



## CITY OF HIGHLAND

27215 Base Line  
Highland, CA 92346  
(909) 864-8732

[www.ci.highland.ca.us](http://www.ci.highland.ca.us)

### **PUBLIC WORKS POLICIES, PROCEDURES AND STANDARDS September 13, 2016**

2016 APWA National Project of the Year  
City of Highland Greenspot Road Bridge



Public Works: Serving you and your Community

**CITY OF HIGHLAND**  
**Public Works Policies, Procedures and Standards**

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## **1.0 GENERAL POLICIES AND PROCEDURES**

The following outline is intended to guide and inform developers and engineers in the preparation and processing of final maps, engineering plans and construction permit applications for development projects in Highland.

Upon City approval of a tentative map, design review, conditional use permit, or other development application, and prior to obtaining construction permits, the developer's engineer must submit an entire engineering development plan and/or map package (development package) to the City for review and approval.

### **1. Conditions of Approval**

- a. The conditions of approval will be provided to the developer by the Planning Division following City's approval of a development proposal.
  - The developer and the developer's engineers should carefully review all conditions of approval that will affect the preparation of final plans or maps and if questions arise regarding the Engineering Conditions of Approval, he or she should contact the City Engineer's office for clarification at (909) 864-8732, ext. 240.

### **2. Plan Check Submittal Requirements**

- a. Plan check submittals must be submitted to: City of Highland, Engineering Department, 27215 Base Line, Highland, CA 92346.
- b. Plan check submittal must include plan and map checking fees.
- c. Plan check submittal must include and conform to the City's Plan Check Submittal form. Refer to Section 2.0 of this handbook.
- d. Plan check submittal must include the entire engineering development package prior to submittal to the City for checking and/or review and approval.
  - The entire development package must include all engineering plans and/or maps, all supporting calculations, quantity estimates, drainage reports, water quality management plans, and any other pertinent data required in accordance with the City's improvement plan checklists to allow complete checking of the entire design development package in one submittal.
- e. Plan check submittal must include appropriate City checklist(s) for improvement type(s) and the checklist items must be indicated with a checkmark as completed by the developer's engineer.

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- f. Plan check review comments will be returned to the developer's engineer once plan review has been completed by and comments received from all City departments including Engineering, Planning, Building and Safety, and Fire.
3. Plan Check Fee Requirement (Make checks payable to City of Highland)
    - a. Plan check fee must be included with 1st plan check submittal.
    - b. Plan check fee amounts in accordance with Section 2.0 must be calculated from the same Engineering Cost Estimates for Bonding and Fee Purposes used to calculate bond amounts. (Note: Fees are subject to change periodically; it shall be the Developer's responsibility to ensure that he or she is using the latest edition of the Engineering Department Policies, Procedures and Standards Handbook and Fee Schedules prior to submittals).
      - Engineering Cost Estimates for Bonding and Fee Purposes are included in Section 16.0.
    - c. Plan and map checking fees provide for three reviews of the design. It is imperative that the plans be prepared in accordance with the appropriate City of Highland plan and/or profile checklist(s) prior to 1st plan check submittal in order to avoid additional plan checking costs.
      - Additional plan check fees will be assessed beginning with the 4th and each subsequent plan check submittal until plans are approved.
  4. Utility Requirements
    - a. The design engineer is responsible for identifying and contacting all utilities having any facilities that may be affected in any manner whatsoever by the proposed work included on the engineering plans.
      - Refer to Section 8.0 for a general list of utilities operating in Highland.
    - b. The design engineer is responsible for obtaining utility company approval for any utility improvements and/or modification required as a result of the development project.
    - c. The developer is responsible for undergrounding utility lines in accordance with the Highland Municipal Code Title 16, Land Use and Development, Section 16.40.380.

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5. Federal Emergency Management Agency (FEMA)
  - a. Portions of the City of Highland are within Special Flood Hazard Areas as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM).
  - b. It is the responsibility of the design engineer to ascertain that all proposed design criteria complies with the requirements of FEMA, and the City of Highland's Drainage Ordinance.
  
6. Standards for Design and Construction
  - a. The appropriate checklists and standard drawings contained herein shall be used for street, storm drain, and grading design and construction within the City of Highland. The Caltrans Highway Design Manual, the California Manual on Uniform Traffic Control Devices and the Greenbook Standard Specifications for Public Works Construction shall also be used for design and construction within the City. If a City of Highland standard drawing does not exist, use of the County of San Bernardino Transportation Department Standard Drawings, the County of San Bernardino Flood Control District Standard Drawings, Caltrans Standard Plans, or the Standard Plans for Public Works Construction is acceptable.
  - a. Hydrology Studies submitted for review must follow the San Bernardino County Hydrology Manual and addendum. The addendum can be accessed at [www.sbcounty.gov/dpw/floodcontrol/water\\_resources.asp](http://www.sbcounty.gov/dpw/floodcontrol/water_resources.asp).
  - b. Hydraulic calculations and studies submitted for review must follow Los Angeles County Flood Control District Hydraulic Design Manual criteria.
  - c. Water Quality Management Plan (WQMP) submitted for review must follow current templates, guidelines and regulations set forth by the Santa Ana Regional Water Quality Control Board.
  
7. Street Lighting and Traffic Signals
  - a. Street lighting and traffic signals shall be designed in accordance with the State of California Standard Specifications and Standard Plans and City of Highland Standards.
  - b. Street light locations will be provided by the City at the beginning of the plan check process.
  - c. Authorization of street light installation and/or modification will be given by the City upon final approval of development plans.

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8. Traffic Studies

- a. Traffic studies shall be prepared in accordance with criteria adopted by the City of Highland.
  - Check with the City Engineer for details before starting any traffic reports. Phone (909) 864-8732, ext. 240.

9. Bond Requirements

- a. The developer's engineer shall submit Engineering Cost Estimates for Bonding and Fee Purposes.
- b. Construction quantities used to calculate bond amounts shall be in accordance with the improvement plans.
- c. The developer's engineer shall use the unit prices provided on the City's Engineering Cost Estimates for Bonding and Fee Purposes to calculate Bond amounts.
  - Engineering Cost Estimates for Bonding and Fee Purposes are included in Section 16.0.
- d. Bond amounts are as follows:
  - 100% of the estimated bond amount for the Faithful Performance Bond
  - 50% of the estimated bond amount for the Labor and Materials Bond
  - 25% of the estimated bond amount cost for the Warranty Bond. The Warranty Bond can be submitted when the proposed work has been faithfully performed and accepted as complete by the City. The warranty bond must be submitted prior to release of the Faithful Performance Bond.
  - 30% of the estimated grading cost for the Grading Bond.

10. Bond Processing (Make check payable to City of Highland)

- a. The City will prepare the subdivision agreement and bonds for processing.
  - Processing fees in accordance with current fee schedules are required prior to preparation of subdivision agreement and bonds.

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- b. The subdivision agreement and bonds must be executed by the developer and returned to the City 15 calendar days prior to the City Council meeting that approval for recordation of the final map is requested.
  - City Council meets on the 2nd and 4th Tuesdays of each month (with exceptions).

11. Erosion Control Deposit

- a. Erosion control deposits are required prior to issuance of a rough grading permit.
- b. The developer's engineer shall submit a wet-signed and stamped erosion control construction cost estimate.
- c. The erosion control deposit shall be 100% of the erosion control estimate.

12. Monumentation Deposit

- a. Monumentation deposits are required prior to recordation of a Final or Parcel Map.
- b. The developer's engineer shall submit a wet-signed and stamped monumentation cost estimate.
- c. The monumentation deposit shall be 100% of the monumentation estimate.

13. Maintenance Districts

- a. The Engineering Conditions of Approval will state the type of maintenance district required, if any. Multiple maintenance districts may be required. Upon payment of the processing fee, the City will prepare the ballot for the property owner's signature consenting to the assessment and amount of assessment. Upon receipt of the signed ballot, the City will coordinate with the County to include the maintenance district in the next annexation cycle.
- b. For residential projects with frontage landscaping in a landscape maintenance district (LMD), a cash payment for one year of landscaping maintenance is required after a 12-month plant establishment period and the City's acceptance of the landscaping. Maintenance will be provided by the City through the assessment district when the City has accepted the landscaping.
- c. For commercial projects with frontage landscaping in a LMD, the developer will maintain the landscaping. The City will assume maintenance of frontage landscaping only if the City determines that adequate maintenance is not being provided by the developer.

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- d. For projects with a landscaped median, a cash payment for one year of landscaping maintenance is required after a 12-month plant establishment period and the City's acceptance of the landscaping. Maintenance will be provided by the City through the assessment district when the City has accepted the landscaping.

14. Insurance Requirements

- a. Insurance requirements are outlined in Section 16.
- b. An Endorsement page attached to the Certificate of Insurance shall contain the following wording:

"Solely as respects work done by and on behalf of the named insured in the City, it is agreed that the City of Highland and their officers, agents, employees, and volunteers are added as an additional insured under this policy and the coverage provided hereunder shall be primary insurance available to the City of Highland, California, and under any third party liability policy.

It is further agreed that this insurance shall indemnify, defend, and hold harmless, the City of Highland and their officers, agents, employees, and volunteers from and against any and all liability, loss, damage, expense, costs (including without limitation costs and fees of litigation) of every nature arising out of or in connection with the Contractors' performance of work hereunder or its failure to comply with any of its obligations contained in the agreement, except such loss or damage which was caused by the sole negligence or willful misconduct of the City.

It is further agreed that the other insurance conditions of the policy are amended to conform herewith."

- No variations of the above endorsement can be accepted

## **2.0 SUBMITTAL FORMS AND FEE SCHEDULES**

All plan check submittals will be reviewed for completeness within three (3) working days of submittal. A complete submittal shall include all plans, \*reports and supporting documents applicable to the project along with all required city fees. Incomplete submittals will not be processed until a complete submittal is received. All re-submittals of plans, maps, and reports must include the previous check prints as well as the required submittals.

All plan check submittals shall be submitted to the Engineering Department, 27215 Base Line, Highland, CA 92346.

NOTE: Landscape plans shall be submitted to the Planning Division.

\* All reports that are required to be included with the first plan check as reference material, such as Soils/Geological Investigations, shall be “comb” bound, (or similar), with front and back covers.

Bound copies of reports that are required for review and approval, such as Hydrology/Drainage Studies, Traffic Studies, etc., must be submitted for review with the exception of Water Quality Management Plans which must be in 3-ring binders.

(Note: Fees are subject to change periodically; it shall be the Developer’s responsibility to ensure that he or she is using the latest edition of the Engineering Department Policies, Procedures and Standards Handbook and Fee Schedules prior to submittals.)

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**2.1 Plan Check Submittal Form**

Submittal Date: \_\_\_\_\_  
 Tract or  Parcel Map No \_\_\_\_\_ City Proj. No. \_\_\_\_\_  
Site Address or Location by Cross Streets: \_\_\_\_\_

---

**Engineer:** \_\_\_\_\_  
Address: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_  
Email: \_\_\_\_\_ Fax: (\_\_\_\_) \_\_\_\_\_

**Developer:** \_\_\_\_\_  
Address: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_  
Email: \_\_\_\_\_ Fax: (\_\_\_\_) \_\_\_\_\_

**FINAL MAP SUBMITTAL - TRACT AND PARCEL MAPS**

- Three (3) complete sets of maps
- One (1) preliminary title report updated in past 90 days
- One (1) set traverse calculations and closures (inverse calculations not acceptable for plan check review)
- One (1) set of reference materials including surrounding maps, deeds, records of survey and centerline ties
- Two (2) complete sets of Composite Development Plan (must be submitted by second check)
- Fees include plan check, microfilming and GIS per latest fee schedule
- One (1) completed set of plan and/or profile checklists

**GRADING/IMPROVEMENT PLAN SUBMITTAL**

- One (1) signed and stamped Engineer's Estimate of Precise Grading (Commercial Projects), street and storm drain improvement costs
- Two (2) sets of street and/or storm drain improvement plans
- Five (5) sets of rough grading plans
- Five (5) sets of precise grading plans
- Two (2) sets of erosion control plans
- One (1) set of water and sewer plans (for reference only)
- Two (2) sets of cross section minimum 50-foot stations where widening existing street
- One (1) set reference street plans 300 feet either direction on existing street connections
- Two (2) sets of hydraulics, drainage study/hydrology and or traffic study reports (where required)
- One (1) completed grading plan checklist
- Three (3) sets of Final WQMP Reports
- Fees include plan check, professional report review, microfilming and GIS per latest fee schedule

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**2.2 List of Engineering Fees and Unit Prices – March 30, 2015**

**FINAL PARCEL MAP REVIEW**

\$2,420 for residential, commercial and industrial parcel maps (4 lots or less)

\$2,420 + \$40/lot for commercial and industrial parcel maps (5 lots or more)

The above map fees include three full plan checks and a fourth "signature" check. Additional deposits will be collected in increments of \$1,000 after third plan check.

**FINAL TRACT MAP REVIEW** .....\$2,255 plus \$40/lot

The above map fee includes three full plan checks and a fourth "signature" check. Additional deposits will be collected in increments of \$1,000 after third plan check.

**FINAL/PARCEL MAP REVISION** ..... Actual Cost/\$1,300 deposit

**REVISIONS TO CONDITIONS OF APPROVAL** ..... Actual Cost/\$1,150 deposit

**BOND PROCESSING**

\$905 per landscape bond

\$755 per other bond (Performance, Labor & Materials, and Maintenance bonds of the same improvement are to be considered as one bond). Bond processing fee to be paid with final map review fee.

**LEGAL DESCRIPTION PREPARATION/REVIEW**

Actual Cost/\$955 deposit per description

Fee covers review of a legal description or preparation of legal description by City for single lot residential (not part of a tract map or parcel map application).

**ANNEXATION TO MAINTENANCE DISTRICT** .....\$1,055 per district

**STREET VACATION REQUEST PROCESSING**

Summary Street Vacation ..... Actual Cost/\$2,700 deposit

Full Street Vacation ..... Actual Cost/\$5,000 deposit

**GIMS MAP PLAN UPDATE**

\$100.00 per map plus "full cost" of San Bernardino County mapping charges

Engineering staff has identified County Mapping charges as follows:

Parcel Map ..... \$173

Tract Map ..... \$317

**MICROFILMING OF MAPS AND PLANS** ..... \$115.00 per project plus \$2.00 per sheet of map/plan

**PROFESSIONAL REPORT REVIEW** .....Actual Cost/\$3,500 deposit

**WQMP REVIEW AND INSPECTION** ..... Actual Cost/\$5,300 deposit

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**ROUGH GRADING PLAN CHECK**

<u>No. Cubic Yards</u>	<u>Fee</u>
5,000 cubic yards or Less .....	\$1,670 minimum
5,001 - 10,000 cubic yards .....	\$1,670 plus \$.220/c.y. exceeding 5,000 c.y.
10,001 - 15,000 cubic yards .....	\$2,770 plus \$.080/c.y. exceeding 10,000 c.y.
15,001 - 20,000 cubic yards .....	\$3,170 plus \$.060/c.y. exceeding 5,000 c.y.
20,001 - 35,000 cubic yards .....	\$3,470 plus \$.040/c.y. exceeding 20,000 c.y.
35,001 - 50,000 cubic yards .....	\$4,070 plus \$.035/c.y. exceeding 35,000 c.y.
50,001 - 100,000 cubic yards .....	\$4,595 plus \$.025/c.y. exceeding 50,000 c.y.
100,001 and greater .....	\$5,845 plus \$.015/c.y. exceeding 100,000 c.y.

Fee includes three full plan checks and a fourth "signature" check. Additional deposits will be collected in increments of \$1,500. If rough grading plan is combined with precise grading plan, applicant shall pay the higher of the plan check fee for rough grading plan or precise grading plan, but not both fees.

**PRECISE GRADING PLAN CHECK**

Residential (with subdivision map)

<u>No. of Lots</u>	<u>Fee</u>
1 - 10 .....	\$1,340
11 - 50 .....	\$1,340 + \$44/lot over 10 lots
51 - 100 .....	\$3,100 + \$33/lot over 50 lots
101 - 200 .....	\$4,750 + \$22/lot over 100 lots
Over 200 .....	\$6,950 + \$11/lot over 200 lots

Commercial, Industrial and Residential (without subdivision map).

<u>Construction Cost</u>	<u>Fee</u>
\$1.00 - \$20,000 .....	\$ 1,670
\$20,001 - \$30,000 .....	\$ 1,620 + 2.25% of project costs exceeding \$20,000
\$30,001 - \$150,000 .....	\$ 1,895 + 2.15% of project costs exceeding \$30,000
\$150,001 - \$400,000 .....	\$ 4,475 + 2.05% of project costs exceeding \$150,000
\$400,001 - \$600,000 .....	\$ 9,600 + 1.80% of project costs exceeding \$400,000
More than \$600,000 .....	\$13,200 + 1.60% of project costs exceeding \$600,000

Fee includes three full plan checks and a fourth "signature" check. Additional deposits will be collected in increments of \$1,500. If rough grading plan is combined with precise grading plan, applicant shall pay the higher of the plan check fee for rough grading plan or precise grading plan, but not both fees.

**PRECISE GRADING PLAN REVISION** .....Actual Cost/\$700 deposit

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**ROUGH GRADING INSPECTION**

<u>No. Cubic Yards</u>	<u>Fee</u>
Up to 5,000 cubic yards .....	\$1,670 minimum
5,001 - 10,000 cubic yards .....	\$1,670 plus \$.220/c.y. exceeding 5,000 c.y.
10,001 - 15,000 cubic yards .....	\$2,770 plus \$.080/c.y. exceeding 10,000 c.y.
15,001 - 20,000 cubic yards .....	\$3,170 plus \$.060/c.y. exceeding 15,000 c.y.
20,001 - 35,000 cubic yards .....	\$3,470 plus \$.040/c.y. exceeding 20,000 c.y.
35,001 - 50,000 cubic yards .....	\$4,070 plus \$.035/c.y. exceeding 35,000 c.y.
50,001 - 100,000 cubic yards .....	\$4,595 plus \$.025/c.y. exceeding 50,000 c.y.
100,001 and greater .....	\$5,845 plus \$.015/c.y. exceeding 100,000 c.y.

The above fee divided by \$57 equals the number of days for which the permit is valid. After that number of days, additional charges will be the hourly rate of all personnel involved plus any other related fully allocated costs.

**PRECISE GRADING INSPECTION**

Residential (with subdivision map)

<u>No. of Lots</u>	<u>Fee</u>
1 - 10 .....	\$1,110
11 - 50 .....	\$1,110 + \$50/lot over 10 lots
51 - 100 .....	\$3,110 + \$33/lot over 50 lots
101 - 200 .....	\$4,760 + \$22/lot over 100 lots
Over 200 .....	\$6,960 + \$16/lot over 200 lots

Commercial, Industrial and Residential (without subdivision map)

<u>Construction Cost</u>	<u>Fee</u>
\$1.00 - \$20,000 .....	\$1,670
\$20,001 - \$30,000 .....	\$1,670 + 2.25% of project costs exceeding \$ 20,000
\$30,001 - \$150,000 .....	\$1,895 + 2.15% of project costs exceeding \$ 30,000
\$150,001 - \$400,000 .....	\$4,470 + 2.05% of project costs exceeding \$150,000
\$400,001 - \$600,000 .....	\$9,600 + 1.80% of project costs exceeding \$400,000
More than \$600,000 .....	\$13,200 + 1.60% of project costs exceeding \$600,000

The above fee divided by \$57 equals the number of days for which the permit is valid. After that number of days, additional charges will be the hourly rate of all personnel involved plus any other related fully allocated costs.

**IMPORT PLAN REVIEW AND INSPECTION..... Actual Cost/\$1,400 deposit**

**WALL INSPECTION**

<u>Construction Cost</u>	<u>Fee</u>
\$0.00 - \$2,500 .....	\$250 minimum
\$2,501.00 - \$5,000 .....	\$500
\$5,001.00 - \$10,000 .....	\$500 plus 5% of project costs exceeding \$5,000
\$10,001.00 - \$300,000 .....	\$750 plus 2% of project costs exceeding \$10,000
\$300,001.00 and up .....	\$6,550 plus 1% of project costs exceeding \$300,000

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**GROVE REMOVAL REVIEW/PERMIT**

<u>No. Gross Acres</u>	<u>Fee</u>
0 – 2 .....	\$1,100
>2 - 20 .....	\$1,100 +\$25/acre over 2 acres
>20 – 40 .....	\$1,550 +\$15/acre over 20 acres
Over 40 .....	\$1,850 + \$5/acre over 40 acres

**STREET IMPROVEMENT PLAN CHECK**

<u>Construction Cost</u>	<u>Fee</u>
\$1.00 - \$20,000 .....	\$525 minimum
\$20,001 - \$ 30,000 .....	\$525 plus 2.45% of project costs exceeding \$20,000
\$30,001 - \$150,000 .....	\$770 plus 2.25% of project costs exceeding \$30,000
\$150,001 - \$400,000 .....	\$3,470 plus 1.95% of project costs exceeding \$150,000
\$400,001 - \$600,000 .....	\$8,345 plus 1.60% of project costs exceeding \$400,000
\$600,001 and up .....	\$11,545 plus 1.50% of project costs exceeding \$600,000

Fee includes three full plan checks and a fourth "signature" check. Additional deposits will be collected in increments of \$1,000.

**DRAINAGE IMPROVEMENT PLAN CHECK**

<u>Construction Cost</u>	<u>Fee</u>
\$1.00 - \$ 20,000 .....	\$525 minimum
\$20,001 - \$ 30,000 .....	\$525 plus 2.25% of project costs exceeding \$ 20,000
\$30,001 - \$150,000 .....	\$750 plus 2.05% of project costs exceeding \$ 30,000
\$150,001 - \$400,000 .....	\$3,210 plus 1.65% of project costs exceeding \$150,000
\$400,001 - \$600,000 .....	\$7,335 plus 1.00% of project costs exceeding \$400,000
\$600,001 and up .....	\$9,335 plus 0.50% of project costs exceeding \$600,000

Fee includes three full plan checks and a fourth "signature" check. Additional deposits will be collected in increments of \$1,000.

**ENGINEERING PLAN REVISION** .....Actual Cost/\$1,100 deposit

**RETAINING WALL CALCS REVIEW** .....Actual Cost/\$780 deposit

**TRAFFIC CONTROL PLAN REVIEW AND INSPECTION** .....Actual Cost/\$1,150 deposit

**RIGHT-OF-WAY ENCROACHMENT REQUEST** .....Actual Cost/\$1,300 deposit

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**PUBLIC WORKS CONSTRUCTION INSPECTION**

<u>Construction Cost</u>	<u>Fee</u>
\$1.00 - \$5,000 .....	\$280 minimum
\$5,001 - \$10,000 .....	\$560
\$10,001 - \$20,000 .....	\$560 plus 3.75% of project costs exceeding \$10,000
\$20,001 - \$600,000 .....	\$935 plus 2.60% of project costs exceeding \$20,000
\$600,001 - \$1,000,000 ...	\$16,015 plus 2.30% of project costs exceeding \$600,000
\$1,000,001 - and up .....	\$25,215 plus 1.80% of project costs exceeding \$1,000,000

The above fee divided by \$57 equals the number of days for which the permit is valid. After that number of days, additional charges will be the hourly rate of all personnel involved plus any other related fully allocated costs.

Fixed fee of 10% of above, if work is to replace existing improvement voluntarily.

**EXCAVATION INSPECTION**

Fixed fee based on lineal feet of excavation as follows:

**EXISTING STREETS**

0 - 50' .....	\$135
51 - 100' .....	\$270
101 - 200' .....	\$405
201 - 500' .....	\$405 + \$1.40/LF
501 - 1,000' .....	\$825 + \$1.20/LF
Above 1,000' .....	\$1,425 + \$1.00/LF

**NEW DEVELOPMENTS**

0 - 50' .....	\$105
51 - 100' .....	\$210
101 - 200' .....	\$315
201 - 500' .....	\$315 + \$1.10/LF
501 - 1,000' .....	\$645 + \$.70/LF
1,001 - 3,000' .....	\$995 + \$.50/LF

**OVERSIZE/OVERWEIGHT VEHICLE PERMIT REVIEW**

Single Trip Permit.....	\$16.00
Annual Permit.....	\$90.00
Deposit against actual cost for special services such as engineering, escort, investigator, tree trimming, etc. ....	\$500.00

## **3.0 SURVEY**

### **3.1 Survey Monument Preservation Guidelines for New and Reconstruction Projects**

A. Prior to construction:

1. Public survey records are to be researched for the location of all possible survey monuments within the scope of the project and copies shall be furnished to the survey crew.
2. The survey crew shall diligently search for all survey monuments of record and on the surface of the road. It is suggested the search include the use of a metal detector. When the detector indicates the possibility of a buried survey monument, then digging below the surface to uncover the monument within 2" of the road surface is required.
3. The survey crew shall properly reference found survey monuments, which may be disturbed or covered during construction, to stable surface points.
4. The authorized surveyor shall properly complete a Corner Record or Record of Survey for the monuments noted in item 3, above. Prior to start of any construction work, the original or a print of the Corner Record or Record of Survey shall be submitted to the County Surveyor for review, signature and filing.

B. After construction and prior to recording Notice of Completion:

1. All covered or disturbed monuments shall be reset with the same or more durable type of monument as the original, in the surface of the construction. Key monuments shall be a minimum 1" inside diameter iron pipe of appropriate length.
2. A monument box or other protective structure should be placed around key monuments (section corners, quarter section corners).
3. The authorized surveyor shall properly complete a Corner Record or Record of Survey for all set monuments and existing monuments with a change in character, including tag number and submit it to the County Surveyor for review, signature and filing.

**CITY OF HIGHLAND**  
**Public Works Policies, Procedures and Standards**

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**3.2 Survey Monument Preservation Guidelines for Overlay Projects**

A. Prior to construction:

1. Public survey records are to be researched for the location of all possible survey monuments within the scope of the project and copies shall be furnished to the survey crew.
2. The survey crew shall diligently search for all survey monuments of record and on the surface of the road. It is suggested the search include the use of a metal detector. When the detector indicates the possibility of a buried survey monument, then digging below the surface to uncover the monument within 2" of the road surface is required.
3. The survey crew shall properly reference found survey monuments, which may be disturbed or covered during construction, to stable surface points.
4. The authorized surveyor shall properly complete a Corner Record or Record of Survey for the monuments noted in item 3, above. Prior to start of any construction work, the original or a print of the Corner Record or Record of Survey shall be submitted to the County Surveyor for review, signature and filing.

B. After construction and prior to recording Notice of Completion:

1. All covered or disturbed monuments and surface monuments are reset in the new road surface, or a new monument is set in the new road surface above the buried one.
2. All existing monument boxes will be adjusted to grade or replaced, as appropriate.
3. A monument box or other protective structure should be placed around key monuments (section corners, quarter section corners).
4. The authorized surveyor shall properly complete a Corner Record or Record of Survey for all set monuments and existing monuments with a change in character, including tag number and submit it to the County Surveyor for review, signature and filing.

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**3.3 Survey Monument Preservation Guidelines for Slurry Seal Projects**

A. Prior to construction:

1. Public survey records are to be researched for the location of all possible survey monuments within the scope of the project and copies shall be furnished to the survey crew.
2. All monument boxes shall be located and steps taken to ensure that the survey monuments inside are readily accessible upon completion of the project.
3. The survey crew shall diligently search for all survey monuments on the surface of the roadway and identify said monuments recovered in the field to ensure that they will be protected. The survey crew shall inventory the monuments recovered in the field in a manner that allows for their recovery and inspection after construction.

B. After construction and prior to recording Notice of Completion:

1. All monument boxes shall be inspected, and appropriate action taken when needed, to ensure that the survey monuments inside are readily accessible.
2. The survey crew shall review the inventory of found monuments by field inspection to ensure that all survey monuments are clean and exposed. Those monuments covered after construction is completed shall be uncovered.

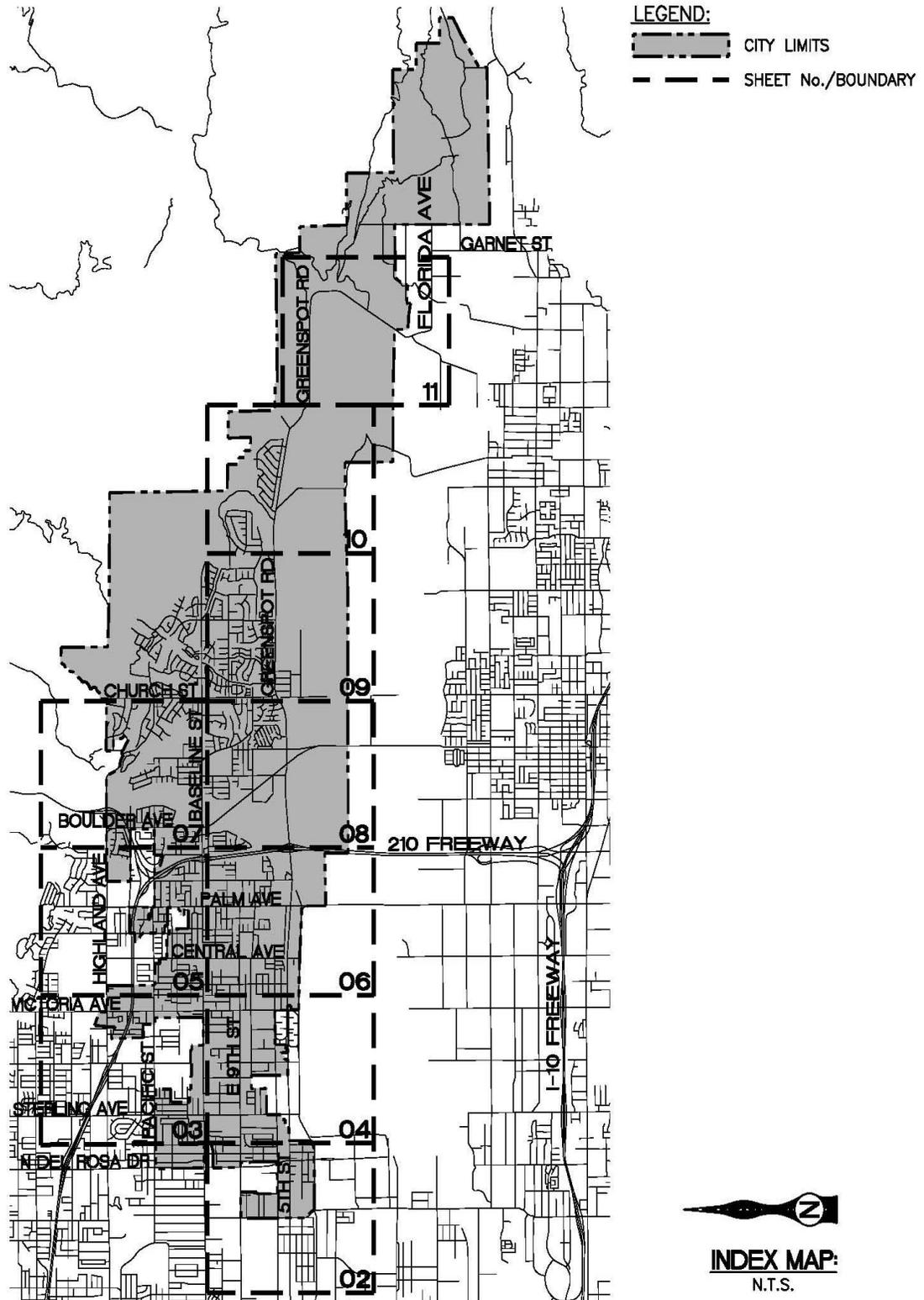
**3.4 Centerline Ties**

Contact the Engineering Department at (909) 864-8732, extension 240.

# CITY OF HIGHLAND

## Public Works Policies, Procedures and Standards

### 3.4 Bench Mark Index Maps - Sheet 1

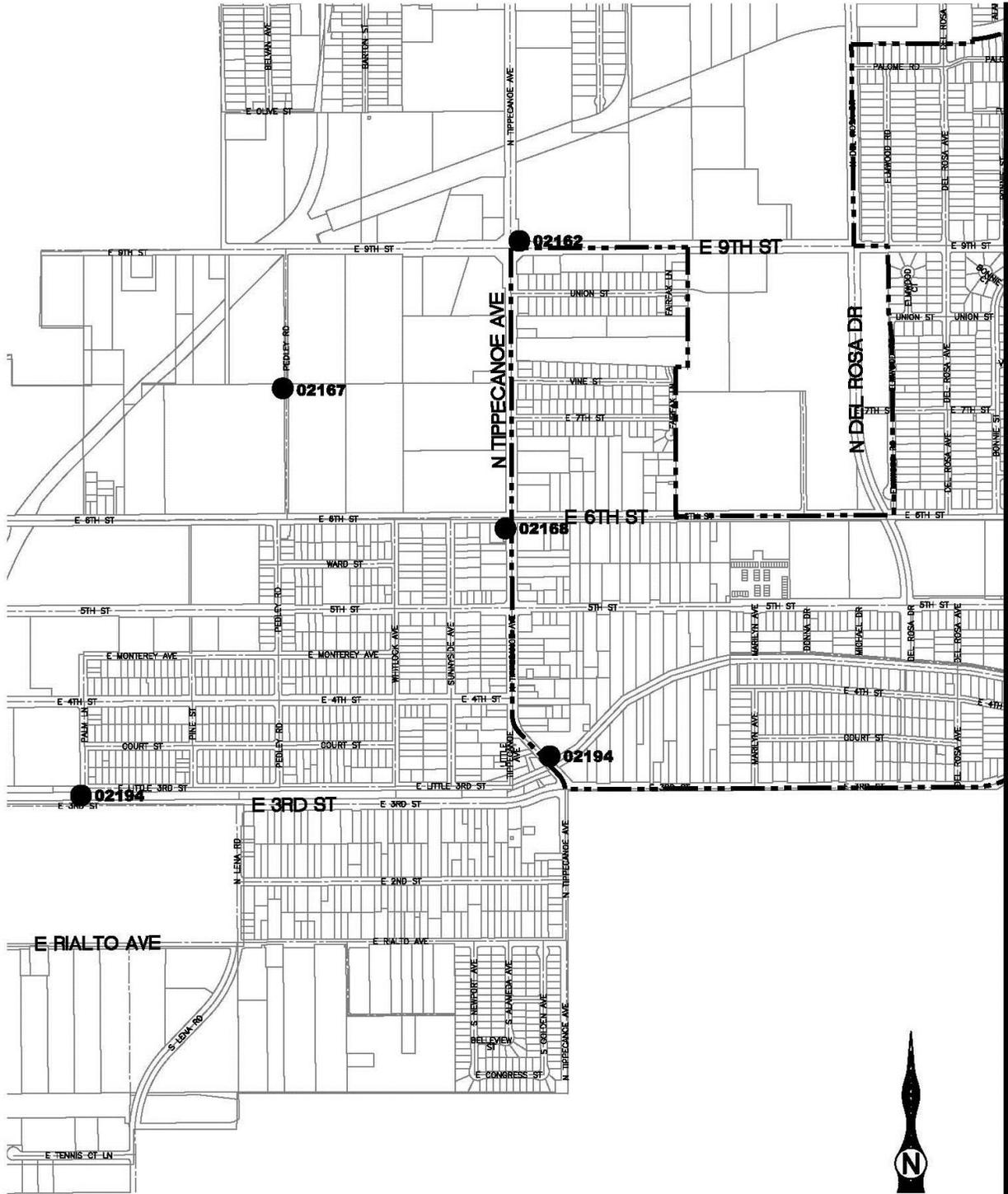


# CITY OF HIGHLAND

## Public Works Policies, Procedures and Standards

Sheet 2

**LEGEND:**  
 - - - - - CITY LIMIT LINE  
 ● 00000 CITY BENCHMARK



SEE SHEET 4

SCALE: 1" = 1000'

# CITY OF HIGHLAND

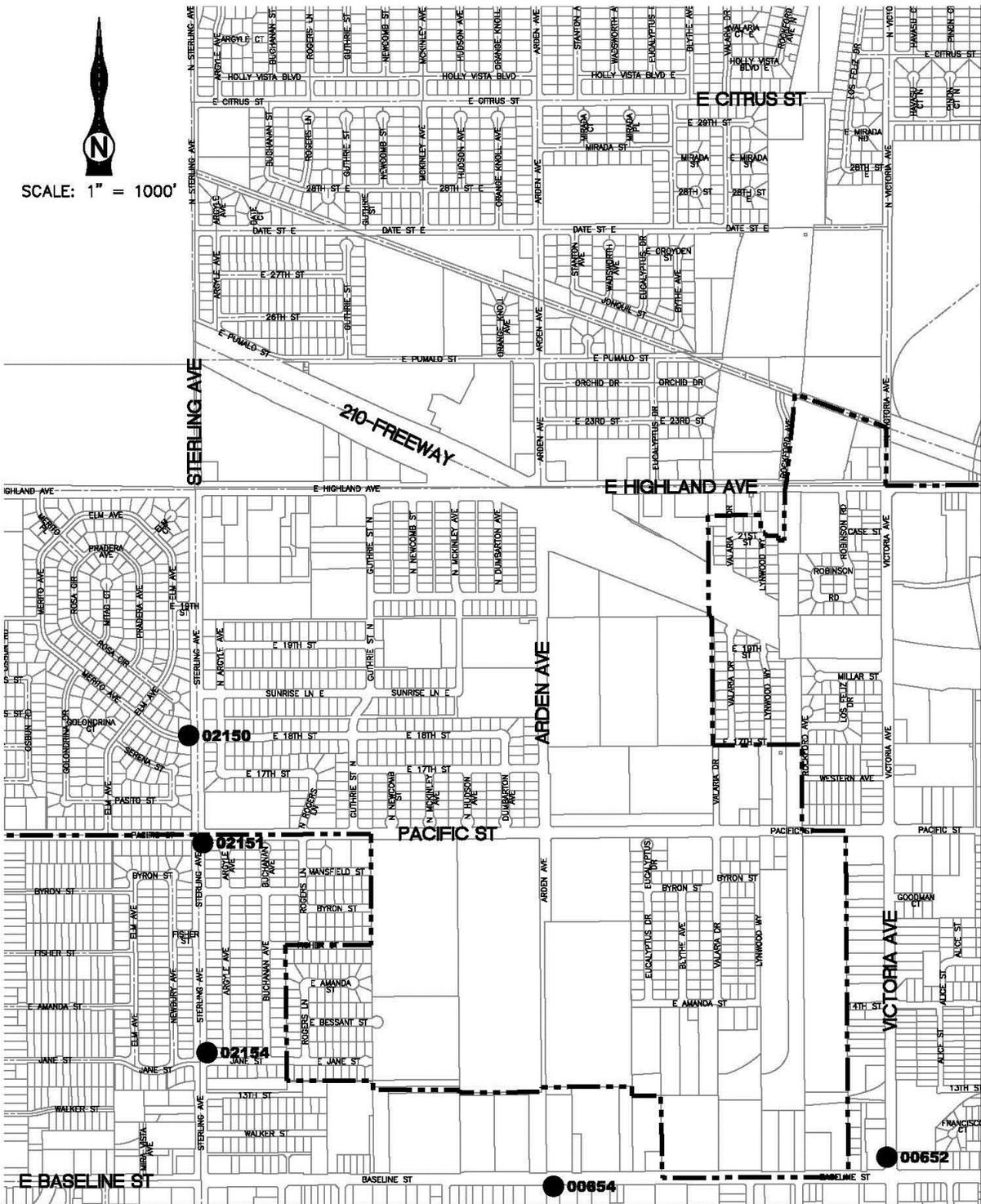
## Public Works Policies, Procedures and Standards

Sheet 3

**LEGEND:**  
 - - - - - CITY LIMIT LINE  
 ● 00000 CITY BENCHMARK



SCALE: 1" = 1000'



SEE SHEET 5

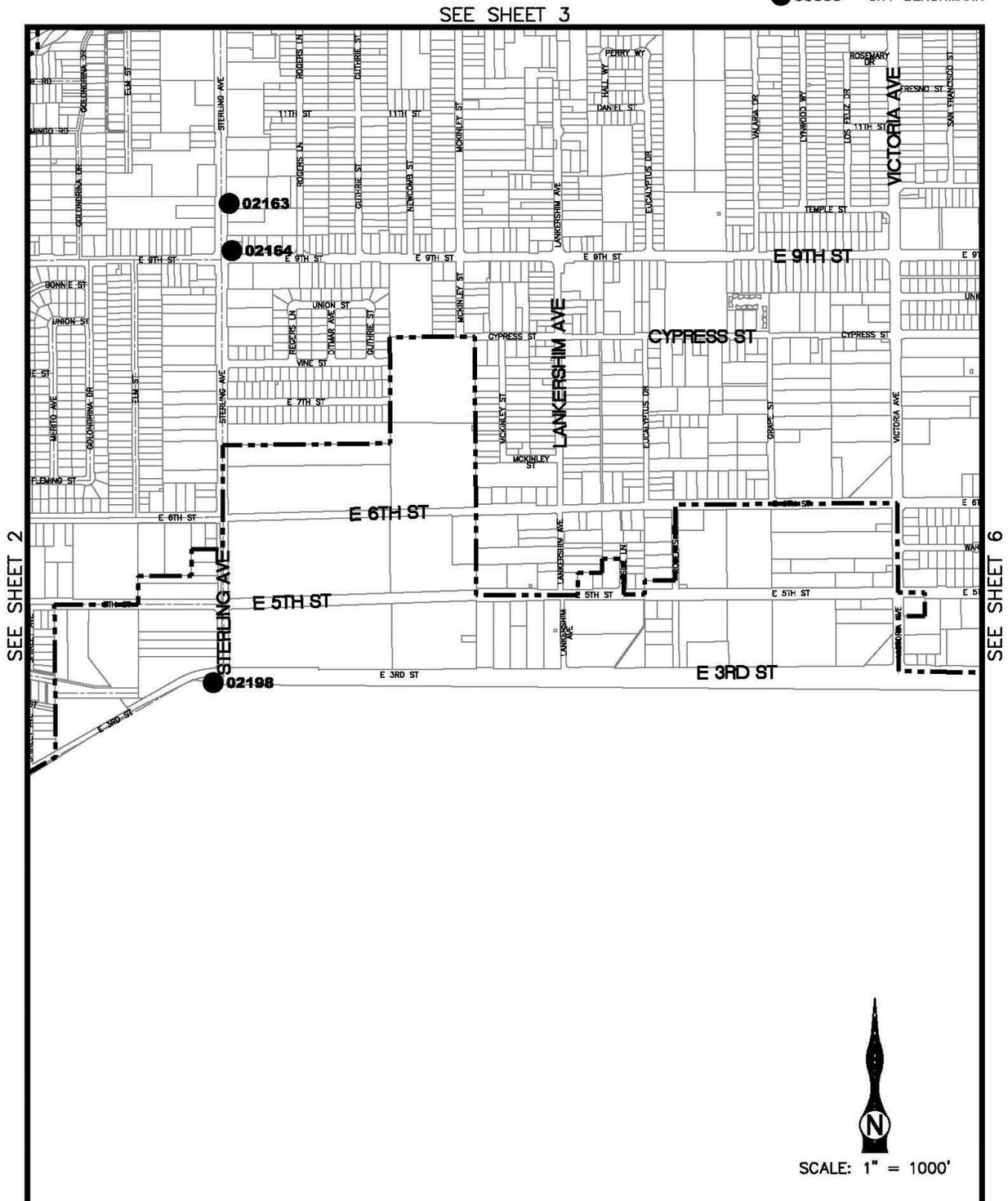
SEE SHEET 4

# CITY OF HIGHLAND

## Public Works Policies, Procedures and Standards

Sheet 4

**LEGEND:**  
 - - - - - CITY LIMIT LINE  
 ● 00000 CITY BENCHMARK

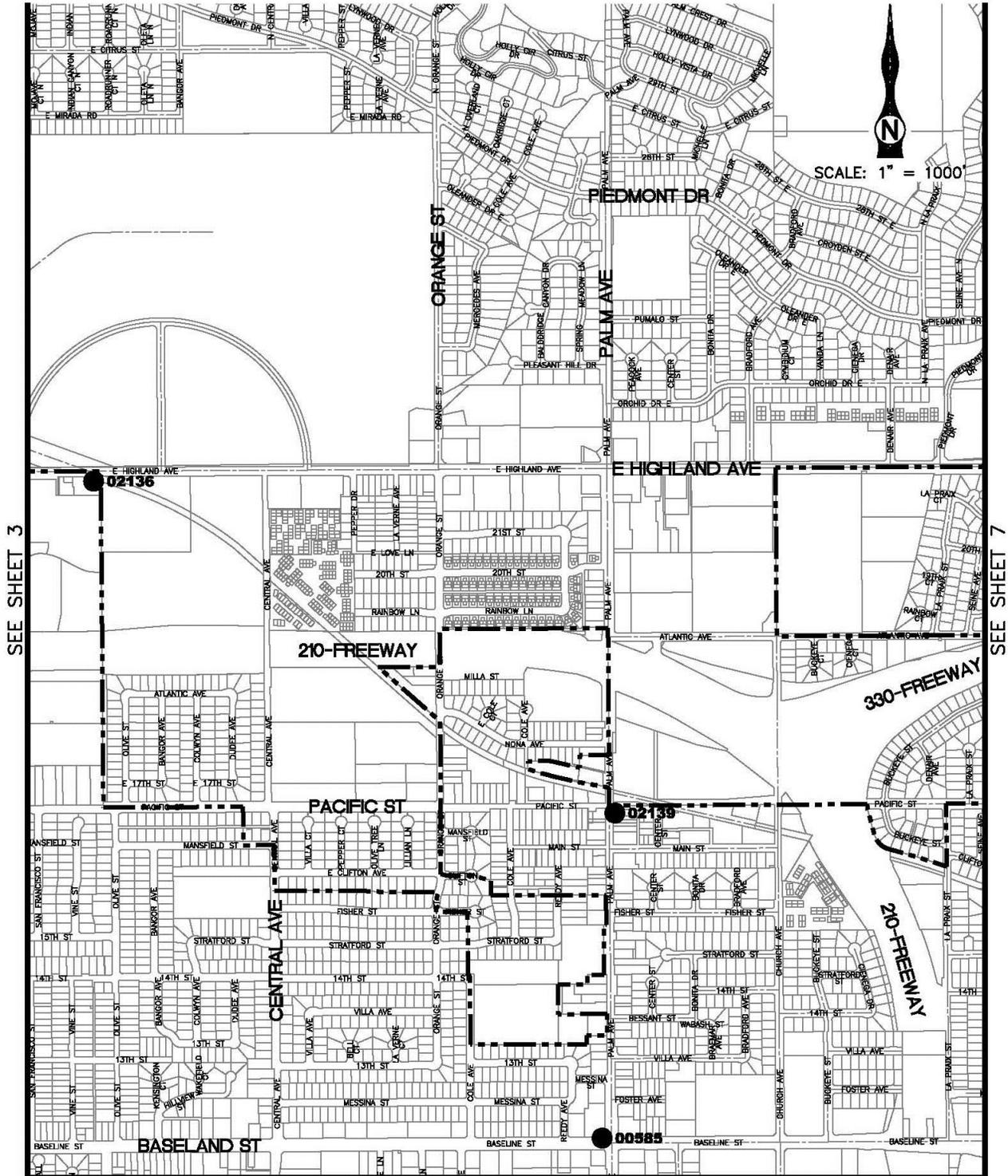


# CITY OF HIGHLAND

## Public Works Policies, Procedures and Standards

Sheet 5

**LEGEND:**  
 - - - - - CITY LIMIT LINE  
 ● 00000 CITY BENCHMARK



# CITY OF HIGHLAND

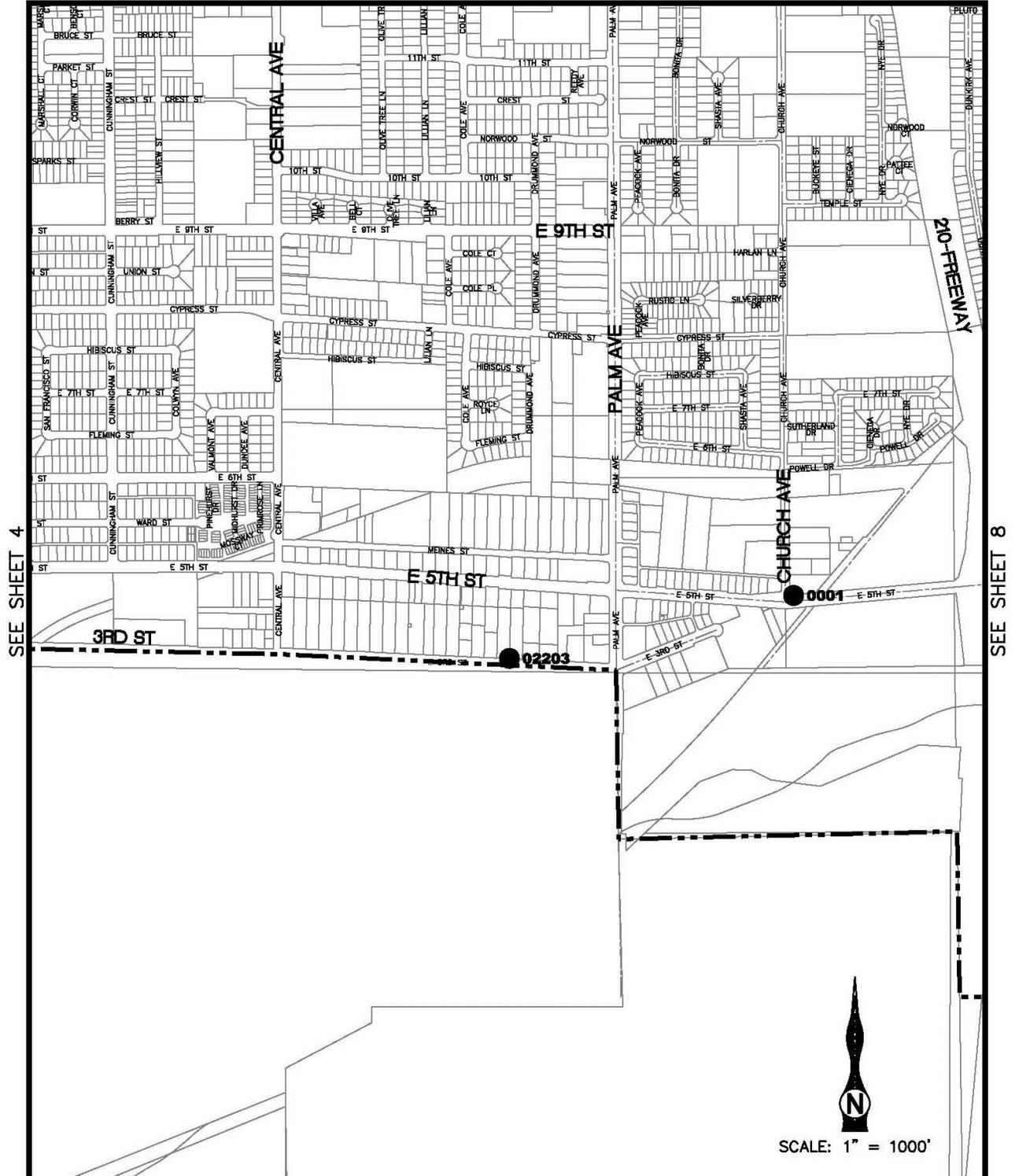
## Public Works Policies, Procedures and Standards

Sheet 6

**LEGEND:**

-  CITY LIMIT LINE
-  00000 CITY BENCHMARK

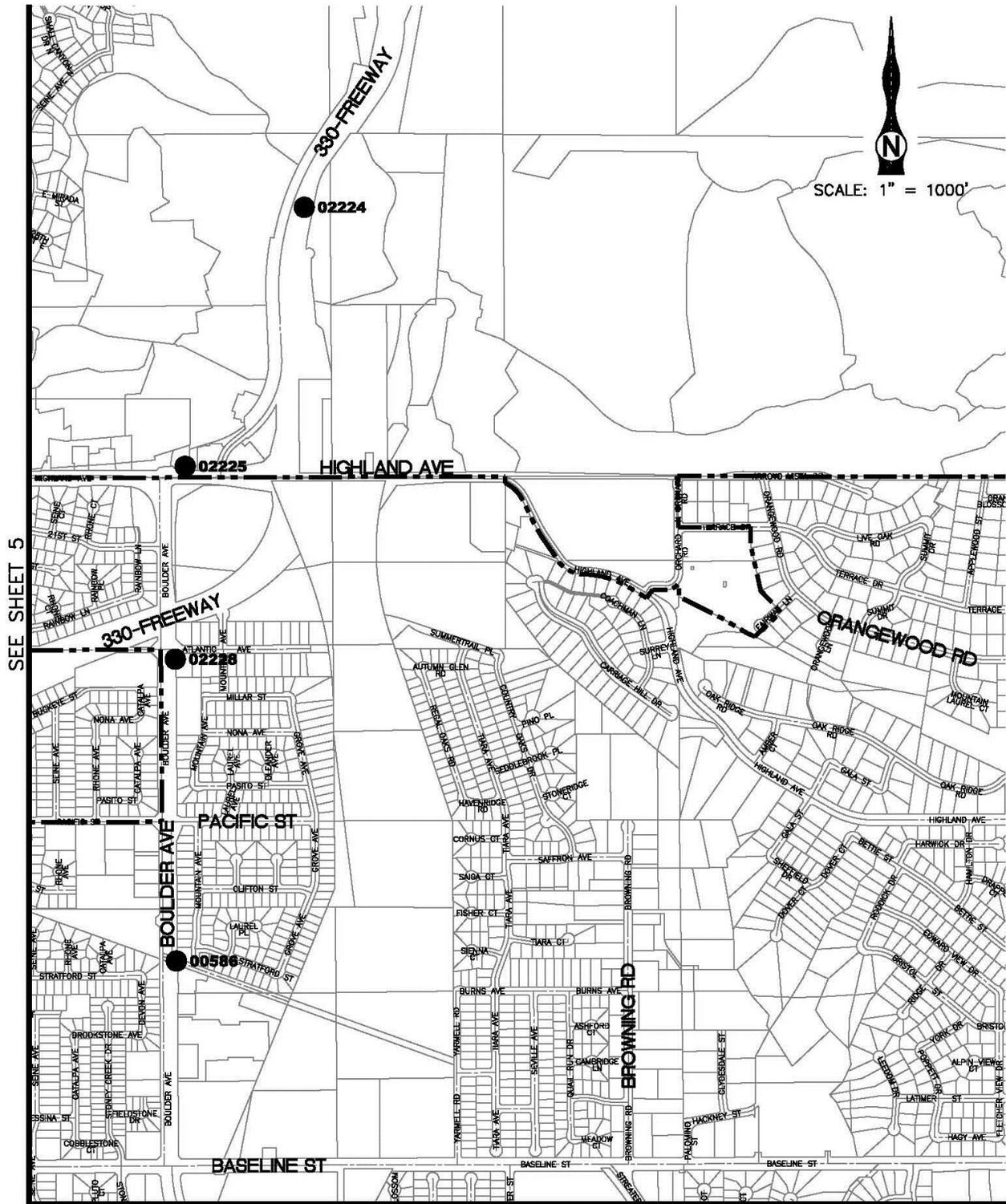
SEE SHEET 5



# CITY OF HIGHLAND

## Public Works Policies, Procedures and Standards

Sheet 7



SEE SHEET 5

SEE SHEET 8

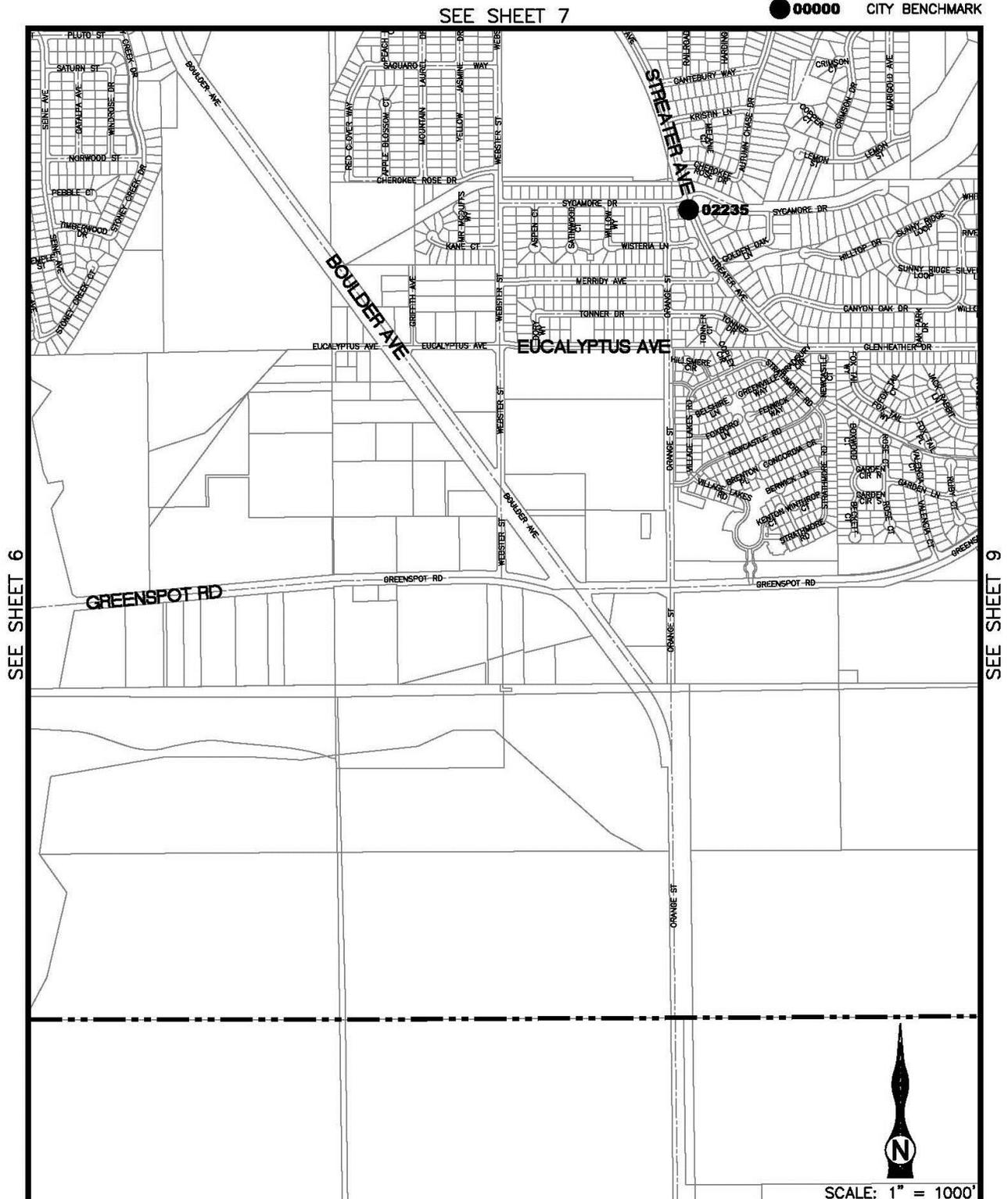
# CITY OF HIGHLAND

## Public Works Policies, Procedures and Standards

Sheet 8

**LEGEND:**

-  CITY LIMIT LINE
-  00000 CITY BENCHMARK

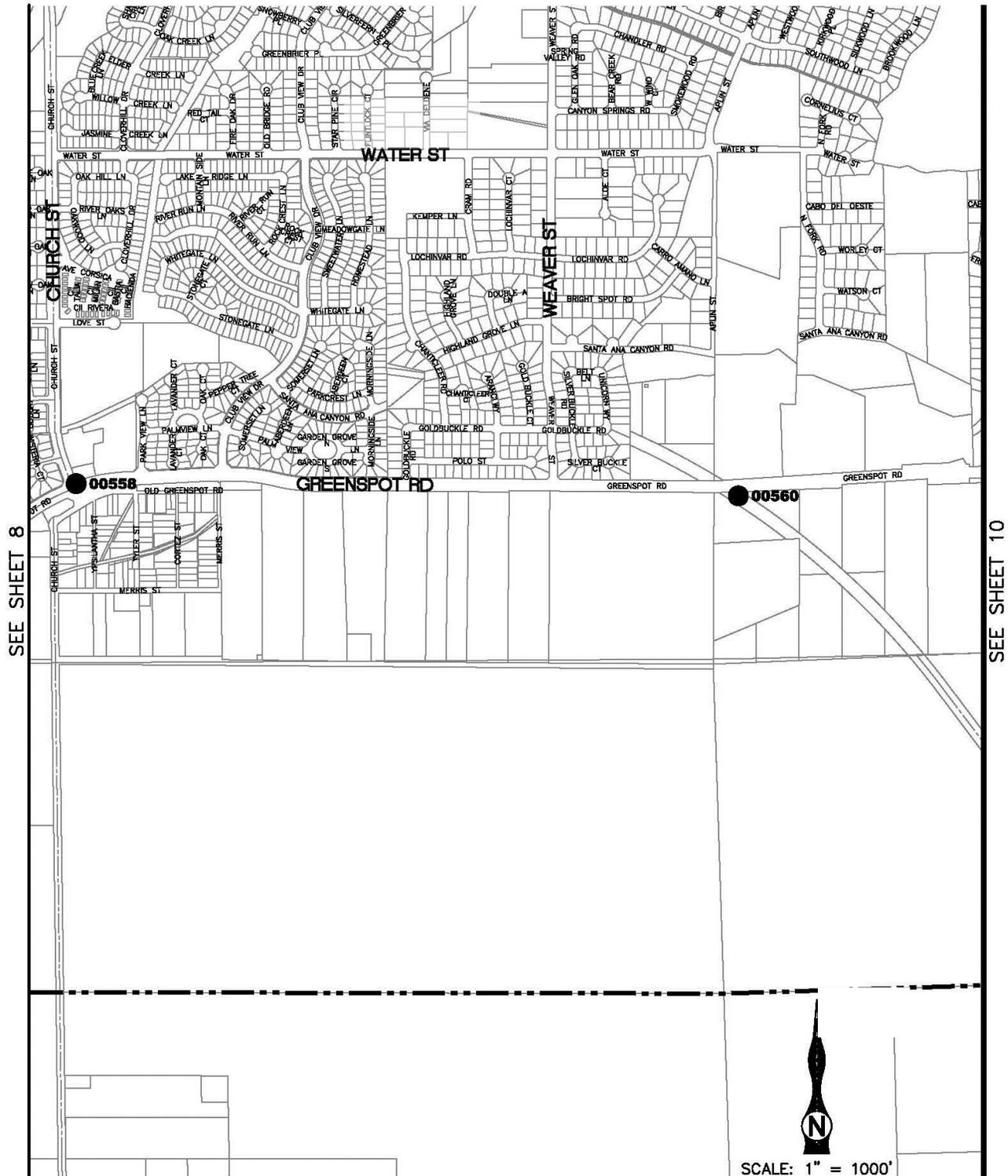


# CITY OF HIGHLAND

## Public Works Policies, Procedures and Standards

Sheet 9

**LEGEND:**  
 - - - - - CITY LIMIT LINE  
 ● 00000 CITY BENCHMARK



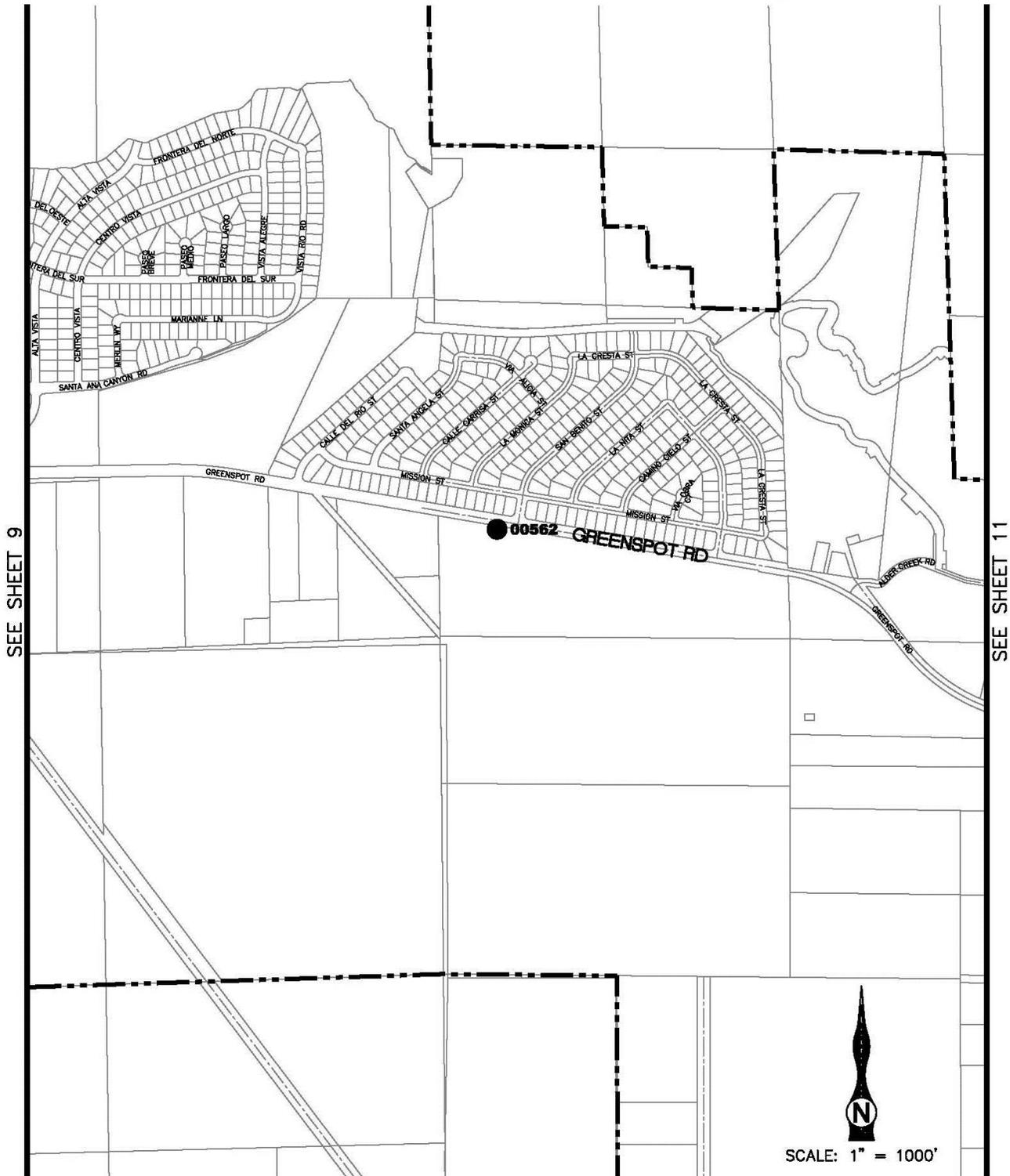
# CITY OF HIGHLAND

## Public Works Policies, Procedures and Standards

Sheet 10

### LEGEND:

-  CITY LIMIT LINE
-  00562 CITY BENCHMARK

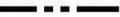


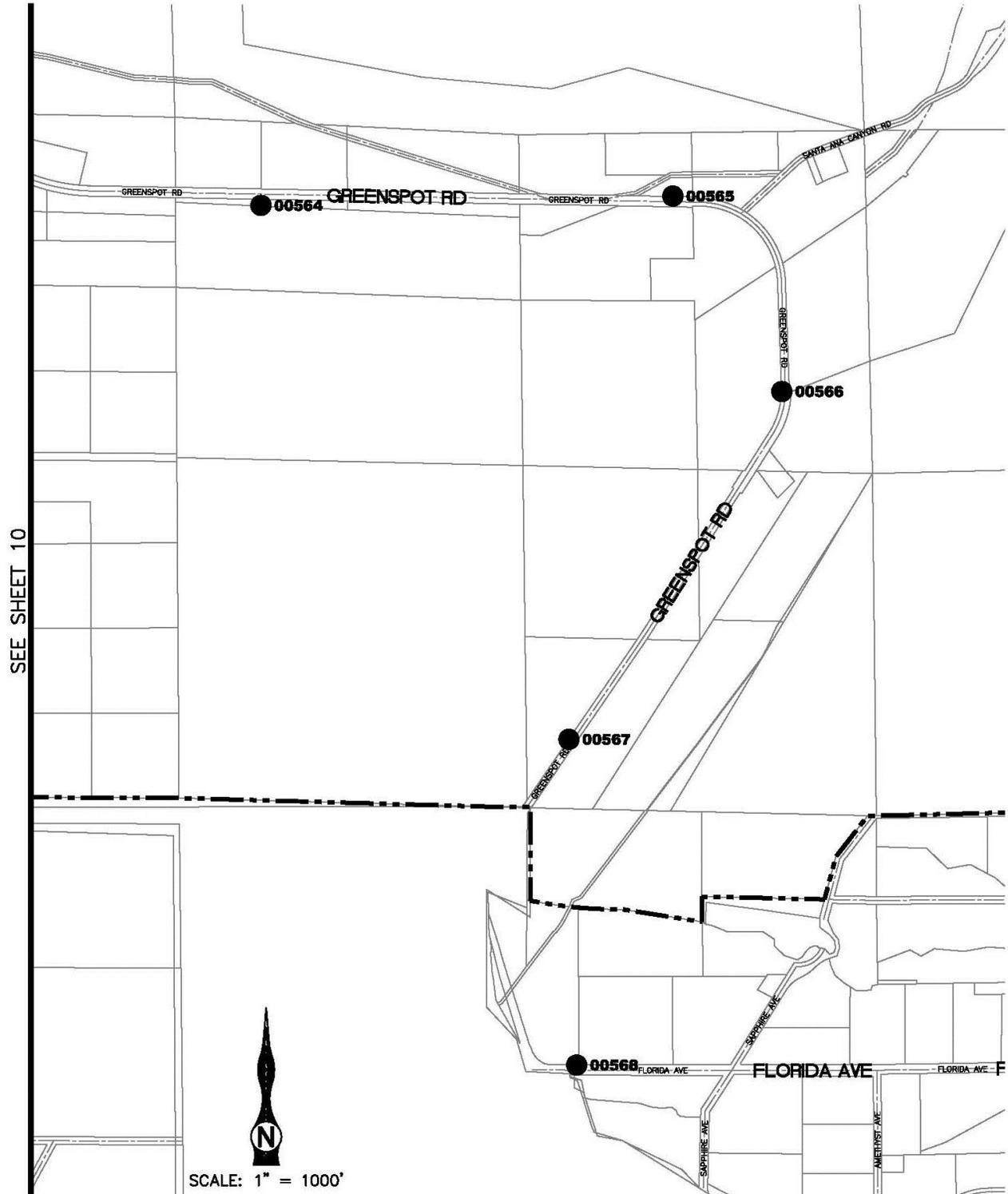
# CITY OF HIGHLAND

## Public Works Policies, Procedures and Standards

Sheet 11

### LEGEND:

-  CITY LIMIT LINE
-  CITY BENCHMARK



**CITY OF HIGHLAND**  
**Public Works Policies, Procedures and Standards**

**3.6 Benchmarks**

<b>Bench Mark No.</b>	<b>Description</b>	<b>Elevation</b>	<b>Designation/ Stamping/ Datum</b>
0001	Chiseled box at the east end of the northeast curb return at 5 <sup>th</sup> Street and Church Avenue	1,213.30	NAVD29
00555	Brass Disk in concrete wing-wall at 3 <sup>rd</sup> Street and concrete bridge over Santa Ana River, 0.10 mile east of "Y" at 5 <sup>th</sup> Street, at northwest end of northwest wing wall, 26.9 feet north of 3 <sup>rd</sup> Street, level with street; 1.1 mile east along 3 <sup>rd</sup> Street from Gate 5 Norton Air Force Base	1,217.081	K-526 1956 NAVD29
00558	1 ½ inch brass cap set in south end of concrete catch basin. 78 feet north of centerline of Greenspot Road and 32.5 feet east of centerline of Church Street.	1327.363	12-12 NAVD29
00560	Brass Disk in concrete monument 1.1 mile east along Greenspot Road from Church Street, 650 feet west of KCAL Radio transmitter Station at #29800, 78 feet south of Greenspot Road, at abandoned railroad bed, at dirt road north to address #29680.	1,424.088	Z-516 1956 NAVD29
00562	Brass Disk in concrete post 2 miles east along Greenspot Road from Church Street, 80 feet south of Greenspot Road, on top of rise south side small wash, 144 feet east and 64 feet south of south end of wall.	1,544.065	12-15 NAVD29
00564	3.2 mile east along Greenspot Road from Church Street, 66 feet south of Greenspot Road, 88 feet east and 51 feet south of south end wall of 9x3 foot concrete box-culvert, level with road.	1,744.1990	12-17 NAVD29
00565	3.8 mile east along Greenspot Road from Church St. 30 feet north of Greenspot Road, 88 feet northeast of power pole #254510E, 1.71 feet northwest of power pole #254511E, near east end of foot of dyke drainage settling basin, level with pavement.	1,836.5220	12-18 NAVD29
00566	4.3 miles east along Greenspot Road from Church Street, 12 feet west of Greenspot Road in southwest corner concrete abutment steel trestle bridge, 15 feet east of a power line north. Level with pavement.	1,874.2450	12-19 NAVD29

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<b>Bench Mark No.</b>	<b>Description</b>	<b>Elevation</b>	<b>Designation/ Stamping/ Datum</b>
00567	4.9 miles east along Greenspot Road from Church Street, 0.6 miles D of steel bridge over Santa Ana River, 91 ft. northwest of Greenspot Road.	1,764.1270	12-20 NAVD29
00568	0.7 mile west along Florida Street from Garnet Street, on north wall drainage channel, 19 feet north of Florida, 11 feet east of north corner drop-in culvert, 41 feet east and 34 feet north of twin power pole #1806099E.	1,827.5270	12-21 NAVD29
00585	San Bernardino County Bench Mark Reset 1992 in T.C. 1 foot west of ECR, northwest corner of Base Line and Palm Avenue.	1,231.407	14-2 NAVD29
00586	Concrete post with Drive Pin, 1 mile southeast along Santa Fe Railroad from railroad crossing at Palm Avenue, near railroad crossing at Boulder Avenue in a 6x6 concrete post at south end of old State Highway right-of-way fence, 23.5 feet north of north rail of railroad, 41 feet east of Boulder Avenue, northbound traffic lane, 12 feet north of culvert headwall.	1,353.458	14-3 NAVD29
00652	Bass Disk in top of curb, 1 mile west along Base Line from Palm Avenue at northwest corner of Victoria Avenue and Base Line at north side of driveway, 102 feet north of Base Line, 32 feet west of Victoria Avenue.	1,146.306	CS72-18-2-75 NAVD29
00654	Brass Disk in concrete monument, 1.5 miles west along Base Line from Palm Avenue, 0.5 miles west of Sterling Avenue, on south side of Base Line across the street from #26122, in 3x3 inch monument at east side large drop-inlet just inside concrete curb, 23.5 feet west of power pole #1196591E.	1,122.202	CSB 01-11 NAVD29

**CITY OF HIGHLAND**  
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Bench Mark No.	Description	Elevation	Designation/ Stamping/ Datum
02136	Brass Disk in brick wall of old railroad station, at AT&SF Railroad and Highland Avenue, 8.5 rails northwest of avenue, at warehouse (formerly railroad station), at northwest corner and vertical in northeast brick wall, 30.8 feet southwest of southwest rail main track, 0.7 feet southeast of northwest end of wall, 0.2 feet above concrete loading platform. (Poor Condition)	1,289.131	W-295 1935 NAVD29
02139	Brass Disk in concrete base of light standard, at Pacific and Palm Avenues, 35 feet south of Pacific, 40 feet east of Palm, in top northwest corner concrete base of sign and light standard.	1,311.022	E-522 NAVD29
02150	Brass Disk in top of concrete curb, at Sterling and Merito Avenues, in top concrete curb at west end northwest curb return.	1,155.952	F-523 NAVD29
02151	Brass Disk in top of concrete clean-out structure, at southeast corner Pacific Street and Sterling Avenue, in top northwest corner concrete clean-out structure.	1,135.914	G-523 NAVD29
02154	Brass Disk in drill hole top of curb, at Sterling Avenue and Jane Street, 38.7 feet east of Sterling, 24 feet north of Jane, 8.75 feet (along curb return) from north end curb return, in top northeast end curb.	1,105.796	B-523 NAVD29
02162	Brass Disk in top of concrete roof of pump station, at Tippecanoe Avenue and 9 <sup>th</sup> Street, 80 feet east of Avenue, 6.6 feet north of north curb southbound lanes, 6.9 feet south of south curb northbound lanes, 49.8 feet east of west end of traffic island, at a 10 feet square underground pump room for a 1047 feet deep water well, in top near center west edge concrete roof. NOTE: concrete structure housing well is cemented to 16 inch well casing at floor.	1,069.867	Q-523 1956 NAVD29

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Bench Mark No.	Description	Elevation	Designation/ Stamping/ Datum
02163	Brass Disk in concrete base of flag pole, at 9 <sup>th</sup> Street and Sterling Avenue, at Warm Springs School 400 feet +/- north of 9 <sup>th</sup> Street, in top southwest corner concrete base of flag pole, 20.2 feet northeast of northeast edge of sidewalk to main entrance, 1.9 feet. southwest of steel pole, level with lawn.	1,111.107	K-523 1956 NAVD29
02164	Brass Disk in top of curb return, at southeast corner 9 <sup>th</sup> Street and Sterling Avenue, at east end curb return.	1,107.708	J-523 NAVD29
02167	2 inch iron pipe (no cap) in pump foundation, 0.4 miles west along 9 <sup>th</sup> Street from Tippecanoe Avenue, 0.15 miles south along paved driveway, 0.15 miles east cross-country to northeast corner San Bernardino City Water Works property, at pump house for water well, welded to east side 16 inch casing, projecting out east side concrete foundation for electric pump, 1 foot northeast of northeast side pump, 0.5 feet above concrete floor.	1,058.564	WELL-E 42 A NAVD29
02168	Brass disk on vault of underground gas line, at 6 <sup>th</sup> Street and Tippecanoe Avenue, 32.9 feet south of 6 <sup>th</sup> Street, 51.3 feet west of Tippecanoe, in top northeast corner of a 5.5 x 5.5 x 5 foot deep concrete well for main underground gas line, flush with ground, level with street.	1,067.806	P-523 1956 NAVD29
02191	Brass disk in concrete headwall of culvert, at 3 <sup>rd</sup> Street and Palm Lane, in top south end west concrete block headwall for 5 - 36 inch CMP culverts, 80.1 feet north of street, 22 feet west of and level with lane.	1,039.824	C-526 1956 NAVD29
02194	Brass disk in concrete walk over culvert, 265 feet +/- north of 3 <sup>rd</sup> Street on Tippecanoe Avenue, in concrete walk over a concrete culvert, 35 feet east of Avenue.	1,066.349	L-523 NAVD29

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Bench Mark No.	Description	Elevation	Designation/ Stamping/ Datum
02198	Brass Disk, at 3 <sup>rd</sup> Street and Sterling Avenue, 140 feet west of Sterling (prolongation), 72.8 feet east along top south side Flood Control District concrete "V" channel wall from south end wing-wall of twin concrete box culvert under 3 <sup>rd</sup> Street, 1 foot north of Norton Air Force Base chain-link fence.	1,100.935	A-523 NAVD29
02203 (Reset)	Brass disk in top of curb, 838.67 feet west along the centerline of 3 <sup>rd</sup> Street from Palm Avenue and 40' north of centerline of 3 <sup>rd</sup> Street.	1,182.500	L-526 NAVD29
02224	Brass disk in embedded granite boulder, 0.2 miles east along Highland Avenue from Boulder Avenue, 0.4 miles north along paved former alignment of City Creek Canyon Road, 0.1 mile north of locked gate, at "T" junction of driveway east to an orange grove, in top of large embedded granite boulder 2.5 feet above ground, 44 feet south of drive, 33.5 feet east of road; Recovery description: Access from Highland blocked at Highland by locked chain link fence gate in note is large steel gate (open) painted bright orange – "T" junction is very visible but does not lead to an orange grove – former buildings all gone but foundations and irrigation structures and mortar and rock flumes remain.	1,604.692	L-297 1935 NAVD29
02225	Brass disk in concrete post, at Boulder Avenue and old Highland Avenue to east, at northeast corner of intersection (south of State Highway 330), at the southwest corner of a 5x6 foot rhomboid shaped concrete vault with matching steel cover, 200 feet northeast along Highland Avenue (old alignment) from a point 10 feet north of center point of traffic island in center of Boulder Avenue (center of old Highland Avenue projected southwest) 47 feet north of Highland Avenue (old alignment), 245 south of State Highway 330 to centerline of old Highland Avenue projected southwest.	1,477.481	B-522 1956 NAVD29

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Bench Mark No.	Description	Elevation	Designation/ Stamping/ Datum
02228	Brass disk in concrete post, at Boulder Avenue and Atlantic Avenues, 0.3 miles south of Highland Avenue, at southeast fence corner, 78.5 feet south of Atlantic, 5.5 feet east of east curb Boulder, 3 feet northeast of power pole #1026903E, 1.7 feet north of steel fence corner post.	1,423.737	C-522 1956 NAVD29
02230	Brass disk in embedded granite boulder, 2.25 miles northwest along AT&SF railroad from Mentone Station, 6 poles northwest of mile-pole 14, at a rocky cut bank, in top of embedded granite boulder, 50 feet northeast across railroad tracks from a telephone pole, 28.8 feet northeast of northeast rail, 3.5 feet above railroad tracks.	1504.046	Z-295 1935 NAVD29
02235	Round head bolt in top of curb, 0.35 miles southeast along Streater Drive (Railroad Street) from Base Line, 80 feet southeast of Sycamore Street, 250 feet southeast of centerline Creek.	1,304.479	00587 1987 NAVD29

## **4.0 GRADING**

### **4.1 Grading Permit Procedures**

*All work done under the permit shall be performed by a licensed grading contractor (Classification "A" or Classification C-12).*

1. Contractor/Developer shall fill out the Grading Permit Application. (All items shall be completed.)
2. The Grading Plan and Erosion Control Plan shall be approved prior to issuance of a permit.
3. Contractor/Developer shall supply certificates of insurance for general liability (unless absolutely no grading work within public right-of-way is being done or shown on the grading plan) and worker's compensation before permit is issued. Both certificates of insurance shall list City of Highland as certificate holder and mailed to City of Highland, Engineering Department, 27215 Base Line, Highland, California 92346. General liability insurance shall be a minimum of \$1 million coverage. See Section 16 for exact verbiage of the required endorsement adding the City of Highland as additional insured.
4. Contractor/Developer shall obtain a City Business License from Highland City Hall and provide a copy prior to issuance of permit.
5. Grading Bond equal to 30% of developer's Engineer's Cost Estimate shall be submitted when quantities exceed 5,000 cubic yards.
6. Contractor/Developer shall pay Grading Inspection and Erosion Control Deposits.
7. Obtain coverage under the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction and Land Disturbance and submit a Storm Water Pollution Prevention Plan (applies when disturbed area is one or more acres). Submit a copy of the Waste Discharger Identification Number (WDID) issued by the State Water Resources Control Board confirming coverage under the Construction General Permit prior to issuance of a grading permit.
8. Original Rough Grade Certifications and Compaction Reports must be on file prior to the issuance of fine grade permits.
9. Submit a traffic control plan, if required by the City Engineer, for review and approval.
10. Comply with the requirements of the City's Construction and Demolition Diversion Program. (If Applicable).

**ENGINEERED GRADING CERTIFICATION FOR THE CITY OF HIGHLAND**

Owner \_\_\_\_\_

Index No. \_\_\_\_\_

Job Address \_\_\_\_\_

Permit No. \_\_\_\_\_

\_\_\_\_\_

Tract No. \_\_\_\_\_

**ROUGH GRADING CERTIFICATION**

**By Soils Engineer**

I certify that fills were installed upon properly prepared base material and compacted in compliance with the current City adopted edition of the C.B.C., and where the report of an engineering geologist has recommended the installation of buttress fills or other measures, such work has been completed in accordance with the approved design. I further certify that the rough grading work incorporates all recommendations contained in the report(s) for which I am responsible and all recommendations that I have made based on field inspection of the work and testing during grading.

Lot Nos. \_\_\_\_\_

See attached report for compaction test data, recommended allowable soils bearing values and other special recommendations.

EXPANSIVE SOILS  Yes  No Lot Nos. \_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_

Engineer \_\_\_\_\_ Reg. No. \_\_\_\_\_ Phone No. \_\_\_\_\_ Date: \_\_\_\_\_  
Stamp, Signature & Expiration Date

**By Grading Engineer**

I certify that the rough grading has been completed in accordance with the approved plans including: grading to approximate final elevations; property lines staked; any swales and terraces complete per plans; berms installed; and any cut and fill slopes correctly graded and located in accordance with the approved plans.

Lot Nos. \_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_

Engineer \_\_\_\_\_ Reg. No. \_\_\_\_\_ Phone No. \_\_\_\_\_ Date: \_\_\_\_\_  
Stamp, Signature & Expiration Date

**FINAL GRADING CERTIFICATION**

I certify that the grading has been satisfactorily completed in accordance with the approved plans. All required drainage devices have been installed and adequate provisions have been made for drainage of surface waters from each building site.

Lot Nos \_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_

Engineer \_\_\_\_\_ Reg. No. \_\_\_\_\_ Phone No. \_\_\_\_\_ Date: \_\_\_\_\_  
Stamp, Signature & Expiration Date

**STRUCTURES WITHIN FLOOD PLAIN REVIEW AREAS:**

Lot Nos./Buildings, and Elevations of habitable floor (including basement, if any):

\_\_\_\_\_

Engineer or Surveyor \_\_\_\_\_ Reg No. \_\_\_\_\_ Phone No. \_\_\_\_\_ Date: \_\_\_\_\_  
Stamp, Signature & Expiration Date

I verify that the above lots/buildings' lowest habitable floors are properly above the floodplain elevation in accordance with Ordinance No. 79.

Building Official: \_\_\_\_\_ Date: \_\_\_\_\_



**CITY OF HIGHLAND**  
**Public Works Policies, Procedures and Standards**

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**4.2 Grading Plan Checklist and General Notes**

Project: \_\_\_\_\_

Checked By: \_\_\_\_\_ Date: \_\_\_\_\_

Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_

Items Required To Be Submitted:

- Complete Grading Plan (\* see below)
- Preliminary Soils Report from Soils Engineer
- Plan Check and Inspection Fee
- Approved Water Quality Management Plan (Required prior to Grading Plan Approval)
- Grading bond, when required, equal to 30% of the grading contract and an erosion control deposit equal to 100% of the cost to implement erosion control measures shall be submitted prior to grading permit issuance.
- Drawings submitted for signature approvals must be either one of the following; plotted with indelible ink on 24"x36" double matte, three-mil thick mylar, or 24"x36" double matte, three mil thick Duplicate Photo Mylar of the original.

\* All applicable provisions of current City adopted edition of the California Building Code shall be met prior to submitting the plan for review, including, but not limited to the following:

(Check When Completed For All Sheets)

- 1. Grading plan shall be signed and stamped by a registered civil engineer, or if less than 5,000 cubic yards and designated regular grading, a registered architect or registered landscape architect may sign, with prior approval from the City Engineer. Grading plans on parks and other projects that are in excess of 5,000 cubic yards may be signed by a registered landscape architect if the graded fills do not support structures and fills do not exceed 10 feet. Engineer, architect or landscape architect shall have current City Business License.
- 2. Printed name address, registration number and phone number of engineer or architect shall be shown on plans.
- 3. City Title Block on plan showing address, related case number, if any, and/or location of project. City Standard Title Block available at [www.cityofhighland.org](http://www.cityofhighland.org)
- 4. The estimated volumes, in cubic yards, of cut and/or fill shall be shown on plan. Ultimate disposition of any excess dirt shall be stated on plan. Excess dirt removed outside the city limits shall comply with the applicable standards of the area it is moved to. Any location within the city limits used for disposal of excess dirt will require separate Grading Plan Review and issuance of a separate grading permit for that site.
- 5. City standard signature block on plan. On grading plans, provide signature lines for the City Engineer, Building and Safety, and Planning Departments to approve. On erosion

## CITY OF HIGHLAND

### Public Works Policies, Procedures and Standards

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control plans, provide signature lines for the City Engineer only. AutoCAD file drawings of the title blocks can be obtained from the Engineering department.

- 6. North arrow pointing up or to the right, engineering scale, and benchmark reference shall be shown on each plan. Benchmark shall be per City datum. Refer to Section 3 for Benchmark Datum.
- 7. Existing contours (maximum interval 2 feet) shall be shown and designated on plan and extend a minimum of 25 feet beyond the perimeter of the property. Also all topo on-site and adjacent topo within 15 feet of the perimeter of the property shall be shown and designated on plan. The effect the proposed grading will have on adjacent properties (cuts, fills, drainage, etc.) shall be shown on plans. Also any grading performed on adjacent private property will require a signed release from the adjacent legal owner.
- 8. Proposed final grades shall be clearly shown and designated on plans along with all cut and fill slopes (max. 2:1 slope). Slopes shall be clearly designated on plans with degree of slope being shown. Top of slope shall be located at property line with a 1' bench.
- 9. Details of any on-site drainage structures, walls, cribbing, surface protection, etc., shall be shown on plans.
- 10. Drainage shall not flow over retaining walls greater than 30" in height or from any tributary drainage area greater than 10', measured horizontally, from the wall regardless of wall height. When drainage is not allowed to flow over retaining walls, concrete v-ditches shall be installed at the back of wall to carry drainage to an approved drainage course. Apply waterproof coating or approved equal to all portions of walls retaining soil.
- 11. Slopes, max. 2:1, unless approved by the soils engineer (with accompanying data) and the Planning Department.
- 12. Do not drain over 2:1 slopes. Conform to the C.B.C. guidelines for terracing and interceptor drains.
- 13. Recommendations and conclusions in the Preliminary Soils Report shall be incorporated in the design of the grading plan.
- 14. Structural calculations shall be required for all non-standard walls.
- 15. Commercial/Industrial grading plans shall show location of roof drain outlets.
- 16. Graded drainage swales around building pads shall have a minimum grade of 1% and shall be located 10 feet from the pad in rear yards.
- 17. The building pad shall have a minimum slope of 2% toward the drainage swale. In addition, the high point of the swale shall be 0.3 feet minimum below the pad.
- 18. Rear yards shall have a minimum slope of 2% and a maximum of 8% toward the drainage swale.
- 19. Side yards shall have a minimum slope of 2% and a maximum of 20% from the building pad to the drainage swale. The flow line of the drainage swales shall be a minimum of 6" below the elevation at the adjacent property line.
- 20. A one foot bench shall be provided at the top of 2:1 slopes between lots.

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- 21. If extended footings are proposed, the additional depth and limits must be shown on the plan.
- 22. All Precise Grading Plans for commercial shall be drawn to 1" = 20' scale.
- 23. Show Air Conditioning Condensing Unit on each lot.
- 24. All yard drains shall be provided with an inlet fixture and shall outlet through the curb face.
- 25. Show Existing and Proposed Storm Drains and Easements within and adjacent to project boundaries.
- 26. Show Street Dimensions.
- 27. Show Public Utility Easements.
- 28. Maintain Minimum 1 foot between Property Line and top of "x" on drive approach.
- 29. Design Contours are required on all Commercial and Industrial Projects.
- 30. Driveway grades shall not exceed 12% at any location.
- 31. Show stoop at garage man door. Include a detail of deepened footing or step down to stoop when required to maintain maximum grades and flow line. (12" maximum grade difference or step is required).
- 32. Provide details for all non-standard handicap ramps.
- 33. Provide truncated domes where required.
- 34. Provide handrails where required.
- 35. Avoid zero curb face adjacent to vehicular travel ways.
- 36. Align cross walks with handicap ramps where applicable.
- 37. Pavement grades shall not exceed 2% in any direction within handicap parking areas.
- 38. Provide handicap accessible trash bin enclosure.
- 39. Show and specify handicap path of travel.
- 40. Provide minimum 8" cover over top of wall footings. Design retaining wall footings under retained area where possible.
- 41. Show minimum building setback dimensions from property lines on all sides per Planning Department requirements.
- 42. Comply with corner sight distance triangle requirements.
- 43. Minimum text height shall be 0.08".

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- 44. Combination retaining/garden walls require City Engineer and City Planner approval. Maximum overall height of walls is 6 feet, unless otherwise approved.
- 45. Comply with recommendations of the Water Quality Management Plan.
- 46. Minimum 6"x6", 10 ga. wwm reinforcing required in v-gutters, all locations.
- 47. Check Engineer's registration expiration date.
- 48. Walls and Fences are not permitted within Public Utility Easements.
- 49. Gates required for easement access.
- 50. The signature of the Soils Engineer with a statement that he or she has reviewed the plans and that the plans are in compliance with his or her recommendations shall be shown on the first sheet of the plans. See the following sample:

**SOILS ENGINEER'S STATEMENT:**

I, the undersigned Soils Engineer, have reviewed these plans and am satisfied that they are in compliance with the recommendations contained in the soils report prepared for this site, dated \_\_\_\_\_, 20 \_\_\_\_\_, and any amendments thereof.

By: \_\_\_\_\_

Registration No.: \_\_\_\_\_

Print Name: \_\_\_\_\_

Phone: \_\_\_\_\_ (Stamp)

- 51. The signature of the Geologist with a statement that he or she has reviewed the plans and that the plans are in compliance with his or her recommendations may be required to be shown on the first sheet of the plans. See the following sample:

**GEOLOGIST'S STATEMENT:**

I, the undersigned Geologist, have reviewed these plans and am satisfied that they are in compliance with the recommendations contained in the geology report prepared for this site, dated \_\_\_\_\_, 20 \_\_\_\_\_, and any amendments thereof.

By: \_\_\_\_\_

Registration No.: \_\_\_\_\_

Print Name: \_\_\_\_\_

Phone: \_\_\_\_\_ (Stamp)

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52. The Following Notes Are Required On Grading Plans:

#### GENERAL NOTES:

1. All grading shall conform to the current City adopted edition of the California Building Code and these provisions.
2. All provisions of the preliminary soils report prepared by \_\_\_\_\_, dated \_\_\_\_\_, 20\_\_\_\_, shall be complied with during grading operations.
3. This plan is for grading purposes only. Approval of this plan does not constitute approval of driveway locations or sizes, parking lot layout, building locations, off-site drainage facilities or other items not related directly to the basic grading operation.
4. Certification (form provided by City) from the registered civil engineer and soils/geological engineer stating that the rough grading has been completed per the approved plan, and a compaction report from the soils engineer on any fill areas that are required shall be provided prior to building permits being issued.
5. Certification (form provided by City) from the registered civil engineer stating that the fine grading has been completed per the approved plan is required prior to occupancy permits being issued.
6. Contractor is responsible for erosion, dust, mud, silt, debris, and temporary drainage control during grading operations.
7. Any on-site retaining walls will require approval as part of these plans. Any necessary retaining walls on the perimeter of this site may be required to be in place and approved by the City Engineer prior to the start of grading. Approved sequenced grading with 1-1/2:1 maximum slopes to within 2 feet of the adjacent property line may be acceptable to allow for start of grading prior to completion of any necessary perimeter retaining walls. (If no retaining walls are shown on the plan, do not put this note on plan.)
8. Any improvement constructed in the public right of way will require separate plan approval and inspection from the City Engineer.
9. Any walls, fences, structures and/or appurtenances adjacent to this project shall be protected in place. If grading operations damage or adversely affect said items in any way, the contractor and/or developer is responsible for working out an acceptable solution to the satisfaction of the affected property owner(s).
10. The contractor/developer is responsible for ensuring that retaining walls do not interfere with provision of utilities.
11. It is the Contractor's responsibility to ensure that compaction has been attained on the entire grading site, including fill areas outside the building pads and on all fill slopes, to the satisfaction of the Soil's Engineer.
12. City approval of plans does not relieve the developer from the responsibility for correction or error or omission discovered during construction. Upon request, the required plan revisions shall be promptly submitted to the City Engineer for approval.

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13. It shall be the Contractor's responsibility to call the City Engineer's Office at (909) 864-8732, ext. 240, for inspection 24 hours prior to performing any work. Work performed without calling for inspection may be rejected and, if rejected, shall be removed solely at the Contractor's expense.
14. No grading shall commence without obtaining a Grading Permit and notifying the Grading Inspector to schedule a pre-grading meeting two working days prior to the start of work.
15. All active irrigation lines encountered during construction shall be replaced with 12-gauge dipped and wrapped welded steel pipe.
16. Prior to the start of grading all existing vegetation and debris, including existing structures, footings, foundations, rubble, trees and root systems shall be removed from the site to the satisfaction of the Soils Engineer.
17. After removal of debris, any existing fill or disturbed natural soils shall be excavated to the satisfaction of the Soils Engineer.
18. The exposed soils shall then be inspected by the Soils Engineer, and any additional over-excavation shall then be made in accordance with the Soils Engineer's recommendations and as contained in the Soils report.
19. The exposed soils shall then be scarified to provide a bond with new fill, brought to proper moisture content and compacted to at least 90% of the maximum density, as determined by ASTM D1557-78 or equivalent compaction shall be obtained by methods specified by the Soils Engineer.
20. If any unforeseen sub-surface structures are encountered during construction, they shall be immediately brought to the attention of the Soils Engineer before proceeding further.
21. The Soils Engineer shall also be responsible to verify and report that proper compaction has been obtained by subcontractors and agencies concerning utility line backfill including, but not limited to sewers, water lines, electrical, gas and landscape irrigation lines.
22. An as-graded grading plan and the certification of compliance forms for said grading plan with the proper stamps and signatures are to be submitted to the City Engineer prior to release of grading bond and prior to final grading inspection.
23. Any drive approaches shown on these plans shall conform to City of Highland standards. Note that 4' of sidewalk at a 2% slope shall be maintained behind drive approaches per Title 24 and ADA requirements.
24. The Contractor shall call in a location request to Underground Service Alert (USA), phone number 811, two working days before digging. No inspection will be provided by the City Engineer's office, and no construction permit issued involving excavation for underground facilities will be valid unless the applicant has been provided an inquiry identification number by USA.
25. For grading of areas of 1 acre or more, a Storm Water Pollution Prevention Plan (SWPPP) shall be kept on-site and made available upon request of a representative of the Regional Water Quality Control Board (RWQCB) - Santa Ana Region and/or the City of Highland. Prior to permit issuance, submittal of correspondence from the RWQCB stating the WDID number is required.

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26. For inspection purposes, the normal work day shall be considered as 7:00 a.m. to 3:30 p.m., Monday through Friday, excluding legal holidays recognized by the City. Neither the Subdivider, his contractors, nor his subcontractors shall perform any work outside the above enumerated working hours without the prior approval of the City Engineer, and the posting of a deposit in an amount determined by the City Engineer to be used as payment for overtime inspection services.
27. If the Developer is to install front yard landscaping, then said landscaping shall be installed prior to issuance of Certificates of Occupancy.

## **5.0 EROSION AND SEDIMENT CONTROL**

### **5.1 Erosion and Sediment Control Notes**

*The following General Notes shall appear on the first sheet of Erosion and Sediment Control Plans:*

#### **GENERAL NOTES**

1. Equipment and workers for placement of erosion control shall be available at all times. Necessary materials shall be available on site and stockpiled at convenient locations to facilitate rapid construction of temporary devices when rain is imminent.
2. The design civil engineer shall supervise erosion control work and insure that work is in accordance with the approved erosion control plan.
3. All removable protective devices shown on the erosion control plan shall be in place at the end of each working day when rain probability exists.
4. After a rainstorm, all silt and debris shall be removed from check berms, silt fences, desilting basins, etc.
5. Graded areas around the tract perimeter must drain away from the face of slope at the conclusion of each working day.
6. The Contractor shall be responsible and shall take necessary precautions to prevent public trespass onto areas where impounded water creates a hazardous condition.
7. Desilting basins, when utilized, are to be constructed as grading of individual areas are complete per the rough grading plans.
8. Temporary erosion protection is required for manufactured slopes prior to permanent planting.
9. Areas shall be maintained in such a state that fire access shall be maintained at all times (including access to neighboring properties).
10. No obstruction or disturbance of natural drainage courses or existing storm drain inlets shall occur during the rainy season, unless adequate temporary/permanent drainage facilities have been approved and installed to carry surface water to a street, storm drain or natural water course.
11. The Contractor shall conduct his operations in such a manner that storm runoff will be contained within the project or channeled into the storm drain system which serves the runoff area. Storm runoff from one area shall not be allowed to divert to another runoff area.
12. Conformance with the erosion control plan does not relieve the Contractor from his responsibilities to protect adjacent properties from possible damage which may arise as a result of the construction of this project. Erosion control shall consist of, but not be limited to, constructing such facilities and any other measures which are necessary to prevent, control and abate water, mud and erosion damage to public and private property as a result of the construction of this project.
13. Slopes constructed prior to October 1 shall be treated for erosion control prior to October 15. Slopes constructed after October 1 shall be treated for erosion control as the construction of slope progresses in increments of 25 feet or less measured vertically.

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14. Fill areas, while being brought up to grade and during periods of completion prior to final grade, shall be protected by various measures to eliminate erosion and the siltation of downstream facilities and adjacent areas. These measures may include, but shall not be limited to: temporary downdrains, either in the form of pipes or paved ditches with protected outfall areas; graded berms around areas to eliminate erosion of fill slopes by surface runoff; confined ponding areas to desilt runoff; temporary check dams in toe of slope ditches to desilt runoff; protection such as sand bags around inlets which have not been brought up to grade; and earth berms and appropriate grading to direct drainage away from the edge of the top of slopes shall be constructed and maintained on those fill areas where earthwork operations are not in progress.
15. Top of cut brow ditches, where required on the plans, shall be constructed prior to exceeding 12 feet of cut measured vertically.
16. Clearing and grubbing should be limited to areas that will receive immediate grading. Erosion control measures will be required to protect areas which have been cleared and grubbed prior to grading operation, and which are subject to runoff during the period of the rainy season. These measures may include but shall not be limited to: graded ditches; brush barriers and silt fences. Care shall be exercised to preserve vegetation beyond limits of grading.
17. At the completion of rough grading but during underground utility installation, erosion control devices need not be placed in areas of active construction but shall be available on-site. When rain probability exists erosion control measures shall be implemented.
18. At the completion of street paving, erosion control shall be placed in accordance with one of the following alternates:
  - a. Sandbag velocity reducers, a minimum of 2 sandbags high, shall be placed at an angle of 45° with the curb and shall begin at the curb and extend a distance of 8' from the curb (measured perpendicular to the curb). The distance between velocity reducers shall be as follows:

#### STREET GRADEDISTANCE

Less than 4% 200' maximum  
4% to 9% 100' maximum  
Greater than 9% 50' maximum

Note that hay bales shall not be used on paved streets.

- b. Provide erosion control on individual lots including, but not limited to sandbag velocity reducers on the lots and in the parkway and continuous placement of sandbags along the top of curb.
19. City approval of plans does not relieve the developer from responsibility for the correction of error and omission discovered during construction. Upon request, the required plan revisions shall be promptly submitted to the City Engineer for approval.

## **6.0 WATER QUALITY MANAGEMENT PLAN (WQMP)**

### **6.1 Water Quality Management Plan (WQMP) Procedure**

1. A Preliminary WQMP (P-WQMP) shall be submitted and approved by the City Engineer prior to approval of a development application. The P-WQMP shall meet the City's National Pollutant Discharge Elimination System (NPDES) permit requirements in effect at the time of submittal. The P-WQMP is intended to be a planning level document and is expected to identify the means and methods for water quality management to be incorporated into the project, including rough sizing and types of Best Management Practices (BMPs).
2. A Final WQMP (F-WQMP) shall be submitted and approved by the City Engineer prior to approval of the project's street, drainage, and grading plans. The F-WQMP shall meet the City's NPDES permit requirements in effect at the time the P-WQMP was approved unless subsequent City NPDES permits require otherwise. The F-WQMP is expected to present the specific means and methods for water quality management to be incorporated into the project, including the specific location, sizing, and types of BMPs. The F-WQMP shall ensure that all runoff from development is managed in accordance with the WQMP Guidance.
3. If a project is phased, the F-WQMP shall ensure that all runoff from a sub-phase of development is managed in accordance with the WQMP Guidance and shall stand and function alone in case future phases of development are delayed or abandoned.
4. Prior to issuance of a Certificate of Occupancy two (2) sets of WQMP BMP Exhibits with a "WQMP BMP As-Built Certificate" (Certificate) wet signed and sealed by the Engineer of Record shall be submitted. The Certificate shall state:

"I hereby certify that the Water Quality Management Plan Best Management Practices have been constructed under my supervision in accordance with the approved plans and are functional to the best of my knowledge."

5. The NPDES Coordinator or his/her designee shall send one copy of the Certificate to the Santa Ana Regional Water Quality Control Board and place one copy in the approved WQMP on file with the Public Services Division of the Public Works Department.

## **7.0 STREET AND STORM DRAIN**

### **7.1 Requirements/Procedures for Contractor/Developer Street Opening/Excavation Permits**

All work done under these permits shall be performed by a licensed contractor (Classification "A" or applicable Classification "C"). Homeowner/builders will not be permitted to perform construction within the street right-of-way in accordance with City Ordinance.

1. Contractor/Developer shall supply contractor's license number and proof of workers' compensation and liability insurance before permit is issued. Liability insurance shall be a minimum of \$1 million. (See attached procedures regarding insurance.)
2. Contractor/Developer shall fill out a Street Opening Permit. (All items shall be completed.)
3. Contractor/Developer shall obtain a City Business License from Highland City Hall prior to issuance of permit and provide a copy upon submittal of permit application.
4. Contractor/Developer shall pay the appropriate permit fee. See schedule on permit application.
5. Contractor/Developer shall provide two copies of plans/sketches of proposed work.
6. If any lane closures are required for work under this permit, a traffic control plan shall be submitted for review and approval. The traffic control plan shall be prepared in accordance with the latest edition of the California Manual on Uniform Traffic Control Devices.
7. A separate lane closure may be required to be determined by Engineering Department staff.

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**7.2 Requirements/Procedures for Construction Permits**

*All work done under this permit shall be performed by a licensed contractor (Classification "A" or applicable Classification "C").*

1. Contractor/Developer shall fill out an Application for Construction of Public Improvements. (All items shall be completed.)
2. Contractor/Developer shall supply certificates of insurance for liability, automobile, and workers' compensation insurance before a permit is issued. Certificates of insurance shall list City of Highland as the certificate holder. The certificates should be mailed to City of Highland, Engineering Department, 27215 Base Line, Highland, California 92346. General liability, automobile, and workers compensation insurance shall be a minimum of \$1 million coverage. See Section 18.0 for insurance procedures.
3. Contractor/Developer shall obtain a City Business License from Highland City Hall and provide a copy prior to issuance of permit.
4. Contractor/Developer shall pay the appropriate permit fee. See schedule on permit application.
5. Contractor/Developer shall provide two copies of plans/sketches of proposed work.
6. If any lane closures are required for work under this permit, a traffic control plan shall be submitted for review and approval. The traffic control plan shall be prepared in accordance with the latest edition of the California Manual on Uniform Traffic Control Devices.
7. A separate lane closure permit may be required to be determined by Engineering Department staff.

**7.3 Requirements/Procedures for Voluntary Street Construction Permits**

Applicability of Policy

1. This policy applies only to permits for construction of public improvements within City rights-of-way or easements as a voluntary act by the homeowner, and not a result of a City requirement associated with applications for new developments or constructions.

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2. This policy applies only to the following public improvements:
  - a. To replace an existing drive approach.
  - b. To replace existing sidewalk.
  - c. To remove and replace an existing street tree or install a new tree.
  - d. To construct new PCC sidewalk and/or drive approach if an existing PCC curb is present.

Procedure

1. The homeowner must make application in person and bring a sketch (minimum 8 ½ x 11”) showing what is proposed and what exists within and adjacent to the street right-of-way.
2. The homeowner must sign an Indemnification, Defend, Hold Harmless statement for all permitted work.
3. The homeowner must submit a copy of his homeowners insurance policy that shows he has liability insurance.
4. The homeowner must pay for the permit based on the City’s approved fee schedule. The City currently charges only 10% of regular permit fee for voluntary improvements).
5. The homeowner shall complete the permitted work within the time specified on the permit or the City can perform the necessary work within tis right-of-way and lien the property for all associated expenses.

**7.4 Permit Applications and the Indemnification, Defense, Hold Harmless statement are on pages 50 through 53**

**CITY OF HIGHLAND  
ENGINEERING DEPARTMENT  
CONTRACTOR/DEVELOPER APPLICATION  
STREET OPENING PERMIT**

Permit No. \_\_\_\_\_

Requested By: \_\_\_\_\_ Date: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Contractor: \_\_\_\_\_ License # \_\_\_\_\_ Phone: \_\_\_\_\_

All work shall be in conformance with applicable City Ordinance and/or according to City specifications for such work, and to the satisfaction of the City Inspector. **Applicant shall contact City Inspector at (909) 864-8732, ext. 240, a minimum of twenty-four (24) hours prior to construction and/or inspection.** Contractor shall and hereby does guarantee all work, for a period of one (1) year after the date of acceptance of the work by the City and shall repair and replace any and all such work, together with any other work which may be displaced in doing so, that may prove defective in workmanship and/or materials within the one (1) year period from the date of acceptance, without expense whatsoever to the City, ordinary wear and tear and unusual abuse or neglect excepted. In the event of failure to comply with the above mentioned conditions within seven (7) days after being notified in writing, or in the event of an emergency the City is hereby authorized to proceed to have the defects repaired and made good at the expense of the Contractor, who hereby agrees to pay the cost and charges therefor immediately on demand.

Applicant wishes to open the following streets: (Location of proposed installation)

1) \_\_\_\_\_ between \_\_\_\_\_ and \_\_\_\_\_

2) \_\_\_\_\_ between \_\_\_\_\_ and \_\_\_\_\_

Address/Tract: \_\_\_\_\_ Part of New Subdivision Yes \_\_\_\_\_ No \_\_\_\_\_

For the purpose of \_\_\_\_\_  
\_\_\_\_\_ (enclose plans if any)

Proposed Start Date: \_\_\_\_\_ Proposed Completion Date: \_\_\_\_\_

Compaction tests of trench backfill, shall be performed at varying depths by a qualified soils laboratory hired by the applicant. Results of which shall be provided to the City of Highland. Testing interval 300 feet (maximum) with a one test per project minimum.

Trenches within asphalt concrete pavement, (street cuts), shall be repaired in accordance with the City's Trench Repair Detail, and as directed by the City's Inspector.

**Final paving shall be completed within sixty (60) days of proposed completion date**

**\*\* FEE PER FEE SCHEDULE \*\***

Permit Fee: \$ \_\_\_\_\_ Paid/Check No. \_\_\_\_\_

Applicant's Signature \_\_\_\_\_ Print Name: \_\_\_\_\_ Date: \_\_\_\_\_

Issued By: \_\_\_\_\_ Date: \_\_\_\_\_ City Engineer: \_\_\_\_\_ Date: \_\_\_\_\_

NOTE: Mail completed application to City of Highland, Engineering Department, 27215 Base Line, Highland, CA 92346.

Final Approval By:

\_\_\_\_\_  
Inspector Date

\_\_\_\_\_  
Ernest Wong, City Engineer Date





**INDEMNIFICATION, DEFEND, HOLD HARMLESS**

Property Owner shall indemnify, defend, and hold harmless the City of Highland and its officers, officials, employees, agents and volunteers from and against any and all liability, loss, damage, expense, costs (including without limitation, costs and fees of litigation) of every nature arising out of or in connection with the issuance of this permit or its failure to comply with any of its obligations contained in the permit.

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Property Address

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Property Owner

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Date

**CITY OF HIGHLAND**  
**Public Works Policies, Procedures and Standards**

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**7.5 Street and Storm Drain Plan and Profile Checklist and General Notes**

**STREET AND STORM DRAIN IMPROVEMENTS**

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Project: \_\_\_\_\_ Checked By: \_\_\_\_\_ Date: \_\_\_\_\_

Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_

This checklist should be considered as a guideline with acceptable minimums to be used for plan preparation by private engineers. Other methods of achieving the desired result can be used.

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**PLAN CHECKLIST**

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- 1. Plan Check Base Fee required when plans submitted. Totaled bond estimate and complete hydrology study required with first check. Quantity estimate required on plans. Plan size shall be 24" x 36" double matte three-mil thick mylar with standard City title block.
- 2. Plans to be approved by engineer. His signature, name, address, phone number and registration number and seal to appear. Does the engineer have a current City business license? City case or project number required in title block. For building permits show address of lot.
- 3. North arrow and vicinity map. North arrow to face up or to the right.
- 4. Approved names of streets checked against the final map. Street name sign schedule and construction note.
- 5. Install stop signs, stop bars, and stop legends if required, in accordance with City policy.
- 6. Show proposed traffic mitigation as identified in the project traffic report.
- 7. Show horizontal scale and bench mark, including a 3" long (minimum) graphic (bar) scale.
- 8. Bearings of all streets shown. Radial bearings on centerline of all catch basins, etc., in a curve. All street intersections shall be at right angles, plus or minus five (5) degrees, unless otherwise approved by the City Engineer.
- 9. Stationing to conform with established stationing on approved City plans. Stationing to be left to right. No negative stationing. If you have any questions or problems on stationing, contact City Engineer's Office prior to design.
- 10. Check stationing and elevations on consecutive sheets. If more than one sheet, show match lines at identical points on consecutive sheets. Give references to other sheets.
- 11. Stationing of all BCR's and ECR's, M.C. of all curves.
- 12. Stations at beginning and end of improvements and at center of catch basins, etc.

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- 13. Centerline curve data, also short and long side for curbed sections.
- 14. The offset for adjacent street intersections shall not be less than 200 feet apart, and may be up to 5 feet apart with the approval of the City Engineer.
- 15. A minimum 300-foot centerline radius on local streets is required unless prior approval is obtained from the City Engineer. The centerline radius for collector, secondary and major streets above shall be determined utilizing the Caltrans Highway Design Manual. A minimum tangent length of 100 feet is required between compound and reverse curves unless prior approval is obtained from the City Engineer.
- 16. 35-foot curb return radii at street intersections with secondary or major streets. All other 25 feet. Wheelchair ramps required at all curb returns except in knuckles. Ramps shall be constructed in accordance with Title 24 and ADA requirements.
- 17. Curb return data (delta, tangent, radius and length).
- 18. Show right-of-way and improvement widths (parcel to be improved, adjoining parcels and parcels across the street). Corner cut-off required at intersections.
- 19. Show lot lines and lot numbers same as record map.
- 20. Show existing improvements and dimensions with dashed lines, along with plan references. Show existing adjacent driveway and topo in and adjacent to area of proposed construction.
- 21. Show existing pipelines, irrigation lines, structures, power poles, trees, etc., in right-of-way, and include note as to their disposition if encroaching. Label with size, etc., and distance from centerline. Show existing underground structures that may conflict with, or enter into, the design of proposed improvements. Private engineer to have owner controlling utility sign plans after second check if utility is affected in any way.
- 22. Show improvements to be constructed with solid lines. Note connections to existing improvements.
- 23. Show details, dimensions, etc., of all improvements if not city standards. For all standard improvements show standard drawing number. Check standard drawings for those dimensions to be shown on plans.
- 24. Use 6-inch curb and gutter on local and collector streets. Use 8-inch curb and gutter on major, primary and arterial streets. If both 6-inch and 8-inch curb and gutter are being used, show limits on plan for each type of transition. Use 6-inch curb only for medians.
- 25. Check general and construction notes against "sample general notes". Show construction notes wherever necessary to clarify construction details.
- 26. Length and location of transitions or super elevations, if used; also, of transitional paved sections for drainage.

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### Public Works Policies, Procedures and Standards

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- 27. Show saw cut lines, limits of new paving, old paving, cold planing, overlay, and removal. Use appropriate shading to delineate areas. For new paving, an R-Value test to determine the paving section is required. Where match up paving is required specify a minimum 0.1' thick, 2' wide cold plane and inlay adjacent to newly saw cut edge of paving per City Standard Pavement Join Details.
- 28. Curb-type sidewalk standard. If property line sidewalk is existing within block, continue property line sidewalk to street intersection and transition through return to curb-type sidewalk. Minimum 4-foot clearance required around any obstacle (tree wells, power poles, fire hydrants, etc.).
- 29. Show detail of cross gutter if not standard. Cross gutter and aprons to show direction of flow with arrows. Show flow line elevations along flow line of cross gutter.
- 30. Show T.C. and flow line elevations on all BCR's and ECR's.
- 31. If cross gutter has upstream drainage area greater than 1,000 feet in length, then 10-foot cross gutter required. Otherwise, 6-foot width. Show width on plans.
- 32. No mid-block cross gutters. Cross gutters across major streets need prior approval from City Engineer.
- 13. Typical sections for all streets. Show existing, proposed and ultimate conditions. Show right and left sides of sections as they would appear looking upstation on the street even if only one side of the street is being improved. Identify property lines. Give level line offsets from centerline to quarter crown and T.C. New streets shall have a cross slope of 2 percent. Show range of slopes on existing and match-up paving. If difference in elevation between top of curb and existing ground at property line exceeds one foot, indicate what slopes are to be constructed outside the right-of-way, 2:1 maximum. Maximum 2:1 slope within street right-of-way.
- 34. Submit design cross sections at 50' intervals where match up paving is proposed. Sections shall be at a scale of not less than 1"= 20' horizontal and 1" = 2' vertical and labeled clearly with existing and proposed cross slopes, elevations, and dimensions. Cross slopes to be in the range of 1% to 2% for driving lanes and 2% to 4% for shoulders. 2% driving lane and 6% shoulder absolute maximums. Cross slopes to be computed from lip of gutter. Butterfly sections (where driving lane is steeper than shoulder) are not permitted.
- 35. If both driving lane and shoulder have variable cross slopes, the 1/4 crown elevations to be shown on plan. 1/4 crown located 8 feet from curb face on all streets.
- 36. Show traffic index (T.I.) under typical sections. Residential T.I. = 5, Collector T.I. = 6, Secondary T.I. = 7 (T.I. = 8 if truck route), Major T.I. = 8 (T.I. = 9 if truck route), Primary T.I. = 9 (T.I. = 10 if truck route). Minimum street section = 3"AC/4"AB. The structural section for all streets shall be designed for a service life of 20 years as outlined in Chapter 600 of the Caltrans Highway Design Manual.
- 37. Barricade needed at temporary dead end streets.

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- 38. Widening flare at 2:1, narrowing flare at rate to be determined by the City Engineer, each from the curb face. Install a minimum of three F-2 delineators with 8"x 24" target plates 25 feet (typical) on center along outgoing taper.
- 39. 2" x 4" headers required at edges of paving that are not adjacent to gutters or existing paving, except for the tapers.
- 40. Block walls connected with backup lot treatment will be placed at the top of any slopes adjacent to the street. Backup walls to be outside of City right-of-way. Details of other than standard walls required on plans. Show height of wall on plan.
- 41. Check for existing sewer lateral and show and label any proposed or existing laterals. (Applies to projects where there are existing sewers.) Laterals to be built before paving.
- 42. Slope letter is needed if cut or fill at end or side of subdivision street adjacent to subdivision boundary extends onto private property.
- 43. Alley approaches, which drain a portion of an alley with a valley gutter, will be depressed at the rear of the approach. Show flow line elevation on plans.
- 44. Minimum 20-foot long by 2-foot wide by 2.5-inch thick A.C. drainage aprons required at downstream end of stub streets.
- 45. On all major street intersections (two or more major streets) 88 feet wide and greater, traffic signal conduit and pullboxes shall be shown on the plans even if no signals are being built at this time.
- 46. If project conditions require fencing, construction limits of required chain link fence, etc., to be shown on plans.
- 47. Sign locations and arrangement on sign posts shall be per City standards.
- 48. Signs shall be placed on light poles or power poles when possible to minimize the number of sign post installations.
- 49. Check existing signage adjacent to new improvements to avoid conflicts.
- 50. Show flow around tract on index map on title sheet, if necessary.
- 51. If flow is diverted from its existing course onto private property, a recorded drainage release letter from the affected property owners will be required.
- 52. Private engineer to use San Bernardino County method for drainage calculations (hydrology and H.G.L.). Assume ultimate upstream development.
- 53. Check to see if new street section will carry same flow as existing street section (critical where there is an existing ditch along street) without diverting flow across centerline.
- 54.  $n = 0.020$  on residential streets (streets with driveways, parked cars, etc.)  $n = 0.015$  on major streets (no driveways, little or no parking, etc.)

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- 55. Check calculations on non-standard box culverts, etc.
- 56. Drainage structures checked for capacity. Check hydraulic calculations submitted by engineer.
- 57. Note size, length and "D" strength for pipe (1350-D minimum). Minimum diameter pipe 18 inches.
- 58. Storm Drain Pipe shall be RCP unless otherwise approved by the City Engineer.
- 59. Underground storm drain systems and open channels shall be designed for a 100-year storm. Sump conditions require a secondary overland freeflow to prevent flooding of buildings should catch basin or storm drain system become blocked. A flowage easement is required for overland freeflow conditions
- 60. Ten-year storm to be carried between curbs and 100-year storm between right-of-way lines on all streets. Secondary, major and primary streets must have one driving lane clear in each direction in 10-year storms.
- 61. Grate catch basins not permitted.
- 62. Construct catch basins to minimize the number of cross gutters if there is a storm drain in the vicinity of an intersection.
- 63. A recorded drainage release letter needed if streets drain onto adjacent property owner's land.
- 64. Any block walls, ditches, etc., needed along tract boundary to prevent flooding (overland, from canals, etc.)? Show on plans.
- 65. Check at subdivision boundaries for any possible problems such as blocking drainage from or discharging drainage to adjacent land or conflict with existing or proposed improvements.
- 66. Check for possible ponding on streets and cross gutters and aprons.
- 67. For storm drains show H.G.L. and elevation of HGL to nearest 0.1' in profile. Show "Q" in streets, into catch basins and into storm drain system and designate  $Q_{100}$ . Show any flowby at catch basins. Show "Q" to the nearest 1 CFS.
- 68. Water surface elevations in catch basins minimum 6 inches below gutter flow line.
- 69. Check for cutoff walls, energy dissipators, etc., at outlets of storm drain systems. Also, headwalls, etc., at inlets.
- 70. No storm drain easements centered on property line and no storm drains located on property line. Minimum width storm drain easement 15 feet. Supplemental access easements may be required.
- 71. An encroachment permit is needed from San Bernardino County Flood Control District if connecting to a District drainage system.

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- 72. Label private drainage system as such. Inlets of private drainage systems to be equal to or above H.G.L. of public storm drain they connect to or if tying into a catch basin, equal to or above the top of curb of the catch basin.
- 73. If proposed construction will affect adjacent driveways in any way, a written concurrence from adjacent property owners is required.
- 74. No "stick on" labels on plan originals. Duplicate mylars shall have a minimum thickness of 3 mil.
- 75. Any supporting calculations or pertinent data that would be required to allow complete checking of the entire design development package (including but not limited to closure calculations for maps; hydrology and hydraulic calculations for storm drain studies, etc.) must be submitted with first check.
- 76. Show all street lights and label "x,xxx lumen street light.
- 77. Check storm drain against WQMP requirements.
- 78. Check Engineer's registration expiration date.
- 79. Show existing survey monuments.

**FOR INFORMATION ONLY: Balance due on plan check fee must be paid prior to plan approval by City Engineer. Also, if R/W is required for the project, plans will not be approved until deeds are in and sent for recording.**

The following notes must appear on the first sheet of the plan set.

#### GENERAL NOTES FOR STREET PLANS

1. All work shall be done in accordance with these plans, the Standard Drawings of the City of Highland and the County of San Bernardino, and the Greenbook Standard Specifications for Public Works Construction, latest edition.
2. It shall be the responsibility of the Contractor to familiarize himself with the job site and the location of all underground facilities shown or not show on these plans. The City of Highland will not be responsible for any damage to underground facilities..
3. It shall be the Contractor's responsibility to obtain all necessary permits.
4. It shall be the Contractor's responsibility to call the City Engineer's Office at **(909) 864-8732, ext. 240**, for inspection 24 hours prior to performing any work. Work performed without calling for inspection shall be rejected and shall be removed solely at the Contractor's expense.
5. Utility Contractors shall be responsible for obtaining compaction tests of all trench backfill and street subgrades and submitting them to the City Engineer for approval. Notify City Engineer's Office at **(909) 864-8732, ext. 240**, 24 hours prior to tests.

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6. The structural sections shown on these plans are tentative. At the completion of rough grading, a material report and the proposed structural section shall be submitted by the design engineer to the City Engineer for review and evaluation. Approval will be given when all structural section requirements prevailing at time of submittal have been met. Current minimum structural section is 3" AC over 4" Class II AB. It shall be the design engineer's responsibility to contact the City Engineer's office to obtain the latest structural section requirements.
7. Locations of driveway approaches shall be added to the precise grading plan if not on original street plans. Any water or sewer laterals constructed within driveway approaches shall be relocated at the Contractor's expense. Note that 4' of sidewalk at a 2% slope shall be maintained around drive approaches in accordance with State and Federal requirements.
8. The Contractor shall satisfy himself that estimated quantities shown are correct before bidding on any item.
9. The Contractor shall maintain dust control at all times. Work site and exterior streets shall be in a neat, clean, hazard free, orderly state throughout construction. Site shall be cleaned upon request of the inspector.
10. All existing pavement to be removed shall be sawcut or wheelcut and removed to clean straight lines.
11. At all locations where new pavement joins existing, the existing pavement shall be coated with an asphaltic emulsion.
12. The Contractor is responsible for the protection of all utility valves, boxes and covers, and adjusting of all water valve boxes and covers to finish grade.
13. The Contractor shall reset manhole rings to surrounding A.C. pavement grade.
14. The Private Engineer signing these plans is responsible for the accuracy and acceptability of the work hereon. In the event of discrepancies arising during construction, the Private Engineer shall be responsible for determining an acceptable solution and revising the plans for approval of the City Engineer.
15. The Contractor shall call in a location request to Underground Service Alert (USA), phone number 811, two working days before digging. No inspection will be provided by the City Engineer's office, and no construction permit issued involving excavation for underground facilities will be valid unless the applicant has been provided an inquiry identification number by USA.
16. All irrigation lines encountered during construction shall be replaced with 12 gauge minimum dipped and wrapped-welded steel pipe.
17. Approval of these plans by the City or its agents does not relieve the developer from the responsibility for the correction of errors and omissions discovered during construction. Upon request, the required plan revisions shall be promptly submitted to the City Engineer for approval.
18. When improvements are to be placed on native soil which consists of a rocky material, the sub-grade shall be prepared by removing all rocks which protrude above the sub-grade and all voids or depressions shall be filled with a fine grade material of a quality better than the native material.

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19. No work shall commence within public right of way without obtaining a Public Improvements Permit and notifying the City Inspector to schedule a preconstruction meeting 24-hours prior to start of work.
20. Asphalt concrete shall be spread and compacted in at least two lifts, with each lift no thicker than **2"**. The City prefers that the final lift not be placed prior to the completion of construction of the residences/buildings within the development. Should the developer choose to pave the full depth of A.C. pavement prior to the completion of building construction, no final inspection of the pavement surface shall be performed. Upon the completion of building construction, a final inspection of the pavement surface shall be performed and any noted deficiencies shall be repaired in accordance with the City's Pavement Repair Policy.
21. After all houses are constructed, **if the final lift was placed prior to completion of construction**, all streets within the tract shall be slurry sealed prior to final bond release or a cash payment made in lieu of slurry seal.
22. Two coats of paint shall be used for pavement striping and markings on local and collector streets. Thermoplastic shall be used on secondary highways, major highways, and primary arterials.
23. It shall be the responsibility of the developer to comply with the provisions of Section 8771 of the Business and Professions Code as amended by Assembly Bill 1414, with respect to all monuments (refer to Section 3).

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### PROFILE CHECKLIST

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1. Show datum elevation at both ends of each street. Benchmark reference on each sheet.
2. Show horizontal and vertical scales.
3. Names and stationing of intersecting streets.
4. Label and show stations and elevations at the beginning and end of all curb returns, vertical curves, horizontal curves, transition sections, grade breaks and beginning and end of improvements.
5. Indicate length of curb returns and length of horizontal curves. Draw curb returns full length, not twice tangent distance. 1/4 delta points to be shown on all returns and elevations.
6. Label all grade lines and profiles. Also show size of curb face.
7. Profile of existing centerline with elevations at least every 50 feet (except for projects involving mass grading).
8. Profile of existing ground at property line (except for projects involving mass grading).
9. Profile of existing E.P. with elevations at least every 50 feet.
10. Show connection with or future design to existing improvements along with existing elevations. Show grade on existing improvements.

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- 11. Check profile of 1/4 crown if required. Show grade.
- 12. Grades of major and secondary streets should not exceed 6%. Residential streets shall not exceed 12% or as required by the Fire Department.
- 13. Check elevations shown in profile against those shown in the plan view.
- 14. Check difference between T.C. and centerline against what typical section shows.
- 15. Minimum centerline and top of curb grade is 1%, show grades in profile. If profile on existing street is less than 0.5%, engineer to have prior approval from the City Engineer. No new streets to have grades less than 1%.
- 16. Use vertical curves for all grade breaks in excess of 0.5% (Parabolic V.C.'s only). Do not use portions of vertical curves. Design speeds are 30 miles per hour for local, 45 miles per hour for collectors, 50 miles per hour for secondary and 55 miles per hour for majors.
- 17. Show tangent grades at PRVC or PCVC.
- 18. Show P.I. elevations on vertical curves.
- 19. Elevations every 25 feet on vertical curves (or fractional part thereof).
- 20. Check sight distance: (both horizontal and vertical). Intersections shall be designed in accordance with Caltrans 7-1/2 second Corner Sight Distance criteria.
  - Design Speeds: 30 mph - local streets
  - 45 mph - collector streets
  - 50 mph - secondary streets
  - 55 mph - major streets
- 21. Show transition between different types of curbs.
- 22. Extend profiles beyond end of improvements as necessary to justify grades.
- 23. If future curb is to go over canal, etc., check to see there will be adequate clearance between bottom of curb and top of canal cover.
- 24. Use straight grades for cross gutters unless there are unusual circumstances.
- 25. Maximum 2.5% grade coming into cross gutter. P.I. for vertical curve to be minimum of 50 feet back from flow line of cross gutter. On streets where the grade is 5% or greater, a grade of 4.5% into the cross gutter is acceptable.
- 26. Curb returns to be designed by plane method of top of curb. Show P.I. and elevations. Show tangent grades if different from T.C. grades.
- 27. Absolute minimum fall around or away from curb returns shall be 1%. Vary curb face if necessary. (Hold the T.C. elevations and vary the flow line.)
- 28. Show profile going into and out of return with grades.
- 29. Check shoulder around curb returns for excessive slope (maximum 6%).
- 30. Check through streets for driveability.
- 31. Show structures to scale (catch basins, etc.). Note critical flow line elevations.

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- 32. Show and label any existing or proposed underground construction that may conflict or enter into the design of the proposed improvements.
- 33. Show existing or proposed flow coming into and going out of new improvements.
- 34. Check for flat spots at high and low points of vertical curves. Vary curb face height to provide minimum flow line grade of 0.5% (vary the flow line, hold the T.C.).
- 35. Use variable curb face height on cul-de-sacs, knuckles, etc., to help alleviate flat slopes. Minimum flow line grade is 1%. Maximum street grade into gutter at back of cul-de-sac shall not exceed 3%. On flat cul-de-sacs with a 0.5% grade in cul-de-sac high-point, omit vertical curve at cul-de-sac high point.
- 36. If curbs are variable height, show T.C. and F.L. elevations and curb height. Show flow line profile with grade.
- 37. Check for car dragging going into driveway or alley. Grade for a residential driveway shall not exceed 12%. Submit a profile for each existing driveway showing existing and proposed elevations, grades, and dimensions of transition for match up. Clearly specify the limits and elevations of the transition on the plan.
- 38. On "grading to drain" situations, check for sufficient elevations and stations to allow grading to be done (critical where grading is to be done in flat area).
- 39. Propose grade checked against City plans, if any.
- 40. All plans must be complete within themselves and not contingent on future or adjacent construction.
- 41. On curb inlets or outlets, the top of the curb remains constant with the flow line varying up or down to allow for the facility. Minimum flow line grade is 1%.
- 42. Where the property being developed is below the level of the street, a driveway profile is required to show that 100-year street flows will not enter onto private property by way of the driveway.
- 43. A minimum velocity of 3 feet per second flowing half full shall be maintained in permanent closed conduit storm drains.
- 44. A minimum slope of 1% shall be used for permanent storm drains. If a 1% slope is not possible due to existing constraints, obtain prior approval from the City Engineer.
- 45. Check storm drain against WQMP requirements.

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## **8.0 UTILITIES**

The design engineer is responsible for identifying and contacting all utilities having any facilities that may be affected in any manner whatsoever by the proposed work included on the engineering plans.

Below is a general list of utilities doing business in Highland.

- **Time Warner Cable Television**  
1500 South Auto Center Drive, Ontario, CA 91761  
Phone: (909) 721-8589
  
- **East Valley Water District (Water and Sewer)**  
3654 Highland Avenue, Suite 18, Highland, CA 92346  
Phone: (909) 888-8986
  
- **AT&T (Telephone Planning)**  
3037 Adams Street, Riverside, CA 92504  
Phone: (951) 359-2511
  
- **Verizon (Telephone Network Engineering and Planning)**  
1980 Orange Tree Lane, Suite 100, Redlands, CA 92374-7880  
Phone: (909) 748-6649
  
- **Southern California Edison (Distribution Facilities)**  
287 Tennessee Street, Redlands, CA 92373  
Phone: (909) 307-6749
  
- **Southern California Edison (Transmission Facilities)**  
300 North Pepper Avenue, Building "B", Rialto, CA 92376  
Phone: (909) 820-5532
  
- **Southern California Gas Company**  
1981 West Lugonia Avenue, Redlands, CA 92374-9796  
Mailing Address: PO Box 3303, Redlands, CA 92374-9796  
Phone: (909) 335-7772
  
- **San Bernardino Valley Municipal Water District**  
1350 South E Street, San Bernardino, CA 92408-2725  
Mailing Address: P.O. Box 5906, San Bernardino, CA 92412-5906  
Phone: (909) 387-9230

## **9.0 TRAFFIC**

Traffic studies shall be prepared in accordance with criteria adopted by the City of Highland. Check with the City Engineer for details before starting any traffic reports.

Traffic signals shall be designed in accordance with the latest edition of the State of California Standard Specifications and Standard Plans, and the latest edition of the California Manual on Traffic Control Devices.

### **9.1 Traffic Study Parameters**

Pursuant to City Council Resolution 93-37 and 96-7, the City of Highland requires a Traffic Report be prepared in accordance with the guidelines of Appendix C of the latest Congestion Management Program for San Bernardino County whenever a project exceeds the CMP thresholds or generates more than 1,000 new two-way daily trips or 100 new two-way peak hour trips.

The City Engineer may require a smaller project to prepare a Traffic Report in accordance with the City Engineer's requirement if there are concerns regarding access, roadway structural impacts or level of service on intersection or roadway segments adjacent to the project.

The following is a summary of parameters for preparation of a traffic impact analysis when such analysis is required by the City of Highland:

1. Provide project general plan or a specific plan description.
2. Analysis Methodology – Provide a general description for the process used to analyze the project in accordance with the latest CMP guidelines.
3. Obtain existing traffic counts and calculate existing levels of service.
4. Traffic Forecasts – Project amount of traffic to be generated from proposed development utilizing ITE trip generation rates or actual study rates for development similar to the type proposed. Another alternative is use of a local model as identified in the latest CMP guidelines. Background traffic forecasts should also be included in accordance with the latest CMP guidelines. Distribute proposed traffic to the existing street system. This should be accomplished in accordance with methods outlined in the latest CMP guidelines. Project traffic volumes to a target year in accordance with the latest CMP guidelines or in the case of projects which do not meet Congestion Management Plan or local thresholds to a target year as specified by the City Engineer. Forecast traffic with and without the project.

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5. Analyze future levels of service with and without the project. All key segments and intersections shall be analyzed in accordance with the latest CMP guidelines and the requirements of the City Engineer. Levels of service shall be analyzed based on procedures in the latest version of the Highway Capacity Manual.
6. Describe projected level of service problems in accordance with the latest CMP guidelines. All intersection levels of service below "D" and all segment levels of service below "C" shall be mitigated. Precisely show all recommended mitigation regarding traffic control measures, striping, street widths, etc.
7. Cost Estimate – The costs of said mitigating deficiencies must be estimated and tabulated within the report.
8. Conclusions and Recommendations – The summary of proposed mitigations and costs shall be provided along with any other recommendations that should be brought to the attention of the City Engineer. The cost for mitigating the deficiencies shall be apportioned to the proposed development in accordance with the method outlined in the latest CMP guidelines.

A minimum of three copies of the report shall be signed and stamped by a registered civil or traffic engineer and submitted with the required review fee. Additional copies may be required when the City Engineer determines that other agencies should be afforded an opportunity to review the traffic impact analysis.

It should be noted that additional items may be required depending upon the size and scope of the project involved. These items could include such things as analysis of driveway intersections, traffic progression analyses, signal timing analyses, signal interconnect analyses, sight distance analyses or speed and access analyses. In general, it would be acceptable to analyze for the most severe condition, i.e. peak hours, but in some cases daily traffic volumes or noon time traffic volumes would also need to be analyzed.

This outline, along with previously referenced resolutions and CMP guidelines, is the basic guide for preparation of traffic reports for the City of Highland.

It is recommended that prior to the consultant undertaking a traffic study, he or she first contact the Public Works Director/City Engineer at (909) 864-8732, ext. 212, so the specifics of the individual project may be discussed.

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**9.2 Traffic Signal Specifications**

**1. Traffic Signal General Notes**

- a. Equipment list shall be submitted to the City Engineer for approval.
- b. Turn-on of the traffic signal system shall not be made on a Friday or the day preceding a legal holiday, and will be permitted between the hours of 9 a.m. and 2 p.m. only.
- c. The City shall be notified at least 48 hours prior to the intended turn-on and the City's signal maintenance company must be present before turn-on is initiated.

**2. Materials and Installation**

- a. Conduit and conduit fittings shall be UL or ETL rigid steel with metallic fittings for traffic signals and street lighting and shall conform to Caltrans Standard Specifications.
- b. Pull boxes shall be pre-cast concrete. Grout-in bottom of pull boxes will not be permitted.
- c. Electrical pull boxes, unless noted otherwise on the Plans, shall be No. 5 or larger and shall have traffic rated lids.
- d. No pull box shall be located in or within 1-foot of any curb ramp.
- e. Multiple circuit conductors shall be THW type.
- f. Electrical service equipment installation and conduit run detail shall be specified by the serving utility company, and written proof of their approval by the utility shall be submitted to the Engineer prior to installation.
- g. Service equipment shall be 120V/240V, type as shown on plans.
- h. Materials and equipment furnished by the contractor shall be tested at Siemens, 10775 Business Center Drive, Cypress, CA 90630.
- i. Costs for testing and delivery to and from the test site shall be borne by the Developer.

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- j. Install model 170E controller assembly complete in 332 cabinet. The controller assembly shall include the following equipment:
  - Remote IP Antenna/Radio (Commpak BB58INT-Encom includes Radio Power Supply)
  - Ethernet Module (to be integrated in the controller)
  - Cat 5e Cable from antenna to controller cabinet.
  - Dimension Battery Backup System.
  - Iteris video detection.
  - Opticom emergency vehicle pre-emption.
  - Other appurtenant equipment as required for operation.
- k. The Battery Backup System shall be installed in a side-mounted cabinet per the manufacturer's specifications.

### **3. Limited Warranty**

- a. The supplier shall provide a limited three-year warranty on the video detection camera. See supplier standard warranty included in the Terms and Conditions of Sale documentation.
- b. During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time a call is made by a user, and this support shall be available from factory-certified personnel or factory-certified installers.

### **4. Maintenance and Support**

- a. The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the video detection camera. These parts shall be available for delivery within 30 days of placement of an acceptable order at the supplier's then current pricing and terms of sale for said parts.
- b. The supplier shall maintain an ongoing program of technical support for the video detection system. This technical support shall be available via telephone, or via personnel sent to the installation site upon placement of an acceptable order at the supplier's then current pricing and terms of sale for on site technical support services.
- c. Installation or training support shall be provided by a factory-authorized representative and shall be a minimum IMSA-Level II Traffic Signal Technician certified.
- d. All product documentation shall be written in the English language.

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**5. Pedestrian Push Buttons**

- a. Pedestrian push buttons shall be Type B "Bumble Bee."
- b. Pedestrian push button signs shall conform to the details shown on the plans, except that the message and symbols shall conform to R62D(CA).

**6. Lighting**

a. LED Luminaires

- Luminaires shall be LEOTEK GC1-80E-MV-NW-3-GY-530.
- Luminaires shall be equipped with photoelectric controls and wiring to a Type III service enclosure for testing.

b. Internally Illuminated Street Name Signs

- New internally illuminated street name signs shall be Type A.
- Details of color, style, borders, and spacing shall conform to the standards established by the City. "Periods" shall not be used on abbreviations. A scale layout for each legend shall be submitted to the Engineer for approval prior to fabrication.
- A 1/2-inch close nipple and LB conduit shall be installed on the mast arm at the coupling point. The cable between sign and conduit shall be 3-conductor AWG No. 16, Type SJO. The green conductor of the cable shall be used for grounding between sign housing and conduit. The cable shall enter the sign housing and conduit through neoprene bushed CGB connectors. The cable shall be dressed in a neat arc between sign and conduit with sufficient slack to facilitate sign swing.

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**7. Controller Maintenance Manual**

- a. The Developer shall furnish a maintenance manual for all controller units, auxiliary equipment, and vehicle detector sensor units, control units and amplifiers. The maintenance manual and operation manual may be combined into one manual. The maintenance manual or combined maintenance and operation manual shall be submitted at the time the controllers are delivered for installation or, if ordered by the Engineer, previous to purchase. The maintenance manual shall include, but need not be limited to, the following items:
  - Specifications
  - Design Characteristics
  - General operation theory
  - Function of all controls
  - Troubleshooting procedure (diagnostic routine)
  - Block circuit diagram
  - Geographical layout of components
  - Schematic diagrams
  - List of replaceable component parts with stock numbers
- b. The Developer shall arrange to have a representative of the Engineer and a signal technician present at the time of the new controller operation is implemented. The technician shall be fully qualified to work on the controller assemblies, and shall be employed by the controller manufacturer or his authorized representative. The Engineer's representative shall be notified at least 48 hours prior to the turn on.

**8. Traffic Signal Faces and Fittings**

- a. All vehicular indications shall be 12-inch with visors and backplates.
- b. All signal heads shall be aluminum alloy. Plastic housings, visors, and backplates will not be permitted.
- c. All signal heads and fittings shall be dark green.
- d. Top openings of signal heads shall be sealed with neoprene gaskets.

**9. Light Emitting Diode Signal Module**

- a. All new indications (red, green, and yellow) shall be Dialight.

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**10. Pedestrian Signals**

- a. Pedestrian signal face type shall be Dialight LED countdown pedestrian heads.

**11. Detectors**

- a. Video detection system shall be Iteris Vantage system with RZ-4AWDR color cameras. Contractor shall provide one extra camera to the City.

**12. Installation**

- a. The coaxial cable to be used between the camera and the VDP in the traffic cabinet shall be Belden 8281. This cable shall be suitable for installation in conduit or overhead with appropriate span wire. A BNC plug connector shall be used at the cabinet end. The coaxial video cable shall be stripped and terminated at the camera and cabinet per manufacturer's instructions (no BNC or other connector shall be used at the camera). The coaxial cable, BNC connector used at the cabinet termination, and crimping tool shall be approved by the supplier of the video detection system. The manufacturer's instructions must be followed to ensure proper connection.
- b. The power cabling shall be 16 AWG three-conductor cable with a minimum outside diameter of 0.325 inch and a maximum diameter of 0.490 inch. The power cable shall be terminated at the camera per manufacturer's instructions and shall only require standard wire strippers and a screw driver for installation (no special connectors or crimping tools shall be used for installation). The cabling shall comply with the National Electric Code, as well as local electrical codes. Cameras may acquire power from the luminaire if necessary.
- c. The video detection camera shall be installed by factory-certified installers as recommended by the supplier and documented in installation materials provided by the supplier. Proof of installer's factory certification shall be provided.

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**10.0 LIGHTING**

1. General Requirements

- a. Utilize the latest National Electric Codes, the City of Highland Street Light Specifications, and the State of California Department of Transportation Standard Specifications.
- b. Use City of Highland standard 24" x 36" mylar plan sheets and title blocks. Plans shall be signed by a Registered Civil Engineer or Electrical Engineer.
- c. Coordinate with Southern California Edison for service points.
- d. Street light locations will be provided by the City at the beginning of the plan check process.
- e. Street light poles shall be Ameron 1C1 octagonal natural gray concrete poles with black and white aggregate, and shall have a factory applied anti-graffiti coating. Mast arms shall be Ameron Type 1AP.
- f. Street light poles shall be located two feet from the center of pole to curb face.

2. LED Street Light Specifications

Specifications by Roadway Designation

Roadway Designation	Curb Separation (Feet)	Lumens	Luminaire Watts	Number of LED's	Voltage	Nominal Color Temperature	Light Distribution	Fixture Casting	Drive Current	Mounting Height (Feet)*	Pole Height (Feet)*	Mast Arm Length (Feet)*	Optimum Spacing Staggered (Feet)*	Average FC
Local	36	2429	24	20G	MV	NW	2	G CJ1	350mA	26	23	6.5	180	0.3
Collector	44	3679	37	20G	MV	NW	2	G CJ1	580mA	26	23	6.5	180	0.4
Special Collector	52	3679	37	20G	MV	NW	2	G CJ1	580mA	26	23	6.5	180	0.5
Secondary Highway	64	9246	106	30F	MV	NW	2	G CM1	1A	31	28	6.5	180	0.8
Major Highway	80-88	11941	138	40F	MV	NW	3	G CM2	1A	31	28	6.5	140	0.8
Primary Arterial	96	11941	138	40F	MV	NW	3	G CM2	1A	31	28	6.5	140	0.8

\* Unless otherwise specified/approved by the City Engineer.

- a. Luminaires shall be Leotek Cobra head LED or approved equal.
- b. Each luminaire shall have an ANSI 134-2, 7 conductor, twist-lock photocell receptacle.
- c. Optimum uniformity ratio = 3:1.
- d. Surge suppression: The luminaire on-board circuitry shall include surge suppression devices to withstand high repetition noise transients as a result of line switching and other interference.

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- e. Thermal management of the heat generated by the LEDs shall be of sufficient capacity to assure proper operation of the luminaire over the expected useful life.
- f. Thermal management shall be passive by design and shall consist of a heat sink with no moving parts or liquids.

#### **3. Physical/Mechanical Requirements**

- a. The luminaire shall be a single, self-contained device not requiring on-site assembly for installation. The power supply shall be integral to the unit.
- b. The housing shall be completely constructed of metal, except for gaskets, lenses, etc. Housing finish shall be gray in color and powder coated.
- c. Luminaire shall be warranted rust proof for the warranty period.
- d. All components must be fully accessible for servicing without removing the luminaire from its mounting.
- e. Access doors and panels shall be hinged and accessible without tools. If not, provide clips or lanyards to prevent them from falling when open.
- f. All hardware and fasteners shall be stainless steel or zinc-nickel plated.
- g. The assembly and manufacturing process for the LED luminaire shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from wind loads up to 100 mph.

#### **4. Luminaire Identification**

- a. Each luminaire shall have the manufacture's name, trademark, model number, serial number, month and year of manufacture with lot number and replacement part numbers permanently marked inside each unit and on the outside of each packaging box.
- b. The following operating characteristics shall be permanently marked inside each unit: rated voltage and rated power in watts and volt-ampere, CCT rating in Kelvin and Luminaire Efficiency Rating.
- c. Luminaire shall have an exterior wattage that can be easily read from the ground.

#### **5. Quality Assurance**

- a. Manufacturer shall provide a written warranty for full replacement of the luminaire due to any failure for a period of ten (10) years from the date on installation.
- b. Luminaire shall, at the City's option, be repaired or replaced if the luminaire fails to function as described in the above specification for the duration of the warranty period.
- c. The written replacement warranty shall be converted to a written on-site replacement warranty if the field observed and documented failure exceeds 5 percent for any installation of 100 or more identical components. On-site warranty replacement includes removal and disposal of failed components, along with delivery and installation of new components.

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6. Splicing
  - a. Splices shall be permitted in pull boxes and lighting standard bases only and shall be waterproof.
  
7. Conduit
  - a. All conduit shall be minimum two-inch UL approved heavy wall polyvinyl chloride (PVC schedule 40).
  - b. Conduit shall be sand encased three inches minimum on all sides.
  - c. Conduit shall be laid to a depth of not less than 30 inches below the top of curb in sidewalk areas and 30 inches below finished grade in all other areas.
  - d. Conduit laid in open trenches shall not be backfilled until installation has been accepted by the public works inspector.
  
8. Pull Boxes
  - a. A number 3½ pull box shall be installed within five feet of each street light and within five feet of each service point, unless the street light is within five feet of the service point. Pull boxes shall not be spaced at over 200 feet.
  - b. The bottom of the pull box shall rest firmly on a 12-inch bed of one-inch crushed rock extending six inches beyond the outside edges on the pull box.
  - c. Pull boxes shall not be installed in any part of a driveway or other traveled way.
  - d. Pull box covers shall be inscribed "STREET LIGHTING" and shall be secured with ⅜-inch brass, stainless steel or other non-corroding bolts

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## **11.0 SIGNAGE**

All signs shall be designed and installed in accordance with the latest edition of the California Manual on Uniform Traffic Control Devices and City of Highland Standards. See Section 12.0 for pavement marking materials.

1. All signs shall be placed on existing street sign posts or street light poles wherever possible.
2. Stop and warning signs shall have 3M Diamond Grade DG<sup>3</sup> reflective sheeting with #1160 anti-graffiti film.
3. Other signs shall have 3M High Intensity Grade prismatic reflective sheeting with #1160 anti-graffiti film.
4. Stop signs shall be installed two (2) feet behind the face of curb at the BC of the curb return.
5. Limit lines shall be installed at all stop signs except if a crosswalk is installed. See City Standard Drawing No. 218 for limit line location.
6. A stop legend shall be installed in conjunction with a limit line when a street intersects a major highway or secondary highway. Stop legends shall also be installed at crosswalks. See City Standard Drawing No. 218 for stop legend location.
7. Sign posts shall be 2" x 2" x 10' without stop signs or 12' with stop signs mounted on the same post. Posts shall be installed into ground with 2-1/4" x 2-1/4" x 30" anchor, c.c.s.s. type. Attach post and anchor with two (2) drive rivets. There shall be a clearance of 7' between the finished grade and lower sign. Anchors shall extend no higher than 3" above finished grade.

## **12.0 PAVEMENT MARKINGS**

All pavement markings shall be designed and applied in accordance with the latest edition of the California Manual on Uniform Traffic Control Devices, and City of Highland Standards.

1. Two coats of paint shall be applied on Local and Collector Streets.
2. Thermoplastic shall be applied on Secondary Highways, Major Highways and Primary Arterials.
3. Two coats of paint shall be applied on all streets that have been slurry sealed unless otherwise required by the City Engineer.

## **13.0 TRAILS**

### **13.1 Trail Specifications:**

The following is a summary of design requirements and specifications for construction of Trails in the City of Highland:

1. Trail Clearance:

10' overhead clearance of tree branches and bushes, with brush, weeds, debris and rocks removed from the trail tread.

Adequate sight distance shall be maintained at all intersections and drive approaches as determined by the City Engineer.

In instances where topography, right-of-way configuration, grading or existing vegetation prevent the full-width construction of the trails as listed above, the Community Development Department may grant relief and reduce the requirements.

2. Trail Width:

Multi-use – 12' (10' minimum)

Multi-use with Class 1 Bikeway – 12' minimum

3. Vertical Grade:

0-5% optimum

10% maximum for distances over 500 feet.

15% maximum for distances limited to 500 feet or less.

20% maximum permitted only in extreme cases and for short distances under 100 feet, and only on cases where no vehicle is to be expected.

4. Cross Section:

2-4% optimum.

6% maximum in approved locations only.

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5. Drainage:

Avoid erosion by proper grading and the use of diversionary devices such as water bars, berms or other diversionary devices. Location of drainage devices are to be reviewed and approved by the City Engineer.

6. Side Slopes Cut and Fill:

2:1 maximum.

7. Surfacing:

Surfacing shall be 4" concrete, 3" asphalt concrete, 4" decomposed granite, or native soil.

Native soil or decomposed granite used for trail tread shall be treated in accordance with one of the following specifications, or an alternative specification as approved by the City Engineer.

Polymer Additive – Trail surfacing material shall be a diluted copolymer emulsion solution incorporated into the top four (4) inches of trail surface as recommended by the supplier. Trail construction shall include, but not be limited to the following.

- d. Scarify the surface and remove rocks greater than 2 inches in size.
- e. Mix solution, one part polymer to 20 parts water.
- f. Apply solution and reverse till three times to saturate the four-inch disturbed layer.
- g. Rake and level the tilled mixture.
- h. Compact the leveled bedding with a five-ton vibratory roller to a relative compaction of 95 percent.
- i. Maintain free of traffic until cured (five to seven days at summer temperatures) before compaction testing.

Removal and/or import of soil required for suitable mixing, cohesion, and compaction shall be the responsibility of the contractor.

Provide a warranty of compacted trail surfacing for a period of one year.

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Organic Binder – Trail surfacing shall be three (3) inches of stabilized decomposed granite over a compacted and smooth subgrade, free of rocks and debris. Decomposed granite shall comply with the requirements of Section 200-2.7 of the Standard Specifications with 100 percent passing a 1/2-inch sieve. Stabilizing organic binder shall have a minimum swell value of 32 ml/gm and shall be incorporated with granite fines by use of a pug mill mixer at a ratio of 12 pounds of stabilizer per ton of granite fines. Mixed material shall be spread and compacted to a relative compaction of 95 percent. Material shall be pre-wet and evenly spread over the subgrade and tested for compaction three to four days after completion.

Provide a warranty of compacted trail surfacing for a period of one year.

8. Flood and Drainage Channel Crossings:

Where trail must cross existing or proposed drainage channels, the continuity of the trail shall be maintained by the construction of an appropriate crossing such as bridges, ramp ways, culverts, etc. Natural streambed crossings should be left as natural as possible.

9. Trail Entrance:

Trail entrances shall be designed to provide for equestrian, pedestrian/hiking/biking use and shall discourage motor vehicle and motorcycle access. Trails shall provide one or more means of access for service vehicles. Access locations are subject to approval by the Community Development Department. Refer to standard drawings for barriers and signs.

10. Street Crossings:

Crossings shall be at grade with appropriate street striping and signing. For equestrian, textured pavement is required to prevent slipping, such as "medium broom" finish concrete. All barricades must be recessed 15 feet back from the street entrance.

11. Concrete Aprons:

For drive approaches at trail entrances or at drainage crossings, concrete aprons shall be a transverse "medium broom" finish. (See Standard Drawing Nos. 501 and 502)

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12. Trail Fencing:

All fences will follow the grade of the trail tread, and all posts shall be leveled and in line with one another. When the fence goes over the hills or down ravines, use a rolling up-and down appearance. Where fencing is required on both sides of the trail, the fences will run parallel and leveled crosswise. All fencing shall be constructed on the easement line where possible. (See Standard Drawing Nos. 504 and 505)

All fence posts shall be cemented with 60 pounds of dry cement; no cement shall be visible upon completion of the trail. Upon cutting of the lodge pole fencing, the cut areas shall be resealed.

Fencing material may include PVC, Cedar Lodge Pole, Cable, Wire or Wrought Iron, or as required by Environmental Mitigation Monitoring Reporting Program. The City's Planning Commission shall have approval authority for the fencing material.

13. Off-Road Vehicle (ORV) Barriers:

ORV barriers shall be constructed whenever there is a break in a fence line that would allow vehicle access. (See Standard Drawing Nos. 506 – 509)

14. Signs:

Trail identification signs will be placed every half mile and be constructed to trail design standards on community trails. Trail identification signs shall be placed on existing street sign poles wherever possible.

Hazard signs shall be constructed to trail design standards and will be placed wherever there is a potential safety hazard to users or their animals, for example, a steep embankment or a 20 percent plus trail grade.

Trail Donor signs may be mounted on the fencing material or on separate sign poles. Usage of existing sign posts is recommended.

## **14.0 LANDSCAPING AND IRRIGATION**

The following landscape policies and procedures are based on the requirements provided within the City of Highland Municipal Code Chapter 16.40.390 and the 2015 State of California Model Water Efficient Landscape Ordinance.

### **14.1 GENERAL REQUIREMENTS**

#### **NUMBER OF PLANS AND SUBMITTAL PROCEDURE**

- a. Initial Submittal: Three (3) hard copies of Landscape Irrigation and Planting plans shall be submitted to the City of Highland Planning Division along with payment of the appropriate current Landscape Plan Review Fee. Upon deposit of sufficient funds, the plans will be routed to Public Works/Engineering Department as well as the City's Landscape Architect for review. For projects containing water quality basins or other BMP's, as well as projects where notable topography is present, a copy of the grading plans and other relevant details shall be provided for reference in the Landscape review.
- b. Resubmittal after receipt of redlined comments: Two (2) hard copies of corrected landscape and irrigation plans, along with previous check redlined plans, shall be submitted directly to the City's Landscape Architect. Electronic submittal of plans in PDF format is encouraged in lieu of hard copy re-submittal.

### **14.2 LANDSCAPE DESIGN PLANS**

#### **1. ALL SHEETS**

A landscape design plan meeting the following criteria shall be submitted as part of the Landscape Documentation Package.

**NOTE:** The name, address, telephone number, along with signature of the person(s) preparing the design shall be on the plans. Licensed landscape architects shall include current license numbers and expiration date.

- a. Landscape plans shall be prepared under the direct supervision of a Licensed Landscape Architect, with current, active registration in the State of California.
- b. Plans shall be legibly drawn to scale on double matte three-mil thick mylar no smaller than 24" x 36" and no larger than 30" X 42".
- c. Plans shall show the name, address, and telephone number of property owner or developer.
- d. Plans shall show location of the property/ properties by vicinity map and nearest cross streets and give the property address or assessor's parcel number.
- e. Plans shall show location of existing and proposed utilities - above ground and underground, including but not limited to water, sewer, electrical, telecom, cable, etc. All street lights, cabinets, hydrants shall be shown on the plans.

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- f. Plans shall show all applicable drawing scales and northerly directional arrow. Landscape plan sheets shall be drawn at 20 scale unless otherwise directed.
- g. All sheets shall include the City signature block in the lower right corner of each sheet:

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<b>APPROVED BY:</b>	
_____	_____
<b>PLANNING DIVISION</b>	<b>DATE</b>
_____	_____
<b>CITY'S LANDSCAPE ARCHITECT</b>	<b>DATE</b>
<b>LICENSE NO. _____</b>	

- h. City Standard Landscape details shall be used on all projects that will be maintained by the City of Highland.
- i. On the Cover Sheet of the Landscape plan set, the following statement shall be provided: "I have complied with the criteria of the City of Highland Water Efficient Landscape Ordinance and applied them for the efficient use of water in the landscape design plan." Applicant's Landscape Architect shall sign and date immediately below the aforementioned statement, also providing the signer's current State of California Landscape Architect license number.
- j. Provide the Total Landscape Area in square feet on the Cover Sheet of the Landscape Plan Set.
- k. Identify all special landscape areas, including areas dedicated solely to edible plants, recreation areas, etc. on the Cover Sheet of the Landscape Plan Set.
- l. Identify all Best Management Practices (BMP's) containing landscape elements on the Cover Sheet of the Landscape Plan Set.

**2. PLANTING PLAN**

The City of Highland consists of several overlapping biomes, including but not necessarily limited to urban, alluvial fan sage scrub, riparian, and foothill chaparral. Accordingly, plant materials shall be selected to complement the specific microclimate present at the project site. For the efficient use of water, each landscape shall be carefully designed and planned for the intended function of the project. The City encourages the protection and preservation of native species and natural vegetation, as well as mature trees.

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While any plant may be selected for the landscape, providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance, selection of water-conserving plant, tree and turf species is encouraged, with an emphasis on locally native, non-invasive species, disease and pest resistance, and minimal maintenance.

- a. Plans shall contain plant legends for all existing and proposed plant material. Planting legend shall provide the following:
  - i. Plant symbol
  - ii. Plant name, botanical and common
  - iii. Plant size (nursery container)
  - iv. Plant quantities
  - v. Plant Spacing (feet on center, 100% coverage, etc.)
  - vi. Water Use Classification (WUCOLS)
- b. Plans shall show existing trees to remain, with current trunk caliper and canopy drawn to scale.
- c. Plans shall show proposed plant material drawn to scale at their anticipated mature, maintained size at 10 years from planting.
- d. Plans shall contain landscape specifications and details.
- e. Plant selection shall adhere to Fuel Modification Plan Guidelines in projects that interface with hillsides and/or open space.
- f. The use of turfgrass is limited to parks and active play areas only, of which areas must not exceed 25% slope gradient (4:1). Use of turfgrass in any other application will be reviewed on a case-by-case basis.
- g. All required turf areas (at special landscape areas only) shall be protected from other landscape areas i.e. groundcover beds, shrub planters by a 6" concrete mow curb. Mow curb shall be 1" above finished grade. Mowcurbs shall also be used to delineate the limits of Landscape Maintenance District (LMD) planter areas, especially at the interface of private homeowner lots and LMD areas.
- h. High water use plants, characterized by a plant factor of 0.7 or greater, are prohibited in street medians.
- i. A minimum 3" layer of mulch shall be provided on all exposed soil surfaces of planting areas except in turf areas.
- j. Plantings shall be grouped by water use hydrozone, which shall be reflected consistently in the irrigation plan.
- k. Landscaped areas shall have plant material selected and planting methods used which are suitable for the soil and climatic conditions of the site. Sizes of the plant materials shall conform to the following mix as required in the City Development Code.
  - i. Trees 20%, 24" box; 50%, 15 gallon; 15%, 36" box; 15%, 48" box
  - ii. Shrubs 80%, 5 gallon; 20% 1 gallon
  - iii. Groundcover 100% coverage within one (1) year

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- iv. Fifteen (15) gallon trees shall have a 1" to 1/2" diameter caliper - 5 inches above the top of the rootball. They shall be 8' to 10' in height, with a 2' to 3' spread. Twenty-four inch (24") box trees shall have a 1 3/4" to 2" diameter caliper - 5 inches above the rootball. They shall be 9' to 10' feet in height, with a 4' to 5' spread.
- l. Slope landscape requirements: To protect against damage by erosion and negative visual impact, surfaces of all slopes more than three (3) feet in height shall be protected by landscaping. Slopes exceeding ten (10) feet in vertical height shall also be landscaped with shrubs spaced at not to exceed 10 feet on center and trees spaced at not to exceed 20 feet on center. Plant material selected and planting method used shall be suitable for the soil and climatic conditions on the site.
- m. Plant sizes on slopes shall be as follows:
  - i. Trees 100% - 15 gallon
  - ii. Shrubs 40% - 5 gallon; 60% - 1 gallon
  - iii. Groundcover 100% - coverage within one (1) year.
- n. The maintenance of graded slopes and landscaped areas shall be the responsibility of the developer until the transfer to individual ownership.
- o. Street trees: Street trees shall be required. Tree varieties and exact location will be determined by the Public Works Department, under the direction of the City's Landscape Architect. The applicant shall mark locations and inspect plant material on site for City approval, prior to planting. A 24-hour notice is required for inspection. The size of the street trees shall be 24" box specimens unless otherwise directed by the Public Works Department and City's Landscape Architect. The 24" box trees shall be planted as street trees within public parkway or City property. For the latest list of street trees, please contact the City's Landscape Architect (Community Works Design Group) at (951) 369-0700.
- p. All required setbacks around the perimeter of the property shall be landscaped (except for walks and driveways which bisect or encroach upon the required landscape area). The required setbacks shall be landscaped with trees, shrubs and groundcover. Landscaped earth berms shall be erected and maintained within the setback. Bermed areas shall have a maximum of 4:1 slope and be planted with 1 gallon groundcover material or other approved landscaping. A minimum width of 5 feet of landscaping shall be placed on the exterior of perimeter building walls.
- q. Gravel and decorative rock are permitted for use as groundcover in no greater than 50% of the total landscape area, and the location of the rock material is compatible with adjacent land use.

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**3. SOIL MANAGEMENT PLAN**

In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, including the following items:

- a. At the completion of rough grading activities (as applicable), submit soil samples representative of the pre-conditioned site soils to a City-approved laboratory for analysis and recommendations. The soils analysis shall include:
  - i. Soil texture
  - ii. Infiltration rate determined by laboratory test or soil texture infiltration rate table
  - iii. pH
  - iv. Total soluble salts
  - v. Sodium
  - vi. Percent Organic Matter
  - vii. Recommendations for amending soil

In projects with multiple landscape installations, such as production lots for housing tracts, a soil sampling rate of 1 in 7 lots or approximately 15% will satisfy this requirement.

- b. The soils report shall be made available, in a timely manner, to the professionals preparing the landscape design plans to make any necessary adjustments to the design plans.
- c. The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to the local agency with Certificate of Completion.
- d. Prior to the planting of any materials, compacted soils shall be transformed to a friable condition. On engineered slopes, only amended planting holes need to meet this requirement.
- e. Soil amendments shall be incorporated according to the recommendations of the soil report and what is appropriate for the plants selected.
- f. For landscape installations, compost at a rate of four cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of six inches into the soil. Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.
- g. Stabilizing mulching products shall be used on slopes that meet current engineering standards.
- h. Organic mulch materials made from recycled or post-consumer products shall take precedence over inorganic materials or virgin forest products unless the recycled post-consumer organic products are not locally available. Organic mulches are not required where prohibited by local Fuel Modification Plan Guidelines or other applicable local ordinances.

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**4. IRRIGATION PLANS**

For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturer's recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance.

- a. All required landscaping shall be irrigated with an automatic irrigation controller that utilizes either evapotranspiration or soil moisture sensor data with non-volatile memory for scheduling in all irrigation systems.
  - i. For City maintained areas, Controller shall be Hunter ICore or Weathermatic SL; final selection shall be determined by City Public Works on a project-specific basis.
  - ii. Sensors (rain, freeze, wind, etc.) either integral or auxillary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation controllers.
- b. Irrigation plans shall be submitted with, attached to, and the same size as landscape plans.
- c. Project applicant shall complete the Water Efficient Landscape Worksheet (see appendix) which contains information on the plant factor, irrigation method, irrigation efficiency, and area associated with each hydrozone. Calculations are then made to show that the evapotranspiration adjustment factor (ETAF) for the landscape project does not exceed a factor of 0.55 for residential areas and 0.45 for non-residential areas, exclusive of special landscape areas. The ETAF for a landscape project is based on the plant factors and irrigation methods selected. The Maximum Applied Water Allowance (MAWA) is calculated based on the maximum ETAF allowed (0.55 for residential, 0.45 for non-residential) and is expressed as annual gallons required. The Estimated Total Water Use (ETWU) is calculated based on the plants used and the irrigation method selected for the landscape design. ETWU must be below the MAWA.

In calculating the MAWA and ETWU, project applicant shall use the ETo values from the Reference Evapotranspiration factor provided by the California Irrigation Management Information System (CIMIS), available online at [www.cimis.water.ca.gov](http://www.cimis.water.ca.gov).

Water budget calculations shall adhere to the following requirements:

- i. The plant factor used shall be from WUCOLS; The plant factor ranges from 0 to 0.1 for Very Low water use plants; 0.1 to 0.3 for Low water use plants; 0.4 to 0.6 for Moderate water use plants; and 0.7 to 1.0 for High water using plants.
- ii. All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.

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- iii. All special landscape areas shall be identified and their water use calculated.
  - iv. ETAF for new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0.
- 
- d. Median irrigation systems, and irrigation systems within landscape maintenance district easements maintained by the City, shall be installed with a separate electric meter and pedestal, water meter, controller and pedestal, and backflow preventer and tamper resistant enclosure.
  - e. Irrigation electric meter enclosures for City maintained irrigation systems shall Caltrans Type III-BF or approved equal.
  - f. Electric meter pedestals, controller pedestals, and backflow preventers shall be installed in flat accessible areas. Retaining walls shall not be constructed to provide the flat areas required for these facilities.
  - g. Landscape water meters, defined as either a dedicated water service meter or private submeter, shall be installed for all non-residential irrigated landscapes of 1,000 square feet, and all residential irrigated landscapes of 5,000 square feet or more.
  - h. Irrigation system within landscape maintenance district easements which are not maintained by the City shall be designed for easy isolation from on-site private irrigation systems in the event the City assumes maintenance of the irrigation and landscaping within the landscape maintenance district.
  - i. If the static pressure is above or below the required dynamic or operating pressure, then pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.
  - j. Static water pressure, dynamic or operating pressure, and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.
  - k. As addressed in Landscape Design Guidelines of the Municipal Code, plans shall address conservation of water and energy to include:
    - i. System components - low gallonage and low precipitation heads, drip systems and other sub-surface techniques, mini-jet heads, moisture sensing devices, controllers with ability of variable programming.
    - ii. Irrigation facilities within the public right-of-way and landscape maintenance district easements, including controllers and controller pedestals, electric remote control valves, spray heads, and bubblers, shall be manufactured by Hunter.
    - iii. Efficiency - velocity shall be as close as possible to 5 feet per second. Plant material with different water requirements shall be on separate valves. Slopes shall be on separate valves. System design shall eliminate overthrow and runoff.

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- I. Plans shall show:
  - i. Static P.S.I. at proposed point of connection
  - ii. Service Main - type, size and length
  - iii. Water Meter - location and size
  - iv. All locations of controller(s), pipe, valves and heads, (includes emitters, etc.), moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices.
  - v. Approved Backflow Prevention Device - location and size, with vandal-resistant enclosure mounted on a concrete pad
  
- m. Slopes required to be planted with efficient and water conserving irrigation systems (over watering should be avoided).
- n. All sprinklers shall be installed with approved swing joints
- o. All sprinklers along pathways, driveways and any other area where foot traffic occurs shall be the pop-up type, installed flushed with the soil. Irrigation heads on risers are permitted where no foot traffic will occur.
- p. Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback area may include drip, dripline, or other low-flow non-spray technology. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if the landscape area is adjacent to permeable surfacing and no runoff occurs, or the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping.
- q. Lateral irrigation pipe shall be Class 200 or better. Mainline shall be Schedule 40 or better. Irrigation sleeves to be Schedule 40 and 2 1/2 times the diameter of lateral or mainline.
- r. All irrigation lines shall be buried. Mainline at least 18" and laterals 12" deep. Browline is permitted on slopes only.
- s. Plans shall contain irrigation legends, including but not limited to identifying all system component by manufacturer, model, description, operating pressure (PSI) and precipitation rate (as applicable). Pipe sizing shall also be shown at each section of pipe, (mains and laterals).
- t. All valves shall be numbered.
- u. Slopes greater than 25% shall not be irrigated with an irrigation system with an application rate exceeding 0.75 inches per hour.

**14.3 CERTIFICATE OF COMPLETION**

The Certificate of Completion shall be prepared by the Applicant's Landscape Architect and shall contain the following items:

- a. Project information sheet with date, project name, applicant name/ telephone number/ mailing address/ email address
- b. Certification by either the signer of the landscape design plans

## **CITY OF HIGHLAND**

### **Public Works Policies, Procedures and Standards**

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- c. Where there have been significant changes made in the field during construction, the “as-builts” shall be included with the certification.
- d. Provide a diagram of the irrigation plan showing hydrozones shall be kept with the irrigation controller for subsequent management purposes.
- e. Provide irrigation scheduling parameters used to set the controller
- f. Provide Landscape and irrigation maintenance schedule; maintenance shall include (but not limited to): routine inspection, auditing, adjustment and repair of the irrigation system and its components; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, removing obstructions to emission devices.
- g. Provide Irrigation Audit report
- h. Provide Soil Analysis report

Upon City’s review of the Certificate of Completion, the City shall:

- a. Receive the signed Certificate of Completion from the project applicant
- b. Approve or deny the Certificate of Completion. If the Certificate of Completion is denied, the City shall provide information to the project applicant regarding reapplication, appeal, or other assistance.

#### **14.4 IRRIGATION AUDIT, IRRIGATION SURVEY, and IRRIGATION WATER USE ANALYSIS**

All landscape irrigation audits shall be conducted by a local agency landscape irrigation auditor or a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape.

- a. In large projects, or projects with multiple landscape installations (such as production lots in housing tracts), an auditing rate of 1 in 7 lots or approximately 15% will satisfy this requirement.
- b. For new construction and rehabilitated landscape projects, the project applicant shall submit an irrigation audit report with the Certificate of Completion to the City that may include, but is not limited to:
  - i. Inspection
  - ii. System tune-up
  - iii. System test with distribution uniformity
  - iv. Reporting overspray or runoff that causes overland flow
  - v. Soil types
  - vi. Plant factors
  - vii. Slope
  - viii. Exposure and other factors necessary for accurate programming

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**14.5 INSPECTIONS**

**1. IRRIGATION SYSTEM**

- a. Inspections shall be performed by the City's Landscape Architect at the following:
  - i. Depth of irrigation trenching, sleeving, mainline, lateral lines (prior to burial), valve installation and irrigation head assembly.
  - ii. Pressure test of irrigation mainline (150 PSI for 2 hours).
  - iii. Coverage test and final acceptance.
- b. Do not allow or cause the above items to be buried prior to inspection and approval of the City representative. A 24-hour notice shall be given prior to anticipated inspections. Contact the City's Landscape Architect (Community Works Design Group) at (951) 369-0700.
- c. The maintenance of landscape areas shall be the responsibility of the developer until all required inspections have been completed by the City of Highland and the "yellow" inspection record signed.

**2. PLANTING AND HARDSCAPE**

- a. Inspection shall be performed by the City's Landscape Architect at the following:
  - i. Upon completion of finished grade, soil preparation and final rake out.
  - ii. When trees and shrubs are spotted for planting, with one example of planting hole for trees and shrubs. Provide samples of plant fertilizer.
  - iii. Final inspection when planting and all other specified work has been completed.
- b. A 24-hour notice shall be given prior to anticipated inspections. Contact the City's Landscape Architect (Community Works Design Group) at (951) 369-0700.

**14.6 GENERAL REQUIREMENTS**

- 1. Notify the Public Works Department or Planning Division of commencement of landscaping. Give anticipated time line (start-to-finish).
- 2. All landscaping, irrigation and street trees shall be installed and maintained in accordance with the City of Highland Municipal Code, ordinances and standard requirements.
- 3. Weed Control: Pre-emergence control, post-emergence control and cultural control of weeds shall be addressed on the landscape plans submitted by the landscape architect.
- 4. Material requirements for all planting material shall be number one (1) grade of the California Nursery Industry Certificate as issued by the Agricultural Commissioner of the County of origin.

## **CITY OF HIGHLAND**

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5. Upon completion, City inspection, and sign-off by City Landscape Inspector, the Contractor shall be responsible for ninety (90) day plant establishment and maintenance period. If landscape is not acceptable, the maintenance period will be extended by the Park Projects Coordinator to insure the proper horticulture establishment.
6. All landscape material, irrigation equipment, irrigation components and workmanship shall be guaranteed for a period of not less than one (1) year from date of final approval by the City Public Works Department or his/her designee. The conditions of the guarantee will be to insure, but not limited to all plant material being in healthy condition and free from abnormal conditions which may have occurred during or after planting, such as defoliation or structure dieback.

**CITY OF HIGHLAND**  
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## **15.0 BIKEWAYS**

1. All bikeways and facilities shall be designed and constructed in accordance with the latest edition of the California Manual on Uniform Traffic Control Devices, and City of Highland Standards.
2. All land development projects shall provide for construction of bikeways at locations where bikeways are specified in the City of Highland General Plan Circulation Element.
3. Class 2 bike lanes shall include wayfinding signage.
4. Class 2 bike lanes shall include in-roadway bicycle detection systems at all signalized intersections.
5. Use 24-inch wide R81 (CA) Bike lane signs. No Parking or No Stopping Any Time signs installed in conjunction with bike lane signs shall be 24 inches wide.
6. No Parking signs shall be installed when bike lanes are eight feet or wider. No Stopping Any Time signs shall be installed when bike lanes are less than eight feet.
7. No Parking signs shall be R8-3a or R26 (CA). New No Parking signs shall be the same type as existing No Parking signs within a roadway segment unless directed otherwise by the City Engineer. Use R26 (CA) No Parking signs within roadway segments where No Parking signs do not exist.
8. No Stopping Any Time signs shall be R26(S) (CA).
9. All sign materials and installation shall be in accordance with Section 11.0 Signage.

## **16.0 ENGINEERING COST ESTIMATES**

Plan check fee amounts in accordance with Section 2 must be calculated from the same Engineering Cost Estimates for Bonding and Fee Purposes used to calculate bond amounts. (Note: Unit prices included in the Engineering Cost Estimates are subject to change periodically. It shall be the Developer's responsibility to ensure latest edition of the Engineering Department Policies, Procedures and Standards Handbook and Engineering Cost Estimates are used prior to submittals).

See pages 92 and 93 for cost estimate forms.

Engineering Cost Estimate  
for Bonding and Fee Purposes

Date: \_\_\_\_\_  
Project No.: \_\_\_\_\_  
By: \_\_\_\_\_

## STREET IMPROVEMENTS

Item	Description	Qty	Unit	Unit Price	Cost
1	SAWCUT		LF	\$1.00	
2	COLD PLANE		SF	\$0.50	
3	REMOVE CURB AND GUTTER		LF	\$7.00	
4	REMOVE AC PAVEMENT		SF	\$0.70	
5	REMOVE PCC PAVEMENT		SF	\$2.30	
6	STREET EXCAVATION		CY	\$12.00	
7	IMPORT EMBANKMENT		CY	\$17.00	
8	PCC CURB AND GUTTER - 8"CF		LF	\$20.00	
9	PCC CURB AND GUTTER - 6"CF		LF	\$20.00	
10	SUBGRADE PREPARATION		SF	\$0.35	
11	4" PCC PAVEMENT		SF	\$4.00	
12	6" PCC DRIVE APPROACH		SF	\$20.00	
13	8" PCC CROSS-GUTTER		SF	\$20.00	
14	AGGREGATE BASE		CY	\$62.00	
15	ASPHALT CONCRETE		T	\$70.00	
16	AC OVERLAY - 1" THICK		SF	\$0.60	
17	2"x 4" REDWOOD HEADER		LF	\$4.00	
18	UNDER SIDEWALK DRAIN		EA	\$3,000.00	
19	STREET SIGN		EA	\$269.00	
20	REFLECTOR/POST		EA	\$149.00	
21	ADJUST SEWER MANHOLE TO GRADE		EA	\$464.00	
22	ADJUST SEWER CLEANOUT TO GRADE		EA	\$254.00	
23	ADJUST WATER VALVE TO GRADE		EA	\$120.00	
24	PAVEMENT STRIPING		LF	\$2.00	
25	PAVEMENT MARKING - SYMBOL		EA	\$250.00	
26	PAVEMENT MARKING - WORD		EA	\$500.00	
27	STREET LIGHT		EA	\$1,500.00	
28	TRAFFIC SIGNAL (PER CORNER)		EA	\$50,000.00	

Subtotal: \_\_\_\_\_

10% Contingency: \_\_\_\_\_

Estimate for fee purposes: \_\_\_\_\_

25% Market Conditions: \_\_\_\_\_

10% Admin and inspection: \_\_\_\_\_

Total for Bonding Purposes: \_\_\_\_\_

Approved By: \_\_\_\_\_

Date: \_\_\_\_\_

(Engineer of Record)



## **17.0 SUBDIVISION AGREEMENT AND BONDS**

The City will prepare the bonds and agreement for execution.

The executed bonds and agreement must be submitted to the City 15 calendar days prior to the City Council meeting at which approval of the map is requested.

Bond amounts must be calculated by the developer's engineer using the City's Engineering Cost Estimate Form (and unit prices) and construction quantities in accordance with the improvement plans.

Bond amounts are:

- 100% for the Faithful Performance Bond
- 50% for the Labor and Material Bond
- 30% for the Grading Bond
- 25% for the Warranty Bond.

Faithful Performance Bonds are required for street and storm drain, landscape maintenance district, and grading improvements.

Labor and Material Bonds and Warranty Bonds are required for street and storm drain, and landscape maintenance district improvements.

The Warranty Bond can be submitted when the proposed work has been faithfully performed and accepted as complete by the City, and prior to release of Faithful Performance Bond.

## **18.0 INSURANCE**

### **18.1 Certificate of Insurance Procedures**

1. General and Auto Liability, and Workers' Compensation Insurance shall be a minimum of \$1 million coverage.
2. City of Highland shall be added as certificate holder and as additionally insured. See attached sample endorsement for proper acceptable wording. Also, please note this endorsement page will be attached to all certificates and must have an original authorized representative signature.
3. The "Cancellation" section of the insurance certificate shall be revised to read *"Should any of the above described policies be cancelled before the expiration date thereof, the issuing company **will** mail 30-day written notice to the certificate holder named"*.
4. City of Highland's Risk Manager will review all certificates of insurance; therefore, please allow at least two working days for issuance of any construction/grading permits.
5. The certificates shall be submitted to City of Highland, Engineering Department, 27215 Base Line, Highland, CA 92346.

# CERTIFICATE OF LIABILITY INSURANCE

Issue Date (mm/dd/yyyy) \_\_\_\_/\_\_\_\_/\_\_\_\_

Producer: "SAMPLE ONLY" This Certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policies below.

Companies Affording Insurance	NAIC
Insurer A:	
Insurer B:	
Insurer C:	
Insurer D:	
Insurer E:	

## COVERAGES

This is to certify that the policies of insurance listed below have been issued to the insured named above for the policy period indicated, not withstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain. The insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies. Limits shown may have been reduced by paid claims.

INSR LTR	Type of Insurance	Policy Number	Policy Effective Date (mm/dd/yyyy)	Policy Effective Date (mm/dd/yyyy)	Limits	
	<b>GENERAL LIABILITY</b> <input type="checkbox"/> Commercial General Liability <input type="checkbox"/> Claim <input type="checkbox"/> Occur General Aggregate Limit Applies <input type="checkbox"/> Policy <input type="checkbox"/> Proj. <input type="checkbox"/> Loc.				Each Occurrence	\$1,000,000
					Fire Damage (Any One Fire)	\$
					Med.Exp. (Any One Person)	\$
					Personal & ADV. Injury	\$
					General Aggregate	\$
					Products-Comp/Op	\$
	<b>AUTOMOBILE LIABILITY</b> <input type="checkbox"/> Any Auto <input type="checkbox"/> All Owned Autos <input type="checkbox"/> Scheduled Autos <input type="checkbox"/> Hired Autos <input type="checkbox"/> Non-Hired Autos <input type="checkbox"/>				Combined Single Limit (Each Accident)	\$1,000,000
					Bodily Injury (Per Person)	\$
					Bodily Injury (Per Accident)	\$
					Property Damage (Per Accident)	\$
	<b>GARAGE LIABILITY</b> <input type="checkbox"/> Any Auto <input type="checkbox"/>				Auto Only (ea. Acc.)	\$
					Other Than Auto Only (Ea.Acc.)	\$
					Other Than Auto Only (Aggregate)	\$
	<b>EXCESS/UMBRELLA LIABILITY</b> <input type="checkbox"/> Occur <input type="checkbox"/> Claims Made <input type="checkbox"/> Deductible <input type="checkbox"/> Retention \$				Each Occurrence	\$1,000,000
					Aggregate	\$
						\$
						\$
	<b>WORKER'S COMPENSATION EMPLOYER'S LIABILITY</b> Any Proprietor/Partner/Executive Officer/Member Excluded? <input type="checkbox"/> YES <input type="checkbox"/> NO If Yes, describe under special provisions below.				<input type="checkbox"/> WC Statutory Limits <input type="checkbox"/> Other	\$
					E. L. Each Acc.	\$1,000,000
					E.L Disease- Ea. Employee	\$
					E.L. Disease- Policy Limit	\$
	<b>OTHER</b>					

### DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS

See Attached Endorsements

### CERTIFICATE HOLDER

City of Highland, Engineering Department  
27215 Base Line, Highland, CA 92346

Should any of the above described policies be cancelled before the expiration date thereof, the issuing insurer will mail 30 days written notice to the certificate holder to the left.

Authorized Representative: \_\_\_\_\_

**SAMPLE ATTACHMENT  
EXHIBIT 1-B**

Policy Number: \_\_\_\_\_ (Commercial General Liability)

**THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY**

**ADDITIONAL INSURED – STATE OR POLITICAL SUBDIVISIONS - PERMITS**

This endorsement modifies insurance provided under the following:

**COMMERCIAL GENERAL LIABILITY COVERAGE PART**

**SCHEDULE**

**State or Political Subdivision**

**City of Highland and their Officers, Officials, Agents, Employees, and Volunteers**

Engineering Department  
27215 Base Line  
Highland, CA 92346

(If no entry appears above, information required to complete this endorsement will be shown in the declarations as applicable to this endorsement)

Location and Operations:

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(Section II)

WHO IS AN INSURED is amended to include as an insured any state or political subdivision shown in the schedule, subject to the following provisions:

4. This insurance applies only with respect operations performed by you or on your behalf at the location designated and described in the schedule of this endorsement for which the state or political subdivision has issued a permit.
5. This insurance does not apply to:
  - a) "Bodily Injury", "property damage", "or personal and advertising injury" arising out of operations performed by the state or municipality.
  - b) "Bodily Injury", "property damage" included with the "products-completed operations hazard".

It is further agreed that such insurance as is afforded by this policy for the benefit of the Additional Insured shown in the schedule above shall be primary insurance as respects any claim, loss or liability arising out of the Named Insured's operations and any other insurance maintained by the Additional Insured shall be in excess and non-contributory with th insurance provided hereunder.

(x) \_\_\_\_\_  
Signature – Authorized Representative

\_\_\_\_\_  
Date

## 19.0 STANDARD DRAWINGS

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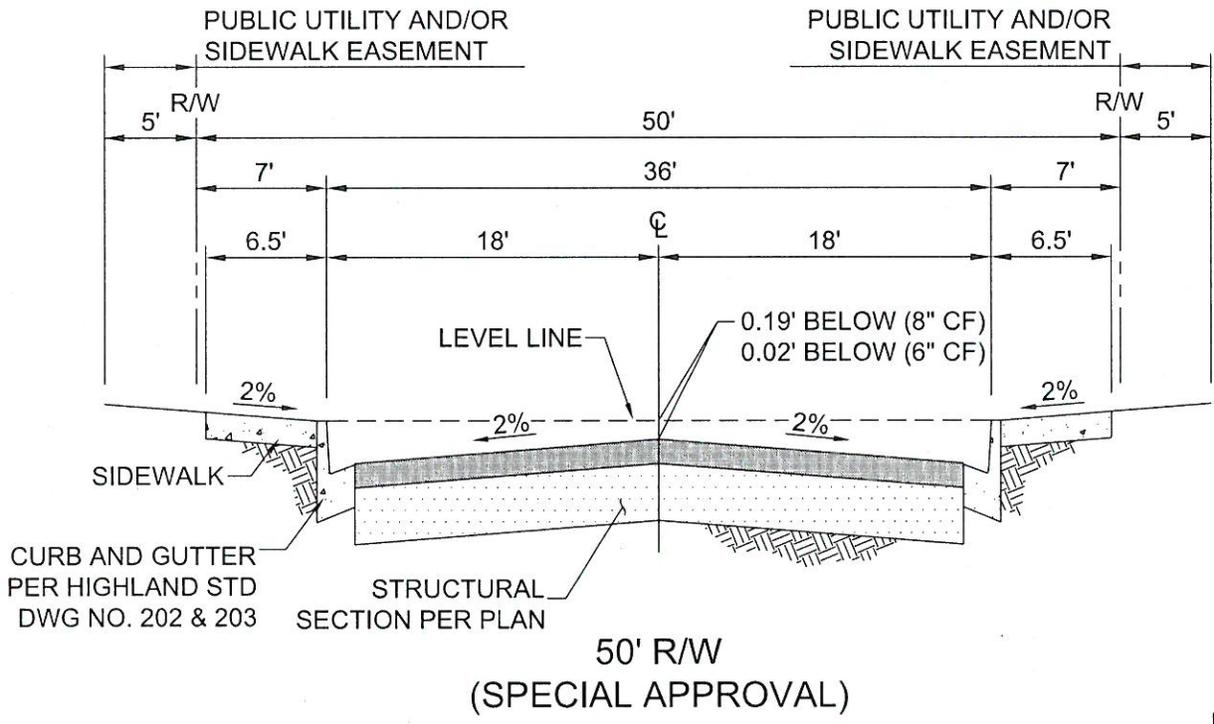
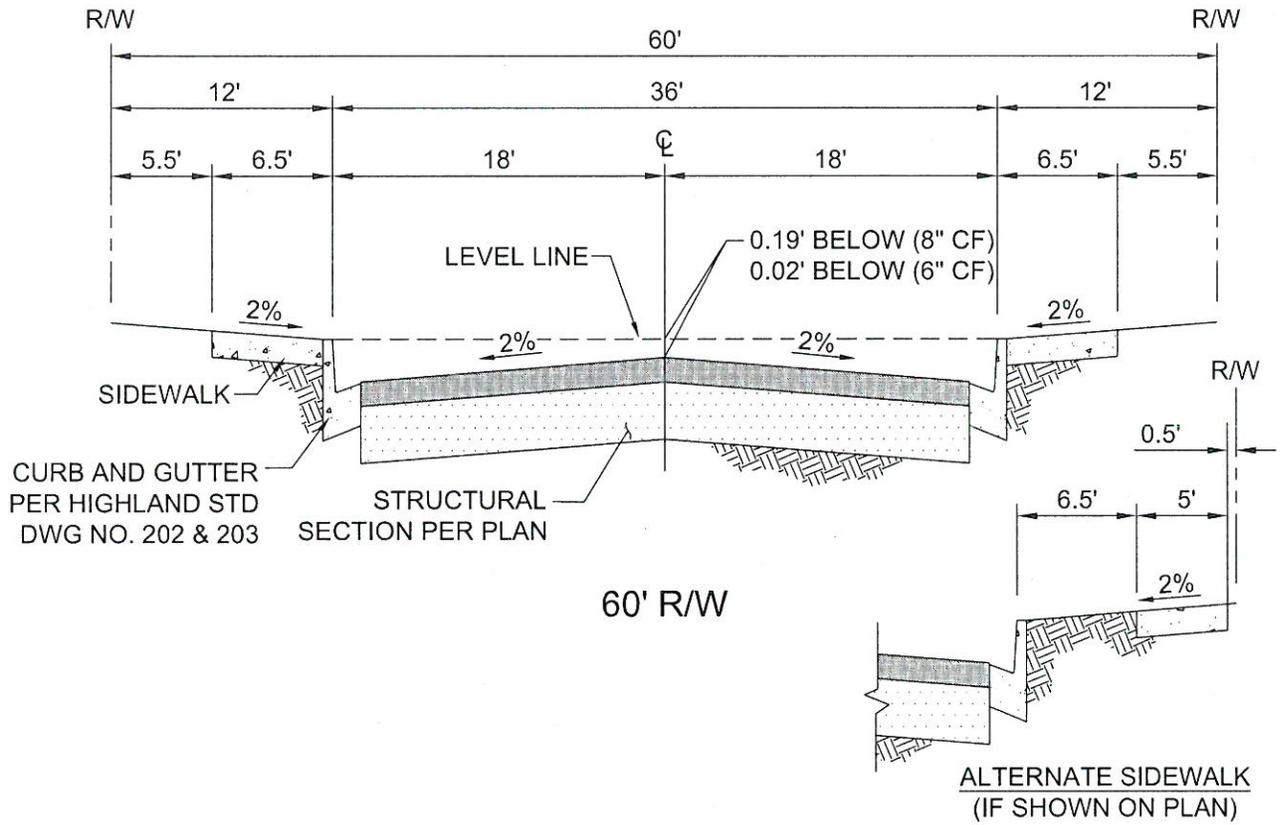
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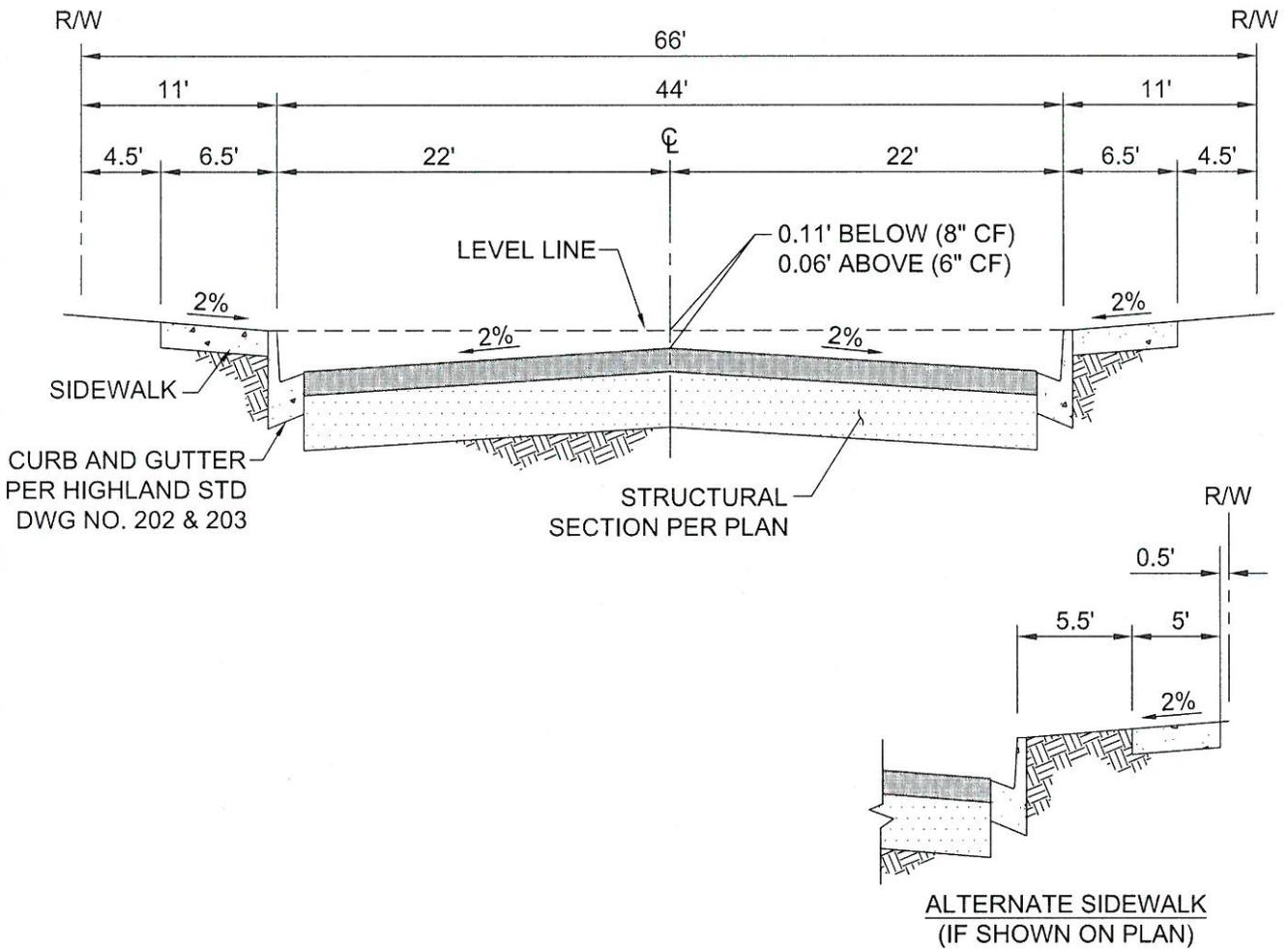
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N.T.S

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>LOCAL STREET TYPICAL SECTION</b>	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer					



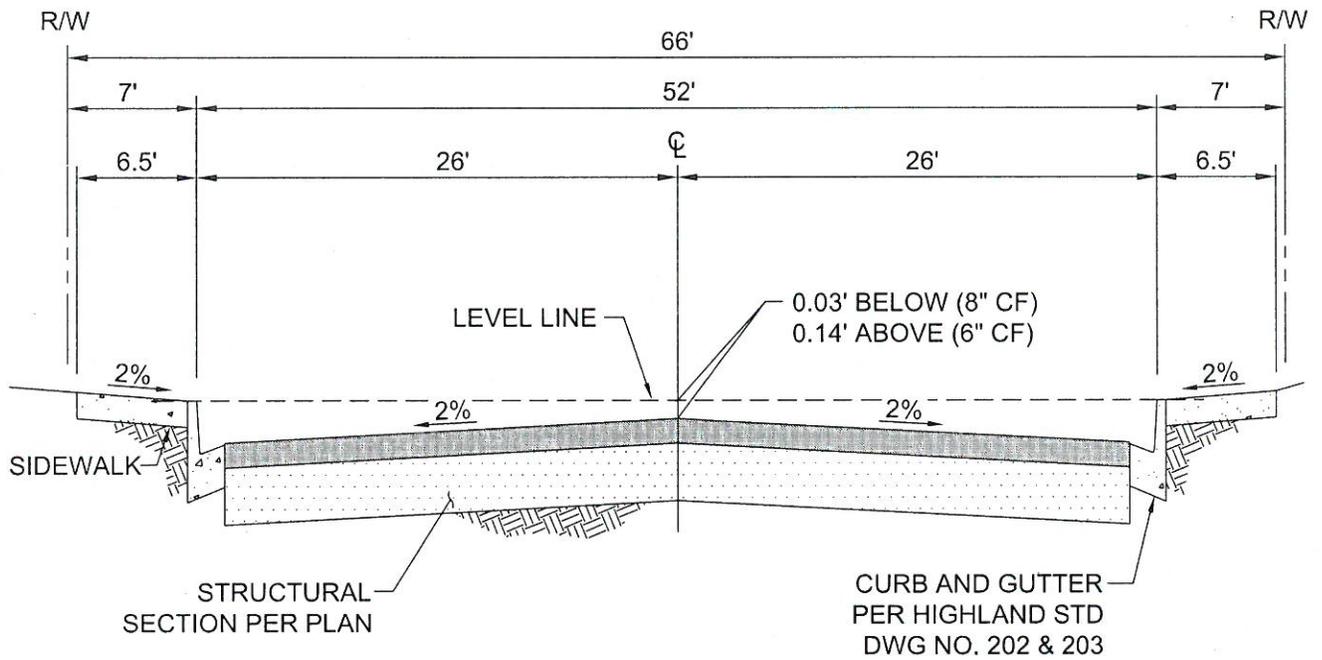
CURB AND GUTTER  
PER HIGHLAND STD  
DWG NO. 202 & 203

STRUCTURAL  
SECTION PER PLAN

ALTERNATE SIDEWALK  
(IF SHOWN ON PLAN)

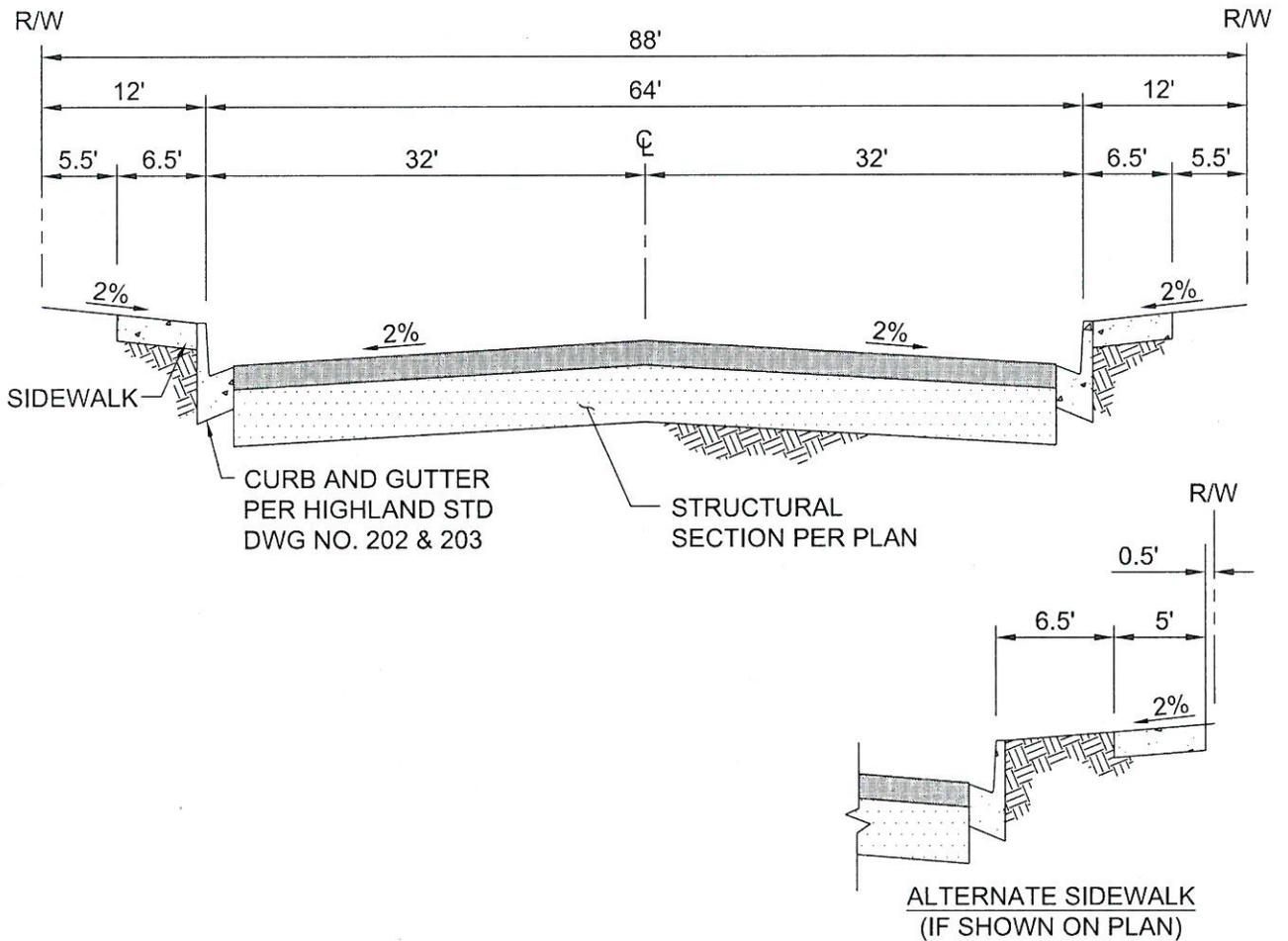
N.T.S

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>COLLECTOR STREET TYPICAL SECTION</b>	
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					



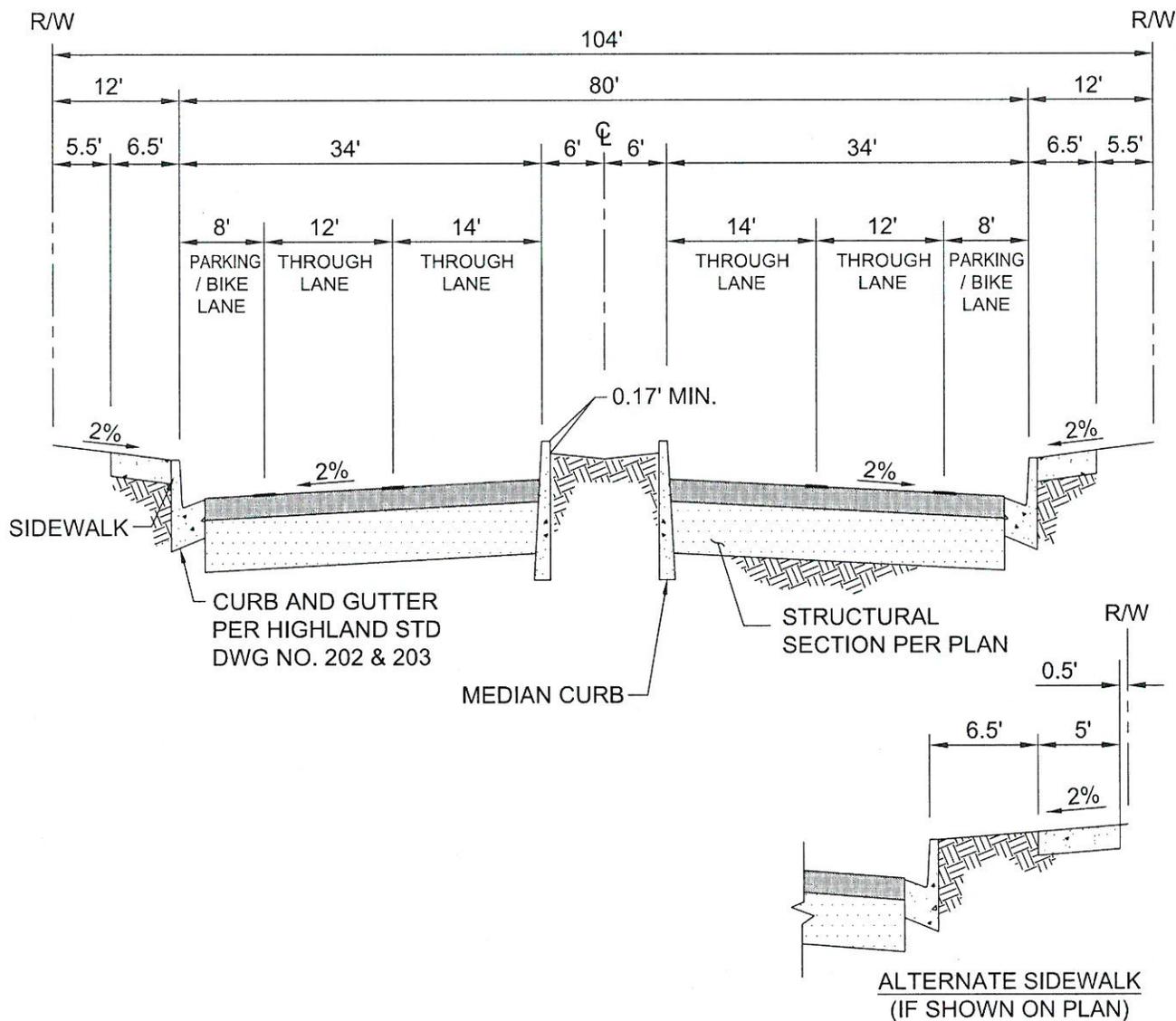
N.T.S

				<b>CITY OF HIGHLAND</b>			
Mark	Revision	By	Date	<b>SPECIAL COLLECTOR STREET TYPICAL SECTION</b>		Standard Drawing No. <b>103</b>	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer							



N.T.S

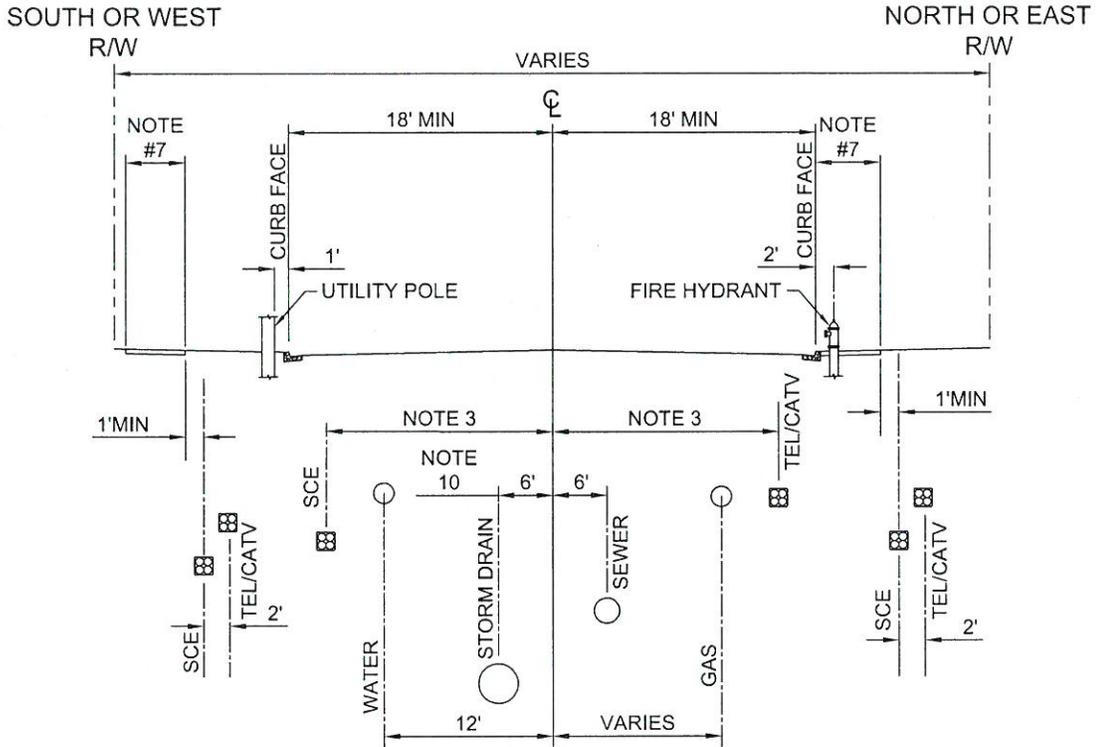
				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>SECONDARY HIGHWAY TYPICAL SECTION</b>	
Approved: <i>Ernest Wong</i> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					



**NOTE:**  
 DRAINAGE FACILITIES SHALL BE PROVIDED IF STORM DRAIN IS AVAILABLE TO DEWATER RAISED MEDIAN.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: 9-6-16	
Ernest Wong, Public Works Director/City Engineer		MAJOR HIGHWAY TYPICAL SECTION	
			Standard Drawing No. <b>105</b>



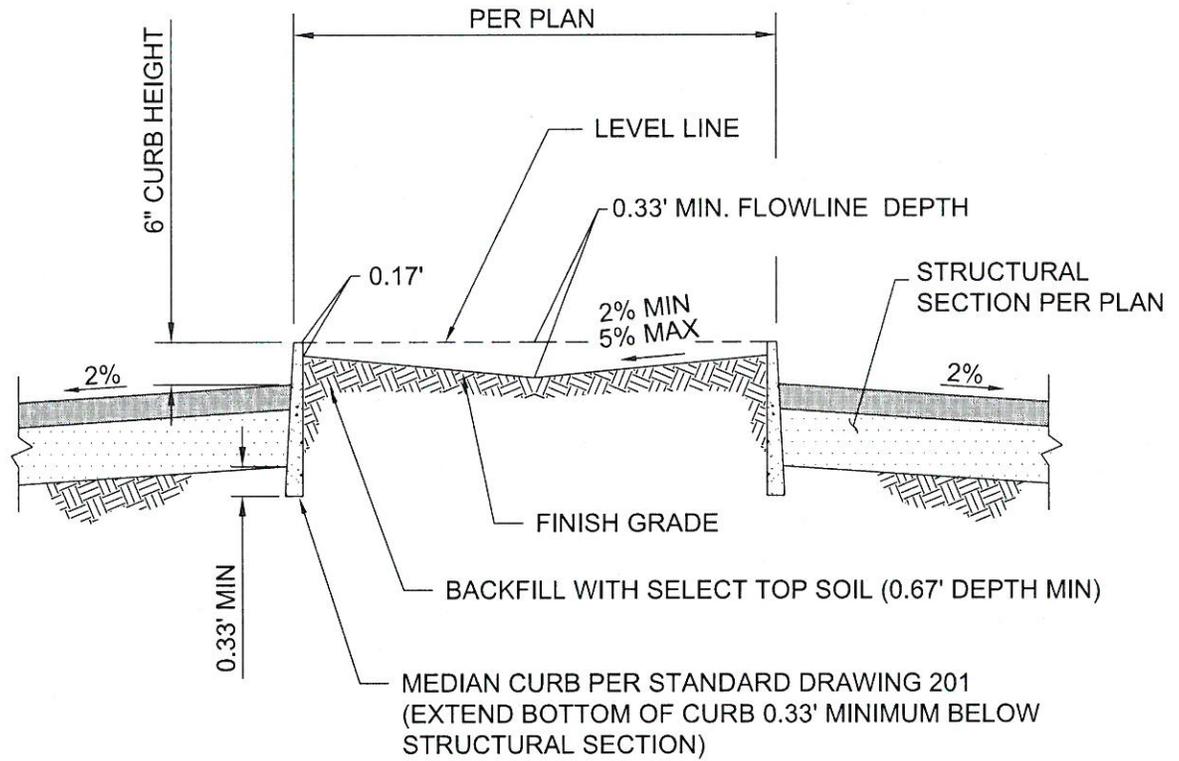
RECOMMENDED CONSTRUCTION ORDER	MINIMUM DEPTH OF COVER
1 STORM DRAIN	VARIES
2 SEWER	84"
3 SCE	48"
4 TEL/CATV	30"
5 CURB AND GUTTER	-
6 WATER	42"
7 GAS	36"
8 PAVING	-

**NOTES:**

- WHERE ULTIMATE STREET IMPROVEMENTS ARE TO BE CONSTRUCTED, MINIMUM COVER OF THE UTILITY LINES MAY BE VARIED TO FACILITATE INSTALLATION.
- THE UTILITY COMPANIES SHALL MAKE EVERY EFFORT TO LOCATE THEIR FACILITIES IN THE RECOMMENDED LOCATIONS, PARTICULARLY IN NEW SUBDIVISIONS.
- SCE, TELEPHONE & CATV UTILITIES MAY USE A COMMON TRENCH. ALTERNATIVE LOCATION MAY BE EITHER THE EDISON POSITION OR THE TELEPHONE POSITION, VARYING BETWEEN 3' FROM THE CURB FACE TO 15' FROM THE CENTERLINE.
- SURFACE OF VAULT OR MANHOLE MUST MATCH PAVEMENT OR PARKWAY GRADES.
- REPAIR OF TRENCHES AND REPLACEMENT OF PAVED SURFACING IN EXISTING CITY STREETS SHALL BE IN ACCORDANCE WITH CITY OF HIGHLAND STANDARD DRAWING No. 220A.
- WHENEVER POSSIBLE, MANHOLE COVERS SHALL NOT BE PLACED WITHIN THE SIDEWALK.
- SIDEWALK LOCATION AND WIDTH VARIES PER PLAN AND STANDARD DRAWING No. 208.
- STANDARD SEWER LINE LOCATION IS 6' EAST OR NORTH OF CENTERLINE OF STREET.
- STANDARD WATER LINE LOCATION IS 12' WEST OR SOUTH OF STREET CENTERLINE.
- STANDARD STORM DRAIN LOCATION IS 6' WEST OR SOUTH OF STREET CENTERLINE. STORM DRAIN MUST KEEP PROPER CLEARANCE FROM WATER LINE IN ACCORDANCE WITH DEPARTMENT OF HEALTH SERVICES GUIDANCE CRITERIA FOR THE SEPARATION OF WATER MAINS AND NON-POTABLE PIPELINES.

N.T.S

<b>CITY OF HIGHLAND</b>			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>7-6-16</i>	
RECOMMENDED UTILITY LOCATION			Standard Drawing No.  108
Ernest Wong, Public Works Director/City Engineer			

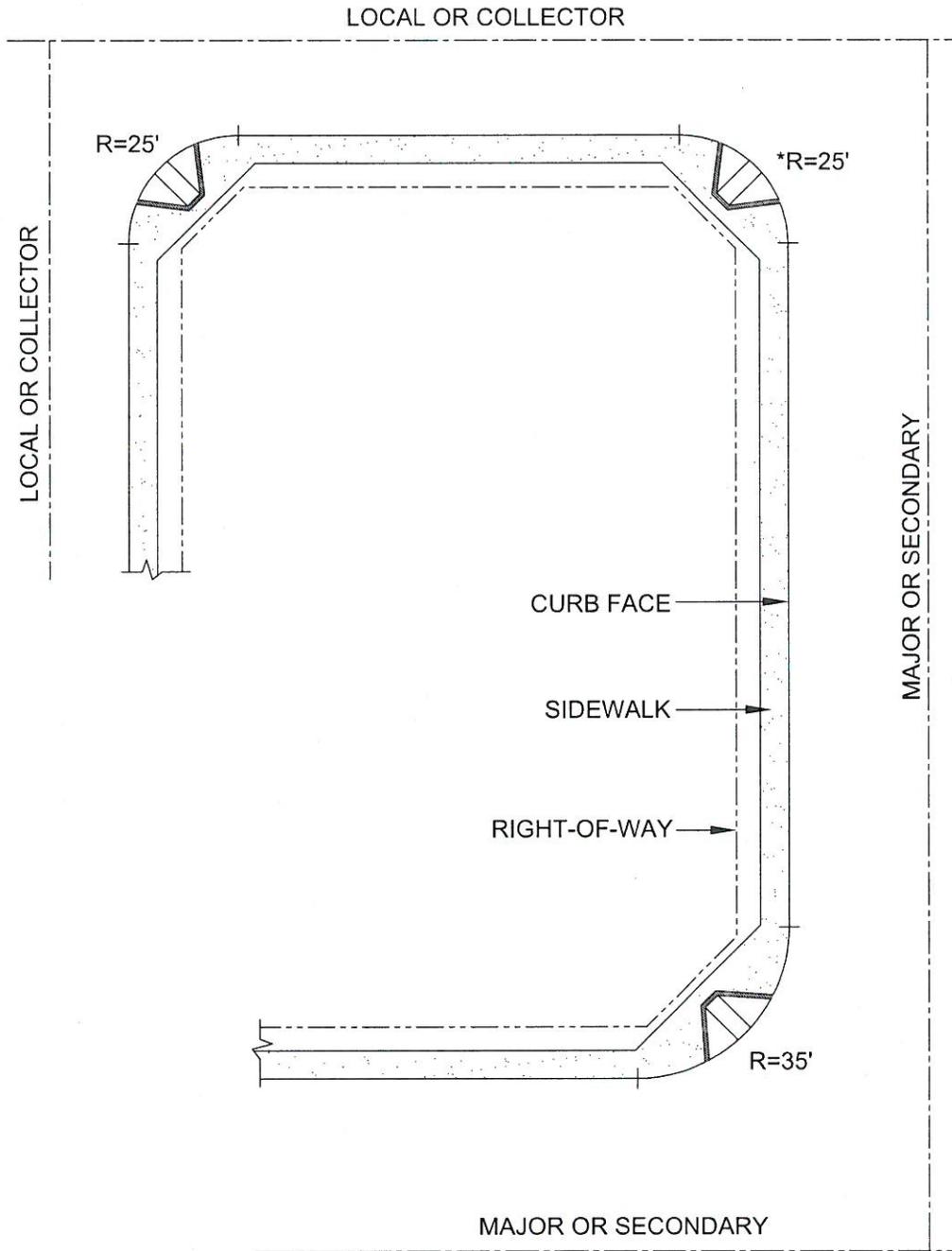


**NOTES:**

1. DRAINAGE FACILITIES SHALL BE PROVIDED TO DEWATER RAISED MEDIAN.
2. EARTHEN MOUNDING SHALL BE RESTRICTED AS REQUIRED FOR LINE OF SITE
3. LINE OF SIGHT EXHIBIT REQUIRED DURING LANDSCAPING DESIGN REVIEW.

N.T.S.

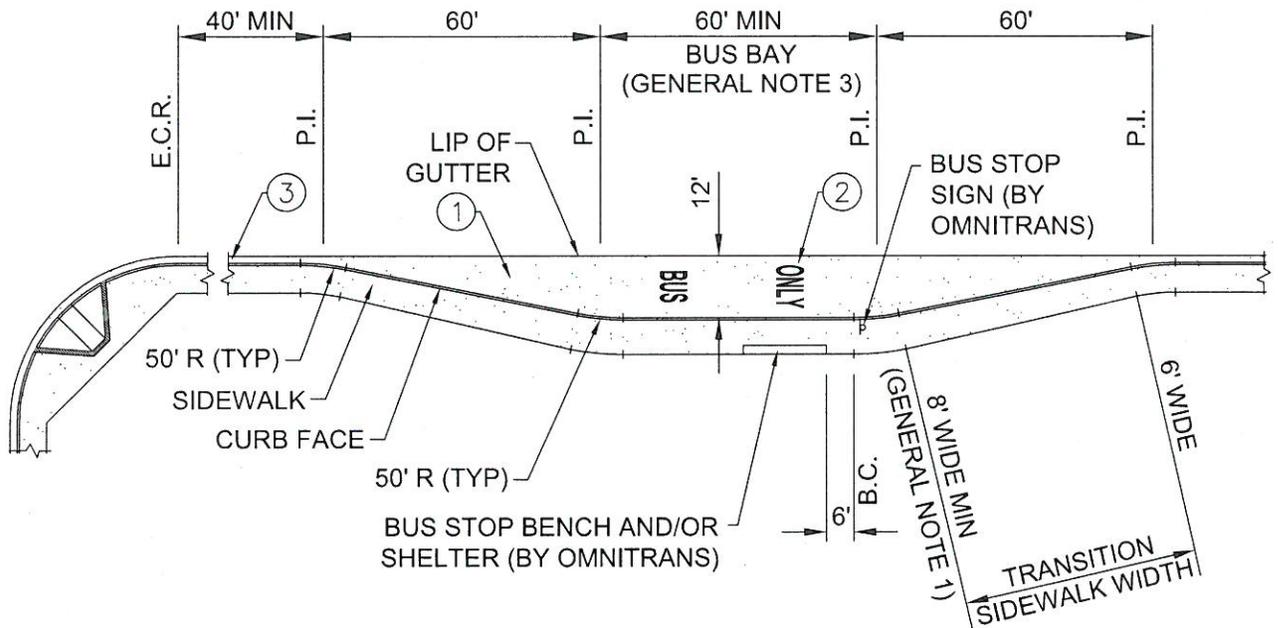
<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer			Date: <i>9-6-16</i>
MEDIAN TREATMENT			Standard Drawing No. <b>107</b>



\* A 35' RADIUS CURB RETURN MAY BE UTILIZED TO PROVIDE TRUCK ACCESS TO COMMERCIAL PROJECTS, AS APPROVED BY THE CITY ENGINEER.

N.T.S

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer		Date: 9-6-16	Standard Drawing No. 109
CURB RETURN AND RIGHT-OF-WAY CUT-OFF			



**CONSTRUCTION NOTES:**

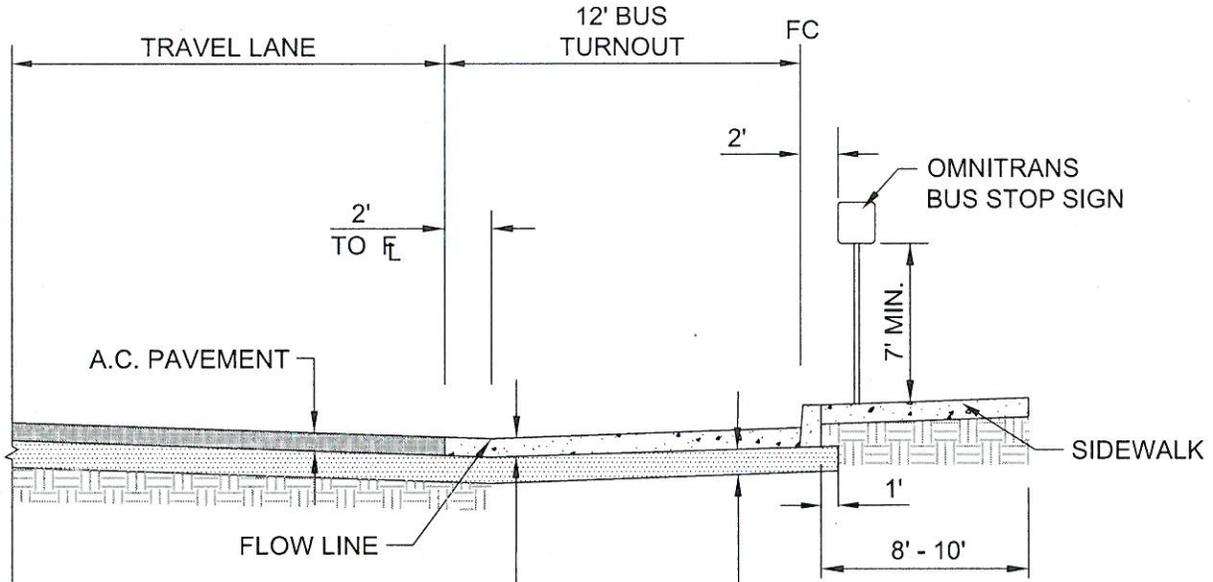
- ① 12' WIDE BUS PAD - 3000 PSI PCC - 0.75' THICKNESS WITHOUT REBAR OR 0.67' THICKNESS WITH #3 REBAR @ 18" OC
- ② PAVEMENT MARKINGS "BUS" "ONLY" PER CALTRANS STANDARD A20E
- ③ PAINT CURB RED AND POST "NO PARKING" FOR A DISTANCE OF 40' MINIMUM AHEAD OF BUS BAY.

**GENERAL NOTES:**

- 1. BUS STOPS SHALL PROVIDE FOR FRONT AND REAR DOOR WHEELCHAIR LOADING IN CONFORMANCE WITH OMNITRANS STANDARDS (LATEST EDITION).
- 2. BUS STOP SIGN, SHELTER AND/OR BENCH (BY OMNITRANS).
- 3. BAY LENGTH SHALL BE EXTENDED TO 140' WHERE MULTI-BERTH ACCOMMODATIONS ARE REQUIRED.

N.T.S.

△				<b>CITY OF HIGHLAND</b>
Mark	Revision	By	Date	<b>BUS BAY AT INTERSECTION</b>
Approved: <i>Ernest Wong</i> Date: <i>7-6-16</i> Ernest Wong, Public Works Director/City Engineer				Standard Drawing No. <b>110A</b>

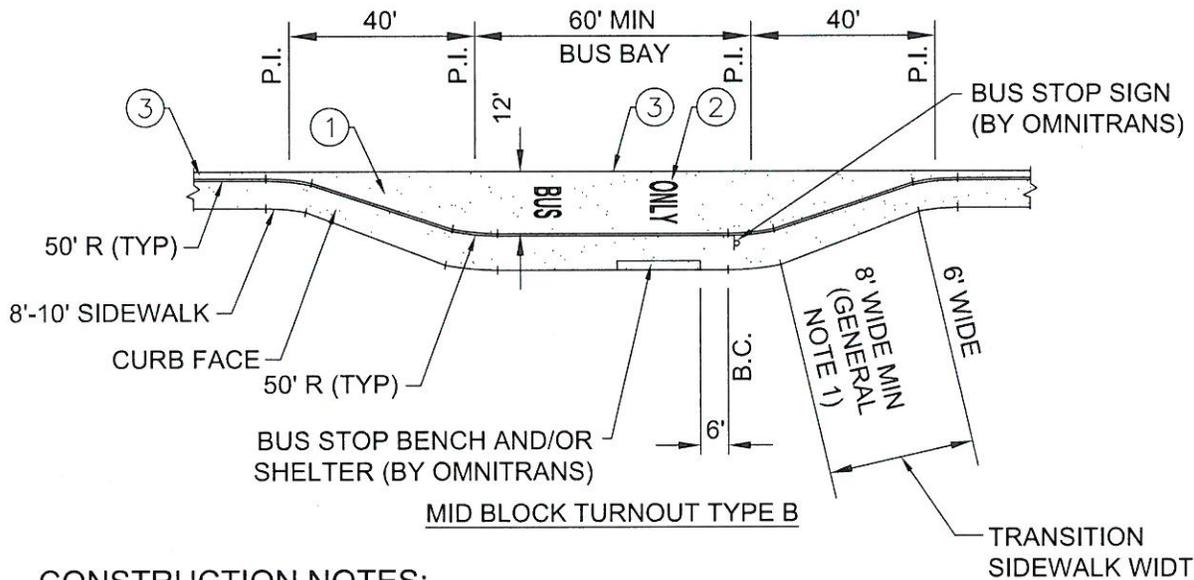
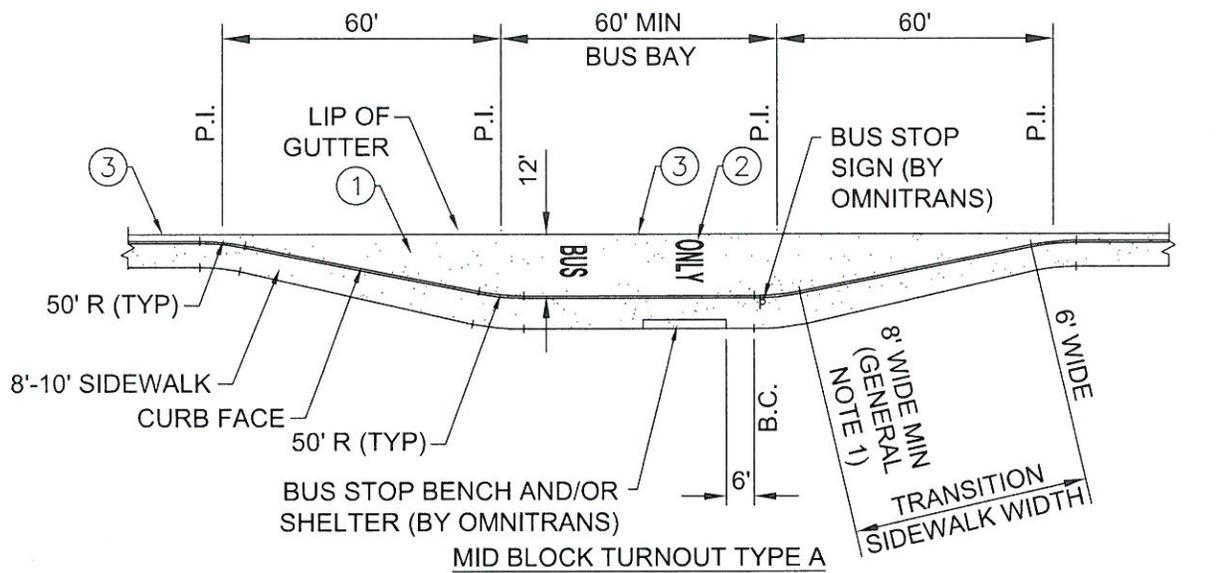


12' WIDE BUS PAD - 3000 PSI P.C.C. PAVEMENT, 0.75' DEEP WITHOUT REBAR, OR 0.67' DEEP WITH #3 REBAR @ 18" ON CENTER.

6" TO 10" AGGREGATE BASE DEPENDING ON LOCAL SOIL CONDITIONS (COMPACT SUB-GRADE TO 95% RELATIVE DENSITY).

N.T.S

CITY OF HIGHLAND			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: 9-6-16	
Ernest Wong, Public Works Director/City Engineer		BUS BAY TYPICAL SECTION	Standard Drawing No.  110C



**CONSTRUCTION NOTES:**

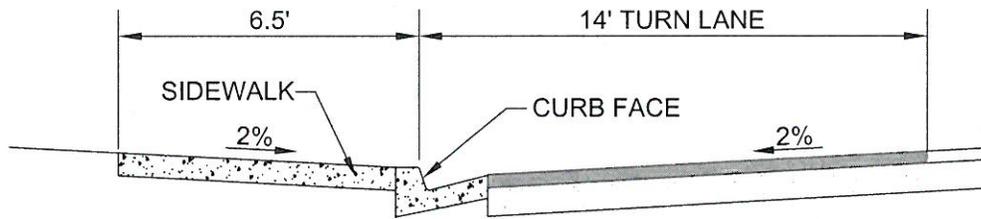
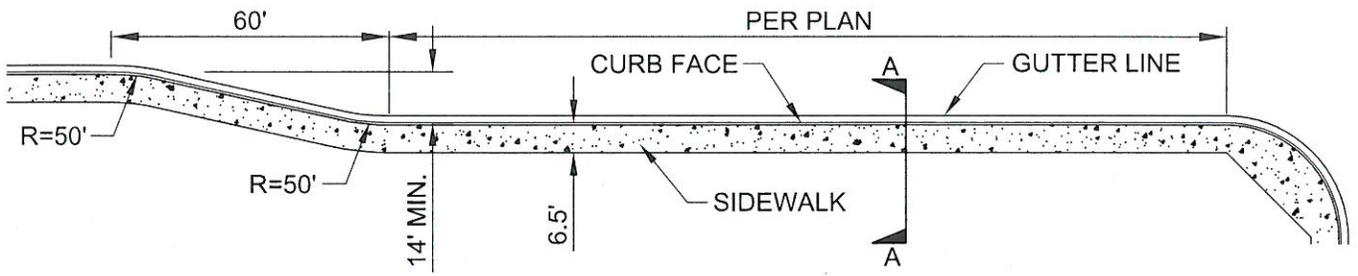
- ① 12' WIDE BUS PAD - 3000 PSI PCC - 0.75' THICKNESS WITHOUT REBAR OR 0.67' THICKNESS WITH #3 REBAR @ 18" OC.
- ② PAVEMENT MARKINGS "BUS" "ONLY" PER CALTRANS STANDARD A20E (OPTIONAL).
- ③ PER CALTRANS STANDARD PLAN A20D, DETAIL 38A (OPTIONAL).

**GENERAL NOTES:**

1. BUS STOPS SHALL PROVIDE FOR FRONT AND REAR DOOR WHEELCHAIR LOADING IN CONFORMANCE WITH OMNITRANS STANDARDS (LATEST EDITION).
2. BUS STOP SIGN, SHELTER AND/OR BENCH (BY OMNITRANS).
3. BAY LENGTH SHALL BE EXTENDED TO 140' WHERE MULTI-BERTH ACCOMMODATIONS ARE REQUIRED.

N.T.S

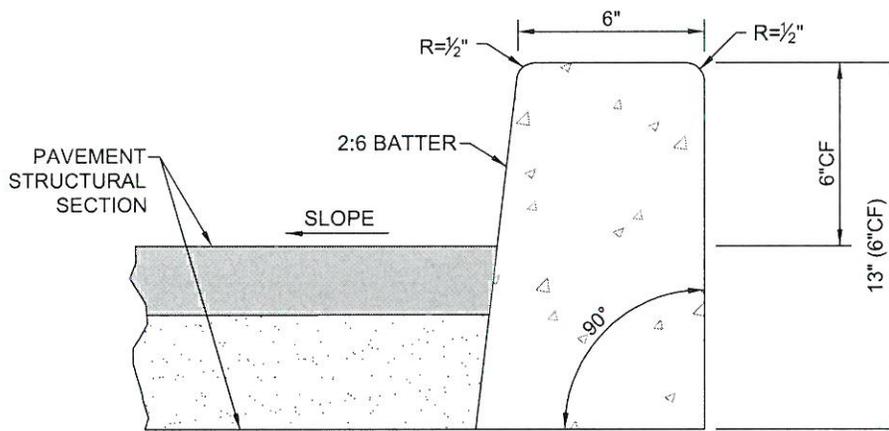
△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>BUS BAY MID-BLOCK</b>	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer					



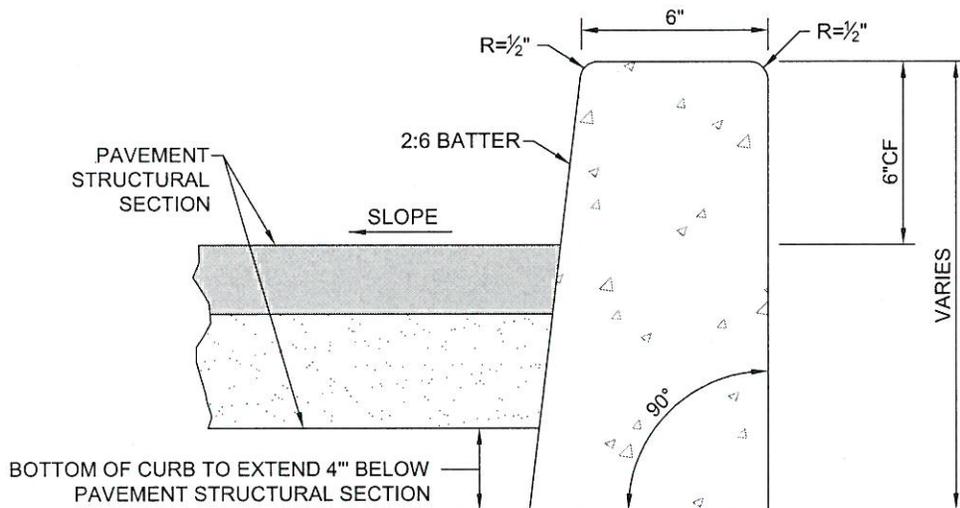
SECTION A-A

N.T.S

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: 9-6-16	
Ernest Wong, Public Works Director/City Engineer		RIGHT TURN LANE	Standard Drawing No.  111



**TYPE "A"**



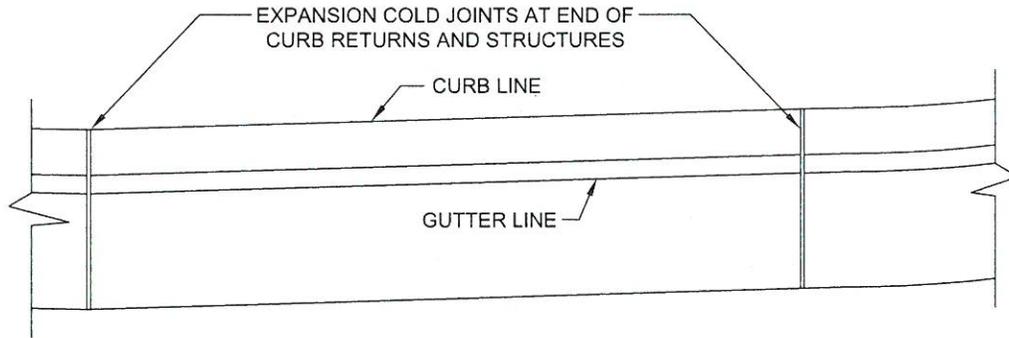
**TYPE "B"**  
**LANDSCAPED MEDIAN CURB**

**NOTES:**

1. CURB SHALL BE CONSTRUCTED MONOLITHICALLY OF CLASS "B" (520-C-2500) CONCRETE.
2. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 10' INTERVALS, EXCEPT THAT THE INTERVAL SHALL BE VARIED TO ALLOW MATCHING OF JOINTS IN ADJACENT EXISTING IMPROVEMENTS.
3. CURING COMPOUND SHALL BE SPRAYED UNIFORMLY ON EXPOSED SURFACES.
4. WHEN CURB IS PLACED BY AN EXTRUSION MACHINE MINOR FINISHING MAY BE DONE TO PROVIDE AN ACCEPTABLE FINISH AND THE WEAKENED PLANE JOINTS MAY BE SAWCUT.

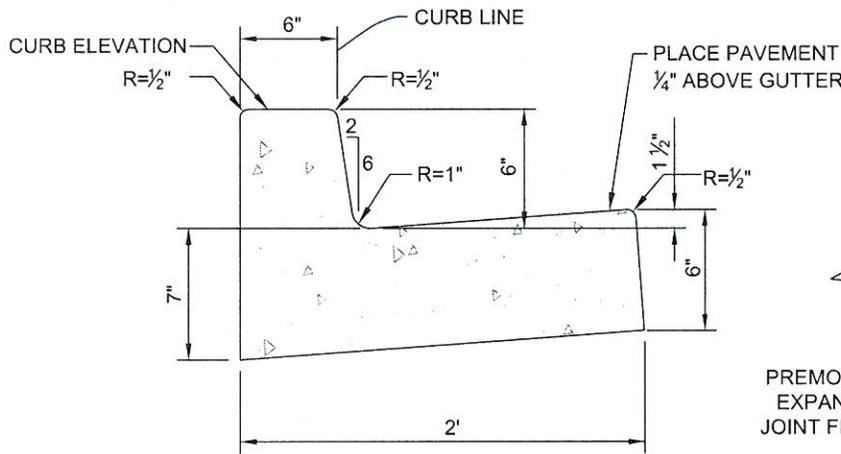
N.T.S.

△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>6" CURB</b>	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer					

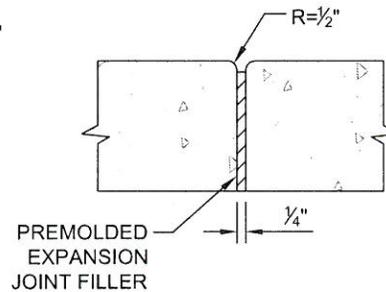


PLAN

0.0494 CUBIC YARDS PER LINEAL FOOT.  
20.3 LINEAL FEET PER CUBIC YARD



SECTION



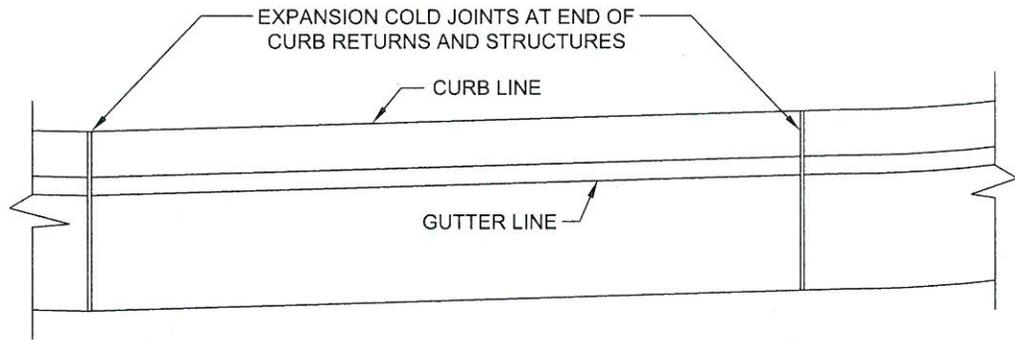
EXPANSION JOINT

**NOTES:**

1. CURB AND GUTTER SHALL BE CONSTRUCTED MONOLITHICALLY OF CLASS "B" (520-C-2500) CONCRETE.
2. WIDTHS OF STANDARD STREET SECTIONS SHOWN ON PLANS ARE TO CURB LINE UNLESS OTHERWISE INDICATED.
3. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 10' INTERVALS, EXCEPT THAT THE INTERVAL SHALL BE VARIED TO ALLOW MATCHING OF JOINTS IN ADJACENT EXISTING IMPROVEMENTS.
4. CURING COMPOUND SHALL BE SPRAYED UNIFORMLY ON EXPOSED SURFACES.
5. WHEN CURB IS PLACED BY AN EXTRUSION MACHINE MINOR FINISHING MAY BE DONE TO PROVIDE AN ACCEPTABLE FINISH AND THE WEAKENED PLANE JOINTS MAY BE SAWCUT.
6. 4" WIDE STEEL TROWEL AT GUTTER FLOWLINE.

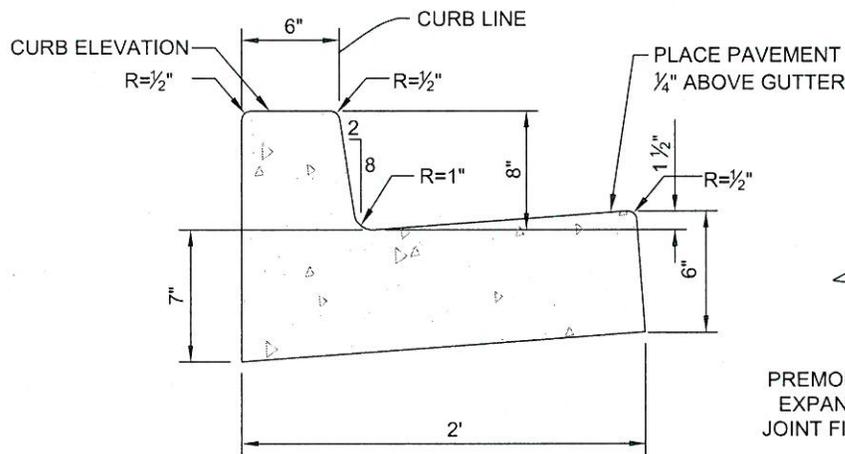
N.T.S

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>202</b>
Mark	Revision	By	Date	
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				<b>6" CURB AND GUTTER</b>

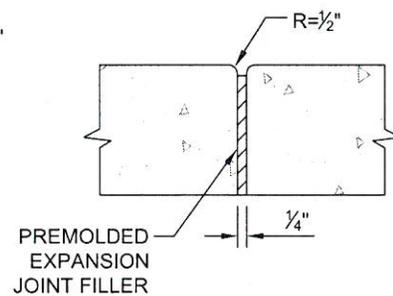


PLAN

0.0520 CUBIC YARDS PER LINEAL FOOT.  
19.2 LINEAL FEET PER CUBIC YARD



SECTION



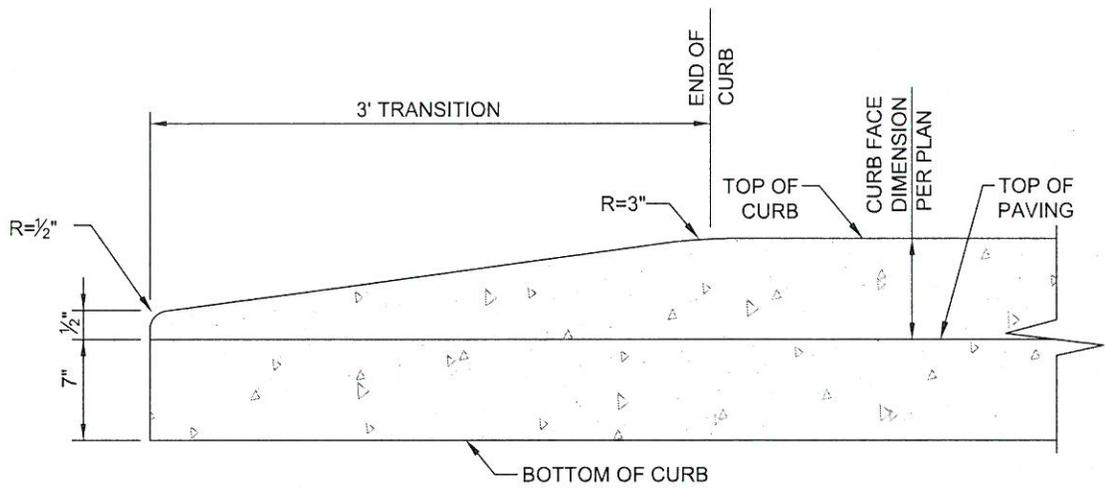
EXPANSION JOINT

**NOTES:**

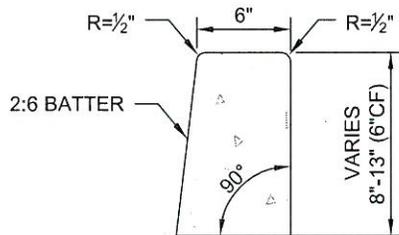
1. CURB AND GUTTER SHALL BE CONSTRUCTED MONOLITHICALLY OF CLASS "B" (520-C-2500) CONCRETE.
2. WIDTHS OF STANDARD STREET SECTIONS SHOWN ON PLANS ARE TO CURB LINE UNLESS OTHERWISE INDICATED.
3. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 10' INTERVALS, EXCEPT THAT THE INTERVAL SHALL BE VARIED TO ALLOW MATCHING OF JOINTS IN ADJACENT EXISTING IMPROVEMENTS.
4. CURING COMPOUND SHALL BE SPRAYED UNIFORMLY ON EXPOSED SURFACES.
5. WHEN CURB IS PLACED BY AN EXTRUSION MACHINE MINOR FINISHING MAY BE DONE TO PROVIDE AN ACCEPTABLE FINISH AND THE WEAKENED PLANE JOINTS MAY BE SAWCUT.
6. 4" WIDE STEEL TROWEL AT GUTTER FLOWLINE.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer		Date: <i>9-6-16</i>	Standard Drawing No. <b>203</b>
<b>8" CURB AND GUTTER</b>			



CURB TRANSITION



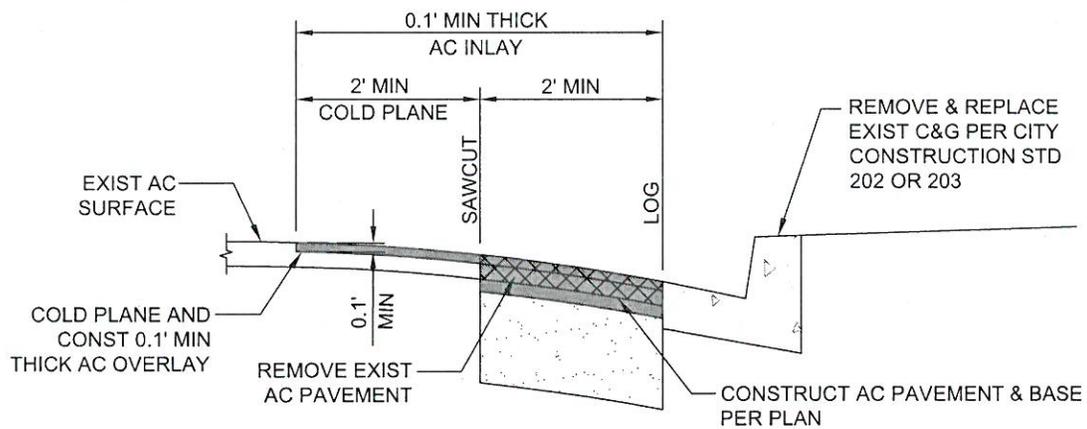
SECTION

**NOTES:**

1. CURB SHALL BE CONSTRUCTED MONOLITHICALLY OF CLASS "B" (520-C-2500) CONCRETE.
2. CURING COMPOUND SHALL BE SPRAYED UNIFORMLY ON EXPOSED SURFACES.
3. WHEN CURB IS PLACED BY AN EXTRUSION MACHINE MINOR FINISHING MAY BE DONE TO PROVIDE AN ACCEPTABLE FINISH AND THE WEAKENED PLANE JOINTS MAY BE SAWCUT.

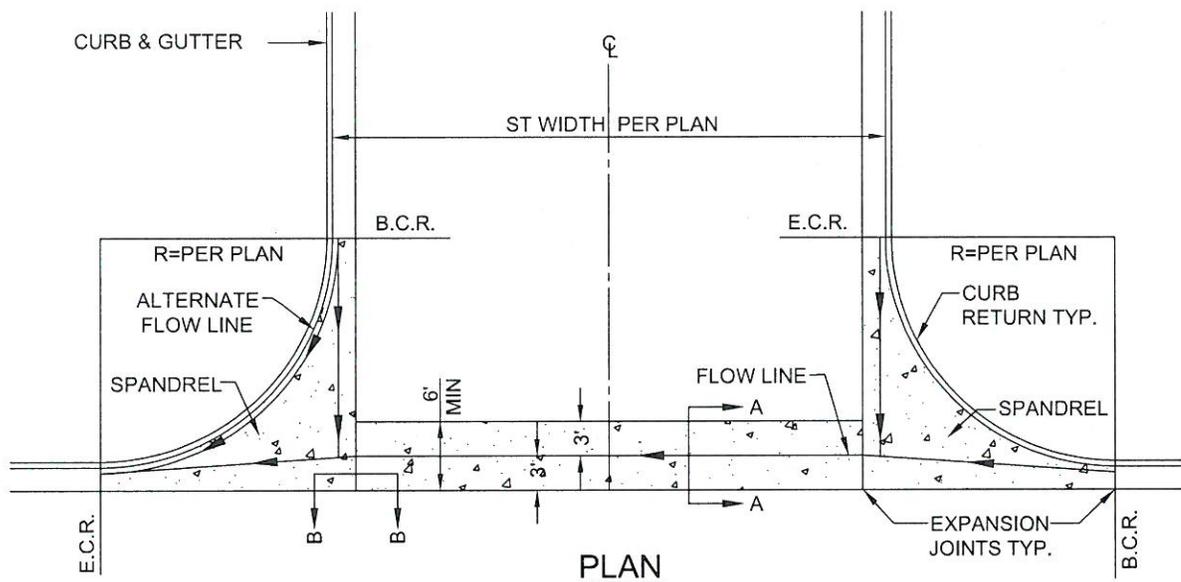
N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer		Date: <i>9-6-16</i>	<b>CURB END TRANSITION</b>
			Standard Drawing No. <b>204</b>

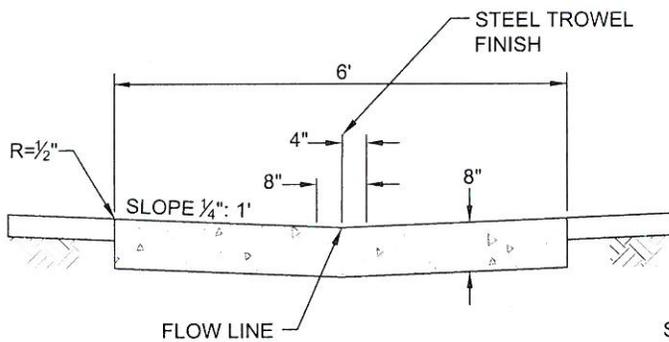


N.T.S

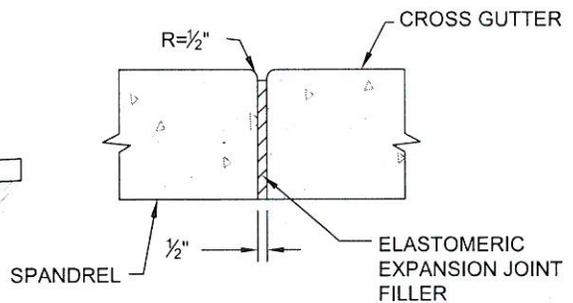
				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>CURB AND GUTTER REPLACEMENT</b>	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					



**PLAN**



**SECTION A-A**



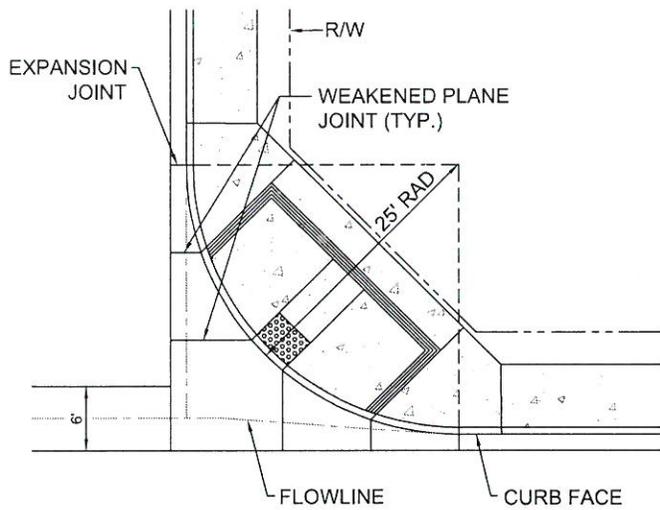
**SECTION B-B**

**NOTES:**

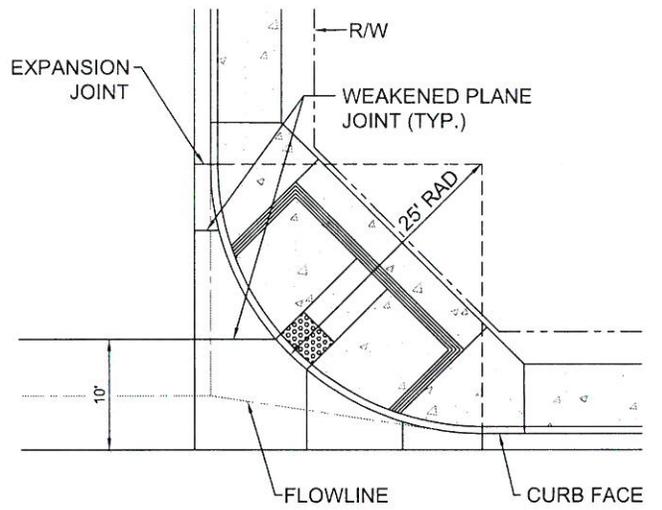
1. CROSS GUTTER SHALL BE CONSTRUCTED OF CLASS "B" (520-C-2500) CONCRETE.
2. THE STRAIGHT GRADE BETWEEN B.C.R.'S MAY BE ALTERED ON AN EXCESSIVE GRADE.
3. ABSOLUTE MINIMUM FALL AROUND OR AWAY FROM CURB RETURNS SHALL BE 1%, VARY CURB FACE IF NECESSARY.
4. SPANDREL SHALL BE 8" THICK, CLASS "B" (520-C-2500) CONCRETE, AND SHALL BE Poured MONOLITHICALLY WITH THE CURB RETURN.
6. VARIABLE CURB FACE ALLOWED FOR DRAINAGE PURPOSES.
7. WEEKEND PLANE JOINTS IN THE SPANDRELS SHALL BE AS SHOWN ON STANDARD DRAWING NO. 206B.
8. WEEKEND PLANE JOINTS IN THE CROSS GUTTER SHALL BE AT A MAXIMUM OF 10' INTERVALS.

N.T.S.

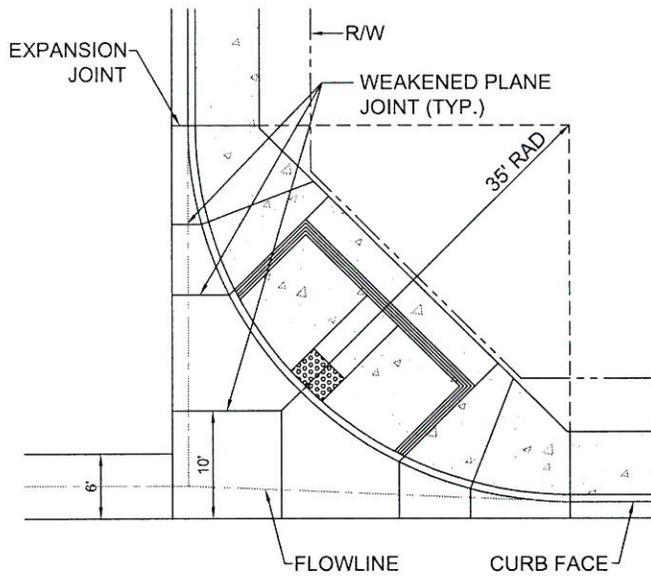
<b>CITY OF HIGHLAND</b>			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>7-6-16</i>	
Ernest Wong, Public Works Director/City Engineer			<b>CROSS GUTTER</b>
			Standard Drawing No. <b>206A</b>



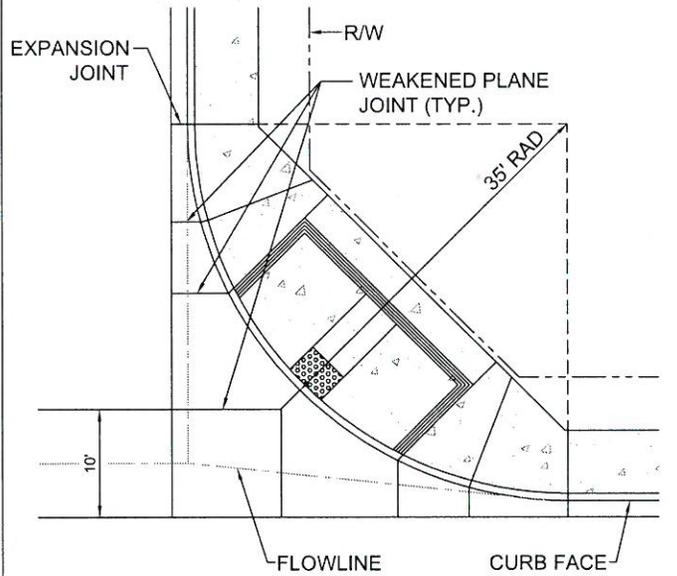
WEAKENED PLANE JOINTS FOR 25' RADIUS CURB RETURN WITH 6' WIDE X-GUTTER



WEAKENED PLANE JOINTS FOR 25' RADIUS CURB RETURN WITH 10' WIDE X-GUTTER



WEAKENED PLANE JOINTS FOR 35' RADIUS CURB RETURN WITH 6' WIDE X-GUTTER



WEAKENED PLANE JOINTS FOR 35' RADIUS CURB RETURN WITH 10' WIDE X-GUTTER

N.T.S.



Mark	Revision	By	Date

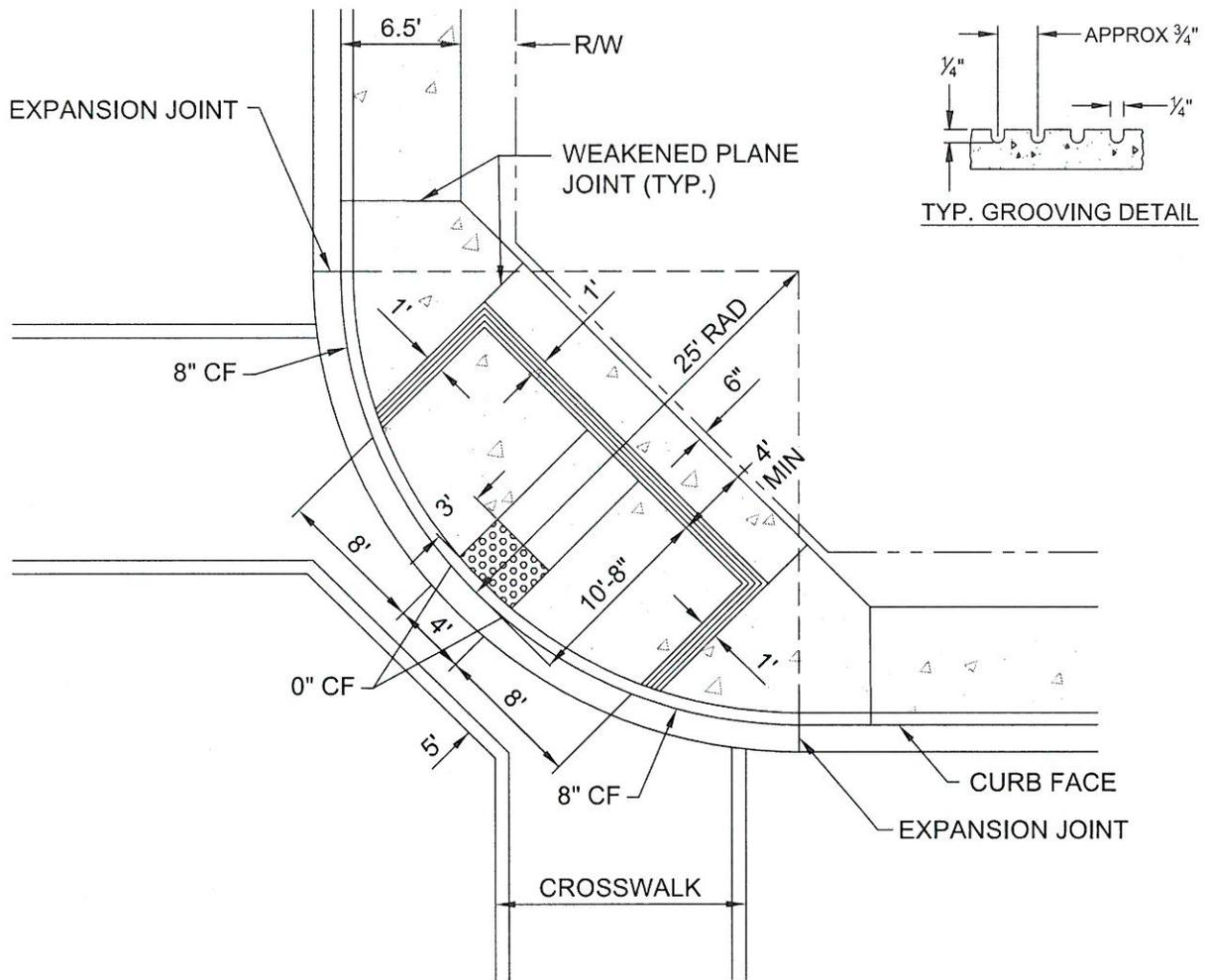
Approved: *Ernest Wong* Date: 7-6-16  
 Ernest Wong, Public Works Director/City Engineer

# CITY OF HIGHLAND

SPANDRELS

Standard Drawing No.

206B

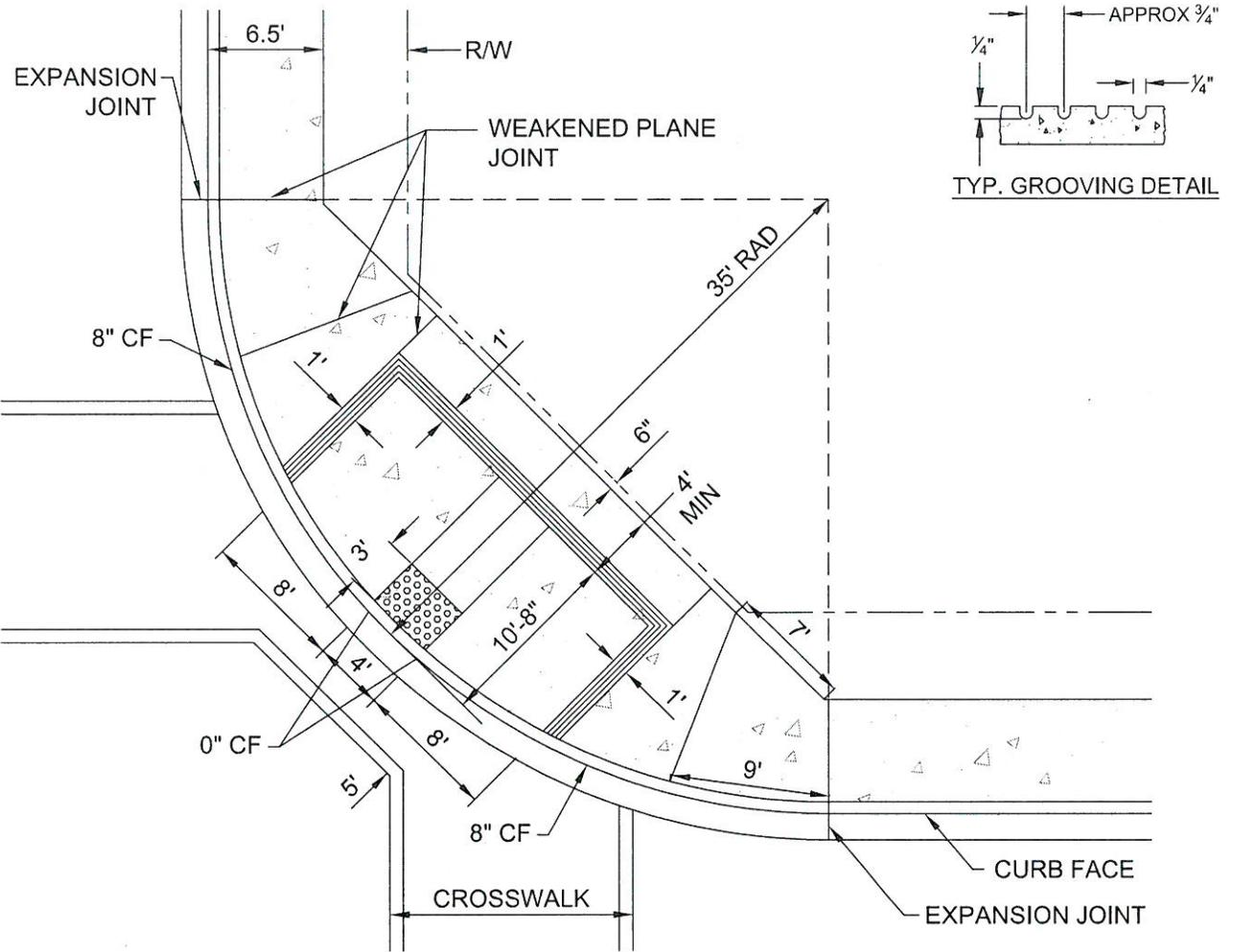


**NOTES:**

1. RAMP SLOPE SHALL BE 8.33% MAXIMUM.
2. THE RAMP SHALL HAVE A 12" WIDE BORDER WITH 1/4" GROOVES APPROXIMATELY 3/4" O.C. SEE GROOVING DETAIL.
3. THE RAMP SHALL HAVE A TRANSVERSE BROOMED SURFACE TEXTURE ROUGHER THAN THE SURROUNDING SIDEWALK.
4. RAMPS SHALL BE BUILT AND FINISHED SO THAT THERE ARE NO ABRUPT CHANGES IN ELEVATION OR ANGLE OF SLOPE.
5. SIDEWALK RAMPS ARE REQUIRED AT ALL CORNERS WHERE CURBS AND/OR SIDEWALKS ARE TO BE CONSTRUCTED OR RECONSTRUCTED AND SHALL BE AS SHOWN ON THE IMPROVEMENTS PLANS.
6. MODIFICATIONS TO LOCATION OR DIMENSIONS OF RAMP SHALL REQUIRE APPROVAL OF THE CITY ENGINEER AND BE SHOWN ON APPROVED PLANS.
7. THICKNESS OF RAMP SHALL BE 4" MINIMUM, CLASS "B" (520-C-2500) CONCRETE.
8. THE SIDEWALK RAMP AREA FROM BCR TO ECR IS 395.68 SQUARE FEET.
9. TRUNCATED DOMES PER STD 223.

SCALE: 1"=10'

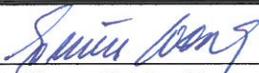
<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer		Date: 9-6-16	<b>SIDEWALK RAMP</b> <b>8" CURB FACE 25' RADIUS</b>
			Standard Drawing No. <b>207A</b>

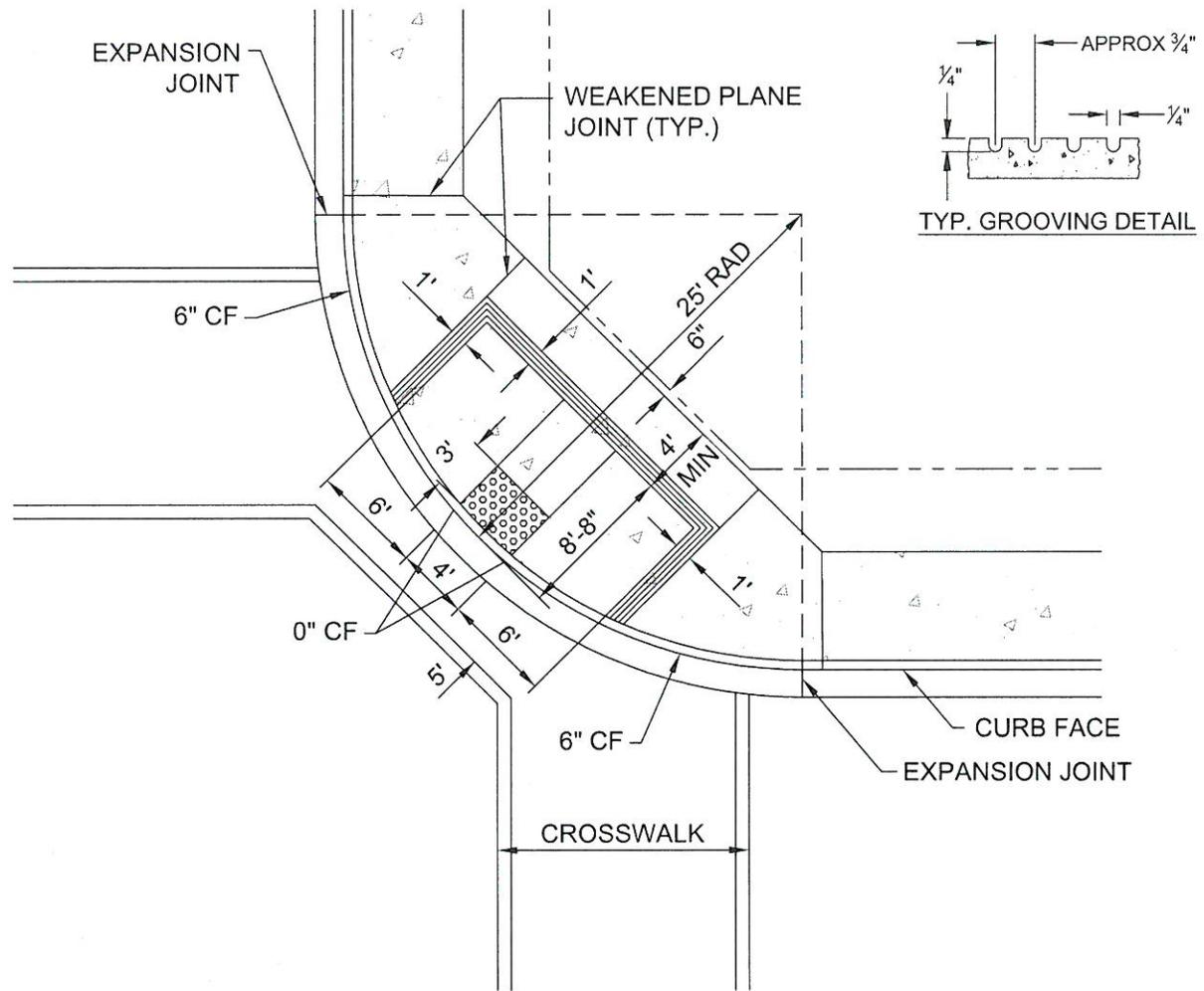


**NOTES:**

1. RAMP SLOPE SHALL BE 8.33% MAXIMUM.
2. THE RAMP SHALL HAVE A 12" WIDE BORDER WITH 1/4" GROOVES APPROXIMATELY 3/4" O.C. SEE GROOVING DETAIL.
3. THE RAMP SHALL HAVE A TRANSVERSE BROOMED SURFACE TEXTURE ROUGHER THAN THE SURROUNDING SIDEWALK.
4. RAMPS SHALL BE BUILT AND FINISHED SO THAT THERE ARE NO ABRUPT CHANGES IN ELEVATION OR ANGLE OF SLOPE.
5. SIDEWALK RAMPS ARE REQUIRED AT ALL CORNERS WHERE CURBS AND/OR SIDEWALKS ARE TO BE CONSTRUCTED OR RECONSTRUCTED AND SHALL BE AS SHOWN ON THE IMPROVEMENTS PLANS.
6. MODIFICATIONS TO LOCATION OR DIMENSIONS OF RAMP SHALL REQUIRE APPROVAL OF THE CITY ENGINEER AND BE SHOWN ON APPROVED PLANS.
7. THICKNESS OF RAMP SHALL BE 4" MINIMUM, CLASS "B" (520-C-2500) CONCRETE.
8. THE SIDEWALK RAMP AREA FROM BCR TO ECR IS 528.70 SQUARE FEET.
9. TRUNCATED DOMES PER STD 223.

SCALE: 1"=10'

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>SIDEWALK RAMP 8" CURB FACE 35' RADIUS</b>	
Approved:			Date: 9-6-16		
Ernest Wong, Public Works Director/City Engineer					



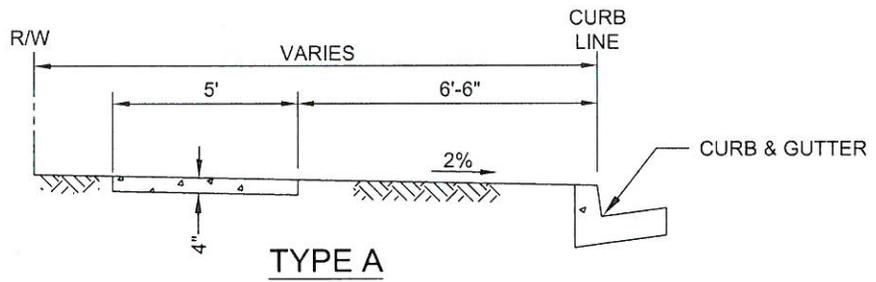
**NOTES:**

1. RAMP SLOPE SHALL BE 8.33% MAXIMUM.
2. THE RAMP SHALL HAVE A 12" WIDE BORDER WITH 1/2" GROOVES APPROXIMATELY 3/4" O.C. SEE GROOVING DETAIL.
3. THE RAMP SHALL HAVE A TRANSVERSE BROOMED SURFACE TEXTURE ROUGHER THAN THE SURROUNDING SIDEWALK.
4. RAMPS SHALL BE BUILT AND FINISHED SO THAT THERE ARE NO ABRUPT CHANGES IN ELEVATION OR ANGLE OF SLOPE.
5. SIDEWALK RAMPS ARE REQUIRED AT ALL CORNERS WHERE CURBS AND/OR SIDEWALKS ARE TO BE CONSTRUCTED OR RECONSTRUCTED AND SHALL BE AS SHOWN ON THE IMPROVEMENTS PLANS.
6. MODIFICATIONS TO LOCATION OR DIMENSIONS OF RAMP SHALL REQUIRE APPROVAL OF THE CITY ENGINEER AND BE SHOWN ON APPROVED PLANS.
7. THICKNESS OF RAMP SHALL BE 4" MINIMUM, CLASS "B" (520-C-2500) CONCRETE.
8. IF CURB HEIGHT TRANSITIONS FROM 6" TO 8" THRU CURB RETURN, USE STD FOR 8" CURB FACE
9. THE SIDEWALK RAMP AREA FROM BCR TO ECR IS 302.44 SQUARE FEET.
10. TRUNCATED DOMES PER STD 223.

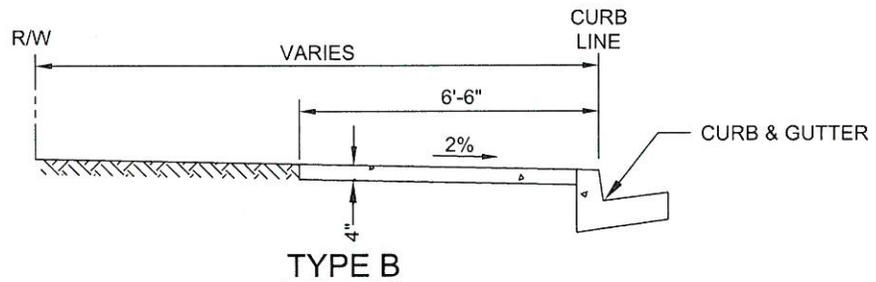
SCALE: 1"=10'

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: 9-6-16	
Ernest Wong, Public Works Director/City Engineer		<b>SIDEWALK RAMP</b> <b>6" CURB FACE 25' RADIUS</b>	
			Standard Drawing No. <b>207C</b>

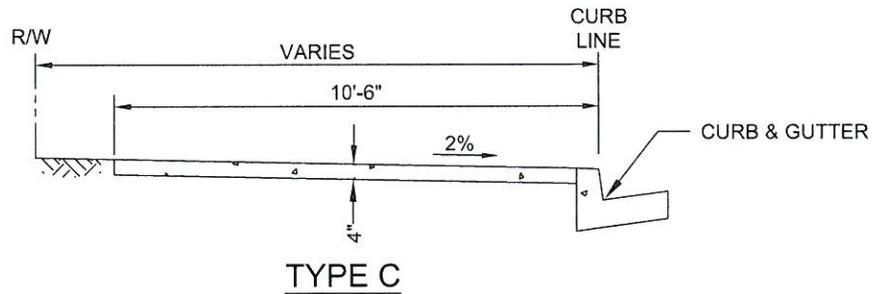




**TYPE A**



**TYPE B**



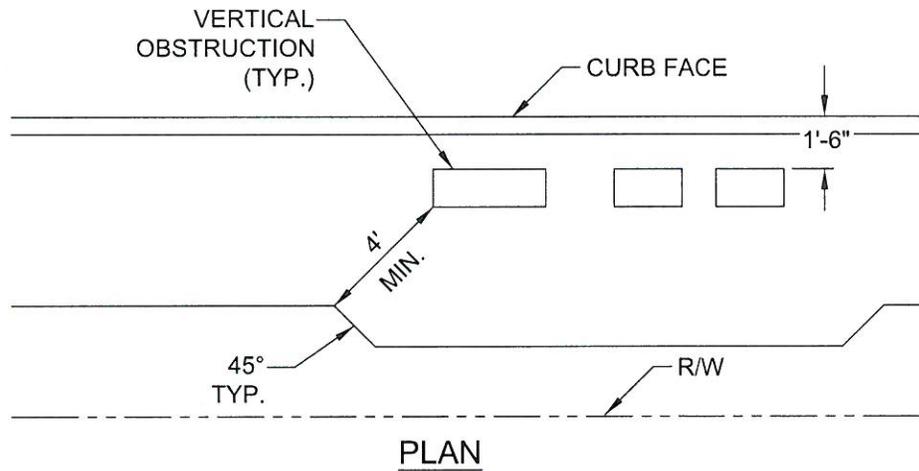
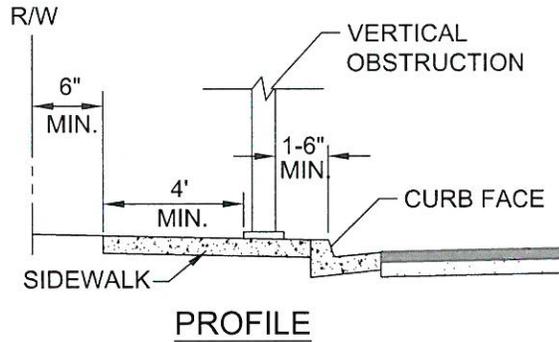
**TYPE C**

**NOTES:**

1. SIDEWALK SHALL BE CONSTRUCTED OF CLASS "B" (520-C-2500) CONCRETE WITH LIGHT-MEDIUM BROOM FINISH.
2. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 10' INTERVALS, EXCEPT THAT THE INTERVAL SHALL BE VARIED TO ALLOW MATCHING OF JOINTS IN ADJACENT EXISTING IMPROVEMENTS.
3. SCORING SIDEWALK WILL BE PERMITTED.

N.T.S.

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		<b>SIDEWALK</b>	Standard Drawing No. <b>208</b>

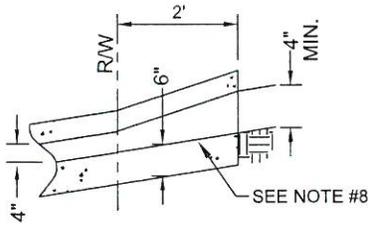


**NOTES:**

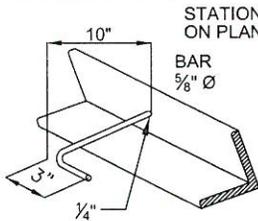
1. FOR ANY VERTICAL OBSTRUCTION, THE MINIMUM CLEARANCE FROM THE CURB FACE SHALL BE 1'-6".
2. THE MINIMUM WIDTH OF CLEAR SIDEWALK SHALL BE 4' FROM ANY VERTICAL OBSTRUCTION.

N.T.S.

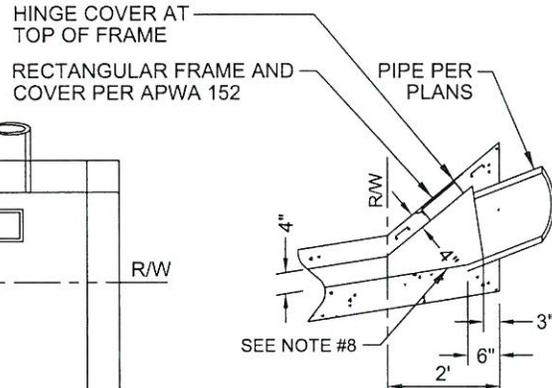
<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>209</b>
Mark	Revision	By	Date	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer				<b>OBJECT CLEARANCE</b>



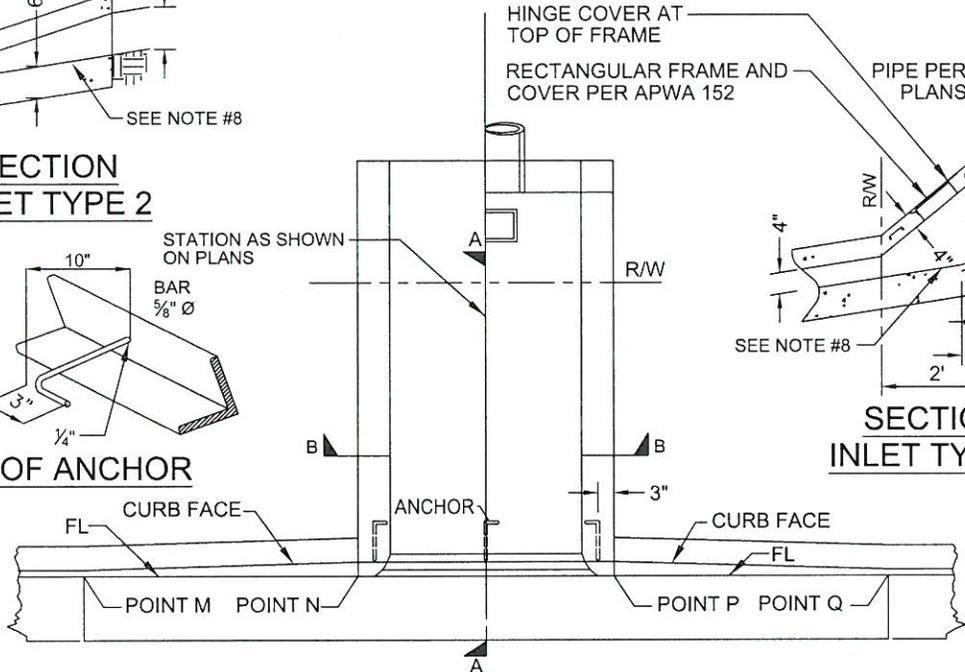
**SECTION  
INLET TYPE 2**



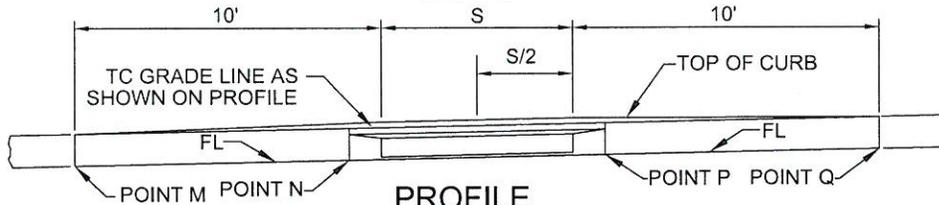
**DETAIL OF ANCHOR**



**SECTION  
INLET TYPE 1**



**PLAN**



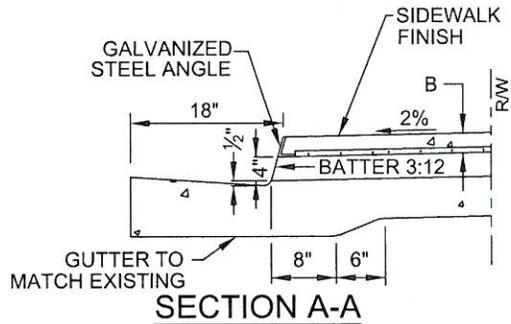
**PROFILE**

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

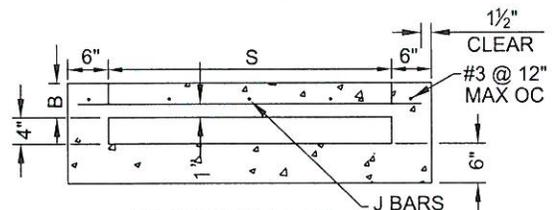
FOR S = 30" AND LESS, USE 2 ANCHORS, OTHERWISE, USE 3 ANCHORS.

FOR S = 48" AND LESS, B = 3" USE 2-1/2"x2"x 3/8" GALVANIZED STEEL ANGLE.

OTHERWISE, B = 4" USE 3-1/2"x3"x 1/2" GALVANIZED STEEL ANGLE. J BARS ARE #3.



**SECTION A-A**



**SECTION B-B**

N.T.S

△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: 9-6-16	
Ernest Wong, Public Works Director/City Engineer			

**CITY OF HIGHLAND**

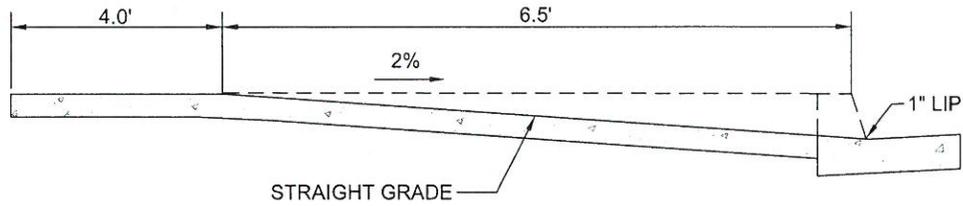
**CURB OUTLET  
STRUCTURE**

Standard Drawing No. 210A

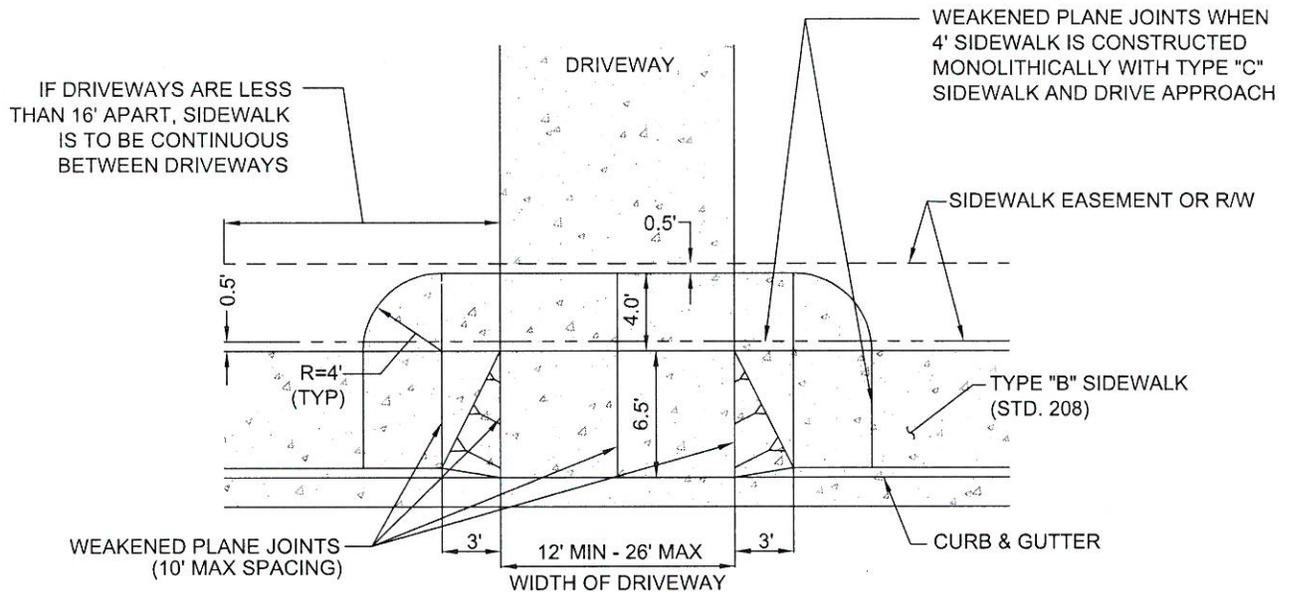
NOTES:

1. FLOOR OF BOX SHALL BE TROWELED SMOOTH.
2. IF THE TOE OF SLOPE IS ALLOWED WITHIN THE RIGHT-OF-WAY, INLET TYPE 1 BEGINS AT THE TOE RATHER THAN AT THE RIGHT-OF-WAY LINE.
3. FOR OPEN DITCH (TYPE 2), THE 24' EXTENSION BEYOND THE RIGHT-OF-WAY LINE IS NOT REQUIRED WHEN BACK OF WALK IS 24" OR MORE FROM THE RIGHT-OF-WAY LINE; HOWEVER, THE PIPE SHALL EXTEND TO THE RIGHT-OF-WAY LINE IN ANY EVENT.
4. TOP OF INLET STRUCTURE (TYPE 1 & 2) SHALL BE FLUSH WITH ADJACENT SURFACE WHERE PRACTICAL.
5. A HEADED STEEL STUD  $\frac{5}{8}$ " X 6-3/8", 1" HEAD ATTACHED BY A FULL PENETRATION BUTT WELD MAY BE USED AS AN ALTERNATE ANCHOR.
6. NORMAL CURB FACE AT POINT M AND Q. CURB FACE IS B + 5" AT POINT N AND P.
7. THE 3" LEG OF THE  $\frac{5}{8}$ " DIAMETER ANCHORS SHALL BE PARALLEL TO THE TOP OF SIDEWALK.
8. BOTTOM OF INLET STRUCTURE (TYPE 1 & 2) SHALL MAINTAIN A SLOPE OF  $\frac{1}{4}$ " PER 1' MINIMUM.

				CITY OF HIGHLAND	
Mark	Revision	By	Date	CURB OUTLET STRUCTURE NOTES	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					



SECTION



PLAN

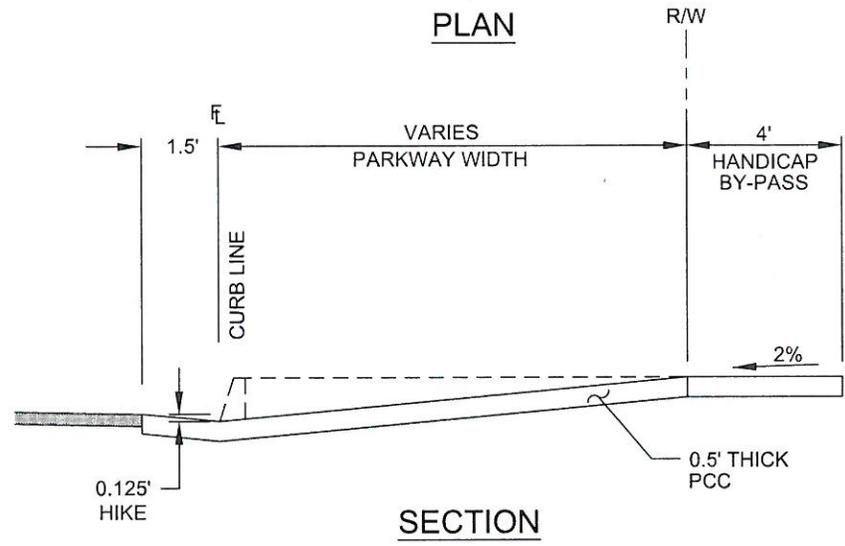
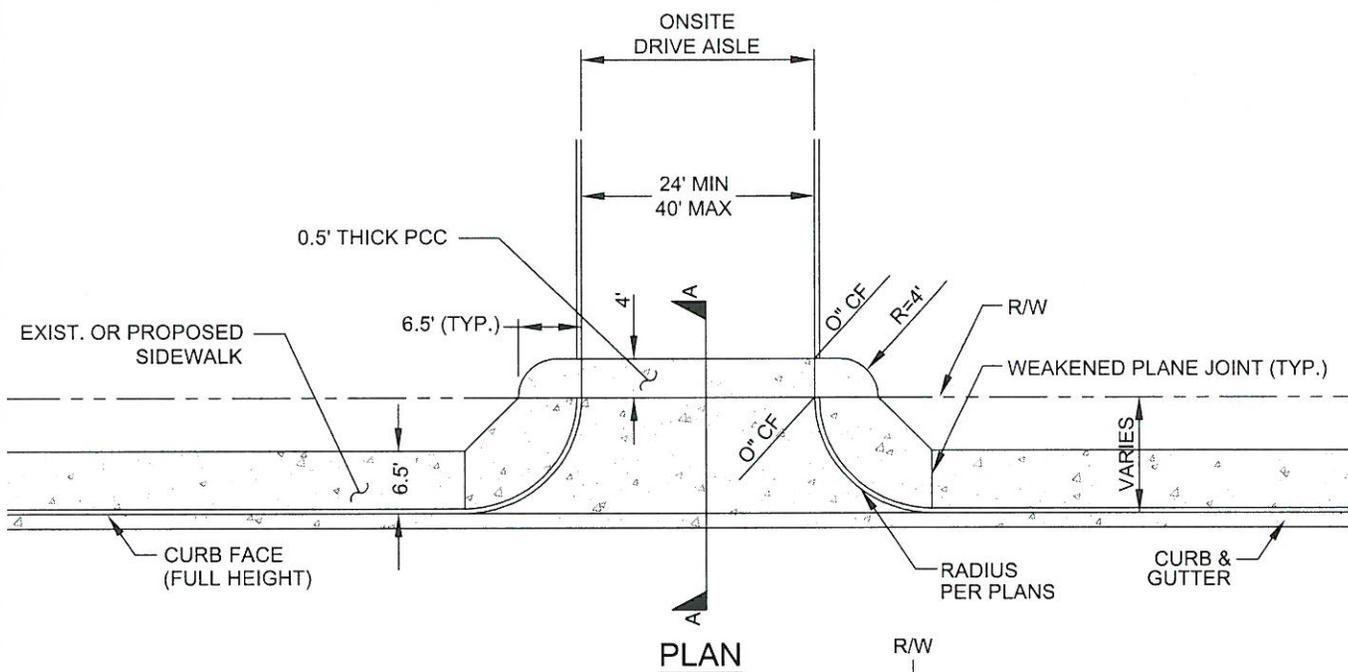
**NOTES:**

1. DRIVEWAY APPROACH LOCATION SHALL BE AS INDICATED IN THE S.B. CO. TRANSPORTATION DEPARTMENT ROAD PLANNING & DESIGN MANUAL. (SEE SECTION 5.3)
2. TO CONSTRUCT A DEPRESSION IN EXISTING CURB & GUTTER:
  - A. SAWCUT AND REMOVE TO THE NEAREST JOINT AND RECONSTRUCT TO THE NECESSARY WIDTH.
  - B. HORIZONTAL SAW CUT AND REMOVE CURB AS NECESSARY.
3. AN APPROACH MUST BE CONSTRUCTED WITH EACH CURB DEPRESSION.
4. DRIVE APPROACH SHALL BE PORTLAND CEMENT CONCRETE CLASS 'B' (520-C-2500) 6" THICK WITH A LIGHT-MEDIUM BROOM FINISH.

N.T.S

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>211</b>
Mark	Revision	By	Date	
Approved: <i>Ernest Wong</i> Date: <i>7-6-16</i> Ernest Wong, Public Works Director/City Engineer				<b>RESIDENTIAL DRIVEWAY APPROACH WITH SIDEWALK</b>



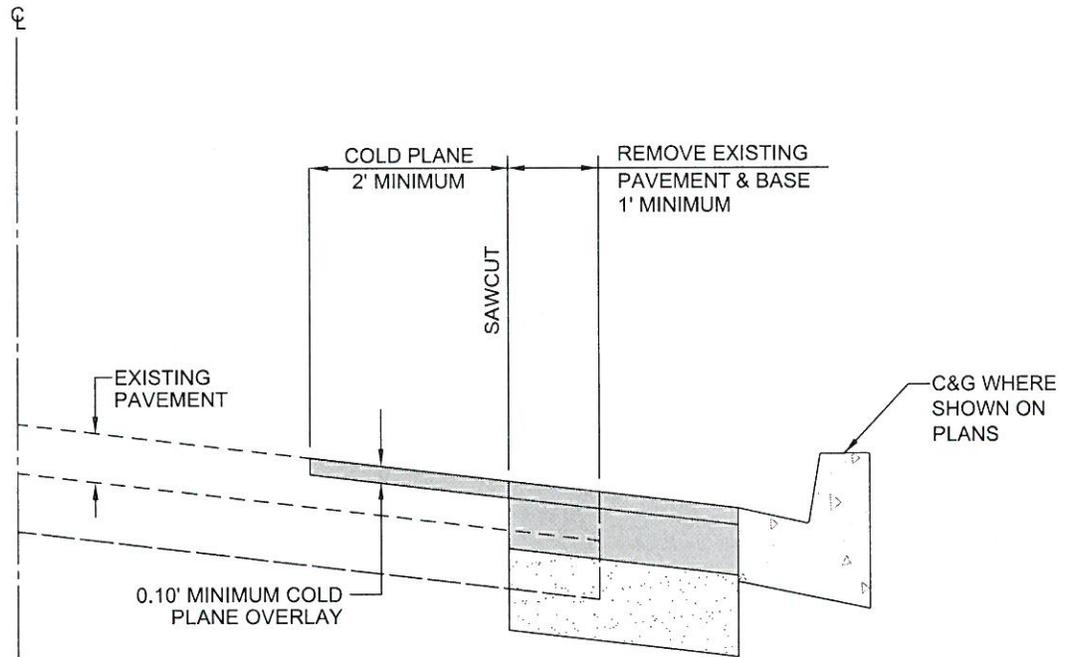


**NOTES:**

1. WEAKENED PLANE JOINTS SHALL BE EQUALLY SPACED AT 10' O.C. MAXIMUM. THEY SHALL BE 3/4" DEEP AND SHALL BE PLACED PRIOR TO LOSS OF FREE WATER.
2. THE 4' -WIDE HANDICAP BY-PASS SHALL BE FREE OF OBSTRUCTIONS AND SHALL SLOPE NO MORE THAN 2%.
3. CONCRETE APPROACH SHALL BE CONCRETE CLASS 'B' (520-C-2500) UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.

N.T.S

△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>COMMERCIAL DRIVE APPROACH WITH CURB RETURNS</b>	
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					

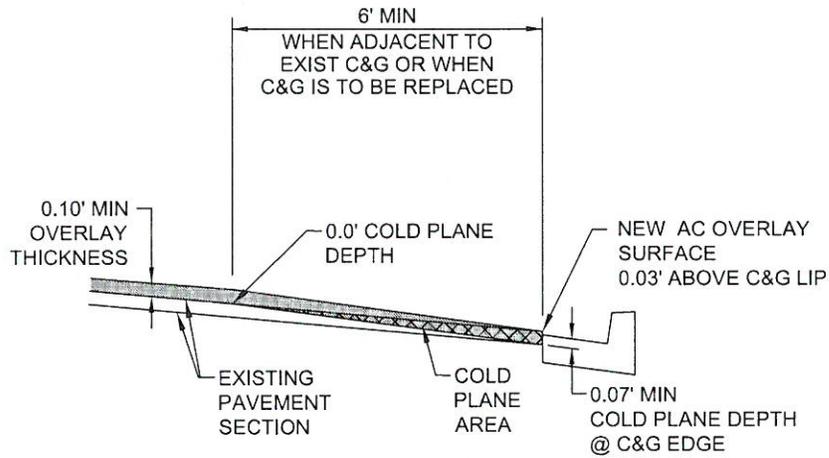


TYPICAL PAVEMENT JOIN DETAIL

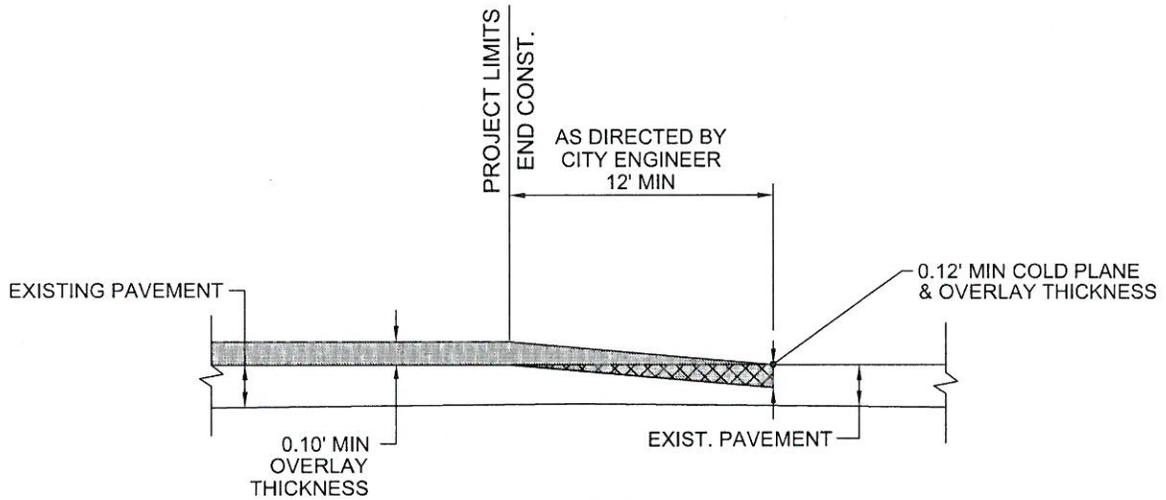
**NOTE:**  
SEE TYPICAL SECTION & PLANS FOR SPECIFIC CONSTRUCTION NOTES.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <u>Ernest Wong</u>		Date: <u>9-6-16</u>	
Ernest Wong, Public Works Director/City Engineer		<b>TYPICAL PAVEMENT JOIN DETAIL</b>	Standard Drawing No. <b>214</b>

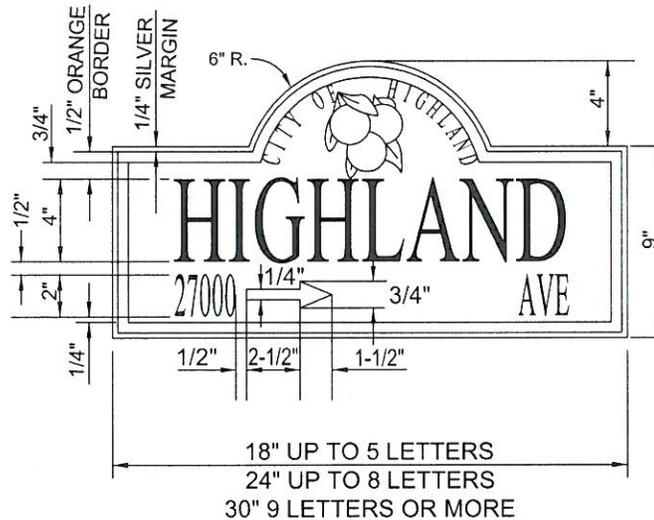


(CROSS-SECTION)  
COLD PLANE DETAIL



(LONGITUDINAL)  
COLD PLANE DETAIL

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>COLD PLANE</b>	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					



**SIGN UNIT** -SHALL BE CONSTRUCTED OF 0.090" THICK 5052H38 ANODIZED ALUMINUM. SIGN BLADES SHALL BE CONSTRUCTED TO THE DIMENSIONS OF 18" - 30" LONG AND FREE OF SHARP EDGES AND DENTS.

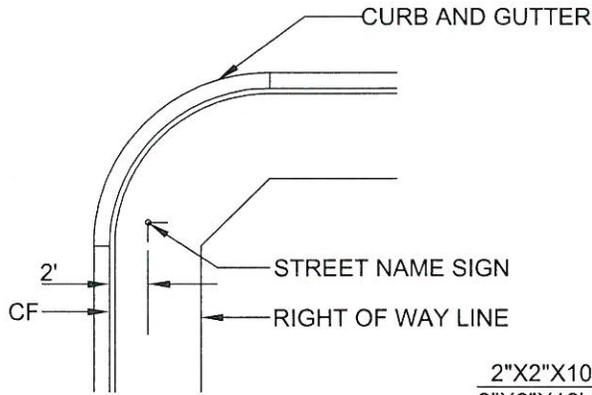
**SHEETING** -ALL SIGN BLADES SHALL HAVE 3M HI-INTENSITY GRADE REFLECTIVE SHEETING. THERE SHALL BE NO SPLICES. THE BLADES SHALL HAVE GREEN BACKGROUND 800 SERIES INK WITH SILVER MARGIN 1/4" IN WIDTH AND ADJACENT ORANGE BORDER 1/2" IN WIDTH. LETTERS AND BLOCK NUMBERS SHALL BE SILVER HI-INTENSITY. THE FONT TYPE OF THE LETTERS AND BLOCK NUMBERS SHALL BE "TIMES NEW ROMAN". THE LEAVES IN THE ORANGE CLUSTER LOGO SHALL BE GREEN WITH SILVER EDGING. ORANGES SHALL BE 3M ORANGE 800 SERIES INK. ALL SIGN SURFACES SHALL HAVE A 1160 SERIES CLEAR COAT FINISH.

**BRACKET** -SIGN MOUNTING BRACKET SHALL BE CANTILEVER ARM SUPPORT WITH TWO (2) BAND-IT 3/4" STAINLESS STEEL STRAPS SECURED TO THE POLE. EACH SIGN BLADE SHALL BE MOUNTED TO BRACKET (CANTILEVER ARM SUPPORT) WITH VANDAL-PROOF PINHEAD ALLEN SCREWS.

**SIGN POST** -SIGN POSTS SHALL BE 2" X 2" X 10' WITHOUT STOP SIGN OR 12' WITH STOP SIGN MOUNTED ON SAME POST. POST SHALL BE INSTALLED INTO GROUND WITH 2-1/4" X 2-1/4" X 30" ANCHOR, C.C.S.S. TYPE. ATTACH POST AND ANCHOR WITH TWO (2) DRIVE RIVETS.

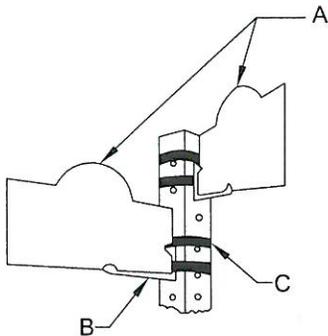
THERE SHALL BE A CLEARANCE OF 7' BETWEEN FINISHED GRADE AND BOTTOM OF LOWER SIGN. ANCHOR SHALL EXTEND NO MORE THAN 3" ABOVE FINISHED GRADE.

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	STREET NAME SIGN	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					



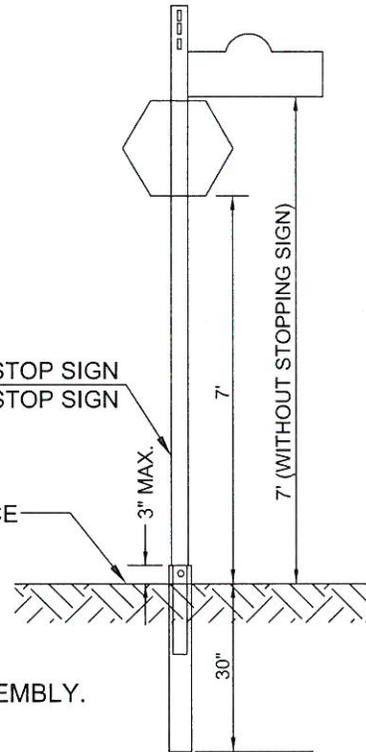
PLAN

2"X2"X10' POST W/O STOP SIGN  
 2"X2"X12' POST WITH STOP SIGN



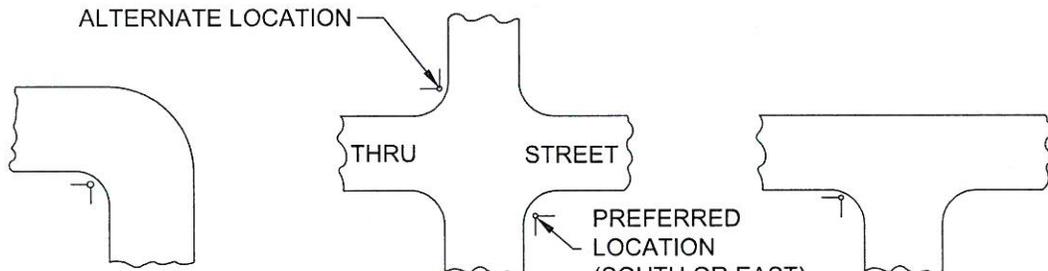
A. STREET NAME SIGN PER 217A.  
 B. SIGN MOUNTING BRACKET ASSEMBLY.  
 C. SIGN POST.

FINISHED SURFACE



ELEVATION

ALTERNATE LOCATION



L INTERSECTION

X INTERSECTION

T INTERSECTION

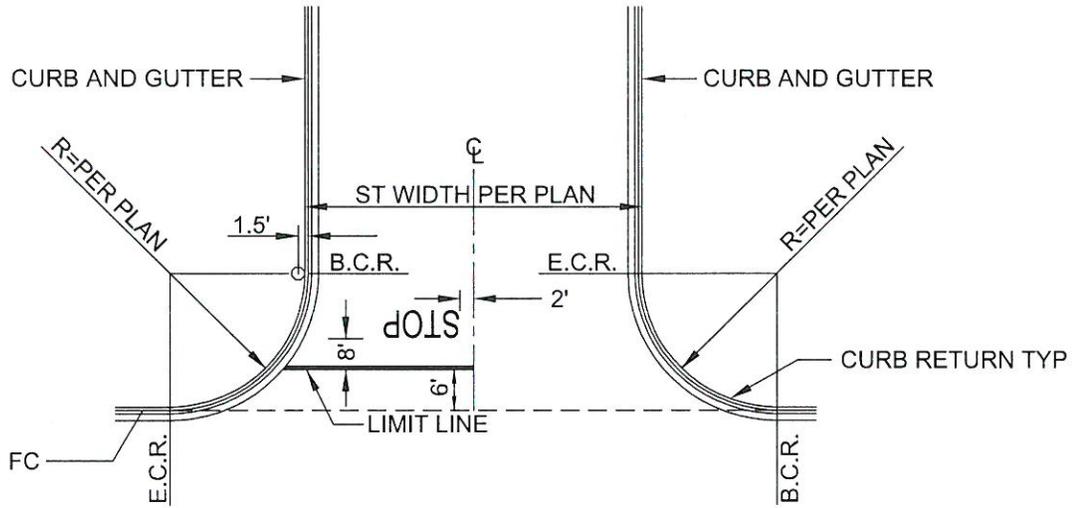
— STREET NAME SIGN

**NOTES:**

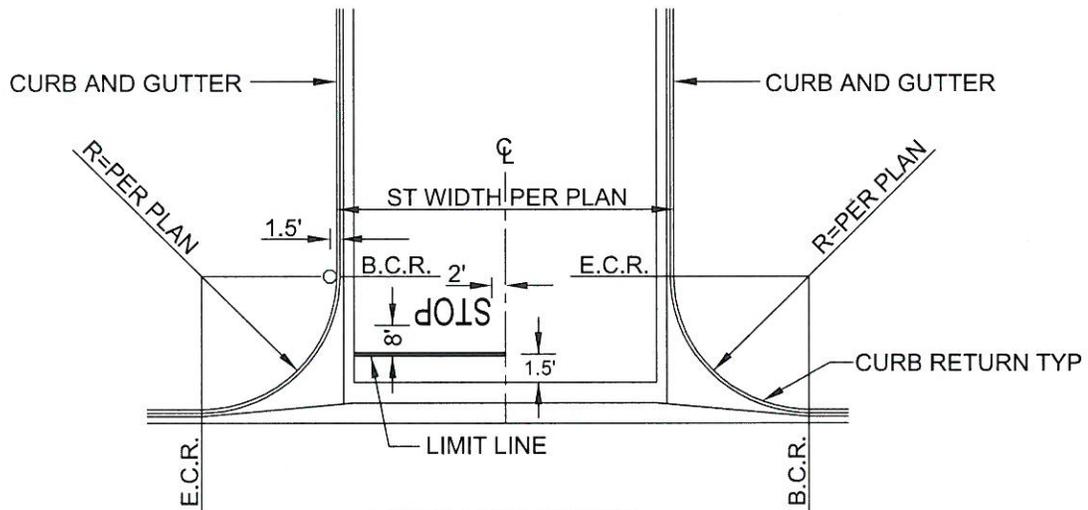
1. SIGN TO BE SET WITHIN CITY RIGHT OF WAY.
2. LOCATION OF SIGN SHOWN IS APPROXIMATE.
3. SIGN TO BE VISIBLE FOR A DISTANCE OF 150' FEET.
4. IF EITHER ROAD IS DIVIDED INTO 4 LANES OR MORE, ADDITIONAL SIGNS MAY BE REQUIRED.
5. SIGN TO BE ON STREET LIGHT IF LOCATED AT INTERSECTION.

N.T.S.

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>217B</b>
Mark	Revision	By	Date	
Approved: <i>Ernest Wong</i> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				<b>STREET NAME SIGN</b>



**LIMIT LINE DETAIL  
NO X GUTTER**

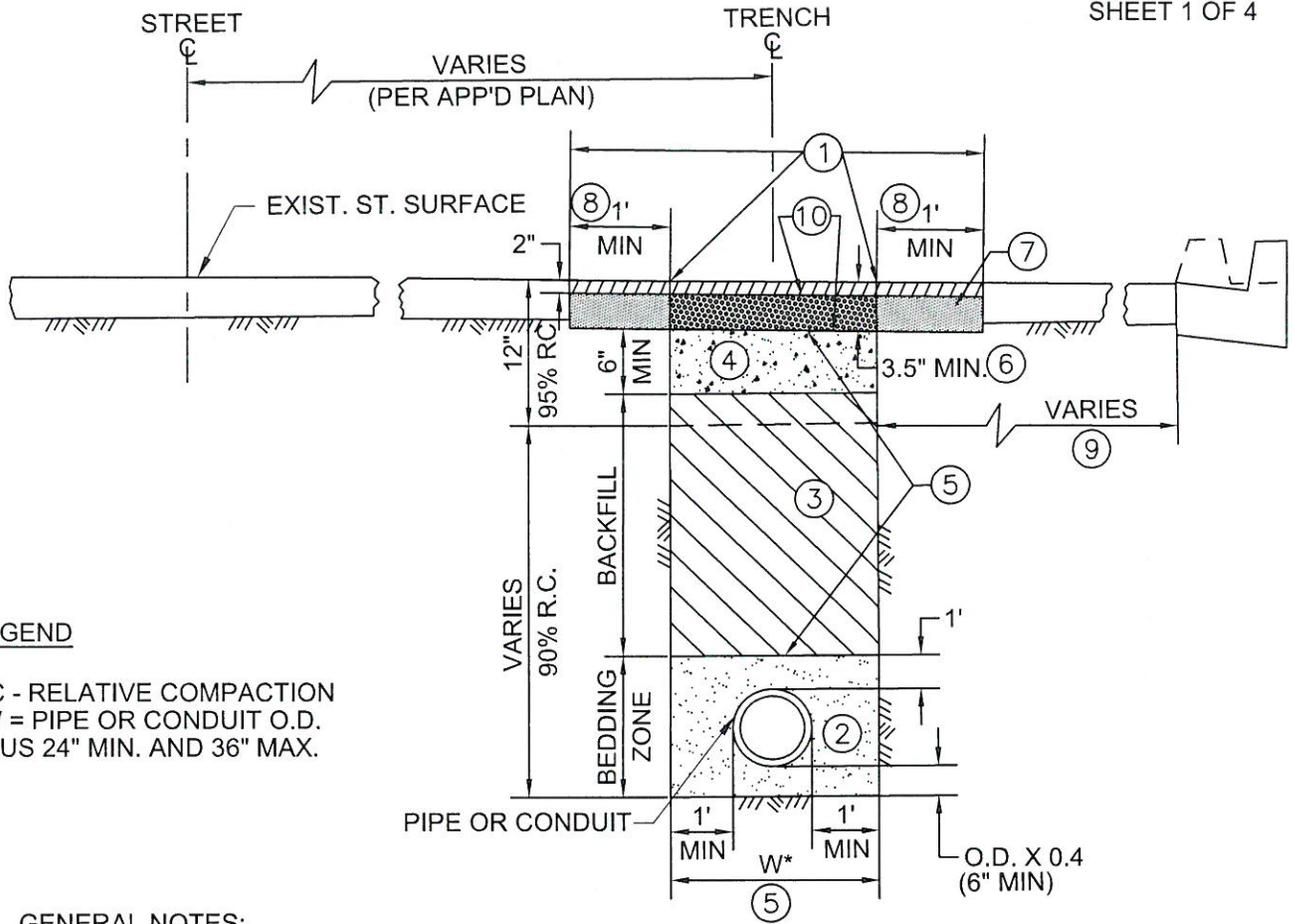


**LIMIT LINE DETAIL  
WITH X GUTTER**

**NOTE:**  
REFER TO CALTRANS STD A24D FOR ADDITIONAL CONSTRUCTION SPECIFICATIONS.

N.T.S

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>STOP SIGN, LEGEND AND LIMIT LINE</b>	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer					



**LEGEND**

RC - RELATIVE COMPACTION  
 \*W = PIPE OR CONDUIT O.D.  
 PLUS 24" MIN. AND 36" MAX.

**GENERAL NOTES:**

**NO EXCAVATIONS NOR STREET CUTS WILL BE PERMITTED WITHIN ANY STREET WHICH HAS BEEN CONSTRUCTED, RE-CONSTRUCTED, PAVED OR RESURFACED IN THE PREVIOUS 3 YEARS AFTER THE COMPLETION OF SAID WORK AS DETERMINED BY THE CITY.**

**CONSTRUCTION NOTES:**

- ① TRENCH EDGES, WITHIN EXISTING STREET PAVEMENT, SHALL BE SAWCUT OR COLD PLANED TO NEAT, STRAIGHT, VERTICAL LINES, AND ALL EDGES OF EXISTING PAVEMENT AND/OR P.C.C. SURFACES BEING JOINED BY AN AC INLAY OR OVERLAY, SHALL RECEIVE A TACK COAT OF ASPHALT EMULSION, PRIOR TO PLACEMENT OF PERMANENT A.C. PAVING.
- ② BEDDING IS THE AREA OR "ZONE" WHICH SUPPORTS, SURROUNDS AND IMMEDIATELY COVERS THE UNDERGROUND PIPE OR CONDUIT. SEE DRAWING ABOVE FOR BEDDING AREA DIMENSIONS. BEDDING MATERIAL MAY CONSIST OF SAND, GRAVEL, CRUSHED ROCK OR CRUSHED MISCELLANEOUS BASE, HAVING A SAND EQUIVALENT OF NOT LESS THAN 30. MATERIAL, PLACEMENT AND COMPACTION OF BEDDING SHALL BE IN ACCORDANCE WITH SECTION 306.1.2.1 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS, (GREENBOOK) LATEST EDITION, AND/OR THE REQUIREMENTS OF THE UTILITY/AGENCY WHICH OWNS AND MAINTAINS THE PIPE/CONDUIT BEING INSTALLED.

N.T.S

△			<b>CITY OF HIGHLAND</b>
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer			STREET CUT TRENCH REPAIR DETAIL (NTS)
			Standard Drawing No. <b>220A</b>

CONSTRUCTION NOTES (CONTINUED)

- ③ REQUIREMENTS FOR PLACEMENT, MATERIAL AND COMPACTION OF TRENCH BACKFILL, SHALL BE IN ACCORDANCE WITH SECTION 306.1.3 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS, (GREENBOOK) LATEST EDITION. ROCKS GREATER THAN 6" IN ANY DIMENSION, SHALL NOT BE PERMITTED IN THE TRENCH BACKFILL BETWEEN 1 FOOT ABOVE THE TOP OF PIPE OR CONDUIT AND 1 FOOT BELOW THE STREET PAVEMENT SUB-GRADE. ROCKS GREATER THAN 2.5" IN ANY DIMENSION, SHALL NOT BE PERMITTED IN TRENCH BACKFILL PLACED WITHIN 1 FOOT OF THE STREET PAVEMENT SUBGRADE. COMPACTION TESTS OF TRENCH BACKFILL SHALL BE PERFORMED BY A SOILS LABORATORY HIRED BY THE APPLICANT. (SEE ALSO NOTE 5).
- ④ BASE MATERIAL SHALL BE PLACED AND COMPACTED AS SHOWN ON THE DRAWING, AND SHALL BE CLASS II AGGREGATE OR CRUSHED MISCELLANEOUS BASE, IN ACCORDANCE WITH SECTION 200-2 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS, (GREENBOOK) LATEST EDITION, AND SHALL HAVE A THICKNESS OF 6" MINIMUM OR MATCH EXISTING THICKNESS IF MORE THAN 6".
- ⑤ TRENCHES IN PAVED AREAS HAVING A WIDTH OF 12" OR LESS, SHALL BE BACKFILLED WITH 1 ½ SACK CEMENT SLURRY. THE SLURRY SHALL BE PROTECTED AND THE CURING TIME SHALL BE A MINIMUM OF 24 HOURS PRIOR TO PLACING FINAL A.C. PAVEMENT. (CONTRACTOR MAY USE CEMENT SLURRY, AS DESCRIBED HEREIN, AS AN OPTION FOR BACKFILL MATERIAL FOR ALL TRENCHES, UNLESS PROHIBITED BY THE UTILITY COMPANY/AGENCY WHO OWNS THE PIPE AND/OR CONDUIT BEING INSTALLED).
- ⑥ TOTAL PERMANENT A.C. THICKNESS FOR TRENCH REPAIR SHALL BE 1" GREATER THAN THE EXISTING A.C. THICKNESS WITH A MINIMUM THICKNESS OF 3 ½" AND A MAXIMUM THICKNESS OF 6".
- ⑦ IF THE EXISTING AC THICKNESS IS 3" OR LESS AND/OR THE TRENCH WIDTH IS BETWEEN 12" AND 24", THEN THE FULL PERMANENT AC REPAIR AS DESCRIBED IN CONSTRUCTION NOTE 6 SHALL BE EXTENDED TO 1' OUTSIDE OF EACH EDGE OF THE TRENCH AS SHOWN.
- ⑧ GRIND EXISTING AC 1' MINIMUM OUTSIDE OF EACH EDGE OF THE TRENCH AT A DEPTH OF 2", INLAY SAID AREA WITH 2" OF AC, FLUSH WITH EXISTING ADJACENT AC SURFACE.
- ⑨ IF EXISTING CURB AND GUTTER LIP, EP, AC BERM, ETC., IS WITHIN 4' OF THE EDGE OF TRENCH, REMOVE EXISTING AC WITHIN THIS AREA AND INCLUDE IN REPAIR AS DESCRIBED IN CONSTRUCTION NOTES 7 OR 8.
- ⑩ BASE PAVING OF TRENCHES SHALL BE PLACED IN COMPACTED LIFTS HAVING A MAXIMUM THICKNESS OF 3", AND THE AC MATERIAL SHALL BE B-PG 64-10 (3/4"). FINISH COURSE SHALL BE 2" THICK AND THE AC MATERIAL SHALL BE C2-PG 64-10 (½") AND SHALL BE COMPACTED FLUSH WITH THE EXISTING STREET SURFACE AND SHALL BE PLACED NO LATER THAN 15 CALENDAR DAYS AFTER A.C. BASE PAVEMENT PLACEMENT. TRENCH SECTIONS OVER 6' IN WIDTH SHALL UTILIZE A SELF PROPELLED, VIBRATING SCREED PAVING MACHINE (BARBER GREEN OR EQUIVALENT).

N.T.S

				<b>CITY OF HIGHLAND</b>
Mark	Revision	By	Date	STREET CUT TRENCH REPAIR DETAIL (NTS)
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				Standard Drawing No.  <b>220A</b>

CONSTRUCTION NOTES (CONTINUED)

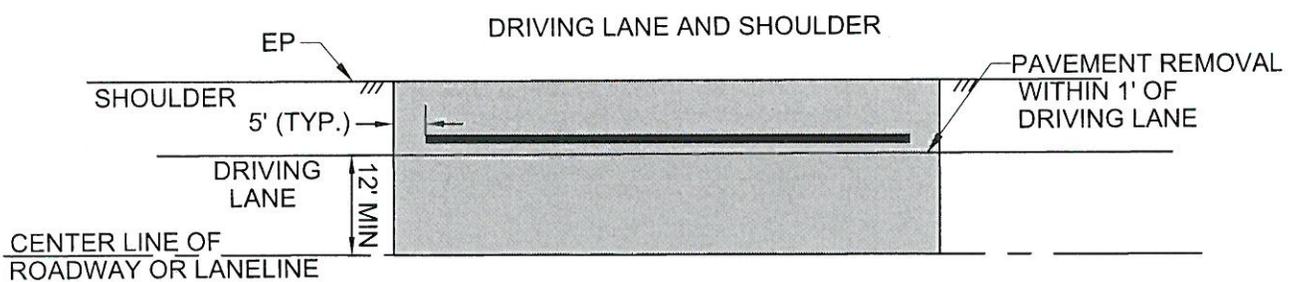
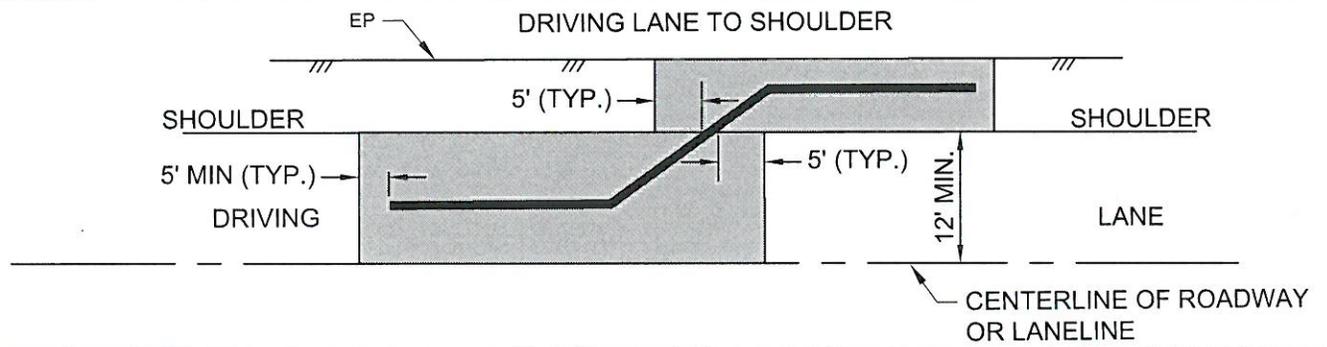
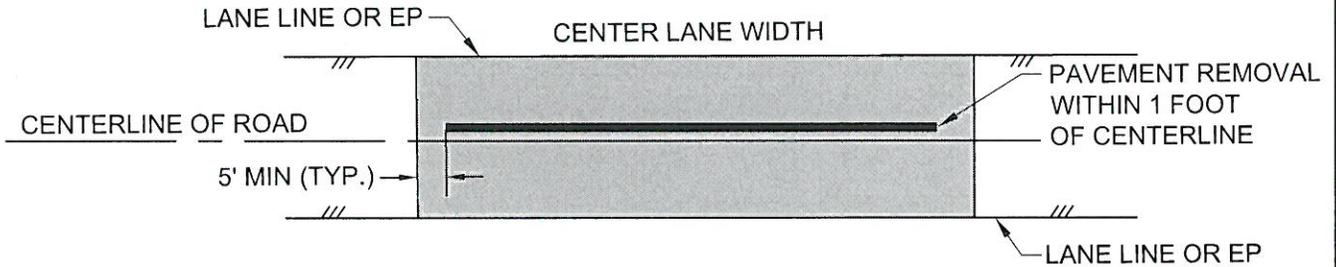
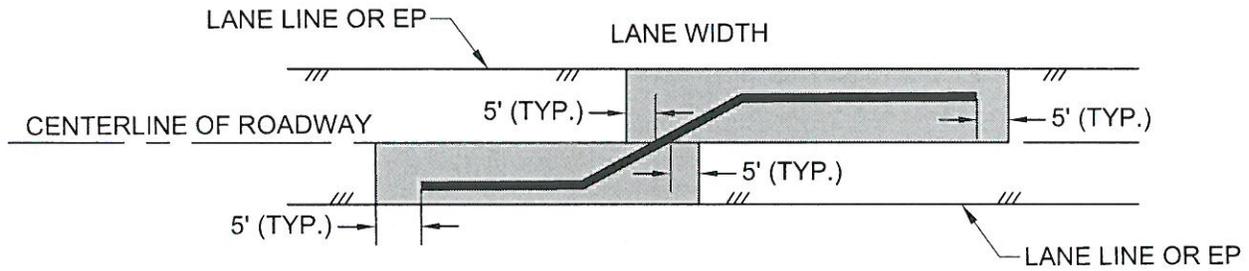
- ⑪ EXCESSIVE PAVEMENT REMOVAL: REGARDLESS OF THE TRENCH METHOD USED, REMOVAL OF SIX OR MORE SEPARATE AREAS OF PAVEMENT OR THE REMOVAL OF 15% OF THE TOTAL AREA OF A LANE OR SHOULDER BY A PERMITTEE WITHIN A 300 FOOT LENGTH OF STREET, SHALL REQUIRE AN OVERLAY OR RECONSTRUCTION DEPENDING UPON THE AGE OF LAST SURFACE IMPROVEMENT AND ROADWAY WIDTH PER NOTE 12, AND THE ATTACHED TRENCH OVERLAY DRAWING.
  
- ⑫ A.C. OVERLAY PAVING: WHEN THE T-CUT OR T-GRIND OPTIONS ARE USED TO REPAIR OR RESTORE PAVEMENT REMOVAL TO 300 FEET OR LONGER, AN OVERLAY MAY NOT BE REQUIRED UNLESS THE STREET HAS BEEN PAVED WITHIN THREE YEARS OR FALLS WITHIN THE CRITERIA OF NOTE 11. WHEN THE NON T-CUT/T-GRIND TRENCH IS USED TO REPAIR OR RESTORE PAVEMENT REMOVALS OF 300 FEET OR LONGER, AN A.C. OVERLAY SHALL BE REQUIRED PER THE ATTACHED OVERLAY DRAWING. THE DETERMINATION OF THE A.C. OVERLAY SHALL BE MADE BY THE CITY'S ENGINEERING DEPARTMENT AT THE PRECONSTRUCTION MEETING OR PRIOR TO THE ISSUANCE OF THE PERMIT. THE A.C. OVERLAY, WHEN REQUIRED, SHALL BE A MINIMUM OF 1" THICK AND THE A.C. MATERIAL SHALL BE ½" C2-PG 64-10, PLACED WITH A PAVING MACHINE PER NOTE 10, ABOVE AND SHALL EXTEND BEYOND PAVEMENT REMOVAL A MINIMUM OF 1-FOOT Laterally AND 5-Feet Longitudinally AND SHALL COVER THE DRIVING OR SHOULDER FULL WIDTH.

N.T.S

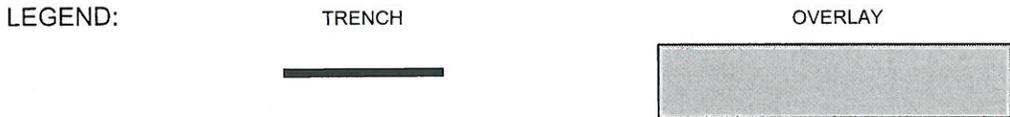
△				CITY OF HIGHLAND	
Mark	Revision	By	Date	STREET CUT TRENCH REPAIR DETAIL (NTS)	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					

# TRENCH OVERLAY DETAIL

SHEET 4 OF 4

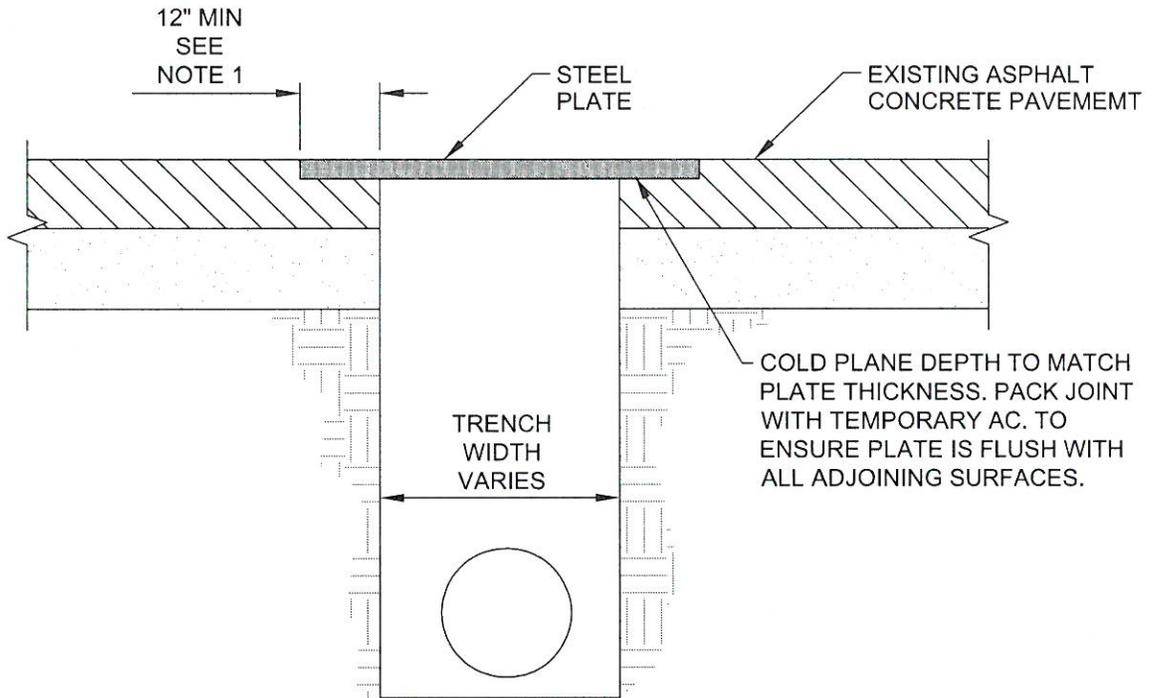


NOTE: OVERLAY TO EXTEND BEYOND TRENCH A MINIMUM 5' LONGITUDINALLY.  
PAVING JOINTS SHALL BE AT THE EDGES OF THE DRIVING LANES OR SHOULDERS.



N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		STREET CUT TRENCH REPAIR DETAIL (NTS)	
			Standard Drawing No. <b>220A</b>



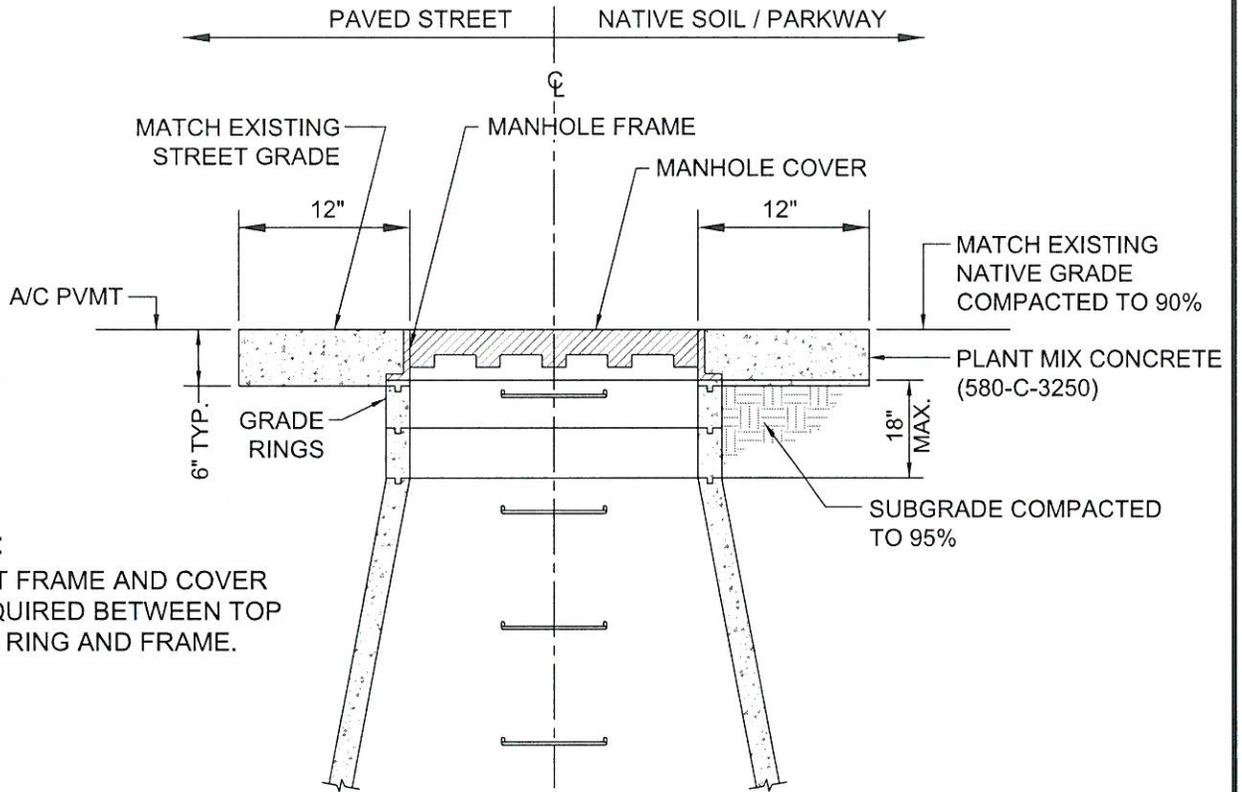
TYPICAL TRENCH PLATE DETAIL

**NOTES:**

1. TRENCH WALLS AND ADJACENT SOILS SHALL BE SUFFICIENTLY STABLE FOR THE USE OF THE ABOVE PLATE
2. THE CONTRACTOR SHALL PROVIDE A MINIMUM 12" LAP OF STEEL PLATE ON EACH SIDE OF TRENCH TO ASSURE NO SLIPPING OF PLATE OR COLLAPSING OF TRENCH WALL. WHERE 12" LAP CANNOT BE MET, ENGINEERING DESIGN IS REQUIRED AND SHALL BE APPROVED BY THE CITY ENGINEER.
3. STEEL PLATE MUST FIT SNUG WITHIN THE RECESSED AREA AND INSTALLED TO OPERATE WITH MINIMUM NOISE. PLATES SHALL BE FREE FROM WARPING OR DISFIGUREMENT SO THAT ALL EDGES ARE RECESSED WITHOUT FORMING A LIP NO ANY EDGES
4. THE PAVEMENT SHALL BE COLD PLANED TO A DEPTH EQUAL TO THE THICKNESS OF THE PLATE, AND TO WIDTH AND LENGTH EQUAL TO THE DIMENSIONS OF THE PLATE.
5. THIS STANDARD SHALL BE IMPLEMENTED ON ALL PROJECTS WITHIN VEHICULAR TRAVELWAY UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
6. MULTIPLE PLATES MUST BE TACK WELDED TO SECURE PLATES.
7. ALL PLATES MUST MEET REQUIRED TRAFFIC LOADS, AND BE SKID RESISTANT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE APPROPRIATE SELECTION AND MAINTENANCE OF THE STEEL PLATES.
8. STEEL PLATES MUST BE REMOVED AND PERMANENT PAVEMENT SHALL BE PLACED WITHIN FIFTEEN (15) WORKING DAYS OR AS APPROVED BY THE CITY ENGINEER.
9. THE CONTRACTOR SHALL PLACE "STEEL PLATES AHEAD" SIGNS.

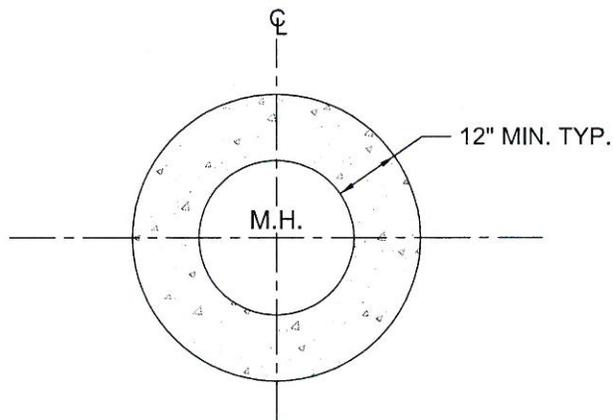
N.T.S

△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>RECESSED TRENCH PLATE DETAIL</b>	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer					



**NOTE:**  
 ADJUST FRAME AND COVER  
 AS REQUIRED BETWEEN TOP  
 GRADE RING AND FRAME.

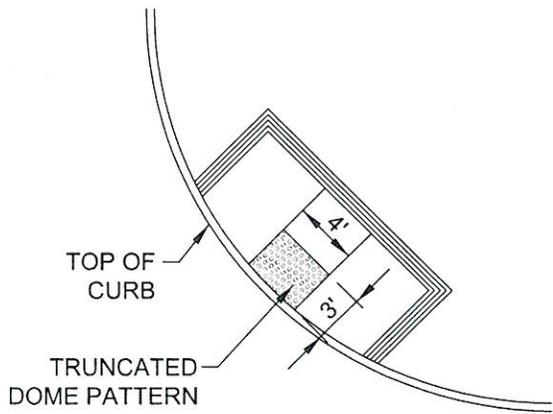
SECTION VIEW



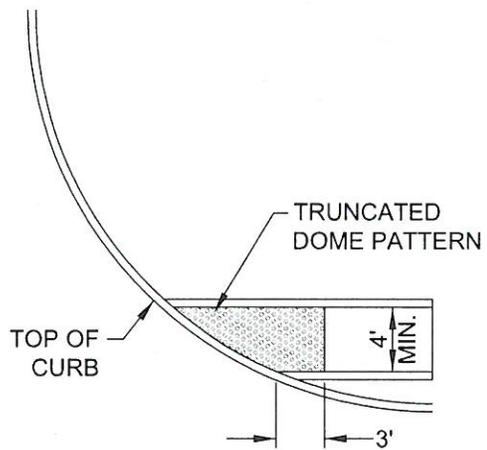
TOP VIEW

N.T.S

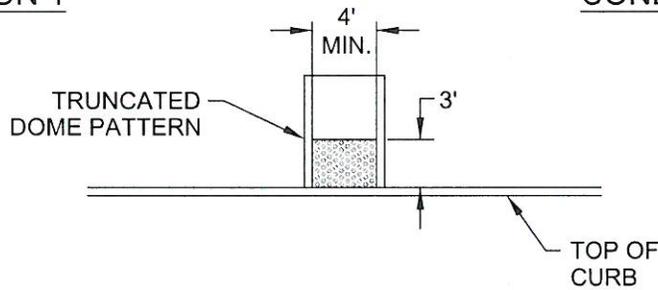
<table border="1"> <tr> <td>△</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mark</td> <td>Revision</td> <td>By</td> <td>Date</td> </tr> </table>				△				Mark	Revision	By	Date	<b>CITY OF HIGHLAND</b>	
				△									
Mark	Revision	By	Date										
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer				<b>STORM DRAIN MANHOLE          AT GRADE DETAIL</b>									
				Standard Drawing No. <b>221</b>									



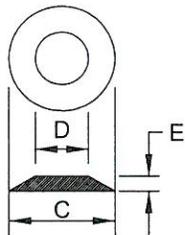
CONDITION 1



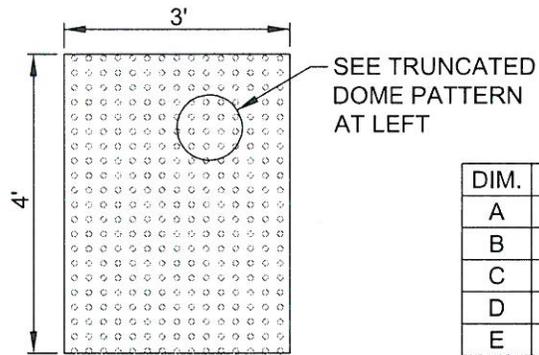
CONDITION 2



CONDITION 3

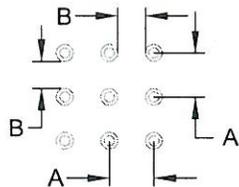


SINGLE "TRUNCATED DOME"



DETECTABLE WARNING SURFACE

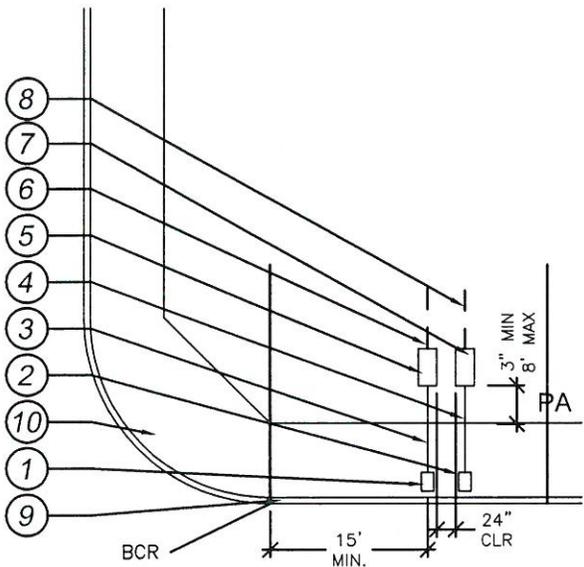
DIM.	ADA REQUIREMENT
A	1.6" TO 2.4"
B	0.65" MINIMUM
C	0.9" TO 1.4"
D	50-60% OF "C"
E	0.2"



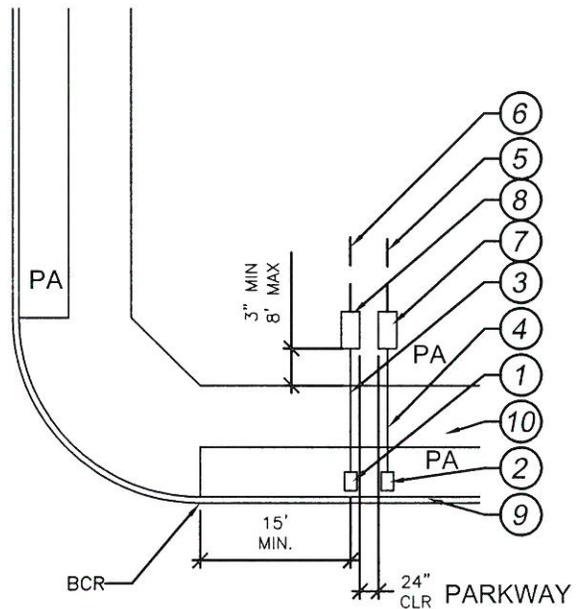
"TRUNCATED DOME" PATTERN

N.T.S.

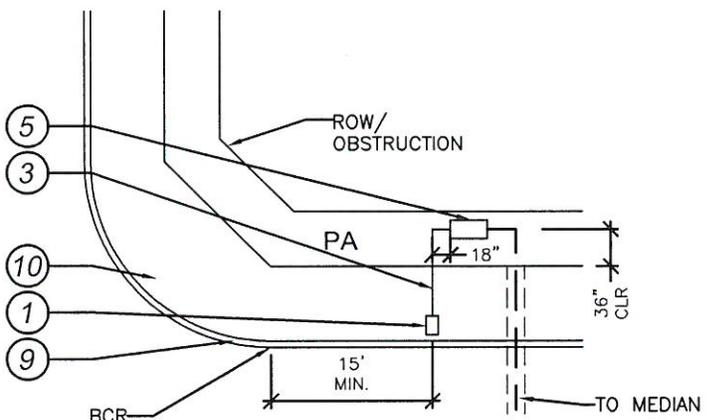
<b>CITY OF HIGHLAND</b>			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		<b>TRUNCATED DOMES</b>	
			Standard Drawing No. <b>223</b>



CURB ADJACENT SIDEWALK



PARKWAY

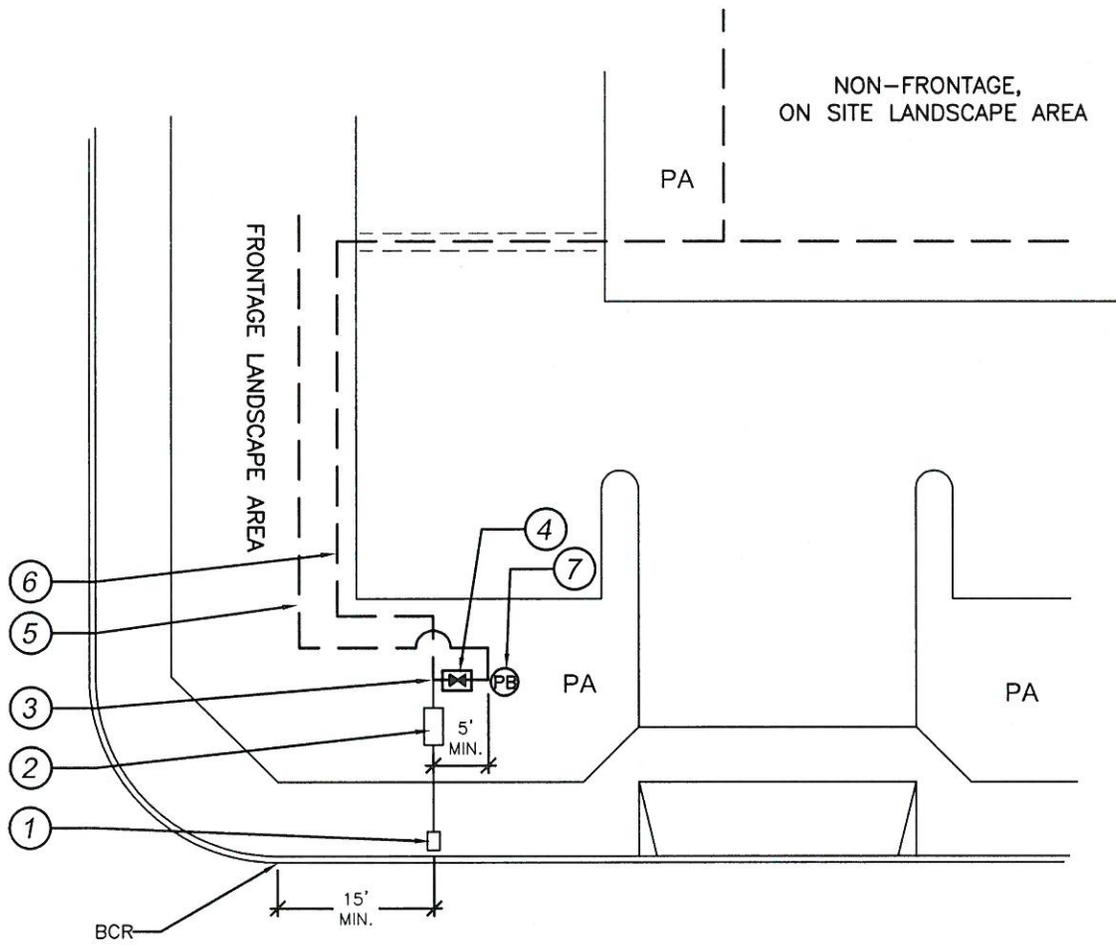


LIMITED LANDSCAPE AREA AND/OR MEDIAN

1. IRRIGATION WATER METER PER EVWD STANDARDS
  2. DOMESTIC WATER METER PER EVWD STANDARDS
  3. IRRIGATION WATER MAIN FROM METER PER STANDARD DETAILS
  4. DOMESTIC WATER FROM METER
  5. IRRIGATION BACKFLOW PREVENTER
  6. IRRIGATION MAINLINE SUPPLY TO SYSTEM
  7. DOMESTIC BACKFLOW PREVENTER
  8. DOMESTIC WATER LINE
  9. STREET CURB
  10. SIDEWALK
- PA =PLANTER AREA

N.T.S

				<h2 style="margin: 0;">CITY OF HIGHLAND</h2>		
Mark	Revision	By	Date	<h3 style="margin: 0;">IRRIGATION METER CONNECTION</h3>		Standard Drawing No.
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer						<h3 style="margin: 0;">401</h3>

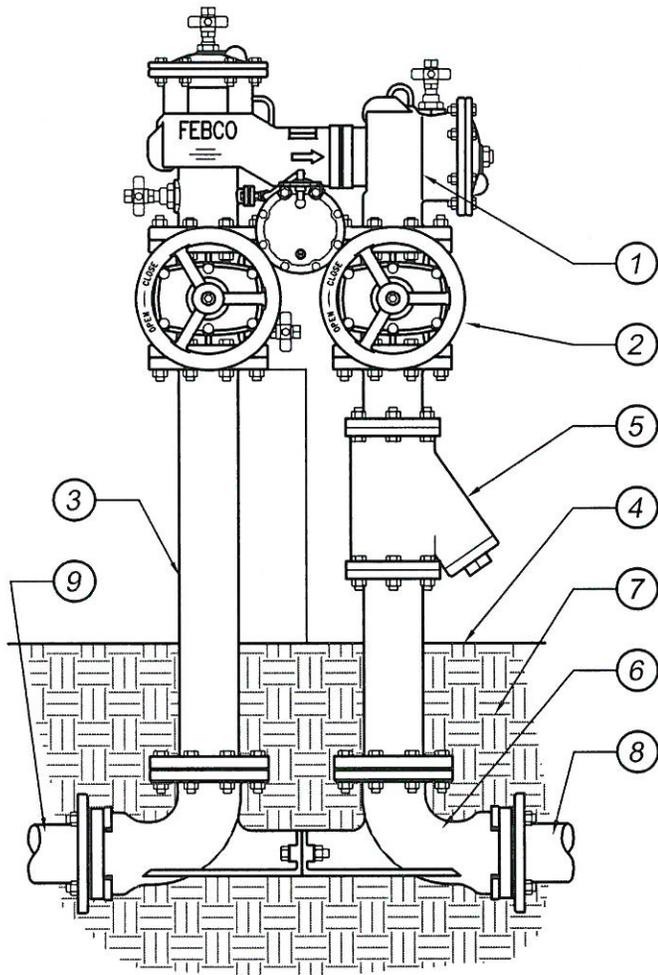


1. IRRIGATION WATER METER PER CITY STANDARD DETAIL 401
2. LANDSCAPE BACKFLOW PREVENTER PER CITY STANDARD DETAIL 401
3. BRANCH IRRIGATION MAINLINE TO SERVE ALL FRONTAGE AREAS SEPARATE FROM ON-SITE LANDSCAPE AREAS.
4. PROVIDE LINE-SIZED BALL VALVE WITHIN VALVE BOX TO ISOLATE FRONTAGE LANDSCAPE IRRIGATION MAINLINE FROM ON-SITE LANDSCAPE IRRIGATION MAINLINE; IN THE EVENT OF THE FUTURE NEED TO ISOLATE THE SHELL LMD FRONTAGE AREA FROM THE REMAINDER OF THE ON-SITE IRRIGATION, FUTURE CONNECTION TO FUTURE SEPARATE FRONTAGE WATER METER TO BE PARALLEL TO AND 5' CLEAR OF ON-SITE WATER METER.
5. FRONTAGE AREA IRRIGATION MAINLINE BRANCH PER PLAN
6. ON-SITE IRRIGATION MAINLINE PER PLAN
7. RUN AND LOOP ALL IRRIGATION CONTROL WIRES SERVING FRONTAGE AREA VALVES TO A PULL BOX LOCATED ADJACENT TO MAINLINE ISOLATION AREA (CALLOUT 4 ABOVE); THIS LOCATION WILL SERVE AS A SPLICE POINT FOR FUTURE SEPARATE IRRIGATION CONTROLLER FOR FRONTAGE-ONLY AREAS IF NECESSARY.

PA =PLANTER AREA

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		IRRIGATION METER AT SHELL LMD	
			Standard Drawing No. <b>401a</b>

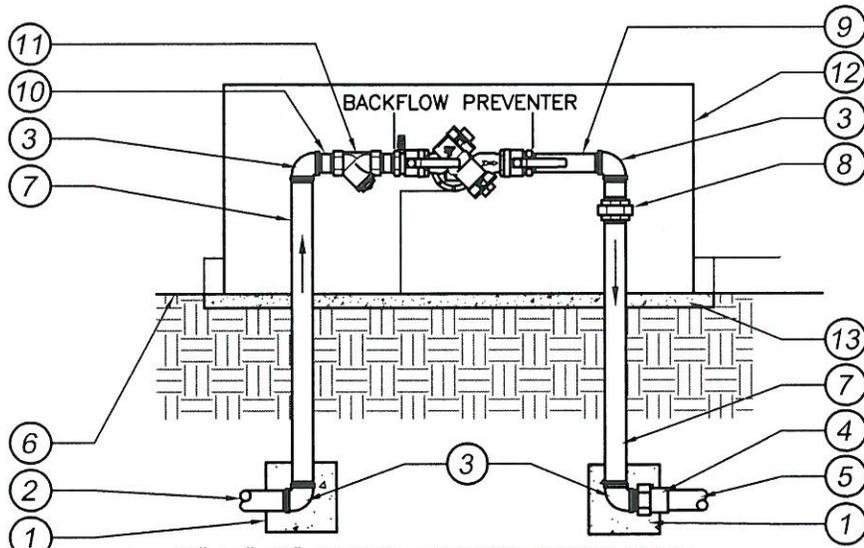


1. FEBCO 880 SERIES REDUCED PRESSURE BACKFLOW PREVENTER (SIZE PER PLAN)
  2. SHUT-OFF VALVE AS SUPPLIED BY MANUFACTURER WITH R/P DEVICE
  3. FLANGED CAST IRON NIPPLE LENGTH AS REQUIRED
  4. FINISH GRADE
  5. WYE STRAINER AS SUPPLIED BY MANUFACTURER
  6. 'VALVE SETTER' BY FEBCO - SIZE PER R/P DEVICE, CONNECTION TYPES AS NECESSARY
  7. NATIVE SOIL - COMPACT AS NECESSARY
  8. MAINLINE FROM POC - ADAPT AS NECESSARY
  9. MAINLINE TO SYSTEM - ADAPT AS NECESSARY
- \* 20" MIN., 36" MAX. OR AS REQUIRED TO ACCESS STRAINER

NOTE: INSTALL BACKFLOW PREVENTER AS REQUIRED BY LOCAL CODES, HEALTH DEPARTMENT STANDARDS, AND MANUFACTURER'S DIRECTIONS. CONTRACTOR SHALL VERIFY LOCAL REQUIREMENTS PRIOR TO INSTALLATION. FINAL BACKFLOW PREVENTER LOCATION TO BE DETERMINED IN THE FIELD. WHERE POSSIBLE, SCREEN BACKFLOW DEVICE WITH SHRUBS.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		BACKFLOW PREVENTER 2-1/2" +	Standard Drawing No.  402

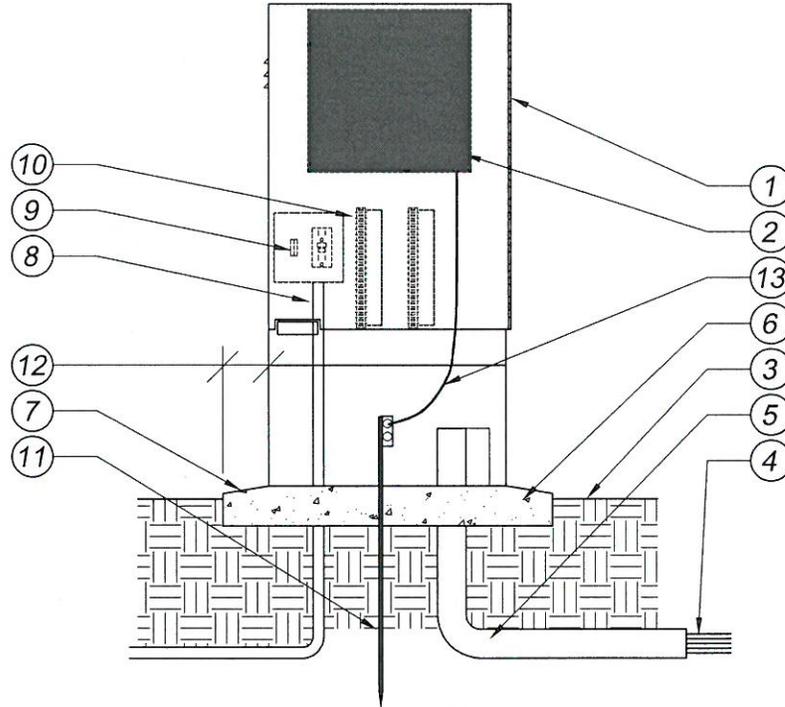


1. 12"x12"x12" MINIMUM CONCRETE THRUST BLOCK
2. TO 'POINT OF CONNECTION' - ADAPT AS NECESSARY
3. BRASS 90 DEGREE ELL - T x T
4. PVC SCH 40 MALE ADAPTER - SIZE AS REQUIRED
5. PVC MAINLINE PER LEGEND - SIZE PER PLAN
6. FINISH GRADE
7. BRASS NIPPLE - T x T - LENGTH AS REQUIRED
8. BRASS UNION - SIZE AS REQUIRED
9. BRASS NIPPLE - T x T - 4" MINIMUM LENGTH
10. BRASS NIPPLE - T x T - 2" MINIMUM LENGTH (TYP. OF 2)
11. BRASS Y-STRAINER - 60 MESH SCREEN W/ HOSE BIB
12. VANDAL RESISTANT ENCLOSURE - MODEL PER LEGEND  
INSTALL PER MANUFACTURER'S REQUIREMENTS
13. INSTALL 4" CONCRETE PAD, EXTEND 6" PAST ENCLOSURE  
\* 12" MINIMUM, 30" MAXIMUM

NOTES:  
 INSTALL BACKFLOW PREVENTER PER LOCAL CODES, HEALTH DEPARTMENT STANDARDS, AND MANUFACTURER'S DIRECTIONS. VERIFY LOCAL REQUIREMENTS PRIOR TO INSTALLATION. WHERE BACKFLOW DEVICE SIZE IS SMALLER THAN MAINLINE, ENTIRE APPARATUS TO BE SIZE OF MAINLINE. BUSH DOWN ONLY AT THE BACKFLOW DEVICE. FINAL LOCATION OF DEVICE TO BE DETERMINED IN THE FIELD. BACKFLOW TO BE LOCATED IN PLANTER AREA AND SCREENED WITH SHRUBS AS POSSIBLE.

N.T.S

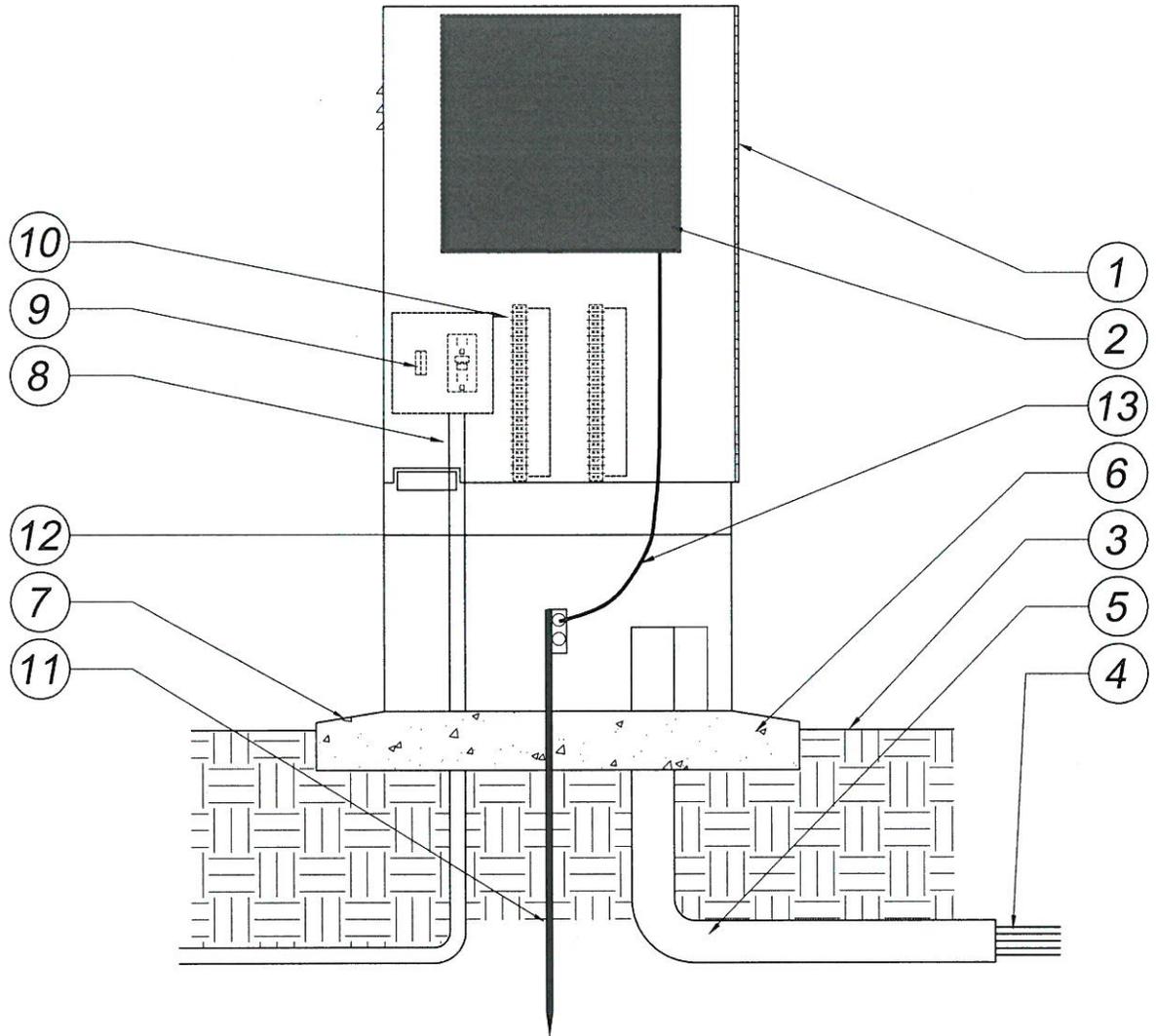
<b>CITY OF HIGHLAND</b>											
<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">△</div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Mark</th> <th style="width: 15%;">Revision</th> <th style="width: 15%;">By</th> <th style="width: 15%;">Date</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	Mark	Revision	By	Date					<p style="margin: 0;">BACKFLOW PREVENTER W/ ENCLOSURE - 3/4" TO 2"</p>	<p style="margin: 0; font-size: small;">Standard Drawing No.</p> <p style="margin: 0; font-size: large;">403</p>
Mark	Revision	By	Date								
<p style="margin: 0;">Approved: <u><i>Ernest Wong</i></u>      Date: <u>9-6-16</u></p> <p style="margin: 0; font-size: small;">Ernest Wong, Public Works Director/City Engineer</p>											



1. CONTROLLER ENCLOSURE PER LEGEND AND/OR NOTES
2. AUTOMATIC CONTROLLER PER LEGEND
3. FINISH GRADE
4. DIRECT BURIAL CONTROL WIRES TO VALVES
5. 3" PVC SWEEP ELL - EXTEND BEYOND EDGE OF BASE
6. 'QUICKPAD' ENCLOSURE MOUNTING PAD PER MFG'S SPECS
7. SLOPE EDGE OF BASE 1% TO DRAIN AWAY FROM ENCLOSURE
8. 120V AC POWER IN CONDUIT
9. 120V ON-OFF SWITCH WITH CONVENIENCE OUTLET
10. TERMINAL STRIPS FOR CONTROL WIRES
11. 5/8" x 5' MIN. LENGTH COPPER GROUNDING ROD
12. EXTEND EDGE OF BASE 6" BEYOND EDGE OF ENCLOSURE
13. GROUND CONTROLLER PER MANUFACTURER
- \* EXTEND 4" ABOVE TOP OF BASE

N.T.S

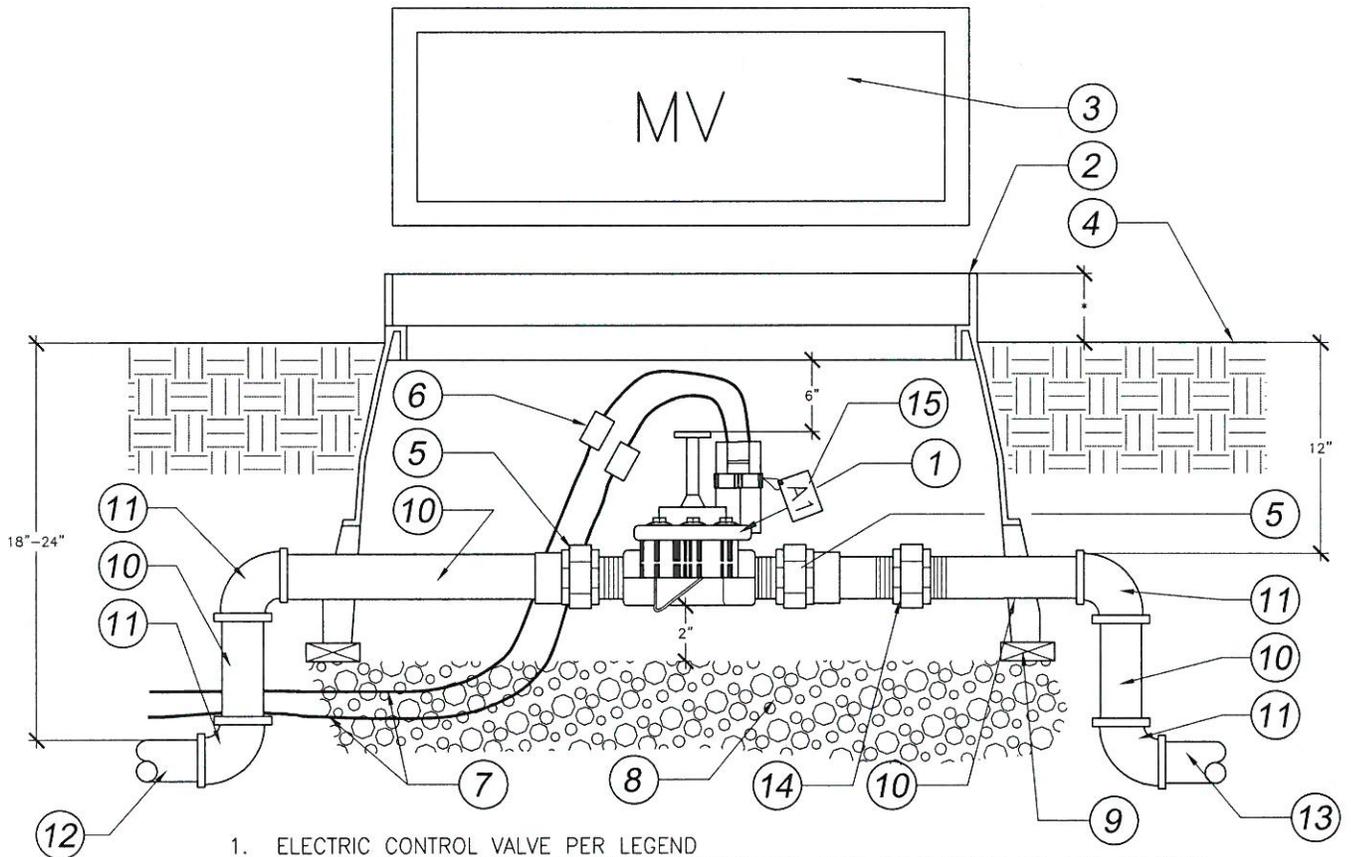
CITY OF HIGHLAND				Standard Drawing No.  404
Mark	Revision	By	Date	
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				IRRIGATION CONTROLLER



1. CONTROLLER ENCLOSURE PER LEGEND AND/OR NOTES
  2. AUTOMATIC CONTROLLER PER LEGEND
  3. FINISH GRADE
  4. DIRECT BURIAL CONTROL WIRES TO VALVES
  5. 3" PVC SWEEP ELL - EXTEND BEYOND EDGE OF BASE
  6. 'QUICKPAD' ENCLOSURE MOUNTING PAD PER MFG'S SPECS
  7. SLOPE EDGE OF BASE 1% TO DRAIN AWAY FROM ENCLOSURE
  8. 120V AC POWER IN CONDUIT
  9. 120V ON-OFF SWITCH WITH CONVENIENCE OUTLET
  10. TERMINAL STRIPS FOR CONTROL WIRES
  11. 5/8" x 5' MIN. LENGTH COPPER GROUNDING ROD
  12. EXTEND EDGE OF BASE 6" BEYOND EDGE OF ENCLOSURE
  13. GROUND CONTROLLER PER MANUFACTURER
- \* EXTEND 4" ABOVE TOP OF BASE

N.T.S

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>405</b>
<b>IRRIGATION CONTROLLER PEDESTAL/METERED ENCLOSURE</b>				
△	Revision	By	Date	
Approved:	<i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer				



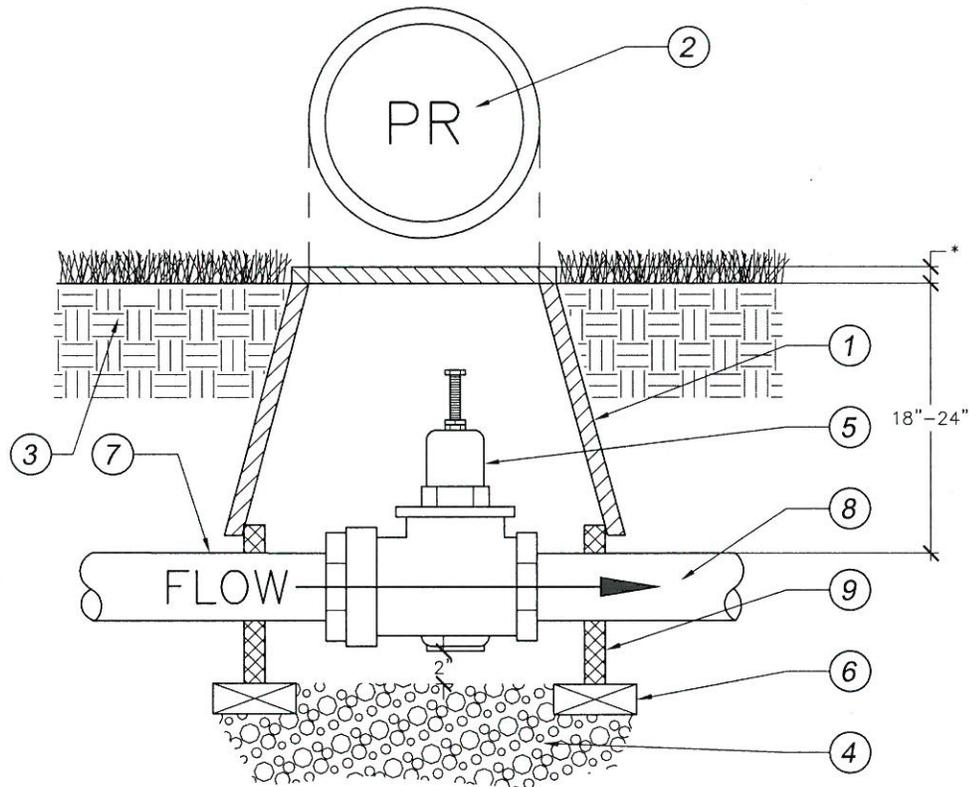
1. ELECTRIC CONTROL VALVE PER LEGEND
2. RECTANGULAR PURPLE NON-POTABLE VALVE BOX WITH BOLT-DOWN LID AND SS BOLT
3. HEAT BRAND "MV" ON LID IN 2" HIGH CHARACTERS
4. FINISH GRADE
5. PVC SCH 40 MALE ADAPTER
6. WATERPROOF WIRE CONNECTION W/3/16" EXPANSION LOOP
7. #14 UF WIRES TO CONTROLLER MASTER VALVE OUTPUT
8. 3/4" CRUSHED ROCK - 6" DEEP
9. COMMON BRICK - 4 REQUIRED
10. PURPLE PVC MAINLINE PER LEGEND - LENGTH AS REQUIRED
11. PVC SCH 40 ELL - SxS
12. MAINLINE PIPING FROM POINT OF CONNECTION
13. MAINLINE PIPING TO CONTROL VALVES
14. PVC UNION - SIZE AS REQUIRED
15. 'CHRISTY'S' NON-POTABLE I.D. TAG OR EQUAL

\* 1/2" IN TURF AREAS, 2" IN SHRUB AREAS  
 NOTE: USE TEFLON PASTE ON ALL MALE PIPE THREADS.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		<b>MASTER VALVE</b>	Standard Drawing No. <b>406</b>

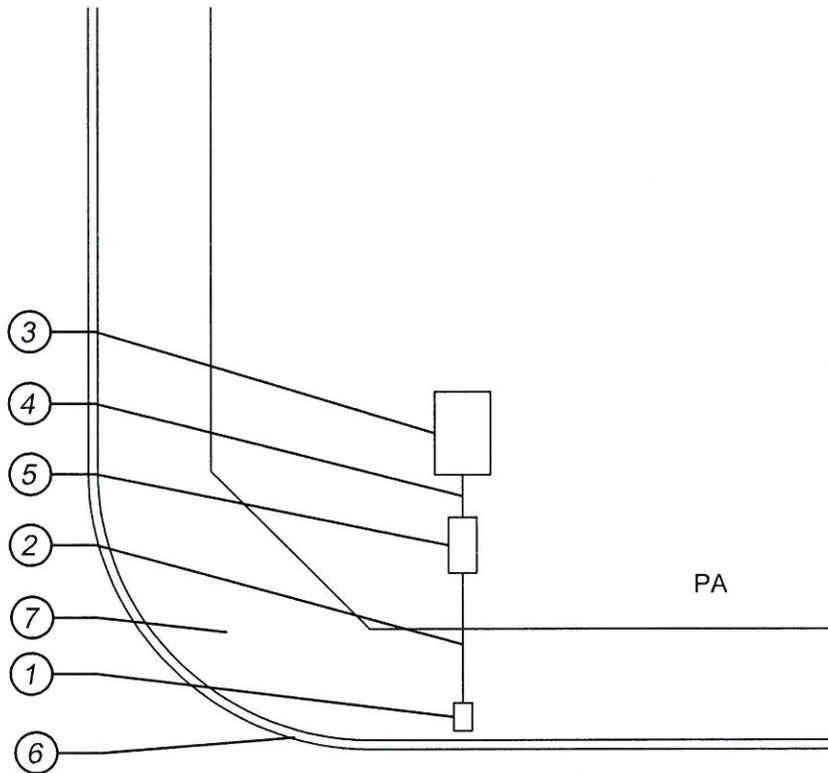




1. 10" ROUND PLASTIC VALVE BOX WITH LOCKING LID AND SS BOLT
  2. HEAT BRAND BRAND "PR" ON LID IN 2" HIGH CHARACTERS
  3. FINISH GRADE
  4. 3/4" CRUSHED ROCK - 4" DEEP
  5. PRESSURE REGULATOR PER LEGEND
  6. COMMON BRICK - 4 REQUIRED
  7. PVC MAINLINE FROM POC - PER LEGEND
  8. PVC MAINLINE TO SYSTEM - PER LEGEND
  9. VALVE BOX EXTENSIONS AS REQUIRED
- \* 1/2" IN TURF AREAS, 2" IN SHRUB AREAS

N.T.S

△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>PRESSURE REGULATOR</b>	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					



1. IRRIGATION WATER METER PER EVWD STANDARDS
2. IRRIGATION WATER MAIN FROM METER PER STANDARD DETAILS
3. IRRIGATION BACKFLOW PREVENTER
4. IRRIGATION MAINLINE SUPPLY TO SYSTEM
5. BOOSTER PUMP
6. STREET CURB
7. SIDEWALK

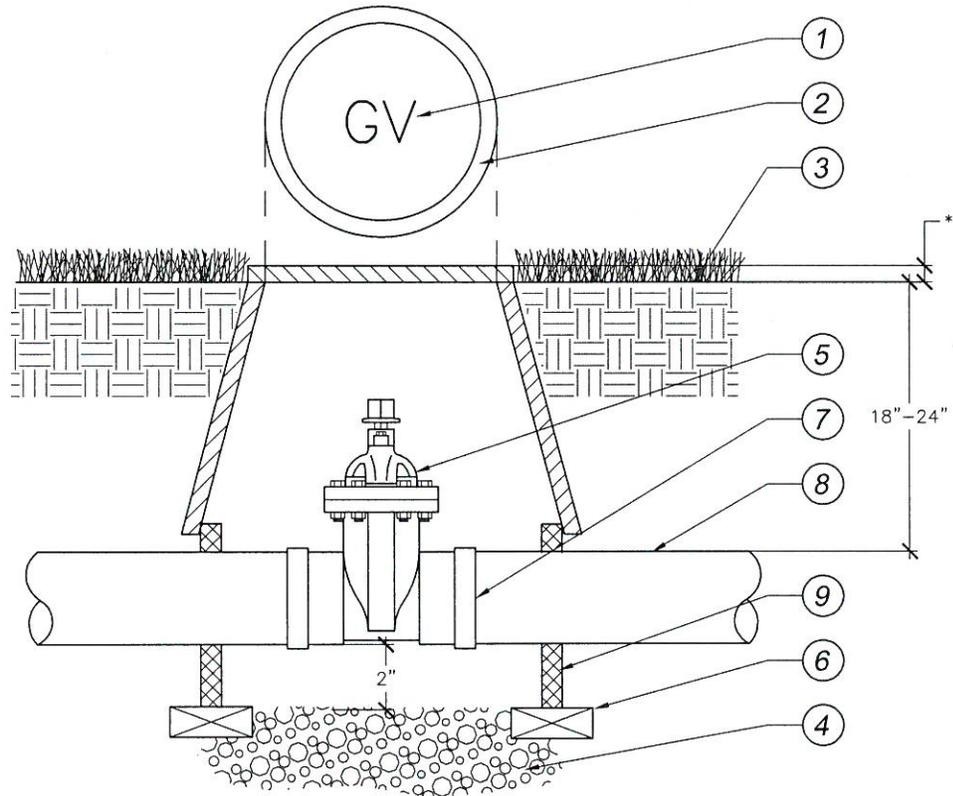
**NOTES:**

- PUMP TO BE EQUIPPED WITH VFD DRIVE
- PUMP TO BE INSTALLED IN A MARINE GRADE ALUMINUM ENCLOSURE WITH RECTANGULAR PUNCH OUTS FOR VIEWING AND HEAT DISSIPATION. ENCLOSURE SHALL BE VANDAL AND WEATHER RESISTANT.
- PUMP TO BE MOUNTED ON STRUCTURAL ALUMINUM SKID WITH MOUNTING FLANGES ON FRONT AND BACK TO ALLOW FOR MOUNTING OF SKID TO CONCRETE PAD
- PUMP CONTROL PANEL SHALL HAVE A NEMA 3R NON-METALLIC ENCLOSURE

PA =PLANTER AREA

N.T.S

<b>CITY OF HIGHLAND</b>				<b>BOOSTER PUMP</b>	Standard Drawing No.  <b>409</b>
△	Revision	By	Date		
Approved:	 Ernest Wong, Public Works Director/City Engineer			Date: <b>9-6-16</b>	

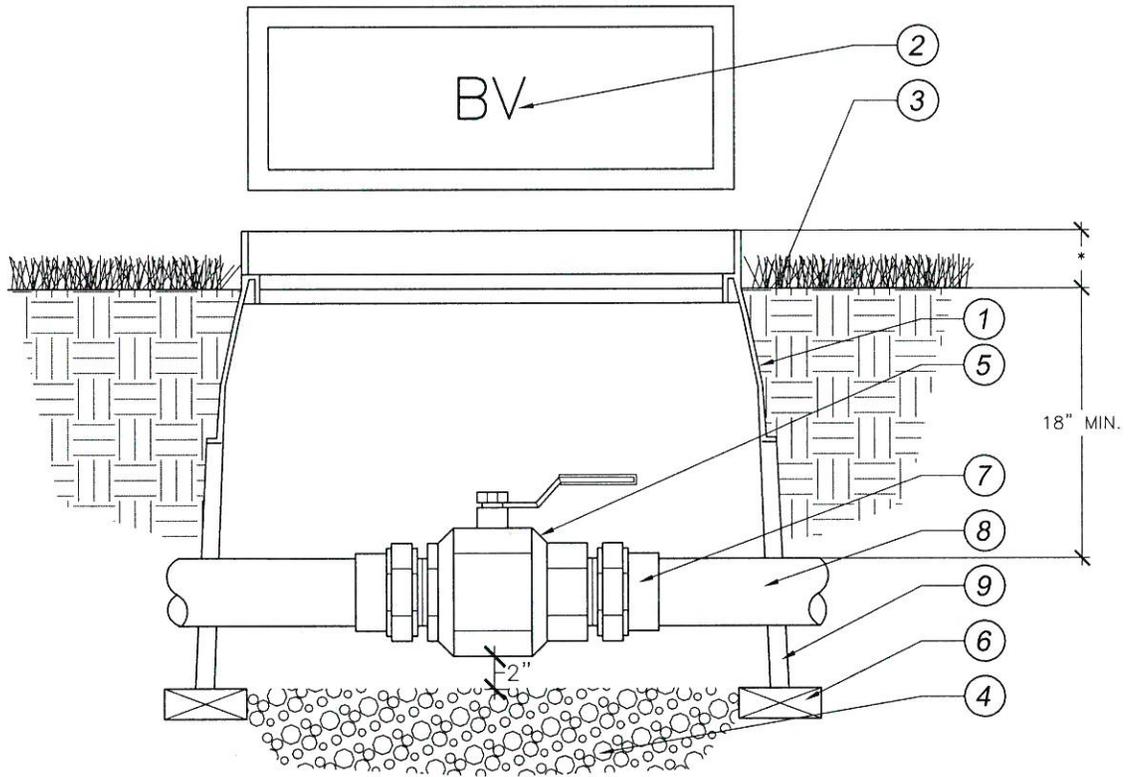


1. ROUND PLASTIC VALVE BOX WITH LOCKING LID AND SS BOLT SIZED AS REQUIRED
2. HEAT BRAND "GV" ON LID IN 2" HIGH CHARACTERS
3. FINISH GRADE
4. 3/4" CRUSHED ROCK - 4" DEEP
5. GATE VALVE PER LEGEND
6. COMMON BRICK - 4 REQUIRED
7. ADAPT TO MAINLINE AS NECESSARY
8. MAINLINE PIPING PER LEGEND
9. VALVE BOX EXTENSIONS AS REQUIRED
- \* 1/2" IN TURF AREAS, 2" IN SHRUB AREAS

NOTES:  
USE TEFLON TAPE ON  
ALL MALE PIPE  
THREADS.

N.T.S

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		GATE VALVE	Standard Drawing No.  410

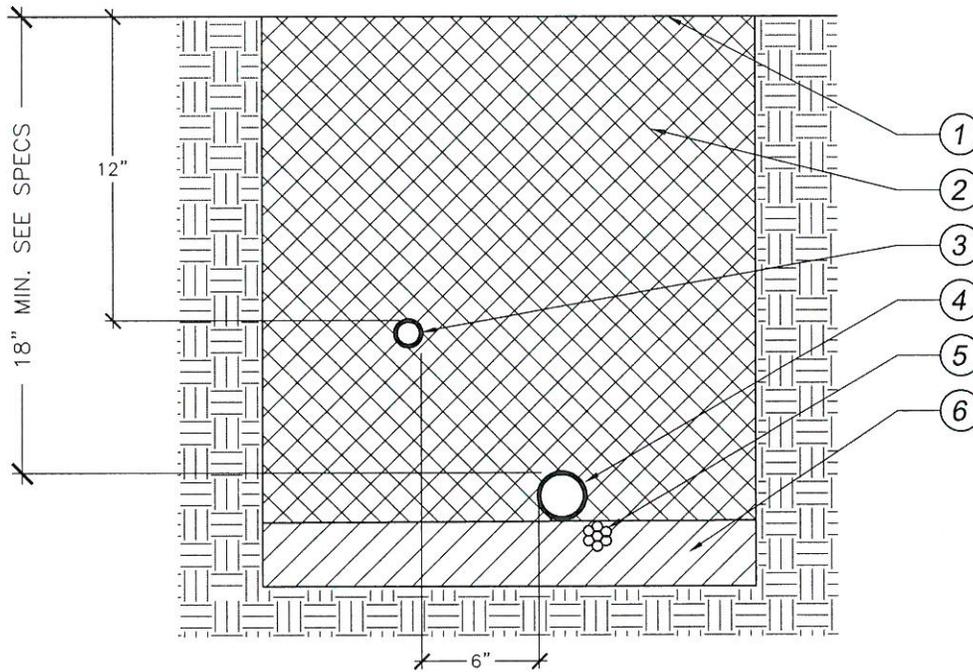


- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. RECTANGULAR VALVE BOX WITH BOLT-DOWN LID AND SS BOLT</li> <li>2. HEAT BRAND "BV" ON LID IN 2" HIGH CHARACTERS</li> <li>3. FINISH GRADE</li> <li>4. 3/4" CRUSHED ROCK - 4" DEPTH</li> <li>5. BALL VALVE PER IRRIGATION PLAN</li> <li>6. COMMON BRICK - 4 REQUIRED</li> <li>7. SCH 40 PVC MALE ADAPTER - 2 REQUIRED</li> <li>8. MAINLINE PIPING PER IRRIGATION PLAN</li> </ol> | <ol style="list-style-type: none"> <li>9. VALVE BOX EXTENSION(S) AS REQUIRED</li> </ol> |
|--|---|

NOTE:  
 USE TEFLON TAPE ON ALL MALE PIPE THREADS.  
 \* 1/2" IN TURF AREAS AND  
 2" IN SHRUB AREAS

N.T.S

△				CITY OF HIGHLAND	
Mark	Revision	By	Date	BALL VALVE	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				Standard Drawing No.	411

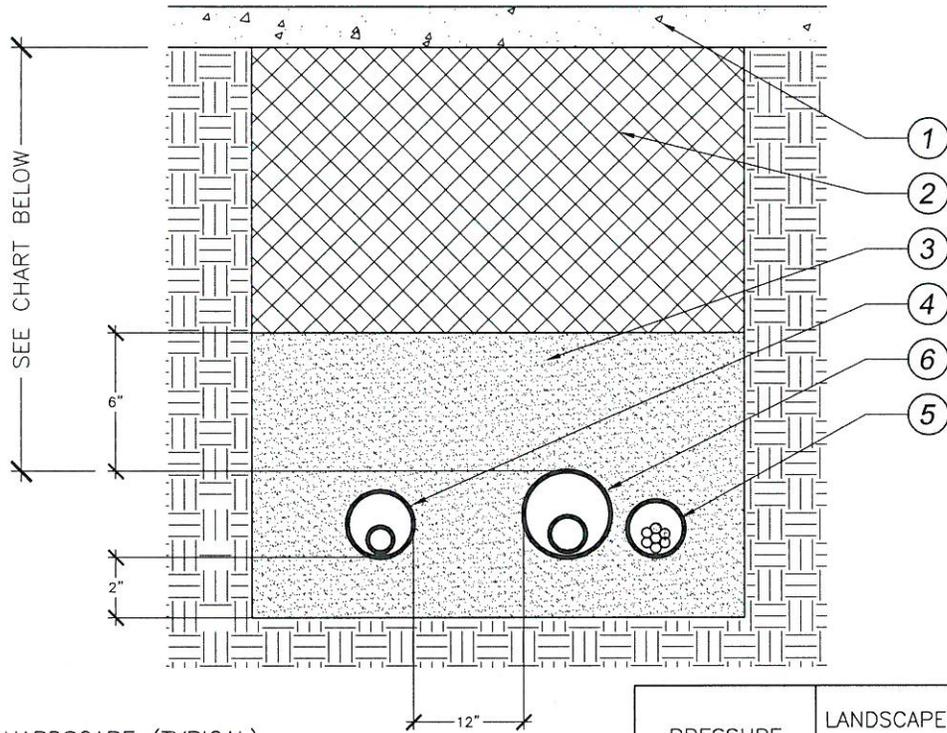


1. FINISH GRADE
2. CLEAN BACKFILL - 90% COMPACTION REQUIRED - SEE SPECS
3. NON-PRESSURE LATERAL LINE PER LEGEND
4. PRESSURE SUPPLY LINE PER LEGEND
5. CONTROL WIRES - INSTALL BELOW PRESSURE SUPPLY LINE
6. PROVIDE 2" OF CLEAN BACKFILL BELOW PRESSURE MAINLINE

NOTES:  
 BUNDLE AND TAPE WIRES AT 12" O.C. PIGTAIL AND LOOP CONTROL WIRES AT ALL 90° CHANGES IN DIRECTION. SPLICING OF WIRE RUNS IS NOT ALLOWED UNLESS APPROVED BY THE CITY. 36" MIN. COVER IS REQUIRED FOR RECLAIMED WATER MAINLINE (WHERE APPLICABLE). INSTALL 1'x1'x1' THRUST BLOCK AT ALL TERMINAL POINTS ON MAINLINE.

N.T.S

CITY OF HIGHLAND			
TRENCHING	Standard Drawing No.	412	
Approved: <i>Ernest Wong</i>	Date: 9-6-16	Ernest Wong, Public Works Director/City Engineer	
Mark	Revision	By	Date



1. HARDSCAPE (TYPICAL)
2. CLEAN BACKFILL - 90% COMPACTION REQUIRED - SEE SPECS
3. SAND (TYPICAL)
4. NON-PRESSURE LATERAL LINE/ SLEEVE (SIZE PER CHART)
5. CONTROL WIRE SLEEVE ADJACENT TO MAINLINE SLEEVE (SIZE PER CHART)
6. PRESSURE SUPPLY LINE / SLEEVE (SIZE PER CHART)

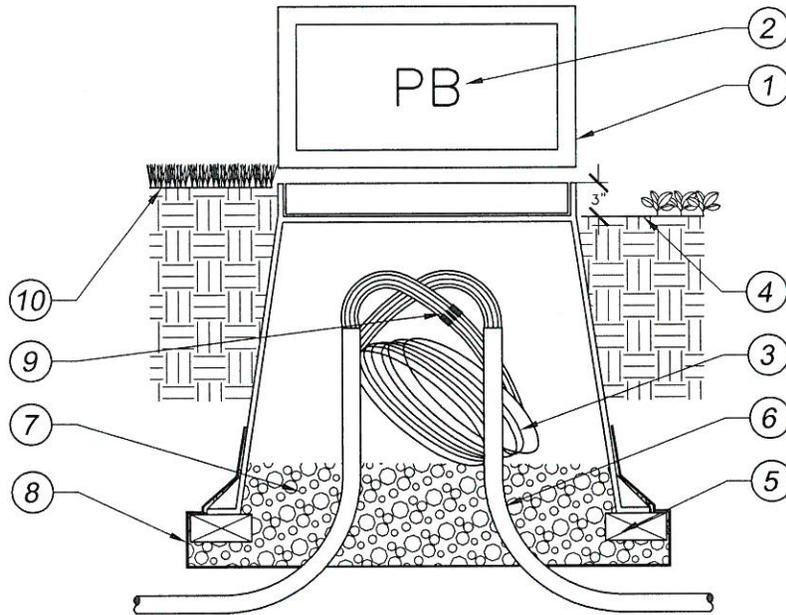
PRESSURE MAINLINE	LANDSCAPE	<3"	24"
	VEHICULAR PAVING	3"+	36"
NON PRESSURE LATERAL	LANDSCAPE	<3"	12"
	VEHICULAR PAVING	3"+	18"
		<3"	24"
		3"+	30"

**NOTES:**

SIZE ALL SLEEVES PER SLEEVING CHART ON PLANS. EXTEND SLEEVES 12" BEYOND EDGE OF HARDSCAPE ON BOTH ENDS. RECLAIMED WATER SLEEVES TO BE A MINIMUM 42"-48" DEEP (OR PER WATER DISTRICT STANDARDS) WHERE APPLICABLE.

N.T.S

△				CITY OF HIGHLAND
Mark	Revision	By	Date	SLEEVING
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				Standard Drawing No.  413

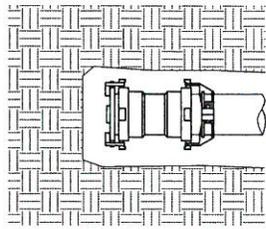


1. PLASTIC RECTANGULAR VALVE BOX WITH BOLT DOWN COVER. USE STAINLESS BOLT, NUT AND WASHER. BOX TO BE PLACED AT RIGHT ANGLE TO HARDSCAPE EDGE.
2. HEAT BRAND 'PB' ONTO LID IN 2" CHARACTERS
3. 36" WIRE EXPANSION LOOP (TYP.)
4. FINISH GRADE IN SHRUB AREAS - 3" BELOW TOP OF BOX
5. COMMON BRICK (4 REQUIRED)
6. PVC ELECTRICAL SWEEP IF INSTALLED IN CONDUIT
7. PEA GRAVEL (3 CU.FT.)
8. LANDSCAPE FABRIC
9. WIRE CONNECTORS
10. FINISH GRADE IN TURF AREAS - 1" BELOW TOP OF BOX

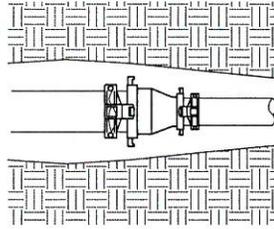
NOTES:  
 ELECTRICAL SWEEPS NOT REQUIRED FOR DIRECT BURIAL INSTALLATION.  
 OPEN ENDS OF ELECTRICAL SWEEPS TO BE SEALED USING APPROVED AEROSOL  
 FOAM PRODUCT.

N.T.S

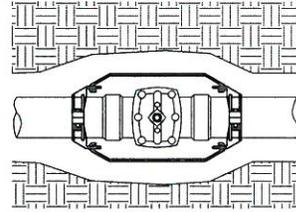
<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		<b>PULL BOX</b>	Standard Drawing No.  <b>414</b>



END CAP OR PLUG



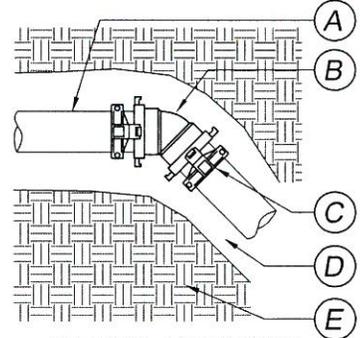
CHANGE LINE SIZE,  
REDUCER



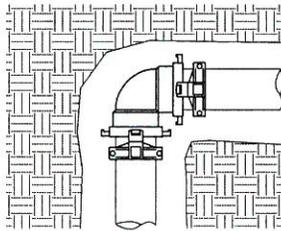
LH SERIES RESTRAINT  
FOR SLIP-ON GATE  
VALVES

DESIGNATED COMPONENTS  
ARE THE SAME IN ALL  
PANELS.

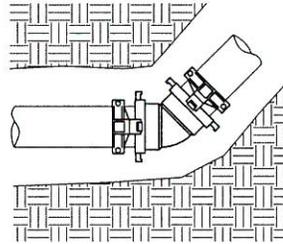
- A. SPECIFIED IRRIGATION PIPE
- B. JOINT FITTING
- C. LH SERIES RESTRAINT
- D. TRENCH AREA
- E. UNDISTURBED SOIL



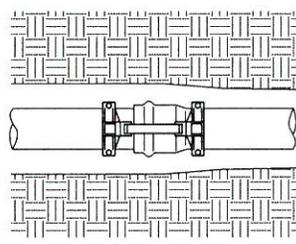
VERTICAL DIRECTIONAL  
CHANGE, 45 ELBOW



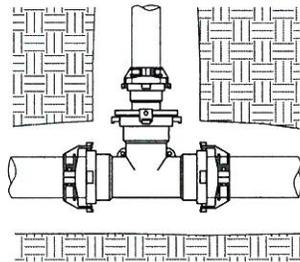
DIRECTIONAL CHANGE,  
90 ELBOW



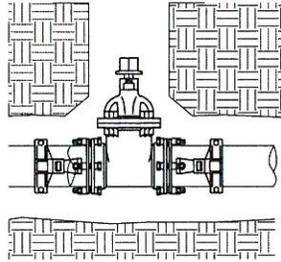
DIRECTIONAL CHANGE,  
45 ELBOW



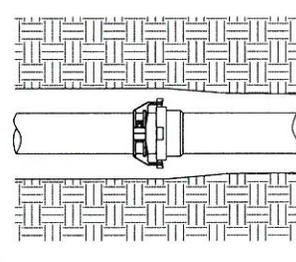
LB SERIES RESTRAINT



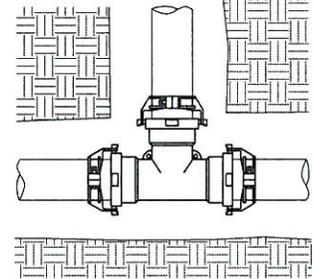
DIRECTIONAL CHANGE,  
TEE USED AS REDUCER



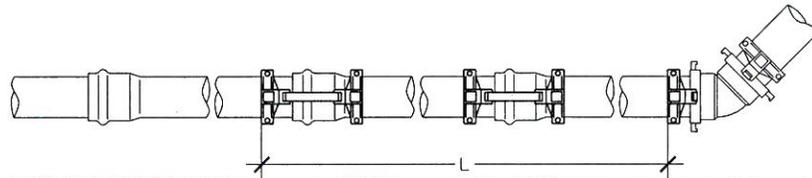
VALVE RESTRAINT



LH SERIES RESTRAINT



THRU LINE CONNECTION,  
TEE



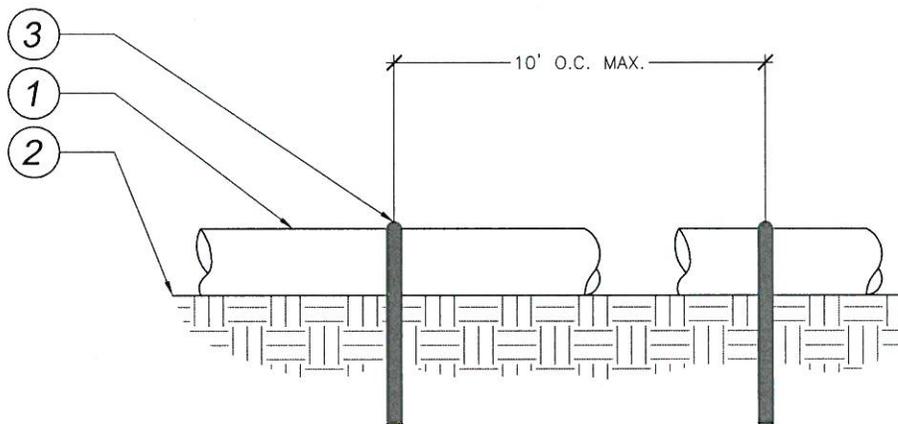
NOTES:  
1D = ONE SIZE DOWN  
(I.E. 4-3, 8-6)  
2D = TWO SIZES DOWN  
(I.E. 6-3, 10-6)  
DE = DEAD END FOR A  
CAP, PLUG OR GATE  
VALVE

PIPE SIZE	MINIMUM RESTRAINED LENGTH (L)						
	BENDS				REDUCTIONS		
	11'	22'	45'	90'	1D	2D	DE
3"	1'	2'	4'	9'	6'	8'	24'
4"	2'	3'	7'	16'	11'	16'	36'
6"	2'	5'	10'	23'	24'	32'	50'
8"	3'	6'	12'	30'	26'	44'	66'
10"	4'	7'	15'	36'	26'	45'	80'
12"	4'	8'	17'	42'	36'	45'	94'

N.T.S

△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: 9-6-16	
Ernest Wong, Public Works Director/City Engineer			

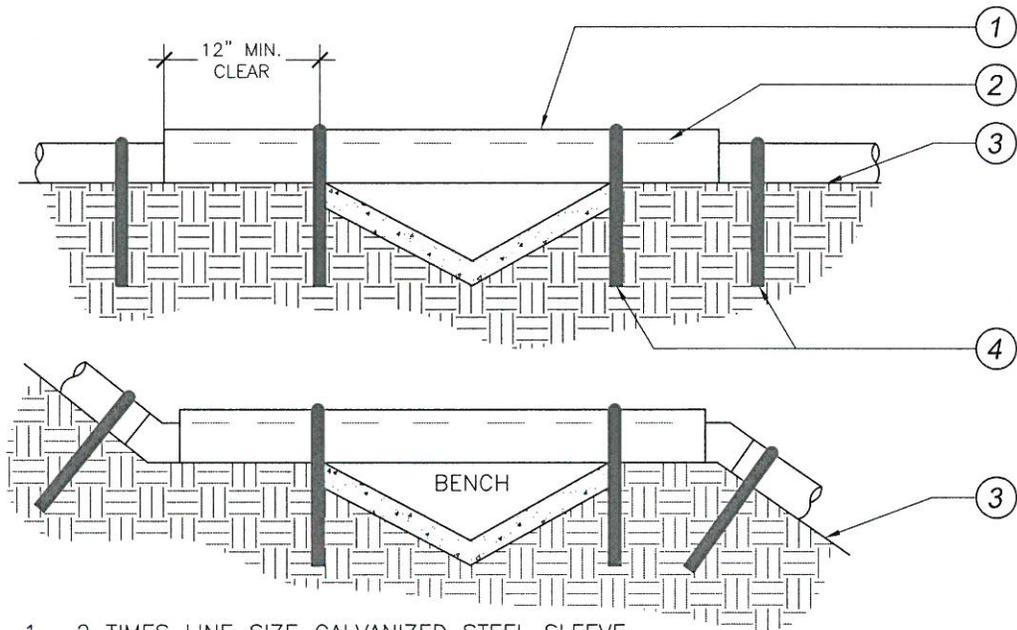
<b>CITY OF HIGHLAND</b>	
<b>JOINT RESTRAINTS</b>	
Standard Drawing No.	415



1. UV RATED PVC PIPE INSTALLED ON GRADE. PIPE TO BE SCH 40 OR AS NOTED IN THE LEGEND.
2. FINISH GRADE
3. #3x24" REBAR STAKE WITH A "J-HOOK" ON ONE END TO SECURE PIPE TO SLOPE. INSTALL AT A MAXIMUM OF 10' O.C. FOR STRAIGHT PIPE RUNS, AND INSTALL AT ALL OF THE FOLLOWING LOCATIONS:
  - a) AT ALL TEES
  - b) AT ALL ELBOWS
  - c) AT ALL HEADS
  - d) AT ALL ATMOSPHERIC VACUUM BREAKERS
  - e) ANY OTHER LOCATION THE PIPE NEEDS TO BE SECURED TO PREVENT THE PIPE FROM "SAGGING" ON THE SLOPE.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <u>Ernest Wong</u>		Date: <u>9-6-16</u>	
Ernest Wong, Public Works Director/City Engineer		<b>BROWNLINE ON-GRADE</b>	Standard Drawing No. <b>416</b>

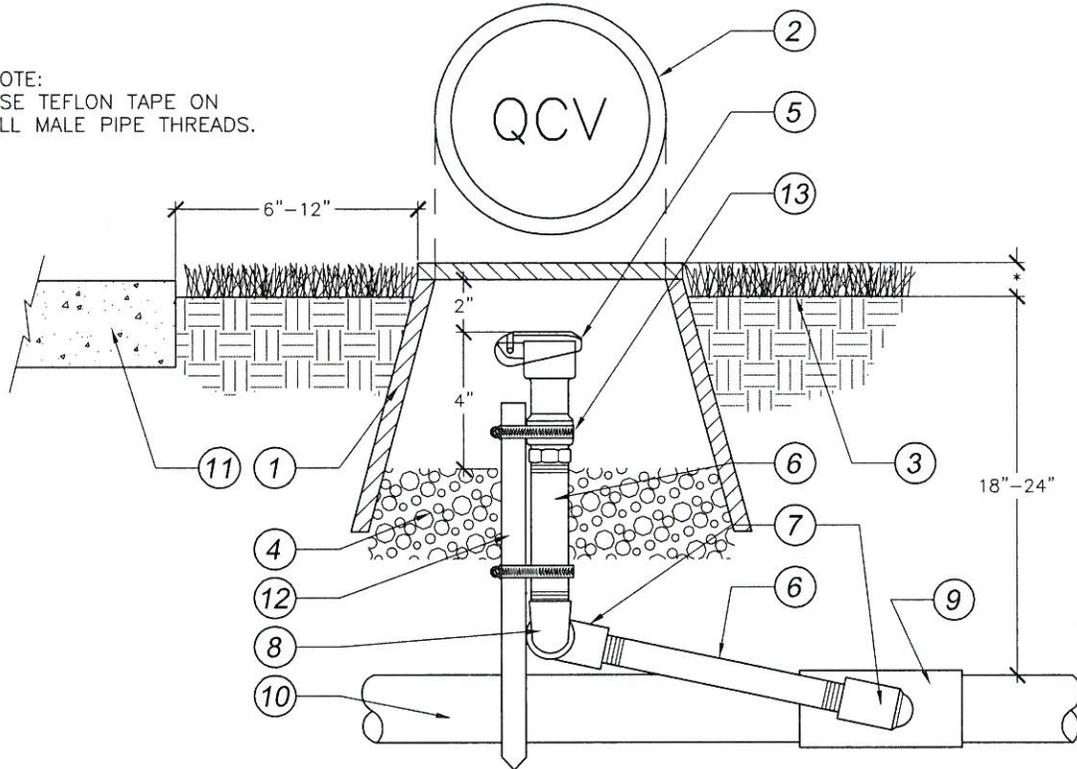


1. 2 TIMES LINE SIZE GALVANIZED STEEL SLEEVE.
2. UV RATED PVC PIPE INSTALLED ON GRADE. PIPE TO BE SCH 40 OR AS NOTED IN THE LEGEND.
3. FINISH GRADE
4. #3x24" REBAR STAKE WITH A "J-HOOK" ON ONE END TO SECURE PIPE TO SLOPE. INSTALL AT A MAXIMUM OF 10' O.C. FOR STRAIGHT PIPE RUNS, AND INSTALL AT ALL OF THE FOLLOWING LOCATIONS:
  - a) AT ALL TEES
  - b) AT ALL ELBOWS
  - c) AT ALL HEADS
  - d) AT ALL ATMOSPHERIC VACUUM BREAKERS
  - e) ANY OTHER LOCATION THE PIPE NEEDS TO BE SECURED TO PREVENT THE PIPE FROM "SAGGING" ON THE SLOPE.

N.T.S

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <u>Ernest Wong</u> Ernest Wong, Public Works Director/City Engineer		Date: <u>9-6-16</u>	Standard Drawing No. <b>417</b>
BROWNLINE ON-GRADE AT V-DITCH			

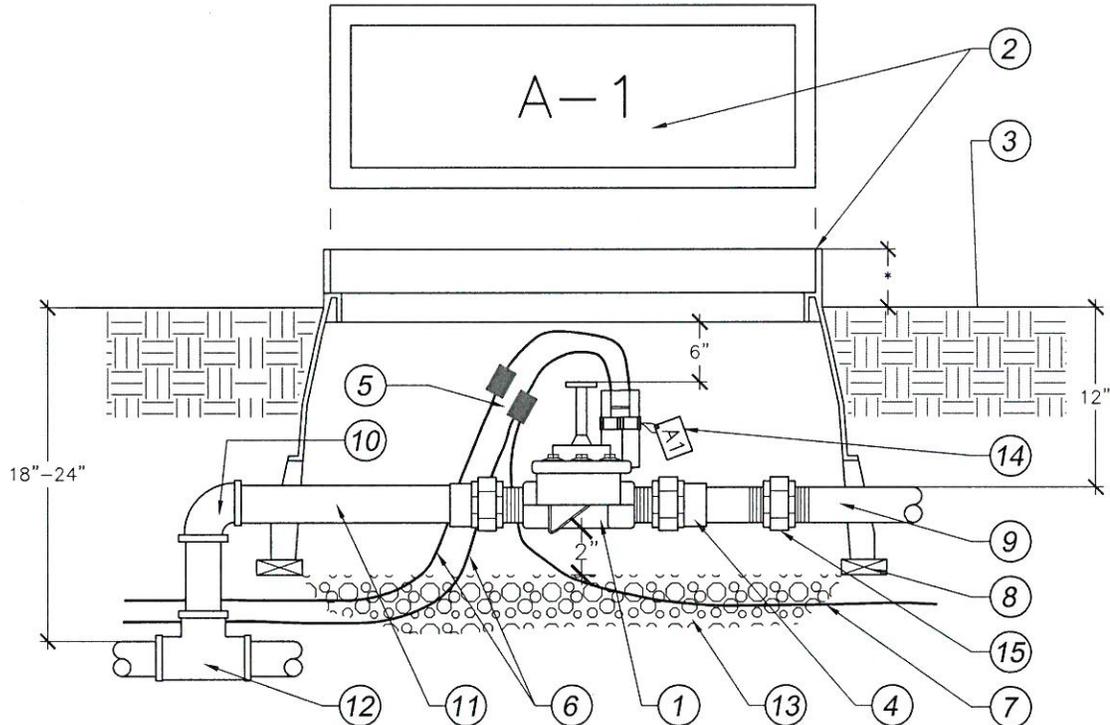
NOTE:  
USE TEFLON TAPE ON  
ALL MALE PIPE THREADS.



1. 10" ROUND PLASTIC VALVE BOX WITH LOCKING LID AND SS BOLT
  2. HEAT BRAND "QCV" ON LID IN 2" HIGH CHARACTERS
  3. FINISH GRADE
  4. 3/4" CRUSHED ROCK 4" DEEP
  5. QUICK COUPLER PER LEGEND
  6. PVC SCH 80 NIPPLE LENGTH AS REQUIRED
  7. PVC SCH 40 STREET ELL - TxT
  8. PVC SCH 40 ELL - TxT
  9. SCH 40 PVC MAINLINE FITTING PER EQUIPMENT LEGEND
  10. PVC SCH 40 MAINLINE PIPING PER EQUIPMENT LEGEND
  11. WALK, CURB, OR WALL, ETC.
  12. #4 REBAR, 18" MINIMUM LENGTH SUPPORT STAKE
  13. STAINLESS STEEL CLAMP - 2 REQ.
- \* 1/2" IN TURF AREAS  
2" IN SHRUB AREAS.

N.T.S

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <u>Ernest Wong</u>		Date: <u>9-6-16</u>	
Ernest Wong, Public Works Director/City Engineer		QUICK COUPLING VALVE	Standard Drawing No. 418

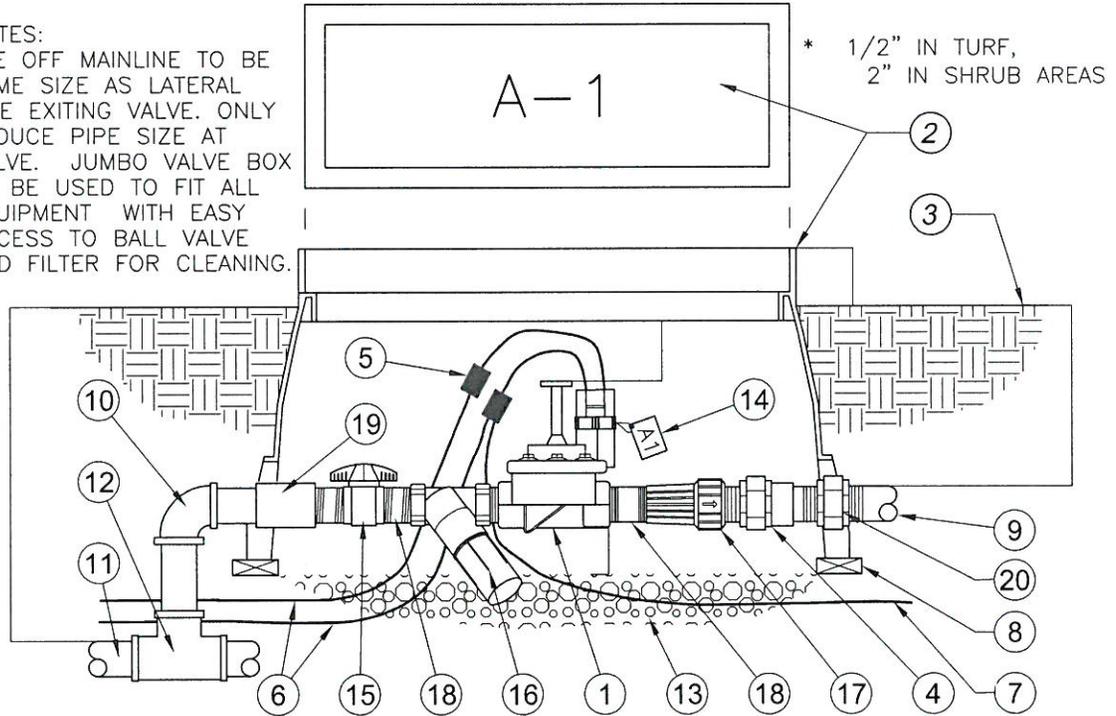


- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. ELECTRIC CONTROL VALVE PER LEGEND</li> <li>2. 12"x18" PLASTIC VALVE BOX WITH BOLT DOWN LID AND SS BOLT - HEAT HEAT BRAND STATION NUMBER ON LID IN 2" HIGH CHARACTERS</li> <li>3. FINISH GRADE</li> <li>4. PVC SCH 40 MALE ADAPTER - SIZE AS REQUIRED - TYP. OF 2</li> <li>5. WATERPROOF WIRE CONNECTOR WITH 36" COILED EXPANSION LOOP</li> <li>6. WIRES FROM CONTROLLER</li> <li>7. COMMON WIRE TO OTHER VALVES ON SAME CONTROLLER</li> </ol> | <ol style="list-style-type: none"> <li>8. COMMON BRICK - 4 REQUIRED</li> <li>9. PVC LATERAL LINE PER LEGEND</li> <li>10. PVC SCH 40 ELL - SxS</li> <li>11. PVC MAINLINE PER LEGEND</li> <li>12. SCH 40 PVC MAINLINE FITTING</li> <li>13. 3/4" DIA. GRAVEL - 6" DEEP</li> <li>14. 'CHRISTY'S' I.D. TAG OR EQUAL</li> <li>15. PVC UNION - SIZE AS REQUIRED</li> </ol> <p>NOTES:<br/>         TEE OFF MAINLINE TO BE SAME SIZE AS LATERAL LINE EXITING VALVE. ONLY REDUCE PIPE SIZE AT VALVE.<br/>         * 1/2" IN TURF, 2" IN PLANTER</p> |
|---|---|

N.T.S

△				CITY OF HIGHLAND	
Mark	Revision	By	Date	REMOTE CONTROL VALVE	
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					

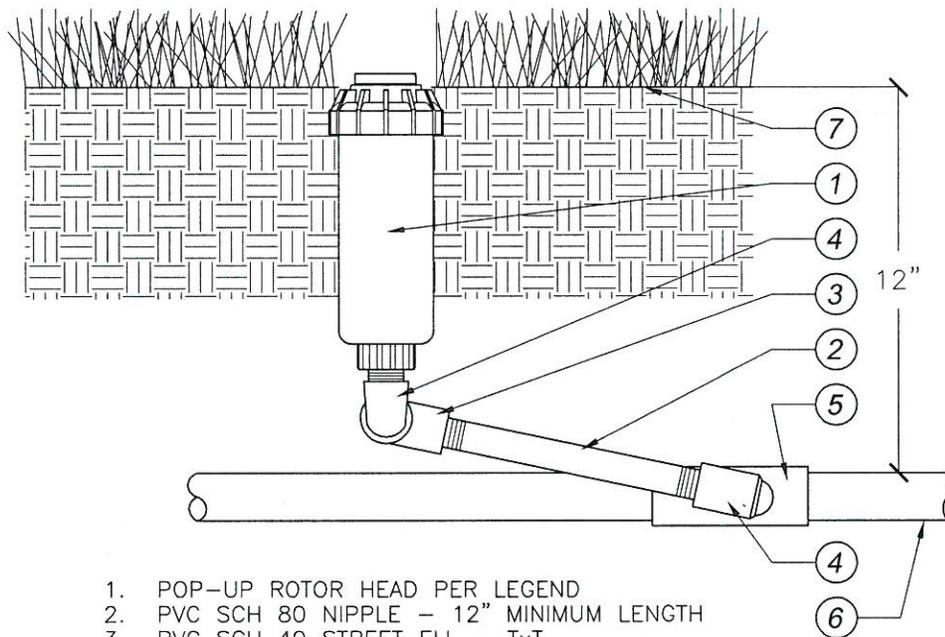
NOTES:  
 TEE OFF MAINLINE TO BE  
 SAME SIZE AS LATERAL  
 LINE EXITING VALVE. ONLY  
 REDUCE PIPE SIZE AT  
 VALVE. JUMBO VALVE BOX  
 TO BE USED TO FIT ALL  
 EQUIPMENT WITH EASY  
 ACCESS TO BALL VALVE  
 AND FILTER FOR CLEANING.



- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. ELECTRIC CONTROL VALVE PER LEGEND</li> <li>2. JUMBO PLASTIC VALVE BOX WITH BOLT DOWN LID AND SS BOLT - HEAT BRAND STATION NUMBER ON LID IN 2" HIGH CHARACTERS</li> <li>3. FINISH GRADE</li> <li>4. PVC SCH 40 MALE ADAPTER</li> <li>5. WATERPROOF WIRE CONNECTOR WITH 36" COILED EXPANSION LOOP</li> <li>6. WIRES FROM CONTROLLER</li> <li>7. COMMON WIRE TO OTHER VALVES ON SAME CONTROLLER</li> <li>8. COMMON BRICK - 4 REQUIRED</li> </ol> | <ol style="list-style-type: none"> <li>9. PVC LATERAL LINE PER LEGEND</li> <li>10. PVC SCH 40 ELL - SxS</li> <li>11. PVC MAINLINE PER LEGEND - TYP</li> <li>12. SCH 40 PVC MAINLINE FITTING</li> <li>13. 3/4" CRUSHED ROCK - 6" DEEP</li> <li>14. 'CHRISTYS' NON-POTABLE I.D. TAG OR EQUAL</li> <li>15. BALL VALVE PER LEGEND</li> <li>16. Y-FILTER PER LEGEND</li> <li>17. PRESSURE REGULATOR PER LEGEND</li> <li>18. SCH 80 PVC NIPPLE - TYP</li> <li>19. SCH 40 PVC FEMALE ADAPTER</li> <li>20. PVC UNION - SIZE AS REQUIRED</li> </ol> |
|---|--|

N.T.S

△				CITY OF HIGHLAND	
Mark	Revision	By	Date	DRIP VALVE FILTER ASSEMBLY	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer					

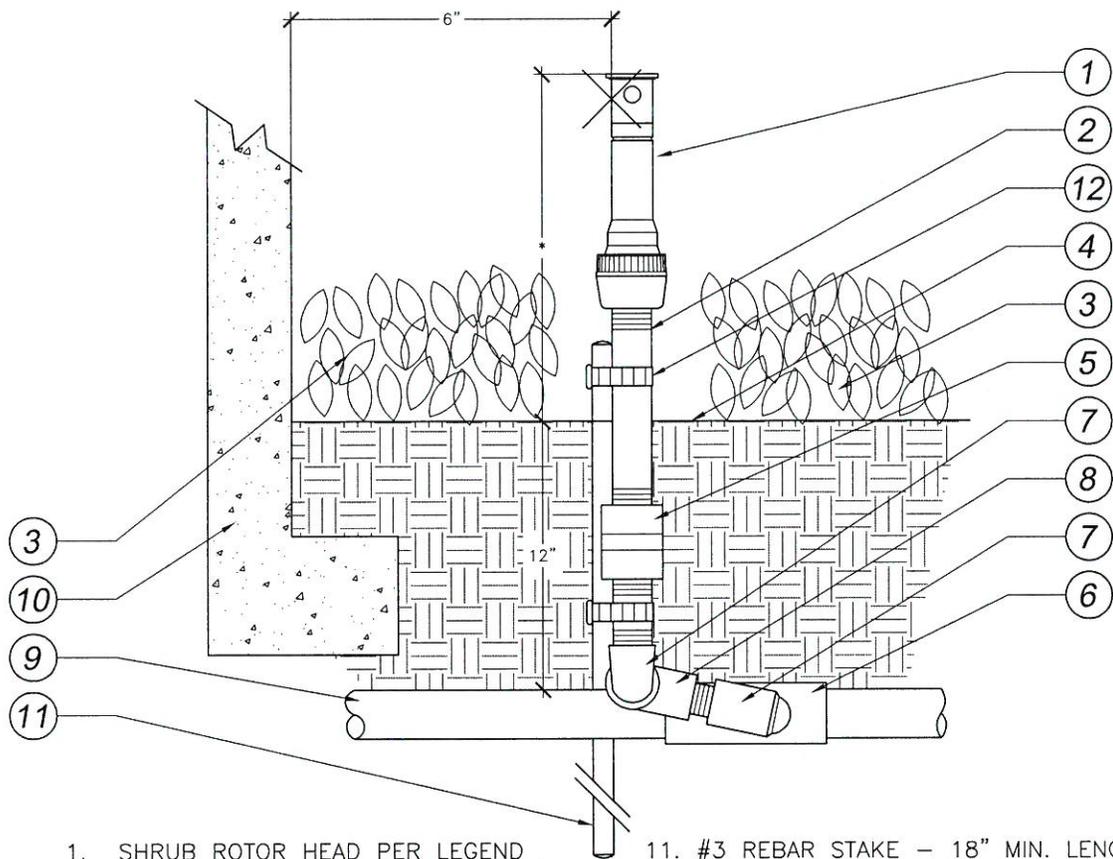


1. POP-UP ROTOR HEAD PER LEGEND
2. PVC SCH 80 NIPPLE - 12" MINIMUM LENGTH
3. PVC SCH 40 STREET ELL - TxT
4. MARLEX STREET ELL - TxT
5. PVC SCH 40 LATERAL LINE FITTING
6. LATERAL LINE PER EQUIPMENT LEGEND
7. FINISH GRADE

NOTES:  
 USE TEFLON TAPE ON ALL MALE PIPE THREADS FOR PVC TO PVC CONNECTIONS. SET PERIMETER HEADS 1"-2" FROM EDGE OF WALK, WALL, OR CURB, ETC. ALL FITTINGS FOR SWING JOINTS MUST BE SAME SIZE AS INLET ON BASE OF HEAD. LATERAL LINE FITTING OUTLET SHALL BE SAME SIZE AS HEAD INLET.

N.T.S

<b>CITY OF HIGHLAND</b>				ROTOR POP-UP	Standard Drawing No.  <b>421</b>
△	Revision	By	Date		
Approved:	<i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer			Date: <b>9-6-16</b>	



1. SHRUB ROTOR HEAD PER LEGEND
2. PVC SCH 80 NIPPLE (TWO NEEDED)  
LENGTH AS REQUIRED
3. SHRUB AND/OR GROUND COVER  
PLANTING
4. FINISH GRADE
5. ANTI-DRAIN VALVE AS REQUIRED
6. PVC SCH 40 LATERAL LINE FITTING
7. MARLEX STREET ELL - TxT
8. PVC SCH 40 STREET ELL - TxT
9. LATERAL LINE PIPING PER LEGEND
10. WALL, FENCE, OR CURB, ETC.

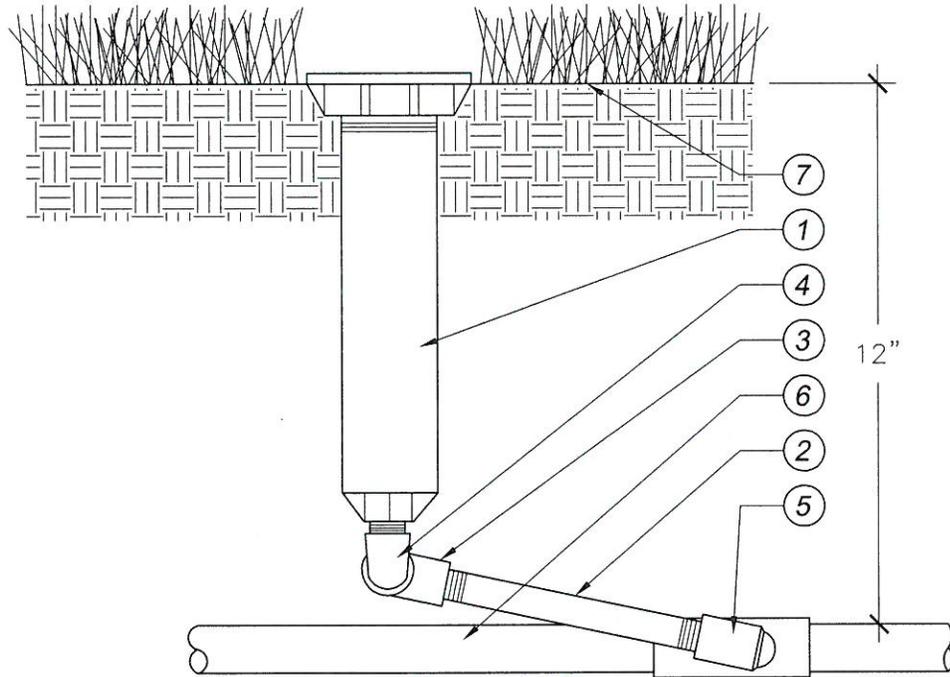
11. #3 REBAR STAKE - 18" MIN. LENGTH
12. STAINLESS STEEL HOSE CLAMP  
(TWO REQUIRED)  
\* 12" MIN. FOR ROTOR HEADS

NOTES:

LOW HEAD DRAINAGE WILL NOT BE ALLOWED. CONTRACTOR TO INSTALL ANTI-DRAIN VALVES ON ALL HEADS THAT SHOW DRAINAGE AFTER VALVE IS SHUT OFF. THIS SHALL BE INCLUDED AT NO ADDITIONAL COST TO OWNER.

N.T.S

<b>CITY OF HIGHLAND</b>				ROTOR FIXED	Standard Drawing No.  422
△	Revision	By	Date		
Approved:	 Ernest Wong, Public Works Director/City Engineer			Date: 7-6-16	

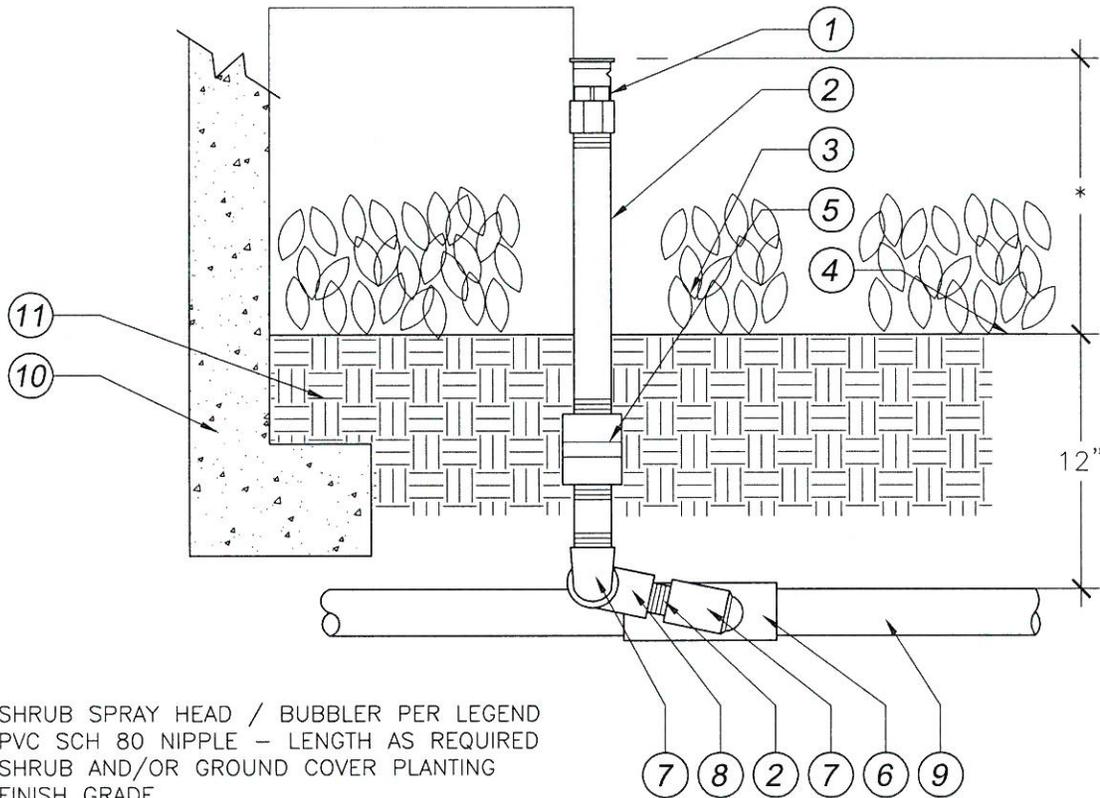


1. POP-UP SPRAY HEAD PER LEGEND
2. PVC SCH 80 NIPPLE - 12" MINIMUM LENGTH
3. PVC SCH 40 STREET ELL - T x T
4. MARLEX STREET ELL - T x T
5. PVC SCH 40 LATERAL LINE FITTING
6. LATERAL LINE PER EQUIPMENT LEGEND
7. FINISH GRADE

NOTES:  
 USE TEFLON TAPE ON ALL MALE PIPE THREADS FOR PVC TO PVC CONNECTIONS. SET PERIMETER HEADS 1"-2" FROM EDGE OF WALK, WALL, OR CURB, ETC. ALL FITTINGS FOR SWING JOINTS MUST BE SAME SIZE AS INLET ON BASE OF HEAD. LATERAL LINE FITTING OUTLET SHALL BE SAME SIZE AS HEAD INLET.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <u>Ernest Wong</u> Ernest Wong, Public Works Director/City Engineer		Date: <u>9-6-16</u>	<b>ROTATORY SPRAY POP-UP</b>
			Standard Drawing No. <b>423</b>

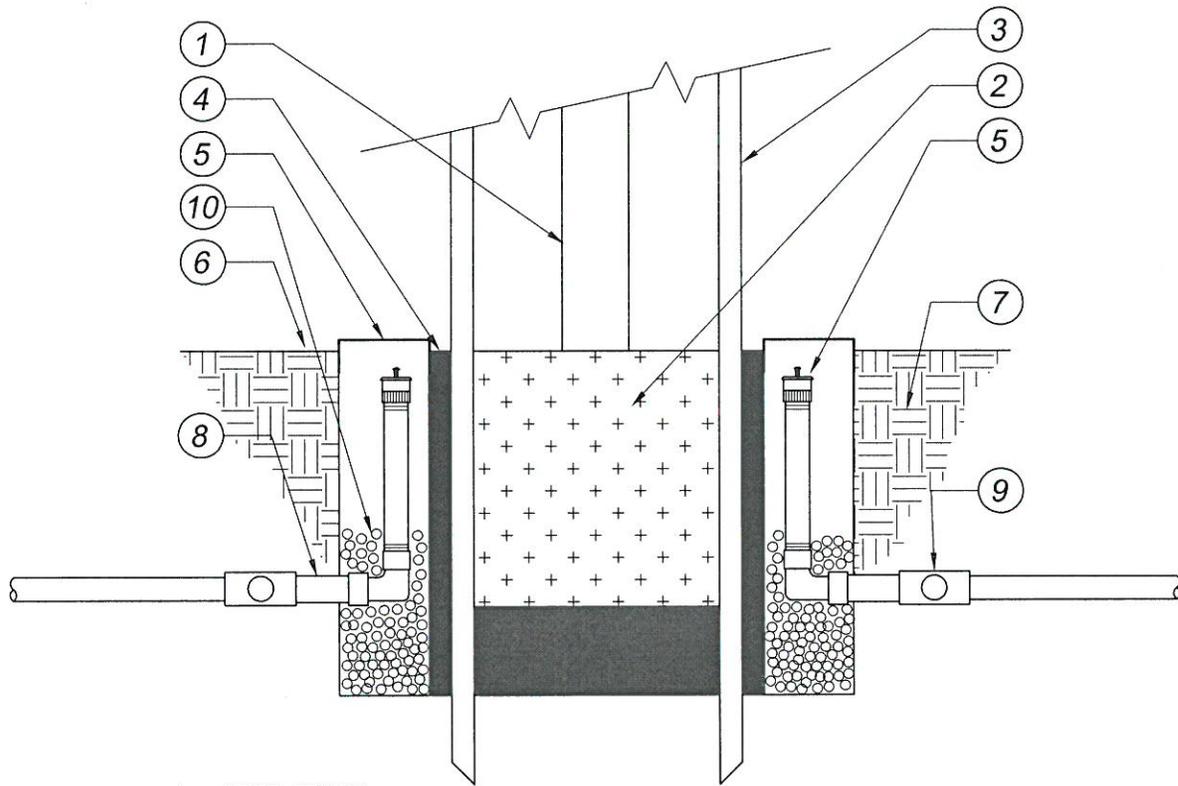


1. SHRUB SPRAY HEAD / BUBBLER PER LEGEND
  2. PVC SCH 80 NIPPLE - LENGTH AS REQUIRED
  3. SHRUB AND/OR GROUND COVER PLANTING
  4. FINISH GRADE
  5. ANTI-DRAIN VALVE AS REQUIRED
  6. PVC SCH 40 LATERAL LINE FITTING
  7. MARLEX STREET ELL - TxT
  8. PVC SCH 40 STREET ELL - TxT
  9. LATERAL LINE PIPING PER LEGEND
  10. WALL, FENCE, OR CURB, ETC.
  11. NATIVE SOIL
- \* 12" ABOVE FINISH GRADE FOR SHRUB HEADS  
3" ABOVE FINISH GRADE FOR BUBBLERS

NOTES:  
LOW HEAD DRAINAGE WILL NOT BE ALLOWED. CONTRACTOR TO INSTALL ANTI-DRAIN CHECK VALVES ON ALL HEADS THAT SHOW DRAINAGE AFTER THE VALVE IS SHUT OFF. THIS SHALL BE INCLUDED AT NO ADDITIONAL COST TO THE OWNER.

N.T.S

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		ROTARY SPRAY FIXED	Standard Drawing No.  424

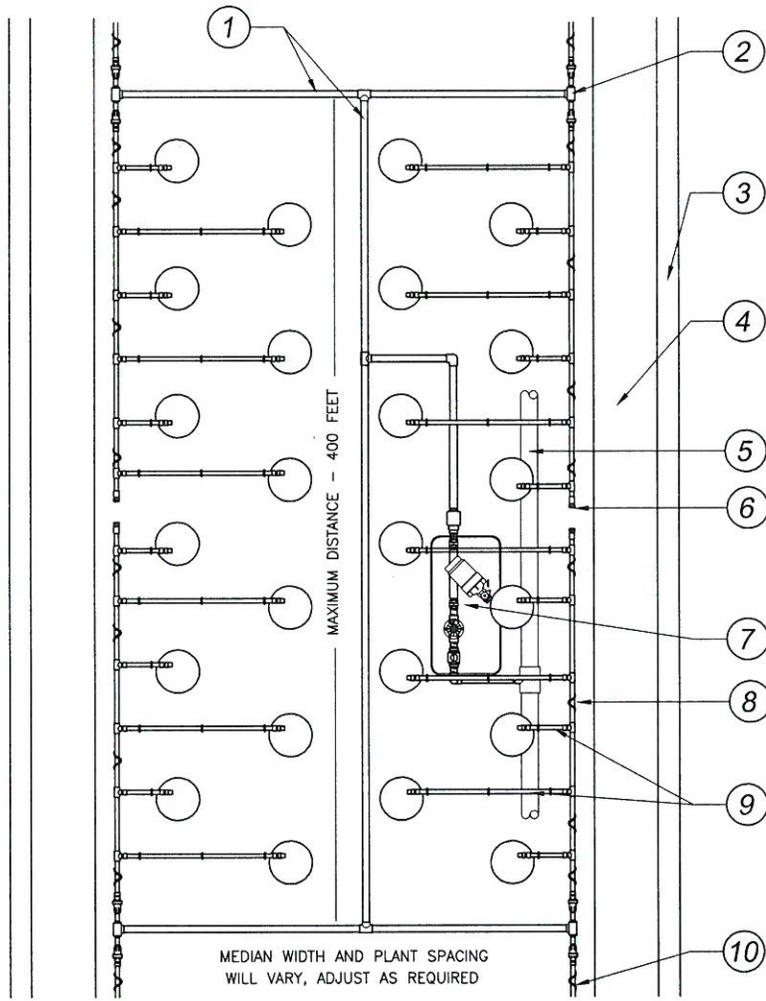


1. TREE TRUNK
2. TREE ROOTBALL
3. 3" LODGE POLE PINE STAKES PER PLANTING PLAN
4. PLANT BACKFILL PER PLANTING PLAN
5. BUBBLER ASSEMBLY PER IRRIGATION LEGEND
6. FINISH GRADE
7. UNDISTURBED NATIVE SOIL
8. 1/2" CLASS 315 PVC LATERAL LINE
9. SCH 40 PVC TEE AROUND PLANTING PIT
10. PEA GRAVEL INBASE OF DRAIN PIPE

\* INSTALL ASSEMBLY WITH CAP FLUSH TO GRADE

N.T.S

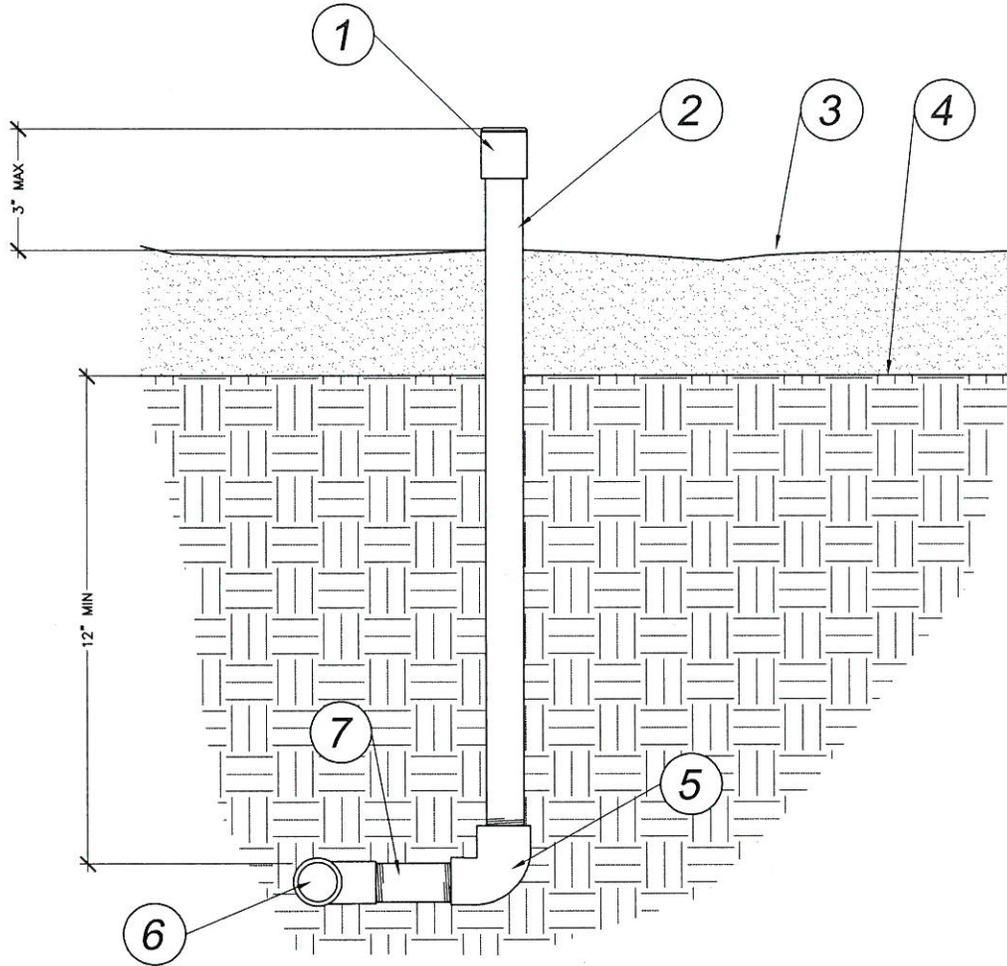
CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer		Date: <i>9-6-16</i>	
TREE ROOT WATERING SYSTEM			Standard Drawing No. 425



1. BURIED SCH. 40 PVC SUBMAIN
2. UVR PVC SST TEE, ON GRADE, TRANSITION UP FROM BURIED PVC SUBMAIN
3. MEDIAN CURB PER PLAN.
4. MAINTENANCE STRIP PER PLAN.
5. BURIED PVC IRRIGATION MAINLINE 18" FROM EDGE OF CONCRETE.
6. FLUSH VALVE PER FLUSH VALVE DETAIL.
7. DRIP REMOTE CONTROL VALVE WITH WYE FILTER AND PRESSURE REGULATOR PER IRRIGATION LEGEND.
8. SCH. 40 PVC LATERAL ON GRADE WITH V.I.T. PS18 PIPE STABILIZERS AT MAX. 6' O.C.
9. DRIP EMITTER ASSEMBLY PER DRIP EMITTER DETAIL.
10. DRIP SYSTEM AND LATERAL PIPING MAY EXTEND NO MORE THAN 200' PAST BURIED PVC CROSS LATERAL. THE TOTAL LENGTH OF ANY ONE DRIP SYSTEM SHALL BE NO MORE THAN 800'.

N.T.S

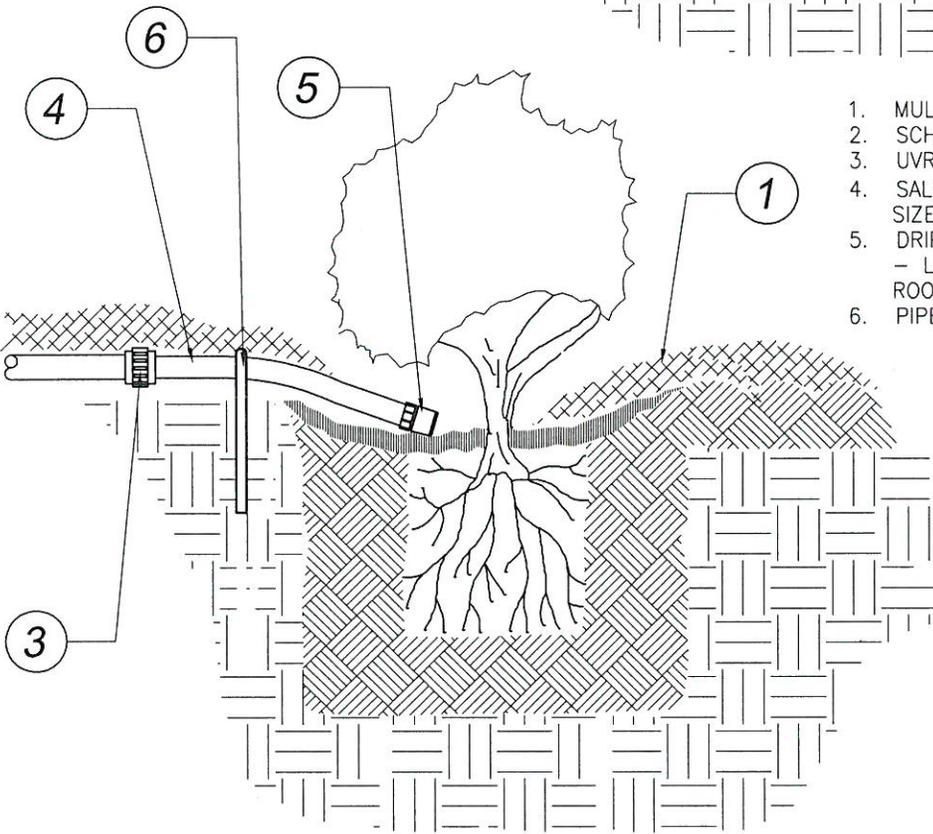
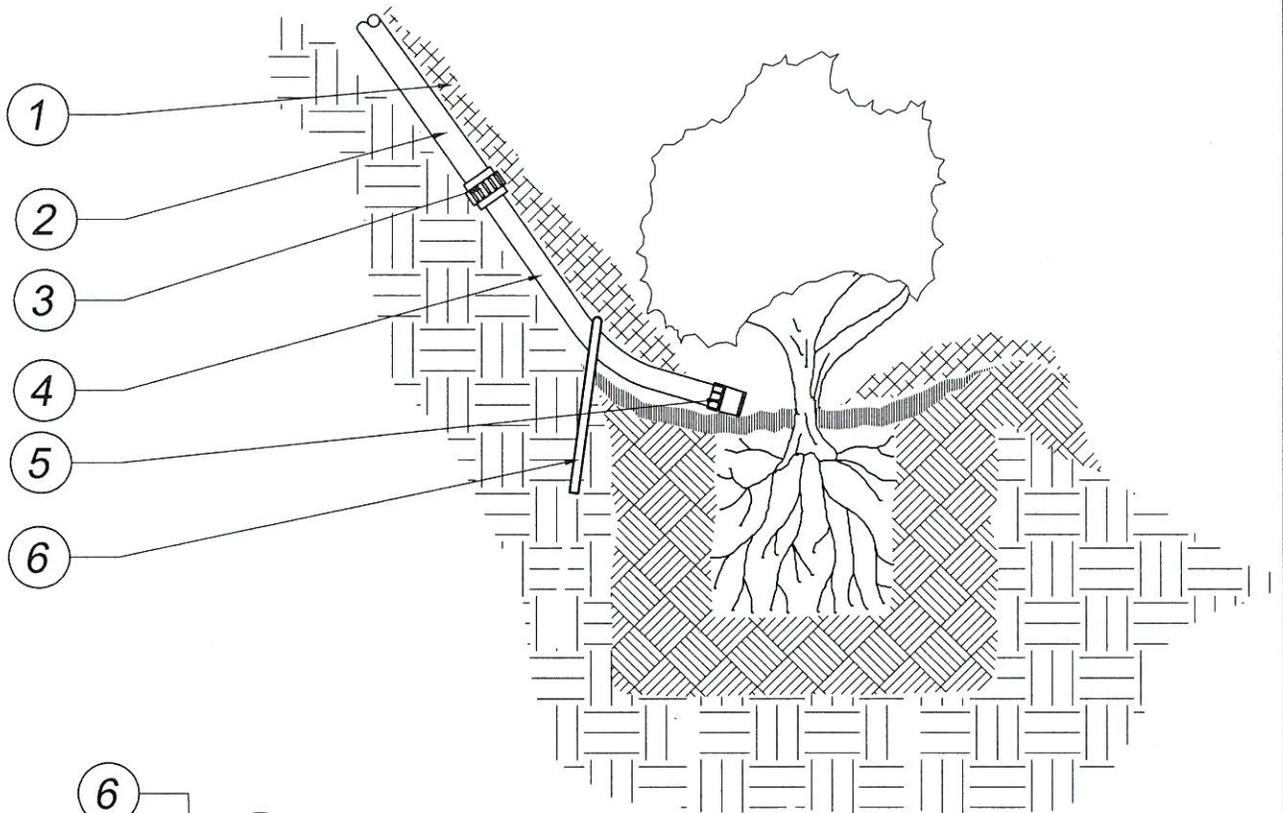
△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>POINT-TO-POINT DRIP LAYOUT</b>	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				Standard Drawing No.	<b>426</b>



1. DRIP EMITTER PER IRRIGATION LEGEND
2. GIH18 18" RISER ASSEMBLY
3. MULCH PER PLAN
4. FINISH GRADE
5. SCHEDULE 40 PVC ELBOW, TXT
6. PVC TEE SCH. 40 OR ELBOW LINE SIZE
7. SCHEDULE 80 PVC NIPPLE, TXT, MAXIMUM 24" LENGTH..

N.T.S

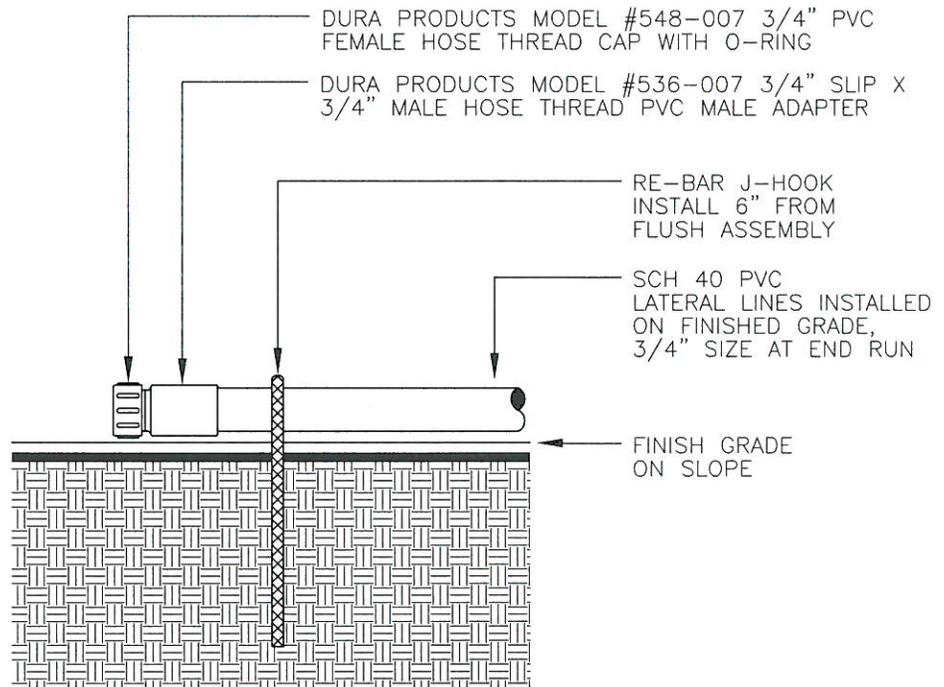
△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	POINT-TO-POINT DRIP GPH ASSEMBLY	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				Standard Drawing No.	427



1. MULCH PER PLANTING PLAN
2. SCH. 40 PVC PIPE
3. UVR FEMALE ADAPTER
4. SALCO 1/2" IPS FLEX PVC RISER - SIZE AS NEEDED.
5. DRIP EMITTER PER IRRIGATION LEGEND - LOCATE AT REAR OF PLANT ROOTBALL WHERE APPLICABLE.
6. PIPE STAKE PER MEDIAN DRIP LAYOUT.

N.T.S

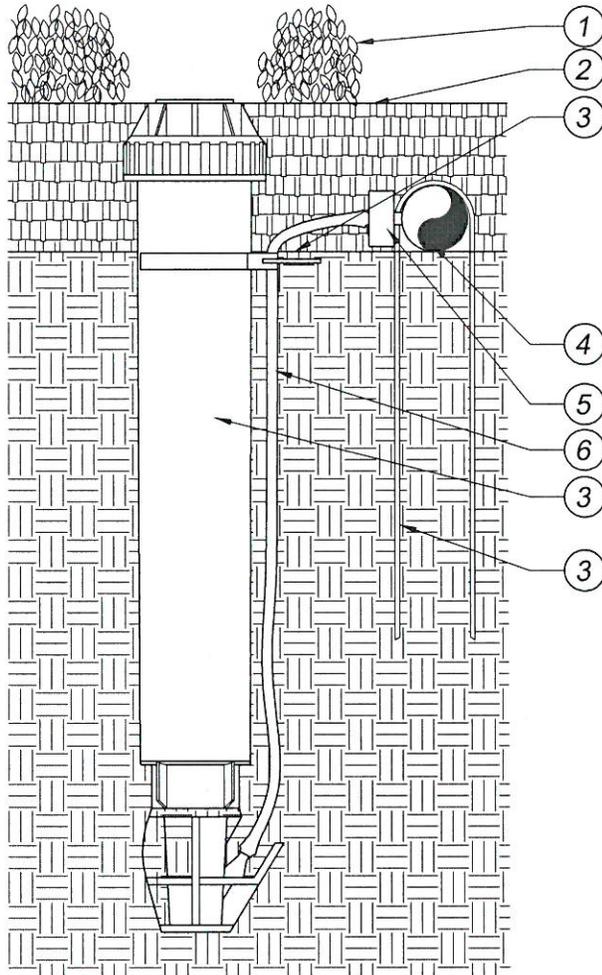
				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>POINT-TO-POINT DRIP EMITTER</b>	
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer			Date: <i>9-6-16</i>		



NOTE:  
 FLUSH CAP TO REMAIN IN PLACE UNLESS FLUSHING DRIP LATERAL LINES.  
 A HOSE SHALL BE ATTACHED TO MHT MALE ADAPTER WHENEVER FLUSHING OF LINES IS PERFORMED TO PREVENT EROSION OF SLOPE MATERIALS.  
 ALL FLUSH VALVES MUST BE LISTED ON AS-BUILTS

N.T.S

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>429</b>
<b>POINT-TO-POINT FLUSH VALVE</b>				
△				
Mark	Revision	By	Date	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				

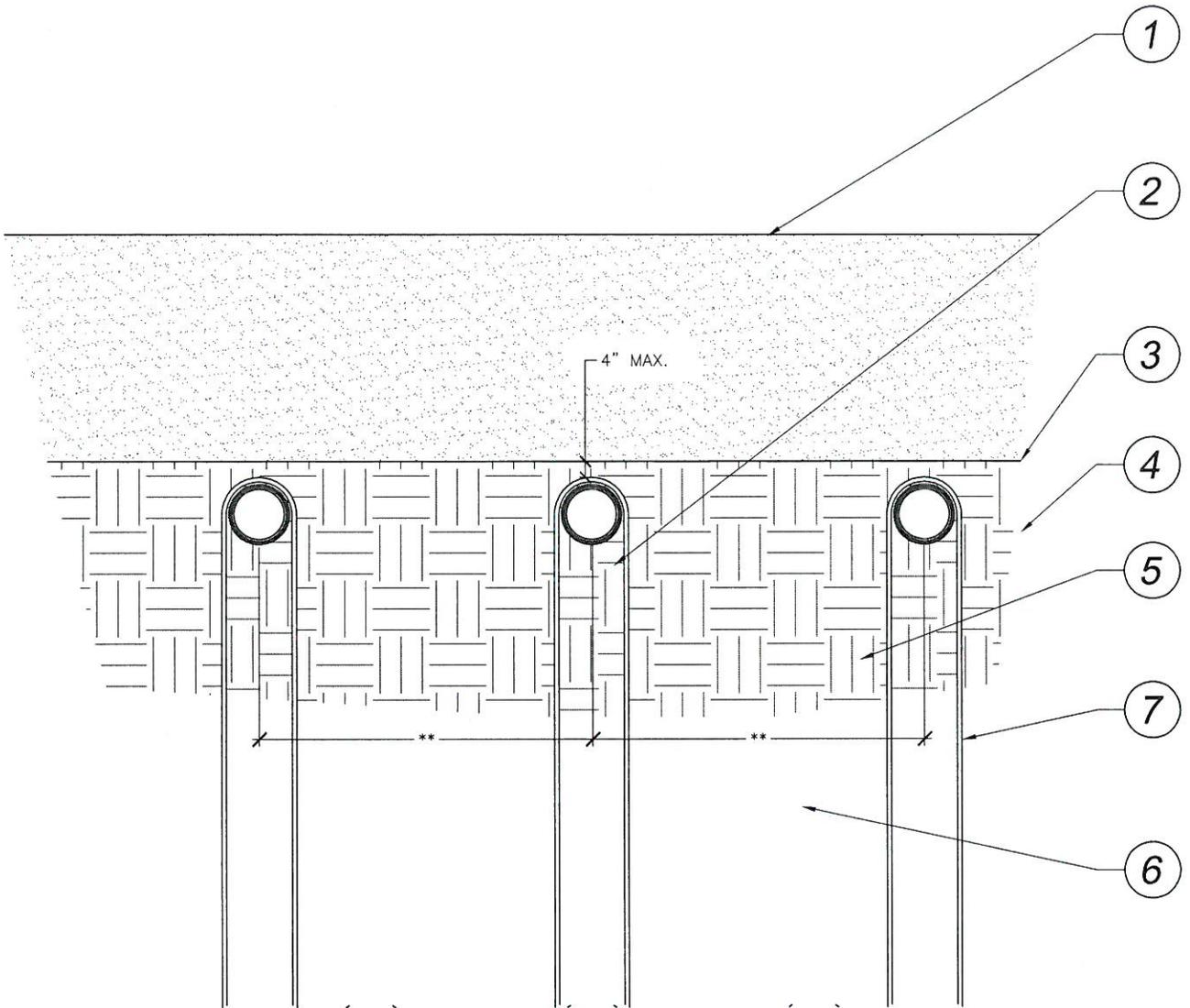


1. PLANT MATERIAL PER PLANTING PLAN
2. TOP OF MULCH
3. FINISH GRADE PER PLAN
4. DRIP TUBING PER PLAN
5. 1/4" SELF-PIERCING BARB CONNECTOR
6. DISTRIBUTION TUBING
7. DRIP SYSTEM OPERATION INDICATOR PER PLAN
8. DRIP STAKE PER SPECIFICATIONS

**NOTES:**  
 SET INDICATOR 2"-6" FROM EDGE OF CURBS AND WALKS, AND 6"-12" FROM FIXED VERTICLE OBJECTS SUCH AS FENCES, WALLS, AND BUILDINGS, ETC.

N.T.S

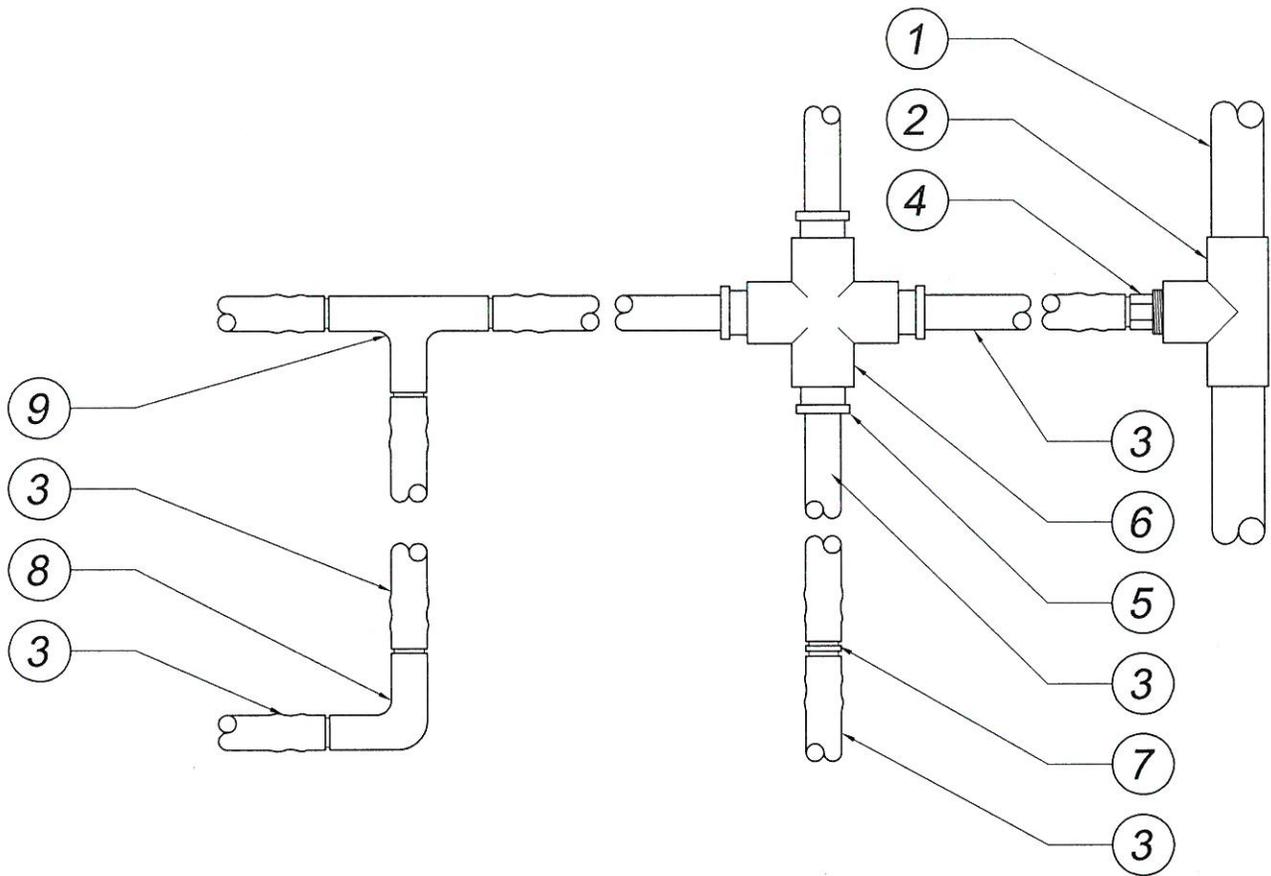
CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer		Date: <i>9-6-16</i>	Standard Drawing No. <b>430</b>
			DRIP OPERATION INDICATOR



1. TOP OF MULCH
2. LANDSCAPE DRIP LINES
3. FINISH GRADE IN PLANTER AREAS, BACKFILL OVER DRIPLINE
4. FINISHED GRADE
5. SUB-GRADE OF NATIVE SOIL
6. (\*\*) LATERAL DRIP LINE SPACING – SPACING
7. RAINBIRD TDS-050 TIE-DOWN STAKE AT 3' O.C. MAX.

N.T.S

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>431</b>
Mark	Revision	By	Date	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				<b>DRIPLINE TRENCH</b>

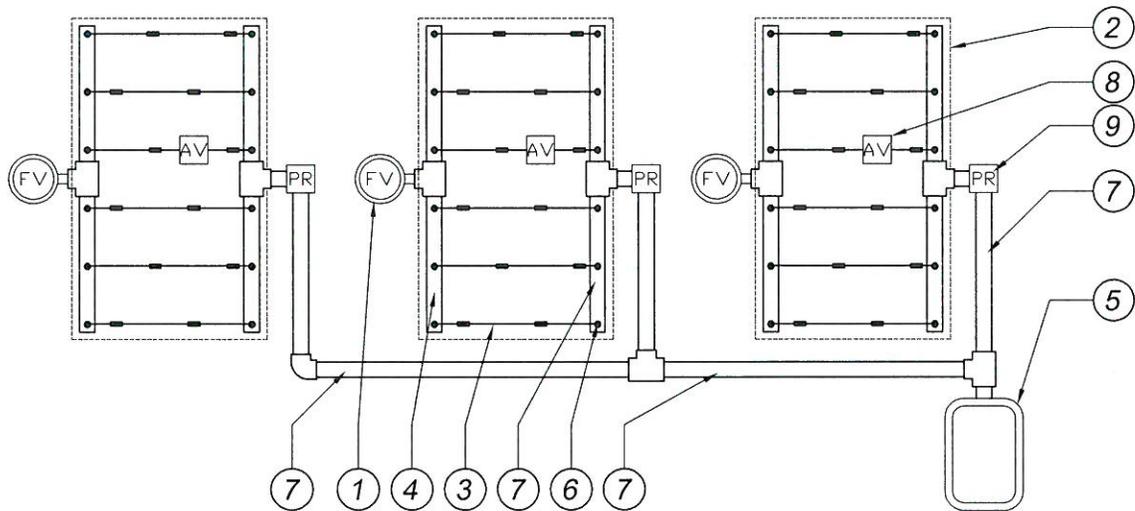


1. PVC PIPE (PER LEGEND)
2. SCH. 40 PVC TEE
3. LANDSCAPE DRIP TUBING (PER LEGEND)
4. SCH. 40 PVC MALE ADAPTER
5. COMPRESSION ADAPTER FITTING
6. SCH. 40 PVC CROSS
7. COMPRESSION COUPLING
8. COMPRESSION ELBOW FITTING
9. COMPRESSION TEE FITTING

NOTES:  
 ALL PERIMETER LATERALS ARE TO BE 2" TO 4" FROM THE EDGE OF PLANTER AREA. CONTRACTOR TO SIZE PVC SUPPLY MANIFOLD TO COMPENSATE FOR FLUSH VALVE FLOWS. THE TOTAL LENGTH OF ALL INTERCONNECTED DRIP LINE SHALL NOT EXCEED THE MAXIMUM RUN LENGTH.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <u><i>Ernest Wong</i></u> Ernest Wong, Public Works Director/City Engineer		Date: <u>9-6-16</u>	
<b>DRIPLINE          FITTINGS</b>			Standard Drawing No.  <b>432</b>

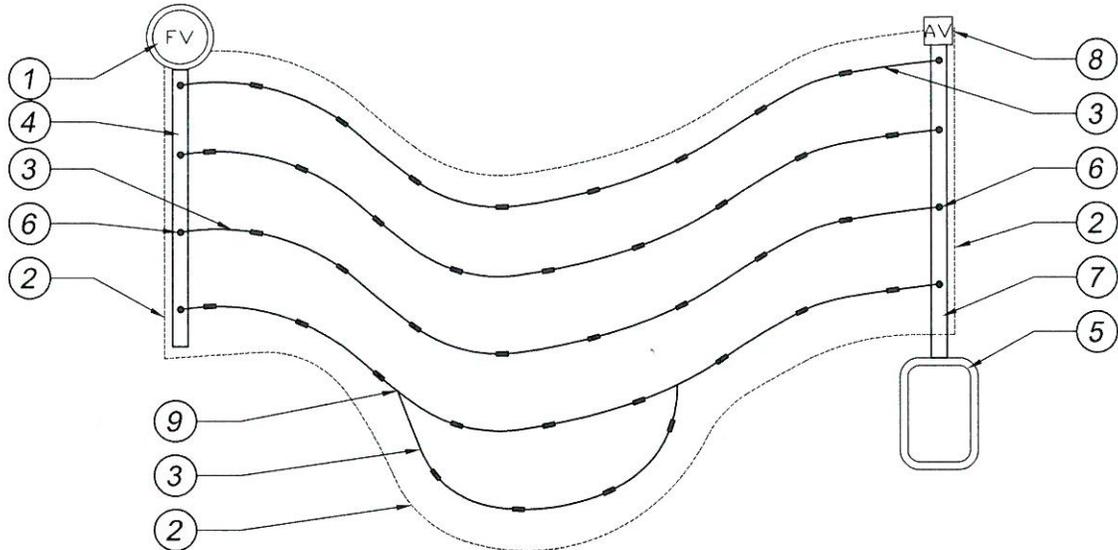


1. AUTOMATIC FLUSH VALVE (PER LEGEND) PLUMBED TO TUBING
2. AREA PERIMETER
3. LANDSCAPE DRIP TUBING (PER LEGEND)
4. PVC FLUSH MANIFOLD
5. REMOTE CONTROL VALVE WITH FILTER AND PRESSURE REGULATOR (SEE RCV DETAIL)
6. MANIFOLD-TO-ELBOW CONNECTION
7. PVC SUPPLY MANIFOLD
8. AIR/VACUUM RELIEF VALVE (PER LEGEND) PLUMBED TO BLANK TUBING AT EACH HIGH POINT
9. PRESSURE REGULATOR LOCATED AT EACH SUPPLY MANIFOLD

NOTES:  
 ALL PERIMETER LATERALS ARE TO BE 2" TO 4" FROM THE EDGE OF PLANTER AREA. CONTRACTOR TO SIZE PVC SUPPLY MANIFOLD TO COMPENSATE FOR FLUSH VALVE FLOWS.

N.T.S

△				CITY OF HIGHLAND	
Mark	Revision	By	Date	DRIPLINE ISLAND	
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					



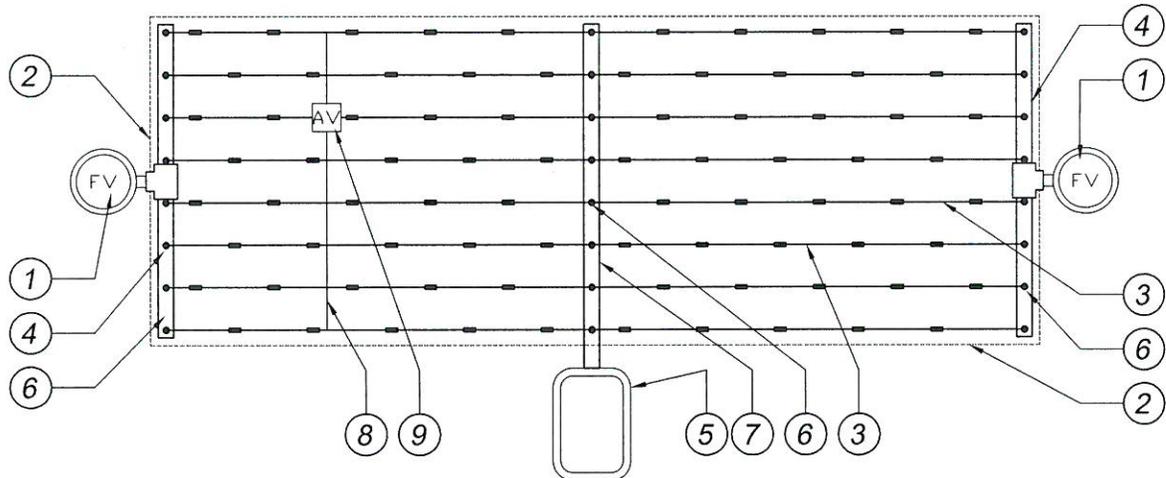
1. AUTOMATIC FLUSH VALVE (PER LEGEND) PLUMBED TO TUBING
2. AREA PERIMETER
3. LANDSCAPE DRIP TUBING (PER LEGEND)
4. PVC FLUSH MANIFOLD
5. REMOTE CONTROL VALVE WITH FILTER AND PRESSURE REGULATOR (SEE RCV DETAIL)
6. MANIFOLD-TO-ELBOW CONNECTION
7. PVC SUPPLY MANIFOLD
8. AIR/VACUUM RELIEF VALVE (PER LEGEND) PLUMBED TO BLANK TUBING AT EACH HIGH POINT
9. COMPRESSION TEE FITTING

NOTES:

ALL PERIMETER LATERALS ARE TO BE 2" TO 4" FROM THE EDGE OF PLANTER AREA. CONTRACTOR TO SIZE PVC SUPPLY MANIFOLD TO COMPENSATE FOR FLUSH VALVE FLOWS. THE TOTAL LENGTH OF ALL INTERCONNECTED DRIP LINE SHALL NOT EXCEED THE MAXIMUM RUN LENGTH.

N.T.S

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>DRIPLINE ODD CURVES</b>	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					

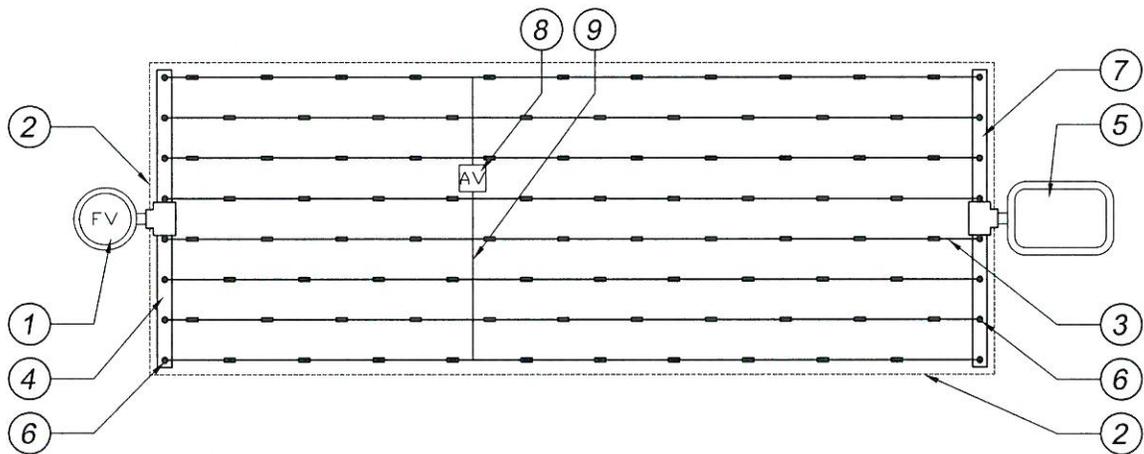


1. AUTOMATIC FLUSH VALVE (PER LEGEND) PLUMBED TO TUBING
2. AREA PERIMETER
3. LANDSCAPE DRIP TUBING (PER LEGEND)
4. PVC FLUSH MANIFOLD
5. REMOTE CONTROL VALVE WITH FILTER AND PRESSURE REGULATOR (SEE RCV DETAIL)
6. MANIFOLD-TO-ELBOW CONNECTION
7. PVC SUPPLY MANIFOLD
8. AIR/VACUUM RELIEF VALVE (PER LEGEND) PLUMBED TO BLANK TUBING AT EACH HIGH POINT
9. AIR/RELIEF BLANK TUBING LATERAL ON MOUNDS OR BERMS

NOTES:  
 ALL PERIMETER LATERALS ARE TO BE 2" TO 4"  
 FROM THE EDGE OF PLANTER AREA.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <u><i>Ernest Wong</i></u> Ernest Wong, Public Works Director/City Engineer		Date: <u>9-6-16</u>	
<b>DRIPLINE CENTER</b>			Standard Drawing No. <b>435</b>

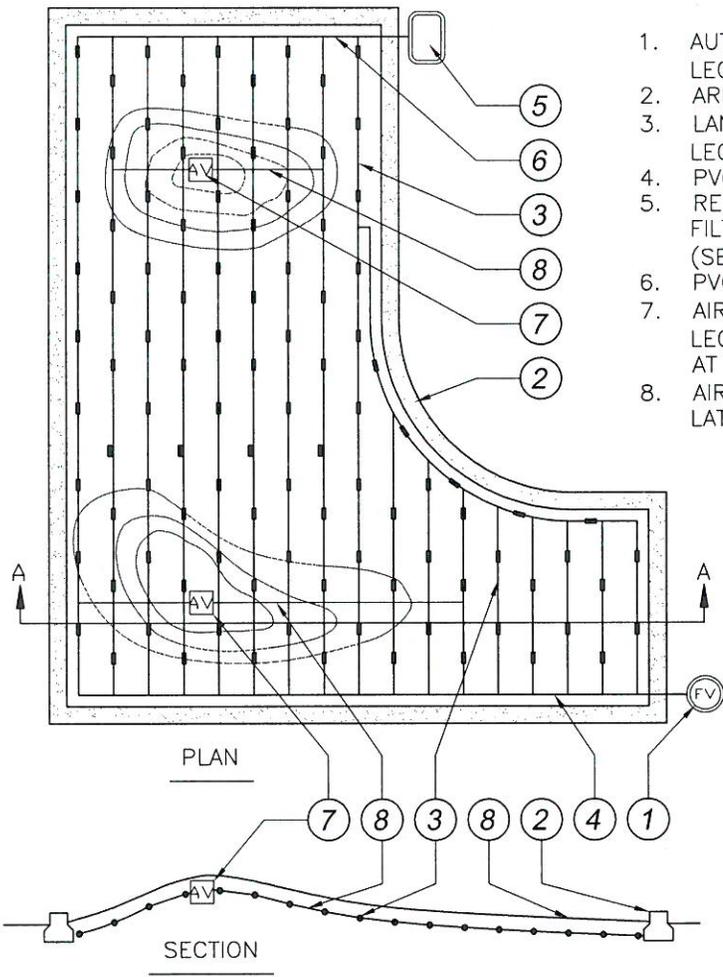


1. AUTOMATIC FLUSH VALVE (PER LEGEND) PLUMBED TO TUBING
2. AREA PERIMETER
3. LANDSCAPE DRIP TUBING (PER LEGEND)
4. PVC FLUSH MANIFOLD
5. REMOTE CONTROL VALVE WITH FILTER AND PRESSURE REGULATOR (SEE RCV DETAIL)
6. MANIFOLD-TO-ELBOW CONNECTION
7. PVC SUPPLY MANIFOLD
8. AIR/VACUUM RELIEF VALVE (PER LEGEND) PLUMBED TO BLANK TUBING AT EACH HIGH POINT
9. AIR/RELIEF BLANK TUBING LATERAL ON MOUNDS OR BERMS

NOTES:  
 ALL PERIMETER LATERALS ARE TO BE 2" TO 4"  
 FROM THE EDGE OF PLANTER AREA.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer		Date: <i>9-6-16</i>	Standard Drawing No. <b>436</b>
<b>DRIPLINE          END</b>			

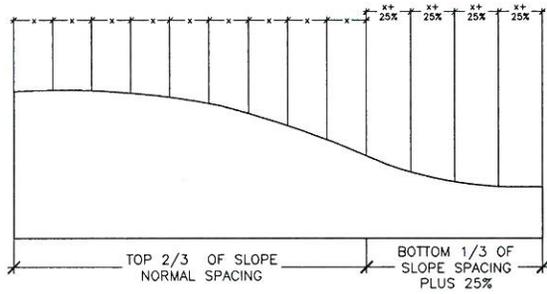
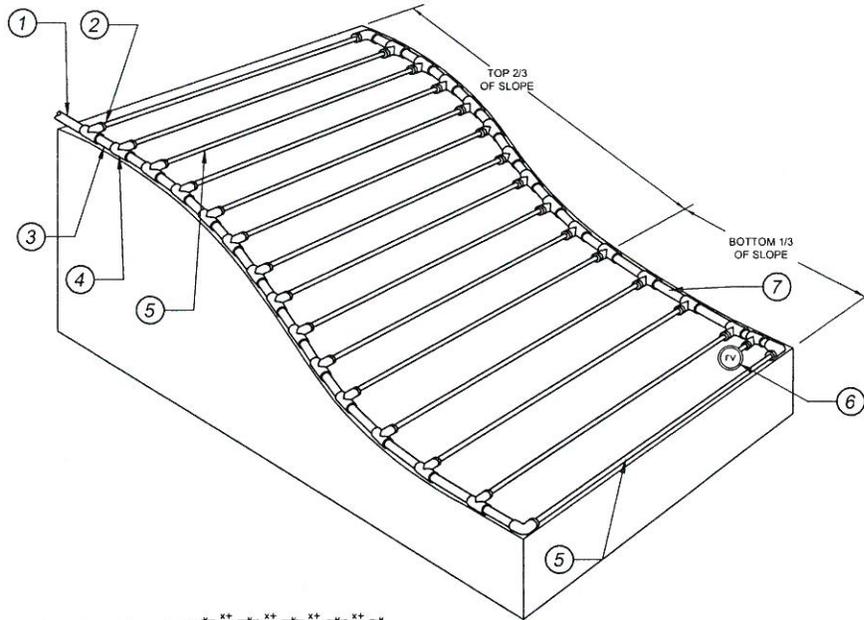


1. AUTOMATIC FLUSH VALVE (PER LEGEND) PLUMBED TO TUBING
2. AREA PERIMETER
3. LANDSCAPE DRIP TUBING (PER LEGEND)
4. PVC FLUSH MANIFOLD
5. REMOTE CONTROL VALVE WITH FILTER AND PRESSURE REGULATOR (SEE RCV DETAIL)
6. PVC SUPPLY MANIFOLD
7. AIR/VACUUM RELIEF VALVE (PER LEGEND) PLUMBED TO BLANK TUBING AT EACH HIGH POINT
8. AIR/RELIEF BLANK TUBING LATERAL ON MOUNDS OR BERMS

NOTES:  
ALL PERIMETER LATERALS ARE TO BE 2" TO 4" FROM THE EDGE OF PLANTER AREA.

N.T.S

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>DRIPLINE BERM</b>	
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					



1. PVC FEED FROM DRIP CONTROL ZONE
2. BARB X MALE FITTING
3. SCH. 40 PVC SUPPLY HEADER
4. SCH. 40 TEE OR EL
5. DRIPLINE PER IRRIGATION LEGEND
6. FLUSH POINT
7. SCH. 40 PVC FLUSH HEADER

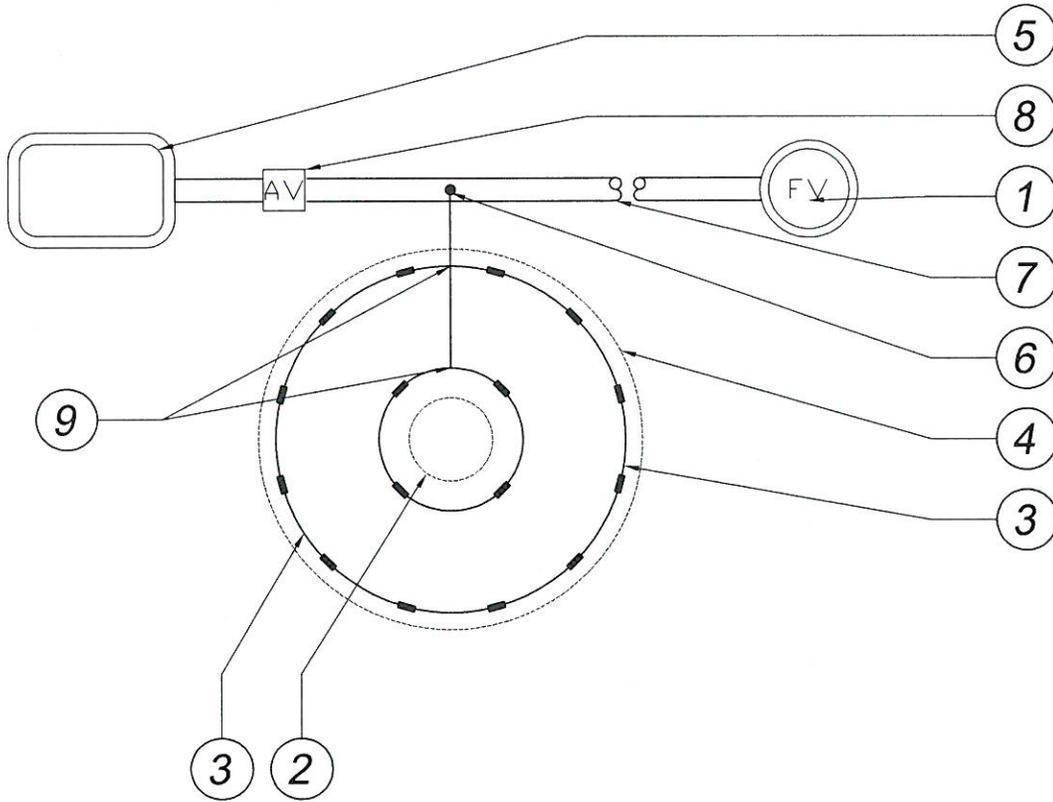
X = DISTANCE BETWEEN DRIP LATERALS PER PLAN

PSI	XFD Dripline Maximum Lateral Lengths (Feet)					
	12" Spacing		18" Spacing		24" Spacing	
	0.6 GPH	0.9 GPH	0.6 GPH	0.9 GPH	0.6 GPH	0.9 GPH
15	273	155	314	250	424	322
20	318	169	353	294	508	368
30	360	230	413	350	586	414
40	395	255	465	402	652	474

- NOTES:
1. DISTANCE BETWEEN LATERAL ROWS AND EMITTER SPACING TO BE PER PLAN. DISTANCE BETWEEN LATERAL ROWS FOR BOTTOM 1/3 OF SLOPE TO BE 1.25X OPTIMAL ROW DISTANCE.
  2. LENGTH OF LONGEST DRIPLINE LATERAL SHOULD NOT EXCEED THE MAXIMUM LENGTH SHOWN IN THE ACCOMPANYING TABLE.
  3. WHEN ELEVATION CHANGE EXCEEDS 10 FEET IT IS RECOMMENDED THAT A NEW DRIPLINE ZONE BE CREATED.

N.T.S

△	<b>CITY OF HIGHLAND</b>		
Mark	Revision	By	Date
Approved: <u>Ernest Wong</u> Ernest Wong, Public Works Director/City Engineer		Date: <u>9-6-16</u>	<b>DRIPLINE SLOPE</b>
			Standard Drawing No. <b>438</b>



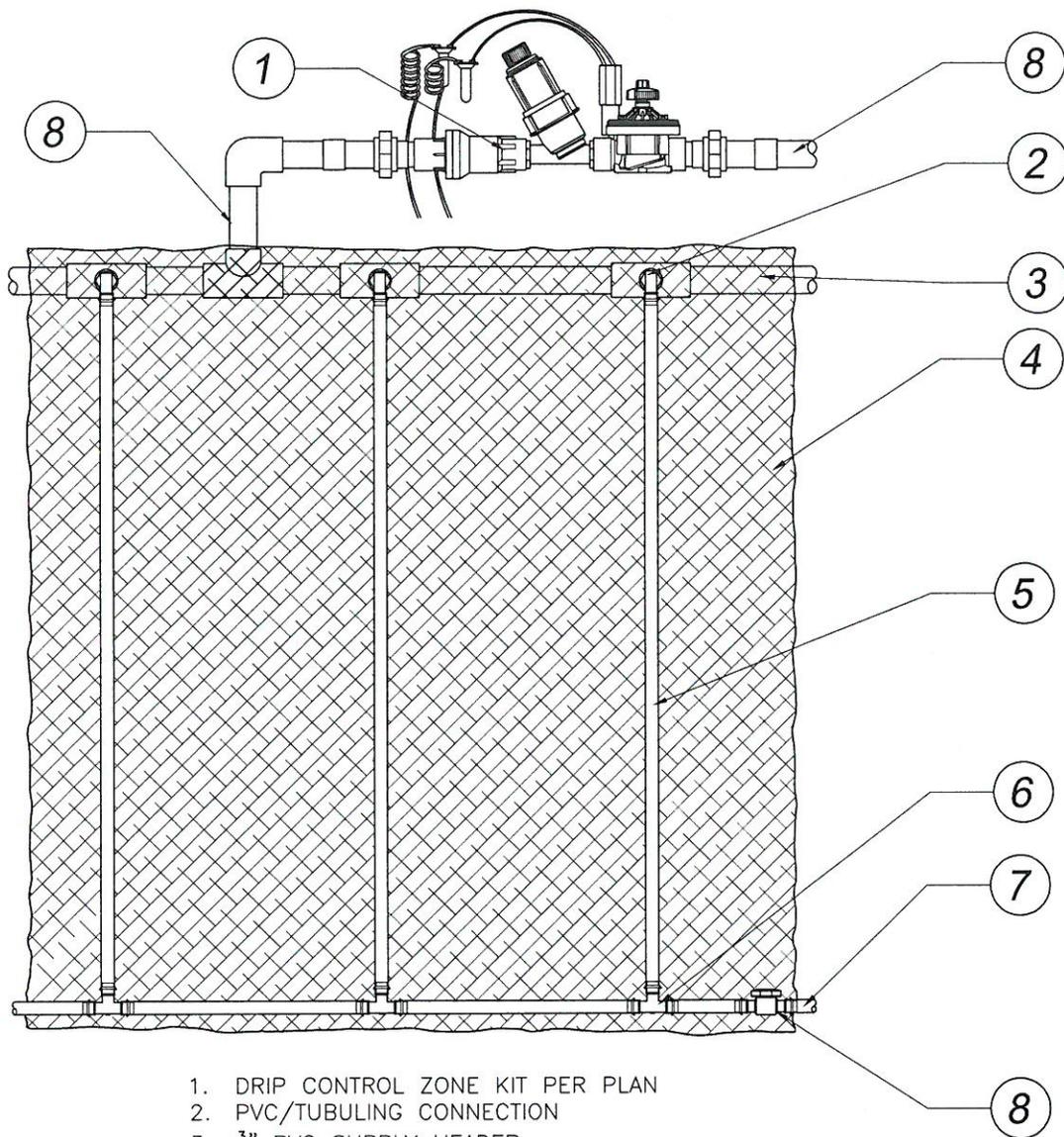
1. AUTOMATIC FLUSH VALVE (PER LEGEND) PLUMBED TO TUBING
2. TREE ROOTBALL
3. LANDSCAPE DRIP TUBING (PER LEGEND)
4. ESTIMATED DRIPLINE OF TREE IN 5 YEARS
5. REMOTE CONTROL VALVE WITH FILTER AND PRESSURE REGULATOR (SEE RCV DETAIL)
6. MANIFOLD-TO-ELBOW CONNECTION
7. PVC SUPPLY MANIFOLD
8. AIR/VACUUM RELIEF VALVE (PER LEGEND) PLUMBED TO BLANK TUBING AT EACH HIGH POINT
9. COMPRESSION FITTING

NOTES:

ALL PERIMETER LATERALS ARE TO BE 2" TO 4" FROM THE EDGE OF PLANTER AREA.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer		Date: <i>9-6-16</i>	
<b>DRIPLINE TREES</b>			Standard Drawing No. <b>439</b>

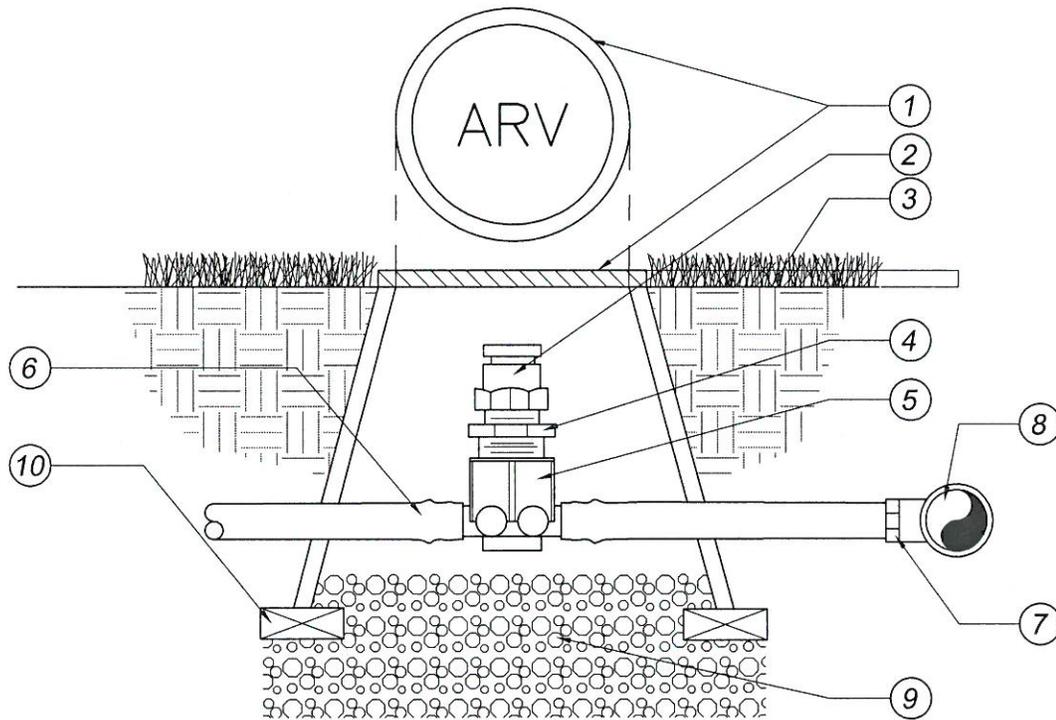


- 1. DRIP CONTROL ZONE KIT PER PLAN
- 2. PVC/TUBULING CONNECTION
- 3. 3/4" PVC SUPPLY HEADER
- 4. ECO-MAT SUBSURFACE IRRIGATION MAT
- 5. DRIP LINE TUBING, WRAPPED IN POLYPROPYLENE FLEECE
- 6. PLD-TEE 17mm BARB x BARB x BARB TEE FITTING
- 7. 17mm PLD BLANK TUBING DISCHARGE HEADER
- 8. LATERAL LINE PER PLAN

NOTES:  
 ALL PERIMETER LATERALS ARE TO BE 2" TO 4" FROM THE EDGE OF PLANTER AREA.

N.T.S

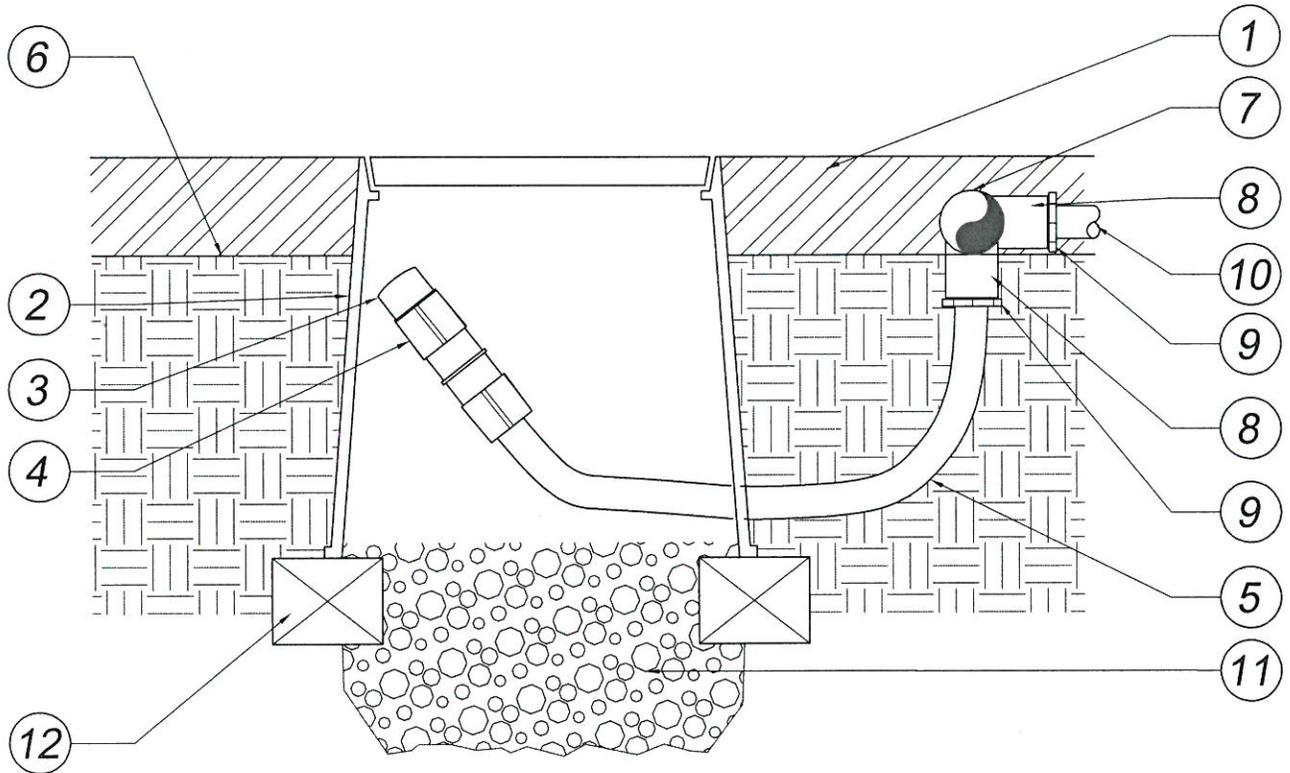
△				CITY OF HIGHLAND	
Mark	Revision	By	Date	DRIPLINE ECO-MAT	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer					



- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. RAINBIRD SEB-7XB PLASTIC EMITTER BOX</li> <li>2. AIR RELIEF PER IRRIGATION LEGEND</li> <li>3. FINISH GRADE</li> <li>4. 1/2" X 3/4" PVC REDUCER BUSHING</li> <li>5. BARB X FEMALE THREAD CONNECTOR:<br/>RAIN BIRD XFD-TFA FITTING</li> <li>6. 1/2" BLANK DRIPLINE TUBING: RAIN BIRD<br/>XF SERIES</li> <li>7. BARB X MALE THREAD CONNECTOR: RAIN<br/>BIRD XFD-MA FITTING</li> </ol> | <ol style="list-style-type: none"> <li>8. PVC TEE CONNECTED TO PVC HEADER<br/>PIPE</li> <li>9. 3" MINIMUM DEPTH OF 3/4" WASHED<br/>GRAVEL</li> <li>10. COMMON BRICK - 2 REQUIRED</li> </ol> |
|--|---|

N.T.S

△				CITY OF HIGHLAND	
Mark	Revision	By	Date	<b>DRIPLINE AIR RELIEF VALVE</b>	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					

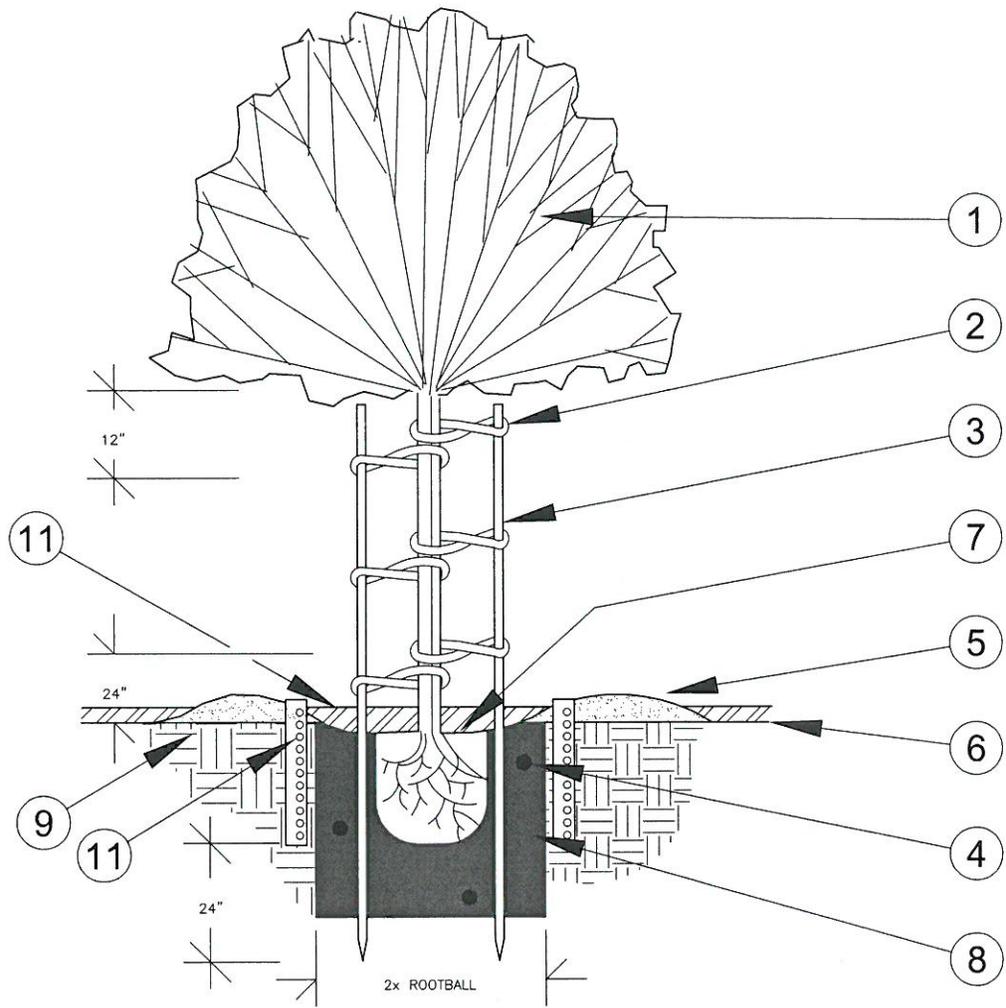


1. MULCH PER PLAN
2. RAINBIRD SEB 7XB EMITTER BOX
3. FLUSH CAP
4. EASY FIT COUPLING
5. 1/2" BLANK POLYETHYLENE TUBING
6. FINISH GRADE
7. PVC EXHAUST HEADER
8. SCH. 40 PVC TEE OR EL
9. BARB X MALE FITTING
10. DRIPLINE PER IRRIGATION LEGEND
11. 3" MINIMUM DEPTH 3/4" WASHED PEA GRAVEL
12. COMMON BRICK (2 NEEDED)

NOTE:  
 ALLOW 6" MINIMUM  
 OF DRIPLINE  
 TUBING IN VALVE  
 BOX

N.T.S

△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>DRIPLINE FLUSH VALVE</b>	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer				Standard Drawing No. <b>442</b>	

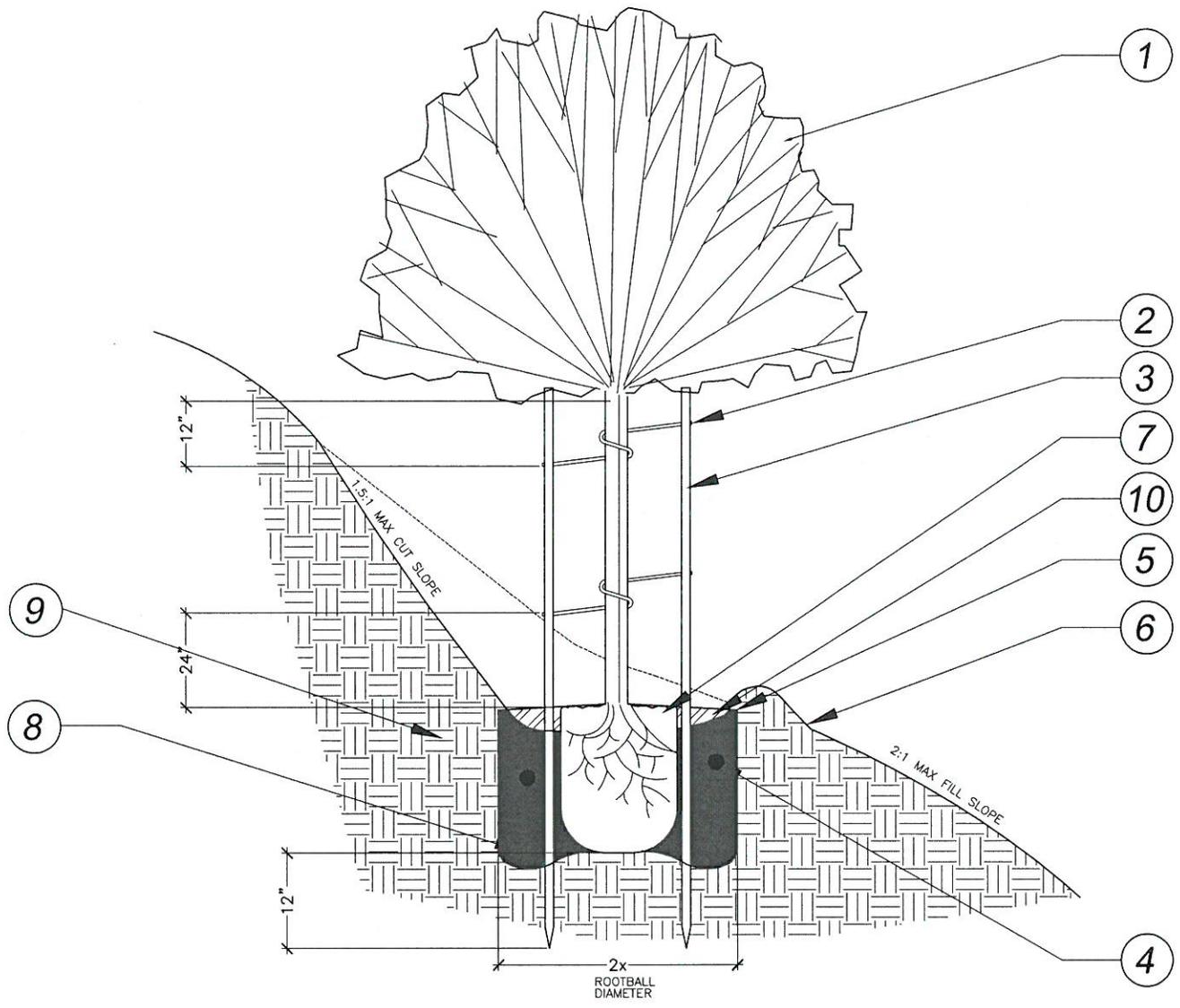


1. TREE PER PLANTING PLAN
2. CINCH TIE (6 PER TREE)
3. (MINIMUM 2) 3" DIA. x 10' LONG LODGE POLE STAKES,
4. PLANT TABLETS PER PLANTING SPECS / NOTES
5. EARTH WATERING BASIN IN GROUNDCOVER AREAS
6. FINISH GRADE
7. ROOTBALL: SET CROWN 1"-2" ABOVE FINISH GRADE
8. COMPACT BACKFILL MIX PER PLANTING SPECS / NOTES
9. NATIVE SOIL
10. 2" MINIMUM DEEP MULCH PER PLANTING PLAN
11. TREE BREATHER TUBE 4" DIA. PERFERATED ABS, 2' LONG, GRATE COVER  
SCREW COVER TO PIPE. PROVIDE 2 ON EACH SIDE OF TREE

NOTE: ROOT BARRIER TO BE PLACED WHEN TREE IS WITHIN 6' OF HARDSCAPE

N.T.S

△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>TREE PLANTING</b>	
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer					

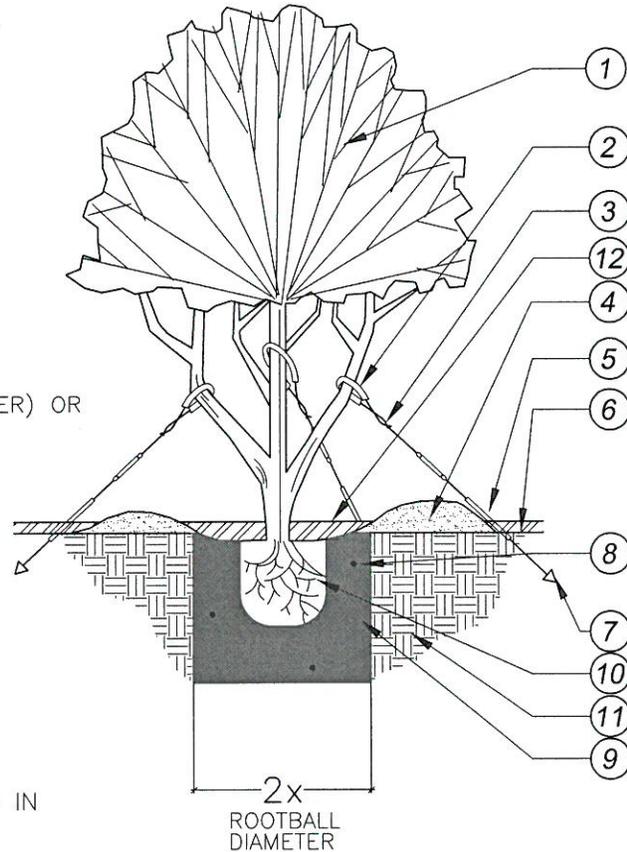


1. TREE PER PLANTING PLAN
2. V.I.T. TWIST-BRACE TREE TIES  
15 GAL-24" BOX: MODEL TB24, ATTACH TO STAKE WITH WOOD SCREWS  
24" BOX-36" BOX: MODEL TB36, ATTACH TO STAKE WITH BOLT AND NUT.  
30" BOX-42" BOX: MODEL TB42, ATTACH TO STAKE WITH BOLT AND NUT.
3. 3" DIA. x 10' LONG LODGE POLE STAKES
4. PLANT TABLETS PER PLANTING SPECS/NOTES
5. 'SLOPE GUARD' BY CENTURY PRODUCTS  
(714) 632-7083
6. FINISH GRADE
7. ROOTBALL: SET CROWN 2" ABOVE FINISH GRADE
8. BACKFILL MIX PER PLANTING SPECS/NOTES
9. NATIVE SOIL
10. MULCH - TYPE & DEPTH PER PLANTING PLAN

N.T.S

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>451</b>
<b>TREE PLANTING SLOPE</b>				
△	Revision	By	Date	
Mark				
Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u>				
Ernest Wong, Public Works Director/City Engineer				

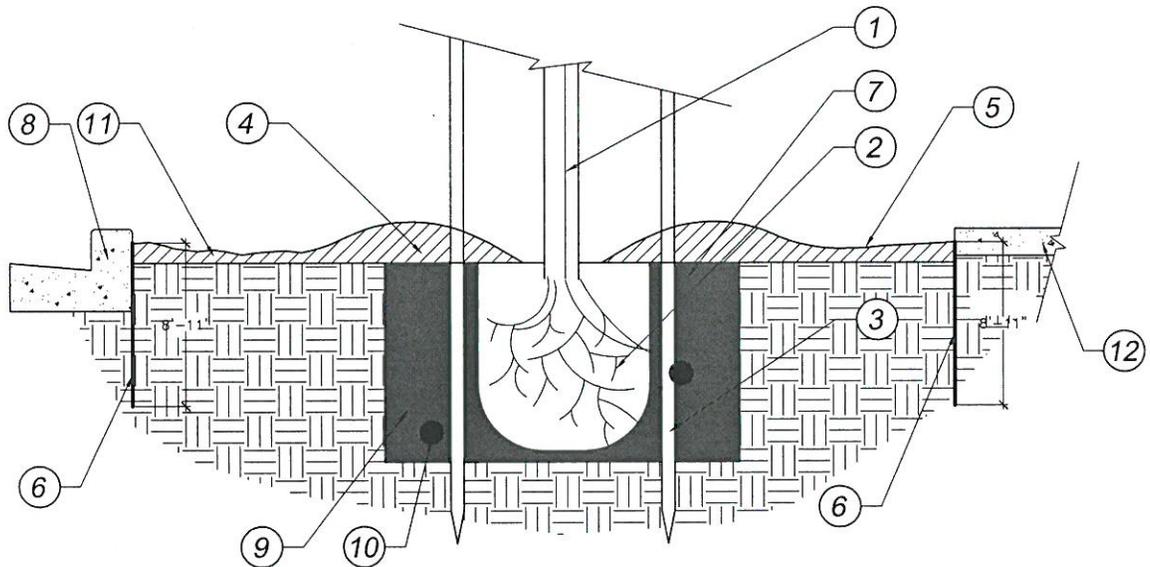
1. SINGLE OR MULTI-TRUNKED TREE PER PLANTING PLAN
2. RUBBER HOSE OVER WIRE AND TRUNK (TYP)
3. GUY WIRE WITH TURN BUCKLE (NO SPLICES)
4. EARTH WATERING BASIN IN GROUNDCOVER AREAS
5. 1/2" SCH 40 PVC PIPE OVER EACH GUY WIRE
6. FINISH GRADE
7. RA-30 RAPID ANCHOR BY 'V.I.T.' (INSTALL PER MANUFACTURER) OR APPROVED EQUAL.
8. PLANT TABLETS PER PLANTING SPECS / NOTES
9. COMPACT BACKFILL MIX PER PLANTING SPECS / NOTES
10. ROOTBALL: SET CROWN 1"-2" ABOVE FINISH GRADE
11. NATIVE SOIL
12. PLANTER AREA MULCH - DEPTH PER PLANTING PLAN



NOTE:  
PROVIDE EXPANDABLE TRUNK GUARD IN ALL TURF AREAS

N.T.S

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>452</b>
Mark	Revision	By	Date	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				<b>TREE GUYING</b>



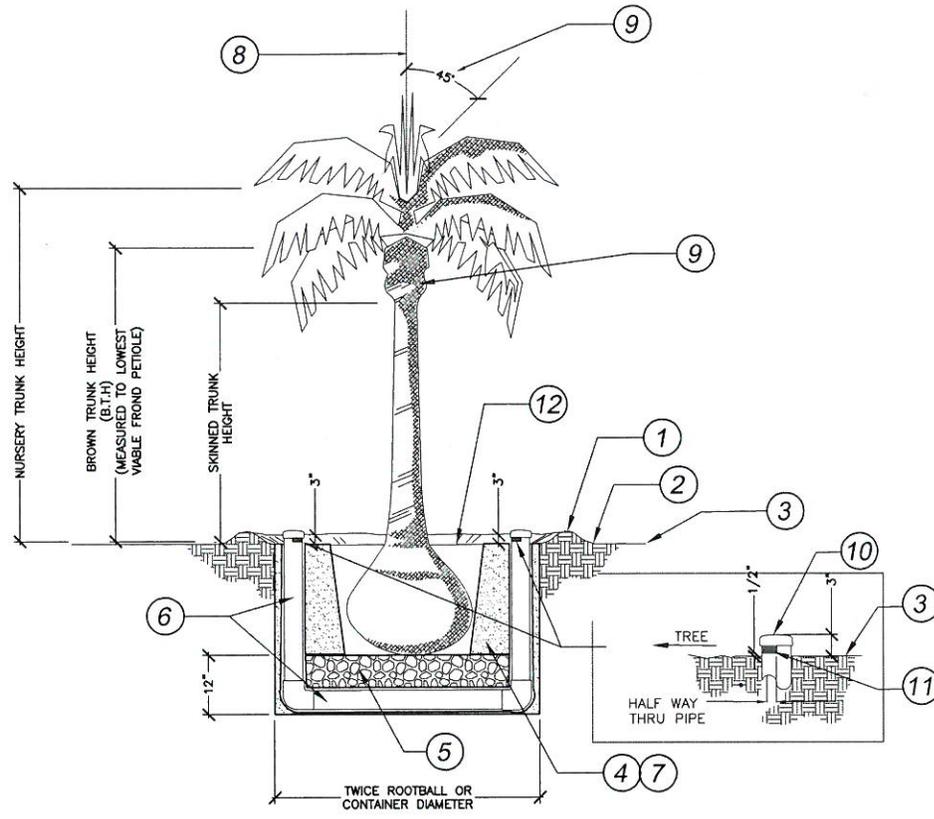
1. TREE PER PLANTING PLAN
2. ROOTBALL
3. STAKE PER 'TREE PLANTING' DETAIL
4. EARTH WATERING BASIN PER 'TREE PLANTING' DETAIL
5. FINISH GRADE
6. DEEP ROOT BARRIER AT EDGE OF HARDSCAPE - 24" DEEP, 10' LONG CENTERED ON TRUNK
7. TREE PLANTING PIT
8. STREET CURB PER STREET IMPROVEMENT PLANS
9. COMPACTED BACKFILL MIX PER PLANTING SPECS / NOTES
10. PLANT TABLETS PER PLANTING SPECS / NOTES
11. MULCH - TYPE & DEPTH PER PLANTING PLAN
12. CONCRETE PAVING PER PLAN

**NOTES:**

1. ROOTBARRIER TO EXTEND 6' TO EITHER SIDE OF TREE TRUNK
2. ROOTBARRIER SHALL NOT ENCIRCLE THE TREE ROOTBALL

N.T.S

△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>TREE ROOT BARRIER</b>	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer				Standard Drawing No. <b>453</b>	



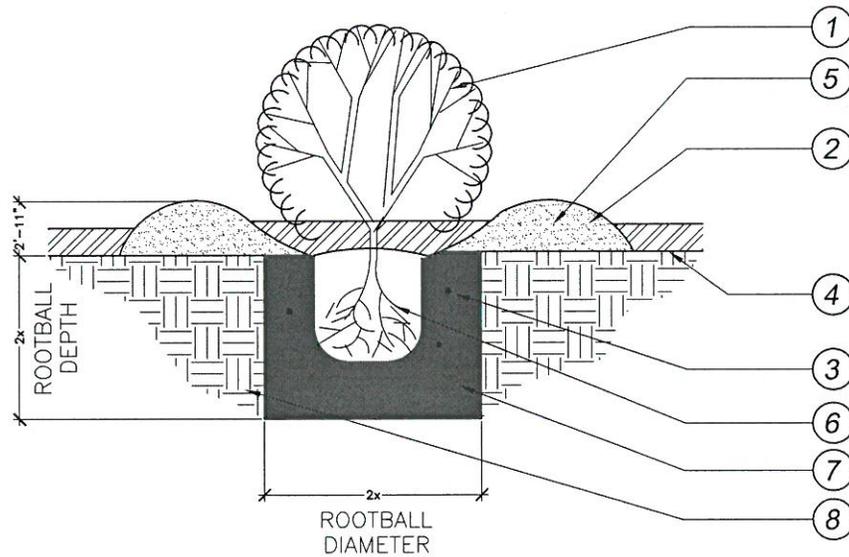
1. 4" HIGH WATER BASIN.
2. MULCH. REFER TO PLANTING PLAN.
3. FINISH GRADE
4. THOROUGHLY SATURATE SAND WITH WATER UPON COMPLETION OF PLANTING
5. 3/4" CRUSHED ROCK OR PEA GRAVEL
6. 4" DIAMETER PVC PERFORATED DRAIN LINE WRAPPED WITH FILTER CLOTH WITH 6" OVERLAP
7. WASHED PLASTER SAND BACKFILL
8. PLANT PALMS SO AXIS IS PLUMB.
9. FRONDS MAY BE REMOVED TO NOT LESS THAN 45% OF VERTICAL AXIS.
10. PVC CAP
11. 1/2" WIDE SLOT HALF WAY THROUGH PIPE
12. PLANT PALM AT ORIGINAL PLANTED DEPTH OR DEEPER AS DIRECT BY LANDSCAPE ARCHITECT.

**PALM PLANTING GUIDELINES**

- A. THE TOP OF THE ROOTBALL SHALL BE AT FINAL GRADE AND NOT MORE THAN 1FT. BELOW THE ORIGINAL GRADE.
- B. INSTALL 4" PERFORATED SCH 40 PIPE WITH ENTIRE LENGTH WRAPPED WITH FILTER CLOTH. PLACE PIPE ADJACENT TO PALM BEFORE BACKFILLING. PIPE MUST EXTEND 5" BELOW THE BOTTOM OF THE ROOTBALL. AFFIX LOOSE FITTING CAP ON UPPER ENDS OF PIPE, SO TAPE CAN BE LOWERED INTO PIPE TO CHECK WATER LEVEL. MONITOR DAILY PRIOR TO APPLICATION OF SUPPLEMENTAL WATER.
- C. BACKFILL MIX:
  - C.a. BACK FILL PITS WITH WASHED PLASTER SAND UP TO THE LEVEL WHERE THE ROOTBALL WILL BE SET.
  - C.b. WATER PIT AS IT IS BEING BACKFILLED USING 6' LONG PIPE STICKER TOPPED WITH 90° ELBOW, PLACED ON END OF MIN. 3/4" HOSE, WITH ADEQUATE VOLUME. STICKER SHALL BE WORKED UP AND DOWN, AS THE PIT IS BACKFILLED.
  - C.c. APPLY A MIXTURE OF 1 OZ. "BASIC H" BY SHAKLEE AND 2 TBSP. "STEM" BY PETERS. INTO 5 GAL. WATER. POUR IN WHEN BACKFILLING IS ALMOST COMPLETE AND THOROUGHLY SATURATE WITH WATER.
- D. WATER PALMS WITH SOAKING OF 100-150 GALLONS WATER PER PALM, EVERY 5 DAYS.
- E. AFTER 14th DAY. THEN MONTHLY. FRONDS SHALL BE SPRAYED (FOLIAR DRENCH) WITH THE FOLLOWING, AT THE RECOMMENDED RATES FOR A 100 GALLON TANK MIX:
  - E.a. KOCIDE 101 W.P. (3/4 LB) OR MAZATE (1 QT./1000 GALLONS)
  - E.b. W.R. GRACE'S MINOR-GRO (1/2 CUP)
  - E.c. HYDRATED UREA (5 CUPS OR 2-1/2 LB.)
  - E.d. SPREADER STICKER (8 OZ.) "BASIC H"
  - E.e. OPTION: ADD GENERAL INSECTICIDE

N.T.S

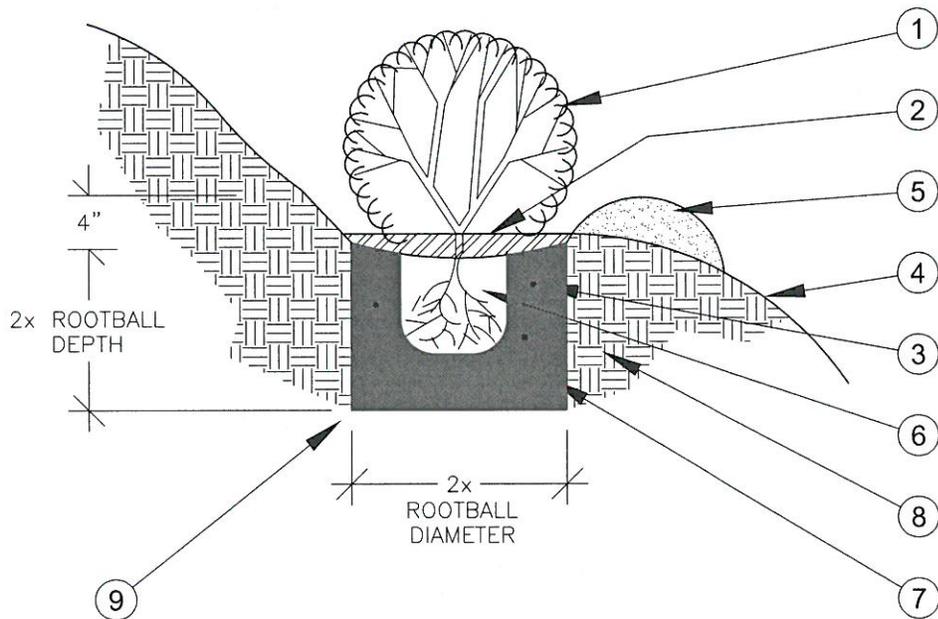
<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>	
Ernest Wong, Public Works Director/City Engineer		<b>PALM PLANTING</b>	Standard Drawing No.  <b>454</b>



1. SHRUB PER PLANTING PLAN
2. WOOD MULCH- DEPTH PER PLANTING PLAN
3. PLANT TABLETS PER PLANTING SPECS / NOTES
4. FINISH GRADE
5. EARTH WATERING BASIN (RAKE SMOOTH PRIOR TO PLANTING GROUNDCOVER)
6. ROOTBALL: SET CROWN SLIGHTLY ABOVE FINISH GRADE
7. COMPACT BACKFILL MIX PER PLANTING SPECS / NOTES
8. NATIVE SOIL

N.T.S

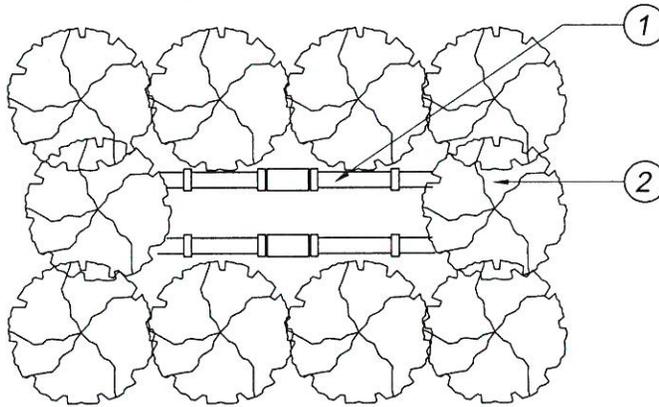
△				CITY OF HIGHLAND	
Mark	Revision	By	Date	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p style="margin: 0;">SHRUB PLANTING</p> </div> <div style="text-align: right;"> <p style="font-size: x-small; margin: 0;">Standard Drawing No.</p> <p style="font-size: large; margin: 0;">455</p> </div> </div>	
<p style="margin: 0;">Approved: <u>Ernest Wong</u> Date: <u>9-6-16</u></p> <p style="margin: 0; font-size: small;">Ernest Wong, Public Works Director/City Engineer</p>					



1. SHRUB PER PLANTING PLAN
2. MULCH – TYPE & DEPTH PER PLANTING PLAN
3. PLANT TABLETS PER PLANTING SPECIFICATIONS
4. FINISH GRADE
5. EARTH WATERING BASIN
6. ROOTBALL: SET CROWN FLUSH WITH FINISH GRADE
7. COMPACT BACKFILL MIX PER PLANTING SPECIFICATIONS / NOTES
8. NATIVE SOIL
9. CUT PLANTING PIT INTO SLOPE TO CREATE LEVEL BASIN

N.T.S

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>456</b>
<b>SHRUB PLANTING SLOPE</b>				
△ Mark	Revision	By	Date	
Approved: <i>Ernest Wong</i>		Date: <i>9-6-16</i>		
Ernest Wong, Public Works Director/City Engineer				

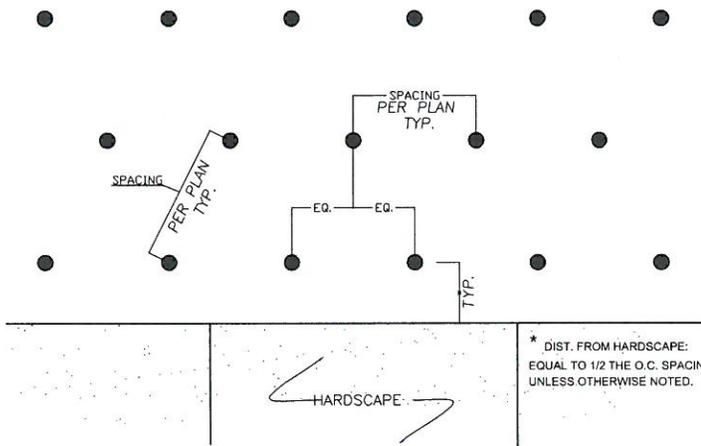


DETAIL NOTES:

1. BACKFLOW PREVENTION DEVICE; REFER TO IRRIGATION PLAN FOR LOCATION
2. MINIMUM 2' TALL SHRUBS. REFER TO PLANTING PLAN FOR TYPE AND SIZE. SHRUBS SHALL VISIBLY SCREEN THE BACKFLOW UNIT FROM VIEW ON ALL FOUR (4) SIDES.

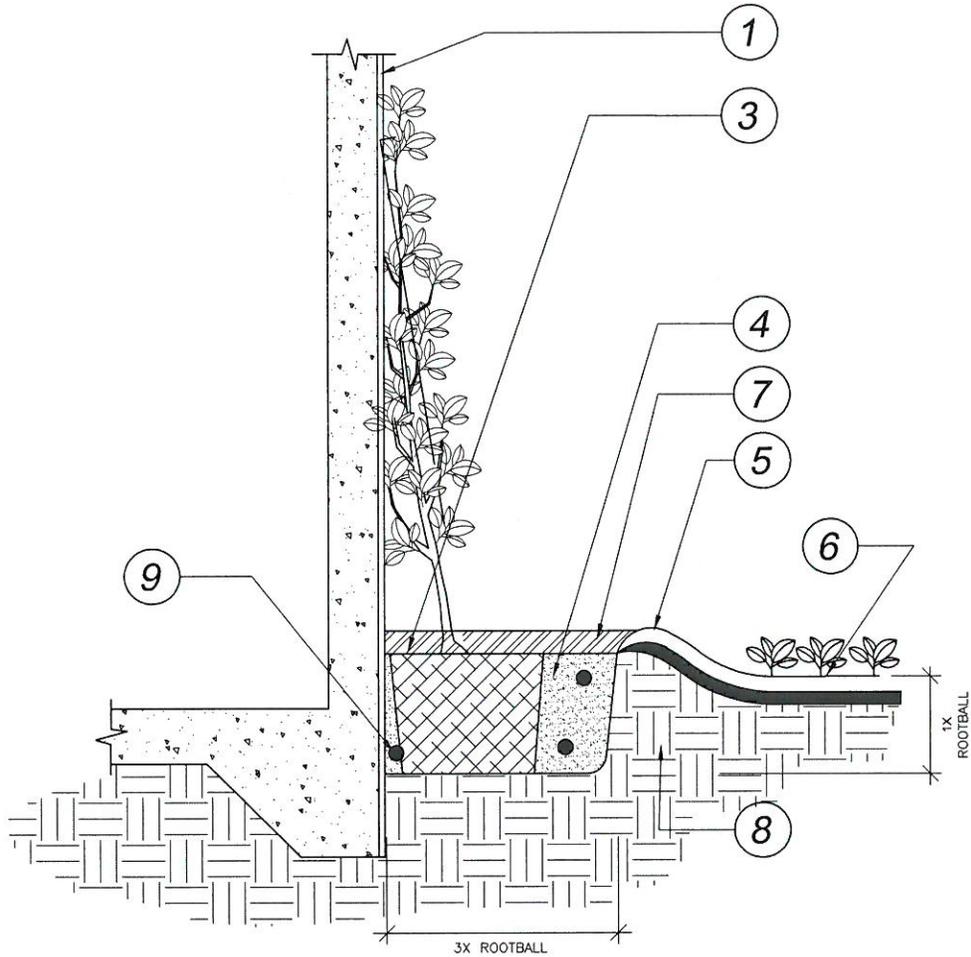
N.T.S

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>457</b>
△	Revision	By	Date	
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer				<b>SHRUB PLANTING BACKFLOW SCREENING</b>



N.T.S

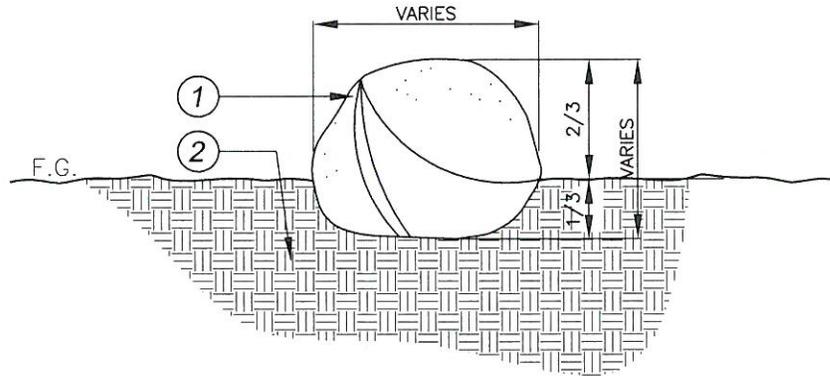
<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <u><i>Ernest Wong</i></u> Ernest Wong, Public Works Director/City Engineer		Date: <u>9-6-16</u>	
<b>GROUNDCOVER PLANTING</b>			Standard Drawing No.  <b>458</b>



1. FACE OF WALL OR BUILDING
2. PROP TOP OF STAKE AGAINST WALL OR BUILDING
3. SET ROOTBALL TIGHT TO FOOTING, REMOVE ALL TRASH OR CONCRETE AT PLANTING HOLE
4. BACKFILL PER PLANTING NOTES/SPECS
5. EARTH WATERING BASIN (RAKE SMOOTH PRIOR TO PLANTING GROUNDCOVER)
6. FINISH GRADE PER PLAN
7. WOOD MULCH – DEPTH PER PLANTING PLAN
8. NATIVE SOIL
9. PLANT TABS PER PLANTING NOTES/SPECS

N.T.S

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <u>Ernest Wong</u> Ernest Wong, Public Works Director/City Engineer		Date: <u>9-6-16</u>	VINE PLANTING
			Standard Drawing No. <b>459</b>



DETAIL NOTES:

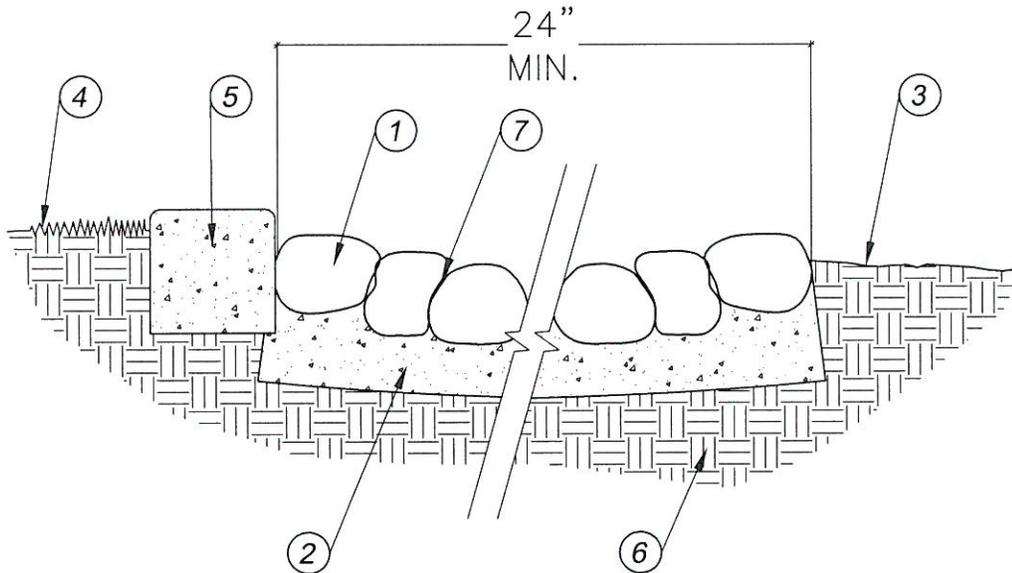
1. STONE OR BOULDER. REFER TO PLANS FOR TYPE, SIZE AND SUPPLIERS
2. 90% COMPACTED SUBGRADE

GENERAL NOTES:

BOULDERS SHALL BE PLACED SO AS TO APPEAR "NATURAL." AT NO TIME SHALL ANY BOULDER BE PLACED ON TOP OF SOIL OR D.G. WITHOUT EMBEDDING IN OR COMPACTING THE SURROUNDING SOIL.

N.T.S

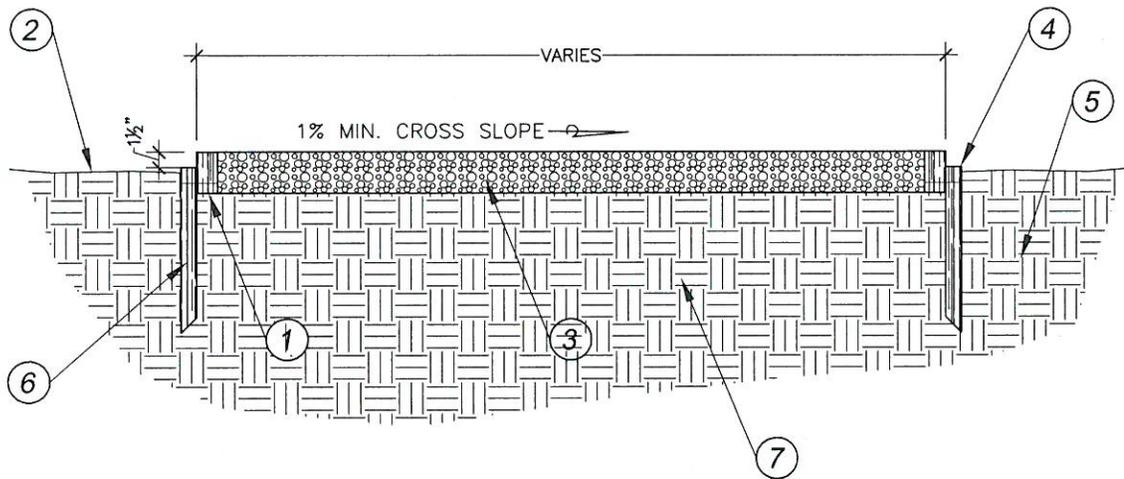
△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>BOULDER INSTALLMENT</b>	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer				Standard Drawing No.	<b>460</b>



1. 3"φ-12"φ RIVER ROCK
2. 3" CONCRETE MORTAR BASE
3. FINISH GRADE IN PLANTER AREAS
4. FINISH GRADE IN TURF AREAS
5. CONCRETE MOWCURB AT TURF AREAS ONLY PER DETAIL 'B', SHEET LC-6
6. COMPACTED SUBGRADE PER SOILS REPORT
7. 1/4" - 1/2" MORTAR JOINTS. 3/4" OF COBBLE TO BE IN MORTAR

N.T.S

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <i>Ernest Wong</i> Ernest Wong, Public Works Director/City Engineer		Date: 9-6-16	ROCK COBBLE
			Standard Drawing No. <b>461</b>



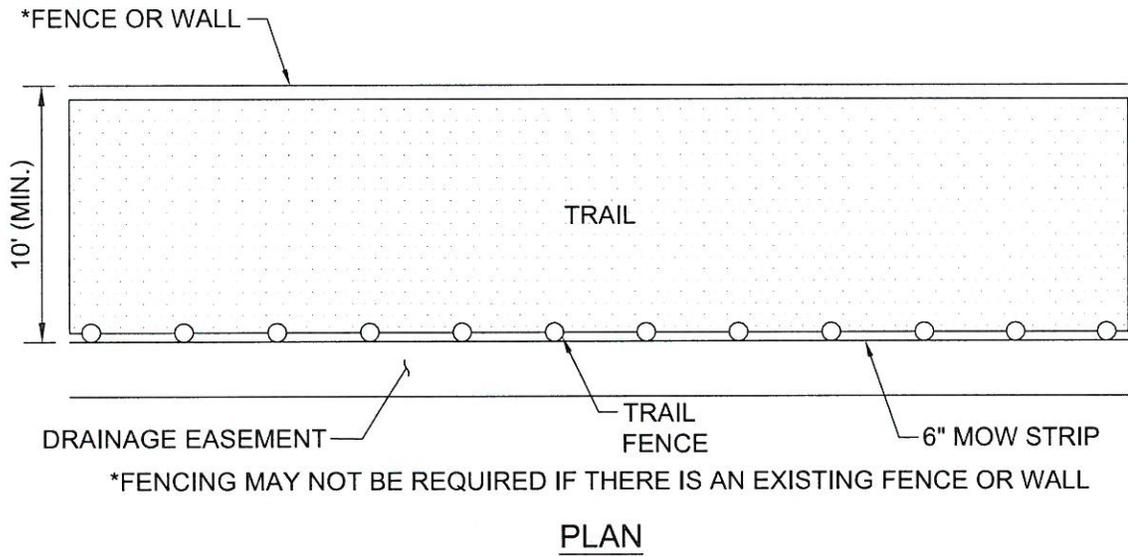
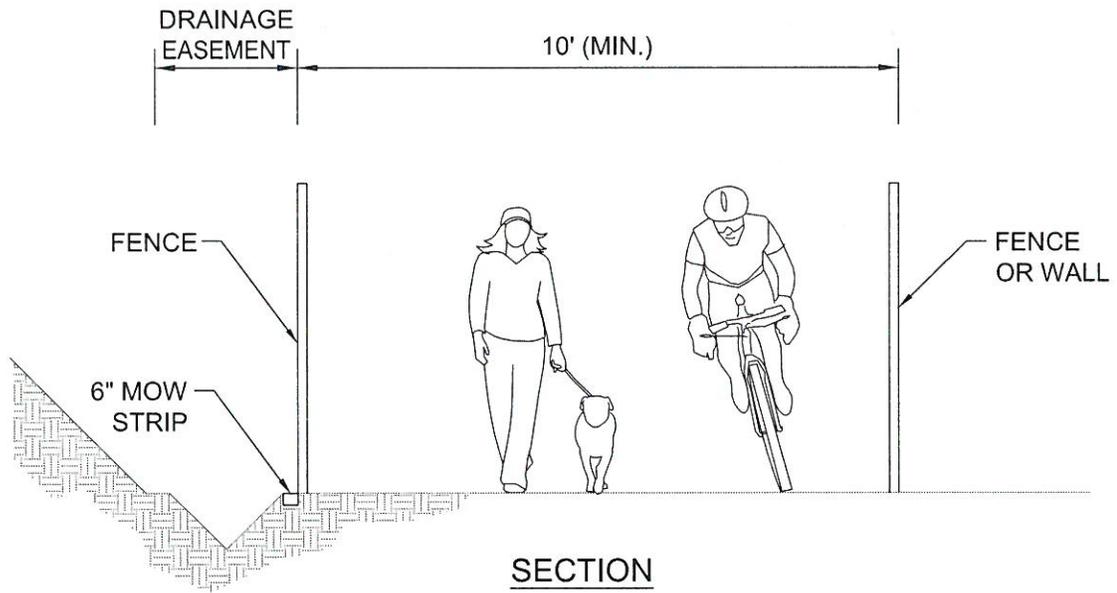
1. 2x4 REDWOOD OR RECYCLED BENDABOARD
2. FINISH GRADE (TYP.)
3. 4" MIN. DEPTH 1/8"Ø-1/4"Ø GRAVEL
4. 45 DEGREE BEVELED EDGE
5. UNDISTURBED NATIVE SOIL
6. 1 1/2" X 18" FLAT STEEL STAKES;  
TOP OF STAKE SHALL BE 1/1/2"  
BELOW TOP OF EDGING - POINTED,  
LOCATE AT ALL SPLICES, CORNERS &  
AT 5' INTERVALS MAX.
7. 90% COMPACTED SUBGRADE

NOTES:

ALL WOOD TO BE CONSTRUCTION GRADE  
REDWOOD HEADER STOCK TO BE IN LENGTHS  
OF 10' MINIMUM. NAIL HEADERS TO STAKES  
WITH (2) GALVANIZED NAILS USE SPLICE  
PLATES (1"x4"x24") AT ALL BUTT JOINTS,  
CENTERED ON THE JOINT & NAILED TO  
EACH HEADER WITH (4) 10D GALVANIZED NAILS.

N.T.S

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <u><i>Ernest Wong</i></u> Ernest Wong, Public Works Director/City Engineer		Date: <u>9-6-16</u>	<b>DECOMPOSED GRANITE (NON-TRAIL)</b>
			Standard Drawing No. <b>462</b>

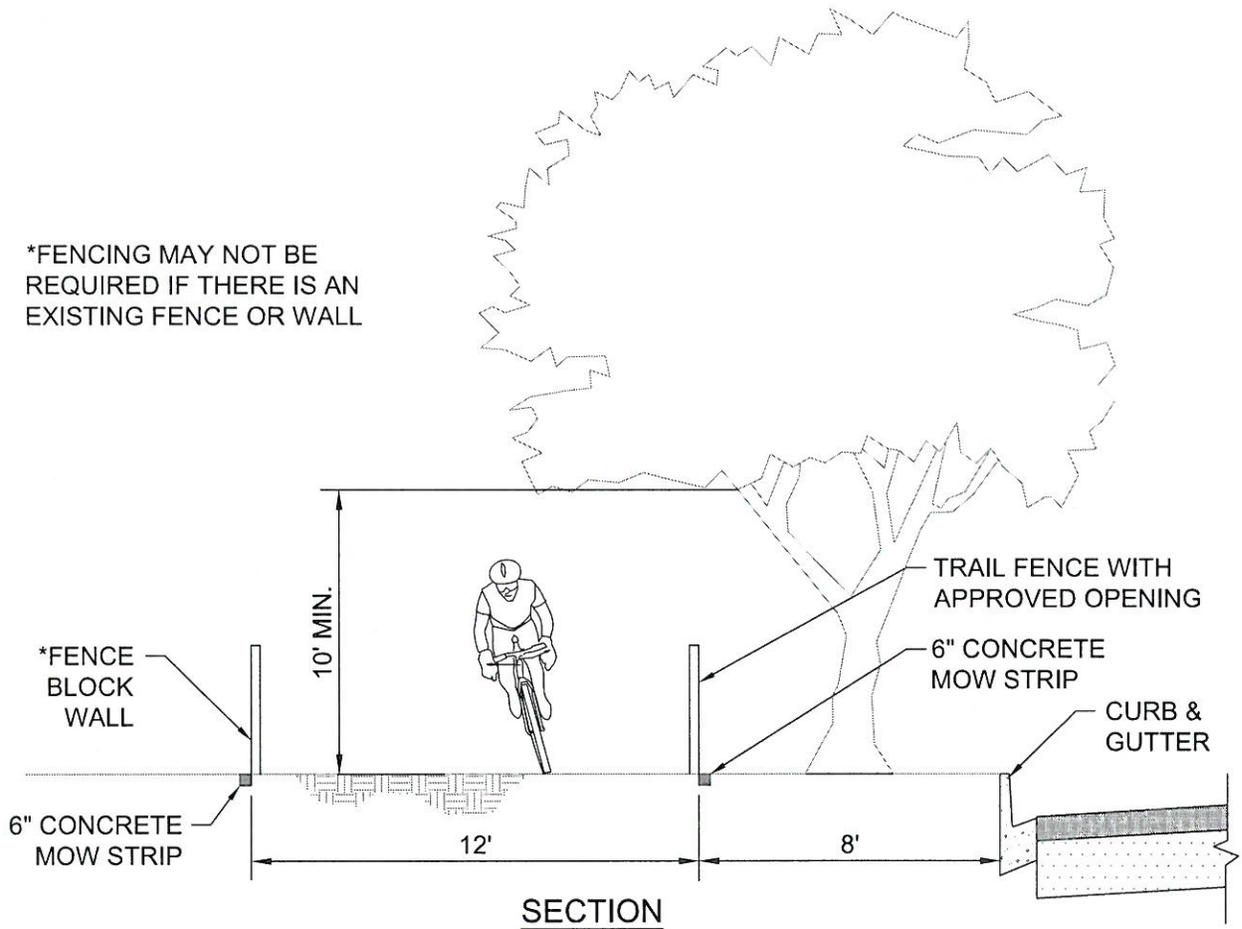


N.T.S.

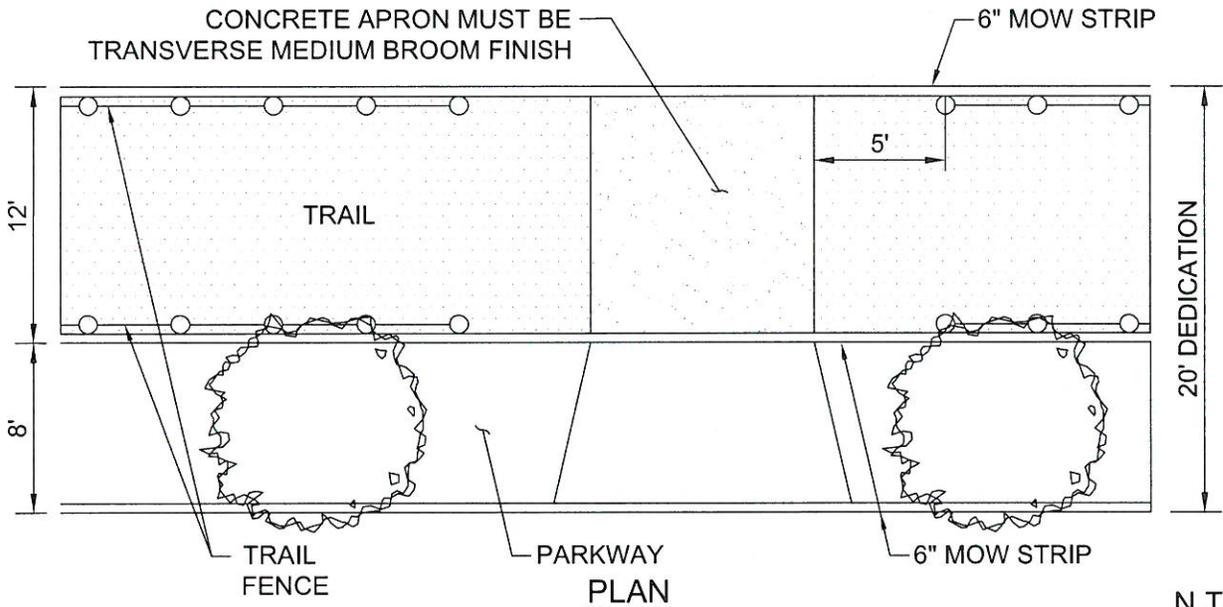
△	Mark	Revision	By	Date
	Approved:	Date: 9/6/16		
Lawrence A. Maine, Community Development Director				

<b>CITY OF HIGHLAND</b>	
RURAL COMMUNITY TRAIL (NON-STREET ADJACENT)	Standard Drawing No. <b>500</b>

\*FENCING MAY NOT BE  
REQUIRED IF THERE IS AN  
EXISTING FENCE OR WALL



SECTION



PARKWAY  
PLAN

N.T.S.

 Mark	Revision	By	Date
	Approved: <i>Lawrence A. Mainez</i> Lawrence A. Mainez, Community Development Director		

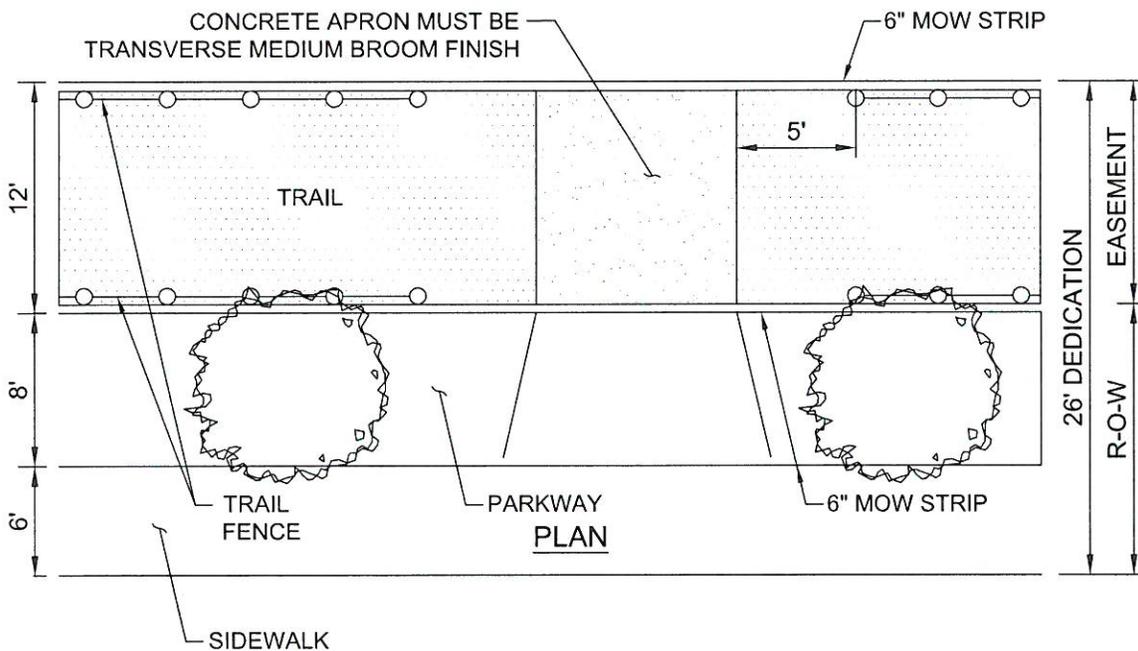
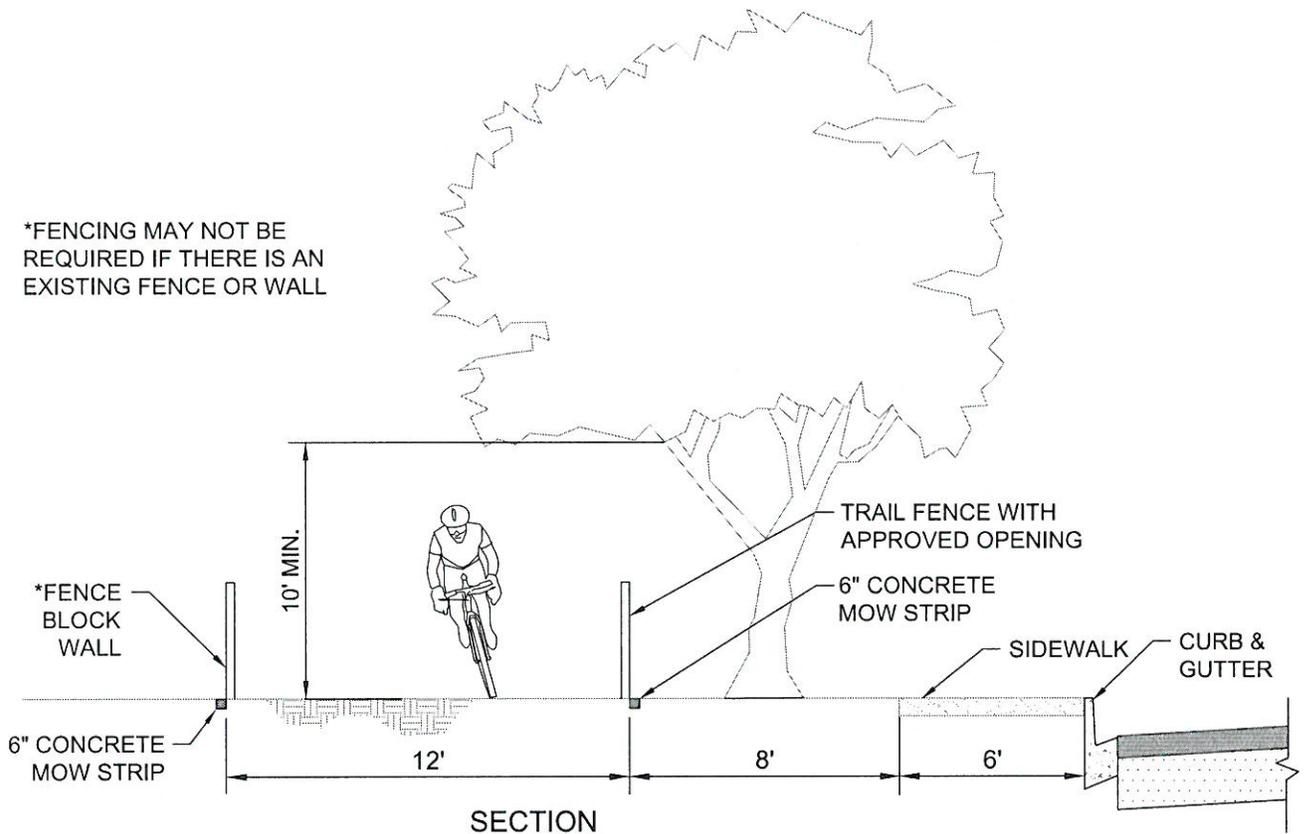
**CITY OF HIGHLAND**

**PARKWAY TRAIL  
FRONT-ON**

Standard  
Drawing  
No.  
**501A**

Date: *9/6/16*

\*FENCING MAY NOT BE REQUIRED IF THERE IS AN EXISTING FENCE OR WALL



N.T.S.

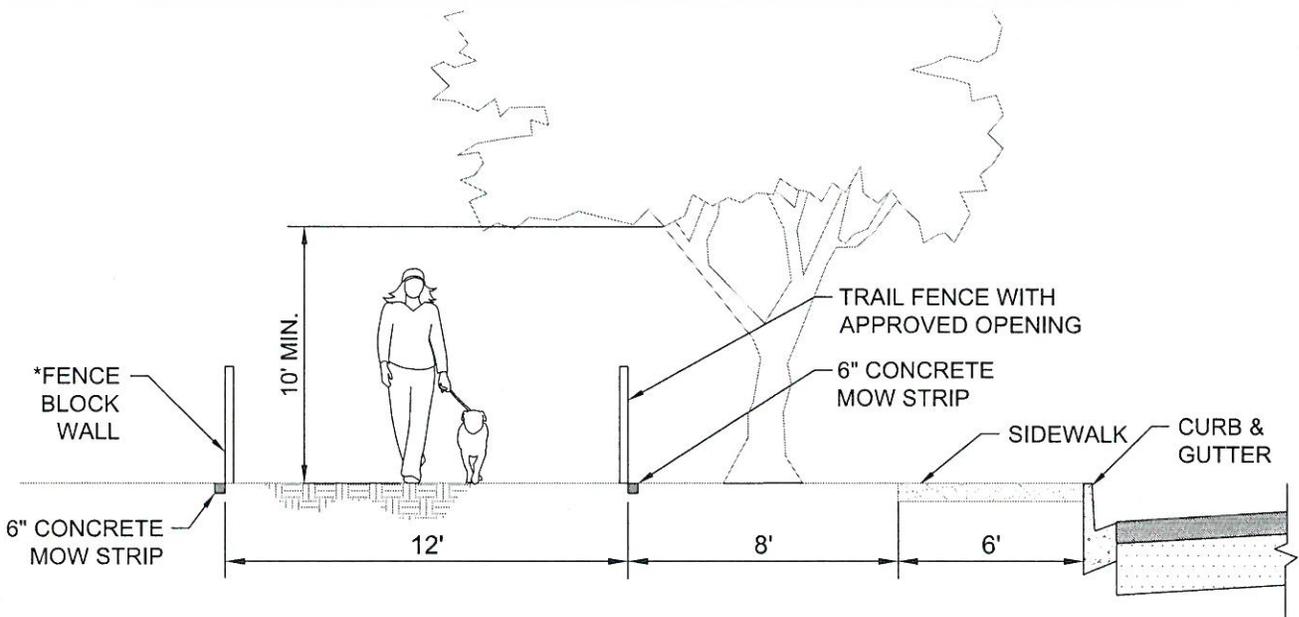
△			
Mark	Revision	By	Date
Approved: <i>Lawrence A. Mainez</i>		Date: 9/6/16	
Lawrence A. Mainez, Community Development Director			

CITY OF HIGHLAND

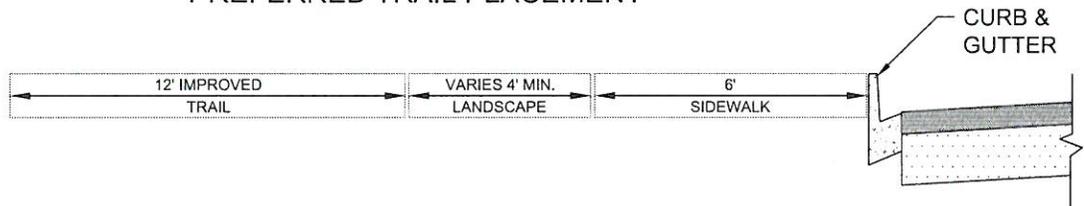
PARKWAY TRAIL WITH SIDEWALK

Standard Drawing No.

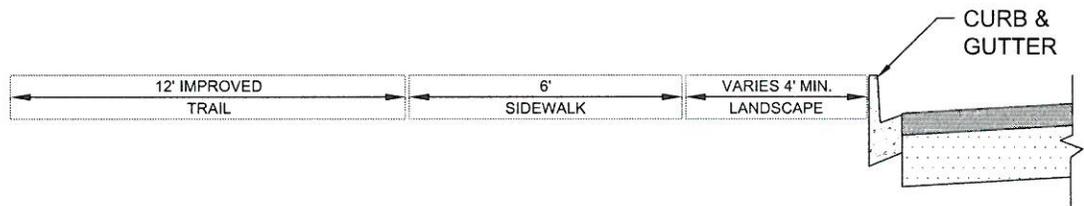
501B



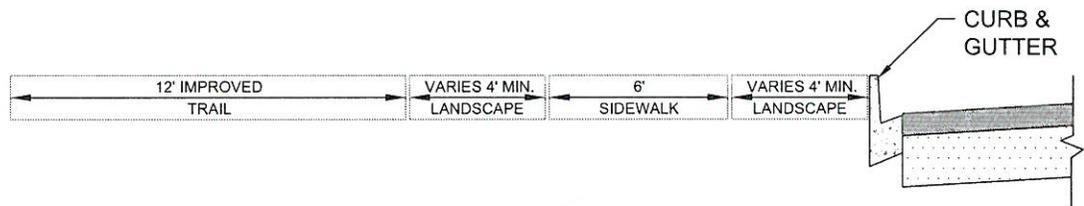
PREFERRED TRAIL PLACEMENT



TRAIL - LANDSCAPE - SIDEWALK



TRAIL - SIDEWALK - LANDSCAPE

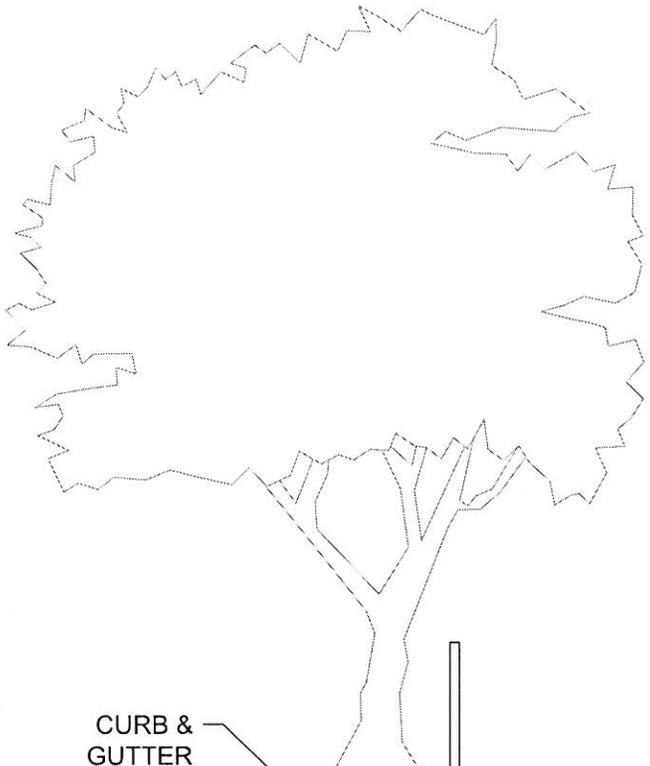


TRAIL - LANDSCAPE - SIDEWALK - LANDSCAPE

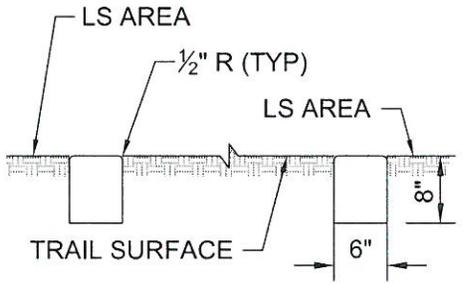
N.T.S.

△			
Mark	Revision	By	Date
Approved: <i>Lawrence Mainez</i> Lawrence A. Mainez, Community Development Director		Date: <i>9/6/16</i>	

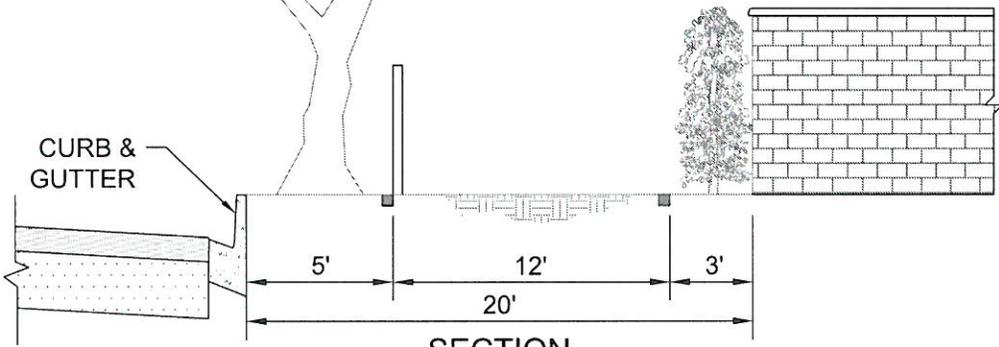
<b>CITY OF HIGHLAND</b>	
PARKWAY TRAIL WITH SIDEWALK VARIOUS CONFIGURATIONS	Standard Drawing No. <b>501C</b>



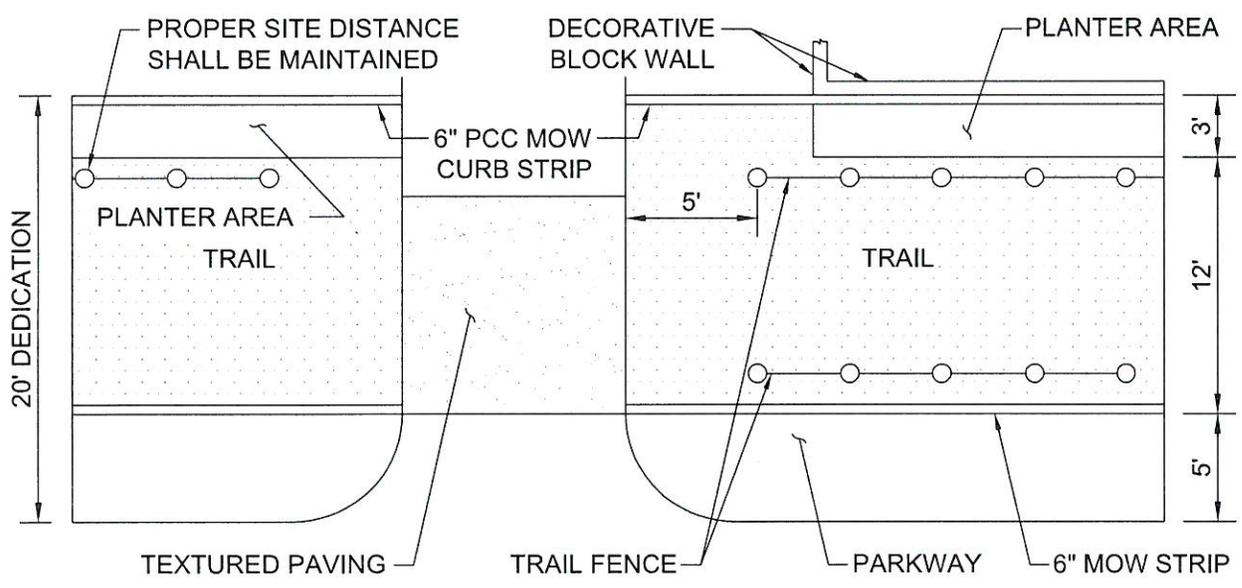
**NOTE:**  
WEAKENED PLANE JOINTS EVERY 5'.



**6" WIDE PCC MOW CURB DETAIL**  
N.T.S.



**SECTION**

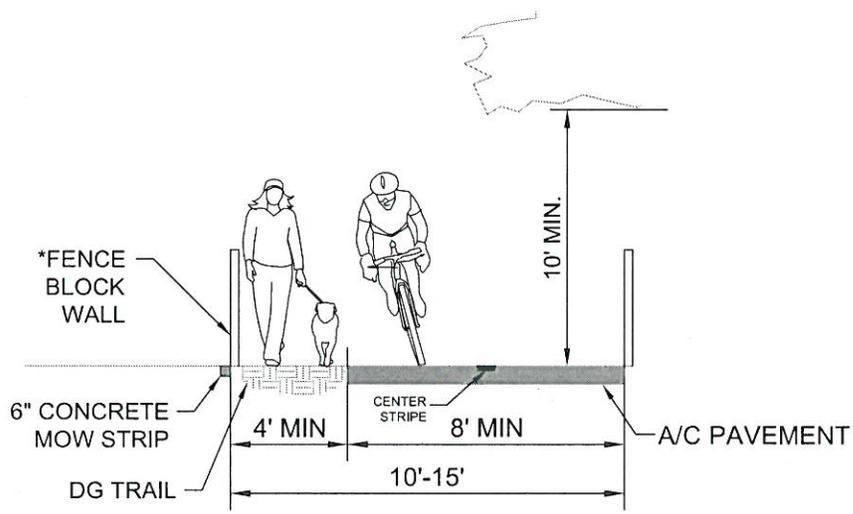


**PLAN**

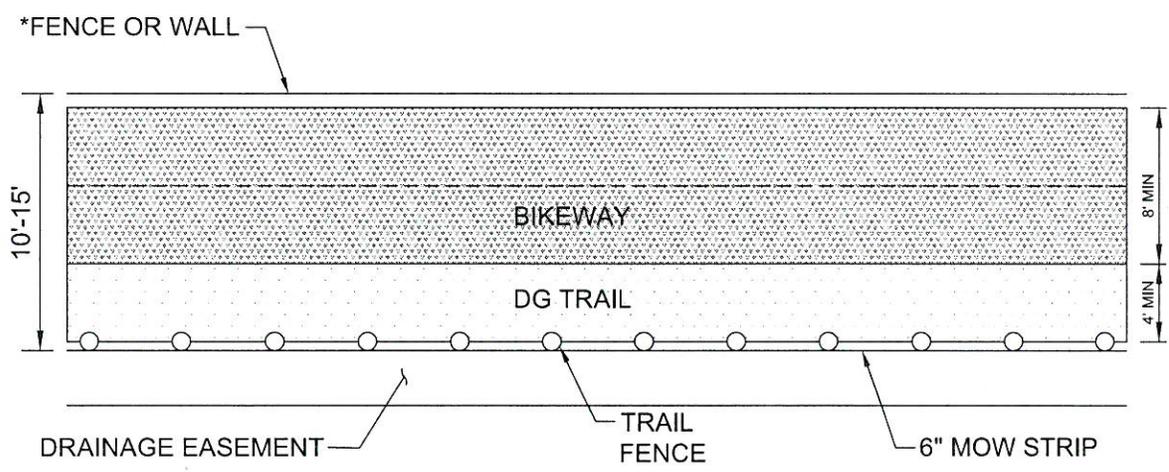
N.T.S.

△			
Mark	Revision	By	Date
Approved: <i>Lawrence A. Mainez</i>		Date: <i>2/6/16</i>	
Lawrence A. Mainez, Community Development Director			

<b>CITY OF HIGHLAND</b>	
<b>PARKWAY TRAIL SIDE-ON</b>	
Standard Drawing No.	<b>502</b>



MULTI-USE TRAIL/BIKEWAY



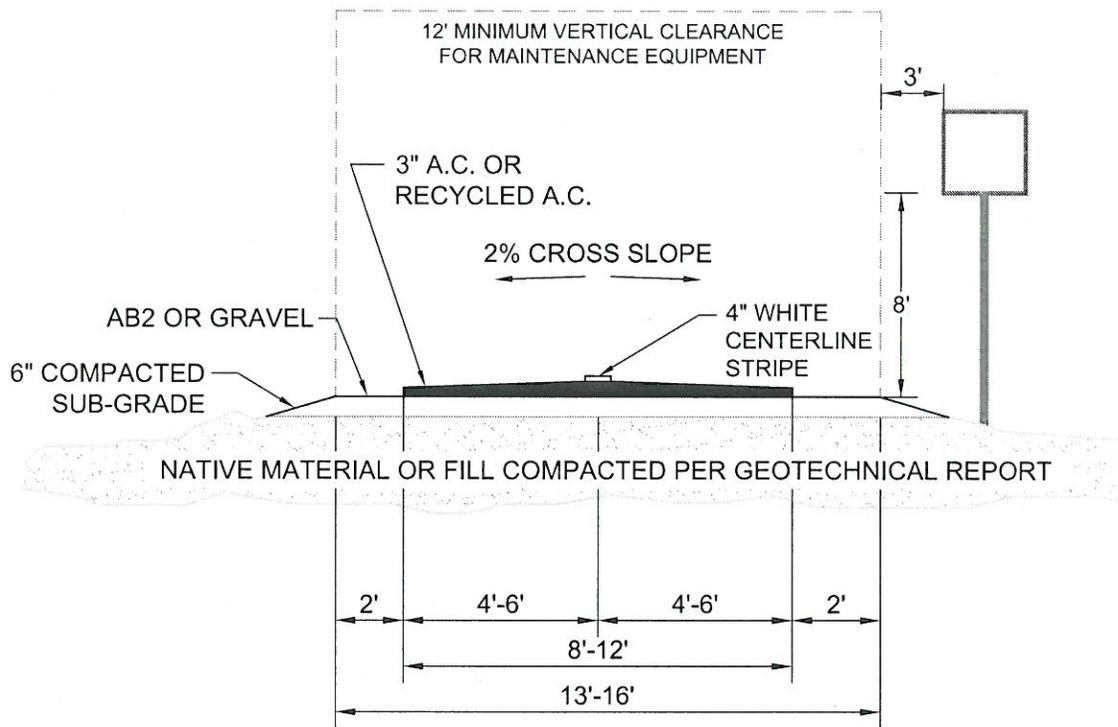
PLAN

NOTES:

1. FENCING MAY NOT BE REQUIRED IF THERE IS AN EXISTING FENCE OR WALL.
2. SLOPE DG TRAIL AWAY FROM BIKEWAY AT 2%.

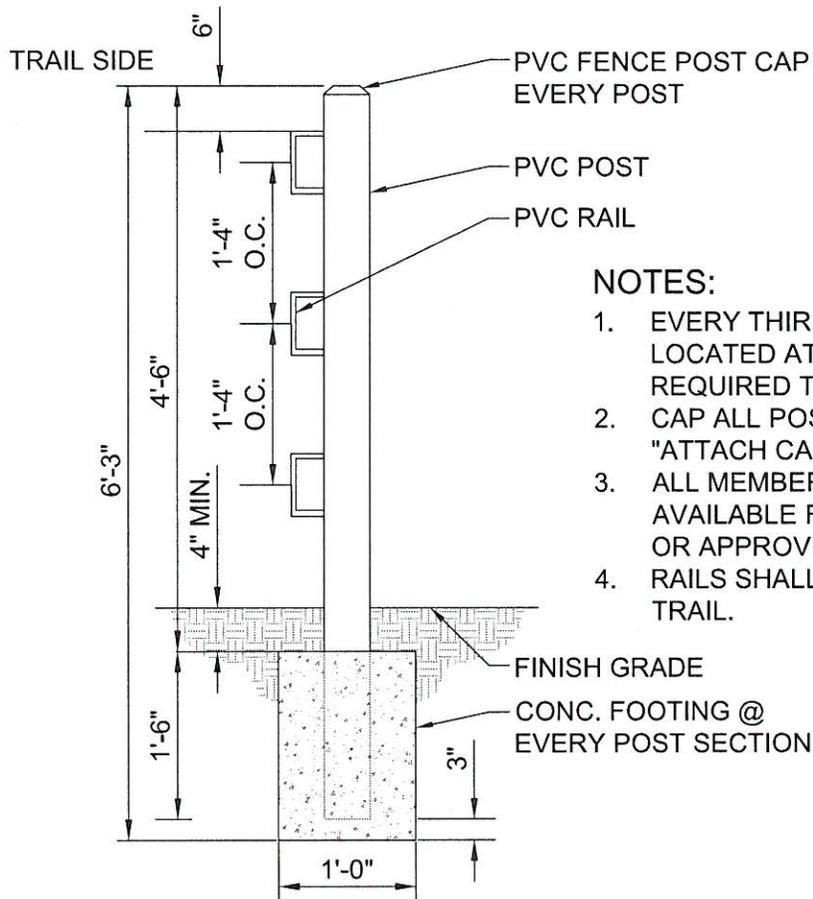
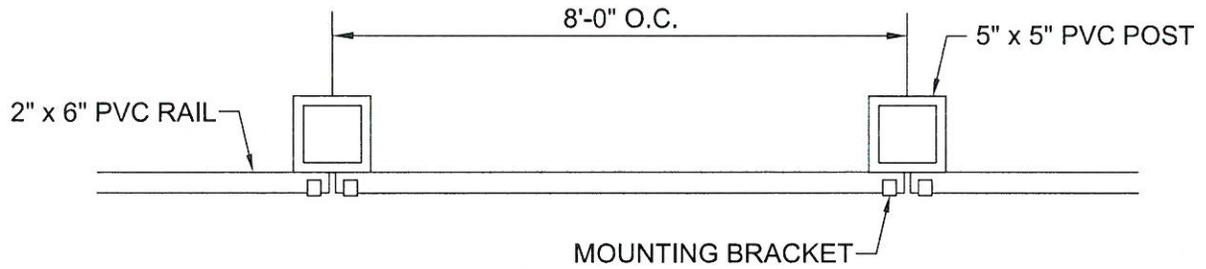
N.T.S.

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>DUAL USE MULTIPURPOSE TRAIL</b>	
Approved: <i>Lawrence A. Mainez</i> Date: <i>9/6/16</i> Lawrence A. Mainez, Community Development Director					



N.T.S.

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>TYPICAL CLASS I BIKEWAY</b>	
Approved: <i>Lawrence A. Mainez</i> Date: <i>9/6/16</i> Lawrence A. Mainez, Community Development Director					



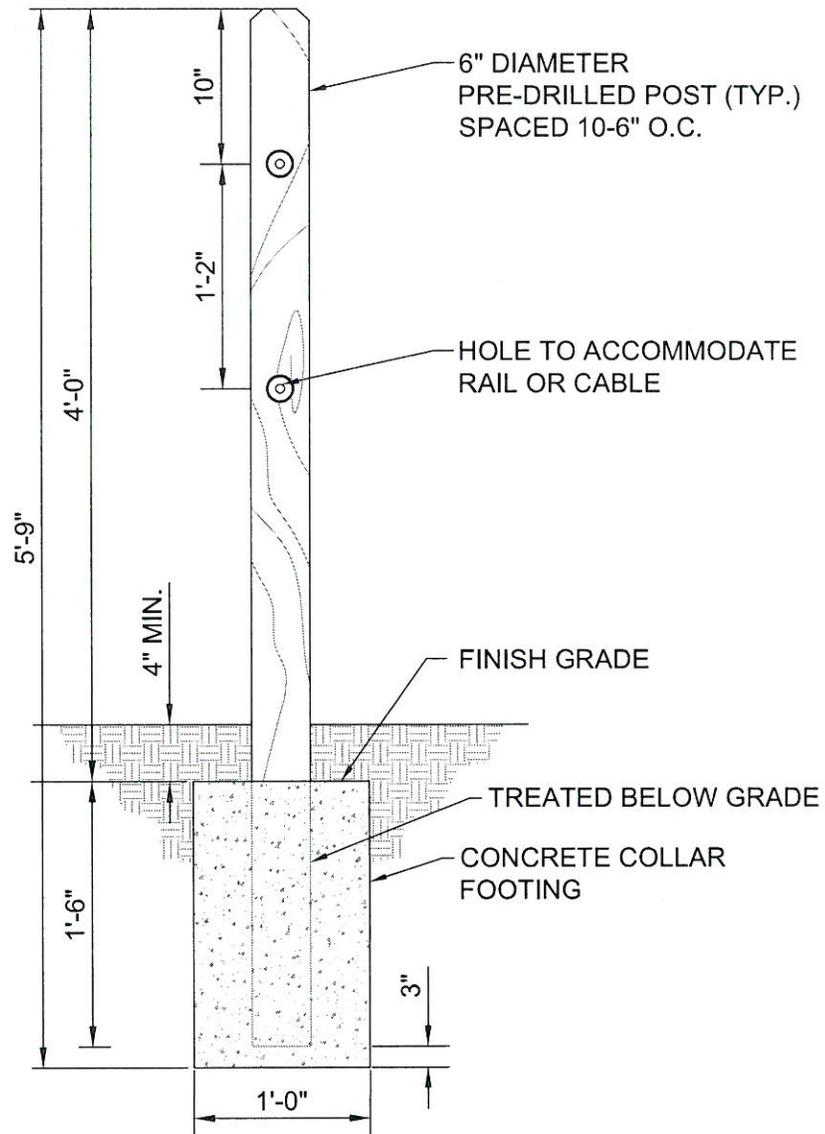
**NOTES:**

1. EVERY THIRD PVC POST AND ALL PVC POSTS LOCATED AT CHANGES OF DIRECTION ARE REQUIRED TO BE FILLED WITH CONCRETE.
2. CAP ALL POSTS & ENDS OF EXPOSED RAIL. "ATTACH CAPS WITH PVC GLUE."
3. ALL MEMBERS SHALL BE PVC FENCE AVAILABLE FROM COUNTRY ESTATE FENCE OR APPROVED ALTERNATE.
4. RAILS SHALL BE ORIENTED IN TOWARDS TRAIL.

"ALL SCREWS USED ON RAIL OR FOR RAIL MOUNTING BRACKETS SHALL BE OF SUFFICIENT SIZE TO SECURELY HOLD RAIL OR BRACKET IN PLACE".

N.T.S.

<b>CITY OF HIGHLAND</b>				Standard Drawing No.  <b>504</b>
Mark	Revision	By	Date	
Approved: <i>Lawrence Mainz</i> Date: <i>9/6/16</i> Lawrence A. Mainz, Community Development Director				<b>PVC RAILING</b>

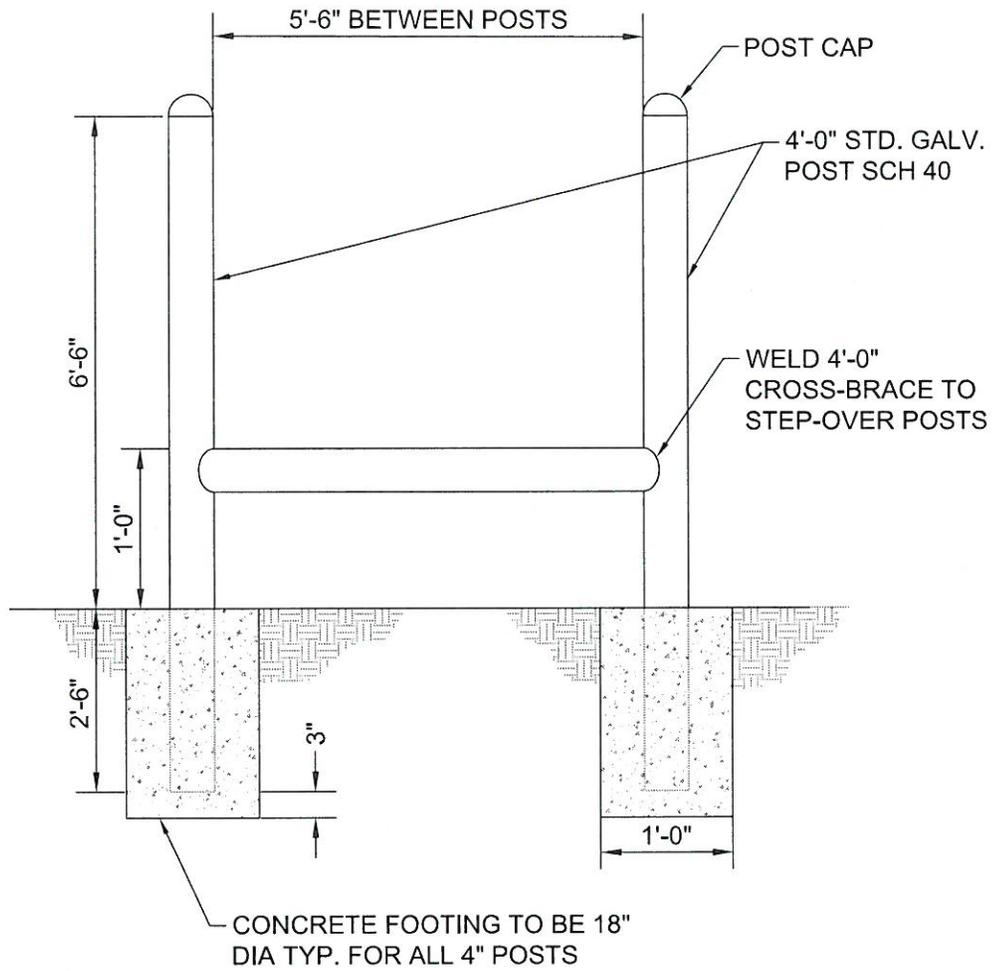


**NOTES:**

1. END OR ANGLE POSTS SHOULD BE ANCHORED IN A 24" X 12" FOOTING.
2. ALL POSTS AND RAILS SHALL BE CEDAR LODGEPOLE AND CABLE, RESPECTIVELY.
3. TWO HORIZONTAL RAIL POSTS SHALL BE SUFFICIENT IN MOST CASES EXCEPT WHERE THE CITY HAS DETERMINED FOR SAFETY REASONS THAT THREE RAILS SHALL BE NECESSARY.

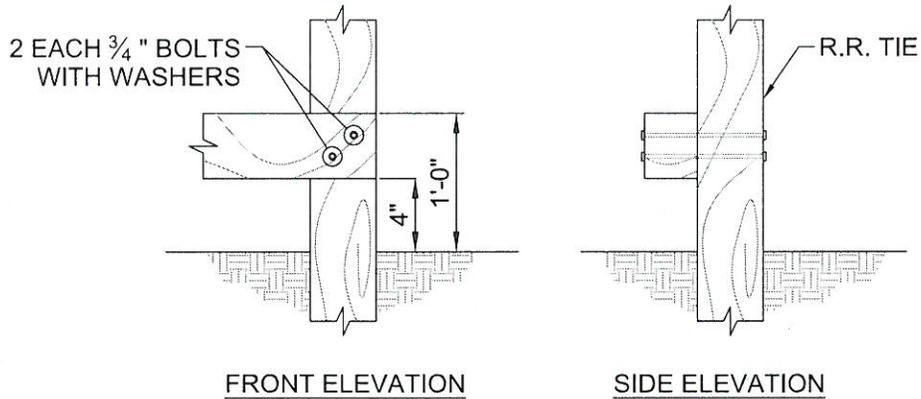
N.T.S.

△				<b>CITY OF HIGHLAND</b>
Mark	Revision	By	Date	<b>RAILING</b>
Approved: <i>Lawrence A. Mainez</i> Date: <i>9/6/16</i> Lawrence A. Mainez, Community Development Director				Standard Drawing No. <b>505</b>

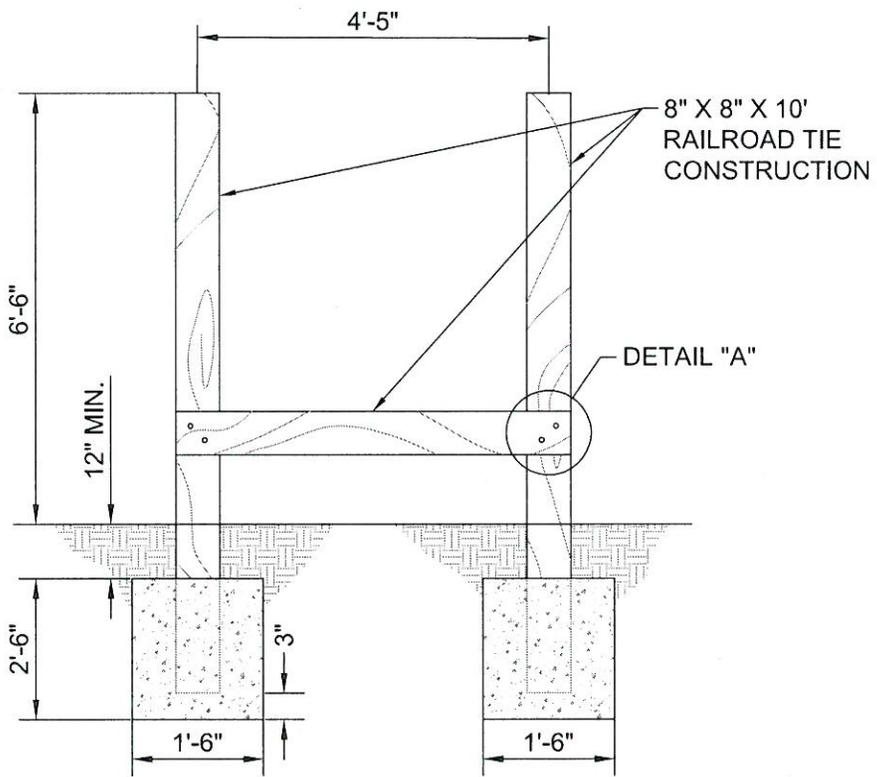


N.T.S.

 Mark	Revision	By	Date	<b>CITY OF HIGHLAND</b>	
				STEP OVERS (GALVANIZED STEEL)	
Approved: <i>Lawrence A. Mainez</i> Date: <i>9/6/16</i> Lawrence A. Mainez, Community Development Director					



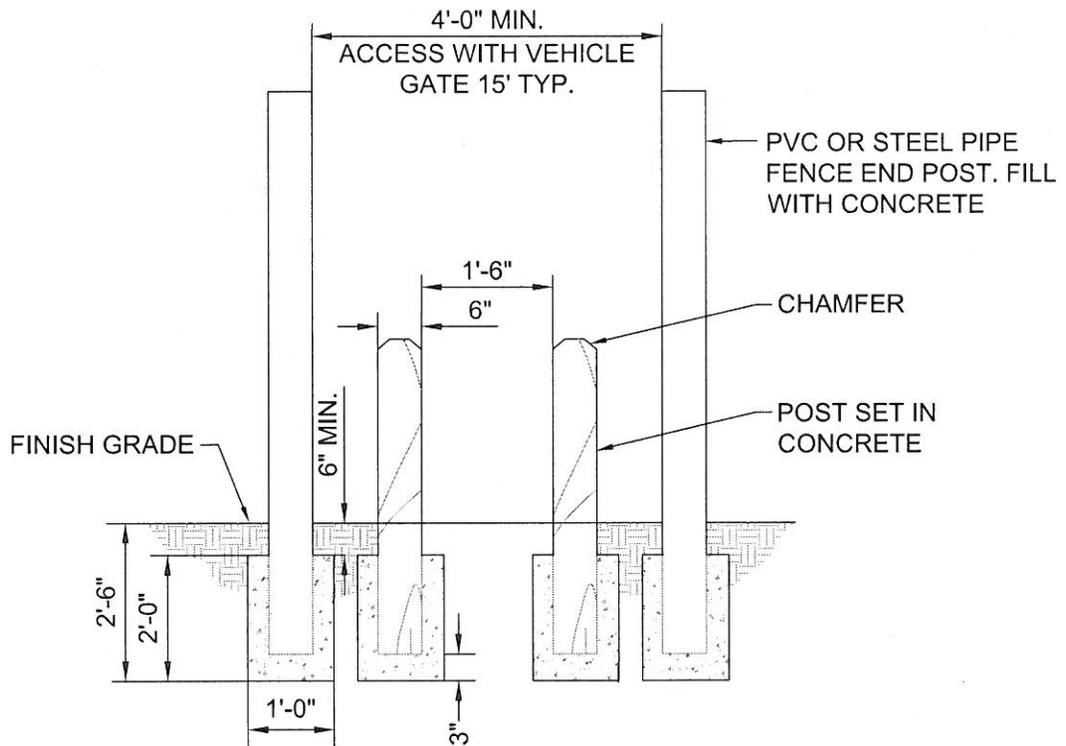
DETAIL "A"



RAILROAD TIE CONSTRUCTION-STANDARD DETAIL

N.T.S.

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <i>Lawrence A. Mainez</i>			Date: 9/6/16
Lawrence A. Mainez, Community Development Director			STEP OVERS (RAILROAD TIE)
			Standard Drawing No. <b>507</b>



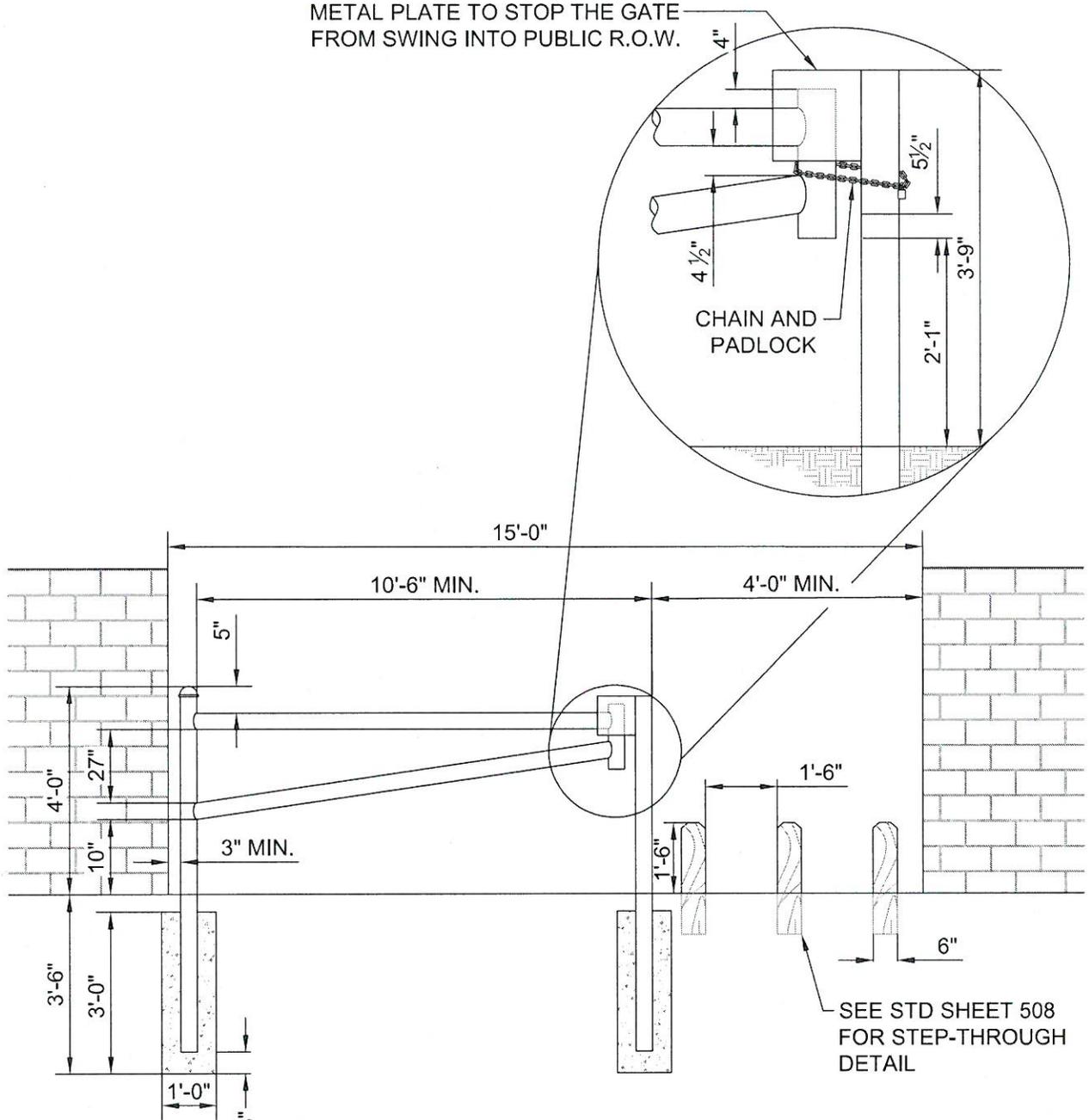
**NOTES:**

1. MINIMUM OF TWO POSTS WITH CENTER PASS THROUGH. MATERIALS USED SHOULD BE SPECIFIED.
2. ALL POST AND STEP THROUGH'S SHOULD BE 30" DEEP AND ANCHORED IN A 24" X 12" CONCRETE FOOTING. CONCRETE SHOULD NOT BE POURED TO GRADE. CONCRETE SHOULD BE POURED UP TO WITHIN 6" BELOW GRADE & BACKFILLED TO FINISH GRADE.

N.T.S.

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Lawrence A. Mainez</i> Lawrence A. Mainez, Community Development Director		Date: 9/6/16	
<b>STEP - THROUGH</b>			Standard Drawing No. <b>508</b>

METAL PLATE TO STOP THE GATE FROM SWING INTO PUBLIC R.O.W.



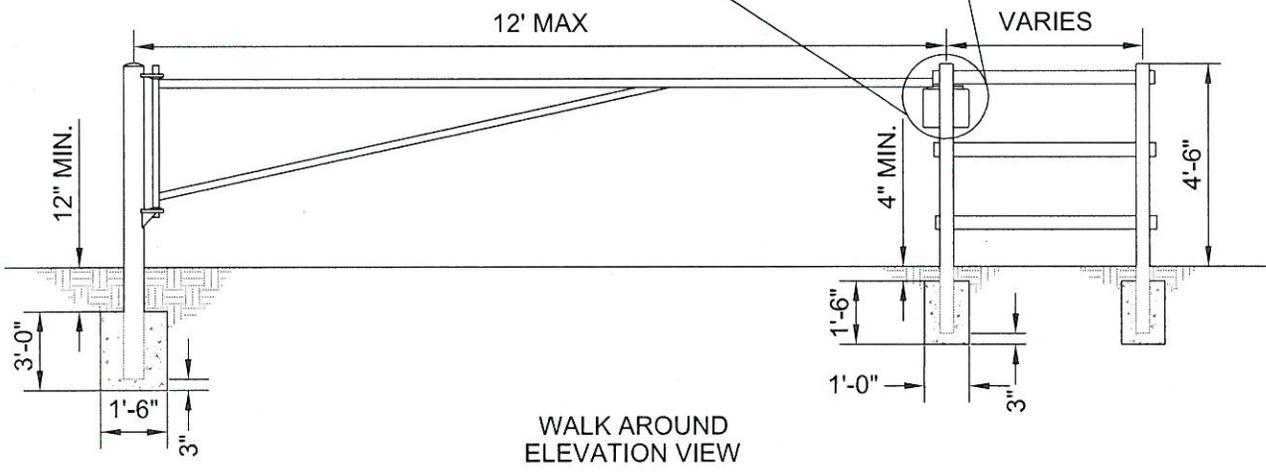
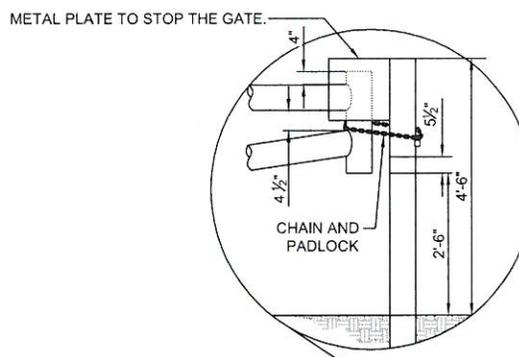
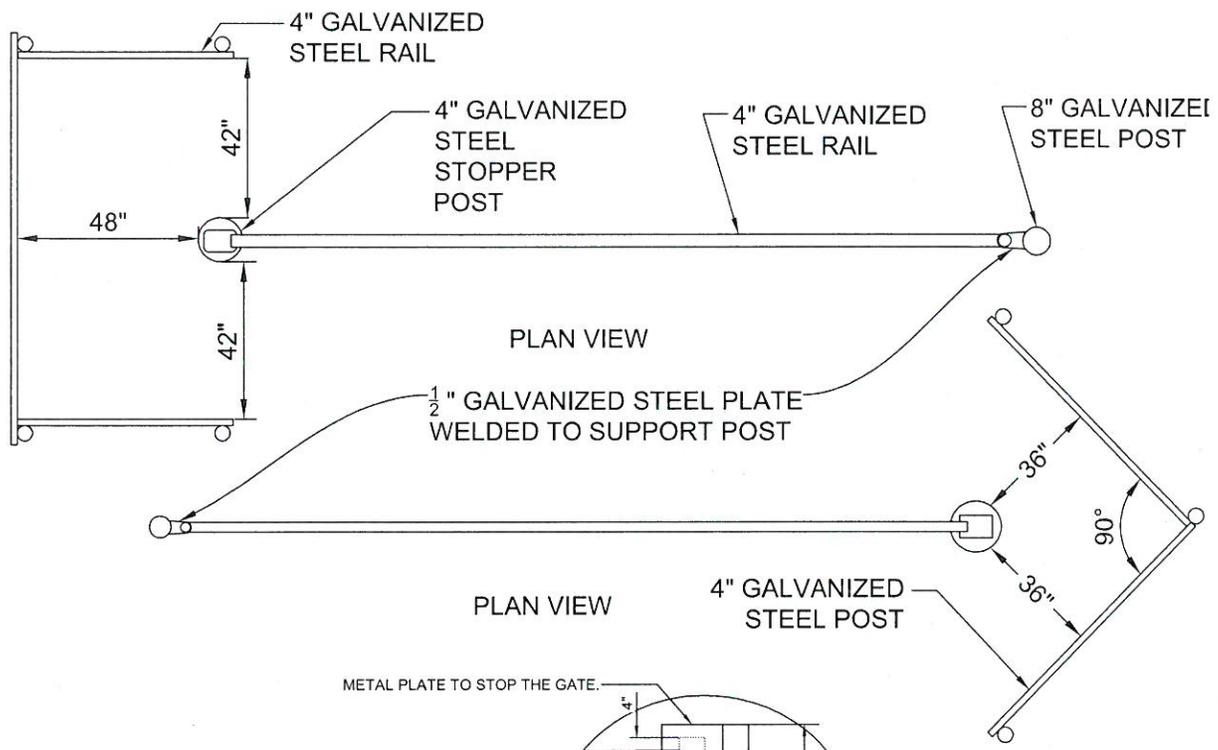
**NOTE:**

GATE CONSTRUCTED OF 2 1/2" GALVANIZED STEEL MEMBERS. HINGE CREATED BY WELDED CROSS MEMBERS TO A 3" GALVANIZED STEEL SLEEVE WITH CAP SLIPPED OVER 2 1/2" UPRIGHT. GATE POST SHOULD BE 40" DEEP AND ANCHOR ON A 36" X 12" CONCRETE FOOTING. GATE SHOULD NOT SWING IN TO PUBLIC RIGHT OF WAY.

N.T.S.

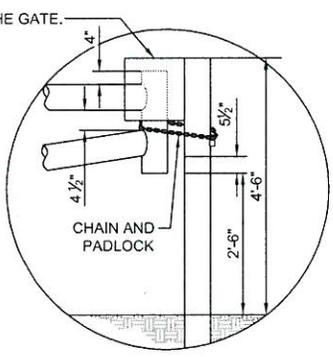
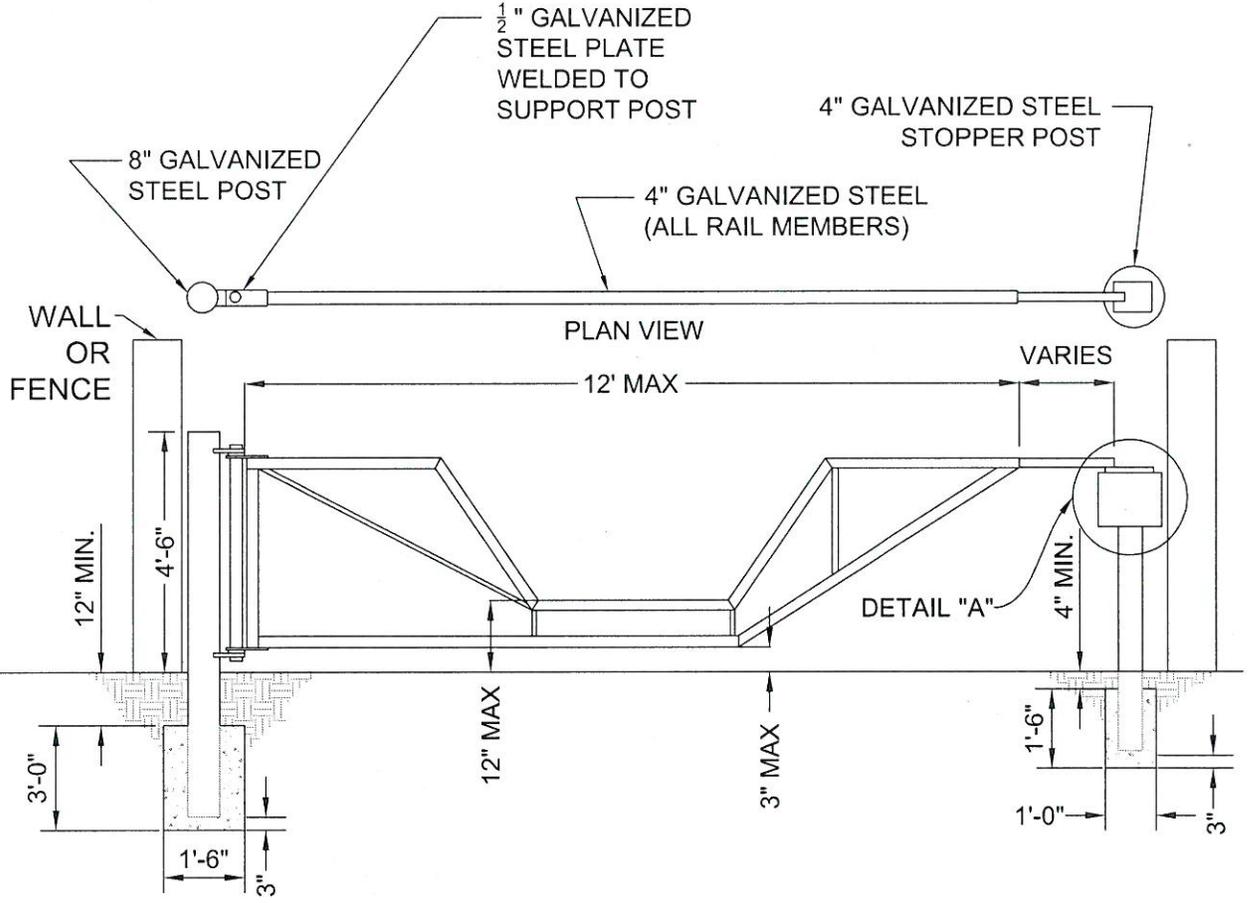
△			
Mark	Revision	By	Date
Approved: <i>Lawrence Mainez</i>		Date: 9/6/16	
Lawrence A. Mainez, Community Development Director			

<b>CITY OF HIGHLAND</b>	
<b>VEHICLE GATE WITH SIDE ACCESS</b>	
Standard Drawing No.	<b>509A</b>



N.T.S.

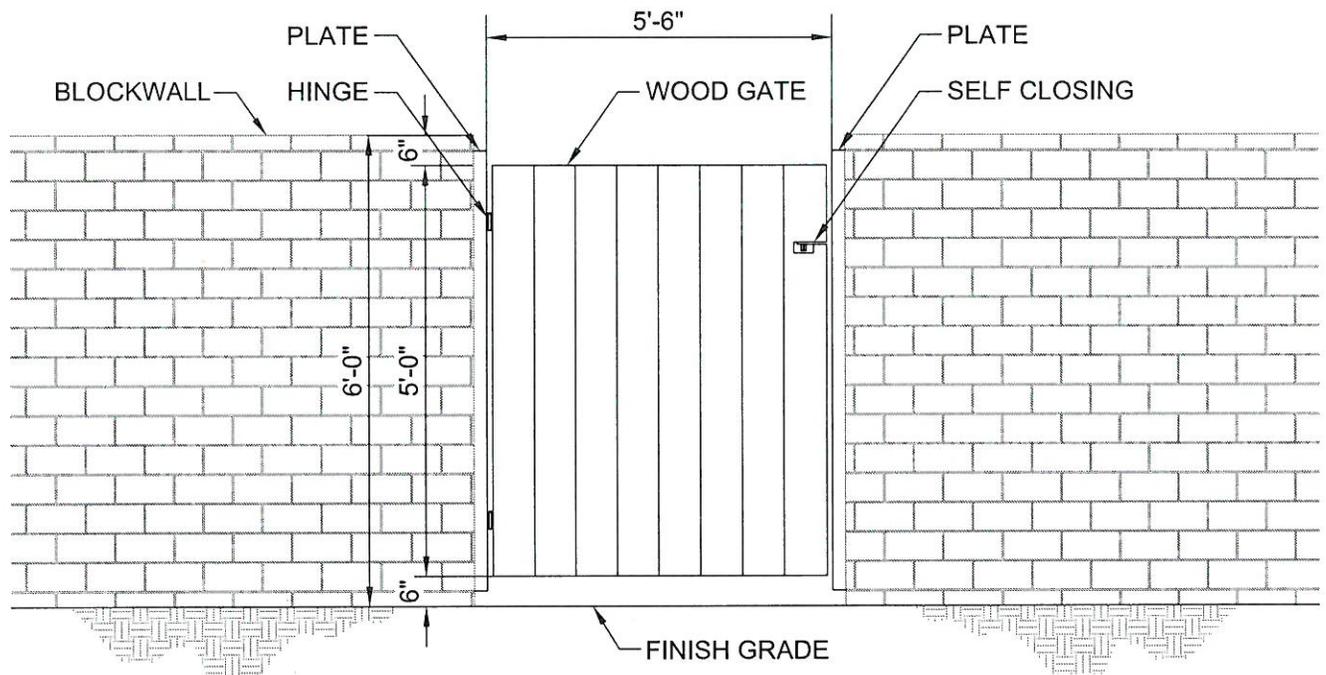
<b>CITY OF HIGHLAND</b>			
Mark	Revision	By	Date
Approved: <i>Lawrence A. Mainez</i>		Date: <i>9/6/16</i>	
Lawrence A. Mainez, Community Development Director		VEHICLE GATE WALK AROUND	Standard Drawing No.  509B



**DETAIL "A"**

N.T.S.

				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>STEP THROUGH SWING GATE</b>	
Approved: <i>Lawrence A. Mainez</i> Lawrence A. Mainez, Community Development Director			Date: <i>9/6/16</i>		

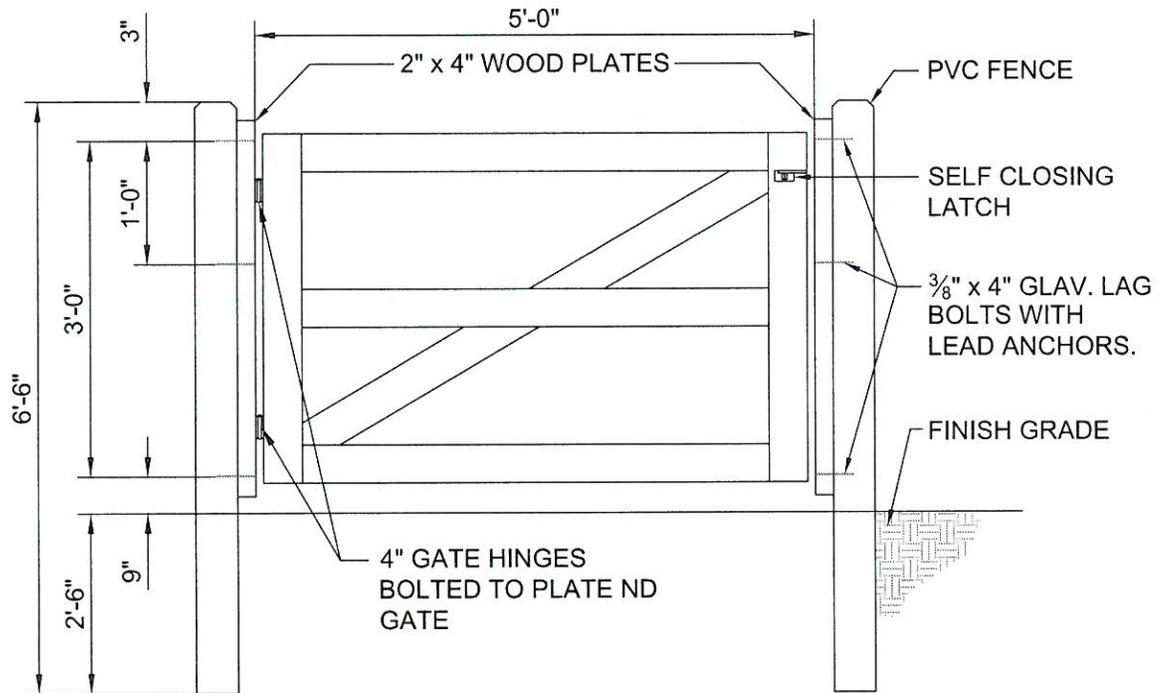
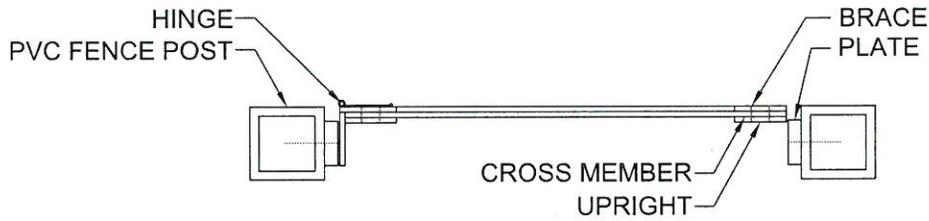


**NOTES:**

1. THE GATE SHALL BE SOLID WOOD AND SELF-CLOSING. THE GATE SHALL BE APPROVED BY THE PLANNING DIVISION.
2. MATERIALS SHALL BE WESTERN RED CEDAR OR APPROVED SUBSTITUTE. DUE TO TOXICITY, MATERIALS SHOULD NOT INCLUDE PRESSURE TREATED DOUGLAS FUR.
3. ALL HARDWARE SHALL BE DIPPED GALVANIZED STEEL.
4. GATE SHALL NOT SWING INTO RIGHT-OF-WAY.

N.T.S.

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Lawrence A. Mainez</i> Lawrence A. Mainez, Community Development Director			Date: <i>9/6/16</i>
<b>PARKWAY GATE</b>			Standard Drawing No.  <b>510</b>

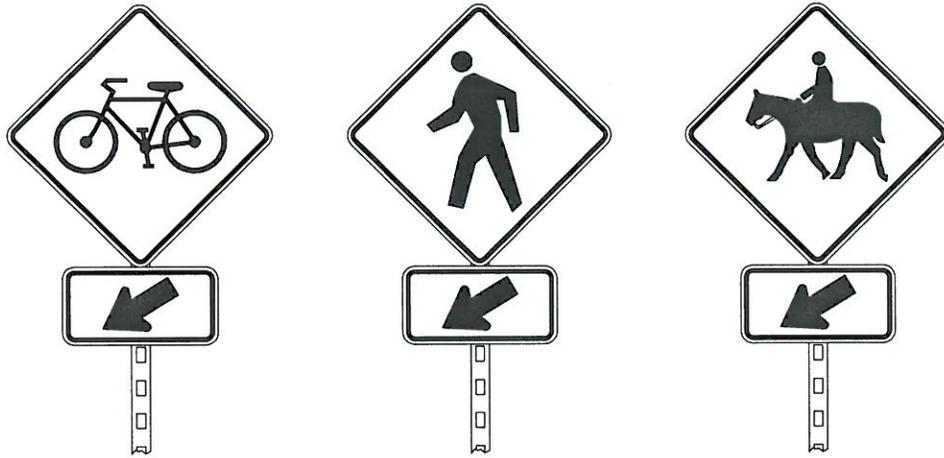


**NOTES:**

1. GATE MEMBERS SHALL BE 1" x 4" WOOD PAINTED WHITE, PRESSURE TREATED WOOD SHOULD BE AVOIDED.
2. MEMBERS SHALL BE ATTACHED WITH 3/4" GALV. BOLTS.
3. HINGE SHALL BE ATTACHED TO PLATE PRIOR TO ATTACHING PLATE TO CONCRETE. COUNTER SINK BOLTS SO THAT THE LATE IS FLUSH WITH POST. GATE SHALL NOT SWING INTO RIGHT-OF-WAY.

N.T.S.

<b>CITY OF HIGHLAND</b>			
△			
Mark	Revision	By	Date
Approved: <i>Lawrence A. Mainez</i>		Date: <i>9/6/16</i>	
Lawrence A. Mainez, Community Development Director		<b>COMMUNITY TRAIL GATE</b>	
			Standard Drawing No. <b>511</b>

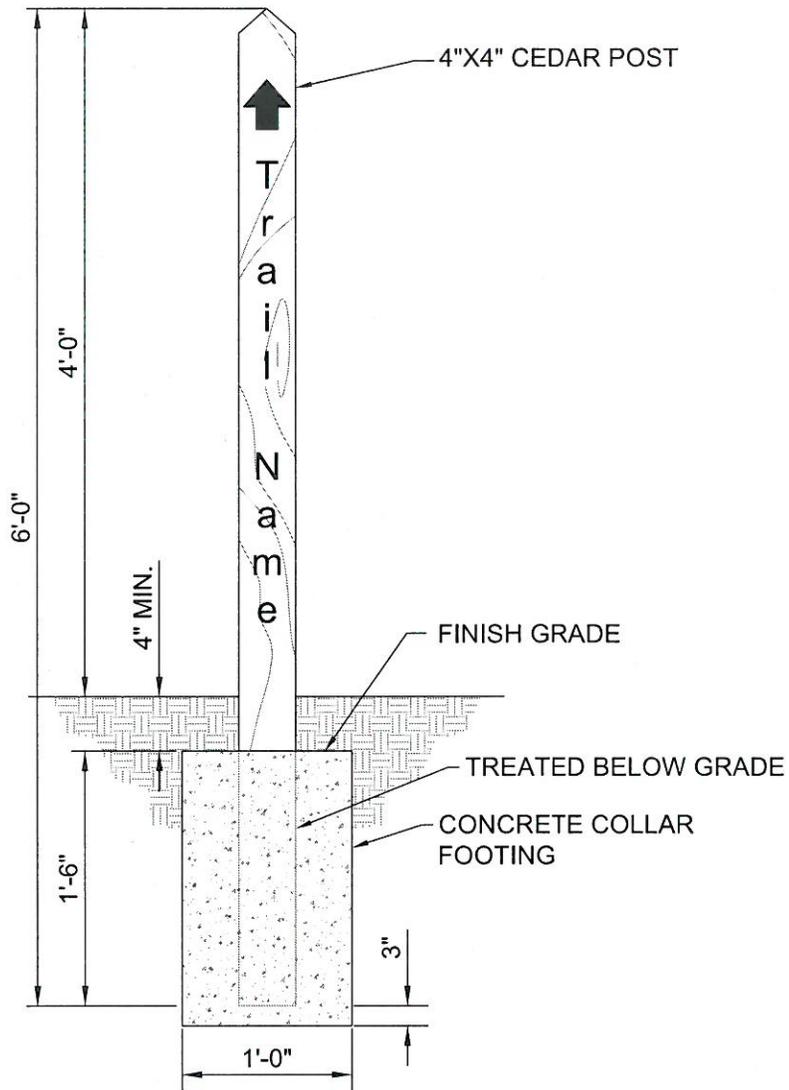


**NOTES:**

1. TO BE USED ON ROADWAYS TO WARN MOTORISTS OF TRAIL CROSSING.
2. TRAIL SIGNS SHALL BE ATTACHED TO EXISTING METAL POLES WHERE POSSIBLE.
3. TRAIL SIGNS SHALL MEET CURRENT CA MUTCD STANDARDS.

N.T.S.

△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	<b>WARNING SIGNS</b>	
Approved: <i>Lawrence Mainez</i> Date: <i>9/6/16</i> Lawrence A. Mainez, Community Development Director				Standard Drawing No. <b>512</b>	

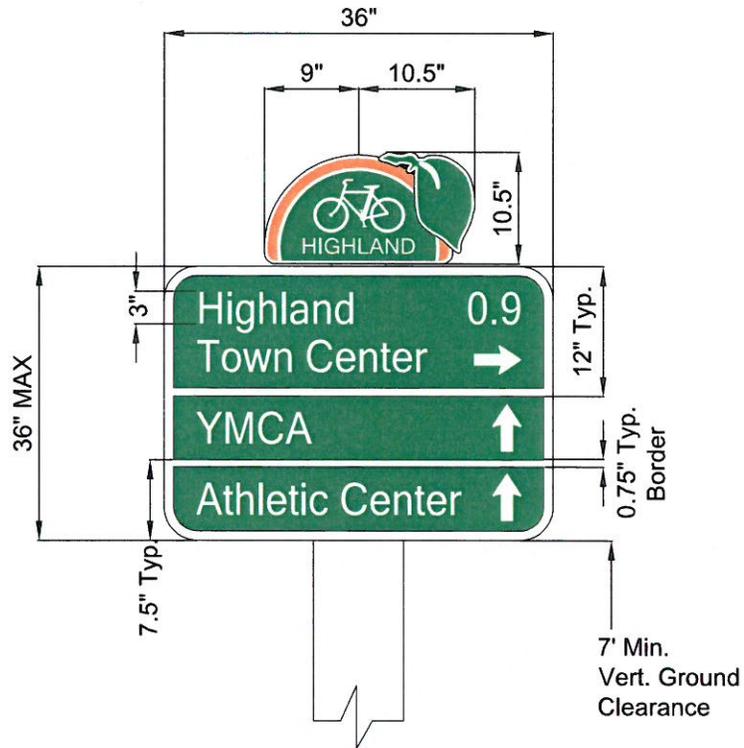


**NOTES:**

1. LETTERS AND DIRECTIONAL ARROW TO BE ROUTED/RECESSED AND PAINTED WHITE AND MAY BE REQUIRED ON MULTIPLE SIDES.
2. UPPER CASE LETTERS TO BE 3" HIGH, LOWER CASE LETTERS TO BE 2 1/2" HIGH AND DIRECTIONAL ARROW TO BE 7" HIGH.

N.T.S.

△				<b>CITY OF HIGHLAND</b>
Mark	Revision	By	Date	<b>TRAIL MARKER</b>
Approved: <i>Lawrence A. Mainez</i> Date: <i>9/6/16</i> Lawrence A. Mainez, Community Development Director				Standard Drawing No. <b>513</b>

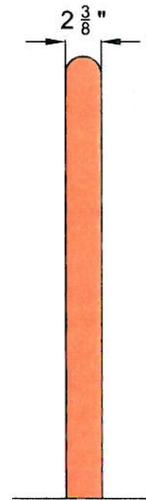
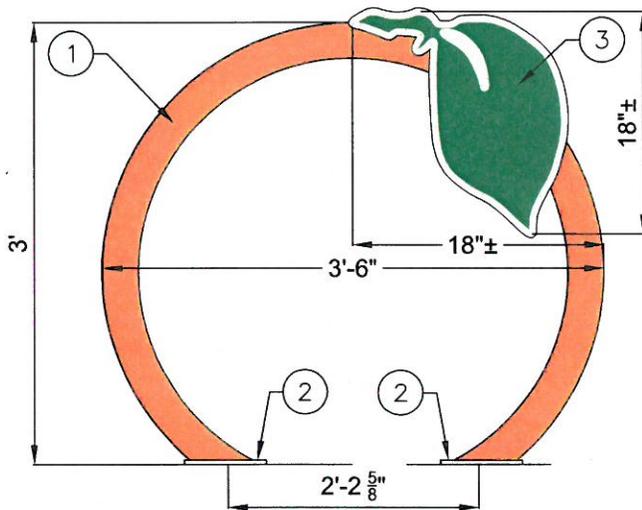
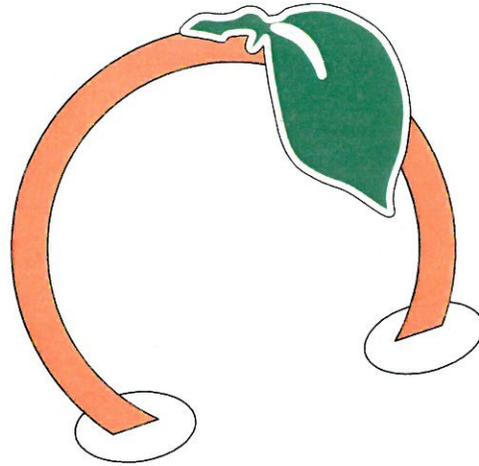


NOTES:

1. CAPITAL LETTERS TO BE 3" HIGH.
2. LOWER CASE LETTERS TO BE 2.25" HIGH.
3. LETTER & LEGEND COLOR TO BE WHITE.
4. BACKGROUND COLOR TO BE GREEN.
5. LOGO TRIM TO BE ORANGE.
6. SIGN TRIM TO BE WHITE.
7. LEAF COLOR TO BE GREEN.
8. SEE STD. DWG. 603 FOR FOUNDATION.
9. COLOR TONES TO BE APPROVED BY THE CITY.

N.T.S

CITY OF HIGHLAND			
△			
Mark	Revision	By	Date
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u> Ernest Wong, Public Works Director/City Engineer			Standard Drawing No. <b>600</b>
			<b>BIKE WAYFINDING SIGNS</b>



NOTES:

1.  $2\frac{3}{8}$ " Ø O.D. SCH. 40 STEEL PIPE BIKE STAND. POWDER COAT 'ORANGE' TO MATCH CITY LOGO.
2. 6" Ø,  $\frac{1}{4}$ " THICK SURFACE MOUNT FLANGE; MOUNT TO EXISTING CONCRETE SLAB W/ (4)  $\frac{3}{8}$ " x  $1\frac{1}{2}$ " CONCRETE EXPANSION ANCHORS PER FLANGE, EVENLY SPACED.
3.  $\frac{1}{4}$ " THICK PLATE STEEL METAL CITY LOGO. CONTACT CITY FOR LOGO ART AND COLORS. INSTALL BIKE RACK WITH LEAF FACING STREET.

N.T.S

△				<b>CITY OF HIGHLAND</b>	
	Mark	Revision	By	Date	<b>BIKE RACK</b>
Approved: <i>Ernest Wong</i>				Date: <b>9-6-16</b>	
Ernest Wong, Public Works Director/City Engineer					

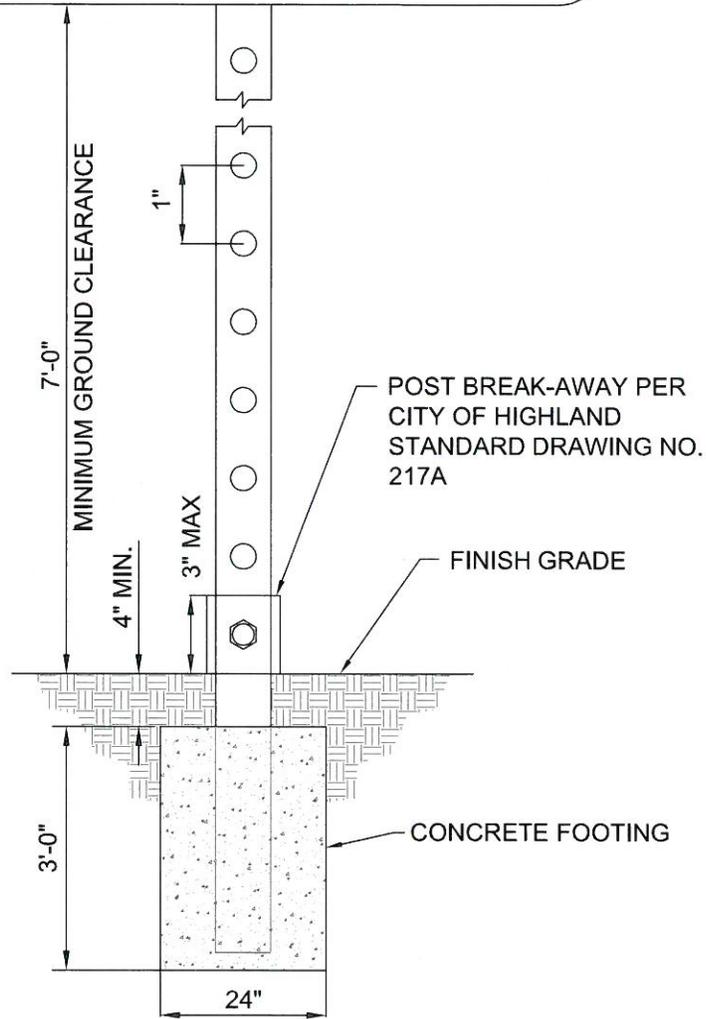


NOTES:

1. USE 24" WIDE R81 (CA) BIKE LANE SIGNS. NO PARKING OR NO STOPPING ANY TIME SIGNS INSTALLED IN CONJUNCTION WITH BIKE LANE SIGNS SHALL BE 24" WIDE.
2. NO PARKING SIGNS SHALL BE R8-3A OR R26 (CA). NEW NO PARKING SIGNS SHALL BE THE SAME TYPE AS EXISTING NOR PARKING SIGNS WITHIN A ROADWAY SEGMENT UNLESS OTHERWISE DIRECTED BY CITY ENGINEER. USE R26 (CA) NO PARKING SIGNS WITHIN ROADWAY SEGMENTS WHERE NO PARKING SIGNS DO NOT EXIST.
3. NO STOPPING ANY TIME SIGNS SHALL BE R26(S) (CA).

N.T.S

△				<b>CITY OF HIGHLAND</b>	
Mark	Revision	By	Date	TYPICAL NO PARKING SIGN CONFIGURATION WITH BIKE LANE	
Approved: <u><i>Ernest Wong</i></u> Date: <u>9-6-16</u>					
Ernest Wong, Public Works Director/City Engineer					



**NOTES:**

1. SIGN POSTS SHALL BE 2" X 2" GALVANIZED STEEL AND SHALL BE INSTALLED INTO GROUND WITH 2-1/4" X 2-1/4" X 30" ANCHOR, C.C.S.S. TYPE. ATTACH POST AND ANCHOR WITH TWO (2) DRIVE RIVETS.
2. THERE SHALL BE A CLEARANCE OF 7' BETWEEN FINISHED GRADE AND BOTTOM OF LOWER SIGN. ANCHOR SHALL EXTEND NO MORE THAN 3" ABOVE FINISHED GRADE.

N.T.S

△				<b>CITY OF HIGHLAND</b>	
	Mark	Revision	By	Date	Standard Drawing No.
Approved: <i>Ernest Wong</i> Date: <i>9-6-16</i> Ernest Wong, Public Works Director/City Engineer				<b>SIGN POST INSTALLATION AND FOUNDATION</b>	
					<b>603</b>