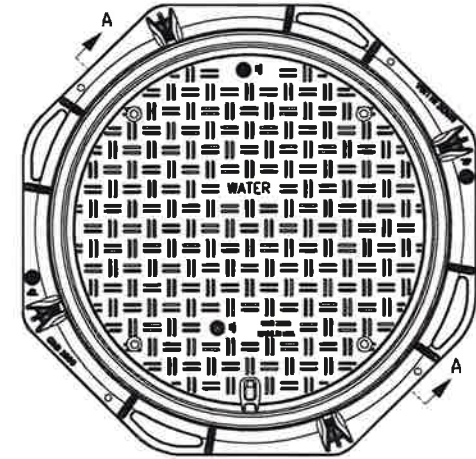
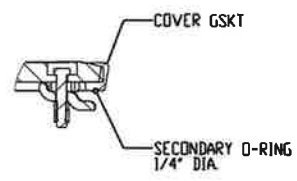
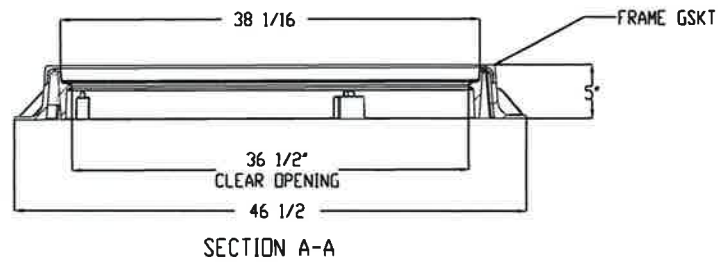
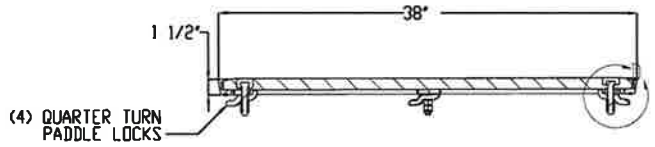
ENVIRONMENTAL UTILITIES
DEPARTMENT

SHALLOW WATER MAINS

SCALE: NONE
REVISED: JANUARY 2017
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APPROVED BY: RICHARD PLECKER

W-23

GMI Cover and Frame Assembly



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 ENVIRONMENTAL UTILITIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA
 ENVIRONMENTAL UTILITIES DEPARTMENT

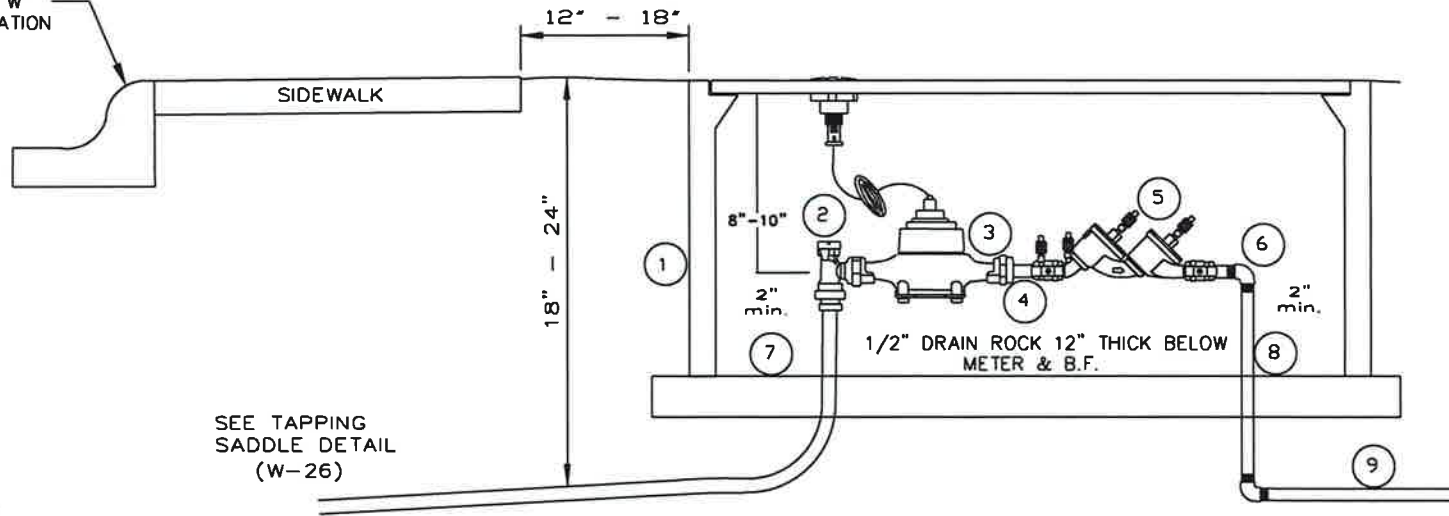
36" MANHOLE RING AND COVER

NOTES:
 TO CONFORM TO AASHTO M306-05, H-20 AND H-25 EN/24 D4000.

SCALE: NONE
 REVISED: JANUARY 2017
 DRAWN BY: R. VAN NESS
 APPROVED BY: RICHARD PLECKER

W-25

CURB STAMPED "W"
AT SERVICE LOCATION



SEE TAPPING
SADDLE DETAIL
(W-26)

NOTES:

WATER METERS SHALL BE PURCHASED THROUGH THE CITY
PURCHASE INCLUDES INSTALLATION.

INSTALL CONCRETE BLOCKING (4"x4"x 15 1/2" SOLID SLUMP BLOCK)
UNDER ENTIRE UTILITY BOX PERIMETER.

BURIED PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL
POLYETHYLENE OR APPROVED EQUAL.

- 1) N 36 UTILITY BOX
- 2) ANGLED METER VALVE W/PADLOCK WINGS (PACK JOINT)
- 3) WATER METER (PURCHASED THROUGH CITY)
- 4) 4" BRASS NIPPLE
- 5) DOUBLE CHECK VALVE (WATTS SERIES 719)
- 6) STREET "L" (BRASS)
- 7) 3" X 5" CONCRETE BRICK
UNDER ENTIRE PERIMETER OF BOX.
- 8) 12" BRASS NIPPLE
- 9) 18" BRASS NIPPLE (MIN.)

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CITY OF
ROSEVILLE
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ENVIRONMENTAL UTILITIES
DEPARTMENT

**DUAL WATER USE (POTABLE)
3/4" & 1" SERVICE LINE**

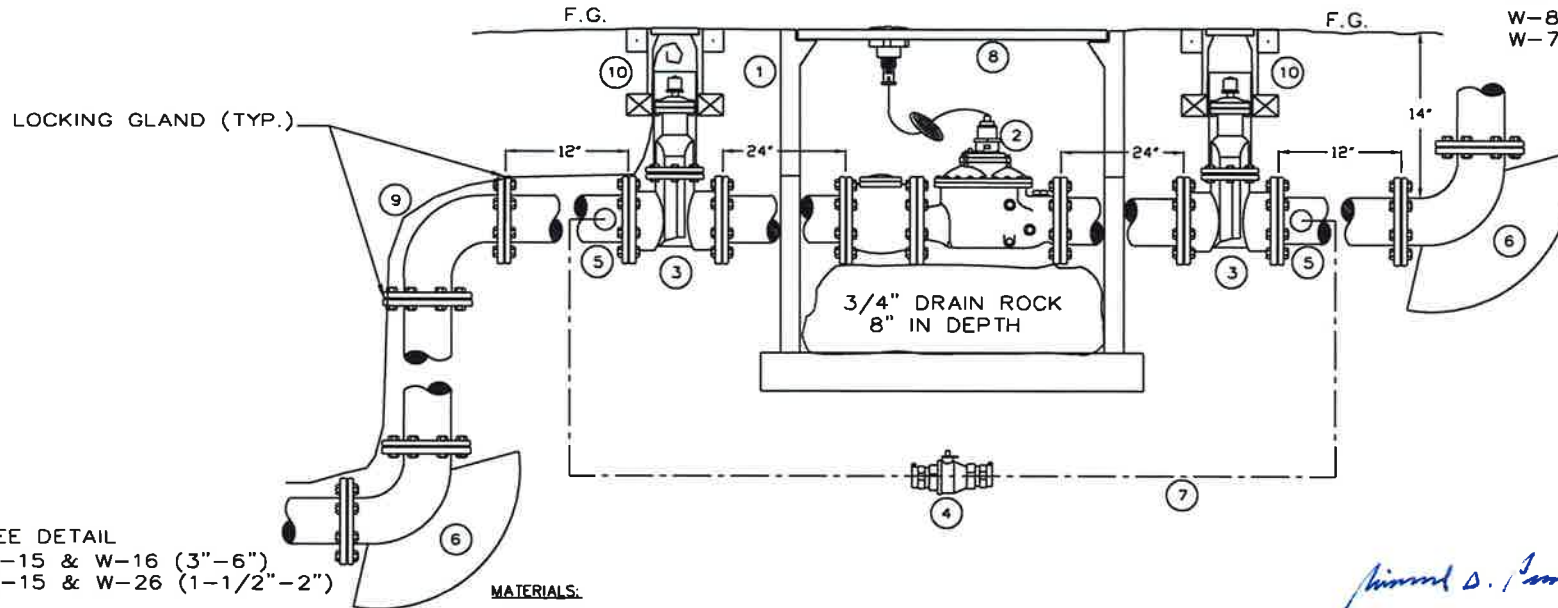
SCALE: NONE
REVISED: JANUARY 2017
DRAWN BY: R. VAN NESS
APPROVED BY: RICHARD PLECKER

W-27

NOTES:

- PIPE SHALL BE DUCTILE IRON FOR 3" AND LARGER. PIPE SHALL BE BRASS FOR 2" AND SMALLER.
- INSTALL (3" X 5") CONCRETE BRICK UNDER ENTIRE PERIMETER OF THE UTILITY BOX.
- PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL. POLYETHYLENE
- USE CITY APPROVED RESTRAINED JOINTS OR FLANGED SPOOLS
- WATER METER SHALL BE PURCHASED THROUGH THE CITY. PURCHASE INCLUDES INSTALLATION.
- USE TURBO METER FOR IRRIGATION & COMPOUND METER FOR COMMERCIAL SERVICE.

TO BACKFLOW
SEE DETAIL
W-8 (3"-6")
W-7 (1-1/2"-2")



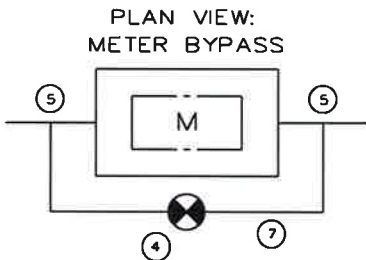
SEE DETAIL
W-15 & W-16 (3"-6")
W-15 & W-26 (1-1/2"-2")

MATERIALS:

- 1) REFER TO TABLE 1 FOR UTILITY BOX SIZING. OR B-48 BOX WITH EXTENSION. MORTAR EXTENSION JOINT INSIDE AND OUT.
- 2) METER WITH STRAINER (PURCHASED THROUGH CITY) INSTALL IDLER SPOOL DURING INSTALLATION OF METER BOX.
- 3) RESILIENT SEAT GATE VALVE (3"-6") OR LOCKING CURB STOP FOR 1-1/2" TO 2" SERVICES
- 4) 2" LOCKING CURB STOP IN G-5 BOX FOR 3"-6" SERVICES OR 3/4" LOCKING CURB STOP FOR 1 1/2"-2" SERVICES. SEE W-16
- 5) 2" DOUBLE STRAP BRASS SADDLE FOR DUCTILE IRON MAIN WITH 2" MIPT BY COMPRESSION ADAPTER
- 6) THRUST BLOCKS (TYP.)
- 7) 3/4" or 2" BYPASS PIPE MATERIAL TO BE SOFT COPPER TYPE K AND FITTINGS TO BE BRASS COMPRESSION TYPE.
- 8) METAL TRAFFIC LID WELD MARKED "RSQL WATER"
- 9) TRACING WIRE
- 10) SEE W-16 FOR VALVE BOX AND RISER DETAIL

Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR



	ENVIRONMENTAL UTILITIES DEPARTMENT
	1-1/2", 2", 3", 4", 6" COMPOUND & TURBO METER WITH BYPASS
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	W-29

CHRISTY B1730 H/20 RATED UTILITY BOX EQUIV. BROOKS OR EQUAL. PROVIDE GALV. STEEL CHECKERED PLATE COVER, SCREW DOWN TYPE, MARKED "B.O."

VALVE BOX W/LID MARKED "B.O." INSTALL PER W-16.

11"Ø OD X 4"Ø RED. FLANGE X NPT

4" 45 EL

4" NPT TO NSHT NIPPLE

4" NSHT CAP

F.G.

NOTE:

ALL THREADED PIPE FITTINGS SHALL BE BRASS

CONCRETE INSTALLED FOR STABILITY

TRANSMISSION WATER MAIN

TRACING WIRE

FLANGED GATE VALVE

6" Ø FIRE HYDRANT BURY


Richard D. Plecker

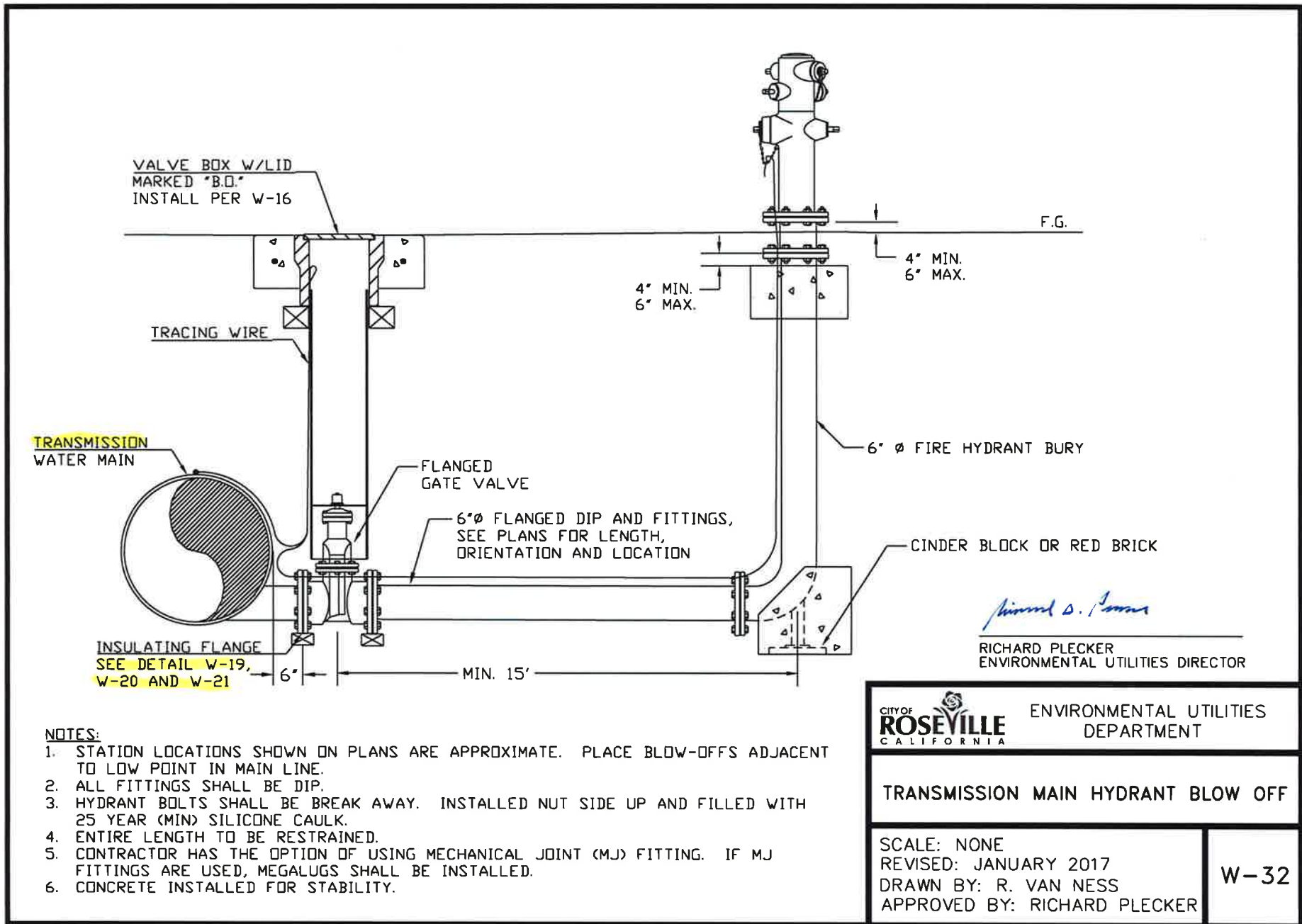
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ENVIRONMENTAL UTILITIES DIRECTOR

INSULATING FLANGE SEE DETAIL W-19, W-20, AND W-21


6" 2'-9"

6"Ø FLANGED DIP AND FITTINGS, SEE PLANS FOR LENGTH, ORIENTATION AND LOCATION

	ENVIRONMENTAL UTILITIES DEPARTMENT
	TRANSMISSION MAIN SUBSURFACE BLOW OFF
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	W-31

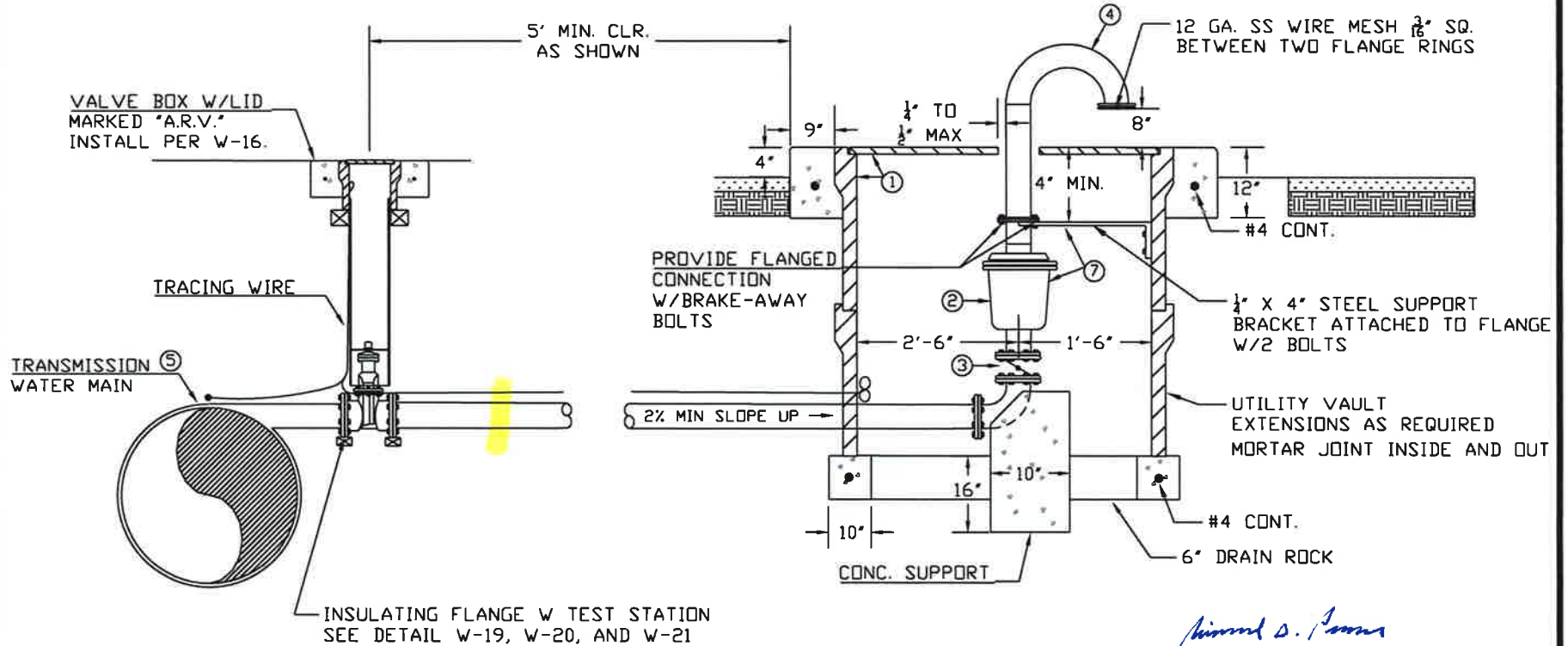


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	ENVIRONMENTAL UTILITIES DEPARTMENT
	TRANSMISSION MAIN HYDRANT BLOW OFF
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	W-32

NOTES:

1. STATION LOCATIONS SHOWN ON PLANS ARE APPROXIMATE. PLACE BLOW-OFFS ADJACENT TO LOW POINT IN MAIN LINE.
2. ALL FITTINGS SHALL BE DIP.
3. HYDRANT BOLTS SHALL BE BREAK AWAY. INSTALLED NUT SIDE UP AND FILLED WITH 25 YEAR (MIN) SILICONE CAULK.
4. ENTIRE LENGTH TO BE RESTRAINED.
5. CONTRACTOR HAS THE OPTION OF USING MECHANICAL JOINT (MJ) FITTING. IF MJ FITTINGS ARE USED, MEGALUGS SHALL BE INSTALLED.
6. CONCRETE INSTALLED FOR STABILITY.




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ENVIRONMENTAL UTILITIES DIRECTOR

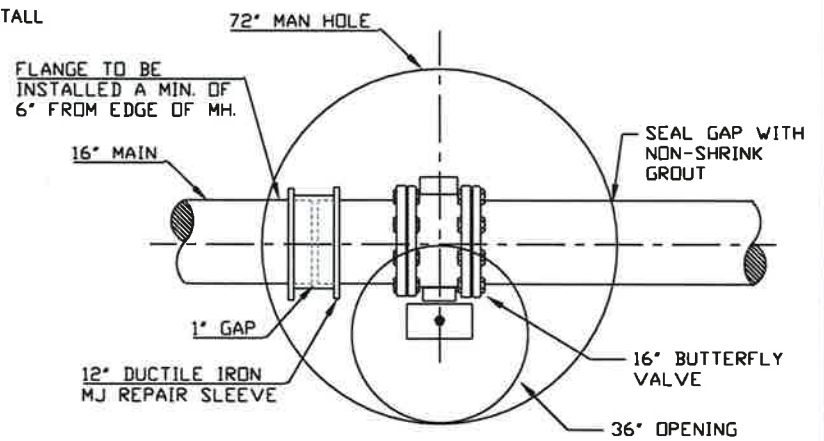
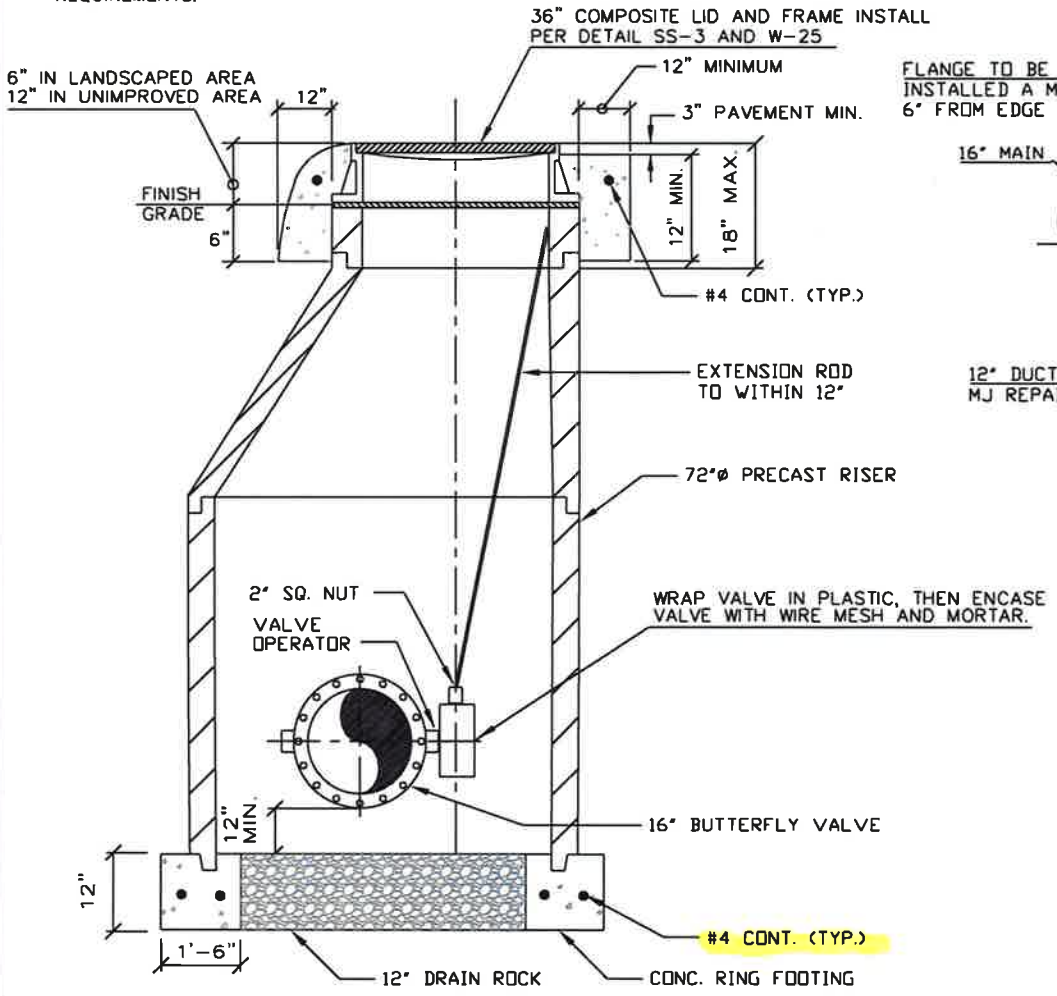
NOTES:

1. PRECAST CONC. UTILITY BOX (48"X48" I.D.) WITH GALV. STEEL LID CHECKERED PLATE COVER (2 PIECE SPLIT LID, DESIGNED FOR H2O LOADING) MARKED "RSVL A.R.V." (USE SS HOLD DOWN SCREWS).
2. COMBINATION AIR/VACUUM RELEASE VALVE, PIPING, AND FITTINGS SIZED AS SHOWN ON PLAN & PROFILE SHEETS. (VALVE SHALL BE FLANGED)
3. FLANGED BUTTERFLY VALVE WITH HAND WHEEL OPERATOR.
4. WSP VENT, SCH 40, GALV. AFTER FABRICATION.
5. ARV TO BE PLACED AT HIGH POINT OF PIPE AT SIDE OUTLET FLANGE.
6. RESTRAIN ALL JOINTS BETWEEN C.C.P. AND ARV. RESTRAINED MJ WITH MEGALUG GLANDS MAY BE USED IN LUE OF FLANGED FITTINGS BEYOND G.V.
7. EXPOSED NON-GALVANIZED PIPING, VALVES, AND APPUR. SHALL BE PAINTED WITH TWO PRIMER AND TWO FINISH COATS OF MACHINERY ENAMEL (COLOR TO BE SELECTED BY EUD)
8. ALL BURIED PIPE, FITTINGS, VALVES AND APPUR. SHALL BE DUCTILE IRON AND ENCASED WITH 8 MIL. POLYETHYLENE.
9. CONCRETE INSTALLED FOR STABILITY.

	ENVIRONMENTAL UTILITIES DEPARTMENT
	3" THROUGH 6" ARV
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	
W-33	

NOTES

1. SEE VALVE BONDING DETAIL FOR ADDITIONAL REQUIREMENTS.



Richard D. Plecker

RICHARD PLECKER
ENVIRONMENTAL UTILITIES DIRECTOR

	ENVIRONMENTAL UTILITIES DEPARTMENT
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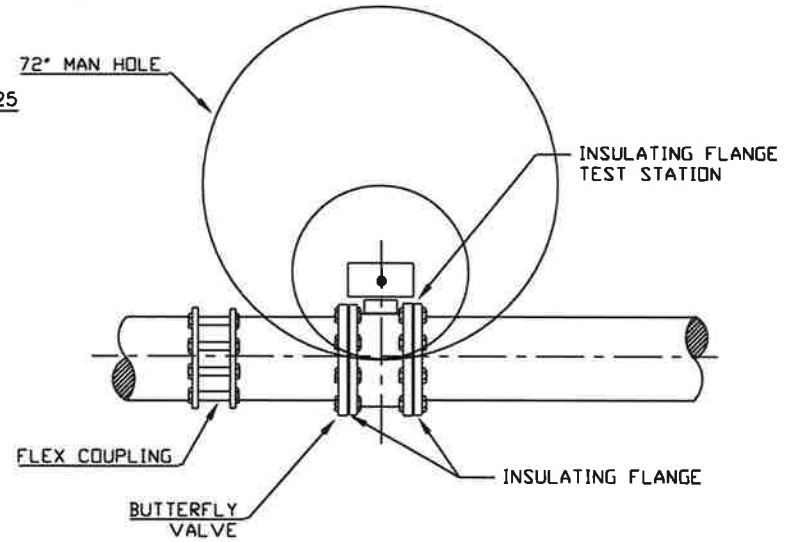
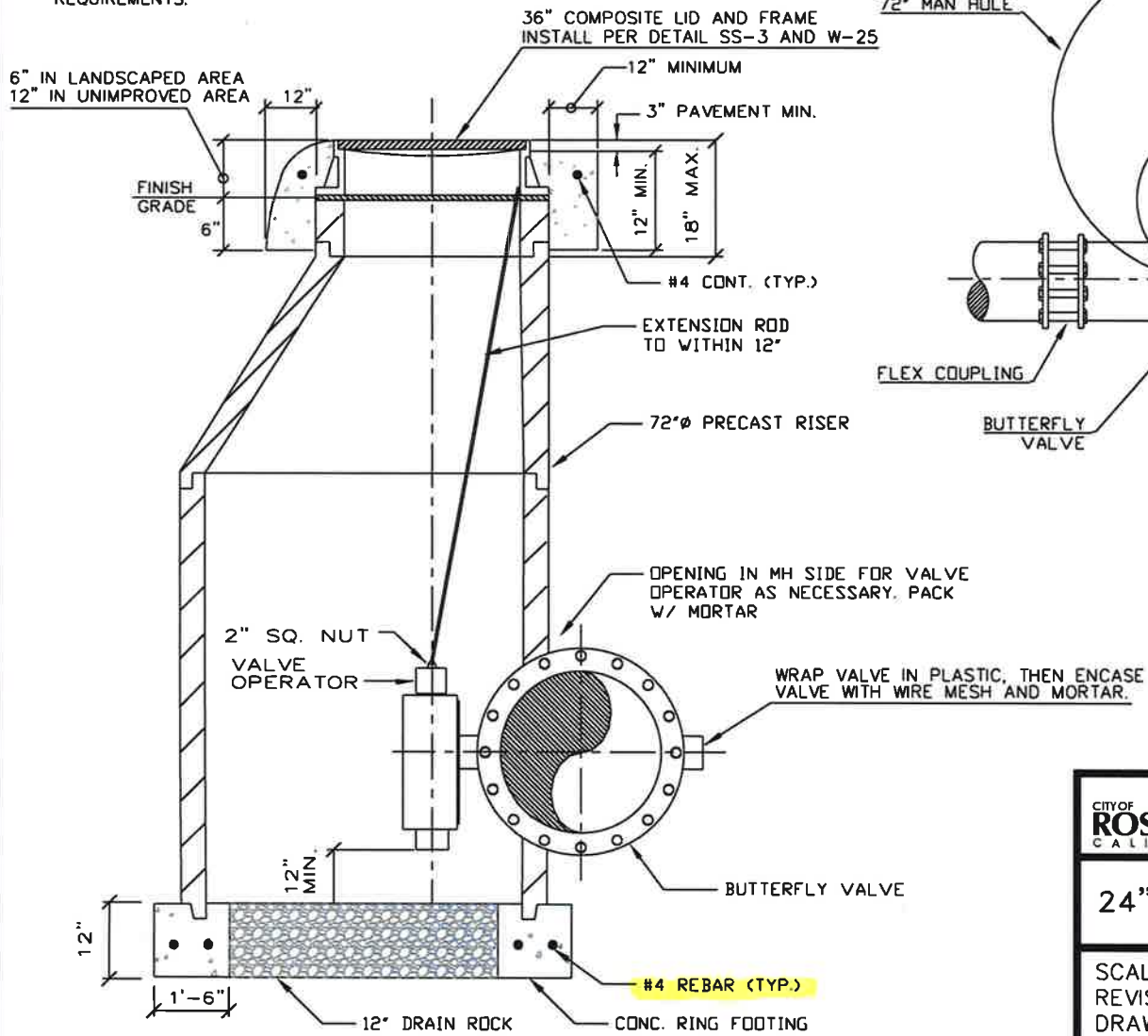
16" MAINLINE VALVE ENCLOSURE

SCALE: NONE
 REVISED: JANUARY 2017
 DRAWN BY: R. VAN NESS
 APPROVED BY: RICHARD PLECKER

W-34

NOTES

1. SEE VALVE BONDING DETAIL FOR ADDITIONAL REQUIREMENTS.



Richard D. Plecker
 RICHARD PLECKER
 ENVIRONMENTAL UTILITIES DIRECTOR

	ENVIRONMENTAL UTILITIES DEPARTMENT
	<p>24" & LARGER MAINLINE VALVE</p>
SCALE: NONE REVISED: JANUARY 2017 DRAWN BY: R. VAN NESS APPROVED BY: RICHARD PLECKER	<p>W-35</p>