



**City of South Lake Tahoe**

**Public Improvement and Engineering**

**Standards**

**2009**

# CITY OF SOUTH LAKE TAHOE PUBLIC IMPROVEMENT AND CITY ENGINEERING STANDARDS

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**AC:** Asphalt concrete as specified in Section 39 of the Standard Specifications and the current City asphalt specifications

**ADA:** Americans with Disabilities Act

**ADT:** Average Daily Traffic

**Addendum:** A written or graphic supplement to any of the contract documents issued in writing to bidders after advertisement of but prior to the opening of bids, which clarifies, corrects, or changes the bidding of contract documents.

**Advisory Agency:** Refers to the body or person which is charged by the City Council with the duty of making investigations and reports on the design and improvements of proposed divisions of real property, the imposing of requirements of conditions thereon, and having the authority by local ordinance to approve, conditionally approve or disapprove the tentative subdivision map.

In the case of subdivisions proposing the creation of four or fewer parcels, which require the filing of a parcel map, the Advisory Agency is the Zoning Administrator or his/her designee. In the case of subdivisions, which require the filing of a final map, parcel maps creating more than four lots, and in the case of subdivisions that create parcels containing 60 acres or more requiring the filing of a tentative map, the Advisory Agency is the Planning Commission.

**Agency:** The legal municipal entity known as the City of South Lake Tahoe, California.

**Agreement:** See contract.

**Appeal Board:** Refers to the City Council which is charged with the duty of hearing and making final determinations upon the appeals of the applicant or subdivider with respect to divisions of real property, the imposition of requirements or conditions thereon, or the kinds, nature and extent of the design or improvements, or both, recommended or decided by the Advisory Agency to be required. Any decision of the Planning Commission may be appealed directly to the City Council pursuant to City code.

**Applicant:** A person, corporation, partnership, association, or other entity that submits a project for review. The applicant may be the legal owner, prospective buyer, or authorized representative.

**Arterial Street:** Any street or road, which carries between 2001 and 7500 vehicles per day. Arterial streets with planned traffic in excess of 7500 vehicles per day will require special determination by the Engineer for the number of traffic lanes, design speed, and right-of-way.

**AASHTO:** American Association of State Highway Transportation Officials

**AASHTO Specifications:** American Association of State Highway Transportation Officials Standard Specifications

**Assessment Act Contract:** A Contract financed by special assessments authorized under a State Act or procedural ordinance of a City or County.

**Average Daily Traffic or Average Daily Trips (ADT):** The weighted average vehicle traffic or trips occurring during a 24-hour period on a weekday. The ADT shall be computed by multiplying the number of lots serving any street or traffic generating use road by the appropriate traffic generation factor. The ADT shall be calculated at the community “build out” condition.

**Award:** The formal action of the governing body or Agency of awarding a contract.

**Base Bid:** The offer or proposal of the Bidder that is submitted on the prescribed form that sets forth the unit prices for the work.

**Bid Guaranty:** The cash, certified check or bidder's surety bond accompanying the bid as a guaranty that the bidder will enter into a contract with the City for the performance of the Work.

**Bidder:** Any qualified individual, firm, partnership, corporation or combination thereof acting directly or through a duly authorized representative.

**BMP:** Best Management Practice(s) – Term used to describe the best available methods that will be used to minimize water quality degradation and erosion during and after construction.

**Bond Bid:** Performance and payment bond or other instrument of security.

**Caltrans:** California Department of Transportation

**CEQA:** California Environmental Quality Act

**Change Order:** A written order issued by the Agency, to the Contractor directing an addition, deletion, or revision in the work, or an adjustment in the contract price or the contract time. A change order is issued after the effective date of the contract.

**City:** City of South Lake Tahoe

**City Code:** The City Code of the City of South Lake Tahoe, California

**City Engineer:** City Engineering Manager – Head of the Engineering Division of the City of South Lake Tahoe or his designee.

**City Engineering Standards:** The Public Improvement and Engineering Standards

**Code:** The terms *Government Code*, *Labor Code*, etc., refer to codes of the State of California, and Federal Government.

**Collector Street:** Is any street, which carries from 500 up to 2000 vehicles per day.

**Consulting Engineer, Design Engineer or Private Engineer:** Any person or persons, firm, partnership or corporation legally authorized to practice engineering in the State of California.

**Contiguous:** As used in this document shall mean parcels having any point or line common to both parcels. Property shall be considered as contiguous units even if separated by roads, streets, utility easements or railroad right-of-way.

**Contract:** A written document between the City and a developer or contractor that defines an agreement between the affected parties.

**Contract Documents:** All integral documents of a contract, including but not limited to the Contract Addenda (which pertain to the contract documents), Notice to Contractors Inviting Bids, Instructions to Bidders; Bid (including documentation accompanying the Bid and any post bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Contract, Bonds, general conditions, permits from other agencies, special provisions, the Construction Plans, Standard Plans, Standard Specifications, Reference Specifications, and all Modifications issued after the execution of the Contract.

**Contract Price:** The total amount of money for which the contract is awarded or amended through contract change order(s).

**Contract Unit Price:** The amount stated in the bid for a single unit of an item of work.

**Council:** The officer or body constituting the awarding authority of the Agency.

**County:** As referred to herein shall mean the County of El Dorado, State of California.

**Cul-de-sac:** A dead end street with a bulb-shaped end, which connects to another street only at one end and serves average daily traffic of 250 vehicles or less.

**Dead End Road:** A road, which has only one point of vehicular ingress/egress (access), including cul-de-sac and looped roads.

**Design:** Includes, but is not limited to the following: (1) street alignments, grades and widths; (2) drainage and sanitary facilities and utilities, including alignments and grades thereof; (3) location and size of all required easements and rights-of-way; (4) fire roads and firebreaks; (5) lot size and configuration; (6) traffic access; (7) grading; (8) land to be dedicated for park and recreation purposes; and (9) such other specific requirements in the plan and configuration of the entire subdivision as may be necessary or convenient to insure conformity to or implementation of the General Plan or community plans.

**Developer:** For the purpose of defining a “Developer” as it pertains to the Public Improvement and Engineering Standards, a “Developer” is a person or persons, firm, partnership, corporation or combination thereof financially responsible for the improvements.

**Development:** Any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

**Development Standards (Code):** Pertinent Chapters of the South Lake Tahoe City Code, General Plan, Community Plans and Plan Area Statements that contain the City’s zoning, land use, subdivision regulations, flood plain regulations, and other development standards.

**Development Agreement:** A written agreement signed by both the City and the developer pertaining to responsibilities of both parties relating to a development project.

**Driveway:** “Driveway” means that improved portion on private property that provides access to parking areas. A driveway may be either one-way or two-way.

**Engineer of Record:** Is the registered engineer that is in responsible charge of the preparation of a document or project plans. The Engineer of Record seals the document with their engineering stamp, date of expiration of license, the date the document was stamped, and signature over the seal.

**Engineering Division:** A Division under the Director of Public Works of the City of South Lake Tahoe.

**Engineer’s Directive:** A subjective opinion of the City Engineer in the form of guidance in engineering matters.

**Excavation:** “Excavation” means the moving of any earth, rock, paving, concrete or other materials on or under any portion of the right-of-way of a city street or land adjacent thereto.

**Final Map:** Refers to a land division map prepared in accordance with the provisions of the Subdivision Land Act and this document and/or any other applicable local ordinance, which map is designed to be placed on record in the Office of the County Recorder for the purpose of creating lots or parcels.

**Flood Hazard:** The possible occurrence of storm water flooding land or improvements or having sufficient velocity to transport or deposit debris, to scour the surface soil, to dislodge or damage buildings or to cause erosion of banks or channels.  
See Chapter 34 of the South Lake Tahoe City Code.

**Freeboard:** Is the vertical distance between the design high water surface elevation in a ditch, basin or channel to the top finish grade of said bank or berm.

**Fuel Modification Zone:** An area where the volume of flammable vegetation has been reduced, providing reduced fire intensity and duration. Ten feet is required on each side of driveways.

**General Plan:** “General Plan” means a general plan or precise plan approved by the City Council in accordance with applicable state law.

**Geotextile:** Synthetic fiber used in civil engineering applications that serve the primary functions of separation, filtration, and stabilization.

**Grade:** The planned and finalized degree of inclination of a slope, road, or other surface. The term, “grade” is also used to describe a specific elevation.

**Grading Plan:** An engineering plan prepared in accordance with the City Grading Ordinance, the ICC, and these Public Improvement and City Engineering Standards.

**Grading Ordinance:** Chapter 36 of the City Code - grading practices, required permits, engineering reports, geotechnical reports, and stormwater protection measures required within the City of South Lake Tahoe.

**Greenbook:** The Standard Specifications for Public Works Construction.

**Gross Area:** Means the total area of a lot computed to the centerline of the adjacent public or private street, road, highway or special district or public utility right-of-way.

**ICC:** International Code Council

**Improvement:** Refers to such street work and utilities to be installed, or agreed to be installed, by the subdivider/developer on the land to be used for public or private streets, highways, ways, and easements as are necessary for the general use of the lot owners in the subdivision and local neighborhood traffic and drainage needs as a condition precedent to the approval and acceptance of the final or parcel map thereof... Improvement may also refer to such other specific improvements or types of improvements, the installation of which either by the subdivider/developer, public agencies, by private utilities, by any other entity approved by the local agency or by a combination thereof, is necessary or convenient to insure conformity to or implementation of the general plan, community plans, and/or plan area statements.

**Improvement Plans:** Engineering plans prepared by or under the direction of a civil engineer registered by the State of California, showing the location and construction details of all improvements required for the subdivision, development project, environmental improvement program (EIP) project, or capital improvement project (CIP).

**Interstate Highways and Freeways:** Limited or controlled access highway.

**Inundation:** Pondered storm water or storm water in motion and of sufficient depth to damage property due to the mere presence of water or the depositing of silt.

**Lahontan:** California Regional Water Quality Control Board, Lahontan Region

**Legislative Body:** Is the City of South Lake Tahoe City Council.

**Local Agency:** The City of South Lake Tahoe, State of California.

**Local Ordinance:** Refers to a local ordinance regulating the design and improvements of subdivisions insofar as the provisions of the ordinance are not in conflict with the current Subdivision Map Act of the State of California.

**Local Road:** A road that functions primarily to provide access to individual properties.

**Lot:** The portion of a parcel of land, which is delineated or described as a single unit on a subdivision or parcel map. The word "Lot" is interchangeable with the word "Parcel."

**Lot Area:** The gross area for new parcels which contain one acre or more and/or net area for new parcels which contain less than one acre.

**Luminaire:** The lamp housing including the optical and socket assemblies (and ballast if so specified).

**Luminaire Arm:** The structural member, bracket, or mast arm that supports the luminars.

**Modification:** Includes Change Orders and Supplemental Agreements. A Modification is the formal process of changing a contract or agreement after it is approved and executed.

**MUTCD:** Manual on Uniform Traffic Control Devices –The nationally accepted standards for traffic control devices.

**NAD83:** North American Datum 1983

**Natural Drainage Course:** An unimproved drainage course having definable sides and bottom, but one which will not necessarily have year around flow.

**Net Area:** The total area of the lot owned by the current parcel owner or owners of record, exclusive of areas currently devoted, dedicated, or to be dedicated for roads, easements, or water bodies.

**Notice of Award:** The written notice to the successful Bidder issued by the Agency stating that upon compliance with the required conditions, the Agency will issue a Notice to Proceed.

**Notice to Proceed:** A written notice issued by the Agency to the Contractor authorizing the Contractor to start the work specified in the contract.

**Offsite:** Anything lying outside the boundaries of a private parcel owned by a project proponent.

**OSHA:** United States Department of Labor-Occupational Safety and Health Administration

**Parcel:** All land which, prior to legal division, is contiguous and under one ownership. The word "Parcel," when used to describe a piece of property is also interchangeable with the term, "lot."

**Parcel Map:** A map prepared in accordance with the provisions of the Subdivision Land Act, this document and any other applicable local ordinance, which map is designed to be placed on record in the office of the County Recorder for the purpose of creating lots or parcels.

**Person:** Any individual, firm, associations, partnership, corporation, trust, joint venture, or other legal entity.

**Preliminary Soil Report:** A report prepared by a Soils Engineer (Geotechnical Engineer) based upon adequate test borings or excavations describing the conditions of the soil in the area of interest.

**Private Contract:** Work subject to Agency inspection, control, and approval, involving private funds, not administered by the Agency.

**Private Street:** Any parcel of land or non-exclusive easement not owned by City, County, or the State of California, nor offered for dedication to the public which is used or intended to be used for access to five or more lots or parcels.

**Project:** The proposed improvements by the City or others.

**Project Proponent(s):** The legal representative(s) for a project or development.

**Public Street:** Is the street for which the fee title or right-of-way is owned by the City, located within a street right-of-way easement, or offered for dedication to the public and is accepted by the City, or is currently on the City list of Maintained Mileage.

**Reference Documents:** Bulletins, standards, rules, methods of analysis or test, codes, and specifications of other agencies, engineering societies, or industrial associations referred to in the Contract Documents. These refer to the latest edition, including amendments in effect and published at the time of advertising the project or issuing the permit, unless specifically referred to by edition, volume, or date.

**Remainder:** The contiguous property of a subdivider which is not included within the boundaries of a final map or a parcel map.

**Right-of-Way:** All of the area within the boundaries of a street, as defined by the instruments creating or conveying such road, and with respect to city streets, created by use, all of the area

used for road purposes, including the roadbed, shoulders, drainage ditches and fixtures, the entire surface of cuts and fills and other road appurtenances.

**Service Connection:** All or any portion of conduit, cable, or duct, and meter, that is located between a utility distribution line and an individual consumer.

**Sewer:** Conduits and related appurtenances intended to collect and transfer sewage and fluid industrial waste to a wastewater treatment facility and eventually to a suitable point of final discharge.

**Slope:** The mathematical ratio of rise divided by run. Rise is the vertical change in elevation between two points. Run is the straight line horizontal distance between the same two points.

**Sheet Overflow or Overland Flow:** Storm water runoff of minor depth (no defined channel) and flowing a distance of less than 300 feet.

**Soil Engineer:** A licensed civil engineer or geotechnical engineer experienced in engineering geology that is responsible for the soil engineering work outlined in this document, including supervision, analysis and interpretation in the field of investigation and laboratory tests for a specific project, preparation of geologic and soil engineering recommendations and specifications, and supervision of grading construction work.

**Special Circumstances:** Unusual circumstances not covered by these standards which require additional specific review and evaluation by the Engineer in order to determine appropriate standards.

**Special Provisions:** A portion of the project specifications that describe project specific specifications.

**Standard Plans:** The 2006 State of California, Department of Transportation Standard Plans, or the latest revision.

**Standard Specifications:** "Standard Specifications" means the currently adopted specifications of the City. (Ord. 260 § 2; Ord. 284 § 1; Ord. 363 § 1). Unless otherwise noted herein, the "Standard Specifications shall mean the 2006 State of California Department of Transportation Standard Specifications, or latest revision as modified herein.

**Standard Engineering Drawings:** Means the standard drawings as shown in this document detailing standard structures, devices, or information/instructions.

**State:** State of California

**Storm Drain:** Any street gutter, channel, storm drain, constructed drain, lined diversion structure, manmade wash area, inlet, outlet or other facility, which is a part of or tributary to the county-wide storm water runoff system and owned, operated, maintained or controlled by the

city and used for the purpose of collecting, storing, transporting or disposing of storm water. (Ord. 977 § 2)

**Streets:** "Streets" or "public way" or "public rights-of-way" means the surface of, and the space above and below, any public street, highway, freeway, bridge, land path, alley, court, boulevard, sidewalk, parkway, way, lane, public way, drive, circle, or other public right-of-way, including, but not limited to, public utility easements, dedicated utility strips, or rights-of-way dedicated for compatible uses and any temporary or permanent fixtures or improvements located thereon now or hereafter held by the franchising authority in the service area which shall entitle the franchising authority and the franchisee to the use thereof for the purpose of installing, operating, repairing, and maintaining the cable system. "Public way" shall also mean any easement now or hereafter held by the franchising authority within the service area for the purpose of public travel, or for utility or public service use dedicated for compatible uses, and shall include other easements or rights-of-way as shall within their proper use and meaning entitle the franchising authority and the franchisee to the use thereof for the purposes of installing and operating the franchisee's cable system over poles, wires, cables, conductors, ducts, conduits, vaults, manholes, amplifiers, appliances, attachments, and other property as may be ordinarily necessary and pertinent to the cable system.

**Subcontractor:** An individual, firm, or corporation that is licensed by the California Contractor's Control Board and having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the contract work.

**Subdivider:** A person, firm, corporation, partnership or association who proposes to divide, divides or causes to be divided, real property into a subdivision for them or for others. Contractors and subcontractors, including but not limited to consultants, employees, engineers and surveyors, employed to render services for the development of the divided property shall be excluded from the definition of Subdivider.

**Subdivision:** The division of any improved or unimproved land, shown on the latest equalized County assessment roll as a unit or as contiguous units, for the purpose of sale, lease or financing, whether immediate or future. Property shall be considered as contiguous units even if it is separated by roads, streets, utility easements or railroad right-of-way. Subdivision includes a condominium project as defined in Section 950 of the Civil Code of the State of California or a community apartment project, as defined in Section 11004 of the Business and Professions Code of the State of California or the conversion of 5 or more existing dwelling units to a stock cooperative, as defined in Section 11003.2 of the Business and Professions Code. Any conveyance of land to a governmental agency, public entity or public utility shall not be considered a division of land for the purposes of computing the number of parcels.

**Suitable Materials:** Materials acceptable for its planned use in construction.

**Supervision:** Supervision, where used to indicate supervision by the Engineer, shall mean the performance of obligations, and the exercise of rights, specifically imposed upon and granted to the Agency in becoming a party to the Contract. Except as specifically stated

herein, supervision by the Agency shall not mean active and direct supervision of details of the Work.

**Supplemental Agreement:** A written amendment of the Contract Documents signed by both parties.

**TRPA:** Tahoe Regional Planning Agency – The bi-state regulatory agency that oversees planning and development activity within the Tahoe Basin.

**Utility:** Overhead or underground wires, pipeline, conduits, ducts, or structures, sewers, or storm drains owned, operated, or maintained in or across a public right of way or private easement for the purpose of providing services to the community (more than one resident).

**Unacceptable/Unsuitable Material:** Construction materials that are determined to be flawed and/or fail to meet minimum acceptable conditions due to its make up, character, potential for failing as a qualitative element, or unacceptable by any construction industry standard.

### **Section 1.02 Contractor Licenses, Insurance and Supervision**

Any contractor performing work under these City standards and specifications is required to possess a valid California Contractor's License to perform such work unless otherwise permitted by law. The contractor or his/her duly appointed representative must be available on the job site during the time when any work is in progress. If such is not the case the work may be stopped at the direction of the City Engineer, or appointed representative.

Any Contractor/Developer performing work within the City of South Lake Tahoe shall provide a copy of their insurance and or bonding requirements. Insurance shall include but not be limited to public liability coverage and property damage liability in the amounts specified by the City of South Lake Tahoe. All contractors and their subcontractors shall pay the City Business and Professions Tax for all work performed in the City of South Lake Tahoe.

### **Section 1.03 Interpretations/Design Exceptions**

If the City Engineer determines that the meaning or applicability of any of the requirements of the Public Improvement and City Engineering Standards are subject to interpretation, the City Engineer may issue an official interpretation.

- A. Request for interpretation A request shall be made in writing specifically stating the provision in question and provide any information to assist in the review.
- B. Record of interpretations Official interpretations shall be in writing and shall quote the section/requirements in question and explain its meaning or applicability.
- C. Exception A formal request to the City to accept an exception to Standard requirements.
- D. Appeal Any interpretations made by the City Engineer may be appealed to the

City Council.

There are certain developments with dimensions, density, topography, and other conditions that would not be practical or would create an extreme hardship for a project proponent to conform to all of the requirements within these City standards. A design exception from the City Engineer may be granted upon written request to the City Engineer if he finds that a design exception would be beneficial to the health, safety, peace, or welfare of the City; will not adversely impact public or private rights-of-way, is a minimum departure from the standards, is in compliance with the requirements of CEQA, and when applicable, is also approved by the TRPA.

For discretionary projects being considered by the City Council or Planning Commission, major design exceptions need to be identified prior to discretionary approval by the approval body. Major design exceptions would include, but not be limited to: Right-of-way width, street width, longitudinal street gradient, and design speed. Minor design exceptions could be approved by the City Engineer subsequent to discretionary approval, so long as appropriate findings can be made.

Should a design exception be granted it will not be considered a precedent setting action; each design exception will need to be reviewed on its own merits.

#### **Section 1.04 Order of Precedence for Design of Improvements within the City Right-of-way**

In case of conflict between the Standard Specifications, the City of South Lake Tahoe Public Improvement and City Engineering Standards, AASHTO standards, the MUTCD, the following shall be the order of precedence:

1. Project specifications and special provisions
2. Project plans
3. City of South Lake Tahoe Grading Ordinance
4. City-wide Design Standards (Chapter 5 of City Code)
5. City of South Lake Tahoe Public Improvement and Engineering Standards
6. Standard Specifications (State of California), 2006 edition
7. State of California Highway Design Manual, 5<sup>th</sup> edition
8. Geometric Design of Highways and Streets 1994 by AASHTO (American Association of State Highway & Transportation Officials)
9. MUTCD (Manual on Uniform Traffic Control Devices), 2003 edition
10. "Greenbook" Standard Specifications for Public Works Construction 2003

#### **Section 1.05 Design Documents Adopted by the City of South Lake Tahoe**

The following documents are adopted by the City of South Lake Tahoe for use in designing improvements within the City's jurisdiction.

- A. Chapter 5 of the City of South Lake Tahoe Code

- B. Caltrans Traffic Manual, 1996 edition (or latest edition)
- C. Highway Capacity Manual
- D. State of California Standard Plans, 2006 edition (or latest edition)
- E. State of California Standard Specifications, 2006 edition (or latest edition)
- F. MUTCD (Manual on Uniform Control Devices), 2003 edition (or latest edition)
- G. A Policy on Geometric Design of Highways and Streets 1994 by AASHTO (or latest edition) (American Association of State Highway & Transportation Officials)
- H. Lake Tahoe Regional Bicycle and Pedestrian Master Plan - TRPA
- I. City of South Lake Tahoe Particulate Matter Air Quality Management Plan
- J. Community Plans (various areas within the city)
- K. Chapter 36 of the City of South Lake Tahoe Code (Grading Ordinance)

### **Section 1.06 City Engineer Approval of Public Improvement Plans**

The South Lake Tahoe City Council approved a resolution (No. 2006-66) authorizing the City Engineer to approve public improvement plans or designs. The resolution also adopts Government Code Section 830.6 that provides design immunity for public entities and public employees if the plans and specifications for construction are approved in advance by the legislative body of their duly appointed designee. Said resolution authorizes the City Engineer as the City Council's designee to exercise the discretionary authority to give the approval of public improvement plans or designs.

### **Section 1.07 Off Site Improvements**

The City Engineer may require off site improvements to be constructed and maintained as part of a development or redevelopment project. Off-site improvements may include but will not be limited to curb, gutter, sidewalks, drainage facilities, and traffic calming devices such as roundabouts, signals, or pedestrian/bike/multi-purpose trails.

Off site improvements may also be required by Community Plans and/or City Planning Department.

## **SECTION 2 IMPROVEMENT PLANS**

### **Section 2.01 General**

Complete plans and specifications for all proposed streets, drainage facilities, sewerage facilities, water distribution systems, industrial and commercial development and subdivisions, including any necessary dedications and easements shall be submitted to the City Engineer for approval and must receive the required approval prior to the beginning of construction of any such improvements. A Development Agreement, Performance Bond, and/or labor bond may also be required as necessary to guarantee compliance to the approved plans. If the City Engineer allows a project proponent to bond for future improvements the bond amount shall be 125% of the approved engineer's estimate for the deferred work. Plans not conforming to the

standard engineering practices of quality, completeness and neatness (including calculations) may be rejected. See these standards for improvement plan requirements.

The City's approval of any plans and specifications does not constitute approval of any features of the plans that are contrary to, in conflict with or do not conform to any federal or state law, City ordinance or resolution, or generally accepted engineering practice in keeping with the standards of the profession, even though such errors, omissions or conflicts may have been overlooked in the review of the plans.

Copies of the preliminary and approved plans shall be provided to the affected utility companies. The Project Proponent, or the Project Proponent's agent, is responsible for obtaining approvals and necessary permits from utilities or other governmental agencies when required prior to City approval. The City may offer conditional approval of the plans upon receipt of proper permits from other agencies, and require acceptance of the project from those utilities prior to City acceptance.

The improvement plans shall be in accordance with the International Code Council, Subdivision Map Act, the project Conditions of Approval, these Public Improvement and Engineering Standards, and the City of South Lake Tahoe Standard Engineering Specifications.

Any project disturbing more than 250 linear feet of roadway or public right-of-way will be required to submit improvement plans. Project disturbing less than 250 linear feet of right-of-way will be eligible to apply for an encroachment permit.

Prior to submitting any plans or maps to the City for a private development, the consulting engineer/developer shall set up a pre-application meeting to discuss the project with City Planning and Engineering staff.

## **Section 2.02 Plan Submittal Requirements**

Three sets of plans and project specifications for the initial project submittal shall be submitted to the City Engineer for review. Plans and specifications shall contain all of the information required in this document. Planning and Building Departments may require additional copies of plans that are submitted for a development project. All plans that are submitted to the City for its review shall become the property of the City and may not be returned to the applicant. Subsequent/additional submittals may require one set of plans as determined by the City Engineer on a case-by-case basis.

Two copies of the engineer's estimate, geotechnical report and drainage reports shall also be submitted to the City for its review. Additional submittals will require one copy of the engineer's estimate, geotechnical report and drainage report.

All plan check fees must be paid with the initial plan submittal. See the current City of South Lake Tahoe Fee Schedule for Public works Engineering Division for permit and plan review fees. Plan submittal, bonding, and fee requirements may vary with franchise utility projects.

### **Section 2.03 Phased Projects**

Where the improvement plans submitted for approval cover only a portion or a phase of the ultimate development, the submitted plans must be accompanied by the approved overall preliminary plan, showing all topographic features of the ultimate development at an adequate scale to clearly show the extent of the proposed development project.

### **Section 2.04 Plan Layout**

Improvement plans shall adhere to the following:

- Be prepared by a civil engineer licensed to do business within the State of California;
- Plotted on 22-inch x 34-inch or 24-inch x 36-inch mylar and sealed by the Design Engineer/Engineer of Record;
- Show all existing facilities and improvements to be constructed; and
- Scales (listed in order of preference) shall be 1"=20' horizontal and 1"=2' vertical; or 1"=40' horizontal and 1"= 4' vertical; or 1"=50' horizontal and 1"=50' vertical. Other scales may be used as necessary to show plan details, as approved by the City Engineer; and a minimum 1.5-inch margin on the left side and a 0.75-inch margin on the remaining sides. The minimum height for lettering and numerals shall be 0.10 inches.

### **Section 2.05 Plan Preparation**

The following details and supplemental information are to be shown on the plans submitted for approval:

#### **A. General**

The plans shall clearly show the following:

- Beginning and end of work by station and coordinates;
- A north arrow and drawing scale;
- Township, Range, and Section numbers;
- Land owner name(s), address and APN when existing);
- Property boundaries, right-of-way limits, and limits of work;
- Existing utilities;
- Edge of existing pavement;
- Cut/fill slope limits;
- Curve data, stationing, bearings, control points, and survey monuments;
- Street name signs and traffic signs;
- Limits of clearing and grubbing;
- Existing and new drainage features, existing creeks;
- Details shown and referenced;
- Fences, retaining walls;
- Connection details shown at beginning and end of project; and
- Location, type, and grade of road approaches.

## **B. Title Sheet**

For improvement plans exceeding three sheets per set (excluding cross sections), a Title Sheet(s) shall be prepared showing:

1. Project name;
2. The entire subdivision or project area boundaries it boundaries, including survey data, and a basis of bearing;
3. Planning and Building Department project numbers on upper right corner;
4. Section lines, property lines, and corners;
5. Section, Township, Range and Assessor's Parcel Numbers for the project site;
6. A location map showing the project site, road names, north arrow, scale, parcel number(s) and associated landmarks;
7. Date and scale of drawing (include date of Survey data);
8. Index of sheets;
9. Revision block including index of all post approval revisions, with revision number, date, applicable sheet number, and approval initials;
10. Legend abbreviations and symbols;
11. Engineer of Record's name, registration number and signature. (Note: all original sheets of plans shall have a seal and original signature of the Engineer of Record);
12. Name, address, and telephone number of the project proponent and of his representative who will act in authority for the Project proponent;
13. Signature blocks for the City Engineer and any other pertinent official;
14. General notes and other notices required by the City Engineer;
15. Record Drawings Certificate;
16. Instructions to Contractors;
17. Developer's Right-of-Way Certificate;
18. Staging areas; and
19. Limits of work.

When a title sheet is not required the above information must be shown on the first page.

Each sheet within the set of drawings shall have a title block showing the project name, sheet title, sheet number, date, scale, revision block and the design engineer's name, stamp, expiration date and registration number. All information presented shall be neat and legible

Project title block shall be listed on the right side of the project drawings.

### **C. Detail Sheets**

All detail drawings shall be fully dimensioned.

Any detail drawings included in this document which are required for the project, shall be shown on the improvement plans, and referenced in the special provisions, by the City of South Lake Tahoe Standard Drawing number.

Any detail drawings from the State of California, Department of Transportation Standard Plans, which may be required for the project, shall be shown within the improvement plans (not referenced on the improvement plans).

All site plans shall show the proposed snow storage location or submit a snow removal plan with the improvement plans.

### **D. Erosion and Pollution Control**

When applicable, a separate erosion and pollution control plan shall be prepared. The plan sheet shall show all temporary and permanent erosion control measures and revegetation methods that will be applied to areas that are disturbed by the Contractor. The City Grading Ordinance shall be adhered to for the preparation of and performance of all work within the City of South Lake Tahoe.

The plans shall provide for erosion control and for the prevention of pollution during and after construction in accordance with Federal and State Laws, City Ordinances and this document. In all cases, adequate erosion control shall be incorporated to stabilize graded areas and any other surface that is disturbed by the Contractor.

The project plans shall include erosion control measures required in the project Stormwater Pollution Prevention Plan (SWPPP), TRPA requirements and a maintenance plan for monitoring and repairing BMPs. Copies of any required TRPA and Lahontan permits will also be required to be submitted with the plans.

Permanent residential and commercial BMPs shall not be constructed within the City public right-of-way or easement unless approved by TRPA and the City.

### **E. Signing/Striping and Traffic Control**

When applicable, a separate roadway signing and striping plan shall be prepared to show all existing and proposed striping and how the proposed signing and striping will conform to existing signing and striping. Signing and striping shall be consistent with the MUTCD.

The striping plan shall show existing striping a minimum of 200 feet past the conform point (where applicable). If an existing turn lane or other change in

striping occurs within 300 feet of the conform point, the existing striping shall be shown a minimum of 350 feet past the conform point.

A traffic control plan shall be included as part of the plans when work is proposed within an existing City right-of-way and when required by the City Engineer. When the work requires phased construction, or is controlled by the Contractor's Order of Work, the preparation of the traffic control plan may be deferred to the Contractor. If preparation of a traffic control plan is deferred the Contractor, the Contractor shall submit the proposed traffic control plan to the City Engineer for review. Traffic Control Plans shall be prepared by a certified traffic control official or a licensed traffic engineer.

#### **F. Orientation and Stationing**

The plans shall be arranged with north at the top of the plan sheet or at the right edge of the sheet. Stationing shown on plan and profile sheets shall be from west to east or south to north. The beginning and ending stations shall be shown for all street and centerlines, and match lines. Stationing shall be designated every 100 feet at a minimum with "tick" marks at the mid-point/50-foot points.

All project improvements shall be located on the plans via station and offset from the project centerline.

#### **G. Typical Sections**

A typical section shall be shown for each type of street within the improvement including detour roads and driveways. The typical section shall show the profile grade point, slope, crown, lane, shoulder, median, curbs, gutter and sidewalk widths, clearing and seeding limits, and cut and fill rounding details. The typical sections shall be labeled with stationing. Typical sections shall be provided for every 100' interval. Existing and proposed utilities, structural sections and details including number of lifts required for asphalt placement, and subgrade preparation shall be shown. Where necessary, footnotes and a table for curve widening shall be included.

#### **H. Cross Sections**

Two sets of supplemental cross sections shall be submitted with the plans on 100' intervals, or as required to show necessary details. Additional cross sections may be required for culverts, utility and other roadway crossings. Cross sections shall be provided for all widening/reconstruction improvements of existing, new and privately maintained roads.

#### **I. Profiles**

The plans shall clearly show the existing and proposed centerline profiles of all roadways, storm drains, culverts, sanitary sewers and areas of potential conflict

between underground utilities. This requirement is also applicable for all driveways constructed as part of the improvement plans. Culverts, utilities and other features shall be shown and labeled in accordance with the plan sheets.

The horizontal scale shall be the same as that used on the plan view. The vertical scale is recommended to be 10% of the horizontal scale (i.e. 1"=10' horizontal and 1"=1' vertical, or 1"=20' horizontal and 1"=2' vertical).

The profile sheet grid elevations shall match the profile scale. Vertical curve data, stationing and grades shall be shown.

#### **J. Horizontal & Vertical Control**

Permanent benchmarks and datum shall be clearly shown on the plans both as to location, description, and elevation. The California State Plane coordinate system, Zone 2 and North American Datum, 1983 (NAD 83) shall be used for horizontal control, unless otherwise approved by the City Engineer. NGVD88 or other specified by the City Engineer shall be used for vertical control. If alternate coordinate systems are approved, they shall be referenced to the aforementioned horizontal and vertical coordinate systems.

If the permanent benchmark is further than 500 feet from the construction site, additional temporary benchmarks shall be established at 1,000 foot intervals prior to construction and shall be shown on the plans. The project improvements shall have ties to a minimum of two monuments of record, which shall be shown on the plans. [Exception: Arbitrary (assumed) vertical benchmarks may be used for individual residential construction]. **Sufficient dimensioning and survey control shall be shown on the plans such that the project can be constructed directly from the plans.**

#### **K. Existing Features**

All pertinent features that may affect the design and construction shall be shown on the plans including but not limited to street lines, curbs, sidewalks, signs, signal poles, signal loops, light poles, vaults, boxes, bollards, shoulders, location and size of utilities, storm drains, sanitary sewers, water, gas, telephone, cable TV, fences, houses, trees, drainage ditches, utility poles, guy wires, and fire hydrants.

#### **L. Franchise Utilities**

Improvement plans submitted by franchise utilities will not be required to include the same detail of information as listed in Section 2.06 herein. The extent of information required by this section generally relates to private development projects.

## **Section 2.06 Composite Utility Location Plans for Developments**

All existing utility lines that were previously abandoned in place, utility lines proposed to be abandoned, how they will be abandoned (removed, left in place etc.) and proposed utilities (e.g. utility poles, water, sewer, gas, electric, telephone, cable, etc.) within 50 feet of the limits of work shall be shown on the plans. Utilities that will be affected by the project construction shall be shown on plans. The locations of all joint trenches shall be shown on the plans. Typical details and sections shall be included on the detail sheets. See [Section 6](#) for utility locations within the right-of-way.

All new utilities within a subdivision or shown on a parcel map shall stub out services to each lot. All utility services shall be placed at the corner or as near as possible to the corner, of the City right-of-way and lot.

All utility boxes, splice boxes, water meters, vaults, bollards, traffic signal poles, loops, conduit runs, hand holes, pull boxes and controllers associated with traffic signals, etc. shall be shown on the utility plan and street design sheets. Sewer, water, cable, power, telephone, gas and storm drain shall be combined on a separate sheet(s); utilities shall not be combined with street design sheets unless approved by the Engineer before the improvement plans are submitted for review.

Existing and proposed locations and design grade of all sewer mains and sewer laterals, water mains and services, fire hydrants, and storm drains and catch basins shall be shown on the utility plan. Manholes, gate valves, air releases, and blowoff valves shall be shown. Manholes and vaults shall not be placed in the “wheel paths.”

## **Section 2.07 Street Design for Developments**

Street dimensioning and cross sections shall be shown on the street design sheets. Pavement structural sections shall be determined by the projected street “traffic index” and the “R” value of the subgrade soil. However, the aggregate base thickness shall not be less than 8” on the City maintained roadways and 4 inches on private driveways and roads. Asphalt concrete thickness shall not be less than 4 inches on the City maintained roadways and 2 inches on private driveways.

Plan view(s) shall include all curb, gutter, catch basins, and drop inlets. Horizontal curves beginning and ends shall be labeled and stationed. Limits of paving shall be clearly indicated. All existing topography, trees, poles, and structures must be shown. Show all survey monuments, street name signs, and traffic signs.

## **Section 2.08 Landscape/Streetscape Plans**

Plans for all medians, parkways, detention basins, irrigation, backflow preventers, lighting, utilities, open spaces, or other areas affecting or within the City right-of-way shall be prepared as part of the improvement plans and be a part of the plan set. Sight distance diagrams shall

be superimposed over the landscaping at all roadway intersections and driveway intersections. A permanent maintenance plan shall be required for all landscape/streetscape improvements.

On a case by case basis, temporary irrigation lines may be allowed to be left on the ground surface and not required to be buried. If temporary irrigation is required for more than one year and the location is a "high profile" area, the irrigation pipe and sprinklers will be required to be designed and placed underground as if they were permanent.

Irrigation shall be supplied to all landscape areas and basins until vegetation is completely established and no longer needed as determined by the Engineer.

All landscaping and streetscape plans shall be in conformance with the City Code.

### **Section 2.09 Soils and Geotechnical Reports**

Soils reports shall be prepared by a California Registered Civil Engineer or Geotechnical Engineer. Soils reports will be required on all commercial projects, subdivisions, and parcel maps, unless otherwise directed by the City Engineer. The report shall address and make recommendations for the specific project. These shall include, as appropriate, road, pavement and parking area designs, structural foundations criteria, retaining wall design criteria, recommendations for grading practices, erosion/winterization recommendations, special problems discovered on-site (i.e. groundwater, frost heave, expansive/unstable soils, etc), slope stability and additional information that may be required for the specific project. The report shall recommend shrink/swell factors to be applied for earthwork calculations. Contaminated soil and other hazardous wastes onsite shall be considered and appropriate measures recommended in conjunction with the El Dorado County Department of Environmental Health, TRPA and Lahontan. See the project conditions of approval, the ICC and the Subdivision Map Act for additional requirements pertinent to the project.

Excavation, to ground water within the work zone shall be cause for a Geotechnical review and or report as determined by the City Engineer (see TRPA requirements: excavations five (5) feet or more require a soils/hydro investigation). Earth slopes shall be a maximum of two to one (2:1). Slopes with rock slope protection may be allowed up to 1:1 slopes. A retaining wall will be required to meet the 2:1 earth slope maximum. Erosion control of slopes shall be provided for as specified in this manual, or as directed by the City Engineer. The plans or special provisions shall designate the requirements for this work.

Unsuitable and expansive soil shall be excavated to a minimum depth of 2 feet below subgrade for all roadways unless otherwise approved by the Geotechnical Engineer and the City Engineer, and in accordance with TRPA regulations. The expansion properties of the soil shall be discussed in the project report. The City Engineer shall have the final authority on the determination of what soils are unsuitable.

Geotechnical reports will be required on all commercial projects, subdivisions, as required by the ICC, the City Grading Ordinance, and where required by the City Engineer. All geotechnical reports shall include at a minimum, soils plastic index, liquid limit, soil density

curves and optimum moisture. The resistance value (“R” Value) of the native subgrade and imported structural fill; “R” value testing shall be provided by the project proponent, as required by the City Engineer.

See Section 4 for soils report applicability to road design.

### **Section 2.10 Right-of-way**

Right-of-way lines, the boundaries of lots with street frontage, drainage easements, slope easements, access easements, utility easements, section lines and corners, property lines, and temporary construction easements, both existing and proposed, shall be shown on the plans. All right-of-way, boundary and easement lines shall be properly dimensioned and labeled.

Minimum right-of-way widths shall be as specified in Table #1, Section 4.02 of this document for the class of street under consideration. When a new street is being designed to extend an existing street, the right-of-way of the new portion shall not be less than the existing right-of-way. The City Engineer may require the dedication of frontage improvements to the City and may require that all roads (public and private) be offered for dedication including public access, but excluding public maintenance.

### **Section 2.11 Traffic Analysis**

If required by the City Engineer the applicant shall complete a traffic analysis including but not limited to the existing traffic volumes and analysis of streets and intersections surrounding the proposed project, and any offsite impacts including pedestrian and parking impacts. The analysis shall show the anticipated traffic volumes for pre- and post-project construction for the current year and for the proposed traffic volumes in the year 2020.

The traffic analysis shall review the level of service at surrounding intersections, and off site parking, transit and pedestrian facilities. The level of service shall check the overall intersection capacity and the capacity of each leg/turning movement in the intersection.

The City may review the traffic analysis with a third party at the developer’s expense.

### **Section 2.12 Topography**

All existing topographic features shall be shown and identified including but not limited to existing contours (1’ interval minimum, unless approved by the engineer in writing, - flat areas may require a smaller interval and for steeply sloped areas, a larger interval may be appropriate), edge of pavement, curbs, sidewalks, shoulders, location and size of storm and sanitary sewer lines, high water and frequent inundation levels, water and gas lines, structures, houses, wooded areas, and other foliage, drainage ditches, utility poles, fire hydrants, fences, and all other features within or adjacent to the project, which may affect the design or construction requirements. Topographic features, including existing contours shall be extended

as necessary beyond the project site and/or construction limits, if needed to define intercepted drainage or other features. Topographic information shall be extended a minimum of 100 feet outside of any future road rights-of-way.

Proposed topographic contours shall be at a 1-foot minimum intervals (smaller intervals may be required for flat areas and for steep slopes, larger intervals may be required). In lieu of final contours, spot elevations at a maximum spacing of 25 feet on center for variable slopes may be accepted. Spot elevations at 50' centers may be used for uniform slopes. These spot elevations must be supplemented with periodic transverse and longitudinal slope arrows and percentages. The use of spot elevations in lieu of contours must be approved by the City Engineer.

### **Section 2.13 Supplemental Information**

All information developed by the Design Engineer for the design of the improvements, such as hydrologic calculation, bmp calculations, and roadway design information shall be submitted with the plans as required by the various sections within this document. The final copies of all supplemental information prepared and submitted shall have the seal and original signature by the appropriate engineers.

An engineer's estimate shall be prepared showing the calculated quantities, unit costs, descriptions, and total of each item of work within the right-of-way, and the estimate shall include a 10% contingency for the total value of the work to be completed. The estimate shall be submitted with the plans.

The special provisions (technical specifications) shall be submitted with or shown on the plans, or incorporated by reference. All design details shall be shown on the plans.

### **Section 2.14 Departmental Review**

Prior to approval as specified in this section, a field review may be performed by the Engineering Department.

A written response shall be submitted with each plan re-submittal, which addresses the City's comments from the previous submittal. The response shall include an explanation of plan revisions, supporting data revisions, and/or reasoning why a revision was not done.

Written documentation shall be submitted outlining all revisions to the plans and supporting documents, which were not required by the City. The documentation shall include a complete description of the revision, applicable sheets of the plan where the revision was made, reasoning for the revisions, and the entity requiring this revision.

Revisions to plans made during the plan check process shall be documented with the plan resubmission as follows:

After the plans, special provisions, supplemental information and estimates have been reviewed, one copy of each shall be returned to the Design Engineer with the required changes noted thereon. The Design Engineer shall correct the original plans, special provisions, supplemental information and estimates, and re-submit three copies (unless otherwise requested by the City Engineer) of the revised plans and the supporting documents (drainage report, soil report, engineer's cost estimate, special provisions, etc. to the City for review).

Once all required corrections have been made to the satisfaction of the City Engineer, the Design Engineer shall submit the original plans and final copies of supporting reports, special provisions, etc., to the City for signature of the City Engineer. Final reports and supporting data must have the original signature and seal of the appropriate Design Engineer.

After plan approval by the City all changes to the plans, special provisions and supporting documents shall be submitted for the approval of the City Engineer, as outlined in this document. Changes shall be clearly noted on the plans. A revision block that references changes shall be placed on the affected sheet of the plans and shall contain a space for the date, description of revision, and approval by the City Engineer.

### **Section 2.15 Grading Plans**

Separate grading sheets shall be required. The following information shall be shown on the grading sheets:

- North arrow and scale
- Existing topography and right-of-way/property lines as noted in Sections 2.16 and 2.17
- Limits of work

Tops and toes of cut/fill shall be shown on the plan view using a slope symbol for all uniform slopes 4:1 or steeper. Toes and tops of cut and fills shall be a minimum of two feet from adjacent property lines. Where cuts are near a building or other existing structure, support of slopes and protection of said structures shall be included in the grading plan. Site grading shall be in conformance with applicable ICC (building code) requirements.

Existing and proposed drainage structures with applicable sizes, stationing, lengths, slopes, elevations (rim and invert), type of material and references to applicable sections and details.

The location and associated grading of any borrow sites or disposal sites for excess material shall be specified; disposal sites must be pre-approved by the TRPA if the disposal sites are located within the Tahoe basin. Earthwork volumes of cut and fill volumes shall be submitted with the improvement plans. If borrow or disposal of excess material is off-site, a separate grading permit may be required for the off-site property accepting the fill or from which borrow is to be taken, unless the location is a legally approved aggregate plant or mining facility.

Location and dimensions of retaining walls shall be shown with a profile showing the top of wall elevations, top of footing elevations, existing grade, proposed grades at face of wall and other pertinent design information. Spot elevations shown on the plan view of the top of wall, top of footing and finish grade at the face of the wall may be substituted for the profile. The spot elevations shall be shown at the end of the walls, all angle points, other points of change in wall height, and sheet match lines. A typical design section showing all applicable wall dimensions and other structural design elements of the wall shall be provided on the plans.

Location of existing and proposed buildings or structures on or adjacent to the site shall be shown with the pad and/or finish floor elevations.

Warped surfaces shall be shown by profile or by elevations on the plan view at 10 foot intervals or one-fourth the internal angle, whichever is less (e.g. gutter flow lines at cul-de-sacs, knuckles, curb returns, etc.). Low points shall be identified, as applicable.

Trees are to be preserved as much as possible. All trees to be removed shall be shown on the grading plan. The City Engineer may require additional trees to be removed for reasons of safety or maintenance, with TRPA approval.

The grading standards as presented in this Section of this Public Improvement and Engineering Standards are not intended to override City Code, Chapter 5 or the City Grading Ordinance. Should a conflict exist, City Code, Chapter 5 shall take precedence over the Grading Ordinance and these Public Improvement and Engineering Standards. Should a conflict exist between the City Grading Ordinance and these Public Improvement and Engineering Standards, the City Grading Ordinance shall take precedence.

### **Section 2.16 Plan Approval**

Once the plans have been reviewed and approved by the appropriate utility companies, other regulatory agencies and the City Engineer, the Design Engineer/Engineer of Record shall submit the original plans and final copies of any supporting documents to the City for final signature. Final reports and plans must have the original signature and seal of the appropriate Design Engineer. After obtaining the City Engineer's signature, the Design Engineer/Engineer of Record shall supply a minimum of three sets of the approved plans to the City.

All appropriate fees shall be paid before the plans can be approved.

### **Section 2.18 Plan Revisions and Change Orders**

Plan revisions shall be submitted to the City Engineer for review. If the City Engineer determines that the changes to the plans are significant, the entire set of plans will be resubmitted. Major changes include modification of gradient on roadways, and modifications to drainage structure sizes and capacities. If the City Engineer determines that the changes are minor, a working copy of the revision may be used in the field and then shown on the record drawings.

No changes to the approved plans are to be implemented until reviewed by the City Engineer.

**There shall be no alterations to the approved set of plans unless such alterations are submitted to, and approved by the City Engineer.**

### **Section 2.19 Record Drawings**

During construction, the project proponent (Owner) and the Contractor shall maintain one set of prints of the approved improvement plans showing all the “as-built” changes. The City Engineer shall approve each “as-built” change. This set shall be available at the job site for inspection by the City Engineer or designee at any time.

Prior to the acceptance of the improvements by the City Engineer, the Design Engineer/Engineer of Record shall submit the original plans to the City labeled "RECORD DRAWINGS" showing all changes made during construction and shall be signed by the Engineer of Record and the Contractor. In addition, a digital copy of the plans and Record Drawings and survey control shall be submitted to the City. The City Engineer will approve the software format that is acceptable to the City prior to the Record Drawing submittal.

“As-Built” changes shall be made to the “RECORD DRAWINGS” on the original plan transparencies (mylar). Original data that changed after the original approval of the plans shall be cross-hatched out. New data shall be border clouded and identified with the respective revision number within a triangle. All lettering must be clear and legible. Original figures shall not be removed from the drawing unless the changes were extensive. Extensive changes, which cannot be made clearly on the original plan, should be made on a new sheet (supplemental sheet). The new sheet shall be signed by the Design Engineer/Engineer of Record and included with the "RECORD DRAWINGS" transparencies. Any supplemental sheet shall be of the same quality as the original plans. The sheets that the new sheets replace must remain in the plan set but shall be crossed out with a note in the revisions block which identifies that the sheet was superseded by the replacement sheet number. All revisions must be noted within a revision block on the applicable sheet with revision number, description, date revised, and approval initial/date by the City Engineer. An index of all plan revisions shall be included on the title (first) sheet of the plans. The title sheet revision table index shall include the revision number; date revised, sheet numbers of revisions and City Engineer approval initial and date. Diazo transparencies or sepias will not be accepted.

### **Electronic Submittal Format**

Unless directed otherwise, Record Drawing files shall be delivered as AutoCAD drawing files (ver. 2004 compatible DWG, .DXF) **and** PDF or other format acceptable to the City Engineer. AutoCAD drawing files shall include all supporting files necessary to reproduce the drawings. The files shall be submitted on portable media such as a CD- ROM. The media containing the files shall become the property of the City and will not be returned to the Design Engineer.

## **SECTION 3**

## **CONTROL OF WORK AND MATERIALS**

### **Section 3.01 Workmanship and Materials**

Workmanship and materials shall be in accordance with this document, the Standard Specifications, and the Contract Documents.

### **Section 3.02 Fines**

The Contractor shall be responsible for any and all fines or monetary penalties incurred during the construction of the improvements that are directly or indirectly related to the contractor's or subcontractor's activities

### **Section 3.03 Conformity with Plans and Specifications**

Field changes to the approved plans and specifications shall not be made without prior approval of the City Engineer or designated representative (see Section 2.19).

### **Section 3.04 Start of Work**

The contractor shall notify the City Engineer at least 48 hour prior to the start of work. See Section 2 of these standards regarding other approvals that may be necessary prior to beginning work. If the proposed work is part of a Public Works Contract, the Contractor shall start work within five (5) working days after the issuance of the Notice to Proceed.

### **Section 3.05 Pre-construction Meeting**

At least 48 hours prior to the start of construction a pre-construction meeting shall be arranged by the project proponent with the City Engineer or designated representative, for all work within the City right-of-way. The meeting shall be used to coordinate all work on the project and within the City's right-of-way, and shall include all affected agencies. If pertinent to the project, the TRPA pre-grade meeting can be scheduled at the same time as the pre-construction meeting.

### **Section 3.06 Inspections**

The City Engineer shall be permitted to inspect all materials and work without advance notice to the Contractor. The Contractor shall make every reasonable effort to assist in the inspection of the work or materials.

### **Section 3.07 Testing**

Relative compaction tests shall be made by the project proponent as required by the City Engineer on subgrade material and material placed within the street areas as specified by the City Engineer. Test results shall be submitted weekly to the City Engineer. See Sections 19 and 39 of the City Standard Specifications for additional testing requirements. A failure to provide test results will be grounds for rejection of the work. Compaction testing may use maximum dry density testing, Modified Proctor ASTM D 1557.

Testing and inspection responsibilities on City sponsored projects (EIP or CIP projects) is detailed in said project special provisions to the Standard Specifications.

### **Section 3.08 Earthwork**

#### **A. Seasonal Requirements**

No earthwork or excavation shall occur after October 15th and before May 1<sup>st</sup> within the City right-of-way unless approved by the City Engineer, TRPA, and Lahontan. If grading is allowed to continue beyond October 15<sup>th</sup>, Lahontan will issue an "Exception to Grading Prohibition" and the TRPA will issue a grading deadline extension. Extended grading activities that occur after the October 15<sup>th</sup> deadline must be in strict conformance to any exception that may be approved by Lahontan and TRPA.

Erosion control measures shall be in place prior to construction and shall be maintained throughout construction. Temporary improvements to "winterize" the project shall be as shown on the approved erosion control plan. The City Engineer may stop work on any project until the project proponent installs erosion control measures as directed. If the required erosion control measures are not installed as directed within 24 hours of the notice to install, the City Engineer shall have the option of installing the necessary devices and recouping the cost from the project proponent (see Section 8).

#### **B. Shoring**

Excavations shall be supported in accordance with the rules, ordinances, and regulations of OSHA.

A detailed plan showing the design of shoring, bracing and/or sloping of all excavations greater than or equal to 5 feet in depth must be completed and available on site prior to commencing with such excavation operations. If the plan varies from the standards established by OSHA the plan shall be prepared by a qualified Civil or Structural Engineer registered in the State of California. Permittees must provide a certified "Competent Person" to comply with these aforementioned regulations regarding trenching and excavations when necessary.

## **SECTION 4** STREETS

All public roadway structural section design shall conform to Chapter 600 of the California Department of Transportation Highway Design Manual unless otherwise noted. Private roads shall be designed as outlined in this document as a minimum. The design of the structural section shall be based upon the following:

- A. The minimum structural section on a local or collector road shall be 4 inches of asphalt on 8 inches of aggregate base. On an arterial road the minimum shall be 4 inches of asphalt on 12 inches of aggregate base.
- B. The traffic index:
  - 1. A minimum traffic index for arterial and industrial roads shall be 8.5
  - 2. A minimum traffic index of 7.5 shall be used for all collector roads
  - 3. A minimum traffic index of local and cul-de-sac streets at future build out will be as follows:
    - a. 1 to 15 potential residences 4.5
    - b. 16 to 50 potential residences 5.0
    - c. 51 to 150 potential residences 5.5
    - d. 151 to 300 potential residences 6.5

Road design shall be based upon the maximum number of potential lots/business that could be served by the roadway.

The City Engineer may require bike/recreational paths along the frontage of the project. All paths shall meet applicable ADA requirements unless otherwise approved by the appropriate regulating agency. See Section 4.06, the Lake Tahoe Regional Bicycle and Pedestrian Master Plan, by the TRPA, and the Caltrans Highway Design Manual.

Fifteen (15) foot wide snow storage easements (SSE) are required adjacent to all roads, and 20 foot snow storage easements will be required on the corners of road intersections, and where directed by the City Engineer. A 20' wide by 50' long snow storage easement will be required along the centerline of all cul-de-sacs (see Standard Drawing 02, 03 and 15 ). No structures or fences shall be located within a snow storage easement without the written permission of the City Engineer.

All roadways and driveways within the public right-of-way shall be paved with asphalt, concrete, or other permanent surface approved by the City Engineer, and shall be compliant with the Plan Area Statements of the City of South Lake Tahoe.

Secondary access to all subdivisions for emergency access is required.

A fuel modification area 10' on each side on all roads shall be provided as required by the Uniform Fire Code Section 17.

## **Section 4.01 Classes of Roads**

- A. Arterial – An arterial road or street is one which may be used primarily to enable traffic to move to and from minor roads or streets and arterial roads or streets. The following roads have been classified in the City General Plan as arterial roads; Pioneer Trail, Ski Run Blvd, Al Tahoe Blvd and Tahoe Keys Boulevard. Any other roads with an (Average Daily Traffic) ADT of 2001 or greater will also be classified as an arterial road.
- B. Collector – A collector road or street is one which may be used primarily to enable traffic to move to and from minor roads or streets and arterial roads or streets. Any road with an ADT between 500 and 2000 will be classified as a collector road.
- C. Local or Cul-de-sac – (Public) - A minor road or street which may be used primarily for access to abutting property and offered for public maintenance. Any road with an ADT less than 500.
- D. Local or Cul-de-sac – (Private) - A minor road or street which will be used primarily for access to an abutting property and not offered for public maintenance. Any road with an ADT less than 500.
- E. Shared Driveway – Minimum standard for vehicular traffic access to a maximum of 4 dwellings.

See the City General Plan Circulation Element and area community plans for conceptual roadway layout of City streets. The Engineer will determine roadway widths on a case by case basis if there is a discrepancy between the specific plans and these standards.

## **Section 4.02 Geometrics and Profiles**

The following standards for the design of geometrics and profiles for all proposed street improvements shall govern the preparation of plans for such improvements.

The use of lower design speeds is encouraged on all local roadways.

Street intersections shall not exceed four separate streets, nor shall “Y” intersections be allowed.

### **Grades and Cross Slopes**

The minimum profile slope/grade on new streets shall be 0.5%.

Minimum slope/grade of a concrete gutter shall be 0.5%.

Centerline to edge of pavement cross-slope on new streets shall be 2.0%. (intersections and super elevations excepted). The minimum allowable concrete gutter slope/grade shall be maintained through vertical curves; the cross slope may vary to allow this grade transition, but shall not result in cross-slopes steeper than 3.5% (if constraints are not mathematically possible, reductions in concrete gutter slope/grade at vertical curve low points will be considered by the City Engineer).

Maximum profile grade on cul-de-sacs shall not exceed 6%.

When two streets intersect, the minor/stop controlled street shall not have a grade greater than 3% average for a minimum distance of 30 feet measured from the curb line of the intersected street and 6% on the non-stop controlled leg, except as approved by the City Engineer.

The vertical alignment of the major road in a controlled intersection shall govern over the vertical alignment of any minor road when designing the intersection.

### **Valley Gutters**

Valley gutters perpendicular to the roadway (across street intersections) are not allowed on any streets.

Culverts, valley gutters, or low profile crossings may be used for driveways depending on the roadside condition.

### **Vertical Curves & Grade Breaks**

Vertical curve design shall be as specified in the 1994 AASHTO Geometric Design Manual to provide the minimum stopping sight distance for the design speed and in no case shall have a length of less than 100 feet unless approved by the Engineer.

Exception: driveways where a length of vertical curve will be allowed.

For drainage purposes and upon approval of the Engineer, vertical grade breaks, not exceeding a 2% algebraic grade difference (1% preferred), shall be allowed without a vertical curve on roads of design speed up to and including 25 mph, provided they are placed a minimum distance apart so that they provide the equivalent vertical sight distance of a vertical curve for the same design speed, and in no case shall they be spaced closer than 200 feet apart.

Vertical grade breaks (the algebraic difference of grades) at local road intersections shall not exceed 5% and driveway intersections shall not exceed 8%.

### **Horizontal Curves**

Unless conditions warrant and when approved by the Engineer, changes in direction of the streets shall be made with horizontal circular curves, with the edges of the pavement and curb lines parallel to and equidistant from the centerline of the right-of-way except in the case of curve widening. Curves of the same direction shall have a minimum tangent length of 125 feet. Tangents between reverse curves are not required. Compound curves shall be avoided. A 30' tangent length shall be required on the minor leg of all road intersections as measured from the edge of the right-of-way.

Where a design speed is specified by the Engineer, the horizontal curve design shall be as specified by AASHTO  $(e+f)=v^2/15R$ . The side friction factor shall not exceed 0.23 for local and collector roads and 0.20 for arterial roads. Superelevation may be used only with approval of the City Engineer and in no case shall exceed 4 percent slope. Superelevations are strongly discouraged.

Under no circumstances will a low speed curve be introduced at the end of a long tangent where high speeds are anticipated.

90 degree elbows shall conform to SD 19 and shall only be allowed where approved by the City Engineer.

### **Cul-de-sacs**

The minimum radius for right-of-way lines in cul-de-sacs shall be per Standard Drawings 2, and 3. The use of Cul-de-sacs shall be minimized.

### **Gate Entrances**

Gate entrances shall be at least two feet wider than the width of the traffic lane(s) serving that gate, and shall allow for emergency access.

All gates providing access from a road to a driveway shall be located at least 30 feet from the edge of traveled way, and shall open to allow a vehicle to stop without obstructing traffic on that road.

Gate entrances shall not be allowed on public roadways, or on private roadways accepted for public access. Gates are highly discouraged on private driveways and roadways.

### **Street Intersections**

All streets and commercial driveways shall intersect as close as possible to right angles (90 degrees; see Standard Drawing (SD) 12).

Local streets and commercial driveways entering on opposite sides of any given street shall have their centerline directly opposite or shall be offset by at least 150 feet, collector roads 225 feet minimum distance, and arterial 400 feet minimum distance.

Intersection designs with left turn lanes shall conform to requirements outlined in the current edition of the Caltrans Highway Design Manual for layout and sight distance.

## **Section 4.03 Typical Sections - Sidewalks**

Minimum design sections and right-of-way widths for new street construction, or modification to existing streets, shall be defined as follows:

Continuation of Existing Streets – No street shall have a right-of-way and improved width of less than the street for which it is a continuation without specific approval of the City Engineer or hearing body responsible for the project approval.

New Street Construction – New streets which are not a continuation of existing streets shall be constructed in conformance with standard drawings, unless otherwise approved by the City Engineer. Right-of-way requirements for widening at intersections shall conform to this document and Section 4.01 Classes of Roads.

#### **Section 4.04 Design Speed**

All public residential streets shall be designed to a 25 mph posted speed limit. Minimum 25 mile per hour sight distance shall be maintained at every street intersection. See Table 1, Section 4.02

Design speed for collector and arterial streets and for commercial/industrial streets shall be as specified by the City Engineer, and as shown on Table 1, Section 4.02.

#### **Section 4.05 Bikeways**

The City of South Lake Tahoe has adopted the TRPA Regional Bicycle and Pedestrian Master Plan. Trails and bikeways shall be constructed in conformance with said document and the Caltrans Highway Design Manual. A trail that is not directly adjacent and parallel to the roadway is preferred (see SD-9).

#### **Section 4.06 Roadbed Design**

Pavement structural sections shall be in compliance with the City pavement specification and Section 39 of the Standard Specifications

Roadway shoulders shall be ¾" Class 2 aggregate base compacted to 90% relative compaction and be a depth equal to the roadway base depth. The finish grade of the roadside shoulders shall match the edge of pavement grade at the hinge point. The roadside shoulder grade shall be no less than 2% and no greater than 5%. The width of the roadside shoulder shall be in accordance with the Caltrans Highway Design Manual or as approved by the City Engineer.

All pavement structural sections shall be designed by a California Registered Civil Engineer or Geotechnical Engineer. The proposed pavement design structural section shall be based on the sub-base soil resistance factor "R value." The proposed pavement structural section shall be filed in a report with the City Engineer for approval. However, in no case will the structural section be less than 8 inches Class 2 aggregate base and 4 inches type PG 64-28 polymer modified asphalt concrete.

Any revised section proposed by the Design Engineer shall be submitted to the Engineer for his approval and shall be supported by a soils report.

In all cases, the traffic index (TI) used for the design of the pavement structural sections shall be furnished by the City Engineer.

#### **Section 4.07 Driveways**

Portland Cement Concrete (PCC) driveways shall not be permitted within the City right-of-way where there are no PCC curbs and gutters unless otherwise approved by the City Engineer. Driveway pavement of residential driveways shall be standard asphalt hot mix from the connection to the City pavement to the right-of-way/property line. If concrete curb and gutter is existing or constructed as a part of the project work along the street frontage, paver stones are allowed to be constructed up to the back of curb.

Commercial driveways that access the public right-of-way shall have a minimum width of 10 feet one way and 20 feet for two-way and a maximum width of 30 feet, excluding any tapers or radii at the interface of the driveway encroachment and the edge of roadway. (See Standard Drawing (SD) 12.)

The driveway grades within the right-of-way (offsite) shall be as follows. The driveway pavement cross slope section shall extend a minimum of two feet (45-degree flare) on each side of the driveway as it connects to the public street edge of pavement. Unless otherwise approved, the driveway shall transition through a valley swale, curb section, or crest to prevent roadway drainage from entering the driveway or driveway drainage from entering the right-of-way (BMPs shall be constructed to infiltrate on-site storm water before it enters the public right-of-way. The type of transition will be determined on the permit depending on the lot site conditions.

The driveway grade outside the right-of-way, on private property (onsite) shall be in conformance with TRPA standards.

Driveways shall have a minimum centerline radius of 43 feet and be capable of supporting a 40,000 pound (H-20) load, unless otherwise approved by the City Engineer and the Fire Department. Applicants for any subdivision may be required to demonstrate these standards can be met prior to tentative approval of the subdivision. Comparable driveway alternatives may be allowed with the approval of both the City Engineer and the South Lake Tahoe Fire Department.

An unobstructed vertical clearance of 15 feet shall be provided along the entire length of the driveway.

The slope of driveway cut surfaces shall be no steeper than is safe for the intended use and shall be no steeper than 2 units horizontal in 1 unit vertical (earth slope) unless the permittee furnishes a soils engineering or an engineering geology report, or both, stating that the site has been investigated and given an opinion that a cut at a steeper slope will be stable and not

create a hazard to public or private property. One horizontal unit to one vertical unit may be approved by the City Engineer with appropriate rock slope protection. The top of cut slopes shall not be made nearer to a site boundary line than one fifth of the vertical height of cut with a minimum of 2 feet and a maximum of 10 feet.

The slope of driveway fill surfaces shall be no steeper than is safe for the intended use and shall be no steeper than 2 units horizontal in 1 unit vertical (50% slope) unless the permittee furnishes an investigation and design (including calculations) by a qualified engineer demonstrating that a fill at a steeper slope will be stable and not create a hazard to public or private property. A 1:1 slope with rock slope protection is also acceptable. All fills shall be compacted to a minimum of 90 percent of maximum density. The toe of fill slope shall be made not nearer to the site boundary line than one half of the vertical height of fill with a minimum of 2 feet and a maximum of 20 feet.

Roadway drainage shall be maintained across the driveway encroachment, whether by valley swale, crest, curb section or culvert as specified by the driveway encroachment permit. The driveway shall be constructed with a 2 inch minimum depth of hot asphalt concrete pavement placed on a 4 inch minimum depth of aggregate base (Class 2) compacted to a minimum of 95 percent of maximum density. Hot asphalt concrete pavement shall not be placed (stockpiled) on the City roadway during driveway paving operations

Trash enclosures shall be located outside the right-of-way on private property. No concrete foundations shall be allowed in the right-of-way.

The following information shall be shown on the site plan prior to issuance of a residential driveway permit:

- A. A site plan of the driveway centerline from the center of the roadway to the parking area.
- B. Driveway grades (offsite and onsite)
- C. Driveway side-slopes
- D. Top of cut and fill slopes
- E. Driveway width and radii

A driveway subgrade inspection is required prior to any foundation inspections. A driveway final inspection is required prior to any building final inspections.

The City Engineer may allow final inspections of incomplete work upon submittal of an improvement bond or cash deposit in the amount of 125% of the incomplete work and payment of a processing fee. A separate agreement will be required to obtain this ability to bond for incomplete work.

#### **Section 4.08 Materials and Construction**

Materials and construction shall be as specified in Section 12 of the City of South Lake Tahoe Public Improvement and City Engineering Standards.

Asphalt concrete shall conform to the requirements as specified in Section 39 of the City of South Lake Tahoe Standard Engineering Specifications or as specified by the City Engineer.

Aggregate Base shall be Class 2 and shall conform to the requirements of Section 26 of the latest edition of the California Department of Transportation Standard Specifications.

All exposed, newly installed equipment, including but not limited to any exposed galvanized or other metal, electrical cabinets, irrigation controller cabinets, light fixtures and mounting hardware shall be powder coated with a color of midnight green. An approved product is Midnight Green Endura-Shield IV, Tnemec Semigloss High Build Acrylic Polyurethane Enamel No. 75-J7751. Contractor must submit product specifications and a color sample for approval by the City Engineer.

## **Section 4.09 Signs and Barricades**

### **Street Names**

All roads and streets within a development shall be named by the subdivider/project proponent and will be subject to approval by the Planning Division. Names already in use or previously proposed will not be approved. Extensions of collector or arterial streets shall continue with existing road names and the names shall not change when crossing intersections.

### **Signs**

Signs and other traffic safety devices shall be furnished and installed in accordance with the approved plans or as required by the City Engineer. Appropriate warning signs shall be installed when the design speed for any portion of the road is less than 25 miles per hour.

Street name signs shall conform to the requirements of these specifications. See Standard Drawings 45.

Street signs shall be visible and legible from both directions of vehicle travel for a distance not less than the stopping sight distances required for the design speed.

It is the cities policy to minimize the placement of roadway signs. Placement of stop signs and roadway signs shall be in accordance with the Highway Design Manual and the MUTCD.

### **Permanent Barricades**

Where improvements cover only a portion of the ultimate improvement, and where an improved street is proposed to be extended in the future, the improvements shall

include a permanent type barricade at the end of pavement surfacing to provide a warning of the end of the street.

## **Section 4.10 Street Lighting**

### **Street Lighting**

Street lighting shall be installed as directed by the City Engineer. Unless otherwise approved by the City Engineer or hearing body, the following streets, street intersections and paths shall be lighted:

1. Intersection of arterial to arterial roads
2. At locations where lighting is required to maintain the design speed sight distance on roadways (such as on vertical or horizontal curves) as directed by the City Engineer

### **Pedestrian Lighting**

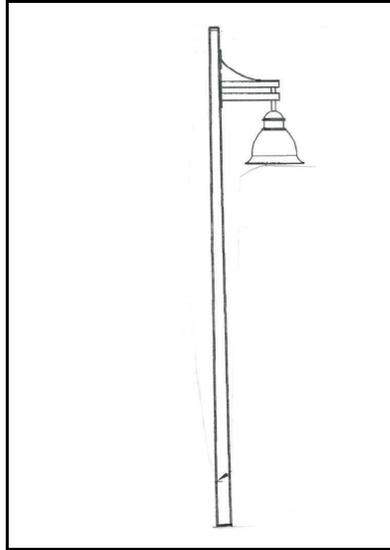
Pedestrian shall be installed as directed by the City Engineer. Unless otherwise approved by the City Engineer or hearing body, the following pedestrian and bicycle paths shall be lighted:

1. All multipurpose and bike paths adjacent to roadways indicated on the *City Lighting Area Map*;
2. All sidewalks adjacent to roadways indicated on the City Lighting Area Map.

### **City-wide Design Standard**

The City shall use the City-wide Light Assembly (Figure 1) for pedestrian lighting on streets depicted in yellow as shown on the *City Lighting Area Map*. This assembly has an Ameron square, spun, pre-stressed, concrete pole and Bieber fixture and bracket (see attached specifications sheet). The City Engineer has the discretion to approve alternative lighting assemblies if proven equivalent in style and function.

For the most part, the City-wide Light Assembly (Figure 1) will apply to all collector and arterial streets within commercial zones in the City. Spacing and intensity of lighting shall be determined by the City Engineer to be the minimum necessary to provide safety along pedestrian and bicycle corridors.



**Figure 1. City-wide Light Assembly**

Redevelopment Design Standard

The City shall use the Redevelopment Area Lighting Assembly (Figure 2) for pedestrian lighting on streets which are depicted in green on the *City Lighting Area Map*. The light assembly is manufactured by Bega (or proven equivalent) and is shown in Figure 2 below. In no case will light assemblies be permitted to be taller than 16 feet and in most cases will be required to be 12 feet. Spacing and intensity of lighting shall be determined by the City Engineer to be the minimum necessary to provide safety along pedestrian and bicycle corridors.

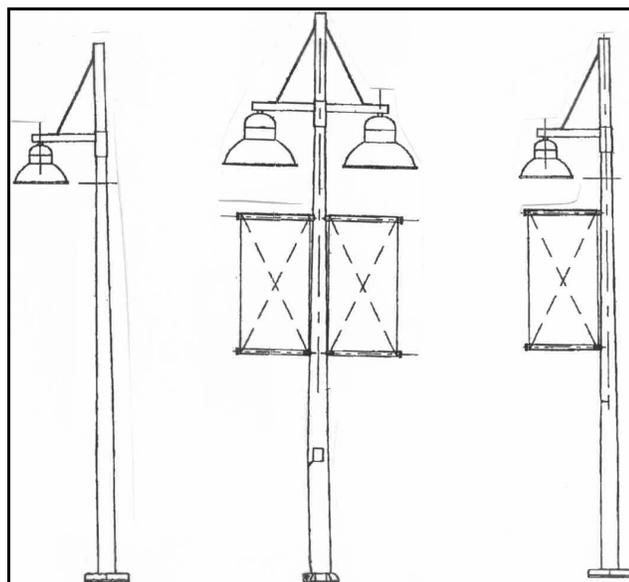


Figure 2. Redevelopment Area Light Assembly

**City Lighting Area Map (Appendix L)**

**Cut/Spec Sheet for Street Light (Appendix L)**

**Section 4.11 Sight Distance**

The minimum sight distances over any segment of the roadway shall be based upon the design speed of the road, but shall in no case be less than 150 feet unless a variation is approved by the City Engineer. Stopping sight distance shall be determined as outlined in Section 201 of the State Highway Design Manual. Corner sight distance may be used in lieu of stopping sight distance depending upon the topography of the area.

**Section 4.12 Trenches / Roadway Repairs**

Encroachment permits are required before beginning any work within the City right-of-way. Limits of roadway repairs will be determined by the City Engineer on a case by case basis, as detailed on the encroachment permit, and as shown on the Standard Drawings.

The Contractor shall perform continuing maintenance to all excavations during the course of construction to ensure a safe environment for the public. Trenches shall not be left open farther than two hundred (200) feet in advance of the operations or two hundred (200) feet to the rear thereof unless otherwise permitted by the City Engineer. The limits of open trench may be decreased on a job by job basis if public safety is an issue. To prevent greater surface damage, no opening in a paved surface shall be increased by trench wall sloping or benching in lieu of the use of trench boxes, shoring or other authorized protective systems unless it is approved by the City Engineer. Additionally, to prevent heat transfer damage, fresh hot mix shall not be deposited nor stockpiled onto any asphalt concrete surface prior top placement into an excavation.

All trench patching within the City street rights-of-way shall be continually maintained by the entity or franchise utility that is responsible for cutting and patching the City street for the lifetime of the subsurface utility. Abandoned subsurface utilities that are located beneath a structural section or paved street that are 6 inches or larger in diameter shall be either removed or filled with a cement slurry.

Trenches within traveled ways of both public and private streets shall be patched in accordance with the City Engineering Specifications. Pavement patching maintenance that is the responsibility of an entity or franchise utility (other than the City Street Maintenance Division) shall perform the needed maintenance as determined necessary by the City Engineer. If pavement patch work maintenance is not performed as directed within 15 days notice, the City may perform the needed work and bill the non-responsive party for expenses incurred to make the pavement patch repairs plus a 15% administrative fee.

All trenches within the City right-of-way shall be completely repaired and hot patched by October 15 of each year unless field conditions allows paving work to continue beyond said date.

Trench repair shall not have the saw cut lines in the wheel path of the roadway. Longitudinal cuts shall be place on the roadway centerline, center of the travel lane or within the roadway shoulder as shown on SD 07. Excessive transverse patches in the roadway may constitute the need for a complete grind and repave of the entire roadway if in the opinion of the City Engineer this method of pavement repair is warranted.

#### **Section 4.13 Signing and Striping**

All road centerline, edgeline, stop bars, lane striping and turn-pocket striping shall be “cat tracked” prior to striping. The City Engineer and/or Street Maintenance Supervisor shall review “cat tracking” prior to final striping on the roadways.

Refer to the Manual on Uniform Traffic Control Devices dated December 2003.

Crosswalks shall be placed at roadways intersections as determined by the City Engineer. Mid-block cross-walks are highly discouraged and require written permission of the City Engineer. The party proposing a mid-block cross-walk shall provide indemnification of the City.

#### **Section 4.14 Road/Improvement Maintenance**

All newly constructed roadways and site improvements shall be maintained by the developer until such time that they are formally accepted by the City Council for maintenance. A formal Maintenance agreement shall be submitted to the City Engineer for review. Maintenance shall be required for onsite and offsite improvements.

#### **Section 4.15 Roadway Clearance(s)**

No obstacles shall be placed in the right-of-way that constitutes a safety hazard to the traveling public. At a minimum no obstacles shall be closer than one (1) foot from the back of the roadway curb or three (3) feet from the edge of the pavement. See Section 6.05 for mailbox location requirements.

### **SECTION 5 DRAINAGE**

#### **Section 5.01 Basic Objectives**

In an effort to provide a uniform drainage system in the City, the following objectives and standards will be followed unless modified by request, with approval confirmed in writing by the City Engineer.

Drainage studies shall be required on all commercial projects, subdivisions, parcel maps, environmental improvement projects, drainage improvement projects, and where directed by the City Engineer.

Improvements shall be protected from inundation, flood hazard, street overflow, ponding of local storm water (unless it's desired), springs, and surface waters. The drainage system shall provide for the control of drainage flows carried through and collected within the improved area without injury to adjacent property. Natural drainage ways and water courses shall be retained and used to convey surface water through the improved area unless otherwise approved by the City Engineer.

Overland flows must be retained within the drainage way in which they collect naturally. Each property owner shall leave the natural flow of surface water undisturbed unless prior written approval for improvements, clearing, or grading has been obtained from the City Engineer except as exempted in this document. It is incumbent upon the owner to avoid injury/damage to adjacent property due to the flow of surface waters. Each improvement shall be designed such that there will be no additional adverse increase in concentrated flow or adverse increase in the rate of flow of water onto downstream properties which can be contributed to the proposed improvement. Unless an individual project requires the diversion of water to conform to a comprehensive drainage plan, water shall be received and discharged at the location, which existed prior to the improvement(s).

In cases of a land division map or condominium development, the entity responsible for maintenance of all drainage facilities, other than those within the city right-of-way, shall be designated and approved prior to filing of the Final Subdivision Map or Parcel Map.

### **Section 5.02 Drainage Design Considerations**

The following items shall be considered and implemented in the drainage design:

- A. Diversion of drainage will only be allowed within the limits of the proposed improvement.
- B. Acceleration of drainage flows shall not cause damage to property and/or the environment.
- C. Drainage and appurtenant structures shall be properly designed to take into account drainage flow, bedload, and debris at all stages of flow.
- D. Overland release drainage shall be designed to convey stormwater runoff without damage to property and the natural environment. No detrimental change in drainage flow pattern shall result above or below the project. This consideration shall be carefully studied in relation to erosion and pollution controls. The proposed project shall be required to provide prevention, control, and abatement of erosion and water pollution. Provisions for the drainage capacity of potential future upstream development shall be considered. Only existing detention facilities that are to remain shall be included in the design calculations. All other facilities must be based on ultimate flows without detention.
- E. The design shall not cause stagnant pools, unless required as part of an approved Best Management Practice (BMP).

- F. The design shall avoid excessive ponding at entrances to drainage structures which may cause property damage, accumulation of drift, and clogging or deposits of debris.
- G. Outlet design of drainage structures shall be effective in re-establishing non-erosive channel flow and shall resist undermining.
- H. Drainage structures shall be designed to allow easy access for maintenance and minimize the need for maintenance.
- I. The design shall consider the safety of pedestrians and vehicular traffic.
- J. The design shall not hinder the passage of fish, as may be necessary and/or required by permits from the California Department of Fish and Game and/or other applicable agencies.
- K. Drainage system design shall include the application of BMPs where ever practical and feasible for water quality protection and be consistent with Chapter 25 of the TRPA Code of Ordinances. BMP measures shall address such concerns including but not limited to erosion and sediment control, prevention of illicit or illegal discharge, protection from the discharge of petroleum products, nutrients, pesticides, chemicals, heavy metals, organics, hydrocarbons, and other pollutants into surface or ground waters.
- L. Compliance with the Federal "Clean Water Act", including acquirement of any necessary storm water discharge permits pursuant to Federal and State law.
- M. For non-graded lots, stormwater runoff shall not cross more than one adjacent lot before entering a drainage easement and/or an approved stormwater drainage facility.
- N. For all critical release points for road drainage, such as low points of sags and cul-de-sacs, adequate drainage collection and conveyance systems and associated grading shall be shown on the grading and drainage plans. Applicable easements shall be obtained.
- O. Cutoff walls shall be placed at inlets and outlets of culverts if culvert lengths are in excess of 250 feet and over 7.5% grade. Cutoff walls along the length of the culvert shall be placed at 50 foot spacing.
- P. Storm drainage facilities and BMPs shall minimize the amount of silt, sand, and debris discharged to receiving waters and drainage facilities.

### **Section 5.03 Hydrology and Runoff**

#### **General**

A civil engineer registered in the State of California shall prepare drainage reports and calculations. Hydrology calculations must be made based upon ultimate land use designations in accordance with the adopted General Plan.

Watershed areas of 160 acres and less may be analyzed by the Rational Method. ( $Q = CIA$ ). Watersheds larger than 160 acres shall be analyzed utilizing the Army Corps of Engineers' computer program HEC-1/ HEC-HMS, or other method approved by the City Engineer.

A submittal of the improvement plans shall be accompanied by the drainage analysis which shall consist of a watershed area map and drainage design calculations (2 copies) stamped and signed by a civil engineer licensed in the State of California.

At a minimum, drainage design hydraulic calculations shall show the model input data used to determine the peak flow rate for both the 10-year and 100-year storm reoccurrence interval at each drainage facility. Additional hydraulic analysis may be required if the Engineer determines the information will be useful during the review of a project.

### Rational Method of Estimating Peak Runoff

The time of concentration is the time required for the runoff from the most remote point in the watershed to reach the point of concentration at which the flow is to be calculated. It is generally composed of two parts, the overland flow time (sheet flow) and the concentrated flow time.

Overland flow in underdeveloped or lightly developed watersheds, in the initial runoff, is usually in the form of sheet flow. Overland flow includes flow over planar surfaces such as roofs, streets, lawns, parking lots and fields. The overland flow length is not always well defined in natural areas, but it usually becomes concentrated in shallow rivulets or swales within 600 feet on gentle terrain and within 300 feet on steeper terrain. Equation 5.1 listed below is used to estimate the overland flow component of response time.

### Equation 5.1

$$Tr = \frac{.355(NL)^{0.6}}{S^{0.3}}$$

Tr = response time, minutes

N = 10n

n = roughness coefficient

L = length, feet

S = slope feet horizontal/vertical, feet

Concentrated flow/channel flow time is the time required for the water to flow from one point of concentration to the next. This flow may take place in a man-made or natural conveyance. The velocity chosen for use in this calculation should accurately reflect the hydraulic conditions in the drainage system. Equation 5.2 listed below may be used to estimate the time of concentration of concentrated flow. This equation applies to open channels in most situations; however Manning's equation may be used in lieu of this equation.

### Equation 5.2

$$Tr = \frac{.00735Ln^{0.75}}{(1+Z^2)^{0.25}}$$

$$S^{0.375} (A c Z)^{0.25}$$

Tr = response time, minutes  
n = roughness coefficient  
S = slope feet horizontal/vertical, feet  
L = length, feet  
Z = side slope, horizontal /vertical, feet.  
Ac = contributing area, acres

The total time of concentration shall be used with the mean annual precipitation chart to determine the precipitation intensity for the given storm event.

Infiltration Factor: When pervious overland flow areas are present the Design Engineer shall estimate the area susceptible to infiltration. The effect of infiltration is reflected in the value for "c" in the use of the rational formula.

Snow Melt: A minimum snow melt rate of 0.10 inches/hour shall be added to the storm intensity values for small watersheds.

The hydrology calculation shall include a hydrology map showing:

1. Rational Method "C" values shall be shown for each watershed and sub watershed.
2. Storm Intensity "I" values can be either computed or acquired from the El Dorado County Standard Specifications.
3. Area of the watershed in the Rational Method is shown as "A" in acres.
4. Time of concentration and runoff coefficients shall be shown for each reach.

## **Section 5.04 Hydraulic Capacity**

### Hydraulic Grade Lines

The hydraulic grade line or HGL is computed from a known water surface elevation, usually the outlet condition, and the summation of head (energy) losses occurring in elements of the system due to friction and turbulence. These losses must be accounted for. At a minimum the following losses are to be addressed in the HGL calculations, friction loss, entrance loss, losses due to sudden enlargement or constriction, structure, and junction losses. The HGL shall at all points be at least six inches below all manhole covers, gratings and inlets at the 10-year design flow.

### Inlet Structures

Design of drop inlets shall allow for 50% blockage of the inlet.

### Inlet and Outlet Control

Inlet or outlet conditions usually control flow in a transverse culvert. In culverts operating under inlet control, only the entrance configuration and headwater depth affect the culvert capacity.

Under outlet control, headwater depth, tailwater depth, entrance configuration and barrel characteristics all influence the culvert's capacity.

After the design flow runoff has been calculated, the drainage channel downstream of the culvert should be investigated to determine normal depth of flow during peak runoff conditions to estimate the tailwater depth and determine whether inlet or outlet control exists.

### **Section 5.05 Detention Basins**

Detention basins are intended to reduce the peak discharge of a watershed by storing the excess flow in a reservoir and slowly releasing it back into the system after the peak of the storm has passed. (All detention basins shall be designed such that the water exits the basin entirely within 96 hours after the storm event). Detention basins shall be fenced or otherwise protected for public safety where appropriate. The 20 year one hour event shall be detained and/or treated onsite per the requirements of the California Regional water Quality Control Board (Lahontan). Flows in excess of the 10 year event shall be determined so post-project flows leaving the project site do not exceed pre-project flows. The size of the detention basins should also consider downstream channel capacities, interactions with other storage basins, water quality, erosion, and sedimentation. If rock rip-rap is used to line the basin, the volume of rock shall be considered in the design. Rock used in detention basins must be pre-approved to meet angular face requirements and color. A rock sample that represents the rock proposed for placement in a project shall be submitted to the Engineer for review and approval.

Generally the basin spillway crest shall be at or above the basins design year hydraulic grade line. When feasible the basin water surface design elevation should be at or below existing natural ground. Generally no more than 50% of the basins design year storage depth should be above the existing ground. The spillway or emergency overflow structure shall be designed to discharge the 100-year peak flow rate. Spillways may be eliminated, at the discretion of the City Engineer, when it can be shown that no damage would occur in the event of a breach. All storage basins and BMPs shall be assumed to be 100% full for the design of flood routing via the spillway.

Storage basins shall have a minimum one foot of freeboard above the design flood high water line on the spillway. On small basins such as parking lots the freeboard requirements may be reduced with approval by the City Engineer.

Basin side slopes shall vary between 3 horizontal (H): 1 vertical(V) to 5H:1V or flatter.

A low flow channel shall be provided from the basin inlet to the basin outlet. The low flow outlet shall be designed to convey 0.1 cubic feet per second (cfs) per acre of the upstream watershed area. The earthen floor of the basin shall slope at a minimum 1% grade towards the low flow channel and shall have a minimum slope of 0.25% from the inlet to the outlet of the basin. Where the basin is located on private property, a maintenance access easement may be required. A maintenance access road to the basin bottom shall be a minimum 15 feet wide with no slopes in excess of 16%.

The outlet pipe for all basins shall be a minimum of 18" in diameter and shall contain a trash rack at the inlet.

All sediment basins shall contain adequate landscaping in addition to the vegetation required for erosion control. Landscaping around the basins shall be designed to help blend in the basins with the surrounding areas. All basins shall be reviewed for possible dual recreational use. The design of all basins shall be reviewed and approved by the City Public Works review panel to confirm landscaping and recreational opportunities are acceptable.

### **Section 5.06 Drainage Reports**

A. It is the responsibility of the Design Engineer to verify the design basis through a review of existing field conditions. This should include but not be limited to a review of the following:

1. Existing flow data
2. Historical high water marks and/or recorded stream flow data
3. Seasonal variation in channel condition
4. Soil type
5. Ground cover
6. Adjacent man-made drainage works

Drainage reports shall be prepared by a civil engineer registered in the State of California, and shall include the seal and original signature of the designer. The drainage report shall include the following information at a minimum:

1. A title sheet with the project name, design engineer's name, address, telephone number and date of report.
2. A vicinity map showing the location of the project area in relationship to well-known features.
3. A written text addressing existing conditions; a description of the proposed improvements, (both on and offsite); the effect of the improvements (both positive and negative); a discussion of how to mitigate any negative effects; the goals and all assumptions of the design; an explanation of all special design considerations; a discussion of design methodology; a description of the hydrologic method used; a description of required easements for construction (any special requirements outlined); proposed BMPs; and a description of any existing drainage features ditches/waterways on the project site upstream or downstream of the site.
4. Watershed maps as described in Section 5.07 of this document.
5. Table(s) indexed to the watershed maps which list drainage areas (in acres); soil and cover types; existing and/or future land use; pervious infiltration rates; impervious areas; and design flows for both pre and post-development conditions for both the 10 year and 100 year recurrence interval storm event.
6. Summary tables of the pre-development and post-development design indexed to the watershed map(s) shall include the following:

- a. Identification of all inlets, outlets, manholes, and pipe runs;
- b. Elevation of flow lines and inlets, outlets, manholes and grates;
- c. Acreage of contributing water sheds;
- d. Q10 and Q100 flows;
- e. Type and capacity of drainage inlets;
- f. Any carry over/by-pass flows;
- g. Downstream flow rates;
- h. HGL elevations for 10 and 100 year events at all inlets, outlets, and manholes with available freeboard, as applicable;
- i. Pipe diameters, lengths, slopes, materials, channel type, side slopes, and bottom width, as well as length and slope;
- j. Velocities;
- k. Roughness coefficients for overland surfaces, pipes, and channels;
- l. Pipe and channel capacities as applicable;
- m. Critical depth of flow and normal flow for channels and pipes;
- n. Summary table of detention basin design data;
- o. For projects requiring HEC-1, HEC-RAZ/HMS and/or HEC-2 calculations, tabulate input and provide one copy of the output;
- p. Additional information may be required to document other aspects of the design; and
- q. Storm drain profile drawing showing hydraulic grade lines.

### **Section 5.07 Drainage Maps**

Separate drainage plans shall be submitted for pre and post-development conditions. The plan scale shall be 1"=100' or 1"=50' for smaller watersheds but not less than 1"= 800' or as otherwise approved by the City Engineer. For drainage areas exceeding one square mile, USGS maps may be used provided that the area under consideration can be clearly defined.

Information shown on the drainage map shall include the following:

- A. Property boundary and limits of work;
- B. Limits of the 100 year event;
- C. Drainage area in acres;
- D. Existing utility locations and/or conflicts;
- E. Existing and proposed contours/elevations with appropriate contour intervals as specified in Section 2 of this document. Contours shall be extended a minimum of 50 feet beyond the limits of the tributary area and further if needed to verify proper delineation of watershed limits;
- F. Travel paths of overland and concentrated flows with defined lengths and slopes noted for both flow types;
- G. Flow to each drainage structure in cubic feet per second (cfs) for both the 10-year and 100-year recurrence interval events with any carryover flow noted;

- H. Identification of each inlet, outlet and junction structure identified by letters or numbers corresponding to tables and calculations included in the drainage report;
- I. All individual watersheds and sub-watersheds shall be clearly defined. Points of Concentration (POC) for each junction shall be shown throughout. At each POC note Q10 and Q100 flow rates;
- J. Show all runoff entering and leaving the site; and
- K. Design drainage inlet rim elevations and inlet/outlet pipe inverts at each drainage structure.

### **Section 5.08 Overland Release Points**

Overland release points for the 100 year storm recurrence interval shall be shown and properly identified. Streets and their associated underground drainage systems must convey the 100-year runoff such that the water surface elevation is at least 1 foot below the finish floor elevation of adjacent structures. All associated grading limits and limits of required drainage easements shall be shown. The easements shall be large enough to ensure that these release areas can be maintained.

### **Section 5.09 Design Criteria and Standards**

Manning's formula shall be used to compute capacities of all open and closed conduits not operating under inlet control, and the hydraulic grade lines.

#### **A. Culverts and Storm Drains**

1. Design flow shall be as specified in this document. Culverts and storm drains shall be designed to carry the peak flow resulting from the 10-year recurrence interval design storm with no head (i.e. a ratio of height of water at inlet (H) to diameter of pipe (D) = 1.0) unless it is part of an approved storm detention design. For upstream watersheds less than or equal to 160 acres, the 100-year storm may be conveyed with head, providing the design complies with Table 5-1, Allowable Street Encroachments. Designs with  $H/D > 1.5$  must be evaluated for pipe seam and joint strength to ensure no failure of the pipe from larger water pressures. All storm events must be analyzed as outlined in this document unless operating under inlet control.
2. Pipe material shall be HDPE or concrete as approved by the City Engineer.
3. Minimum depth of cover for overfill conditions shall be determined from Standard Drawing (SD) 42 of this manual. Minimum cover over culverts and storm drains shall be 1.5 feet. Culverts and storm drains shall not extend into the road structural section. Where the 1.5 feet of minimum cover cannot be met, the conduit shall be encased in a two-sack slurry on the bottom and sides of the pipe, with 1.0 feet of slurry cover, or protected in a manner approved by the Engineer.

4. Culverts under driveways shall be designed to carry the design flow of the roadside ditch with a minimum diameter of 15 inches unless a smaller size pipe is approved by the Engineer.
5. When design flow outlet velocities exceed allowable velocities for the downstream drainage way or watercourse, suitable protection shall be provided.
6. For culverts or storm drains that are 48 inches in diameter or greater, inlets and outlets shall have cut-off walls. Inlets and outlets shall include erosion protection.
7. To prevent sedimentation, the minimum design flow velocity allowable in any closed conduit system shall be 2.5 feet per second. The maximum design flow velocity in any closed conduit system is 14 fps. Velocities exceeding 14 fps shall be reviewed on a case-by-case basis by the City Engineer. Velocities shall be computed using the Manning equation unless an alternative method is approved by the Engineer (i.e. pressure flow condition).
8. Closed conduit pipe slopes shall be less than 70 percent of critical slope or greater than 130 percent of critical slope at design flow. The maximum design quantity of flow for any line steeper than critical slope shall be computed assuming that the floor is at critical slope and critical velocity.
9. The wetted perimeter of a pipe increases more rapidly than the area as the pipe approaches full capacity. Therefore, the capacity of a circular conduit at a given grade is the same at 91% and 100% ratios of  $d/D$ . Because it is impractical to design for the theoretical range where capacity exceeds that for the full conduit, open channel flow should only be assumed for  $d/D$  ratios less than 0.90.
10. The maximum spacing between cross culverts shall be 500 feet and the maximum grade differential in elevation between cross culverts shall be 20 feet, unless otherwise approved by the Engineer.
11. The maximum spacing between storm drain manholes shall be 400 feet.
12. The maximum spacing between drop inlets shall be 400 feet.
13. The minimum storm drain pipe diameter to be used in the City right-of-way shall be 18 inch.
14. Culverts and storm drains shall be designed for H-20 loading criteria and installed as applicable.

B. Roadway Drainage

1. Roadway drainage design includes the collection and removal of drainage from the roadway. Such drainage includes that which originates from within the right-of-way, as well as surface drainage outside of the right-of-way which may be impacted by the conditions of the road. This includes overland flows, channel flow and groundwater.
2. In the design of roadway drainage facilities, provisions shall be made for stormwater release at all natural channels.

3. The limits of flooding used in the design of roadway drainage facilities shall be as set forth in the project drainage report. The limits shall conform to Table 5-1 of this section.
4. Drop inlet types shall conform to the design standards shown in the Standard Plans, and these specifications, and Standard Drawings.
5. Drop inlets shall have a minimum of 2 foot deep sump where possible.
6. The hydraulic design of storm drain system for the 10-year design flow shall conform to the following:
  - a. New drainage systems shall be designed for open channel flow under the design storm flow (i.e., hydraulic grade line is at or below the crown of the pipe).
  - b. For existing systems, the hydraulic grade line shall be at least 0.50 feet below the manhole cover, grate or inlet.
  - c. For design storms greater than the 10-year recurrence interval and watersheds larger than 320 acres, reduced velocities must be approved by the City Engineer.
7. Joints and seams of new drainage pipes under pressure must be leak tested in accordance with ASTM F1417-92 (98) "Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low Pressure Air."
8. Pipelines shall be located parallel to and concentric to road center lines, as close as possible. Meandering and unnecessary angular changes of pipelines shall be avoided. (See standard drawing SD 07 for "new construction" pipeline locations within the right-of-way.)
9. Angular changes of storm drains within a drainage structure shall not be greater than 90 degrees. However laterals entering the structure from drain inlets may be at greater than 90 degrees from the direction of flow through the structure. If laterals entering a structure are greater than 90 degrees from the direction of main flow, the invert of the lateral shall be at or above the crown elevation of the main storm drain line. Where angle points in alignment exceed 5 degrees, a manhole or inlet type junction structure, or circular bend may be used, as approved by the Engineer.
10. Manholes shall be located at pipe junctions and changes in pipeline gradient or size. "Blind connections" will not be allowed. For pipes 24" or less in diameter on curves with radii at 200-400 feet, manholes shall be placed at the beginning of curve (B.C.) or end of curve (E.C.) and then on 400 feet maximum intervals along the curve. Approval by the Engineer will be required for curve radii less than 200 feet. Standard pre-cast manholes shall be used whenever feasible in traffic areas. All manholes or junction boxes must have standard 24 inch diameter manhole covers and must be located out of the gutter line.
11. Drainage inlets shall have a maximum spacing of 400 feet as measured longitudinally along the road, and have bicycle-proof grates.

12. Junction boxes shall be constructed of reinforced concrete in accordance with the material specifications. Minimum wall thickness shall be 6 inches for cast-in place structures. Approved precast reinforced concrete structures may have a minimum wall thickness of 6 inches. Inside dimension shall be such as to provide a minimum of 3 inches clearance on the outside diameter of the largest pipe in each face for rectangular boxes and 8 inches minimum clearance between pipes along inside wall of circular junction boxes. Manholes, drop inlets, junction boxes and related appurtenances including grates shall be designed for AASHTO's HS-20 traffic loading.
13. Downstream pipes in a storm drain system shall be designed with the same or larger size as the upstream pipe(s).
14. Pipes entering and leaving junction boxes shall be designed with matching crowns, or the upstream pipe(s) may be higher. In no case will the crown of a smaller upstream pipe be below the crown of the downstream pipe unless specifically approved as part of the design of a detention facility or BMP.
15. Longitudinal gutter grades shall not be flatter than 0.50 percent.
16. Pipe materials shall conform to requirements of Section 5.09, A, 2 (listed above).
17. Open channels shall be designed to accommodate the effects of supercritical flow. Open channels shall be designed to prevent erosion and scouring.

C. Open Channels

1. Open channel construction materials are listed in order of preference: Grass lined; earth; rock lined; asphalt concrete lined. A closed storm drain system with dikes/curbs is preferred over roadside ditches unless the conveyance improvement is part of an erosion control/water quality improvement project.
2. The minimum velocity for earth channels is 2.0 fps and the maximum velocity is 6.0 fps. The minimum velocity for concrete lined channels is 2.0 fps and the maximum is 14.0 fps.
3. The side slopes for realigned channels shall not exceed 1:1 on the lined portion and 2:1 on the unlined portion.

**Table  
5-1  
Allowable Street Encroachments**

Type	Profile	10-year storm	100-year storm
Local	Continuous grade	Traveled way is open and does not carry water	Max. stormwater elev. is 4" above the top of curb and the water velocity is less than 3 ft./sec.
	Sag points	Stormwater elev.	Stormwater is min. one Ft. below building pad.

		doesn't exceed the top back of sidewalk Max depth in traveled way is 6". Centerline is dry	Ponding is less than 120 feet away from inlet
Collector	Continuous grade and sag points	Traveled way is open and does not carry water	Stormwater is within right-of-way, Center 12 feet of roadway is clear of water. Velocity is less than 3ft./sec
Arterial	Continuous grade	no encroachment allowed	All travel lanes are clear bike lane may be inundated, Max. depth of 6" over sidewalk.

#### D. Subsurface Drainage

1. Where subsurface drainage is encountered, special investigations and reports by a qualified Engineer shall be required.
2. All subsurface drainage shall be conveyed by perforated pipes, except at the outlet portion which shall be non-perforated pipe.
3. Minimum inside pipe diameter for underdrains shall be 6 inches for pipe lengths of 500 feet or less. For pipe lengths exceeding 500 feet, the minimum diameter shall be 8 inches.
4. Surface drainage shall not be permitted to discharge into an underdrain which is designed to intercept groundwater.
5. A terminal cleanout shall be installed at the upper end of the underdrain, and intermediate cleanouts shall be installed at all angles and as approved by the Engineer. The riser diameter shall be equal to the diameter of the underdrain. A suitable marker/stake shall be provided for permanent reference.
6. Outlets shall be provided at maximum intervals of 500 feet.

#### **Section 5.10 Easements**

Drainage structures and improved channels when not located in a public street, road, alley, or within a public right-of-way must be located in a dedicated and recorded public drainage easement. Necessary dedication must be completed before the improvement will be approved or finalized. A dedicated and recorded meandering drainage easement (MDE) shall be provided for all existing natural drainage swales.

A. Easements for closed conduits:

1. The drainage easement shall be a minimum of 20 feet wide, with the conduit centered within the easement.
2. A temporary construction easement shall be provided to ensure adequate access and working space rights during construction.
3. For pipes 24 inches in diameter and larger or where trench depth exceeds 5 feet, additional easement width may be necessary to provide adequate working space.

B. Easements for open channels (man made waterways):

1. The drainage easement shall have sufficient width to contain the channel and a service road with a turnaround.
2. Minimum easement requirements are the same as the requirements for closed conduits.

C. Easements for culverts:

The drainage easement shall provide sufficient width for maintenance purposes including inlets and outlets.

**Section 5.11 Fencing for Drainage Improvements**

Suitable fencing or barriers shall be installed when the Engineer determines that they are needed for safety or security reasons.

**SECTION 6 UTILITIES**

**Section 6.01 Composite Utility Plan**

Subdivision improvement plans shall include composite utility plans showing electrical, telephone, gas, cable TV, sewer, water, storm drain, irrigation, traffic signal equipment and street lighting (if applicable). All newly constructed utility infrastructure shall be placed below ground.

The following information shall be shown as a minimum:

- All utilities in detail on the typical sections. Include depth, trench dimensions, number and size of conduits.
- Complete utility layout. Include line location, road crossings, utility boxes, manholes, service connections, clean outs, vaults, poles, guy wires, fire hydrants, traffic loops and bollards.
- The typical utility section shall be in accordance with SD 07.

The project proponent shall obtain the signature of all affected utilities approving the improvement plans for construction prior to the City approving the plans.

### **Section 6.02 Utility Line Completion**

The City adopts by this reference, the latest version of the South Tahoe Public Utility District (STPUD) water and sewer standards. Where a conflict exists between the City Public Improvement and Engineering Standards and STPUD standards, the City's Standards shall prevail.

All water lines shall be pressure tested prior to backfilling and paving restorations. All sewer lines shall be inspected and televised prior to backfilling and paving or completing trench restoration. All water and sewer pipe and lateral testing shall be in conformance with STPUD testing standards.

Written approval of accepted test results shall be provided to the City before acceptance of the project improvements.

All manhole lids shall be set 1/4" below finish pavement grade. When set in aggregate base shoulders, the manhole cover shall be set 3" below the finish grade.

Sanitary sewer shall be located 6 feet from the road centerline, in the middle of the travel lane. Storm drains shall be located along the road centerlines. Water lines shall be located six feet from the road centerline in the center of the travel lane. All other utilities shall be located outside the edge of pavement in the road shoulder or within a utility easement. (See SD 07).

### **Section 6.03 Encroachment Permits**

"Blanket" annual encroachment permits may be issued by the City on a case-by-case basis. Utility companies that are approved for a "blanket" encroachment permit shall make an annual request to the City for such permits. "Blanket" permits will cover all work in the City right-of-way. Permits for each project need not be obtained for all work done in the City right-of-way if a "blanket" permit is obtained. "Blanket" permit holders will still be charged per project.

Encroachment permits will be issued for projects including trenches less than 250 feet in length. Projects with trenches exceeding 250 feet in length will be required to submit improvement plans that detail the extent of work within the City public rights-of-way. The plans shall be prepared in conformance with the City of South Lake Tahoe Public Improvement and Engineering Standards, associated standard details, and standard specifications. The purpose of the utility plans submitted to the City for encroachment permits is to confirm the work affecting the City's public rights-of-ways will be in conformance with the adopted City construction standards.

Encroachment permits will be required for all work done within the City right-of-way and on roads that have been offered to the City for dedication.

## **Applications for encroachment permits shall contain the following:**

### General

The plans shall clearly show the beginning and end of work by station and coordinates. The plans shall show a north arrow, land owner name(s), property boundaries, limits of work, existing utilities, edge of existing pavement, cut/fill slope limits, right-of-way limits, traffic signs, limits of clearing and grubbing, existing and new drainage features, existing creeks, details shown and referenced, fences, retaining walls, and connection details shown at beginning and end of project.

### Erosion and Pollution Control

The plans shall provide for erosion control and for the prevention of pollution during and after construction in accordance with Federal and State Laws, City Ordinances and this document. All temporary and permanent erosion control measures and vegetation restoration methods for disturbed areas shall be shown on the plans. All major construction projects (as determined by the City Engineer) shall submit and acquire approval, a *Storm Water Pollution Prevention Plan* regardless of whether the total area of disturbance is less than an acre. A NPDES Storm Water Discharge Permit will be required for all projects of one acre or greater in disturbed ground surface.

Copies of any required TRPA and Lahontan permits shall be submitted with the plans.

### Signing/Striping and Traffic Control

When applicable, a separate roadway signing and striping plan shall be prepared showing all existing and proposed striping and how the proposed signing and striping will conform to the existing condition. (Refer to the MUTCD.)

When proposed striping within a roadway must conform to existing pavement striping, the striping plan shall show existing striping a minimum of 200 feet past the conform point. If an existing turn lane or other change in striping occurs within 300 feet of the conform point, the existing striping shall be shown a minimum of 350 feet beyond the conform point.

A traffic control plan, including detour roads, shall be included as part of the plans when work is proposed within an existing City right-of-way and where a traffic control plan is required by the City Engineer.

### Orientation and Stationing

Insofar as practical, the plans shall be so arranged that north shall be at the top and right or at the right edge of the sheet. The stationing on plan and profile shall be from west to east or south to north. The beginning and ending stations shall be shown for all street and utility centerlines.

All project improvements shall be located on the plans via station and offset from the project centerline where possible or, by northings and eastings based on a common basis of bearing if approved by the Engineer.

### Typical Sections

A typical section shall be shown for each type of proposed modification within the right-of-way. Label the typical sections with stationing. Existing and proposed utilities shall be shown. Show structural section and details including number of lifts required for asphalt placement.

### Existing Features

All pertinent features that may affect the design and construction shall be shown on the plans including but not limited to: street lines, curbs, sidewalks, signs, signal poles, signal loops, light poles, vaults, boxes, bollards, shoulders, location and size of storm drains, sanitary sewers, water, gas, telephone, cable TV, fences, houses, trees, drainage ditches, utility poles, guy wires, and fire hydrants.

### **Section 6.04 Fire Hydrants**

Fire hydrants, utility structures and associated bollards shall be constructed and located in accordance with the specifications of the City Fire Department and local water district and the following criteria:

- A. Bollards, hydrants and other obstructions shall be installed a minimum of six feet, from the edge of pavement to face of obstruction, and two feet minimum from the back of curb or sidewalk to face of obstruction.

Fire hydrants shall not be located within 50 feet of the centerline of road intersections unless specifically approved by the City Engineer.

### **Section 6.05 Mail Boxes**

All mail boxes shall be placed in accordance with the rules and regulation of the United States Post Office Department, but no box shall be placed within the road right-of-way. The location and installation of mail boxes shall be in accordance with the City's *Snow and Ice Removal Plan*.

### **Section 6.06 Plan Review**

Prior to issuance of a permit to work within the right-of-way, including boring operations, all utility companies in the vicinity of the project shall be notified by the project applicant, and given the project plans for their review.

## **SECTION 7**

## **SURVEY MONUMENTS**

### **Section 7.1 Monuments**

Survey monuments shall be set in accordance with the following:

#### **A. Materials and Workmanship**

1. Materials and workmanship shall conform to the requirements of the California Land Surveyors' Act and local standards and regulations. Section and quarter section corners shall be not less than two (2) inches inside diameter galvanized iron pipe 30 inches long. The pipe is to be capped and marked in accordance with the instructions in Chapter IV of the 1973 Manual of Instructions prepared by the Bureau of Land Management. Section or quarter corners that are being set in asphalt surfaced City maintained roads shall be placed in a monument box (see Standard Drawings 40 and 41).
2. Property corner and right-of-way monuments shall be galvanized iron pipes having an inside diameter of not less than  $\frac{3}{4}$  inch or  $\frac{5}{8}$  inch diameter reinforcing bars, either of which shall have a minimum length of 18 inches. When improvements are constructed with the back of sidewalk or curb near to or contiguous with the right-of-way line, a brass nail & survey tag or 1-inch brass disk shall be set in & flush w/ the improvement. All survey tags or brass disks shall be permanently marked with the Surveyor or Engineer registration number. In all cases, monuments shall be of sufficient length to ensure stability.
3. Monuments shall be driven vertically with their tops flush with the ground except within roadways where they shall be driven  $\frac{1}{4}$  inch below the traveled surface or recessed within monument boxes. In cultivated areas they shall be set at a proper depth for their protection.
4. Wooden stakes identifying the corner will be placed adjacent to the monument where practical. All set monuments shall be permanently marked with the Surveyor/Engineer's registration number.
5. Found monuments which are used to establish lines of the property being surveyed shall be rehabilitated to City standards when found in a perishable condition.
6. When required, monument boxes shall be comparable to the "G5" water box manufactured by Christy Concrete Products, fitted with a lid marked "Monument". All monument boxes must be capable of having a grade ring attached to accommodate pavement overlays.

#### **B. Monumenting Property Lines**

Monument the entire exterior boundary of the property and the corners of the lot or parcels being created. The maximum distance between monuments shall be

1000 feet. (For exceptions see Monumentation of Roads, Monumenting Easements, and Exceptions to Monumentation listed below.)

C. Ties to Existing Monuments

Find and show on the map of the survey (with ties) all existing monuments in the immediate area which either have or might have a significant bearing on the confirmation or establishment of the lines of the property being surveyed. Identify on the map the monuments used for the basis of the bearings for the survey.

D. Monumenting Roads (Public & Private)

1. Parcel Maps

- a. Private and Public Roads - Monument right-of-way lines at property line intersections with the centerline or right-of-way line, and road intersections.

E. Major Subdivisions

1. Public & Private Roads - Monument the right-of-way line of all existing public highways fronting the subdivision boundaries. All intersections of centerlines shall be monumented with a monument set inside a monument box (see Standard Drawing 22 and 23). Monument the right-of-way line at property line intersection points. When improvements are constructed with the back of curb or walk near to or contiguous with the right-of-way line a chiseled mark may be made in the back the walk or on the top of the curb on the extension of the side lot line produced. The centerline of off-site dedications shall be monumented to the above standard. An additional monument and monument box shall be set as directed by the City Surveyor within sight distance of another monument box to provide for facile retracement of the centerline.

F. Monumenting Easements (Existing and Proposed)

1. Monument easement lines rather than the property lines in situations where the easement is adjacent and within the property and it would not be appropriate or practical to set the monument on the property line because of flowing water, erosion, proposed construction, etc.
  - a. Monument the proposed property lines in situations where land is to be purchased or dedicated in fee for public use.
  - b. Monuments on easement lines other than those described in and above are not required unless they are needed to determine the setbacks for buildings or other permanent improvements.

G. Exceptions to Monumenting Policy



- C. Natural features, including vegetation, terrain, and watercourses shall be preserved wherever possible. Limits of grading shall be clearly defined and marked to prevent damage by construction equipment.
- D. Permanent vegetation and structures for erosion and sediment control shall be installed as soon as possible.
- E. Adequate provisions shall be made for long term maintenance of permanent erosion and sediment control structures and vegetation.
- F. No soil shall be removed from the site unless otherwise directed or approved by the City Engineer. Topsoil overburden shall be stockpiled and redistributed where appropriate within the graded area after rough grading to provide a suitable base for seeding and planting. Runoff from stockpiled areas shall be controlled to prevent erosion and sedimentation of receiving water. Landscape areas may require additional soil preparation.
- G. Site runoff shall not be discharged from the site in quantities or at velocities substantially above those which occurred before construction except into drainage facilities that have been designed to accommodate such flows.
- I. Project proponent shall take reasonable precautions to ensure that vehicles do not track or spill earth materials from the construction site into public streets and shall immediately remove such materials if this occurs.
- J. All disturbed areas shall be restored with vegetation.

Runoff Treatment:

- A. Runoff from impervious surfaces shall be collected, treated and contained on-site utilizing infiltration facilities based upon the 20-year, one-hour event as outlined by Lahontan.
- B. Surface and subsurface runoff shall not drain across sidewalks.
- C. Runoff from snow storage shall be collected, treated and contained onsite.
- D. Runoff into wetlands or Stream environment zones shall not be increased or decreased above or below the pre-project levels unless approved by the appropriate review authority.

**Section 8.02 Erosion Control Measures**

Erosion control measures shall be consistent with the Regional Water Quality Control Board's Basin Plan and the TRPA Code of Ordinances.

A. Temporary Measures

Temporary erosion control measures are required and shall be installed prior to the start of construction on all projects.

1. All non-construction areas shall be clearly marked and protected during construction by fencing or other identification approved by the City Engineer.
2. The protection of loose piles of debris, sand, silt, soil or other earthen material during periods of precipitation, wind or runoff shall be covered with

non woven filter fabric, or plastic sheets and shall be weighted down with gravel bags or equivalent. Particulates shall not be allowed to blow off of the site during construction operations.

3. All soil disturbance activities shall cease if adverse weather conditions exist unless otherwise specifically approved by the City Engineer.
4. Supplemental, temporary erosion control measures shall be kept onsite and be available for use at all times.

#### B. Permanent Erosion Control Measures

1. All surplus earthen materials shall be removed from the site and deposited in an approved location.
2. Earthen materials shall not be placed in surface water drainage courses, permanent or temporary, or in a location to allow the discharge of earthen materials to any surface water or drainage course.
3. All disturbed areas shall be permanently stabilized or vegetated using the TRPA approved native and/or adapted plants consistent with *Living with Fire Guide for the Homeowner*, Lake Tahoe Basin Edition. Vegetated areas shall be continuously maintained to ensure adequate growth and root development. Vegetation shall consist of seeding, planting mulching and initial fertilizing and watering as needed.
4. All permanent soil stabilizations shall be complete by October 15 of each year unless otherwise directed by the City Engineer.
5. All sediment ponds or detention basins shall be landscaped to the satisfaction of the City Engineer.

#### C. Maintenance

All required drainage and erosion control improvements shall be maintained for the life of the project including routine maintenance, repair and replacement of the improvements. Maintenance shall include:

1. Unclogging of basins, pipes, swales, and trenches of debris, ice, and sediment;
2. Repair of damaged basins, pipes, swales, and trenches;
3. Replacement of unhealthy damaged or non-productive vegetation; and
4. Re-stabilization of eroded areas.

### **Section 8.03 Emergency Conditions**

Should increased sediment discharge occur or become imminent, the project proponent shall take all necessary steps to control or reduce such discharge. Such steps may include construction of additional facilities or removal or alteration of facilities required by approved erosion and sediment control plans. Facilities removed or altered shall be restored as soon as possible after an event or appropriate changes in the plan shall be immediately requested pursuant to this Chapter. The Project proponent shall take prompt action to resolve emergency



### **Section 9.1 Stop Work Notices**

Whenever it comes to the attention of the City Engineer that any person is performing work in violation of the provisions of this document the City Engineer may serve upon such person a written notice citing such violations and directing that person performing the work to stop work immediately.

Upon receipt of such stop work notice, the person performing the work shall:

- A. Stop work immediately until authorized by the City Engineer.
- B. Within a 24-hour period provide the City Engineer with a list of remedies, which can be immediately undertaken to bring the work into compliance with this document and the plans and specifications.

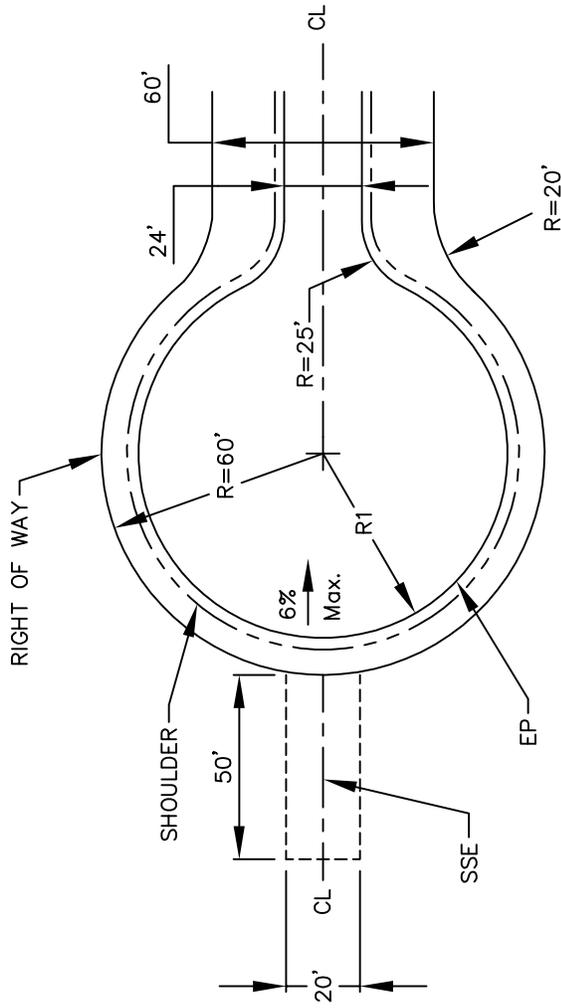
### **Section 9.2 Criminal Enforcement**

Any person violating a stop work notice may be found guilty of a misdemeanor or an infraction.

<b>DRAWING INDEX</b>	<b>DRAWING NUMBER</b>
Road Section-Typical	SD01
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Offset Cul-de-sac	SD03
Curb & Gutter, Vertical Battered & Rolled	SD04
Roadside AC Swale	SD05
V-Gutter & Barrier Curb	SD06
Utility Line Locations, New Construction	SD07
Sidewalk-Straight	SD08
Sidewalk-Meandering	SD09
Commercial Driveway	SD10
Commercial, Frontage Entrance	SD11
Driveway Approach-with Curb & Gutter	SD12
Commercial Driveway-Locations	SD13
Roadway Sight Distances	SD14
Residential Driveway, Sight Distances	SD15
Standard Road Intersection	SD16
Single Family Residential, Driveways with Curb & Gutter	SD17
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Stormdrain Manhole-24", Frame & Cover	SD43
Stormdrain Manhole-36", Frame & Cover	SD44
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Sediment Trap-Single, Type B	SD50
Sediment Trap-Single, Type C	SD51
Sediment Trap-Double	SD52
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Drain Inlet-36" CMP, Side Inlet	SD54
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Cover Requirements	SD64

<b>DRAWING INDEX</b>	<b>DRAWING NUMBER</b>
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Erosion Control, Inlet Protection	SD81
Erosion Control, Inlet Protection-Sag	SD82
Erosion Control, Inlet, Fiber Roll Protection	SD83
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Erosion Control-Fences, Peelercore Fence	SD90
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Erosion Control-Gates, Access Gate	SD95
Erosion Control-Tree Staking	SD96
Monuments	SD100
Survey Monument in Pavement	SD101
Construction Staking	SD102





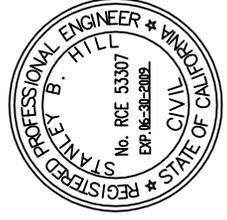
CUL-DE-SAC

SSE - SNOW STORAGE EASEMENT

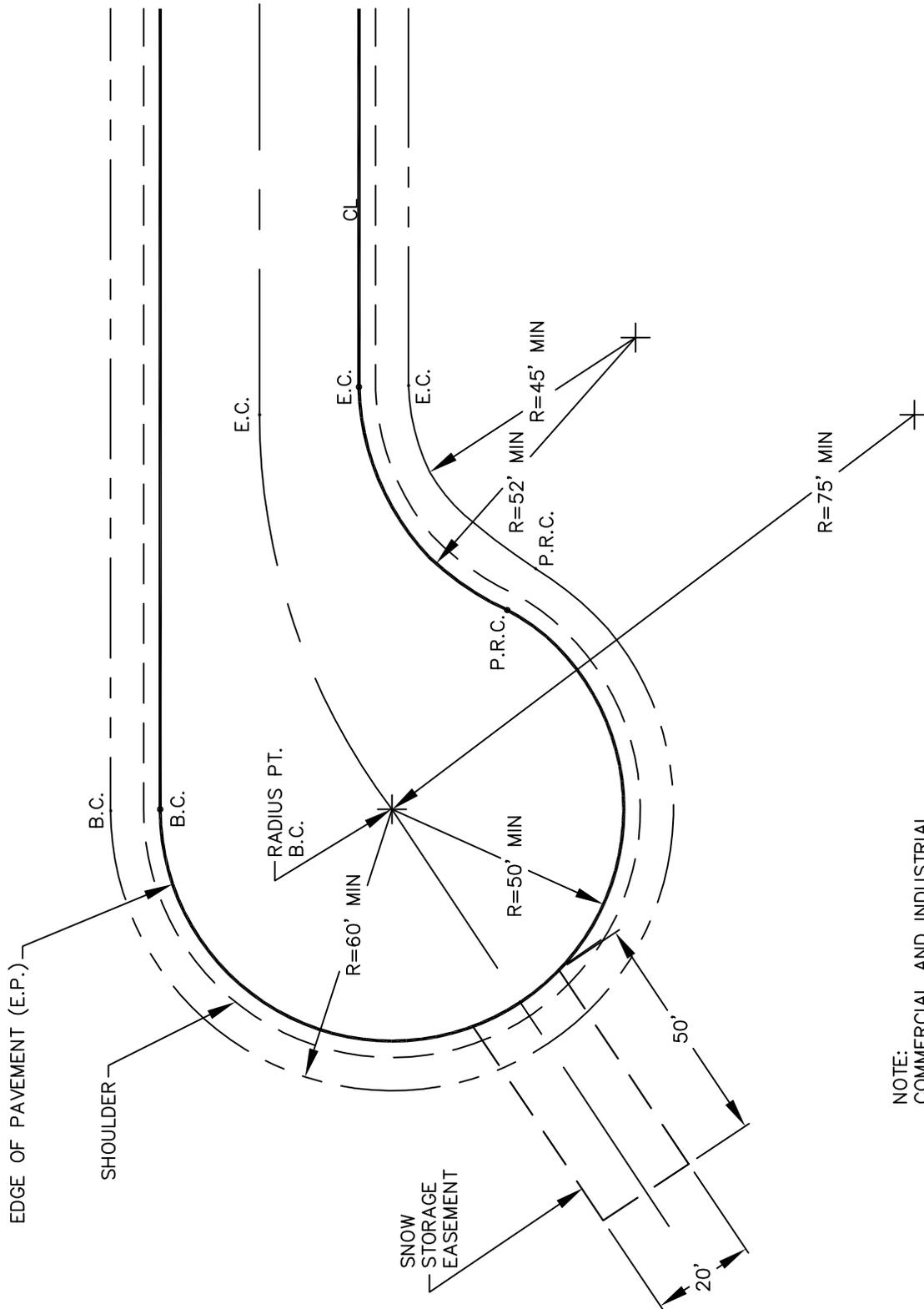
NOTE:  
 R1=40' IF ON STREET PARKING IS PROHIBITED OR ON PRIVATE ROADS. R1=50' WHEN ON STREET PARKING IS ALLOWED.



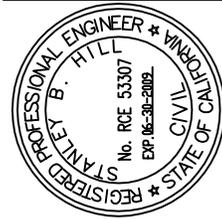
City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 CUL-DE-SAC



APPROVED BY:	CITY ENGINEER	STANDARD DRAWING
05/01/2009		SD02
	NOT TO SCALE	



NOTE:  
 COMMERCIAL AND INDUSTRIAL  
 APPLICATIONS WILL REQUIRE A SPECIAL  
 DESIGN APPROVED BY THE CITY ENGINEER.



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 OFFSET CUL-DE-SAC

APPROVED BY:

NOT TO SCALE

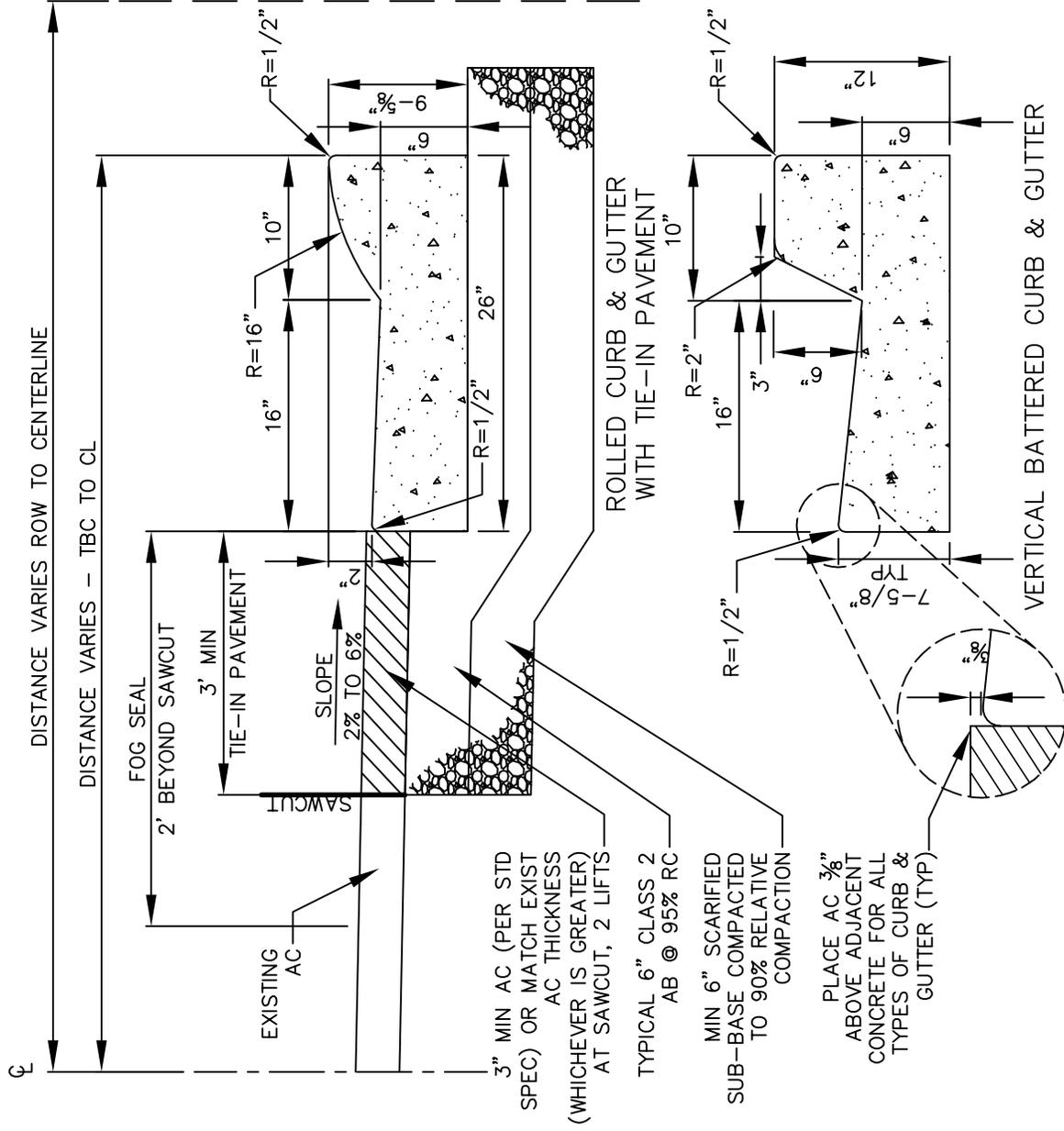
05/01/2009

CITY ENGINEER

STANDARD DRAWING

SD03

1. CONCRETE SHALL BE 7 SACK MIX AND SHALL CONFORM TO SECTION 90 OF THE CALTRANS STANDARD SPECIFICATIONS WITH 6% AIR ENTRAINMENT. CEMENT CONTENT SHALL NOT BE LESS THAN 658 LBS PER CY.
2. THE MATERIALS AND METHOD OF PLACING SHALL CONFORM TO SECTION 73 OF THE CALTRANS STANDARD SPECIFICATIONS.
3. CONCRETE SHALL HAVE A LIGHT BROOM FINISH RUNNING PARALLEL WITH THE FLOWLINE.
4. CONCRETE SHALL BE SPRAYED UNIFORMLY WITH A CLEAR PIGMENTED CURING COMPOUND IMMEDIATELY FOLLOWING BROOM FINISHING. THE MATERIAL, METHOD, AND RATE OF APPLICATION SHALL CONFORM TO SECTION 90-701B OF THE CALTRANS STANDARD SPECIFICATIONS.
5. ALL BASE MATERIAL SHALL BE COMPACTED AND TESTED BY THE CITY OR BY A THIRD PARTY INSPECTOR AT THE CITY'S DISCRETION PRIOR TO CONCRETE POUR. NOTIFY THE CITY AT LEAST 24 HRS PRIOR TO POUR.
6. CONTRACTOR SHALL CONTACT INSPECTOR FOR SCHEDULING CURB STRINGLINE INSPECTION AT LEAST 24 HRS PRIOR TO CONCRETE POUR.
7. ALL FLOWLINES SHALL BE WATER TESTED BEFORE ACCEPTANCE FOR PAYMENT. CONTRACTOR SHALL CONTACT INSPECTOR TO SCHEDULE WATER TESTING.
8. LOCATE 2" DEEP TRANSVERSE SCORES AT 10' INTERVALS IN CURB AND GUTTERS. INSTALL EXPANSION JOINTS AT 30' INTERVALS AND AT ALL COLD JOINTS.
9. NO WASHOUT OF TRUCKS AND/OR EQUIPMENT WILL BE ALLOWED ON SITE UNLESS A BASIN IS PROVIDED AND APPROVED BY THE INSPECTOR.
10. CONTRACTOR MUST TRENCH PLATE ALL DRIVEWAYS FOR 72 HOURS AFTER CONCRETE POUR.
11. CITY HAS THE RIGHT TO REJECT CURB FOR NON-COMFORMANCE AND/OR POST CONSTRUCTION DAMAGE.
12. CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY BMPs, AC CUTS AND REPLACEMENT, REVEGETATION AND ALL OTHER INCIDENTALS ASSOCIATED WITH CURB INSTALLATION.



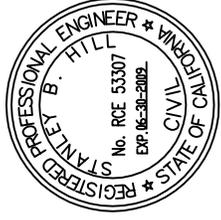


City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
CURB & GUTTER  
VERTICAL BATTERED & ROLLED

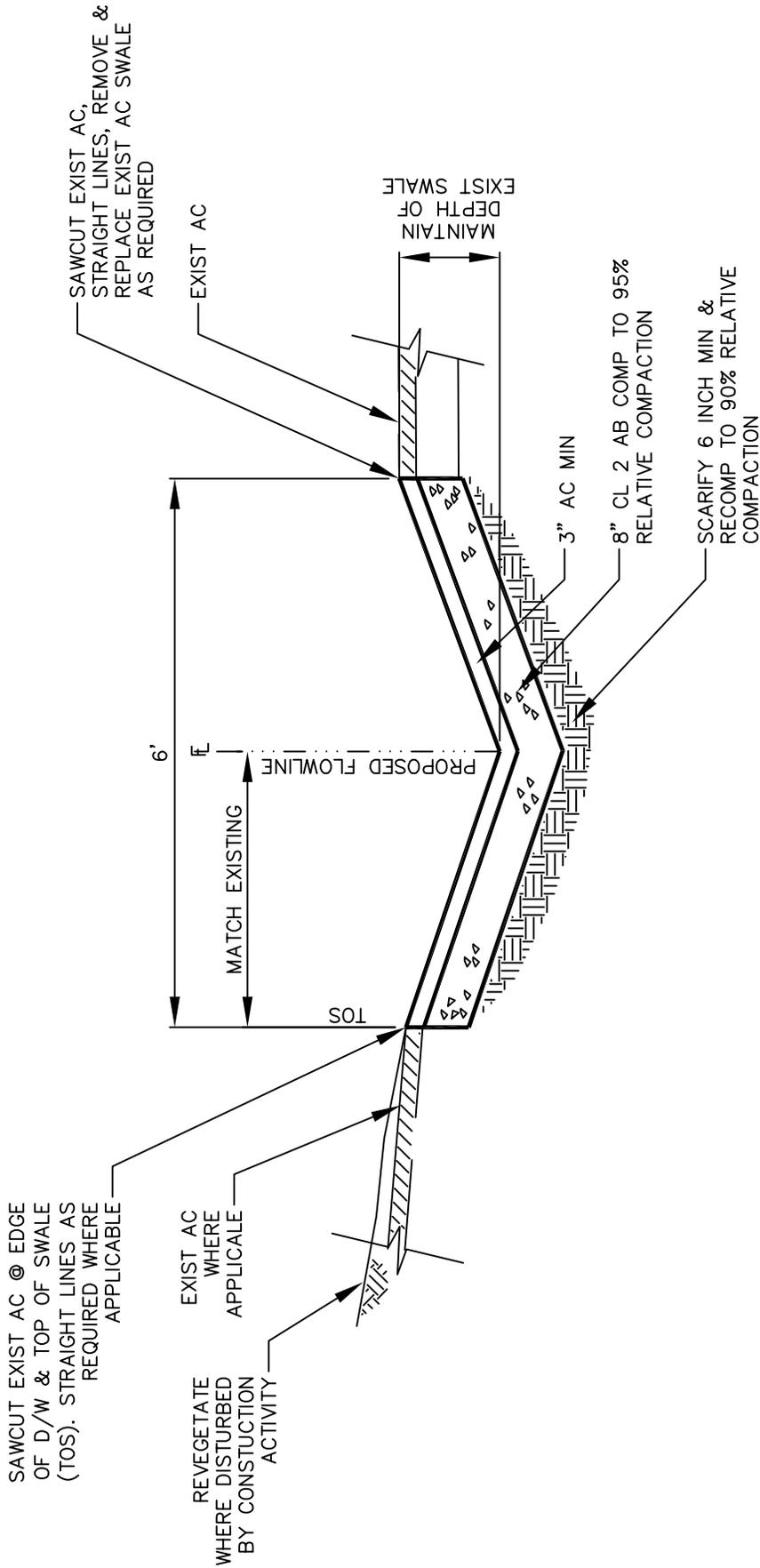
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CITY ENGINEER

NOT TO SCALE

STANDARD DRAWING  
SD04



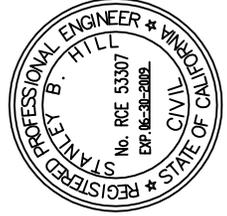
REGISTERED PROFESSIONAL ENGINEER  
STANLEY B. HILL  
No. RCE 53307  
Exp. 06-30-2009  
CIVIL  
STATE OF CALIFORNIA



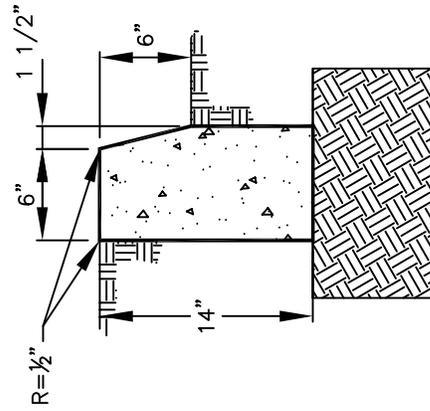
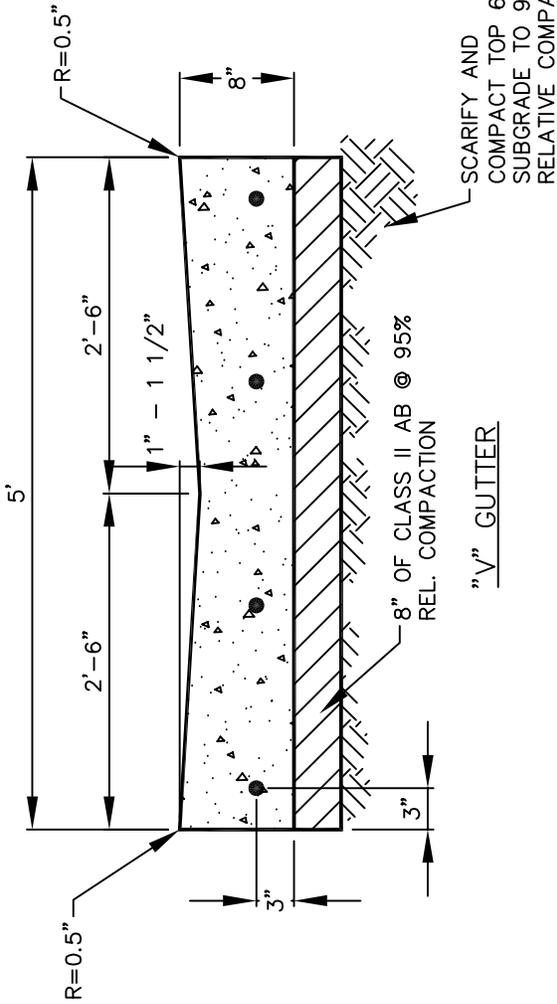
TYPICAL SECTION



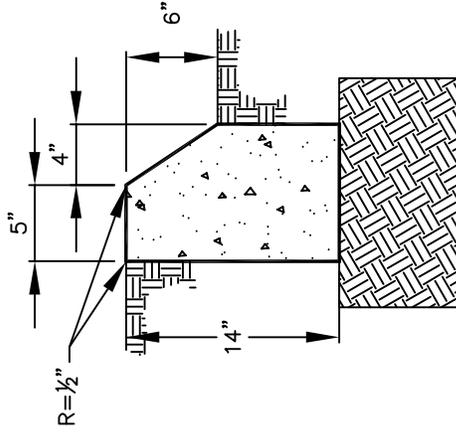
City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 ROADSIDE AC SWALE



APPROVED BY: CITY ENGINEER  
 05/01/2009  
 NOT TO SCALE  
 STANDARD DRAWING SD05



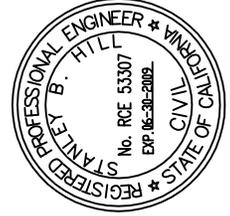
TYPE A1-6  
BARRIER CURB FOR  
COMMERCIAL  
FRONTAGE



TYPE B1  
BARRIER CURB

NOTES:

1. STRUCTURAL THICKNESSES ARE MINIMUM. INCREASED SECTIONS MAY BE REQUIRED BASED ON ACTUAL SOIL CONDITIONS.
2. LOCATE 0.5 INCH THICK TRANSVERSE EXPANSION JOINTS OF APPROVED TYPE IN SIDEWALK, CURB, AND GUTTER AT 18 FOOT INTERVALS AT ALL CURB RETURNS, COLD JOINTS AND OTHER TRANSITION POINTS. WEAKENED PLANE JOINTS SHALL BE INSTALLED WITH A CONCRETE TOOL AT 6-FT INTERVALS, 1.5 INCHES DEEP. ALL EDGES OF JOINTS SHALL BE ROUNDED.
3. ALL CONCRETE TO BE CLASS "A" AND CEMENT CONTENT SHALL BE NO LESS THAN 658 LBS PER CUBIC FOOT.
4. V-GUTTER AND BARRIER CURBS NOT ALLOWED IN RIGHT-OF-WAY WITHOUT CITY ENGINEER APPROVAL.



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
V-GUTTER & BARRIER CURB

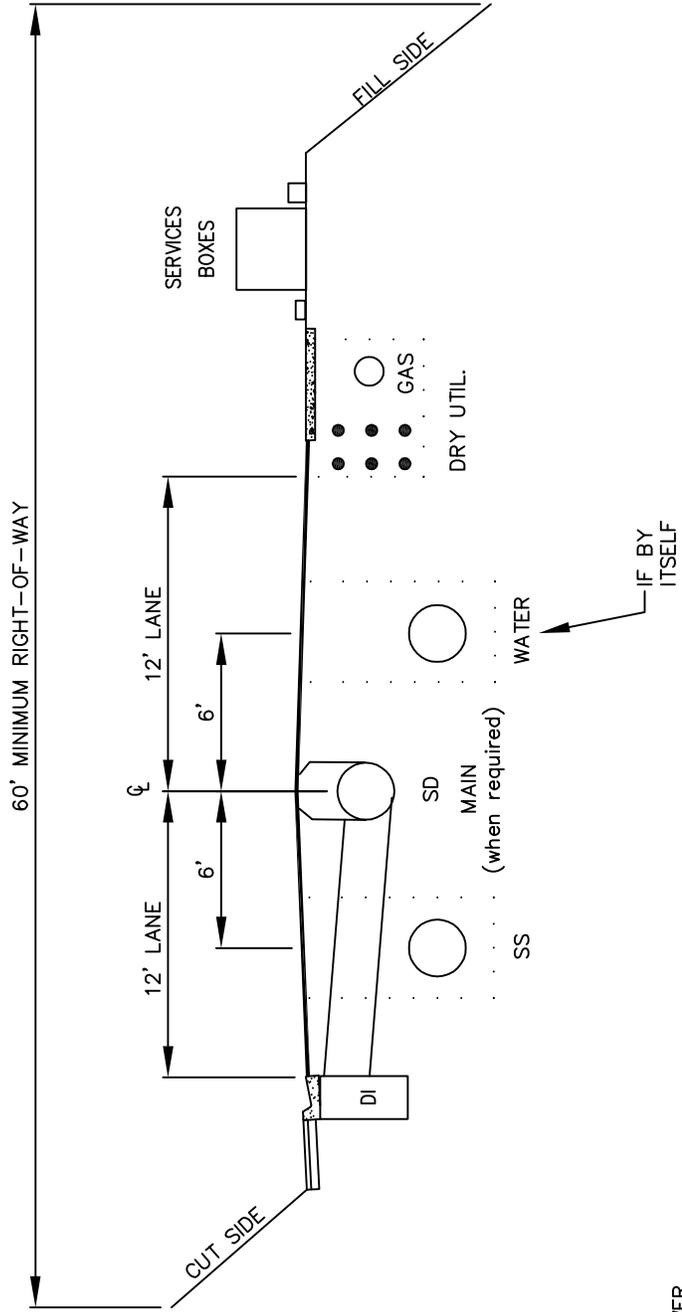
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NOT TO SCALE

STANDARD DRAWING  
SD06

05/01/2009

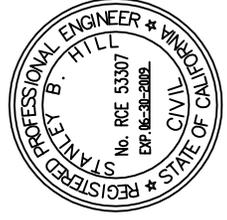
CITY ENGINEER



- SS - SANITARY SEWER
- SD - STORM DRAIN
- DI - DRAINAGE INLET

NOTES:

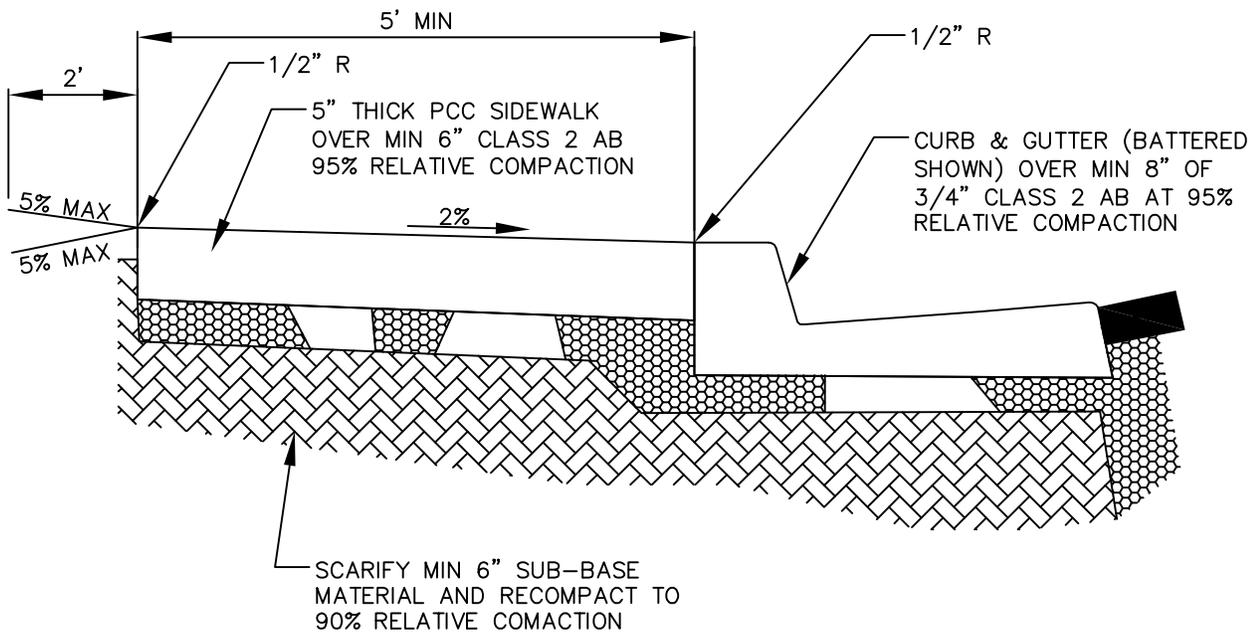
1. ALL UTILITY SERVICE LINES SHALL STUB OUT TO THE PROPERTY LINES.



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 UTILITY LINE LOCATIONS  
 NEW CONSTRUCTION

APPROVED BY:	NOT TO SCALE	STANDARD DRAWING
05/01/2009	CITY ENGINEER	SD07

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**NOTES:**

1. ALL WORK AND ALL MATERIALS SUPPLIED SHALL CONFORM TO THE STANDARD SPECIFICATIONS LATEST EDITION.
2. SIDEWALK AND CURB RAMPS SHALL BE A MINIMUM OF 4 INCHES THICK.
3. IN ALL AREAS WHERE ROLLED CURB TRANSITIONS TO VERTICAL CURB OR CATCH BASINS, SIDEWALK SHALL BE A MINIMUM OF 4 INCHES THICK.
4. ALL BROOMING SHALL BE PERPENDICULAR TO THE CURB.
5. 1/2-INCH THICK PRE-MOLDED JOINT FILLER SHALL BE INSTALLED IN EXPANSION JOINTS AT 18 FOOT INTERVALS.
6. CONTROL JOINTS SHALL BE 1.5 INCHES DEEP AND AT 6 FOOT INTERVALS.
7. ALL EXISTING STREET SIGNS SHALL BE RELOCATED AND ALL REQUIRED NEW SIGNS PLACED PER THE STANDARD SPECIFICATIONS.

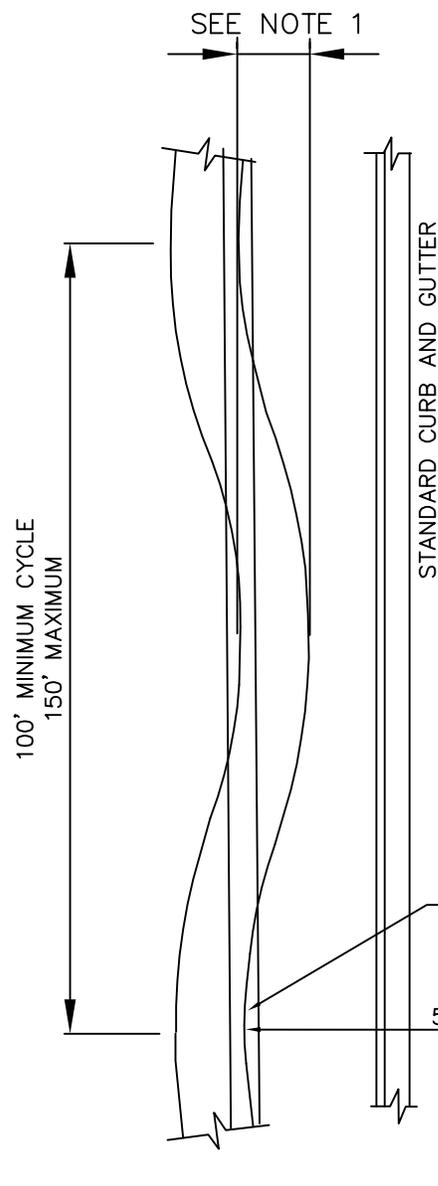
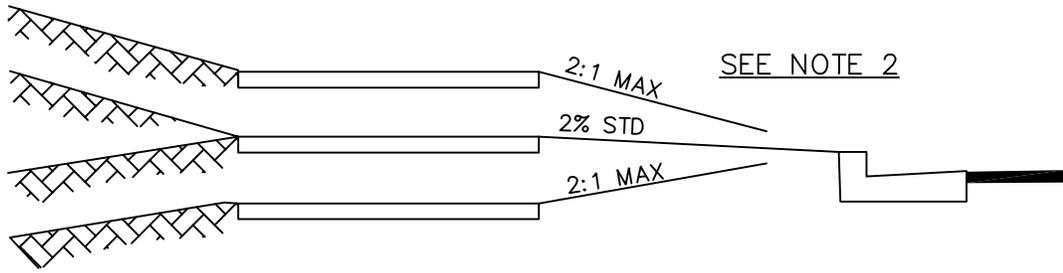


City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
SIDEWALK - STRAIGHT

APPROVED BY:  
05/01/09 CITY ENGINEER

NOT  
TO  
SCALE

STANDARD DRAWING  
SD08



**NOTES:**

1. MAXIMUM AND MINIMUM MEANDER DISTANCES SHALL BE AS SPECIFIED ON IMPROVEMENT PLANS. (TYPICAL MEANDER DISTANCE IS EQUAL TO SIDEWALK WIDTH).
2. THE SLOPE OF THE AREA BETWEEN CURB AND SIDEWALK SHALL BE 2% AT ALL DRIVEWAYS AND AT ALL CURB RETURNS. SLOPE MAY INCREASE TO A MAX OF 2:1 IN ALL OTHER AREAS. SEE SD19 FOR ADA COMPLIANT CURB RAMP DETAIL.
3. SIDEWALK WIDTH SHALL BE AS SHOWN ON IMPROVEMENT PLANS.

JOINT UTILITY TRENCH TO BE CENTERED AT MAXIMUM MEANDER DISTANCE FROM CURB.

50' PREFERRED INSIDE RADIUS

(25' MINIMUM)

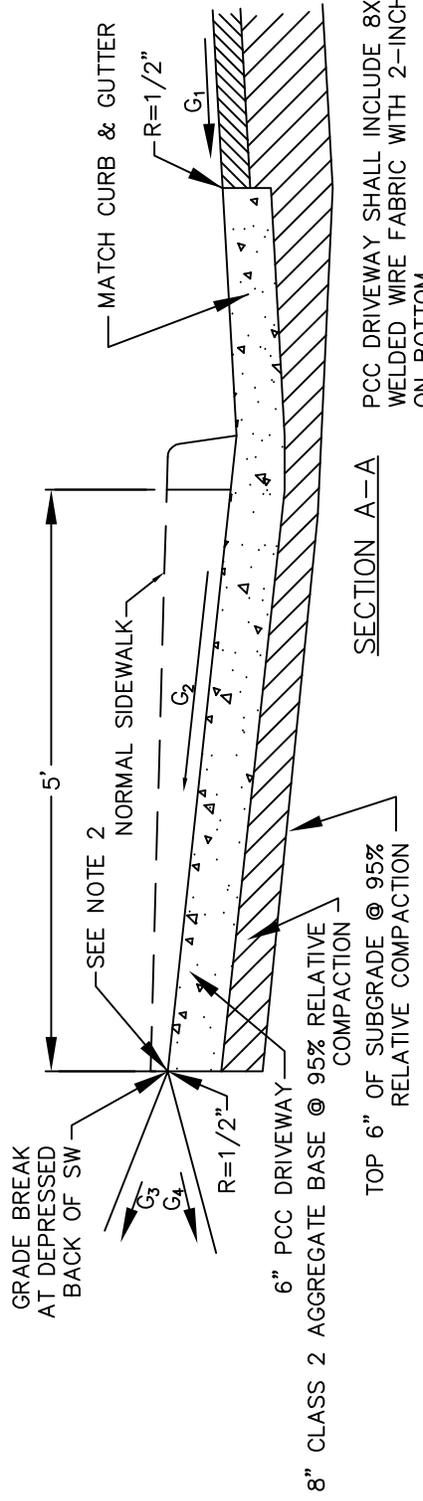


City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
SIDEWALK - MEANDERING

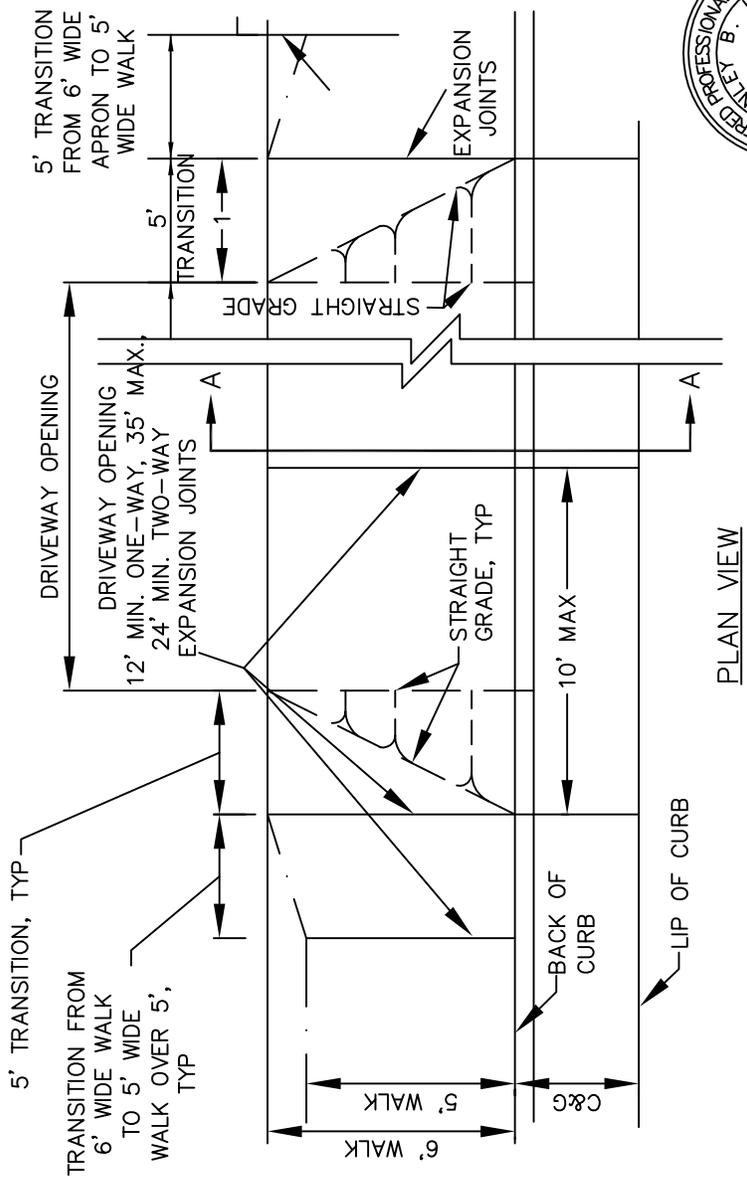
APPROVED BY:  
05/01/09 CITY ENGINEER

NOT TO SCALE

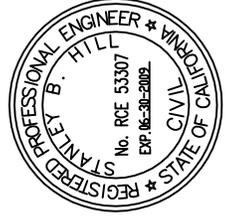
STANDARD DRAWING  
SD09



PCC DRIVEWAY SHALL INCLUDE 8X8X8 GAGE WELDED WIRE FABRIC WITH 2-INCH CLEARANCE ON BOTTOM



- NOTES:
- MAXIMUM GRADES FOR DRIVEWAYS SHALL BE AS FOLLOWS AND ARE BASED ON A -2% (G1) ROAD CROSS SLOPE:
    - G2= +2% MAXIMUM ON SIDEWALK
    - G3= AS DETERMINED BY A MAXIMUM 5% ALGEBRAIC GRADE DIFFERENCE FOR A GRADE BREAK OR GRADIENT OF A VERTICAL CURVE (L=30 FT. MIN., BEGINNING AT GRADE BREAK).
    - G4= AS DETERMINED BY A MAXIMUM 5% ALGEBRAIC GRADE DIFFERENCE FOR A GRADE BREAK OR GRADIENT OF A VERTICAL CURVE (L= 30 FT. MIN., BEGINNING AT GRADE BREAK).
  - BACK OF DRIVEWAY MAY BE DEPRESSED 0.25 FT MAX.



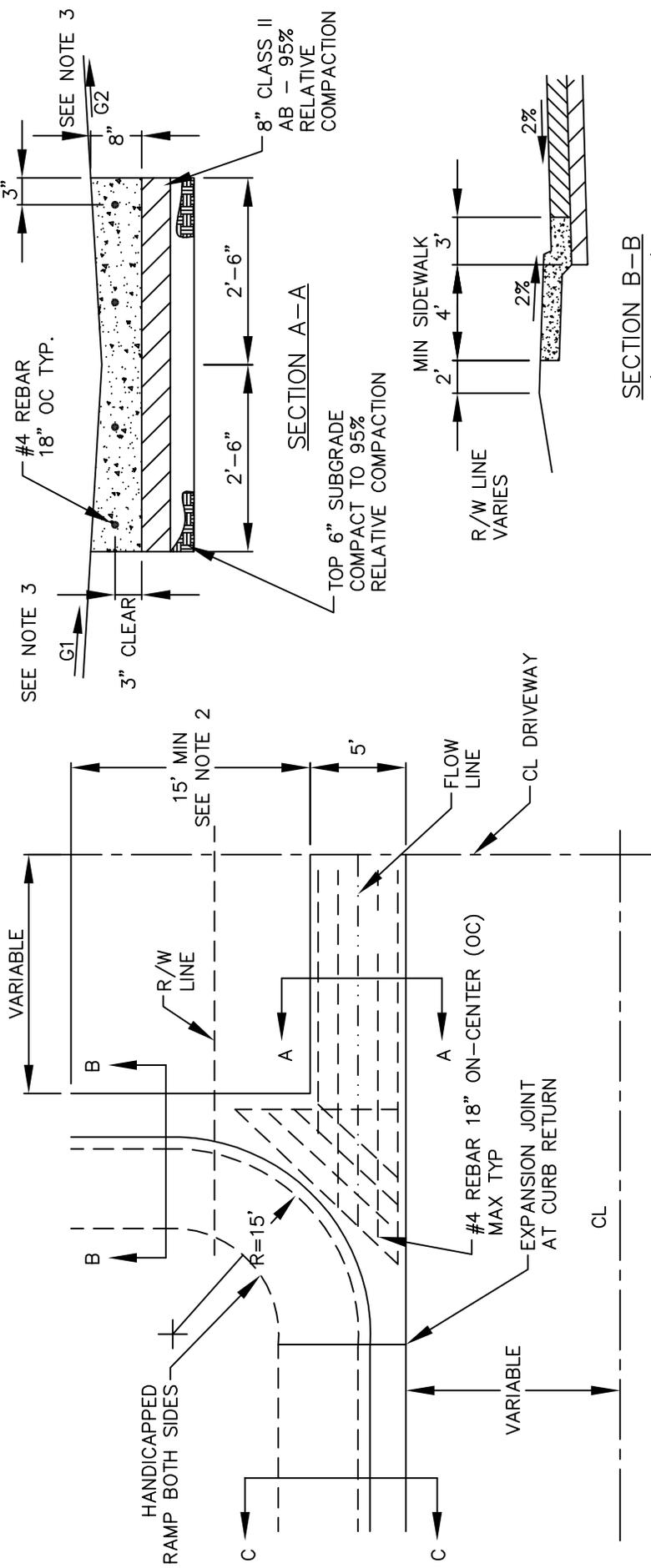
City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
COMMERCIAL DRIVEWAY

APPROVED BY: [Signature]

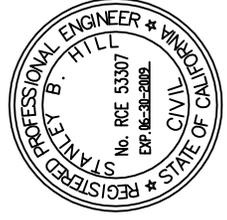
NOT TO SCALE

STANDARD DRAWING SD10

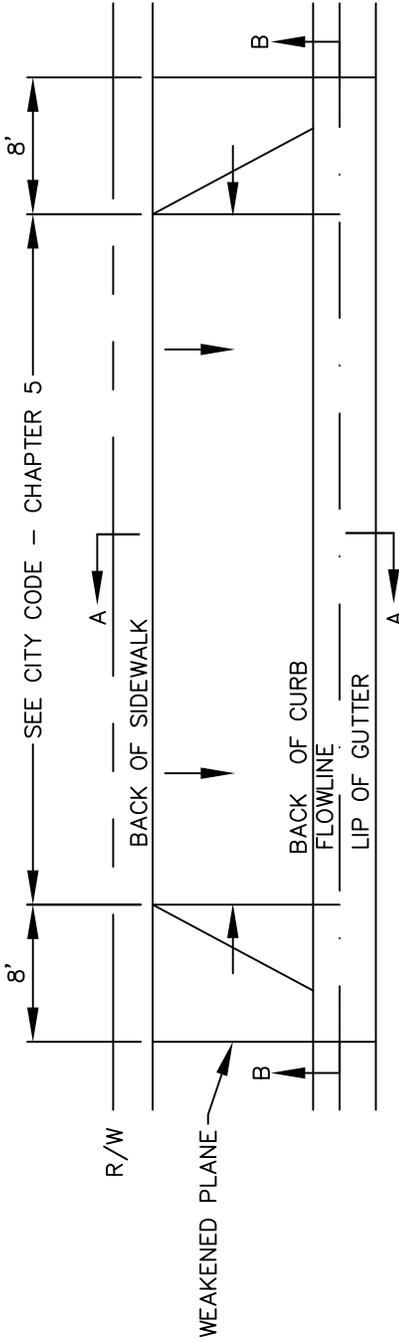
04/01/2009 CITY ENGINEER



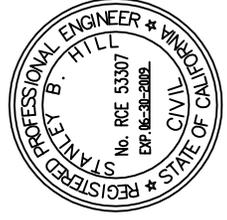
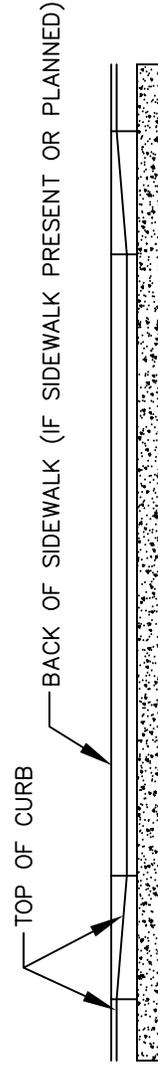
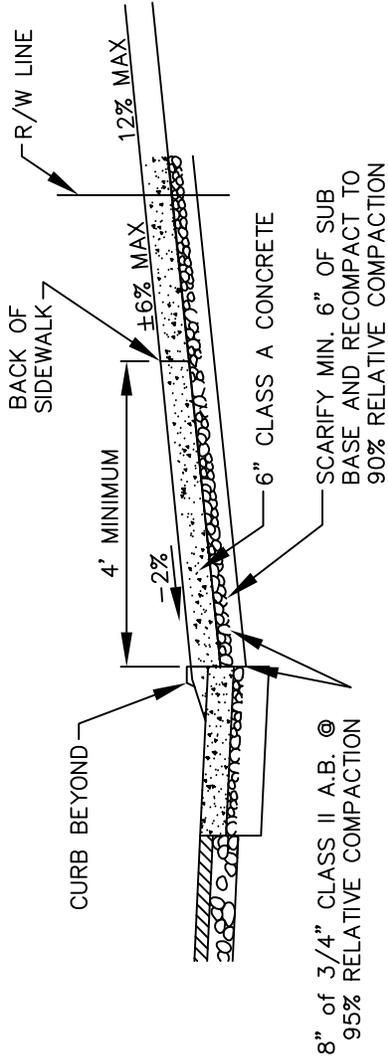
- NOTES:
1. THE CURB RETURN RADIUS MAY NEED TO BE LARGER DEPENDING ON THE DRIVEWAY WIDTH, ROAD WIDTH THAT THE DRIVEWAY ACCESSES FROM AND THE TYPE OF VEHICLE THAT WILL USE THE DRIVEWAY.
  2. MINIMUM LIMITS OF THE CURB, GUTTER AND SIDEWALK, FROM INSIDE LIP OF VALLEY GUTTER TOWARD THE SITE, SHALL BE EQUAL TO THE DESIGN RADIUS OF THE CURB RETURN.
  3. MAXIMUM ALGEBRAIC GRADE DIFFERENCE BETWEEN STREET CROSS SLOPE AND THE DRIVEWAY CENTERLINE GRADIENT SHALL BE 5%
  4. SEE APPLICABLE STANDARD DRAWING FOR CURB, GUTTER AND SIDEWALK SPECIFICATIONS.



City of South Lake Tahoe		APPROVED BY: NOT TO SCALE	STANDARD DRAWING SD11
ENGINEERING DEPARTMENT			
COMMERCIAL		CITY ENGINEER	
FRONTAGE ENTRANCE			



PLAN VIEW



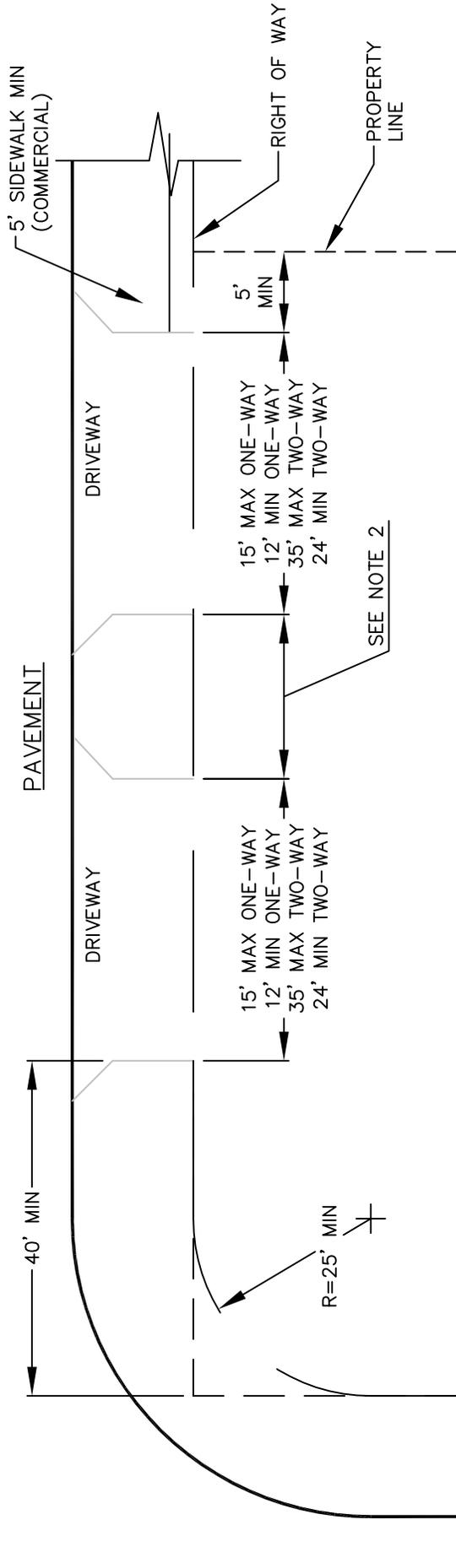
City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 DRIVEWAY APPROACH  
 WITH CURB & GUTTER

APPROVED BY: [Signature]

NOT TO SCALE

STANDARD DRAWING SD12

05/01/2009 CITY ENGINEER



PAVEMENT

DRIVEWAY

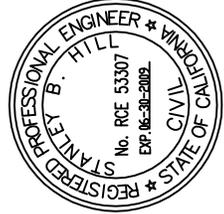
15' MAX ONE-WAY  
12' MIN ONE-WAY  
35' MAX TWO-WAY  
24' MIN TWO-WAY

5' MIN

PROPERTY LINE

NOTES:

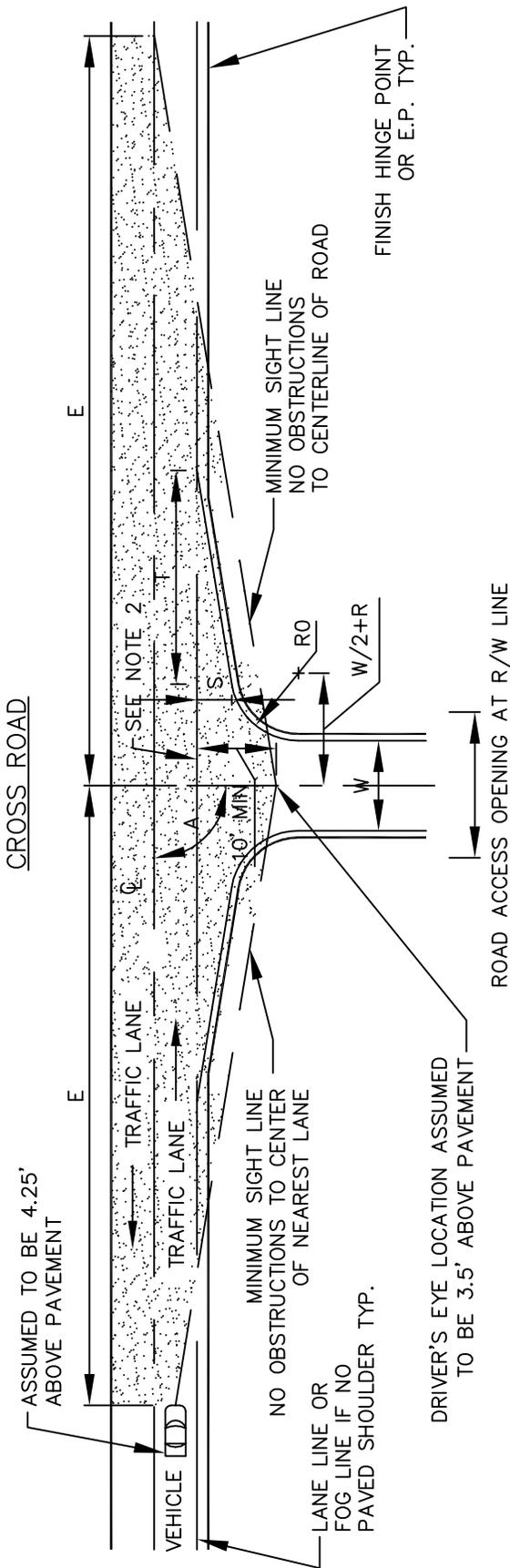
1. FRONTAGE MEASURED ALONG R/W LINE AND FROM THE INTERSECTION OF PROJECTED R/W TANGENTS ON LOT CORNERS. DRIVEWAYS NOT PERMITTED WITHIN 5 FEET OF PROPERTY LINES OR 40 FEET OF INTERSECTING R/W TANGENTS.
2. MINIMUM ALLOWABLE DISTANCE BETWEEN DRIVEWAYS IS 20 FEET.
3. SPECIAL CASES TO BE SUBMITTED FOR SPECIFIC APPROVAL.



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
COMMERCIAL DRIVEWAY  
LOCATIONS

APPROVED BY:	NOT TO SCALE	STANDARD DRAWING
05/01/2009	CITY ENGINEER	SD13

CROSS ROAD

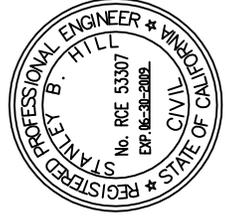


NOTES:

1. INTERSECTING R/W LINES AT ROADWAY CONNECTIONS SHALL BE JOINED BY A 25 FT. OR GREATER RADIUS CURVE TO ALLOW FOR ROADWAY IMPROVEMENTS.
2. SETBACK = 10 FT. MIN. FROM EDGE OF TRAVELED WAY. THIS ASSUMES 6 FT. TO STOP BAR, 1 FT. FOR STOP BAR, AND 8 FT. FROM THE FRONT OF BUMPER TO THE DRIVER. THIS SETBACK MAY BE REQUIRED TO BE INCREASED UP TO 30 FT. DUE TO INTERSECTION LAYOUT.
3. IN BOTH DIRECTIONS OF TRAVEL ALONG THE CROSSROAD, SIGHT DISTANCE (E) IS TO BE MEASURED ALONG THE CROSSROAD CL FOR TWO LANE CROSSROADS, AND ALONG THE CL OF THE NEAREST LANE TO THE ROAD FOR MULTI-LANE ROADS.
4. WHERE RESTRICTIVE CONDITIONS DO NOT ALLOW COMPLIANCE WITH THE SPECIFIED SIGHT DISTANCE REQUIREMENTS, THE ENGINEER MAY APPROVE A REDUCTION OF THE CORNER SIGHT DISTANCE TO THE MINIMUM STOPPING SIGHT DISTANCE AS OUTLINED IN THE CALTRANS HIGHWAY DESIGN MANUAL.

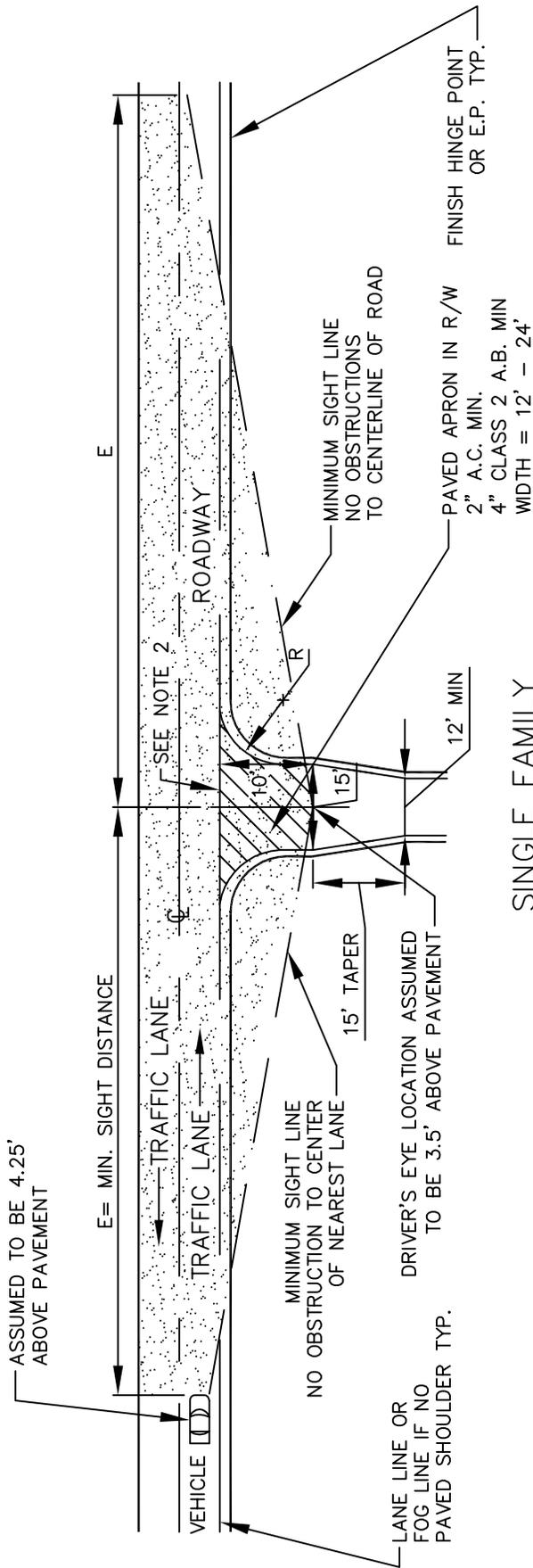
MAJOR CONNECTION	
MULTIPLE RESIDENTIAL DESIGN SPEED	
COMMERCIAL & OR PUBLIC	
SERVING 5 OR MORE LOTS (m.p.h.)	
A	25 30 35 40 45 50 55 60
E	275' 330' 385' 440' 495' 550' 605' 660'
S	8' 12' 12' 12' 12' 12' 12' 12'
R	25' 30' 35' 40' 45' 50' 50' 50'
T	50' 75' 100' 150' 200' 250' 250' 250'
W	CONFORM TO ROAD SECTION

MINOR CONNECTION	
RESIDENTIAL DESIGN SPEED	
SERVING LESS THAN 5 LOTS (m.p.h.)	
A	25 30 35 40 45 50 55 60
E	275' 330' 385' 440' 495' 550' 605' 660'
S	3' 3' 3' 4' 4' 4' 5' 5'
R	15' 15' 20' 20' 25' 25' 25' 25'
T	VARIABLE - 25 FT. MIN.
W	AS APPROVED



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 ROADWAY SIGHT DISTANCES

APPROVED BY: [Signature] NOT TO SCALE  
 STANDARD DRAWING SD14  
 05/01/2009 CITY ENGINEER

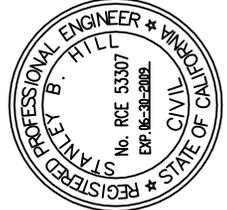


SINGLE FAMILY  
RESIDENTIAL DRIVEWAY

**NOTES:**

1. THIS IS TO ONLY BE USED WITH SINGLE RESIDENTIAL DRIVEWAYS CONNECTING TO ROADS WITH DESIGN SPEEDS OF 25 MPH OR LESS. SHARED RESIDENTIAL DRIVEWAYS, SINGLE RESIDENTIAL DRIVEWAYS CONNECTING TO ROADS WITH DESIGN SPEEDS ABOVE 25 MPH, AND ALL OTHER CONNECTING DRIVES AND ROADS SHALL BE DESIGNED TO MEET APPLICABLE REQUIREMENTS OF STD DRAWING #28. SETBACK = 10 FT. MIN FROM EDGE OF TRAVELED WAY OR EDGE OF R/W. THIS ASSUMES 6 FT. TO STOP BAR, 1 FT. FOR STOP BAR, AND 8 FT. FROM FRONT OF BUMPER TO THE DRIVER. THIS SETBACK MAY BE REQUIRED TO BE INCREASED UP TO 30 FT. DUE TO INTERSECTION LAYOUT. IN BOTH DIRECTIONS OF TRAVEL ALONG THE CROSSROAD, SIGHT DISTANCE (E) IS TO BE MEASURED ALONG THE CROSSROAD CL FOR TWO LANE CROSSROADS, AND ALONG THE CL OF THE NEAREST LANE TO THE ROAD FOR MULTI-LANE ROADS.
2. WHERE RESTRICTIVE CONDITIONS DO NOT ALLOW COMPLIANCE WITH THE SPECIFIED SIGHT DISTANCE REQUIREMENTS, THE ENGINEER MAY APPROVE A REDUCTION OF THE CORNER SIGHT DISTANCE TO THE MINIMUM STOPPING SIGHT DISTANCE AS OUTLINED IN THE CALTRANS HIGHWAY DESIGN MANUAL.
3. THE RETURN RADIUS (R) SHALL BE DESIGNED SUCH THAT EMERGENCY FIRE VEHICLE ACCESS IS PROVIDED FOR BOTH DIRECTIONS WITHOUT REQUIRING THE VEHICLE TO SWING INTO OPPOSING TRAFFIC LANES. THE MINIMUM RADIUS SHALL BE 3 FT.

SINGLE FAMILY RESIDENTIAL DRIVEWAY CONNECTING TO ROADS WITH DESIGN SPEED ≤ 25 MPH	
A	60' TO 120'
E	200 FT.
R	3-6 FT. - SEE NOTE 5.

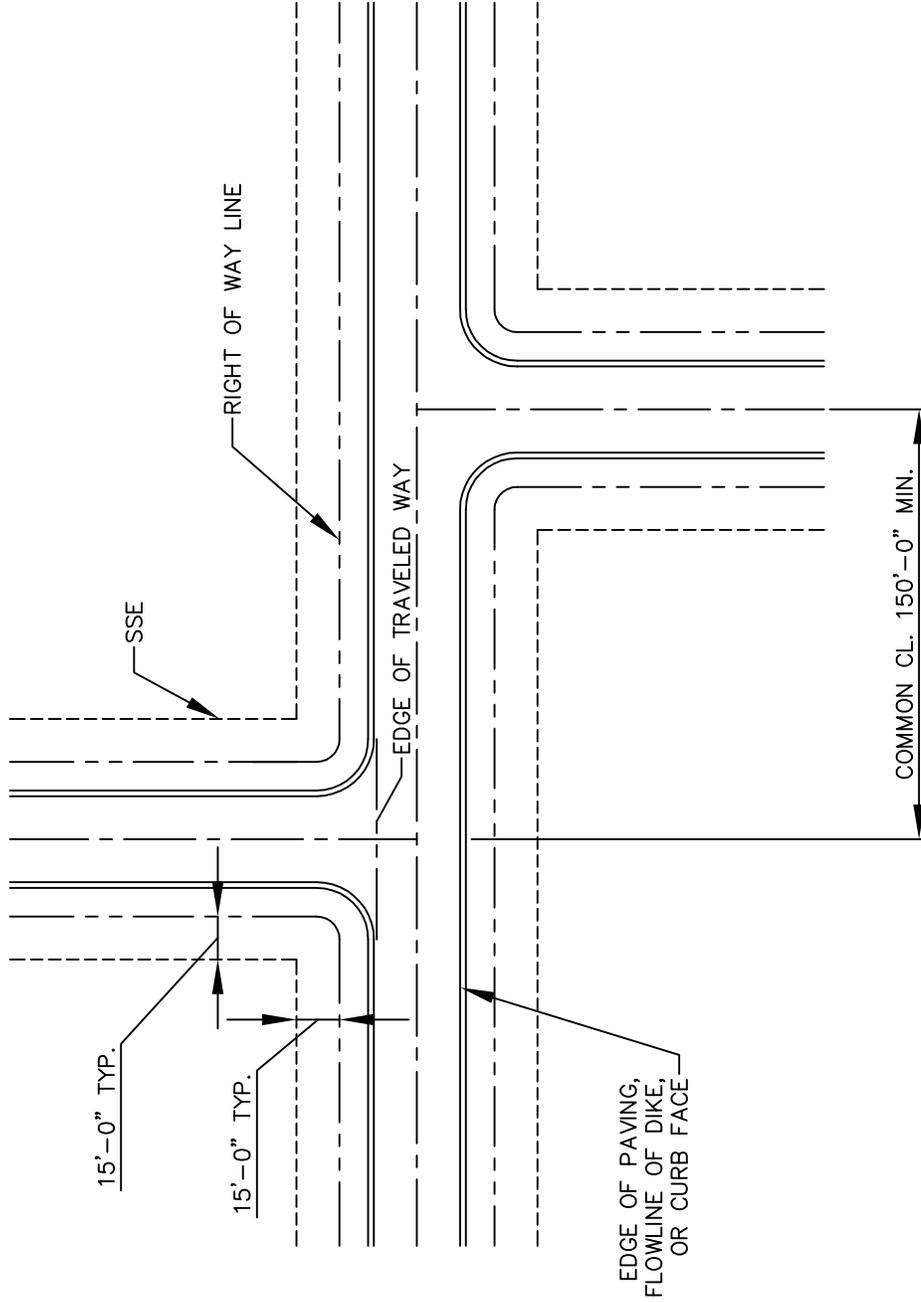




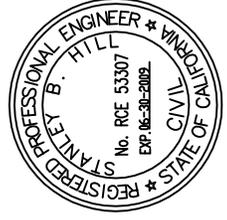
City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
RESIDENTIAL DRIVEWAY  
SIGHT DISTANCES

APPROVED BY:	NOT TO SCALE
05/01/2009	CITY ENGINEER
STANDARD DRAWING SD15	

NOTE:  
 A MINIMUM 15' WIDE SNOW STORAGE EASEMENT (SSE) IS  
 REQUIRED ALONG THE FRONT OF ALL ROADS OFFERED  
 FOR PUBLIC MAINTENANCE.

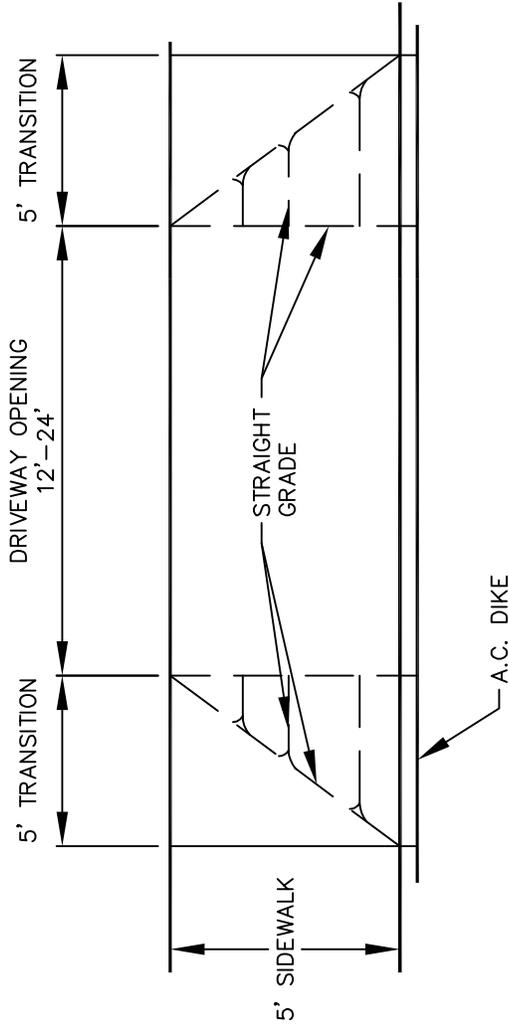


City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 STANDARD ROAD  
 INTERSECTION

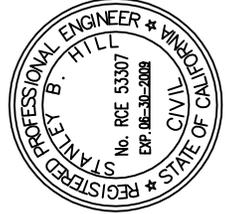
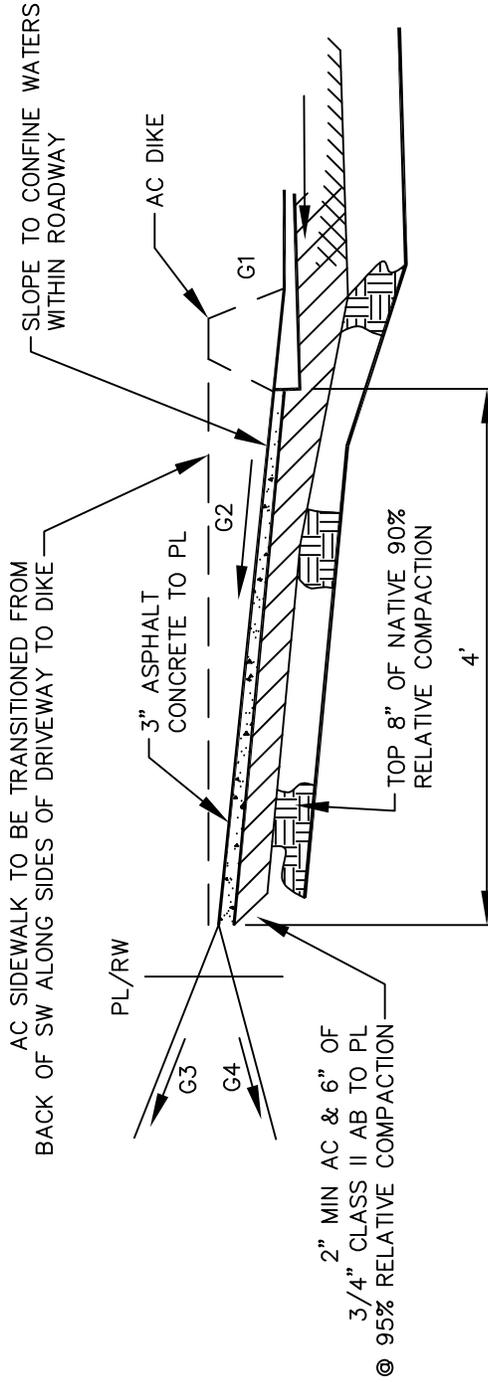


APPROVED BY: [Signature Line]  
 CITY ENGINEER  
 05/01/2009  
 NOT TO SCALE  
 STANDARD DRAWING SD16





NOTE:  
 MAXIMUM GRADES FOR DRIVEWAYS SHALL BE AS FOLLOWS AND ARE BASED ON A -2% (G1) ROAD CROSS SLOPE:  
 G2= +2% MAXIMUM ON SIDEWALK  
 G3= AS DETERMINED BY A MAXIMUM 8% ALGEBRAIC GRADE DIFFERENCE FOR A GRADE BREAK OR GRADIENT OF A VERTICAL CURVE.  
 G4= AS DETERMINED BY A MAXIMUM 8% ALGEBRAIC GRADE DIFFERENCE FOR A GRADE BREAK OR GRADIENT OF A VERTICAL CURVE.



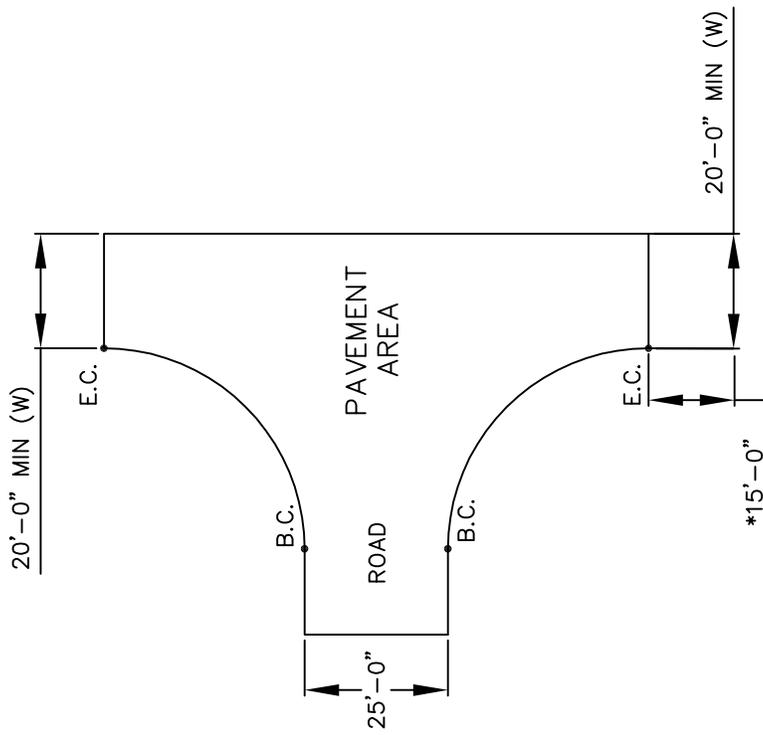
City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 RESIDENTIAL DRIVEWAY  
 WITH AC DIKE

APPROVED BY: [Signature]

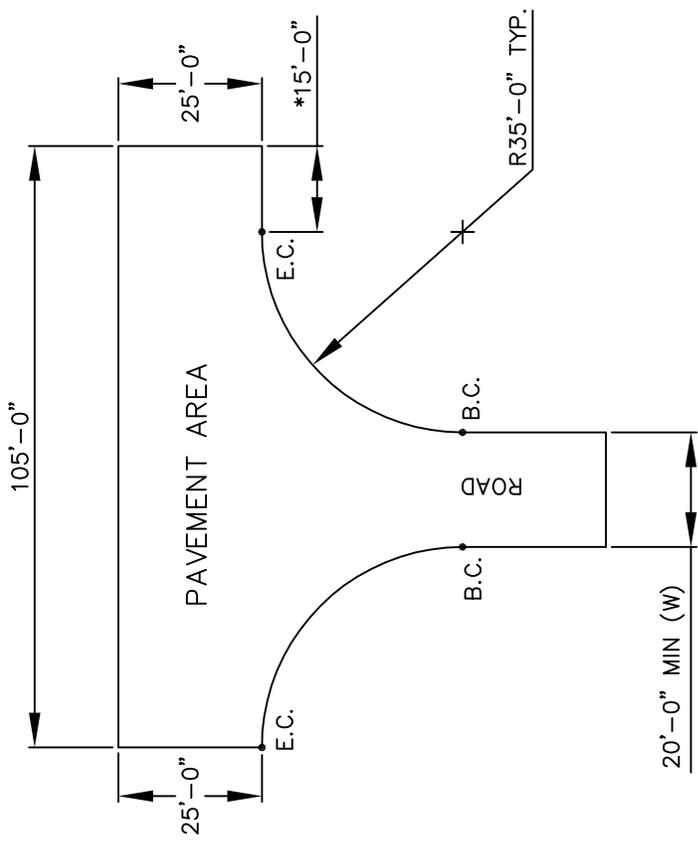
NOT TO SCALE

STANDARD DRAWING SD18

05/01/2009 CITY ENGINEER

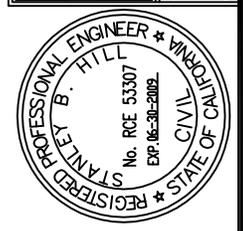


ORIENTATION 2



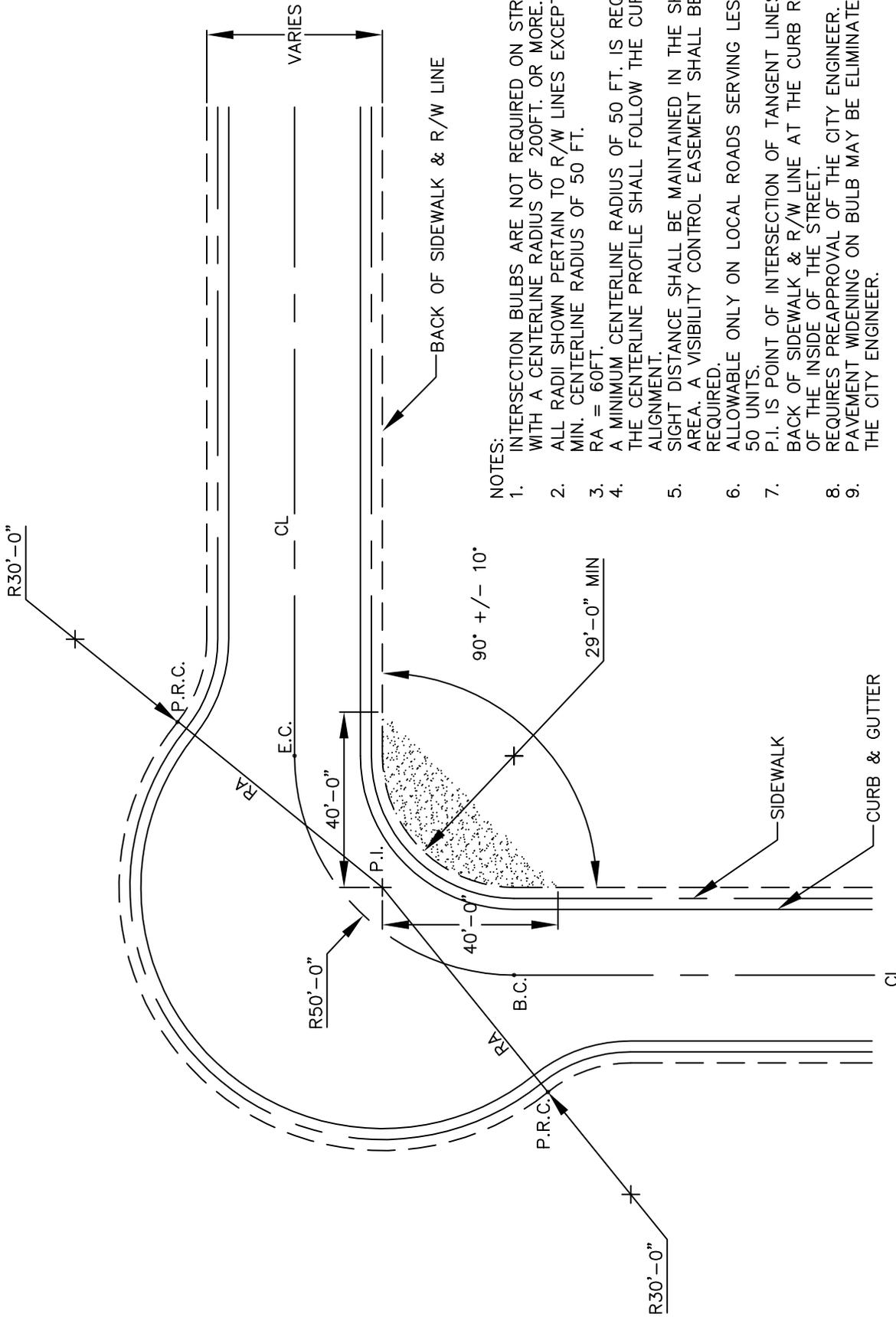
ORIENTATION 1

\* FOR ROADS WHERE WIDTH (W) IS GREATER THAN 20' THIS TANGENT LENGTH MAY BE REDUCED BY THE DIFFERENCE OF (W-20'). MAXIMUM REDUCTION IS 25'.



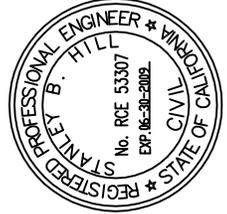
City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
ACCESS ROAD: HAMMERHEAD

APPROVED BY:	CITY ENGINEER	STANDARD DRAWING	SD19
05/01/2009		NOT TO SCALE	



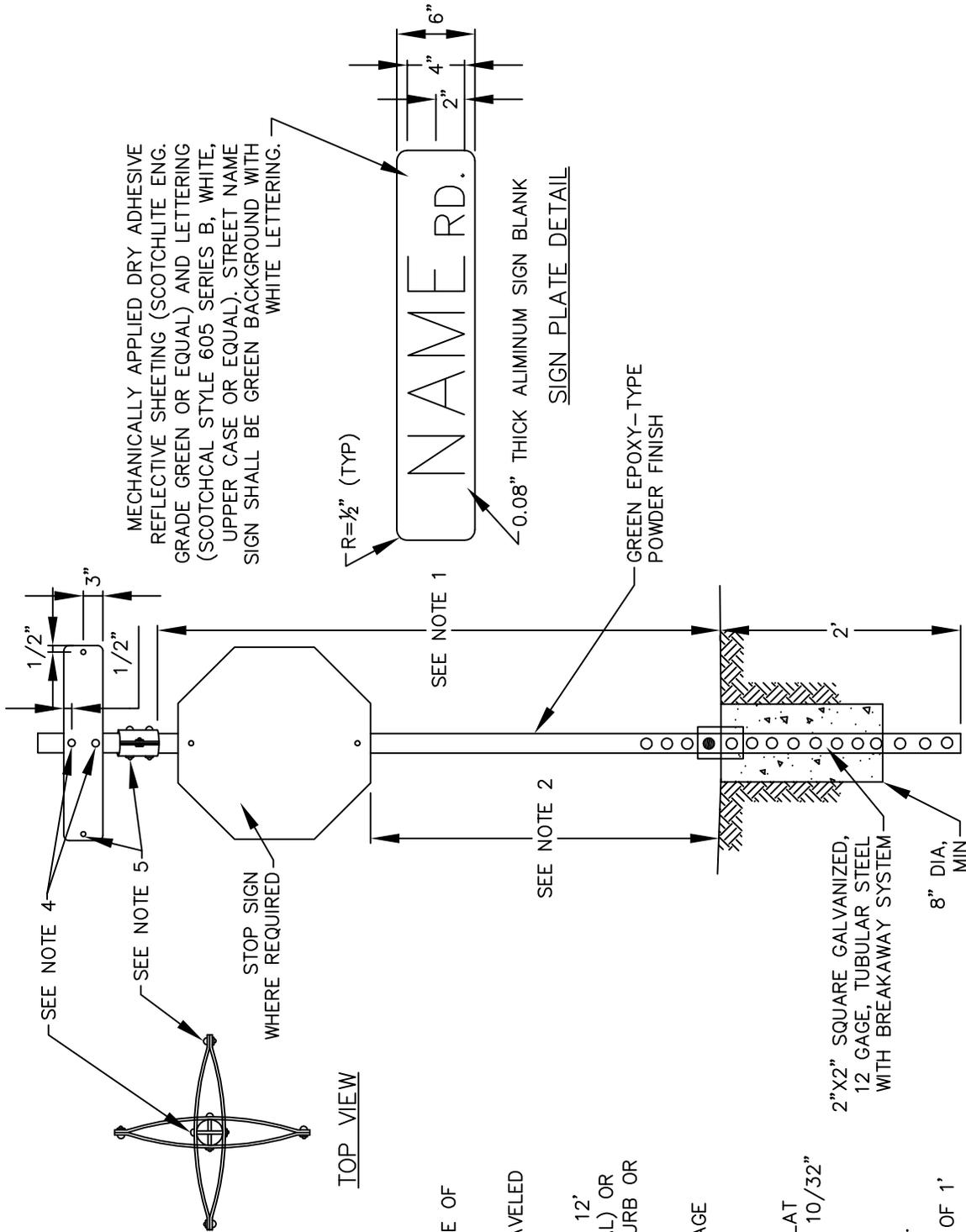
NOTES:

1. INTERSECTION BULBS ARE NOT REQUIRED ON STREETS WITH A CENTERLINE RADIUS OF 200FT. OR MORE.
2. ALL RADII SHOWN PERTAIN TO R/W LINES EXCEPT THE MIN. CENTERLINE RADIUS OF 50 FT.
3. RA = 60FT.
4. A MINIMUM CENTERLINE RADIUS OF 50 FT. IS REQUIRED. THE CENTERLINE PROFILE SHALL FOLLOW THE CURVILINEAR ALIGNMENT.
5. SIGHT DISTANCE SHALL BE MAINTAINED IN THE SHADED AREA. A VISIBILITY CONTROL EASEMENT SHALL BE REQUIRED.
6. ALLOWABLE ONLY ON LOCAL ROADS SERVING LESS THAN 50 UNITS.
7. P.I. IS POINT OF INTERSECTION OF TANGENT LINES AT BACK OF SIDEWALK & R/W LINE AT THE CURB RETURN OF THE INSIDE OF THE STREET.
8. REQUIRES PREAPPROVAL OF THE CITY ENGINEER.
9. PAVEMENT WIDENING ON BULB MAY BE ELIMINATED BY THE CITY ENGINEER.



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 INTERSECTION BULB  
 FOR 90° INTERSECTION

APPROVED BY:	CITY ENGINEER	STANDARD DRAWING
05/01/2009		SD20
NOT TO SCALE		



MECHANICALLY APPLIED DRY ADHESIVE REFLECTIVE SHEETING (SCOTCHLITE ENG. GRADE GREEN OR EQUAL) AND LETTERING (SCOTCHCAL STYLE 605 SERIES B, WHITE, UPPER CASE OR EQUAL). STREET NAME SIGN SHALL BE GREEN BACKGROUND WITH WHITE LETTERING.

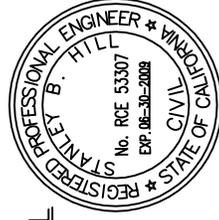
$R = \frac{1}{2}$  (TYP)  
 0.08" THICK ALUMINUM SIGN BLANK  
 SIGN PLATE DETAIL

GREEN EPOXY-TYPE POWDER FINISH

TOP VIEW

- NOTES:
1. 7" MINIMUM ABOVE THE EDGE OF TRAVELED WAY.
  2. 7" ABOVE THE EDGE OF TRAVELED WAY.
  3. POSTS SHALL BE SET 6' TO 12' FROM TRAVELED WAY (RURAL) OR 2' FROM THE BACK OF A CURB OR DIKE (URBAN).
  4. 1/4" DIAMETER X 3" CARRIAGE BOLT WITH 1/4" NUT, 5/16" DIAMETER HOLE.
  5. 10/32" DIAMETER X 3/4" FLAT HEAD MACHINE SCREW WITH 10/32" NUT, 3/8" DIAMETER HOLE CENTERED ON PLATE.
  6. LETTERING TO BE CENTERED.
  7. POST SHALL BE A MINIMUM OF 1' BEHIND SIDEWALK.

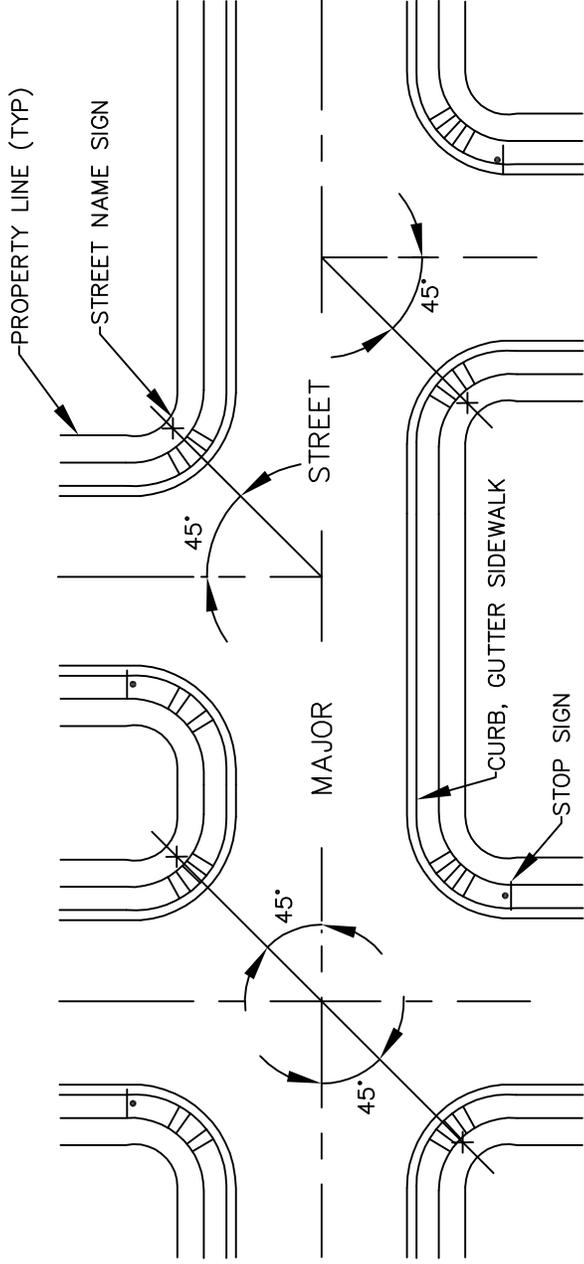
2" X 2" SQUARE GALVANIZED, 12 GAGE, TUBULAR STEEL WITH BREAKAWAY SYSTEM  
 8" DIA, MIN



SIGN DETAIL

City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 STREET NAME & STOP SIGN

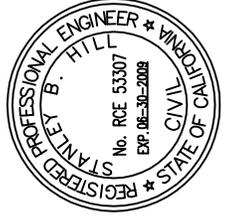
APPROVED BY:	NOT TO SCALE	STANDARD DRAWING
05/01/2009	CITY ENGINEER	SD21



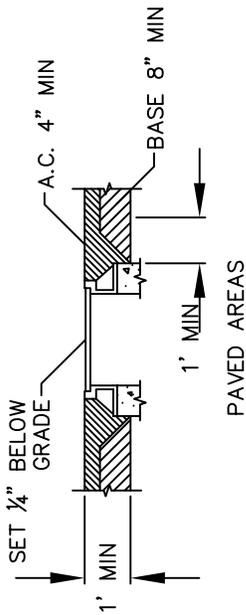
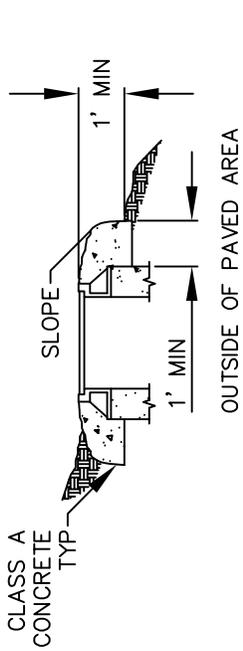
TYPICAL SIGN LOCATION



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 STREET SIGN LOCATION

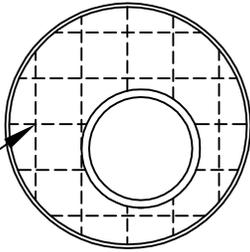


APPROVED BY: CITY ENGINEER  
 05/01/2009  
 NOT TO SCALE  
 STANDARD DRAWING SD22

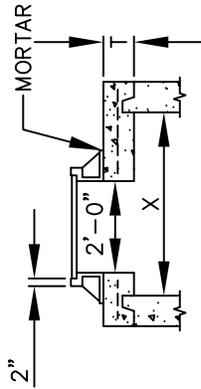


**MANHOLE FRAME AND COVER FINISHES**

#5 REBAR  
12" O.C.



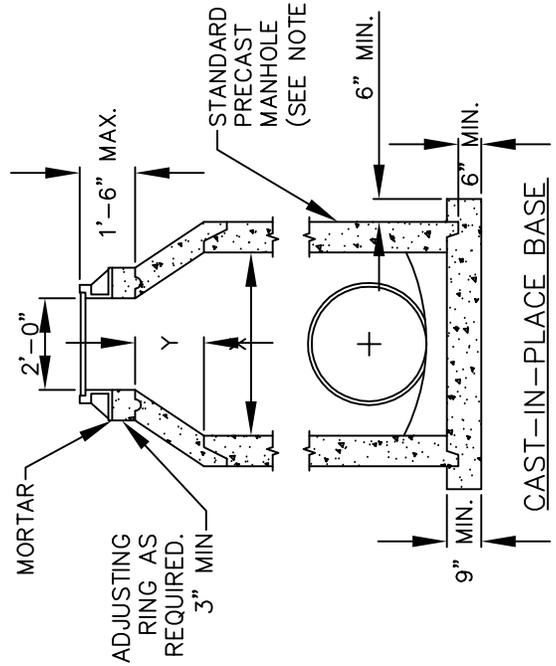
**FLAT SLAB TOP**



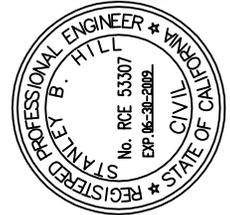
**FLAT SLAB**

FLAT SLAB SHALL BE USED  
WHEN DEPTH DOES NOT  
PERMIT USE OF TAPER UNIT

TABLE OF DIMENSIONS		MAX PIPE			
M.H.	X	Y	T	MIN	INNER DIA
48"	48"	18"	8"	8"	30"
60"	60"	30"	9"	9"	42"
72"	72"	42"	10"	10"	54"



- NOTES:**
- ECCENTRIC CONES SHALL BE USED WHEN SPECIFIED ON THE PLANS.
  - JOINTS MAY BE EITHER KEYED OR TONGUE AND GROVE.
  - RISER SECTIONS, CONES, AND ADJUSTING RINGS SHALL CONFORM TO ASTM DESIGNATION C-478.
  - FRAME SHALL BE SECURED TO RISER OR FLAT SLAB TOP WITH MORTAR CEMENT.
  - DIMENSION "Y" IS A MINIMUM DIMENSION AND MAY BE GREATER IF DEPTH PERMITS.
  - MANHOLE FLOORS SHALL HAVE WOOD TROWEL FINISH AND SLOPE FROM ALL DIRECTIONS TOWARD THE OUTLET.
  - COVER FOR STORM DRAINS SHALL BEAR THE LETTER "D" OR "SD".
  - EXTRA DEPTH MANHOLES OR MANHOLES WITH PIPES OVER 54 INCHES IN DIAMETER SHALL REQUIRE SPECIAL DESIGN.
  - THERE SHALL BE AN 8 INCH MINIMUM CLEAR DISTANCE BETWEEN ALL PIPE OUTSIDE DIAMETERS AT THE MANHOLE UNLESS SPECIFICALLY APPROVED BY THE ENGINEER.
  - CAST-IN-PLACE MANHOLE WALLS MAY BE APPROVED BY THE ENGINEER. ALL CAST-IN-PLACE MANHOLES MUST BE FORMED IN A CIRCULAR SHAPE CONSISTENT WITH THE DIAMETER SPECIFIED ON THE PLANS AND REQUIRED TO FIT UPPER PRECAST SECTIONS. MINIMUM WALL THICKNESS SHALL BE 8 INCHES. MAXIMUM HEIGHT OF THE CAST-IN-PLACE SHALL BE 60 INCHES (MEASURED FROM THE TOP OF THE MANHOLE). PRECAST RINGS SHALL BE SET WET OR REQUIRED KEY FORM SHALL BE INCLUDED IN THE FORM WORK TO ACCEPT THE PRECAST KEY. ALL CAST-IN-PLACE CONCRETE SHALL BE CONSOLIDATED BY AN ACCEPTABLE METHOD TO ENSURE VOIDS ARE REMOVED.
  - ANY VARIATIONS FROM THIS DETAIL OR SPECIAL MANHOLES AND JUNCTIONS BOXES WILL REQUIRE DESIGN REVIEW AND APPROVAL BY THE ENGINEER.



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
STORMDRAIN MANHOLE (SDMH)

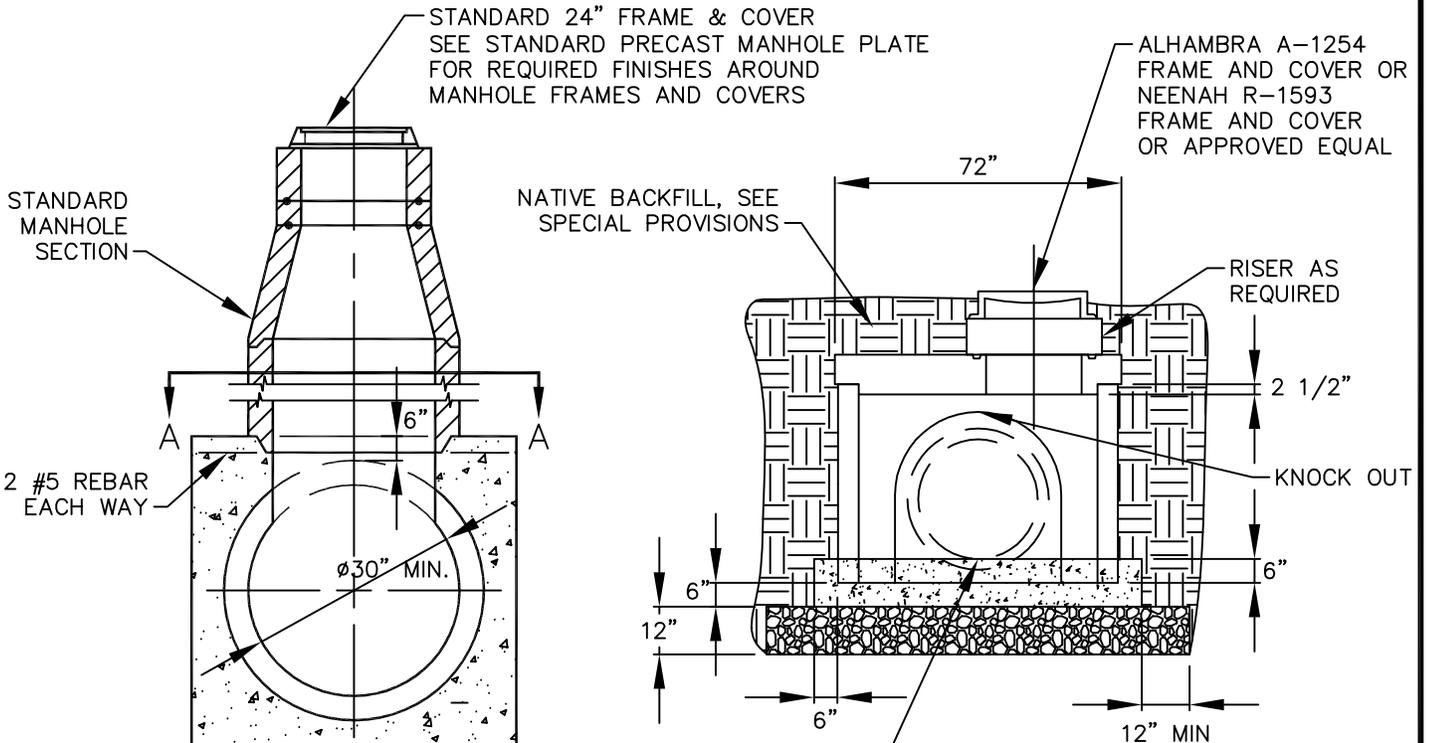
APPROVED BY:

NOT TO SCALE

STANDARD DRAWING  
SD40

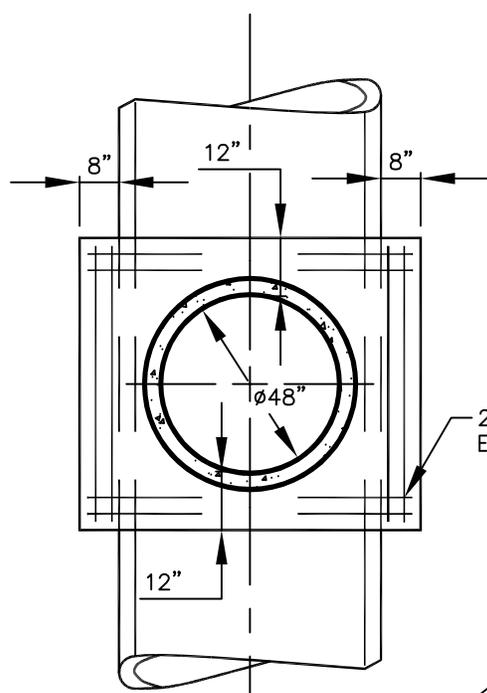
05/01/2009

CITY ENGINEER

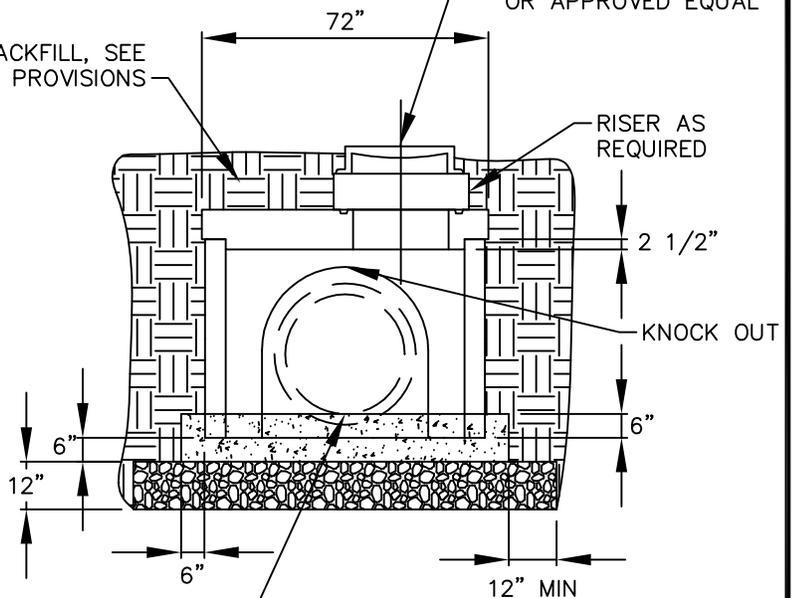


**SADDLE MANHOLE**

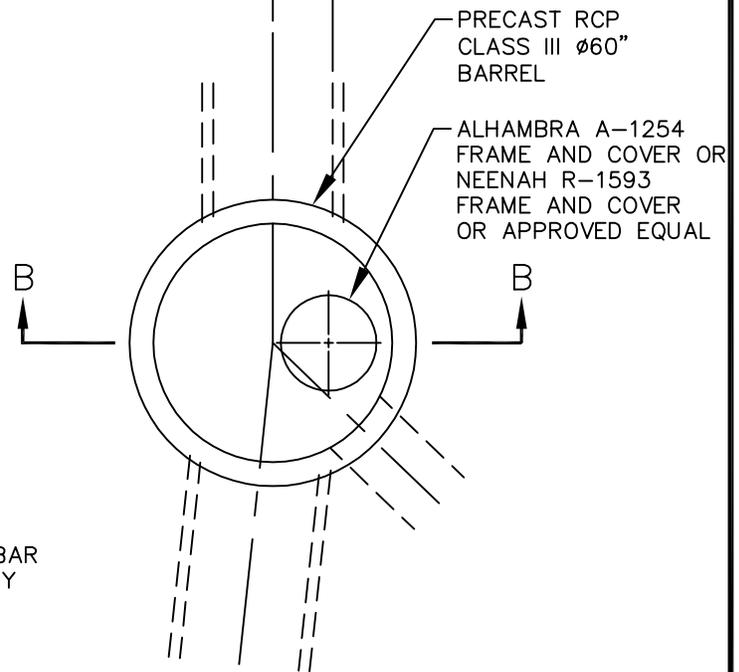
NOTE:  
PLACE RISER SECTION AFTER  
CONCRETE HAS SET.



**SECTION A-A**



**SECTION B-B**



**FLAT TOP OPTION**



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
**SADDLE STORMDRAIN MANHOLE**

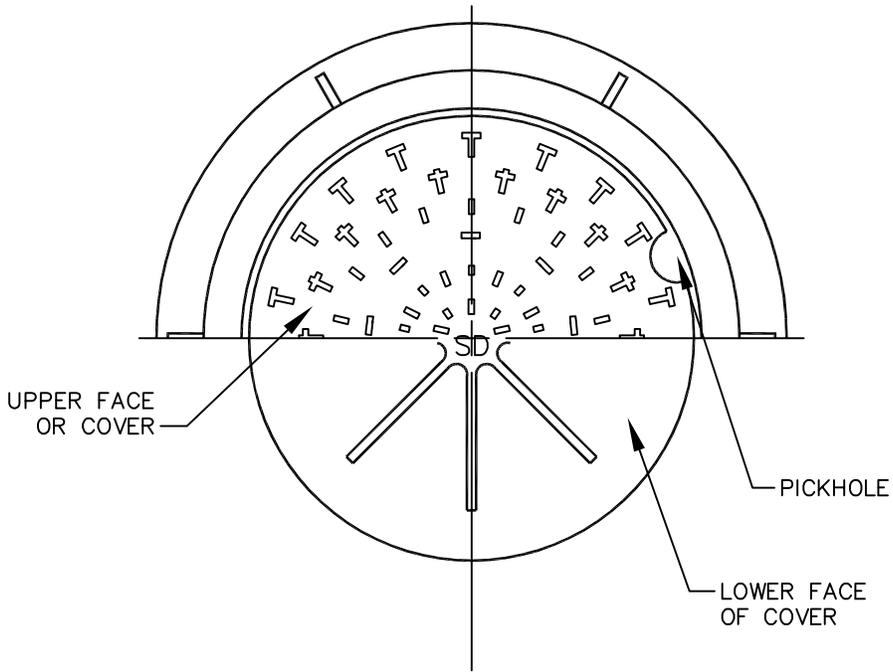
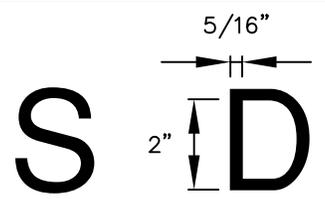
APPROVED BY:  
12/28/07 CITY ENGINEER

NOT TO SCALE

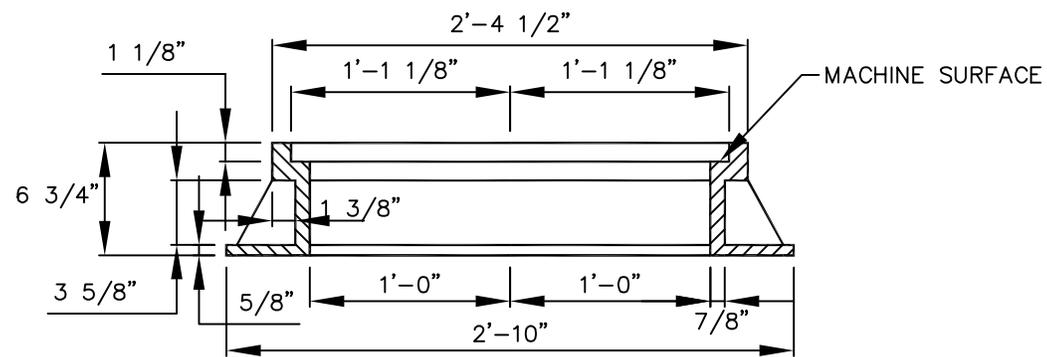
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SD41



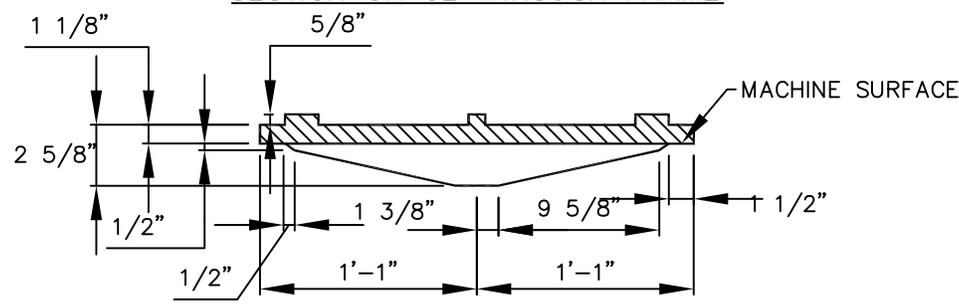
LETTER "S" AND "D" OR "D"  
AT CENTER OF COVER



HALF PLAN OF MANHOLE FRAME & COVER  
SD OR D = STORM DRAIN



SECTION ON CL THROUGH FRAME



SECTION ON CL THROUGH COVER



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
STORMDRAIN MANHOLE  
24" FRAME & COVER

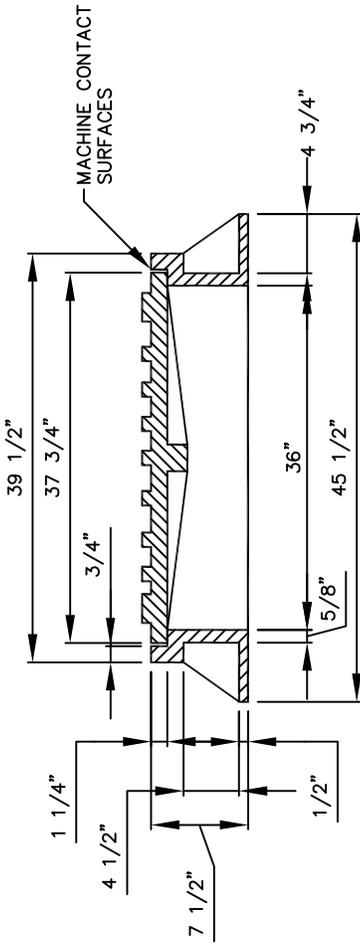
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05/01/09 CITY ENGINEER

NOT TO SCALE

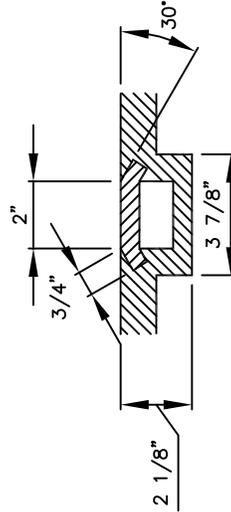
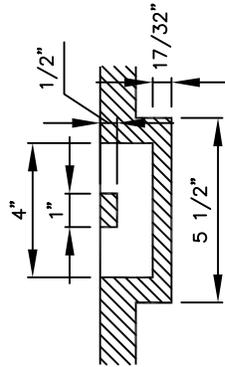
STANDARD DRAWING  
SD43

5/16" **S** **D** 2"

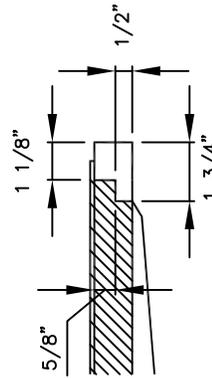
LETTERS "SD" OR "D"  
AT CENTER OF COVER  
SD OR D = STORM DRAIN



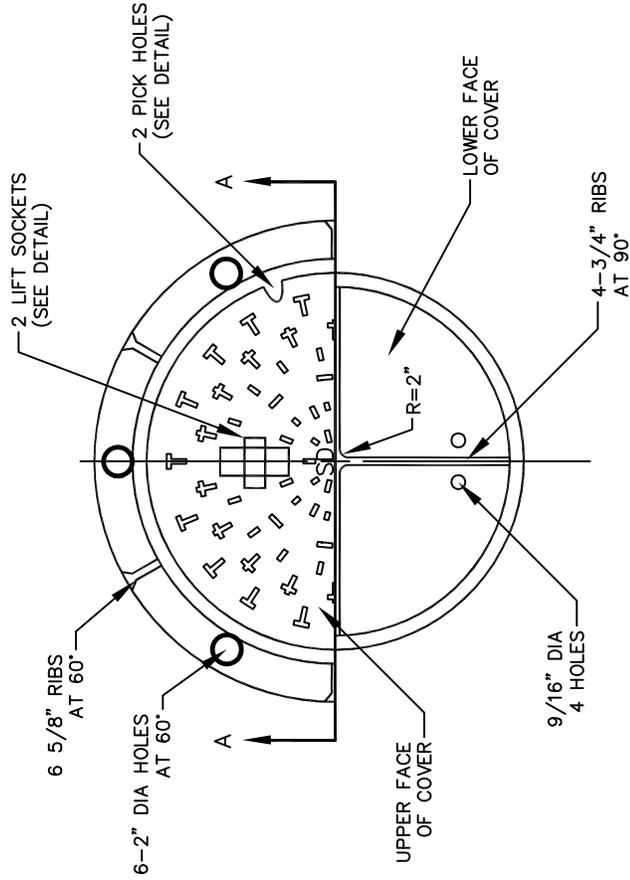
SECTION A-A



LIFT SOCKET DETAIL



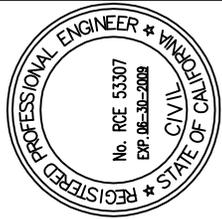
PICK HOLE DETAIL



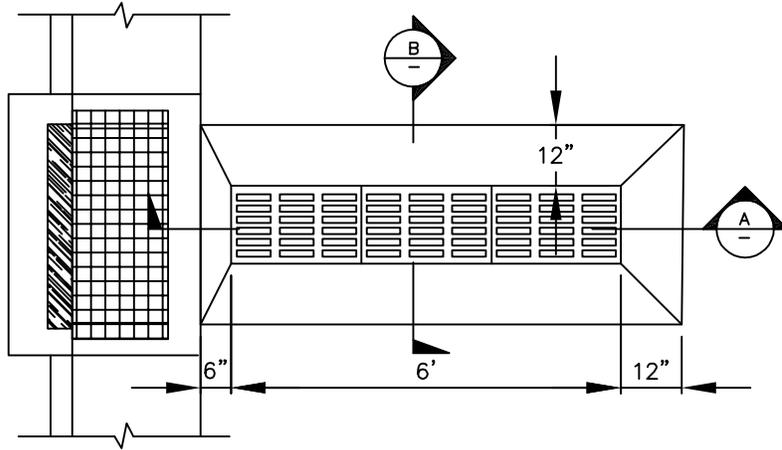
HALF PLAN OF MANHOLE FRAME & COVER



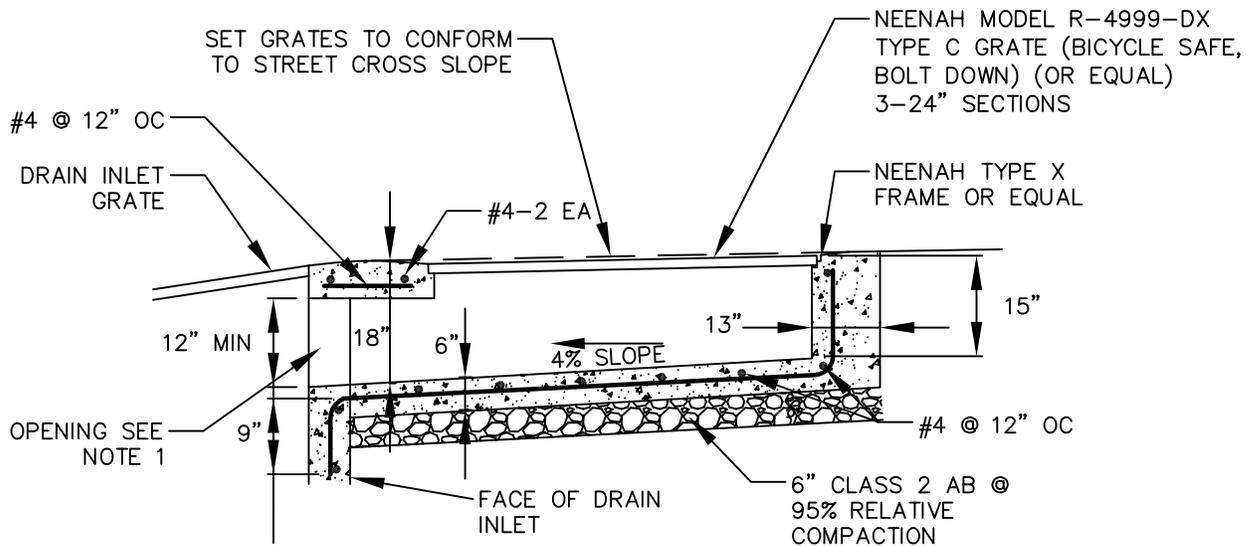
City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
STORM DRAIN MANHOLE - 36"  
FRAME & COVER



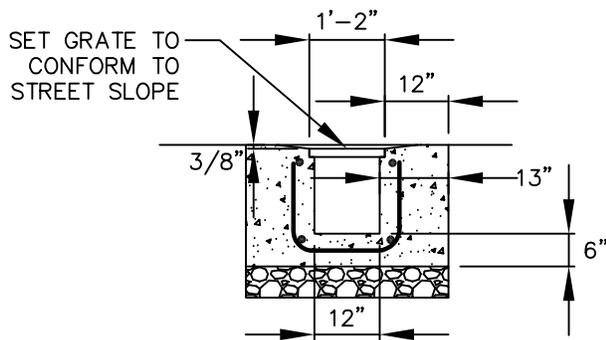
APPROVED BY: [Signature]  
CITY ENGINEER  
NOT TO SCALE  
STANDARD DRAWING SD44



PLAN VIEW



SECTION A



SECTION B

NOTE:  
 OPENING TO DRAIN INLET TO BE 12" HIGH BY A MINIMUM OF 12" WIDE. WIDTH OF OPENING WILL DEPEND ON ANGLE OF TRANSVERSE DRAIN.



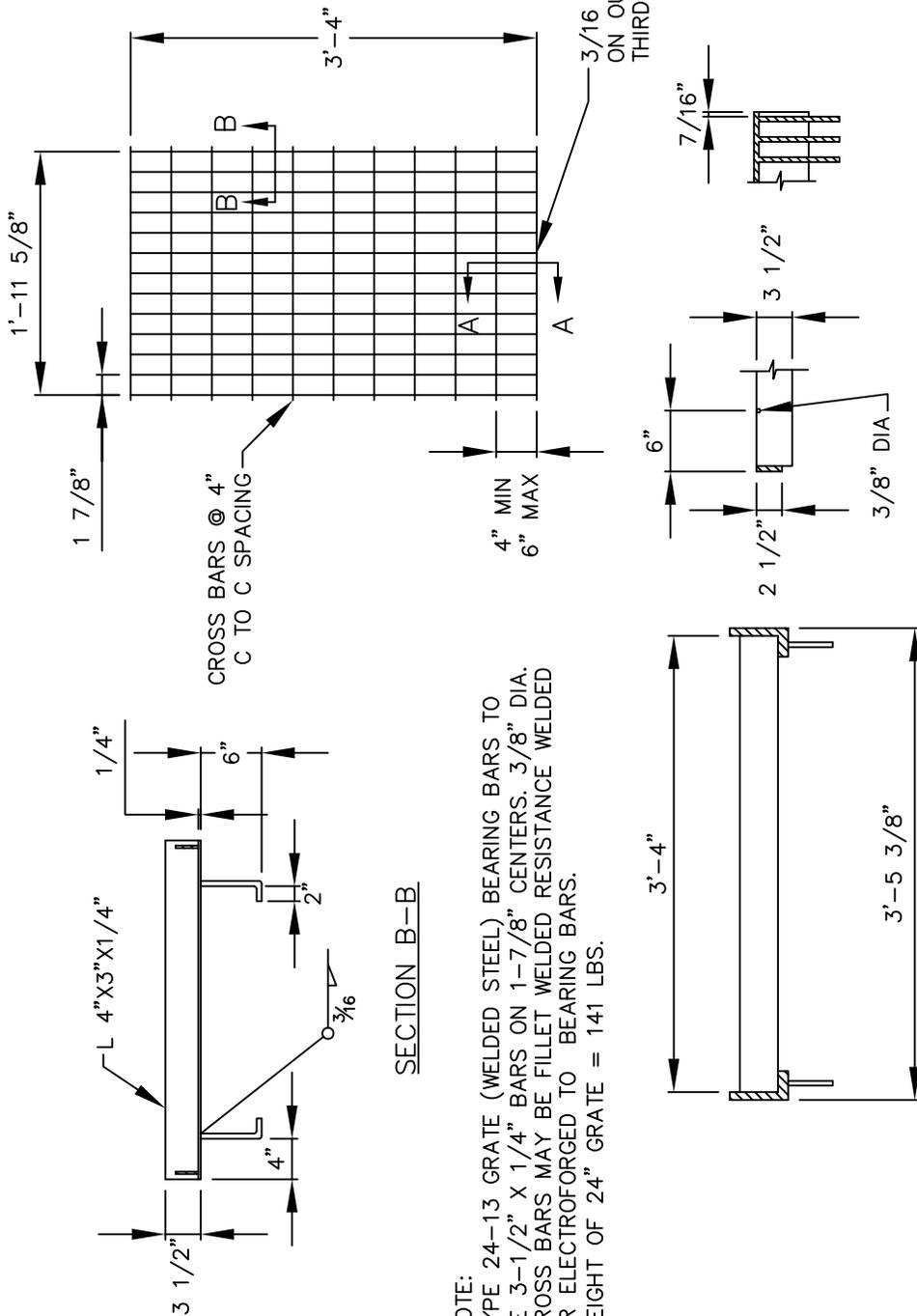
City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 TRANSVERSE DRAIN

APPROVED BY:  
 05/01/09 CITY ENGINEER

NOT TO SCALE

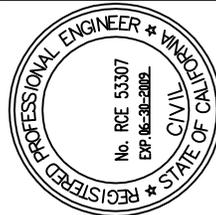
STANDARD DRAWING  
 SD45

NEENAH HIGH CAPACITY VANE  
 STYLE TYPE "L" OR EQUIVALENT  
 PREFERRED. BI-DIRECTIONAL VANES  
 IN SAG LOCATIONS, OTHERWISE  
 PROPERLY ORIENTED SINGLE  
 DIRECTION VANES.



NOTE:  
 TYPE 24-13 GRATE (WELDED STEEL) BEARING BARS TO  
 BE 3-1/2" X 1-1/4" BARS ON 1-7/8" CENTERS. 3/8" DIA.  
 CROSS BARS MAY BE FILLET WELDED RESISTANCE WELDED  
 OR ELECTROFORGED TO BEARING BARS.  
 WEIGHT OF 24" GRATE = 141 LBS.

ALL GRATES SHALL BE HOT DIP GALVANIZED AFTER  
 FABRICATION



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 DRAIN INLET  
 FRAME & GRATE

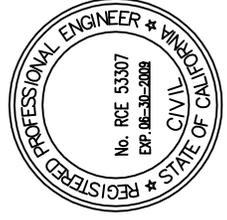
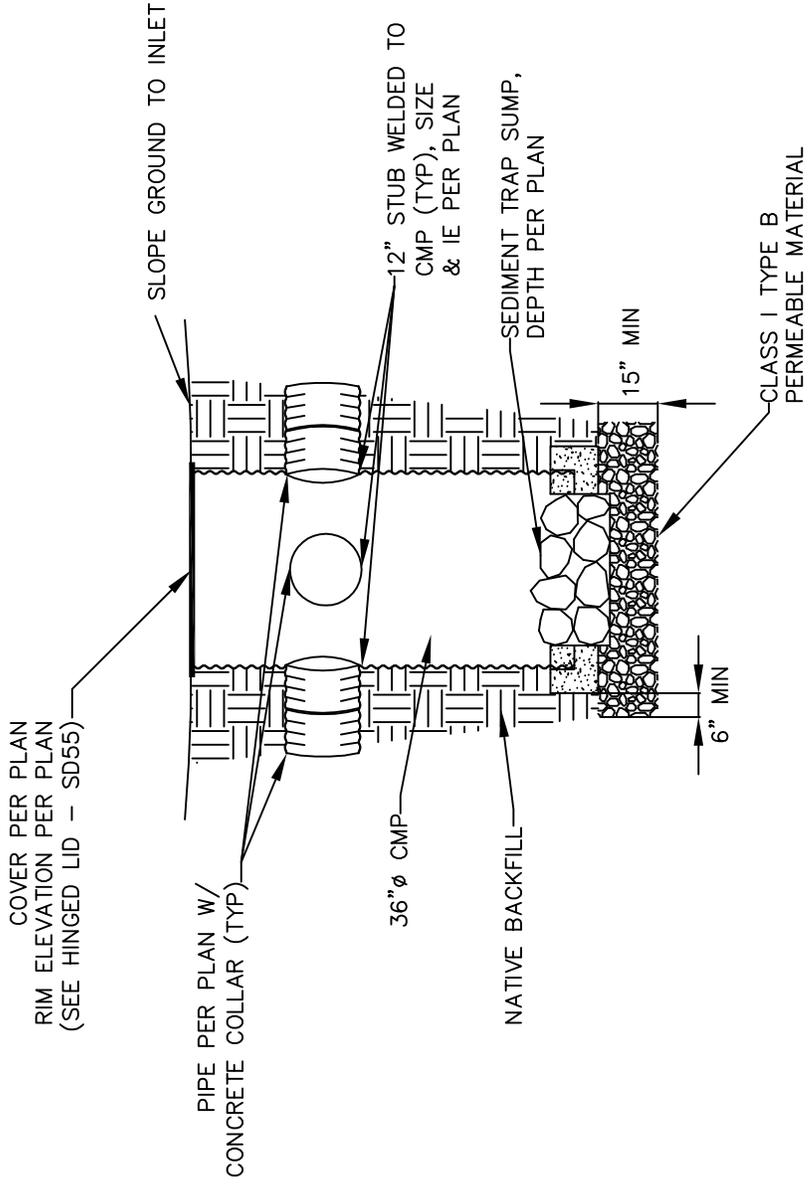
APPROVED BY:

NOT  
 TO  
 SCALE

STANDARD DRAWING  
 SD46

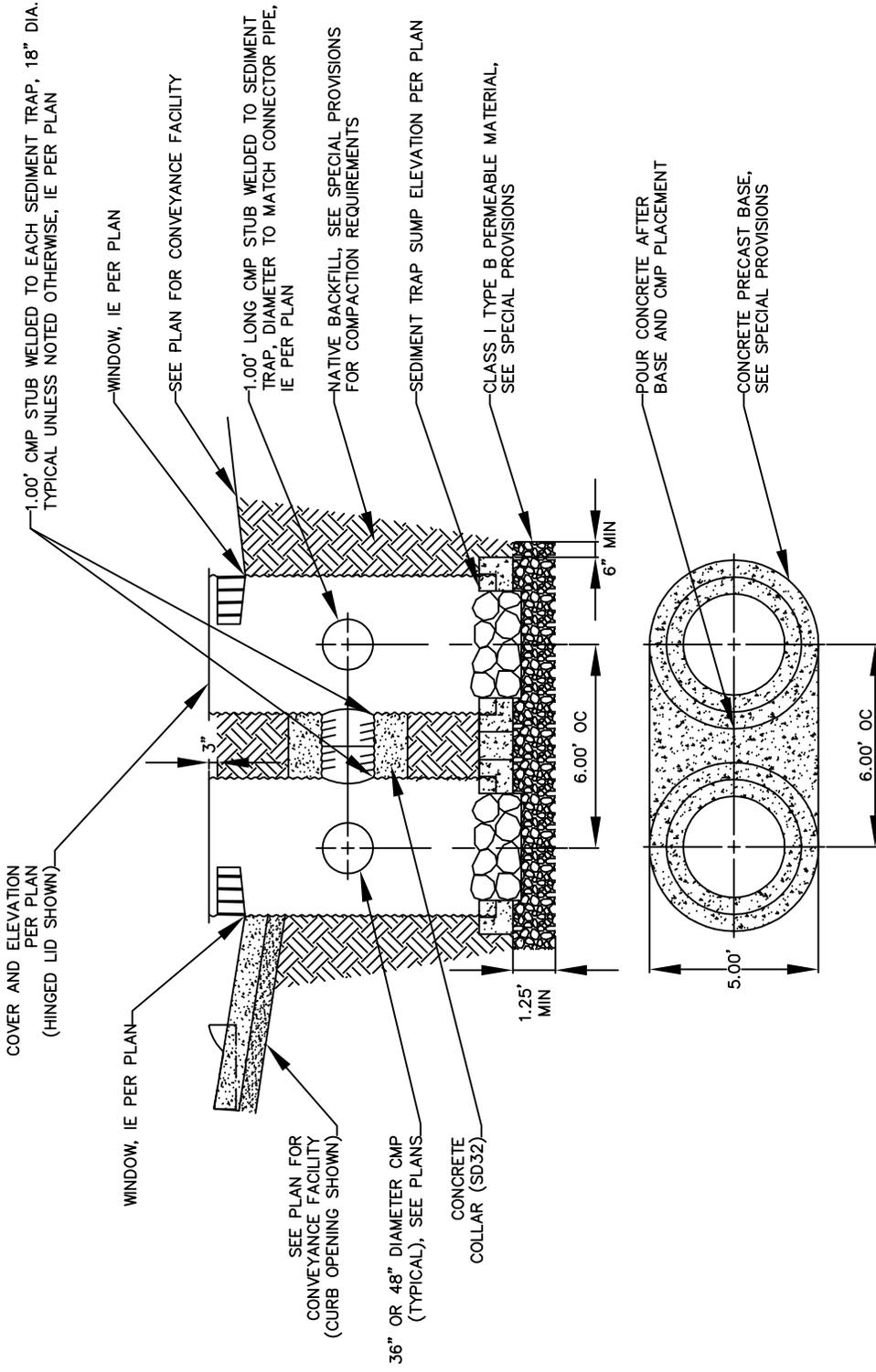
CITY ENGINEER

05/01/2009

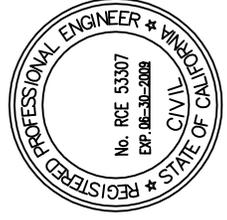


City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 SEDIMENT TRAP - SINGLE

APPROVED BY: \_\_\_\_\_ CITY ENGINEER  
 NOT TO SCALE  
 STANDARD DRAWING SD50  
 05/01/2009



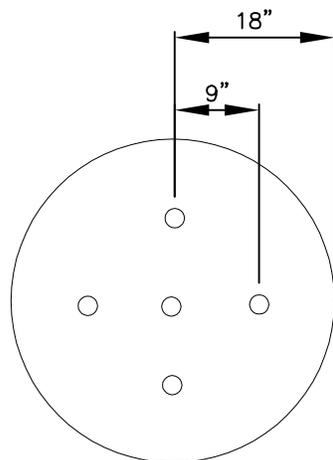
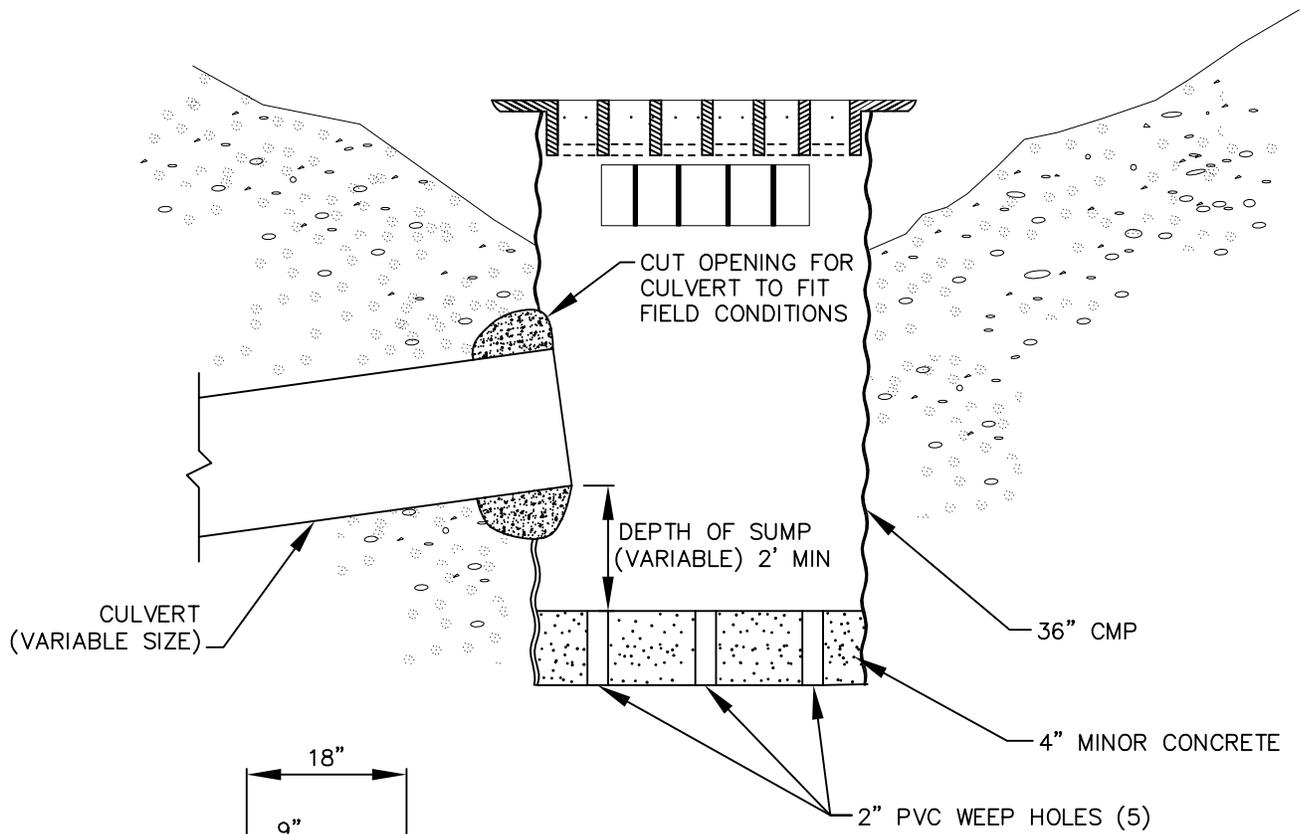
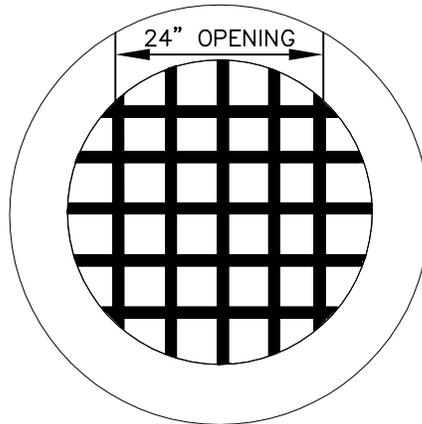
City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 SEDIMENT TRAP – DOUBLE



APPROVED BY:	CITY ENGINEER	STANDARD DRAWING	SD52
05/01/2009		NOT TO SCALE	



36" CMP WITH SIDE INLET



TOP OF SUMP; PLAN VIEW



City of South Lake Tahoe  
ENGINEERING DEPARTMENT

DRAIN INLET - 36" CMP  
WITH SIDE INLET

APPROVED BY:

12/28/07

CITY ENGINEER

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TO  
SCALE

STANDARD DRAWING

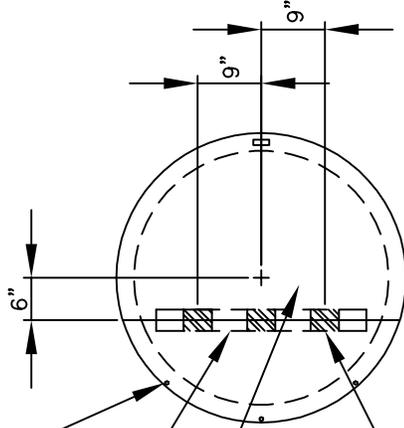
SD54

1/2" HEX HEAD BOLTS,  
WASHERS, & NUTS (3);  
SEE DETAIL 'A'

1 1/2" X 1 1/2" X 1/4"  
STIFFENERS BOTH SIDES

1/4" CHECKERED  
PLATE COVER

WELD 3 - 4" X 4" X 1/4"  
WITH 3/8" PIN HINGES TO  
COVER



SEE DETAIL 'A'

1 1/2" X 1 1/2" X 1/4"  
WELD TO COVER PLATE

HINGE

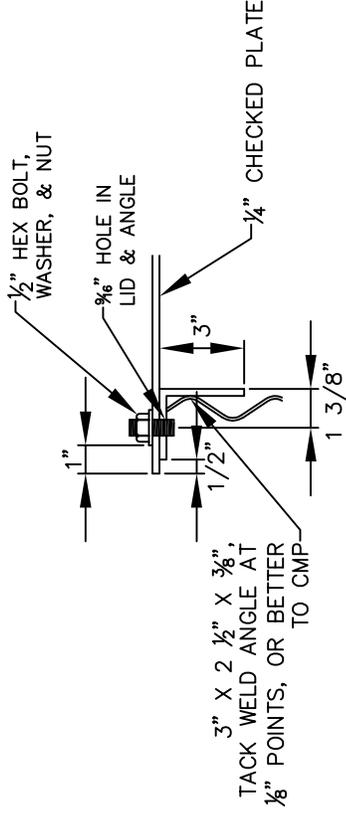
SEE DETAIL 'B'

4"

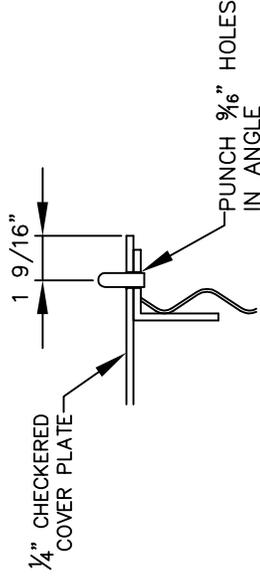
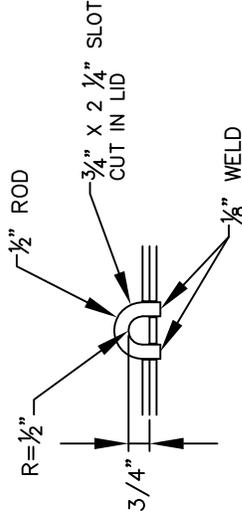
2"

36" OR 48"  
DIAMETER CMP

- HOT DIP GALVANIZE AFTER FABRICATION



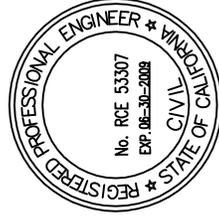
DETAIL 'A'



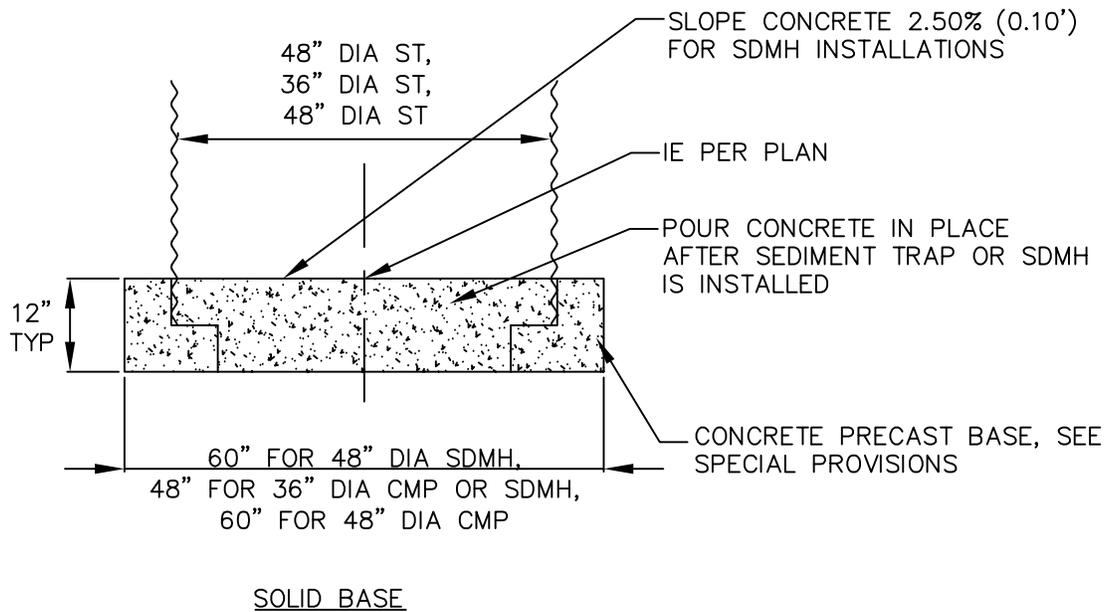
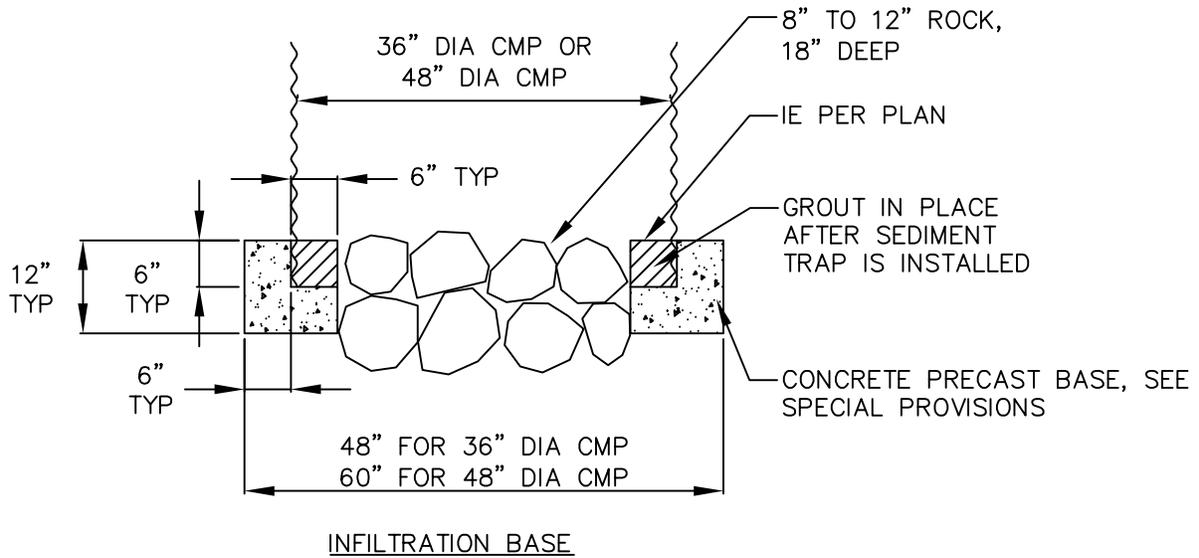
DETAIL 'B'



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
HINGED LID



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CITY ENGINEER  
STANDARD DRAWING  
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SD55



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
SEDIMENT TRAP - BASE

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12/28/07

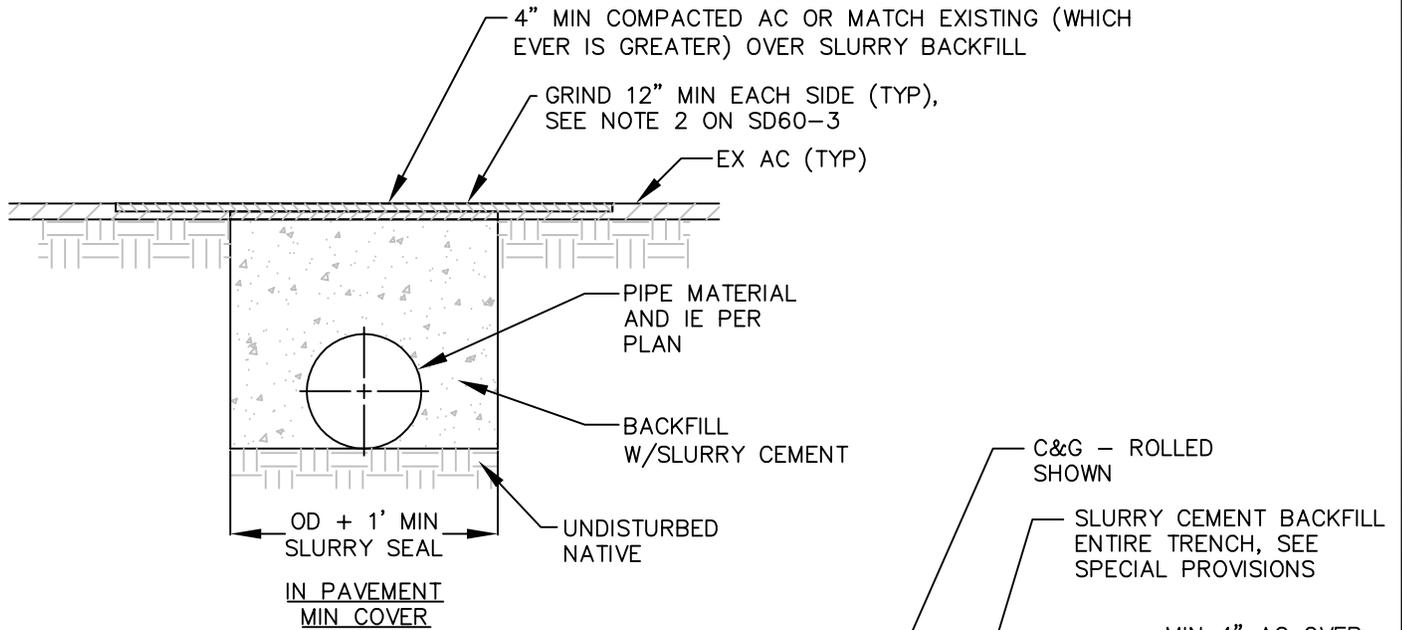
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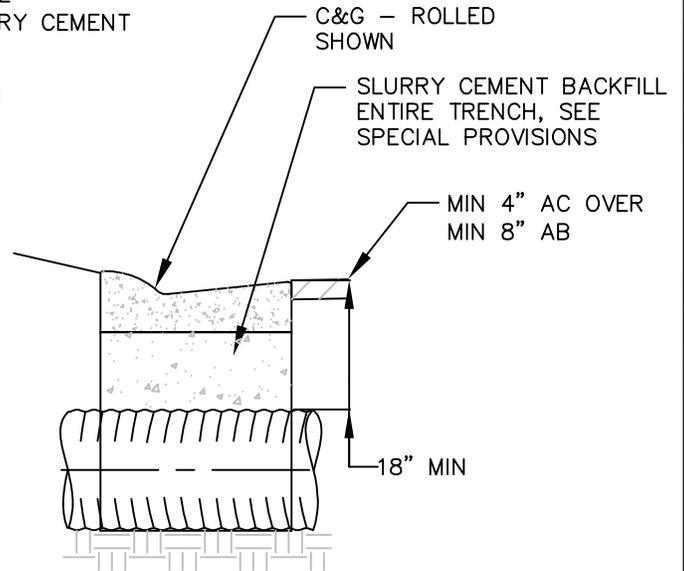
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SD56

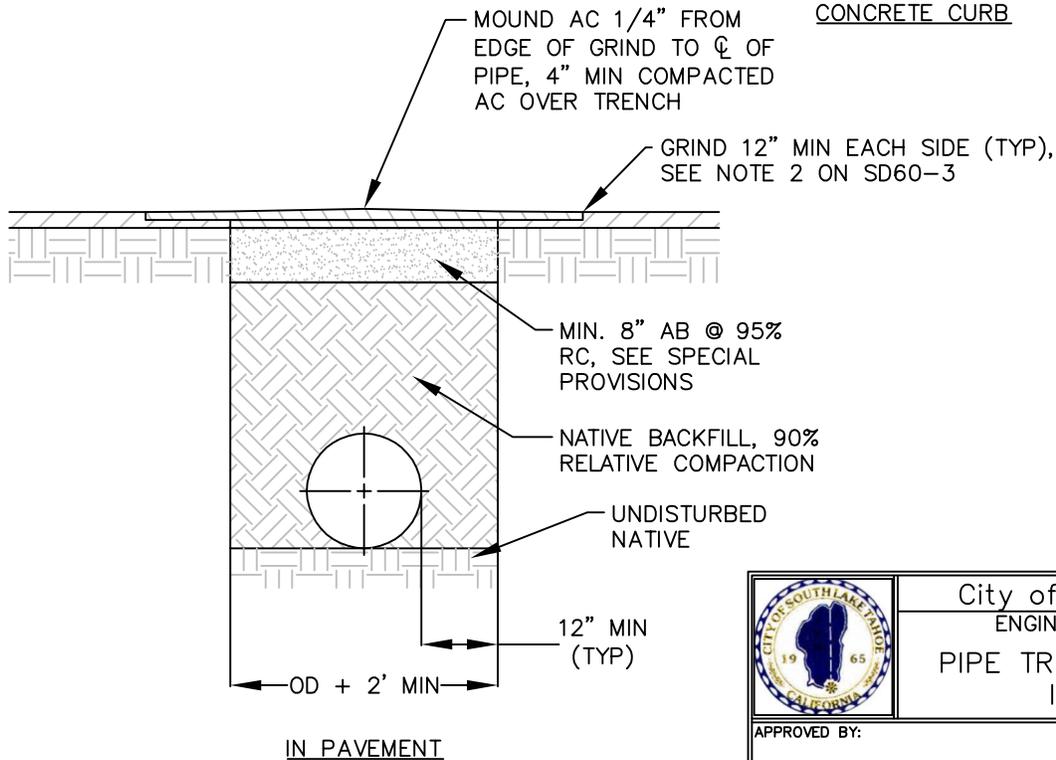
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**IMPORTANT!**  
SEE SD60-3 FOR  
PIPE TRENCH NOTES



**UNDER  
CONCRETE CURB**

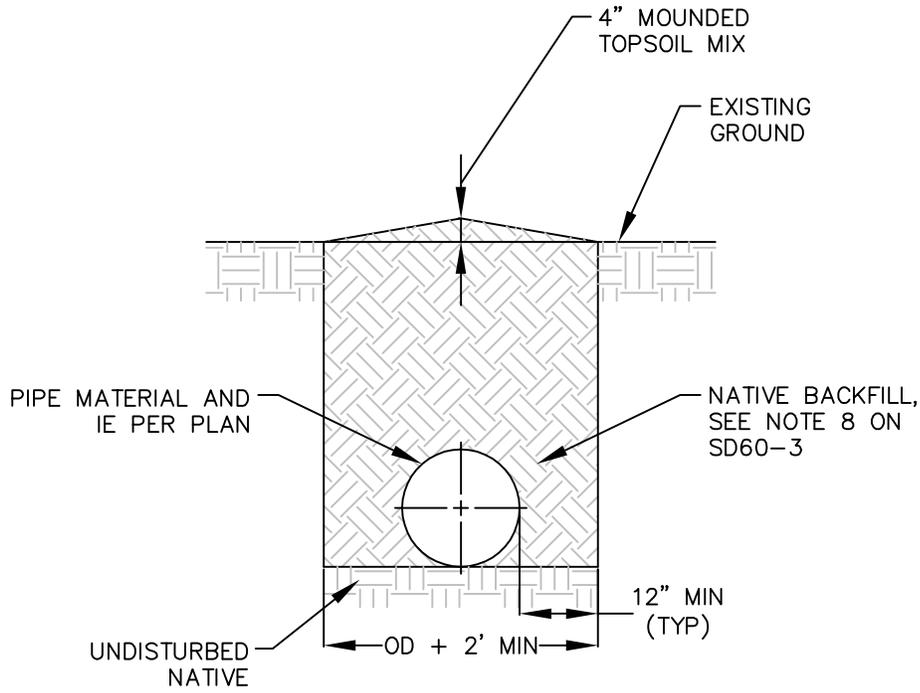


City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
**PIPE TRENCH - CONDITIONS  
IN PAVEMENT**

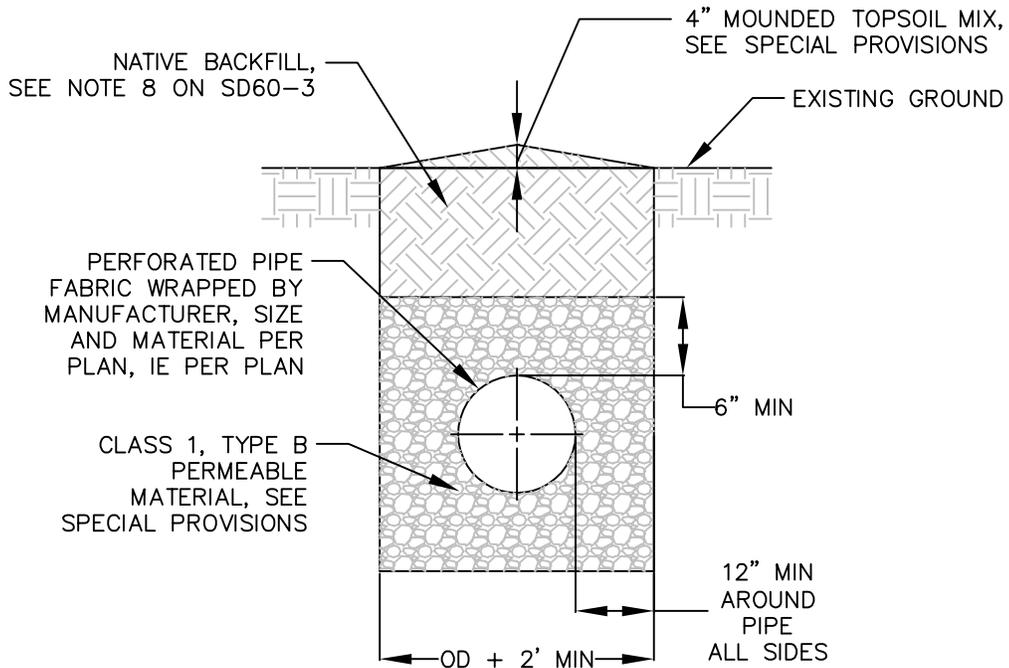
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05/01/09 CITY ENGINEER

NOT  
TO  
SCALE

STANDARD DRAWING  
SD60-1



OUT OF PAVEMENT



PERFORATED PIPE  
OUT OF PAVEMENT

**IMPORTANT!**  
SEE SD60-3 FOR  
PIPE TRENCH NOTES



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
PIPE TRENCH – CONDITIONS  
OUT OF PAVEMENT

APPROVED BY:  
05/01/09 CITY ENGINEER

NOT  
TO  
SCALE

STANDARD DRAWING  
SD60-2

NOTES:

1. MINIMUM COVER\* FROM CROWN OF PIPE TO FINISH GRADE SHALL BE AS FOLLOWS:  
    CULVERTS           18 INCHES  
    STORM DRAINS   18 INCHES FOR RCP  
                          24 INCHES FOR HDPE  
    \*UNLESS OTHERWISE APPROVED. SEE ALSO SD64.
2. GRIND PAVEMENT A MINIMUM OF 1 FOOT BEYOND EACH SIDE OF THE LONGITUDINAL OR TRANSVERSE EXCAVATION AFTER TRENCH BACKFILL AND FIRST LIFT OF HOT MIX AC.
3. REPLACE PAVEMENT TO EDGE OF PAVEMENT (EP) IF THE EXCAVATION IS WITHIN 3 FEET OF THE EP.
4. IN WET OR ROCKY MATERIAL THE DEPTH OF THE TRENCH BEDDING SHALL BE INCREASED TO THE LARGER OF EITHER 6 IN. OR 1/4 DIA OF PIPE.
5. FOR CULVERTS/STORM DRAINS THE MINIMUM DISTANCE BETWEEN THE SIDE OF THE TRENCH AND THE SIDE OF THE PIPE SHALL BE 1/2 OD OR 12", WHICHEVER IS GREATER.
6. STORM DRAINS AND CULVERTS INSTALLED WITHIN FILL SHALL BE 95% RELATIVE COMPACTION UP TO A MINIMUM OF 12 INCHES ABOVE THE TOP OF PIPE.
7. IN AREAS WITH MINIMUM COVER, BACKFILL ABOVE BEDDING SHALL BE CLASS 2 AGGREGATE BASE UNLESS BACKFILLING WITH CEMENT SLURRY.
8. IN AREAS OF NATURAL VEGETATION OR LANDSCAPING, REMOVE TOP 12 INCHES OF MATERIAL, STOCKPILE & REPLACE ON TRENCH IN A MOUND. BACKFILL COMPACTED BETWEEN 80% AND 85% RELATIVE COMPACTION.
9. ALL LANDSCAPING CONDUITS WITHIN THE ROADWAY PRISM AND/OR TRAFFIC AREAS MUST HAVE MINIMUM OF 30 INCHES COVER.
10. AC PATCH SHALL BE HOTMIX ASPHALT A MINIMUM COMPACTED THICKNESS OF 4 INCHES AND PLACED IN A MINIMUM OF 2 LIFTS.
11. COLD MIX ASPHALT MAY BE PLACED TEMPORARILLY, BUT MUST BE COMPLETELY REMOVED BEFORE PLACING THE PERMANENT HOT MIX ASPHALT.
12. PLACE ASPHALT BASE (AB) AT THE TOP OF THE EXCAVATION WHERE THE EXCAVATION IS WITHIN 2' OF EP OR IF AB PRESENTLY EXISTS ABOVE THE EXCAVATION. IF THE EXCAVATION IS AT THE BOTTOM OF A ROADSIDE DITCH, BEYOND A ROADSIDE DITCH, OR BEHIND A CURB, THE REQUIREMENT FOR AB CAN BE WAIVED.
13. TRANSVERSE EXCAVATION ON ROADWAYS PAVED WITHIN 2 YEARS ARE NOT ALLOWED AND MUST BE BORED. LONGITUDINAL EXCAVATIONS ON ROADWAYS PAVED WITHIN 5 YEARS OR ON COLLECTOR ROADS WITH A HIGH QUALITY RIDING SURFACE REQUIRE A 2" OVERLAY WHICH CONFORMS OR A 2" GRIND AND OVERLAY OF THE TRAVEL LANE.
14. STORM DRAIN BACKFILL TO BE STRUCTURAL BACKFILL.
15. EXCESSIVE TRANSVERSE CUTS MAY REQUIRE A GRIND AND REPAVE OF ENTIRE TRAVEL LANE BETWEEN CUTS.
16. NO SAWCUTS WILL BE ALLOWED IN WHEEL PATHS. SAWCUT LINES SHALL BE PLACED AT ROAD CL, WITHIN SHOULDER OR MIDDLE OF TRAVEL LANE, AND OUTSIDE WHEEL PATHS.
17. MINIMUM PATCH WIDTH SHALL BE 3' WIDE.
18. PATCH WORK SHALL NOT RESULT IN "RIBBON" STRIPS OF PAVEMENT (LESS THAN 3 FEET WIDE). EXISTING PAVEMENT WIDTHS LESS THAN 3 FEET WIDE SHALL BE REMOVED AND PAVED WITH THE PATCH WORK.

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City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
PIPE TRENCH – NOTES

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05/01/09

CITY ENGINEER

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TO  
SCALE

STANDARD DRAWING

SD60-3

EDGE OF PAVEMENT (EOP) OR LIP OF CURB (LOC)

RIGHT OF WAY VARIES

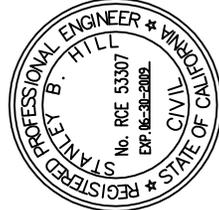
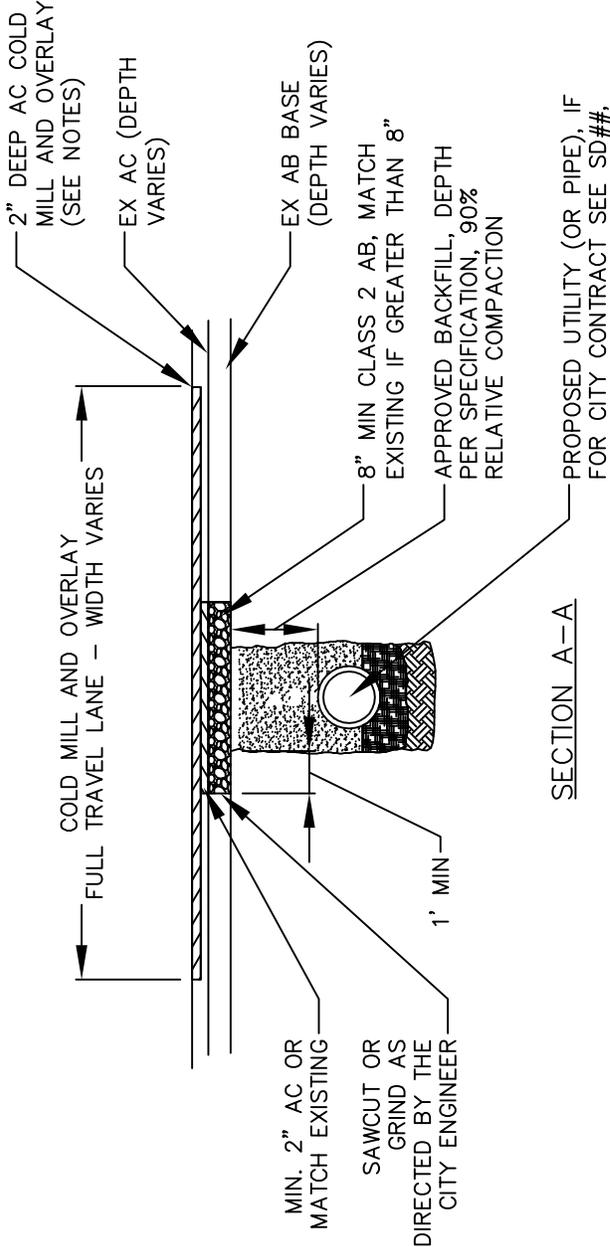
PROPOSED TRENCH CONSTRUCTED PARALLEL TO OR WITHIN A SINGLE TRAVEL LANE.

TRAVEL LANE COLD MILL AND OVERLAY REQUIRED WHEN TRENCH LENGTH EXCEEDS 250 FEET



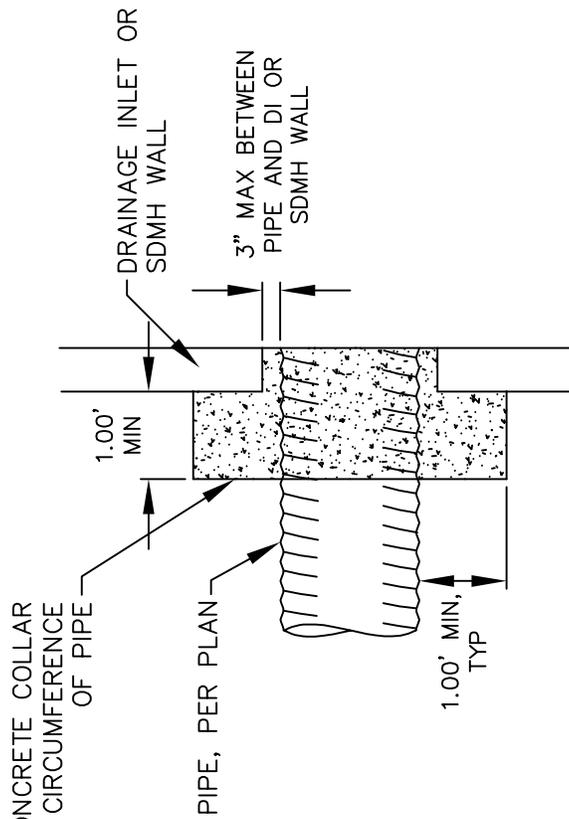
NOTES:

1. AC SHALL MEET CURRENT CITY PAVING STANDARDS.
2. WHERE REMAINING PAVEMENT WIDTH FROM SAWCUT LINE TO GUTTER, CURB, OR EDGE OF PAVEMENT IS LESS THAN 36" AC, A FULL DEPTH PAVEMENT REPAIR SHALL EXTEND TO LIP OF CURB, OR EDGE OF PAVEMENT.
3. ALL AFFECTED STREET IMPROVEMENTS SHALL BE REPLACED TO CITY STANDARDS. CITY APPROVAL IS REQUIRED BEFORE ANY WORK COMMENCES.
4. FINISH AC SURFACE SHALL BE 3/8" ABOVE LOC (SEE CURB DETAIL-SD?).
5. CONTRACTOR SHALL CONTINUALLY REMOVE AC FROM GUTTER PAN SO PROPER COMPACTION CAN BE ACHIEVED.
6. ALL SURFACES SHALL BE VIGOROUSLY CLEANED AND TACK COATED PRIOR TO AC PLACEMENT.
7. CITY ENGINEER WILL DETERMINE WHETHER TRENCH CUTS SHALL BE SAWCUT OR GRINDED. GRINDING IS PREFERRED WHERE EXISTING PAVEMENT ALLOWS.
8. TRENCH BACKFILL SHALL MEET CITY STANDARDS FOR MATERIALS AND COMPACTION.

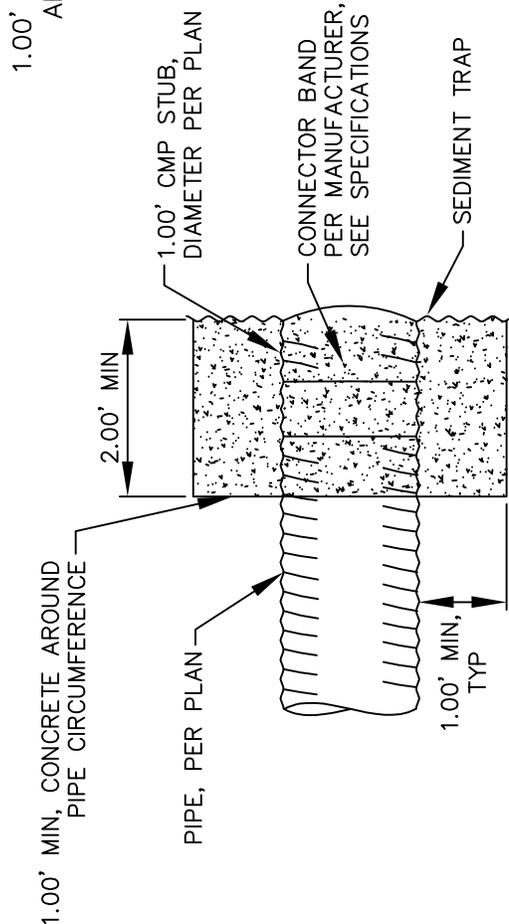


City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
LONGITUDINAL TRENCH  
PAVEMENT PATCH

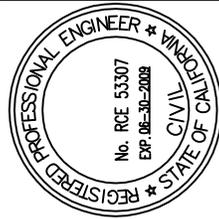
APPROVED BY:	NOT TO SCALE	STANDARD DRAWING
05/01/2009	CITY ENGINEER	SD62



DI OR SDMH



SEDIMENT TRAP



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 CONCRETE COLLAR

APPROVED BY:	NOT TO SCALE	STANDARD DRAWING
05/01/2009	CITY ENGINEER	SD63

CORRUGATED HIGH DENSITY POLYETHYLENE  
PIPE DUAL WALL  
SMOOTH INTERIOR ONLY

DIA (INCHES)	MIN. COVER (INCHES)	MAX. FILL (HEIGHT - FEET)
12	24	22
15	24	22
18	24	22
24	24	22
30	24	22
36	24	22

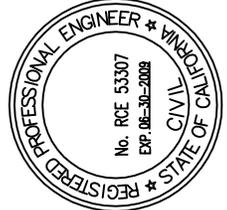
THICKNESS	GAGE NO.					
	22	20	18	16	14	12
UNCOATED (IN.)	0.0299	0.0359	0.0478	0.0598	0.0747	0.1046
GALVANIZED (IN.)	0.034	0.040	0.052	0.064	0.079	0.109
GALVANIZED (MM.)	0.762	1.02	0.32	1.63	2.01	2.77
UNCOATED (IN.)	10	8	7	5	3	1
GALVANIZED (IN.)	0.1345	0.1644	0.1838	0.2145	0.2451	0.2758
GALVANIZED (MM.)	0.138	0.168	0.188	0.218	0.249	0.280
GALVANIZED (MM.)	3.51	4.27	4.78	5.54	6.32	7.11

CLASS	CONCRETE PIPE					CMP UNSTRUCTURED					STRENGTH		
	C-14 REINFORCED												
DIA	SS	ES	I	II	III	IV	V	16 GA	14 GA	12 GA	10 GA	8 GA	30
10	13	30											
12	12	26		8	12	30							26
15	12	26		10	15	35							26
18	12	29		11	16	38							29
21	12	29		12	17	39							29
24	12	24		12	18	39							24
27				13	19	39							19
30				14	19	38							19
33				14	20	38							20
36				13	17	27	64	13*	18	33	48		
42				14	18	29	62	18*	28	38	100		
48				15	19	30	60	16*	24	29	39		
54				16	20	31	58	14*	20	25	35		
60				14	16	21	57	12*	17*	20	30		
66				15	17	22	56		14*	20	25		
72				15	18	23	56		7*	16	21		

\*ONLY ON MINOR STREETS AND UNTRAVELED AREAS  
MAXIMUM ALLOWABLE COVER - DRAINAGE PIPES  
(MEASURED FINISH GRADE TO BOTTOM OF TRENCH IN FEET)

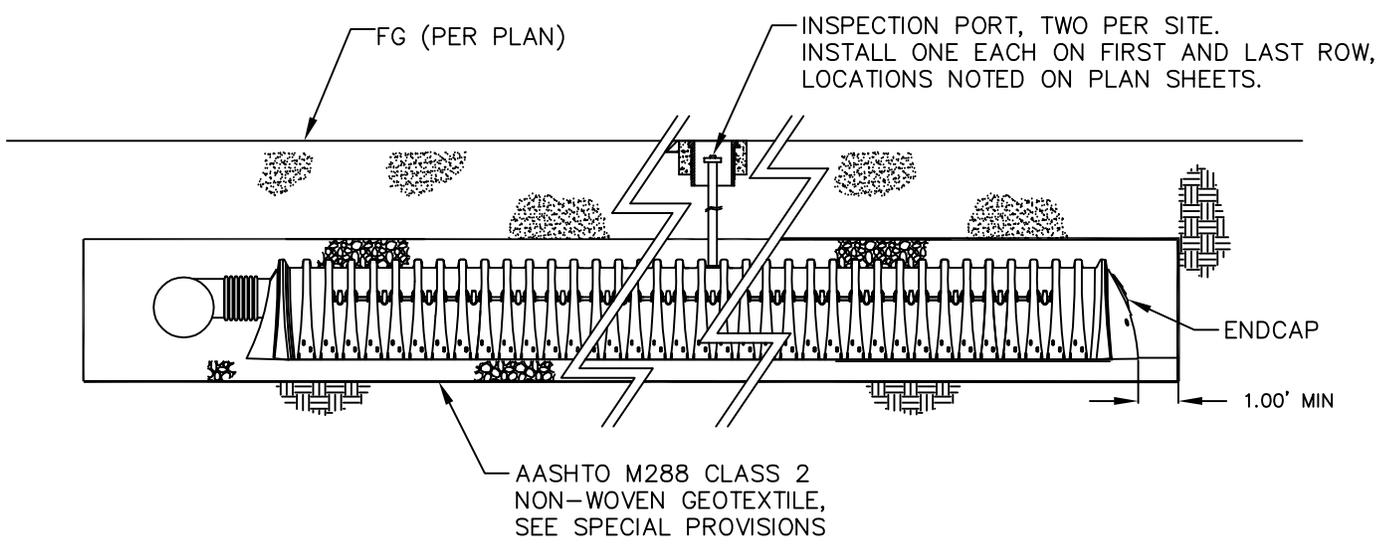
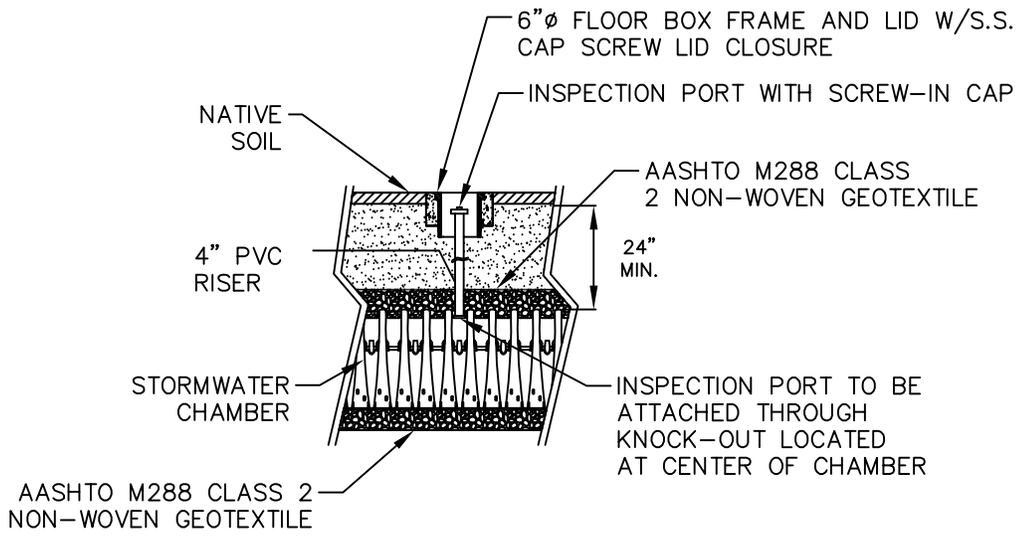
CLASS	CONCRETE PIPE					CORRUGATED METAL PIPE ALL SIZES 11-20 LOADING	CORRUGATED HIGH DENSITY POLYETHYLENE DUAL WALL INTERIOR ONLY SMOOTH INTERIOR ONLY
	C-14 REINFORCED						
DIA	SS	ES	I	II	III	IV	V
ALL SIZES	27"	24"	27"	24"	18"	12"	12"
							18"

MINIMUM ALLOWABLE COVER - DRAINAGE PIPES  
(MEASURED SURFACE TO TOP OF PIPE IN INCHES)



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
COVER REQUIREMENTS

APPROVED BY: [Signature Line]  
CITY ENGINEER  
STANDARD DRAWING SD64  
NOT TO SCALE

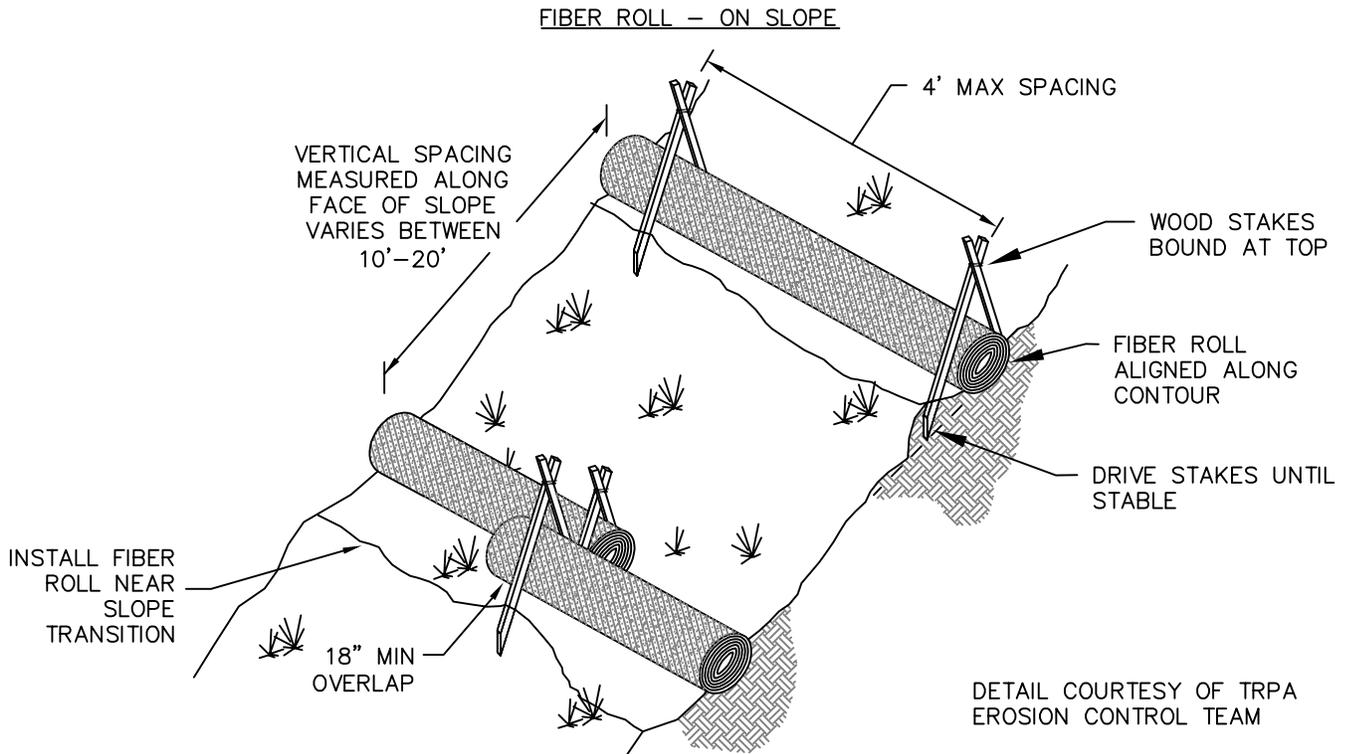
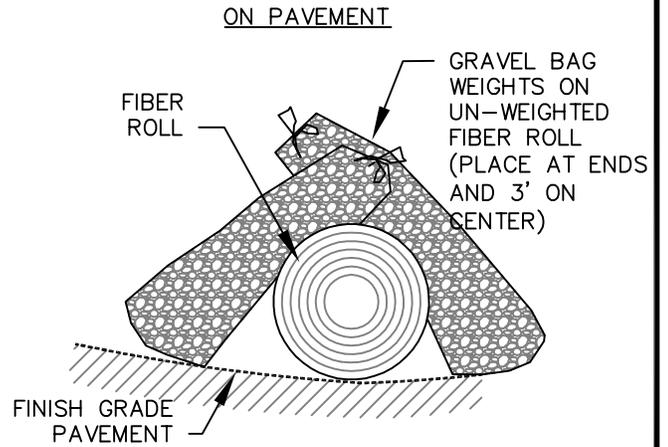
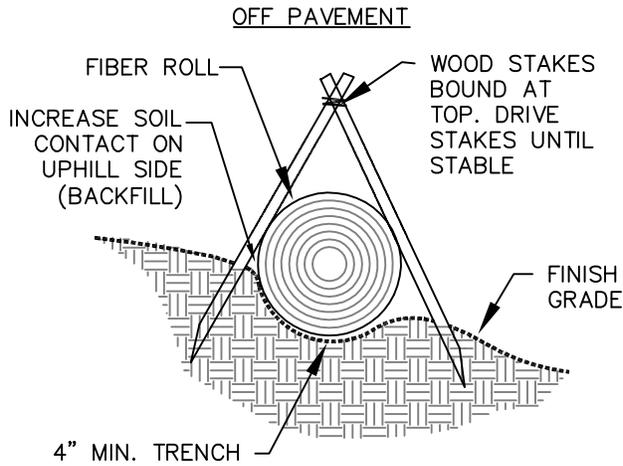


City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
INFILTRATION GALLERY  
AND INSPECTION PORT

APPROVED BY:  
12/28/07 CITY ENGINEER

NOT TO SCALE

STANDARD DRAWING  
SD70



DETAIL COURTESY OF TRPA  
EROSION CONTROL TEAM

**NOTES**

1. INSTALL ALONG SLOPE CONTOUR, PERPENDICULAR TO SLOPE DIRECTION.
2. INSTALL FROM BOTTOM OF SLOPE UP TO PREVENT ACCIDENTAL DOWNSLOPE CONTAMINATION.
3. FIBER ROLLS MUST BE ENTRENCHED 1/3 TO 1/2 HEIGHT OF ROLL TO ENSURE MAXIMUM CONTACT SURFACE AREA WITH SOIL.
4. ENSURE THAT THE FIBER ROLL MAKES GOOD CONTACT WITH THE SOIL AT ALL LOCATIONS; THERE SHALL BE NO GAPS BENEATH THE FIBER ROLL.
5. FIBER ROLLS SHALL BE STAKED IN SUCH A MANNER THAT THEY ARE NOT DISTURBED BY WIND OR SHEET FLOW RUNOFF.
6. IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED A MINIMUM OF 18", NOT ABUTTED.
7. TURN THE ENDS OF THE FIBER ROLL UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE ROLL.
8. FIBER ROLLS SHALL BE A MINIMUM 12" DIAMETER AND USED ON SLOPES LESS THAN 7%.
9. INSPECT AND MAINTAIN FIBER ROLLS DAILY AND AFTER EACH STORM EVENT. REMOVE SEDIMENT DEPOSITS WHEN DEPOSITS REACH 1/3 HEIGHT OF INSTALLED BARRIER.

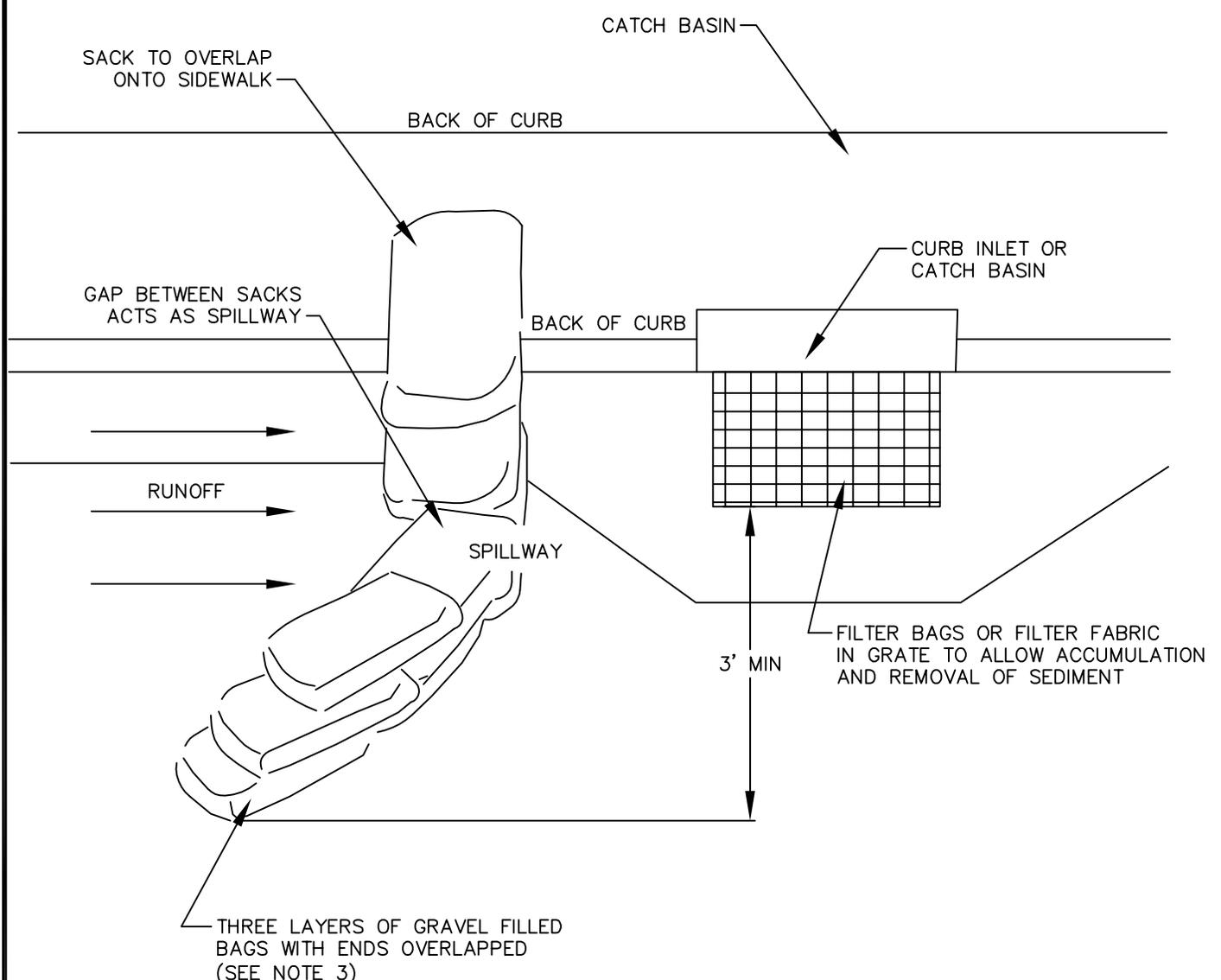


City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
EROSION CONTROL  
FIBER ROLLS

APPROVED BY:  
05/01/09 CITY ENGINEER

NOT TO SCALE

STANDARD DRAWING  
SD80



**NOTES:**

1. SACKS SHALL BE MADE OF WOVEN GEOTEXTILE FABRIC.
2. SACKS TO BE FILLED WITH 3/4" WASHED DRAIN ROCK OR 1/4" WASHED PEA GRAVEL.
3. CONSTRUCT ON GENTLY SLOPING STREETS WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE OUT OF SUSPENSION.
4. PLACE SEVERAL LAYERS OF FILLED SACKS OVER THE FIRST, OVERLAP AND PACK SACKS TIGHTLY TOGETHER TO MINIMIZE THE SPACE BETWEEN SACKS.
5. LEAVE A GAP OF ONE SACK IN THE MIDDLE OF THE TOP ROW OF SACKS TO SERVE AS THE SPILLWAY. SPILLWAY HEIGH SHALL BE LOWER THAN CURB HEIGHT AND SUFFICIENT SIZE TO PASS FLOWS FROM SEVERE STORM EVENTS.
6. INSPECT AND REPAIR BARRIER AFTER EACH STORM EVENT. REMOVE SEDIMENT WHEN IT REACHES TOP OF SPILLWAY (CURB HIEGHT)
7. SEDIMENT SHALL BE COLLECTED AND DISPOSED OF AT A TRPA APPROVED SITE.
8. SEDIMENT AND GRAVEL SHALL BE IMMEDIATELY REMOVED FROM TRAVELED WAY OF ROAD.
9. PROPRIETARY INLET PROTECTION OR ALTERNATIVES SUCH AS WEIGHTED FIBER ROLLS ARE ACCEPTABLE.

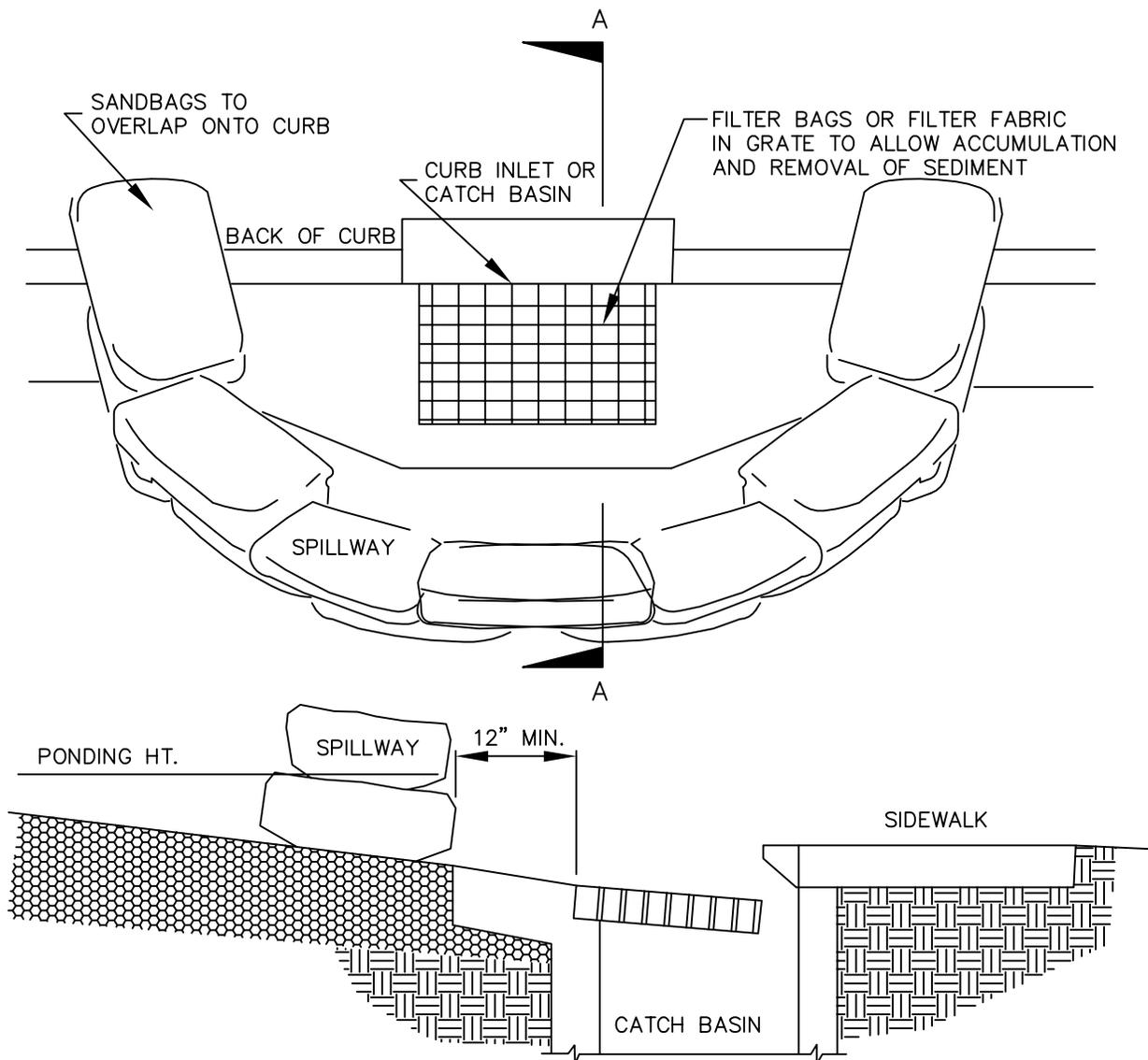


City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 EROSION CONTROL  
 INLET PROTECTION

APPROVED BY:  
 05/01/09 CITY ENGINEER

NOT TO SCALE

STANDARD DRAWING  
 SD81



**NOTES:**

1. SACKS SHALL BE MADE OF WOVEN GEOTEXTILE FABRIC.
2. SACKS TO BE FILLED WITH 3/4" WASHED DRAIN ROCK OR 1/4" WASHED PEA GRAVEL.
3. CONSTRUCT IN SAG LOCATIONS WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPERATE OUT OF SUSPENSION.
4. LEAVE A GAP OF ONE SACK IN THE MIDDLE OF THE TOP ROW TO SERVE AS THE SPILLWAY. SPILLWAY HEIGHT SHALL BE LOWER THAN CURB HEIGHT AND SUFFICIENT IN SIZE TO PASS FLOWS FROM SEVERE STORM EVENTS.
5. PLACE 2 LAYERS OF FILLED SACKS, OVERLAPPING BAGS AND PACK THEM TIGHTLY TOGETHER TO MINIMIZE THE SPACE BETWEEN SACKS.
6. INSPECT AND REPAIR FILTERS AFTER EACH STORM EVENT. REMOVE SEDIMENT WHEN ONE HALF OF THE FILTER DEPTH HAS BEEN FILLED.
7. SEDIMENT SHALL BE COLLECTED AND DISPOSED OF AT A TRPA SITE
8. SEDIMENT AND GRAVEL SHALL BE IMMEDIATELY REMOVED FROM TRAVELED WAY OF ROAD.
9. PROPRIETARY DI PROTECTION OR ALTERNATIVES SUCH AS WEIGHTED FIBER ROLLS ARE ACCEPTABLE.



City of South Lake Tahoe  
ENGINEERING DEPARTMENT

EROSION CONTROL  
INLET PROTECTION – SAG

APPROVED BY:

05/01/09

CITY ENGINEER

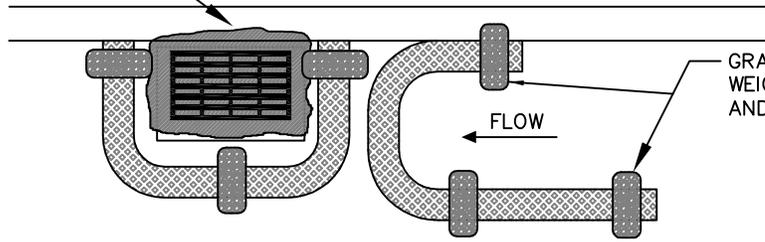
NOT  
TO  
SCALE

STANDARD DRAWING

SD82

H:\Autocad files\CSLT\_STD\_DWGS\SD83\_EC\_INLET\_PROTECT\_FIBERROLL.dwg, 4/22/2009 3:03:39 PM

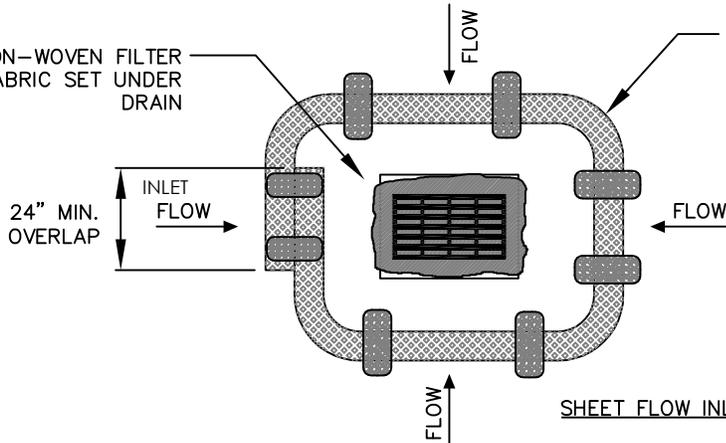
NON-WOVEN FILTER FABRIC  
SET UNDER DRAIN INLET



GRAVEL BAG  
WEIGHTS AT ENDS  
AND 3' ON CENTER

CURB INLET

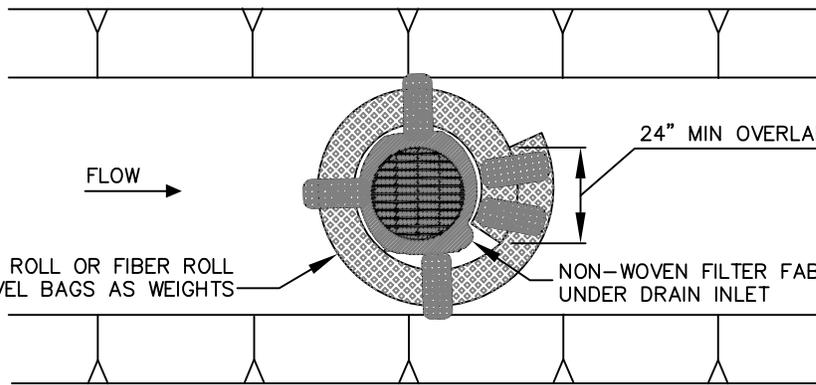
NON-WOVEN FILTER  
FABRIC SET UNDER  
DRAIN



WEIGHTED FIBER ROLL  
OR FIBER ROLL WITH  
GRAVEL BAGS AS  
WEIGHTS

24" MIN.  
OVERLAP

SHEET FLOW INLET



24" MIN OVERLAP

WEIGHTED FIBER ROLL OR FIBER ROLL  
WITH GRAVEL BAGS AS WEIGHTS

NON-WOVEN FILTER FABRIC SET  
UNDER DRAIN INLET

DRAINAGE DITCH INLET

**NOTES**

1. FIBER ROLL DRAIN INLET PROTECTION SHALL USE A MIN 12" DIAMETER ROLL AND BE INSTALLED BEFORE CONSTRUCTION BEGINS.
2. GRAVEL BAGS SHALL BE WOVEN FILTER FABRIC. SAND BAGS ARE NOT AN ACCEPTABLE SUBSTITUTE.
3. ON PAVED SURFACES, SUBSTITUTE STAKES WITH GRAVEL BAGS (USE PROPER STAKING METHODS).
4. CONSTRUCT ON GENTLY SLOPING STREETS WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE OUT OF SUSPENSION.
5. INSPECT AND REPAIR FIBER ROLLS EACH DAY AND AFTER EACH STORM EVENT. REMOVE SEDIMENT WHEN ONE THIRD OF THE FILTER DEPTH HAS BEEN FILLED. REMOVED SEDIMENT SHALL BE DISPOSED OF PROPERLY.
6. SEDIMENT AND GRAVEL DEPOSITED ON ROADWAYS SHALL BE IMMEDIATELY REMOVED.
7. IN HIGH TRAFFIC AREAS, MARK DRAIN INLET PROTECTION WITH VISIBLE BARRIERS SUCH AS SAFETY CONES.
8. REMOVE DRAIN INLET PROTECTION AFTER THE SURROUNDING AREA IS STABILIZED.

DETAIL COURTESY OF TRPA  
EROSION CONTROL TEAM



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
EROSION CONTROL – INLET  
FIBER ROLL PROTECTION

APPROVED BY:

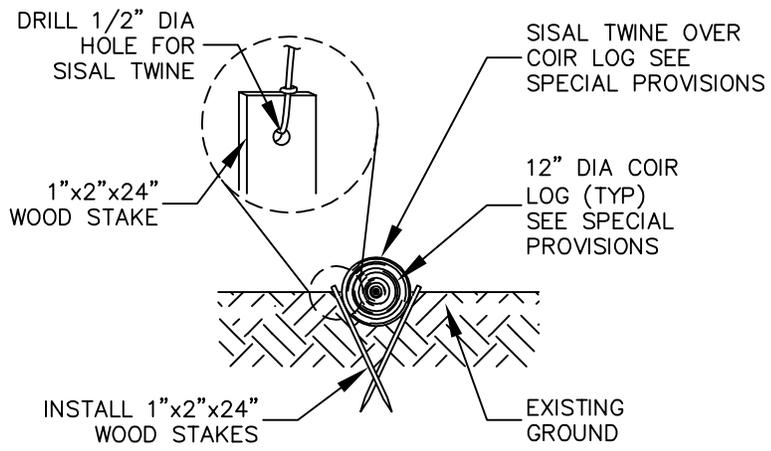
05/01/09

CITY ENGINEER

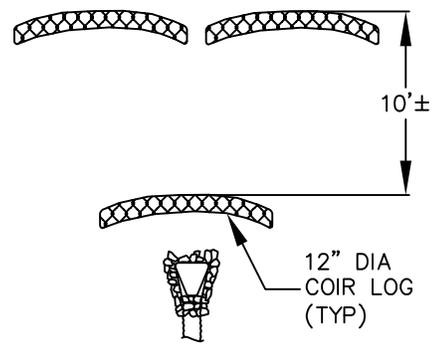
NOT  
TO  
SCALE

STANDARD DRAWING

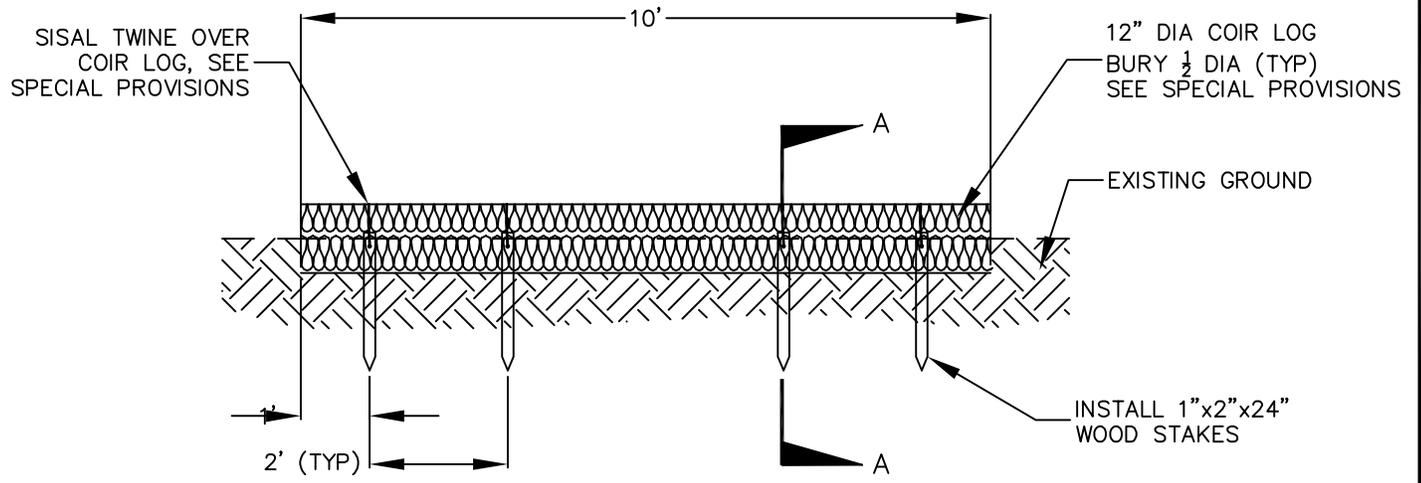
SD83



SECTION A-A



COIR LOG PLAN



COIR LOG PROFILE

NOTE:  
 PLACEMENT OF COIR LOGS IS SUBJECT TO EXISTING CONDITIONS. FINAL LOCATIONS TO BE DETERMINED BY THE ENGINEER IN THE FIELD.

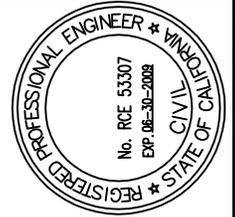
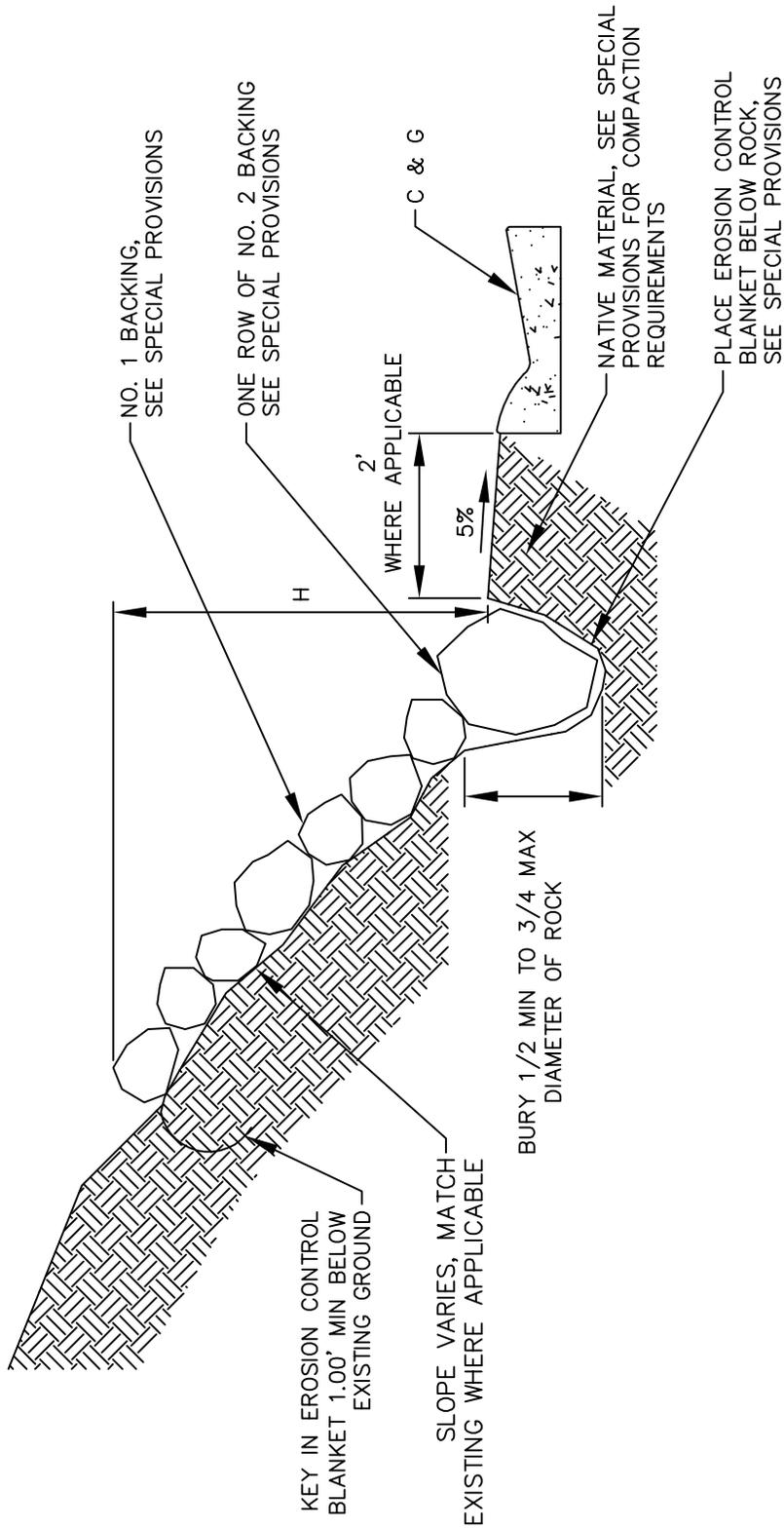


City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 EROSION CONTROL  
 COIR LOG STAKING

APPROVED BY:  
 05/01/09 CITY ENGINEER

NOT TO SCALE

STANDARD DRAWING  
 SD84



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 EROSION CONTROL  
 ROCK SLOPE PROTECTION

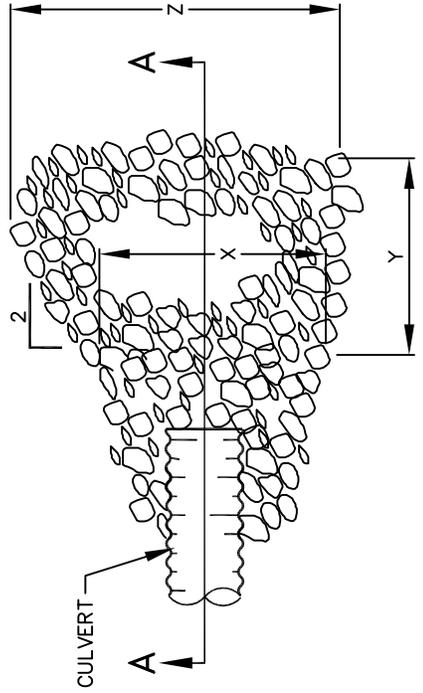
APPROVED BY:

NOT TO SCALE

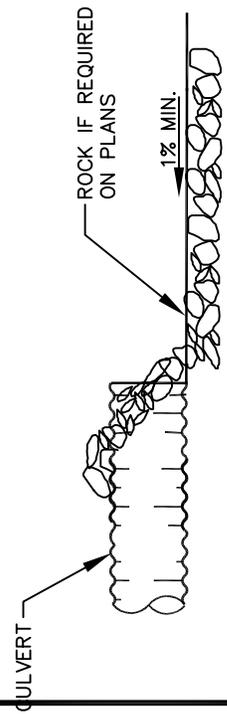
STANDARD DRAWING  
 SD85

05/01/2009

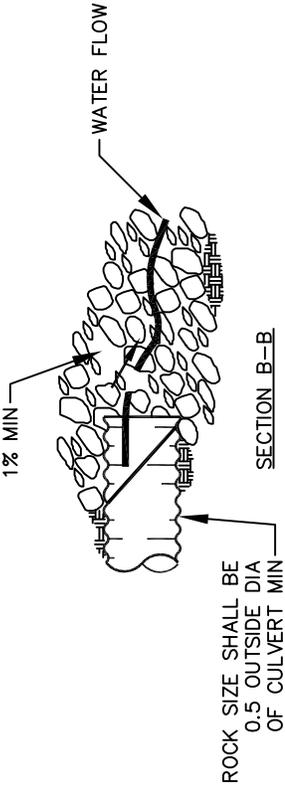
CITY ENGINEER



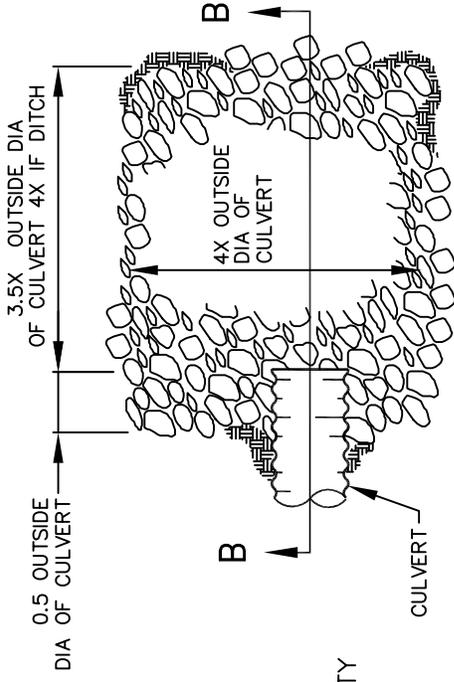
INLET PROTECTION  
PLAN VIEW



SECTION A-A



SECTION B-B



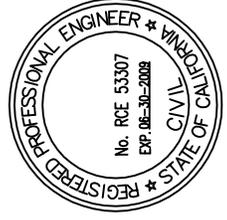
OUTLET PROTECTION  
PLAN VIEW

DO NOT USE THIS DETAIL IF THE STORM WATER VELOCITY IS LESS THAN 5ft./SEC

INLET PROTECTION MINIMUM DIMENSIONS					
ROCK CLASS	PIPE Ø IN.	X FEET	Y FEET	Z FEET	Z FEET
NO. 1 BACKING	12	3	4	5	5
NO. 1 BACKING	18	4.5	6	7.5	7.5
NO. 1 BACKING	24	6	8	10	10
NO. 1 BACKING	30	7.5	10	12.5	12.5
NO. 1 BACKING	36	9	12	15	15
NO. 1 BACKING	42	10.5	14	17.5	17.5
NO. 1 BACKING	48	12	16	20	20

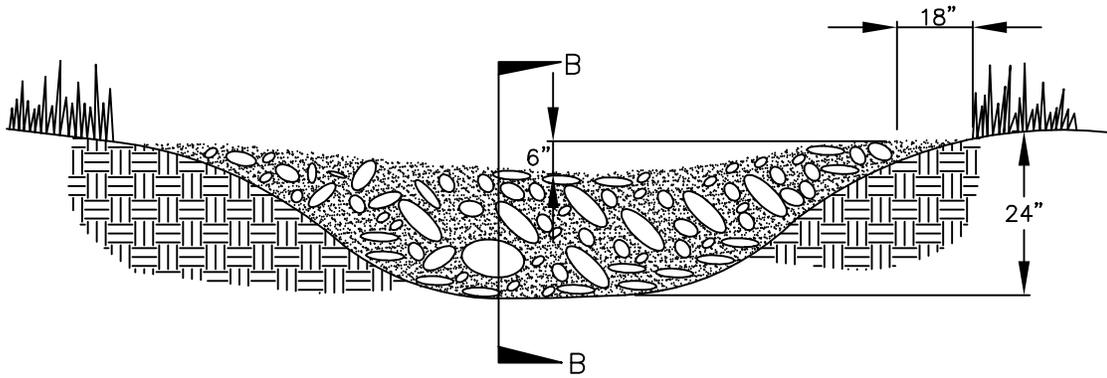
NOTES:

- HAND PLACE ROCKS.
- ALL ROCKS SHALL BE ANGULAR.
- WHERE OUTLET SLOPE EXCEEDS 5%, A SEDIMENT BOWL OR ENERGY DISSIPATOR SHALL BE REQUIRED.
- ROCK SLOPE PROTECTION SHALL BE SLOPED AT A MIN OF 1% INTO OR OUT OF CULVERT.
- ALL CULVERTS OF 48 INCHES OR LARGER SHALL BE INSTALLED WITH REINFORCED CONCRETE HEADWALLS AND END WALLS WITH CUTOFF WALLS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- ON OUTLET APPLICATIONS, 50% OF THE ROCKS SHALL BE LARGER THAN HALF THE DIAMETER OF THE PIPE.



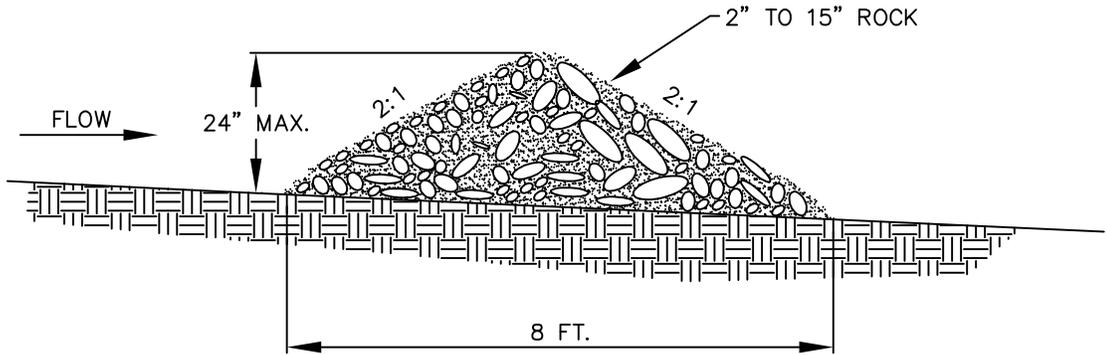
City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
EROSION CONTROL – OUTLET  
ROCK PROTECTION

APPROVED BY: \_\_\_\_\_ NOT TO SCALE  
CITY ENGINEER \_\_\_\_\_ STANDARD DRAWING SD86  
05/01/2009



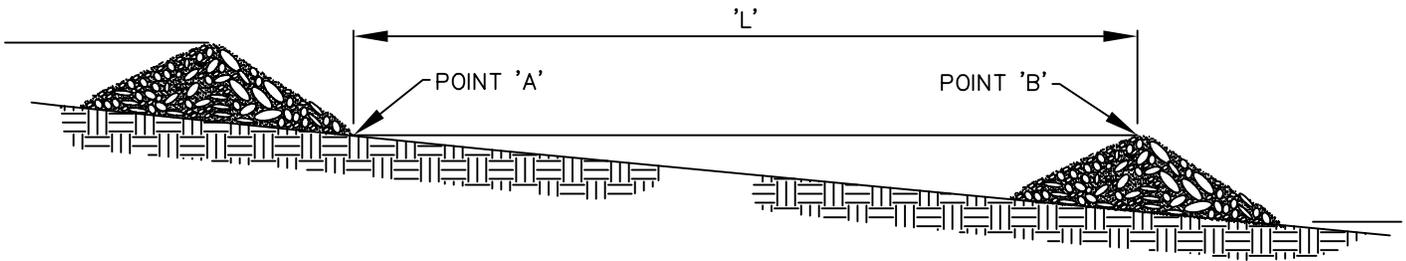
VIEW LOOKING UP STREAM

NOTES:  
KEY STONE INTO THE DITCH BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT OVER FLOW AROUND DAM.



SECTION B-B

'L' = THE DISTANCE SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION



SPACING CHECK DAMS



City of South Lake Tahoe  
ENGINEERING DEPARTMENT

EROSION CONTROL  
ROCK CHECK DAM

APPROVED BY:

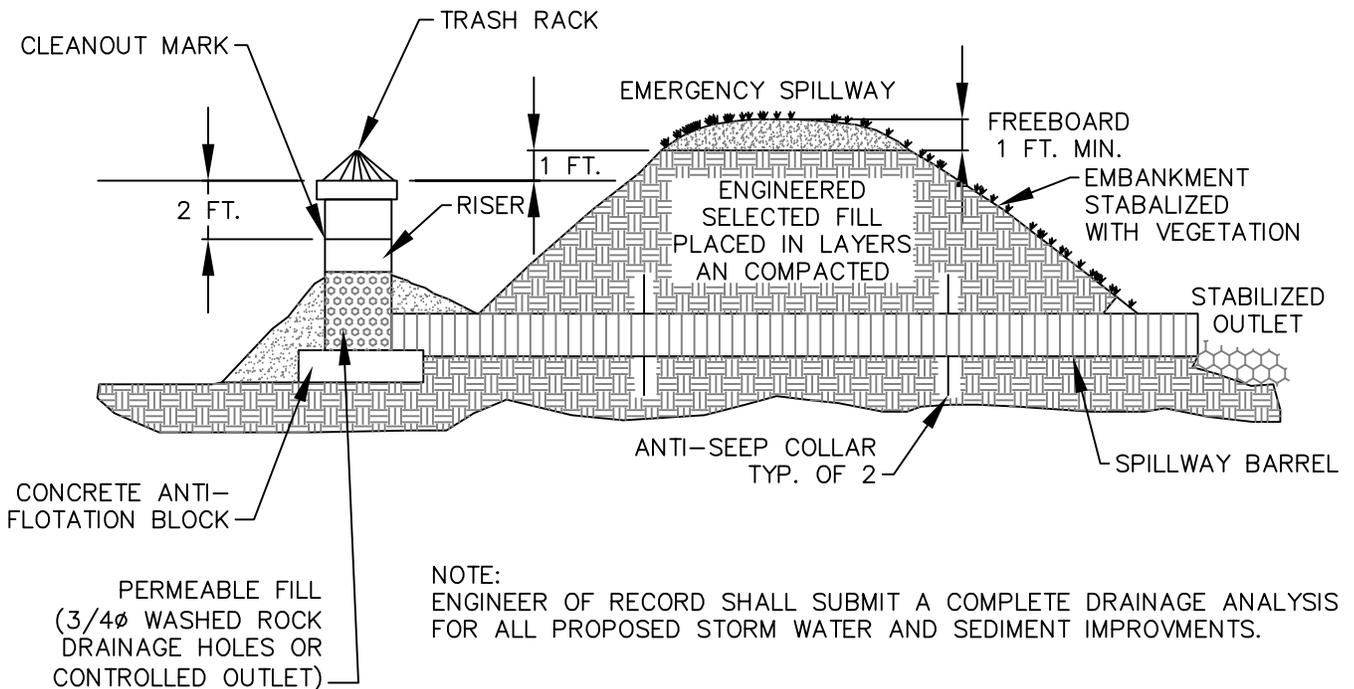
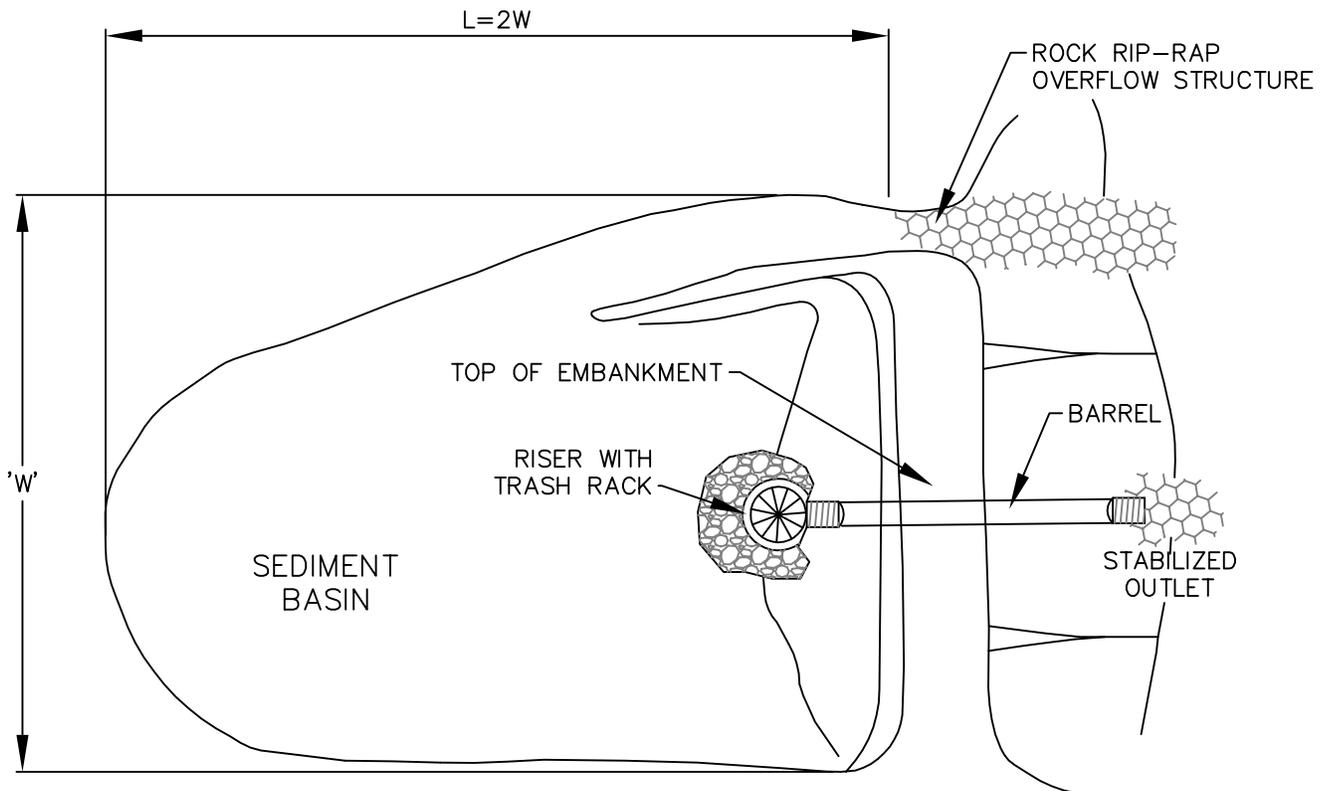
12/28/07

CITY ENGINEER

NOT  
TO  
SCALE

STANDARD DRAWING

SD87



NOTE:  
ENGINEER OF RECORD SHALL SUBMIT A COMPLETE DRAINAGE ANALYSIS  
FOR ALL PROPOSED STORM WATER AND SEDIMENT IMPROVEMENTS.



City of South Lake Tahoe  
ENGINEERING DEPARTMENT

EROSION CONTROL  
SEDIMENT BASIN

APPROVED BY:

12/28/07

CITY ENGINEER

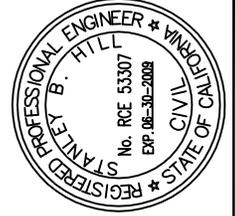
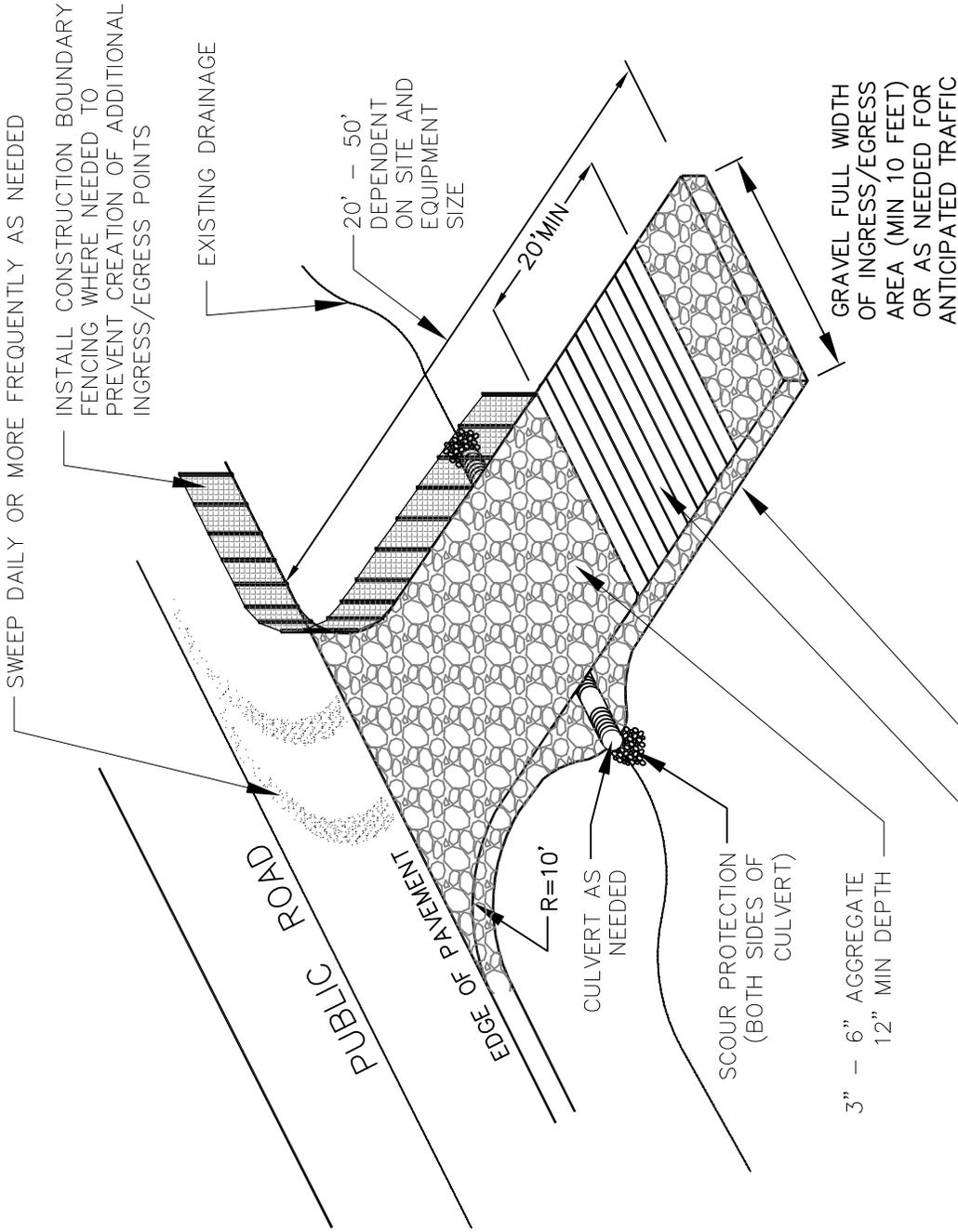
NOT  
TO  
SCALE

STANDARD DRAWING

SD88

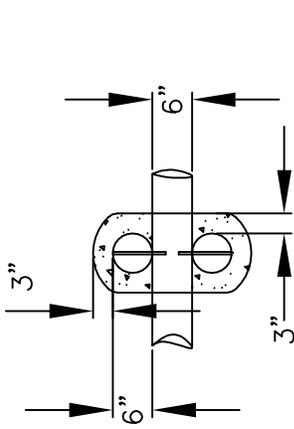
**NOTES:**

1. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE USED AT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS.
2. THE AGGREGATE SHALL BE 3" - 6" CRUSHED ROCK.
3. THE ENTRANCE SHALL BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
4. THE ENTRANCE SHALL BE CONSTRUCTED ON LEVEL GROUND, WHERE FEASIBLE, AND LOCATED WHERE PERMANENT DRIVEWAY OR PARKING AREAS ARE PLANNED.
5. TOP DRESSING WITH ADDITIONAL STONE SHALL BE PROVIDED WHEN SURFACE VOIDS ARE NO LONGER VISIBLE OR WHEN THERE IS FREQUENT OFF-SITE TRACKING. FREQUENT OFF-SITE TRACKING MAY INDICATE THE NEED FOR GRAVEL REPLACEMENT.
6. CONTRACTOR TO MAINTAIN CONSTRUCTION ENTRANCE AT ALL TIMES.
7. ALL SEDIMENT DEPOSITS ON PAVED ROADWAYS SHALL BE SWEEPED AND REMOVED DAILY OR MORE FREQUENTLY AS NEEDED.
8. LIMIT CONSTRUCTION TRAFFIC DURING WET WEATHER OR WHEN THE SITE IS SATURATED, MUDDY OR COVERED IN SNOW.
9. LIMIT SPEEDS OF INGRESS/EGRESS VEHICLES TO 5 MPH OR LESS.
10. GEOTEXTILE & ROCK SHALL BE REMOVED AT COMPLETION OF CONSTRUCTION.
11. ALL AREAS DISTURBED BY THE CONTRACTOR AND NOT OTHERWISE STABILIZE SHALL BE RESTORED WITH VEGETATION TO THE SATISFACTION OF THE ENGINEER.

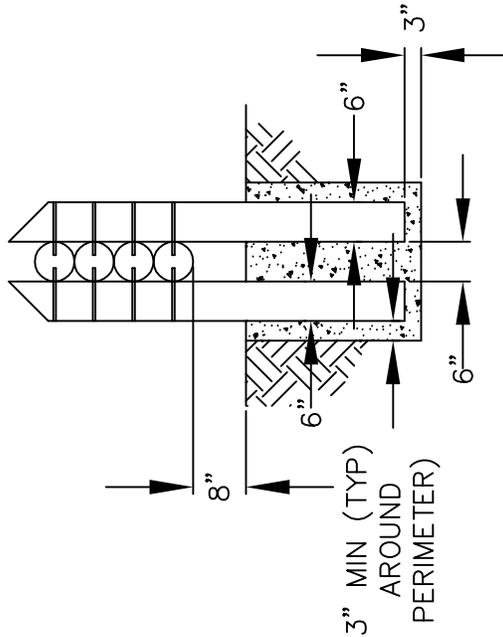
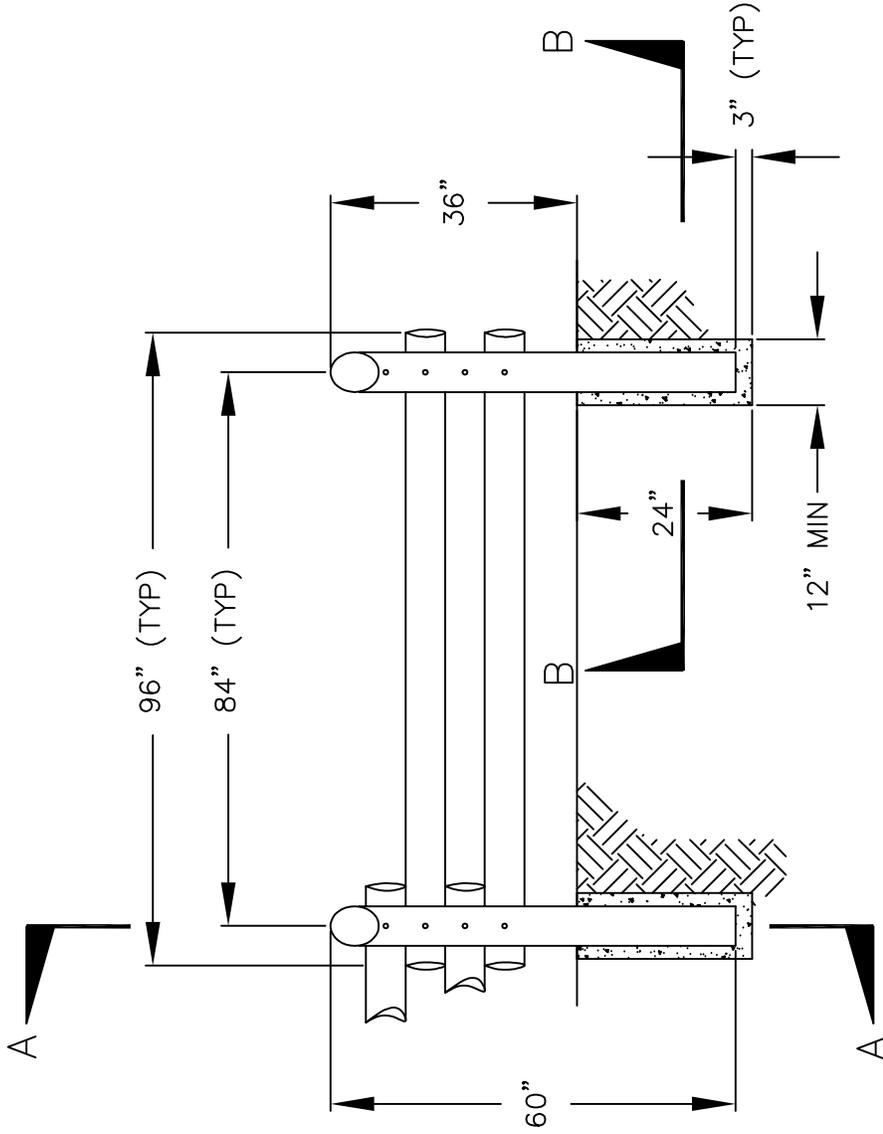


	City of South Lake Tahoe ENGINEERING DEPARTMENT	NOT TO SCALE STANDARD DRAWING SD89
	EROSION CONTROL CONSTRUCTION ENTRANCE	
APPROVED BY:	CITY ENGINEER	05/01/2009

GEOTEXTILE FABRIC FOR  
 SUBGRADE REINFORCEMENT  
 AS NEEDED  
  
 RUMBLE STRIP AS NEEDED  
  
 3" - 6" AGGREGATE  
 12" MIN DEPTH  
  
 SCOUR PROTECTION  
 (BOTH SIDES OF  
 CULVERT)  
  
 CULVERT AS  
 NEEDED  
  
 R=10'  
  
 EDGE OF PAVEMENT  
  
 PUBLIC ROAD  
  
 SWEEP DAILY OR MORE FREQUENTLY AS NEEDED  
  
 INSTALL CONSTRUCTION BOUNDARY  
 FENCING WHERE NEEDED TO  
 PREVENT CREATION OF ADDITIONAL  
 INGRESS/EGRESS POINTS  
  
 20' - 50'  
 DEPENDENT  
 ON SITE AND  
 EQUIPMENT  
 SIZE  
  
 20' MIN  
  
 GRAVEL FULL WIDTH  
 OF INGRESS/EGRESS  
 AREA (MIN 10 FEET)  
 OR AS NEEDED FOR  
 ANTICIPATED TRAFFIC

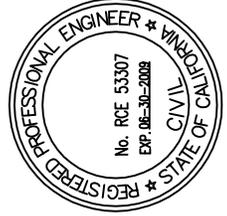


SECTION B-B



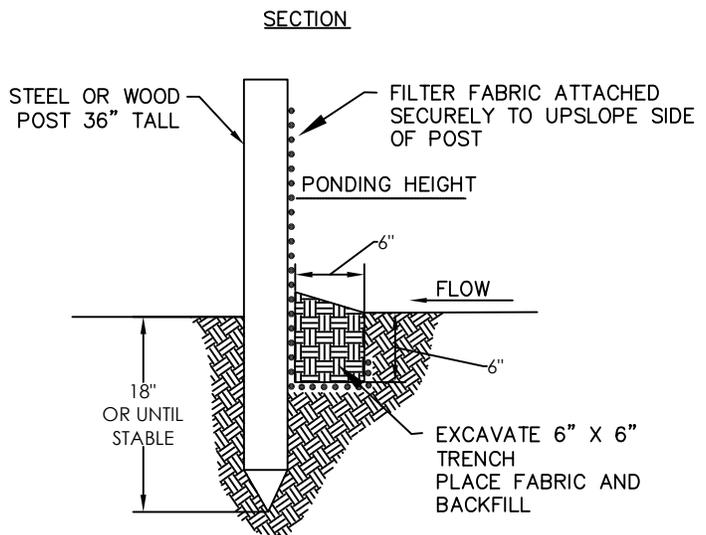
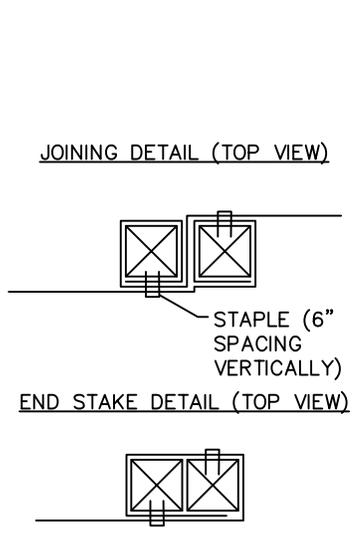
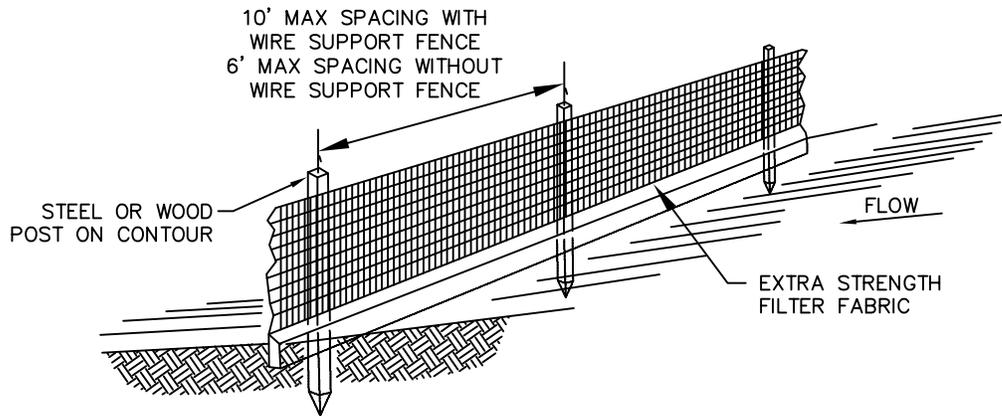
SECTION A-A

NOTE:  
 COUNTERSINK 3/8" X 8" LONG LAG SCREW  
 & WASHER 1" DEEP WITH 1" BIT.



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 EROSION CONTROL - FENCES  
 PEELERCORE FENCE

APPROVED BY: \_\_\_\_\_ CITY ENGINEER  
 NOT TO SCALE  
 STANDARD DRAWING SD90  
 05/01/2009



**NOTES:**

1. USE PRINCIPALLY IN AREAS WHERE SHEET FLOW OCCURS.
2. DO NOT USE IN STREAMS, CHANNELS, OR ANYWHERE FLOW IS CONCENTRATED. DO NOT USE SILT FENCES TO DIVERT FLOW.
3. DO NOT USE BELOW SLOPES SUBJECT TO CREEP, SLUMPING, OR LANDSLIDES.
4. SILT FENCE SHOULD BE WOVEN POLYPROPYLENE WITH A MINIMUM WIDTH OF 36 INCHES AND A MINIMUM TENSILE STRENGTH OF 100 LB FORCE.
5. INSTALL ALONG A LEVEL CONTOUR, SO WATER DOES NOT POND MORE THAT 1.5 FT AT ANY POINT ALONG THE SILT FENCE.
6. THE MAXIMUM LENGTH OF SLOPE DRAINING TO ANY POINT ALONG THE SILT FENCE SHOULD BE 100 FT OR LESS.
7. THE MAXIMUM SLOPE PERPENDICULAR TO THE FENCE LINE SHOULD BE 1:1.
8. PROVIDE SUFFICIENT ROOM FOR RUNOFF TO POND BEHIND THE FENCE AND TO ALLOW SEDIMENT REMOVAL EQUIPMENT TO PASS BETWEEN THE SILT FENCE AND TOES OF SLOPES OR OTHER OBSTRUCTIONS.
9. TURN THE ENDS OF THE FILTER FENCE UPHILL TO CREATE A "J" SHAPE, TO PREVENT STORM WATER FROM FLOWING AROUND THE FENCE.
10. LEAVE AN UNDISTURBED OR STABILIZED AREA IMMEDIATELY DOWN SLOPE FROM THE FENCE WHERE FEASIBLE.
11. SILT FENCES SHOULD REMAIN IN PLACE UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.
12. REMOVE SEDIMENT WHEN DEPOSITS REACH APPROXIMATELY 1/3 HEIGHT OF BARRIER.

DETAIL COURTESY OF TRPA  
EROSION CONTROL TEAM

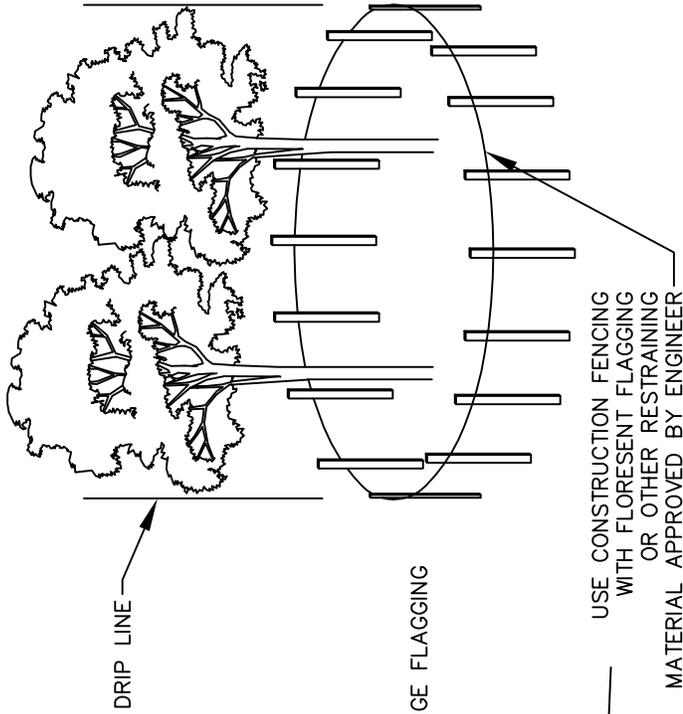


City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
EROSION CONTROL – FENCES  
SILT FENCE

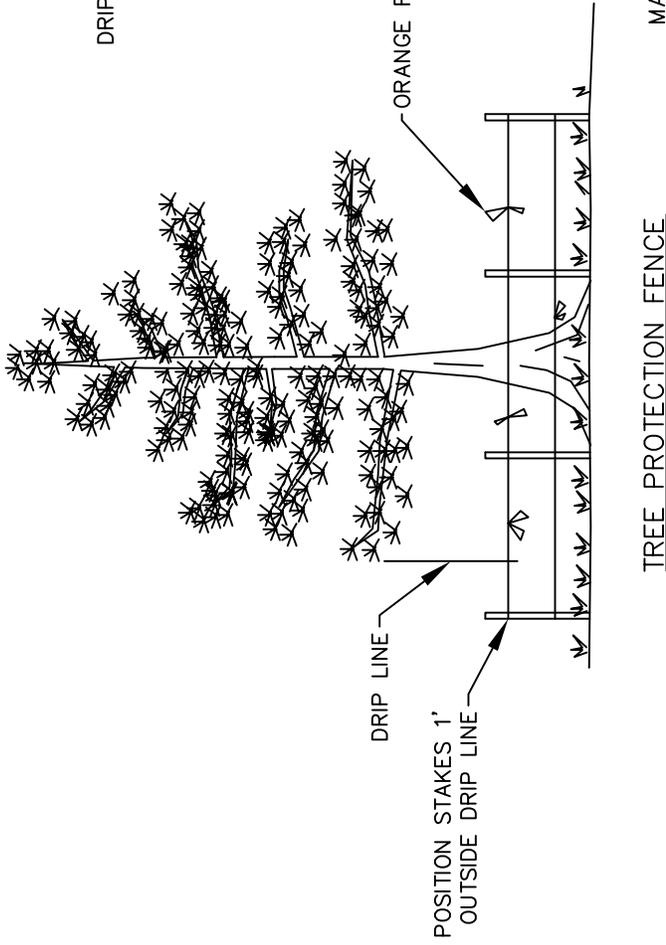
APPROVED BY:  
12/28/07 CITY ENGINEER

NOT TO SCALE

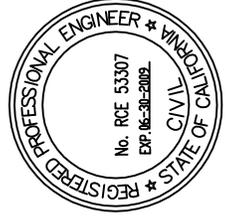
STANDARD DRAWING  
SD91



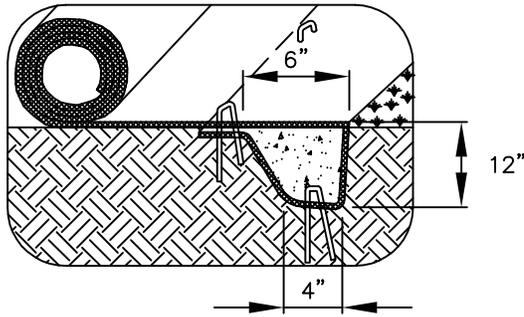
TEMPORARY VEGETATION PROTECTION FENCING



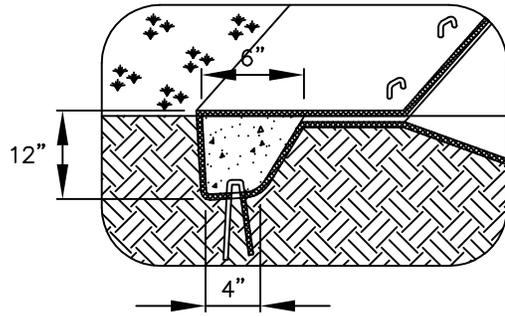
City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 EROSION CONTROL – FENCES  
 TREE PROTECTION



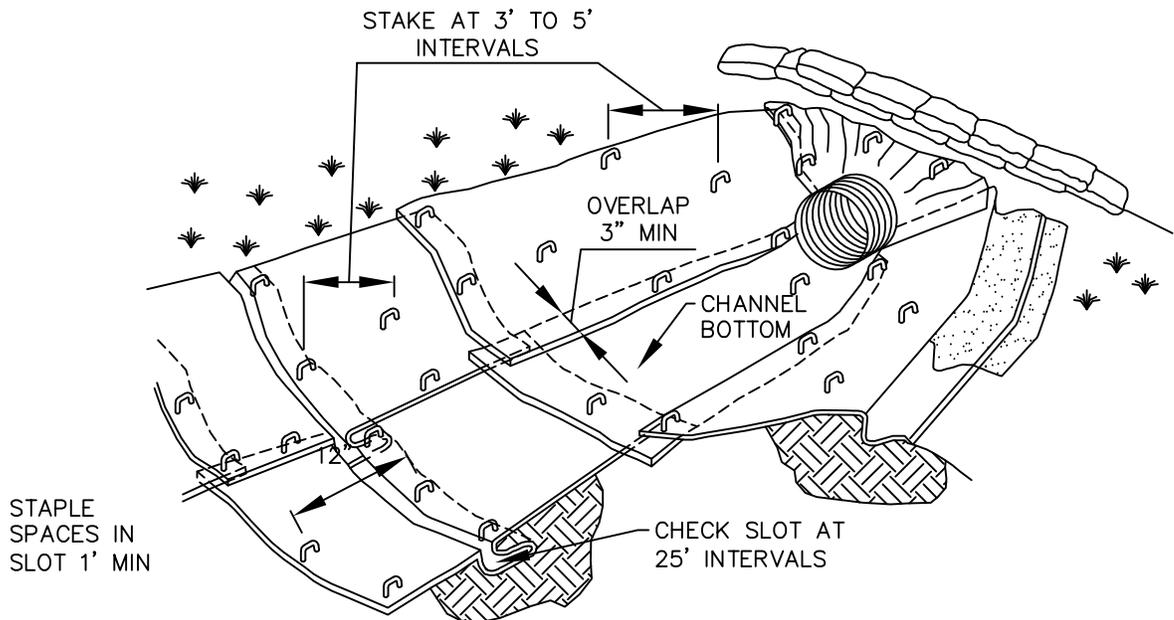
APPROVED BY: \_\_\_\_\_ CITY ENGINEER  
 NOT TO SCALE  
 STANDARD DRAWING SD92



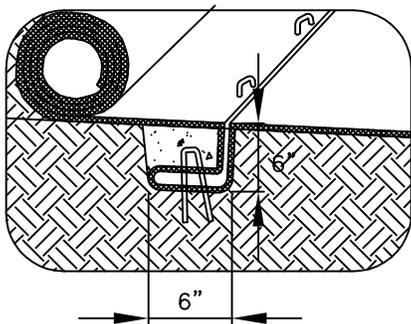
INITIAL CHANNEL ANCHOR TRENCH



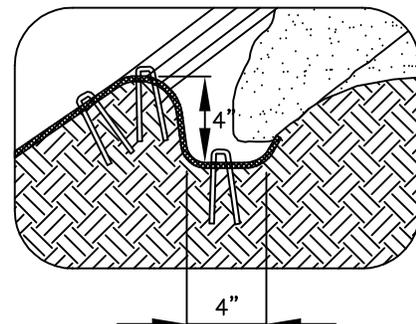
TERMINAL SLOPE & CHANNEL ANCHOR TRENCH



TYPICAL CHANNEL DETAIL – ISOMETRIC VIEW



INTERMITTENT CHECK SLOT



LONGITUDINAL ANCHOR TRENCH



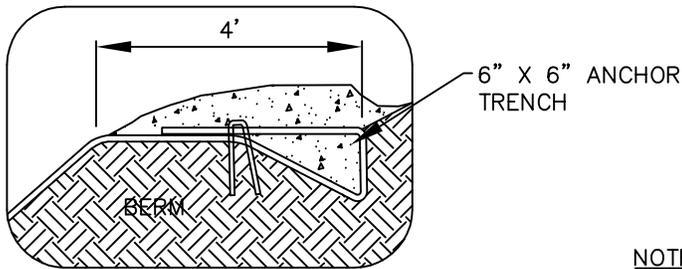
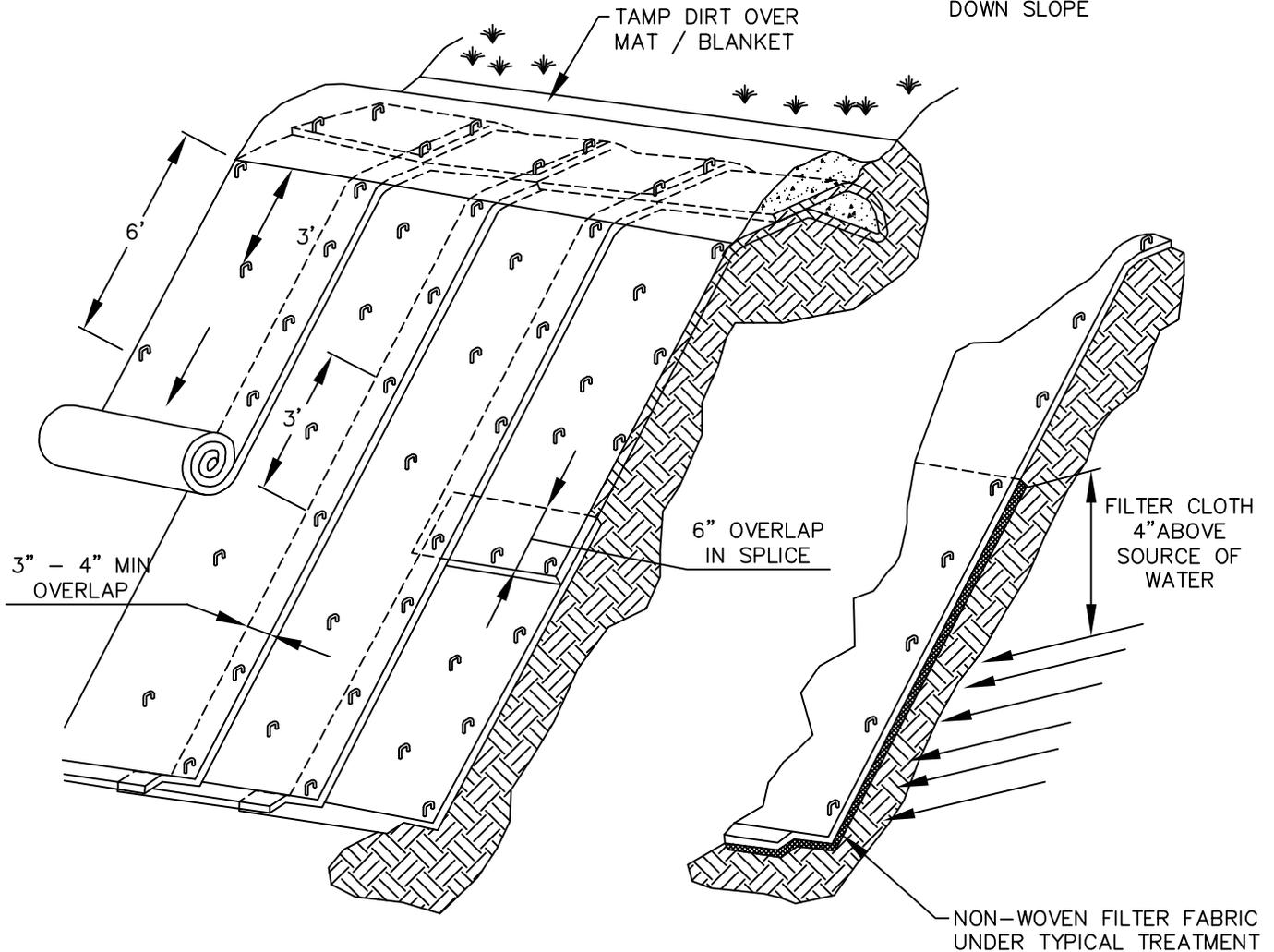
City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
EROSION CONTROL – CHANNELS  
FILTER FABRIC, MATS & BLANKETS

APPROVED BY:  
05/01/09 CITY ENGINEER

NOT TO SCALE

STANDARD DRAWING  
SD93

MATS/BLANKLETS SHOULD BE INSTALLED VERTICALLY DOWN SLOPE



**NOTE:**

FILTER CLOTH BELOW FABRIC IN ALL APPLICATIONS NEAR OR BELOW FILTER WATER TABLE.

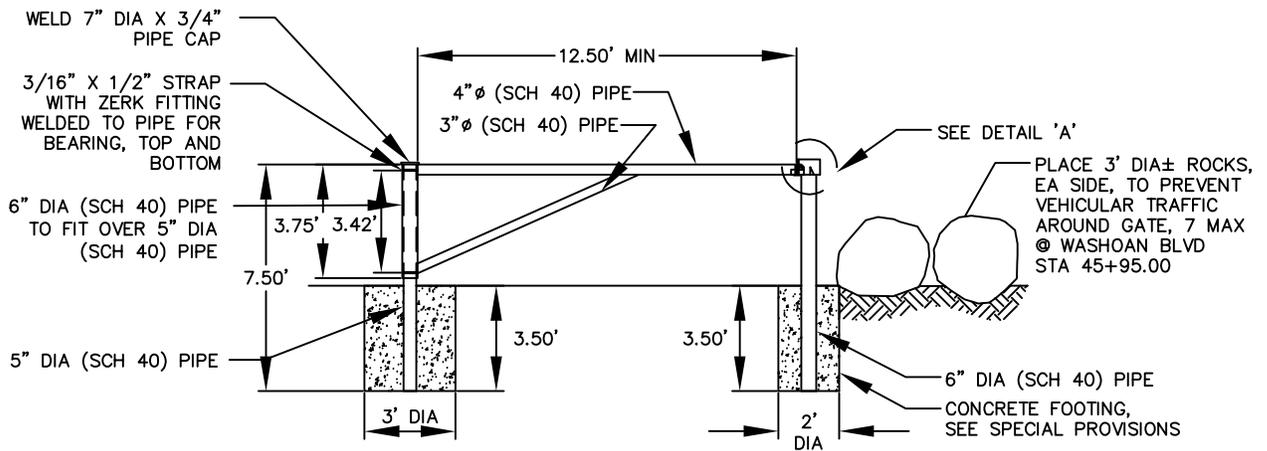
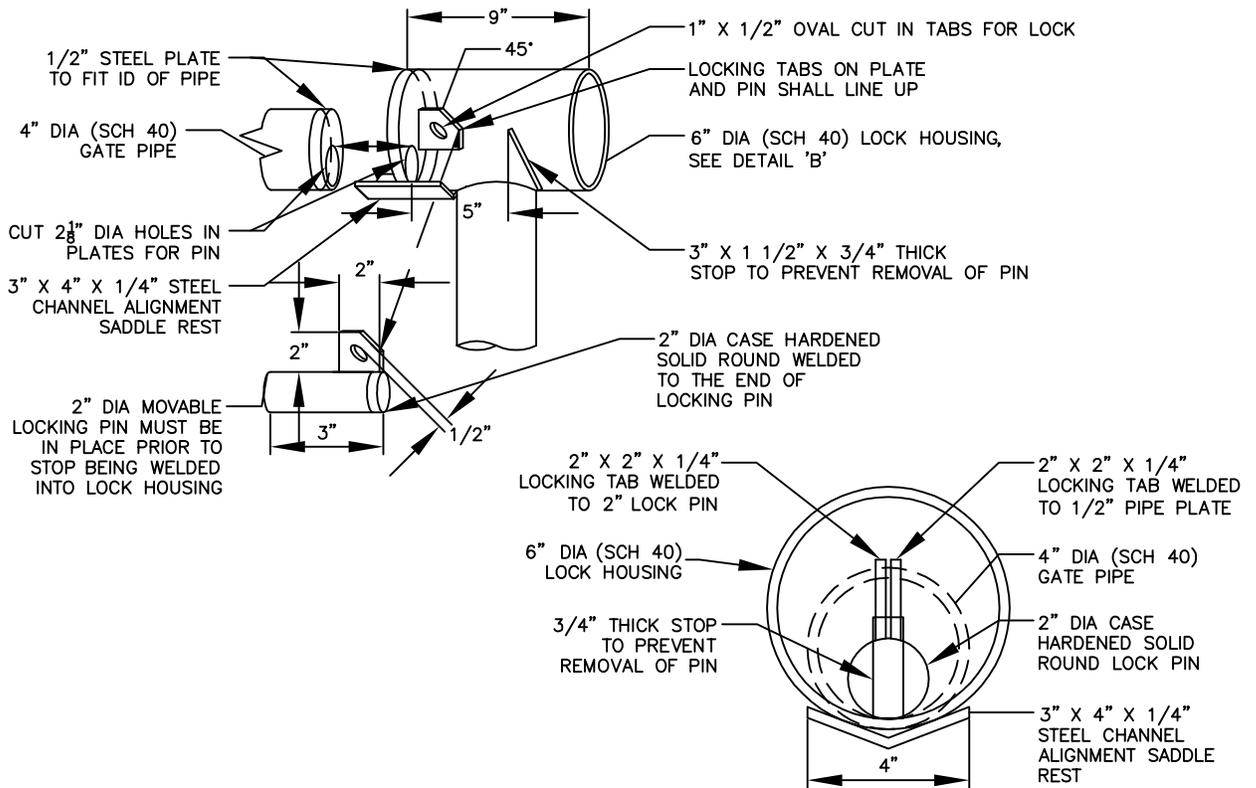


City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 EROSION CONTROL – SLOPES  
 FILTER FABRIC, MATS & BLANKETS

APPROVED BY:  
 05/01/09 CITY ENGINEER

NOT TO SCALE

STANDARD DRAWING  
 SD94



NOTE: ALL PIPES SHALL BE POWDER COATED DARK GREEN AT SHOP PRIOR TO INSTALLATION.



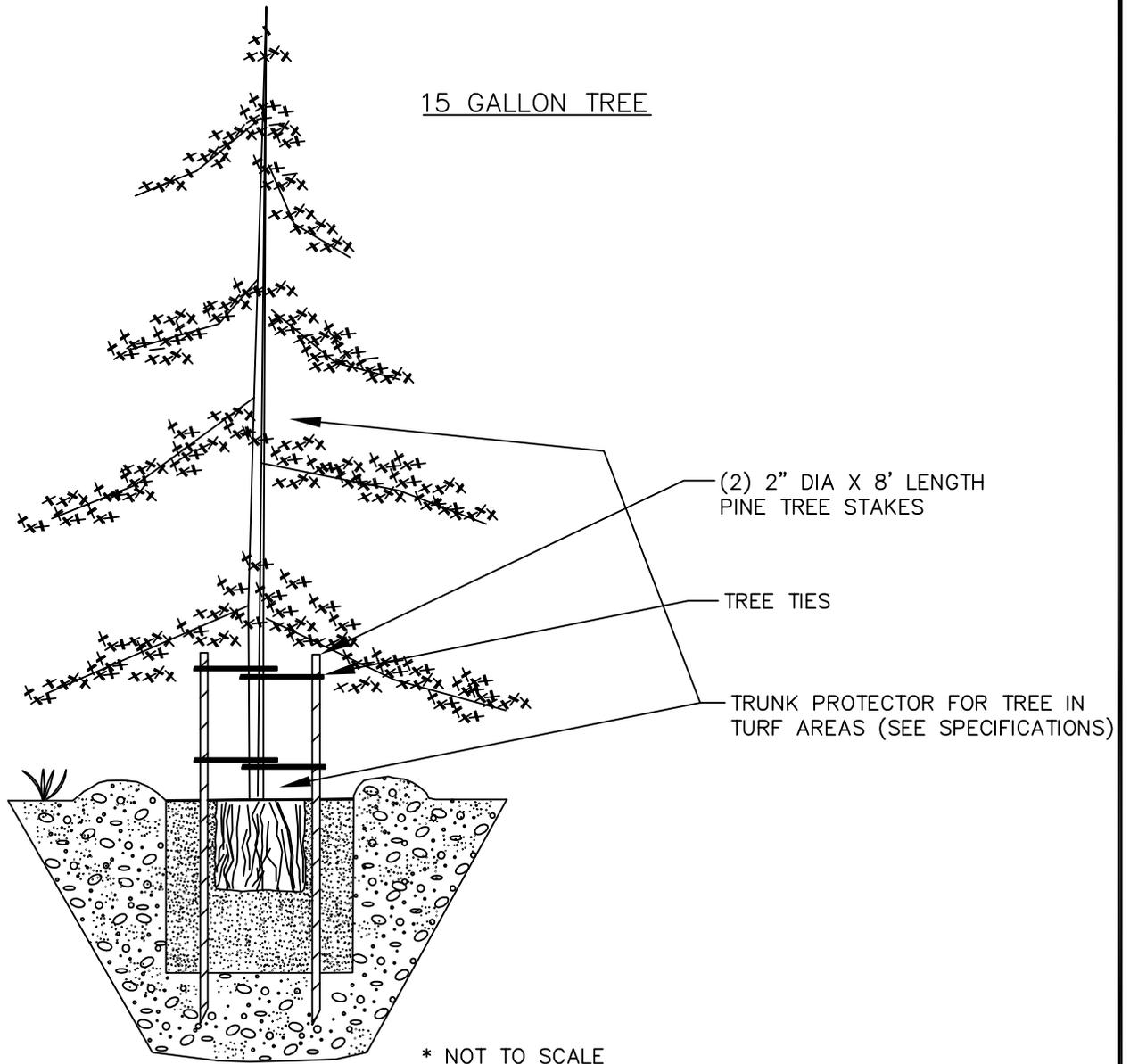
City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
EROSION CONTROL – GATES  
ACCESS GATE

APPROVED BY:  
05/01/09 CITY ENGINEER

NOT TO SCALE

STANDARD DRAWING  
SD95

15 GALLON TREE



\* NOT TO SCALE

NOTES:

1. STAKING SHALL BE COMPLETED THE SAME DAY AS THE TREE PLANTING.
2. SPACE STAKES EVENLY AND VERTICALLY ON THE OUTSIDE OF THE TREE ROOT BALL AND DRIVE FIRMLY INTO UNDISTURBED SOIL. STAKE SHALL BE DRIVEN AT AN ANGLE AND DRAWN TO VERTICAL. DO NOT DRIVE STAKE THROUGH ROOT BALL.
3. REMOVE NURSERY STAKE AT TIME OF INSTALLATION.
4. TREES SHALL BE DOUBLE STAKED AND SUPPORTED WITH FOUR "CINCH-TIES". WRAP "CINCH-TIE" AROUND THE TREE TRUNK AND THE STAKE TWISTING TO FORM A FIGURE EIGHT. SECURE WITH A GALVANIZED NAIL DRIVEN THROUGH THE "CINCH-TIE" AND INTO THE STAKE TO PREVENT SLIPPAGE.



City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
EROSION CONTROL  
TREE STAKING

APPROVED BY:

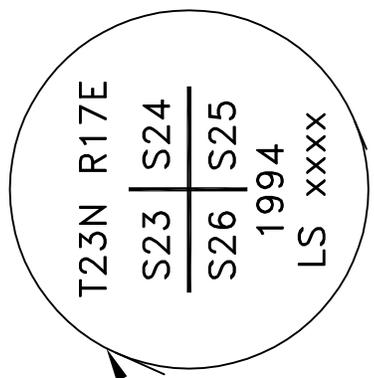
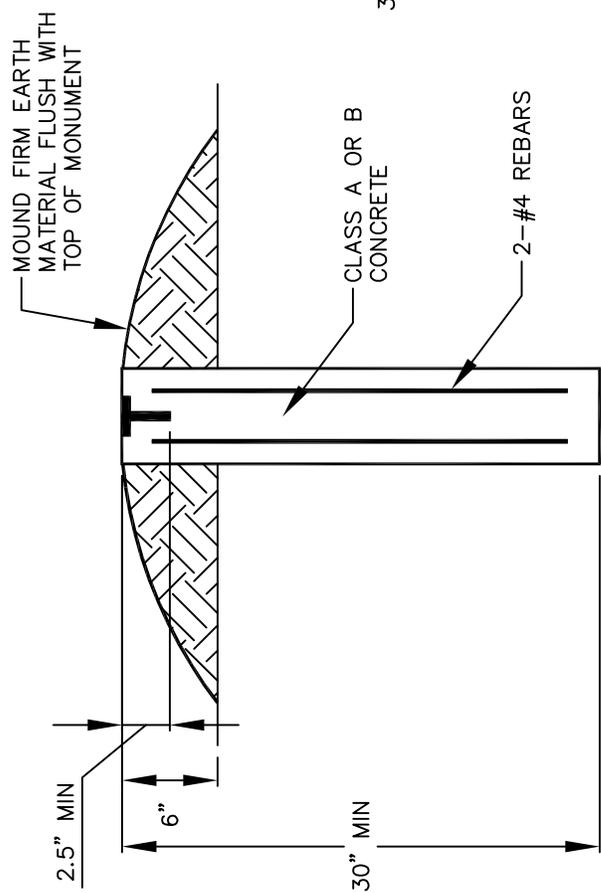
05/01/09

CITY ENGINEER

NOT  
TO  
SCALE

STANDARD DRAWING

SD96



BRONZE MARKER OR CAP  
2"  $\phi$  MIN  
(W/ SAMPLE MARKINGS)

BRONZE CAP  
2"  $\phi$  MIN

PLACE ROCK MOUND

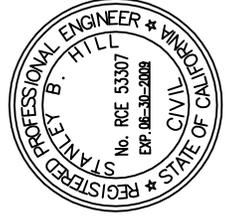
2" MIN INSIDE DIAMETER GALVANIZED IRON PIPE DRIVEN INTO GROUND. IF PLACED IN HOLE CONCRETE SHALL BE USED AS BACKFILL

DETAIL A

DETAIL B

NOTES:

1. SET ACCORDING TO DETAIL A, IF ACCESSIBLE.
2. SET ACCORDING TO DETAIL B, IF NOT READILY ACCESSIBLE.
3. SET ACCORDING TO STD. DRAWING #41 IF CORNER FALLS ON ROAD.

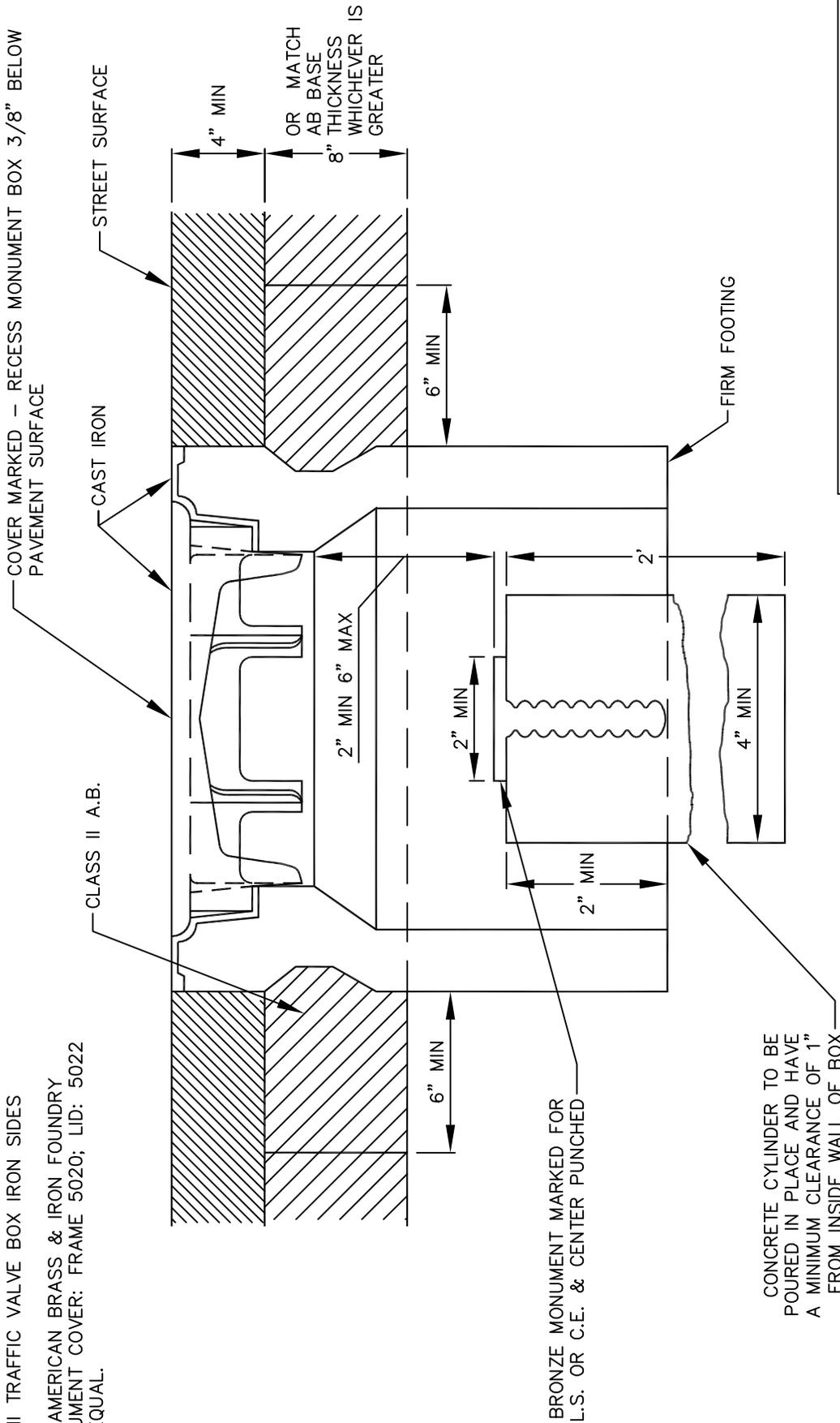


City of South Lake Tahoe  
ENGINEERING DEPARTMENT  
MONUMENTS

APPROVED BY:	CITY ENGINEER	STANDARD DRAWING
05/01/2009		SD100
	NOT TO SCALE	

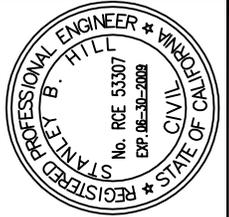
MONUMENT BOX

BROOKS #3-RT TRAFFIC GATE VALVE BOX  
 FORNI TRAFFIC VALVE BOX IRON SIDES  
 THE AMERICAN BRASS & IRON FOUNDRY  
 MONUMENT COVER: FRAME 5020; LID: 5022  
 OR EQUAL.



BRONZE MONUMENT MARKED FOR  
 L.S. OR C.E. & CENTER PUNCHED

CONCRETE CYLINDER TO BE  
 POURED IN PLACE AND HAVE  
 A MINIMUM CLEARANCE OF 1"  
 FROM INSIDE WALL OF BOX



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 SURVEY MONUMENT  
 IN PAVEMENT

APPROVED BY:

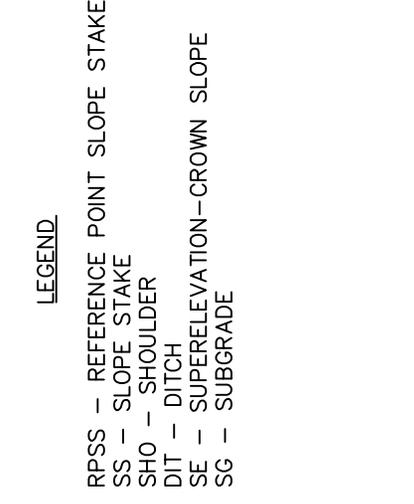
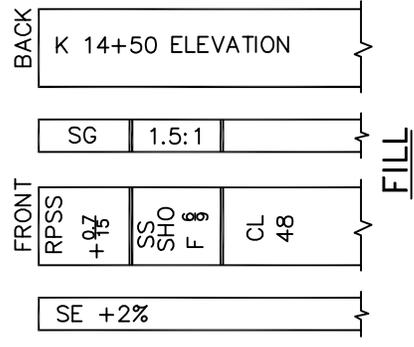
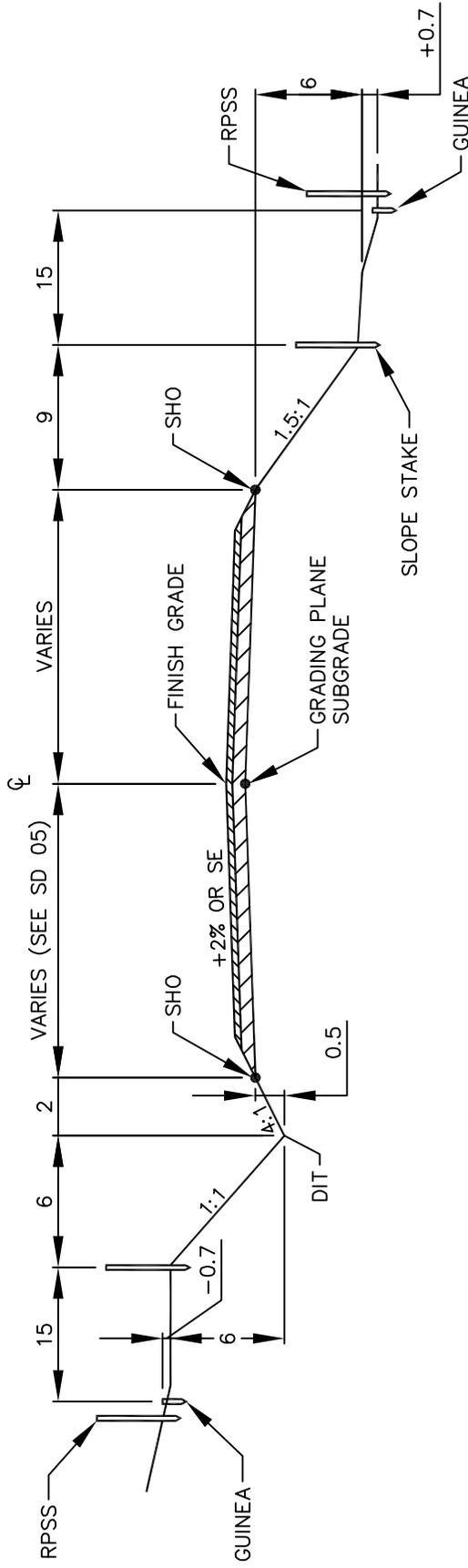
NOT TO SCALE

05/01/2009

CITY ENGINEER

STANDARD DRAWING

SD101

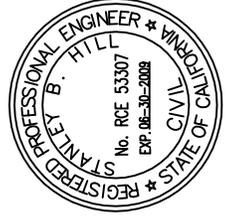


**LEGEND**

RPSS - REFERENCE POINT SLOPE STAKE  
 SS - SLOPE STAKE  
 SHO - SHOULDER  
 DIT - DITCH  
 SE - SUPERELEVATION - CROWN SLOPE  
 SG - SUBGRADE

**NOTES:**

- SUBGRADE AND AGGREGATE BASE GRADING NOTES SHALL BE SUPPLIED WITH ELEVATIONS AND CROSS SLOPE AT EACH STATION FOR CENTERLINE AND BOTH SHOULDER POINTS. A GUINEA WITH WHISKERS SHALL BE PLACED TO THE CORRECT ELEVATION AND GRADED TO CENTERLINE ON BOTH SHOULDERS AT EACH STATION FOR SUBGRADE AND AGGREGATE BASE GRADE.
- ALTERNATIVE STAKING METHODS MAY BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.
- STAKING NOTES SHALL BE GIVEN TO THE CITY ENGINEER UPON REQUEST.



City of South Lake Tahoe  
 ENGINEERING DEPARTMENT  
 CONSTRUCTION STAKING

APPROVED BY: [Signature]

STANDARD DRAWING SD102

NOT TO SCALE

05/01/2009 CITY ENGINEER

**SECTION 11** **CITY OF SOUTH LAKE TAHOE STANDARD**  
**ENGINEERING SPECIFICATIONS**

**PLEASE NOTE: Section 11 is in reference to the State of California, Department Of Transportation, Standard Specifications (Caltrans Standard Specifications) (Sections 11-1 – 11-95 are equivalent to Caltrans Sections 1-95, In Parentheses)**

**Scope and Precedence**

This document shall be known and referred to as "City of South Lake Tahoe Standard Engineering Specifications." These Specifications were adopted by resolution of the City Planning Commission on April 30, 2009. Unless modified by these Specifications, the design, construction, maintenance, and repair of roads shall be performed in accordance with the most current edition of the *State of California Department of Transportation Standard Specifications*. Should subjective issues arise that are not specifically addressed within the Standard Specifications, or other reference specifications, and guidelines, such as the *Standard Specifications for Public Works Construction* ("GREENBOOK") the Engineer shall be notified for clarification.

The Engineering Division may continuously develop or amend and include within these Standards as warranted, what shall be known and referred to as, the "City of South Lake Tahoe Standard Drawings" or "Standard Drawings," and the City of South Lake Tahoe Public Improvement and Engineering Standards, for the purpose of delineating what constitutes accepted practices for those minor details of road construction not specifically set forth in this document, but necessary for the complete design of improvements.

All construction, trenching, excavation, and improvement work shall conform to these Standards, Specifications, Standard Drawings, or Engineer's directives, which are on file in the Engineer's Office of the City of South Lake Tahoe, California and/or in effect at the time of the actual start of work. Deviations or departures from such standards, specifications, and/or drawings require written approval/variance from the City Engineer. Any details of road construction not specifically included in these Standards shall be designed in accordance with currently accepted engineering practices, subject to approval by the Engineer. Within the scope of this document, the Engineer or designee has the authority to enforce compliance with these Standards.

All documents referenced in these Standards are intended to be complimentary and to describe and provide for a complete work. In descending order of precedence, the following documents shall be applicable to the improvement designs and engineering standards:

- A. Project Specifications
- B. Project Plans
- C. Special Provisions of Encroachment Permits or Contracts

- D. City of South Lake Tahoe Public Improvement and Engineering Standards
- E. City of South Lake Tahoe Standard Specifications
- F. City of South Lake Tahoe Standard Drawings
- G. Permits from agencies as may be required by law
- H. Reference Guidelines or Specifications
- I. State Standard Plans
- J. Other Specifications
- K. Engineer's Directives, Change Orders, supplemental agreements, and approved revisions to any Standards or Drawings shall have precedence over B through J above.

If the proposed work, or any of the matters relative thereto are not sufficiently detailed or explained in the Contract Documents, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform to them as part of the contract. In the event of any doubt or questions arising respecting the true meaning of the Contract Documents, reference shall be made to the Engineer, whose decision thereon shall be final.

In the event of any discrepancy between drawing and the figures written thereon, the figures shall be taken as correct. Detail drawings shall prevail over general drawings.

### **Section 11-1 Standard Specifications**

The current edition of the State of California Department of Transportation (Caltrans) Standard Specifications. Reference to, or use of the term "Standard Specifications" are to the Caltrans Standard Specifications unless noted otherwise. All section numbers and titles herein are identical or added consecutively to the Standard Specifications. When the statement, "The Standard Specifications are incorporated herein," is used, it means the section(s) is adopted from the Standard Specifications without change. When the statement, "The Standard Specifications are incorporated herein except as noted" is used, it means that the section(s) is adopted from the Standard Specifications except for additions or exceptions incorporated. When the statement, "NOT ADOPTED" is used, it means that the section(s) from the Standard Specifications has not been adopted.

### **SECTION 1 DEFINITIONS AND TERMS**

The Standard Specifications are incorporated herein except as noted:

#### **Section 11-1.03 Acceptance**

The formal written acceptance by the City of South Lake Tahoe of an entire contract which has been completed in all respects in accordance with the plans and specifications and any modifications thereof previously approved.

**Contractor**

The individual, partnership, corporation, joint venture, or other legal entity having a Contract with the Agency to perform the Work. In the case of work being done under permit issued by the Agency, the permittee shall be construed to be the Contractor. The term "prime contractor" shall mean Contractor.

**Department of Public Works or Department**

The City Department that oversees/heads the Engineering Division (City Engineer), Street Maintenance Division, Building Facilities Division, and Motor Pool. The Director of Public Works advises the Agency and Council concerning street maintenance, snow removal, City owned buildings maintenance, motor pool, and engineering.

**Engineer**

The Registered Civil Engineer and City Engineering Manager for the City of South Lake Tahoe or his/her designee.

**Plans**

The drawings, profiles, cross sections, working drawings, and supplemental drawings, or reproductions thereof, approved by the Engineer, which show the location, character, dimensions, or details of the Work.

**Specifications**

Refer to the City of South Lake Tahoe Standard Specifications unless otherwise referenced.

**Subgrade**

For roadways, that portion of the roadbed on which pavement, surfacing, base, sub-base, or a layer of other material is placed. For structures, the soil prepared to support a structure.

**SECTION 11-2 PROPOSAL REQUIREMENTS AND CONDITIONS**  
**(NOT ADOPTED)**

**SECTION 11-3 AWARD AND EXECUTION OF CONTRACT**  
**(NOT ADOPTED)**

**SECTION 11-4 SCOPE OF WORK**

The Standard Specifications are incorporated herein except as noted:

**Section 11-4(1.03) Changes**

The Engineer reserves the right to make such alterations, deviations, additions to or deletions from the plans and specifications, including the right to increase or decrease the quantity of any item or portion of the work or to delete any item or portion of the work, as may be deemed by the Engineer to be necessary or advisable and to require such extra work as may be determined by the Engineer to be required for the proper completion or construction of the whole work contemplated.

- 4-1.03A Procedure and Protest (Not Adopted)
- 4-1.03B Increased and Decreased Quantities (Not Adopted)
- 4-1.03B(1) Increases of More than 25% (Not Adopted)
- 4-1.03B(2) Decreases of More than 25% (Not Adopted)
- 4-1.03B(3) Eliminated Items (Not Adopted)
- 4-1.03C Changes in Character of Work (Not Adopted)
- 4-1.03D Extra Work (Not Adopted)

**SECTION 11-5 CONTROL OF WORK**

The Standard Specifications are incorporated herein except as noted:

**Section 11-5 (1.04) Coordination and Interpretation of Plans, Standard Specifications, and Special Provisions**

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Contract Documents, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform to them as part of the contract. (Also see Scope and Precedence.)

**Section 11-5 (1.07) Lines and Grades**

- 5-1.07A Staking - The following lines and grades will normally be furnished by the Private Engineer for construction:
  - 5-1.07A(1) Clearing stakes - One set of stakes at 50-foot intervals, or as required.
  - 5-1.07A(2) Slope stakes - One set of offset stakes at 50 foot intervals, or as required.
  - 5-1.07A(3) Subgrade, Subbase and Base Stakes - The Contractor shall place blue tops at 50ft intervals, or as required by the City Engineer for subgrade, subbase and base grade as directed by the Engineer. See Standard Drawings. Alternate staking methods may be submitted to the City Engineer for approval. Two copies

of the approved staking notes shall be submitted to the City Engineer prior to construction.

The Contractor shall furnish two men to assist the Engineer in checking blue top elevations at any time.

- 5-1.07A(4) Utility Stakes - When required by the Engineer, grade stakes shall be used for utility line control. Separate staking shall be required at street intersections.
- 5-1.07A(5) All necessary line, location and elevations stakes for pipes, drainage structures, curb and gutter, and other miscellaneous facilities.
- 5-1.07B When errors in staking are found by the Contractor, he shall notify the Engineer. The Private Engineer shall immediately correct the erroneous stakes.

## **SECTION 11-6 CONTROL OF MATERIALS**

The Standard Specifications are incorporated herein except as noted:

### **Section 11-6 (1.02) State-Furnished Materials (not adopted)**

### **Section 11-6 (2.0) Local Materials (not adopted)**

### **Section 11-6 (2.02) Possible Local Material Sources (not adopted)**

### **Section 11-6 (2.03) Mandatory Local Material Sources (not adopted)**

## **SECTION 11-7 LEGAL RELATIONS AND RESPONSIBILITY**

The Standard Specifications are incorporated herein except as noted:

- 7-1.01A Labor Code Requirements (not adopted)
- 7-1.01A(l) Hours of Labor (not adopted)
- 7-1.01A(2) Prevailing Wage (not adopted)
- 7-1.01A(2)(a) Travel and Subsistence Payments (not adopted)
- 7-1.01A(3) Payroll Records (not adopted)
- 7-1.01A(4) Labor Nondiscrimination (not adopted)
- 7-1.01A(5) Apprentices (not adopted)
- 7-1.01A(6) Worker's Compensation (not adopted)
- 7-1.01A(7) Suits to Recover Penalties and Forfeitures (not adopted)
- 7-1.01B Fair Labor Standards Act (not adopted)
- 7-1.01J Assignment of Antitrust Actions (not adopted)
- 7-1.03 Payment of Taxes (not adopted)

### **Section 11-7 (1.10) Preservation of Property**

Attention is directed to Section 7-1.12, "Responsibility for Damage," and to Section 8-1.10, "Utility and Non-Highway Facilities." Roadside trees, shrubs, and other plants that are not to be removed, and pole lines, fences, signs, markers and monuments, buildings and structures, conduits, pipelines under or above ground, sewer and water lines, all highway facilities, and any other improvements or facilities within or adjacent to the highway shall be protected from injury or damage, and if ordered by the Engineer, the Contractor shall provide and install suitable safeguards, approved by the Engineer, to protect such objects from injury or damage. If such objects are injured or damaged by reason of the Contractor's operations, they shall be replaced or restored at the Contractor's expense. The facilities shall be replaced or restored to a condition as good as when the Contractor entered upon the work, or as good as required by the specifications accompanying the contract, if any such objects are part of the work being performed under the contract. The Engineer may make or cause to be made such temporary repairs as are necessary to restore to service any damaged highway facility. The cost of such repairs shall be borne by the Contractor and may be deducted from any monies due or to become due to the Contractor under the contract.

The location of existing utilities such as gas mains, water and sewer mains, drainage lines, underground electric and telephone installations where indicated on the plans are in accordance with such information as may be available to the City. However, the exact positions of such facilities must be ascertained by the Contractor by means of potholing. Likewise it shall be the duty of the Contractor to ascertain if additional facilities other than those shown on the plans may exist. The information concerning utilities as shown on the plans is offered for such use as the Contractor may wish to make of it but the City does not guarantee its correctness or completeness.

The limits of work shall be flagged in the field by the Private Engineer. The contractor shall confine all construction activities to these limits. Upon completion of the work, denuded areas within the limits shall be cleaned up and seeded or planted as specified in Section 20.

### **Section 11-7 (1.12A) Protection of the Public and Private Property**

Unusual conditions may arise on the work which will require that immediate and unusual provisions be made to protect the public from danger or loss or damage to life or property, due directly or indirectly to the prosecution of the work, and it is part of the service required of the Contractor to make such provisions and to furnish such protection.

Whenever, in the opinion of the City, an emergency exists, against which the Contractor has not taken sufficient precaution for the safety of the public or the protection of utilities or of adjacent structures or property which may be injured by process of construction on account of such neglect; and whenever, in the opinion of the City, immediate action shall be considered necessary in order to protect public or private property interest, or prevent likely loss of human life or damage on account of the operations under the contract, then, and in that event the City

may provide suitable protection to said interests by causing such work to be done and material to be furnished as, in the opinion of the City, may seem reasonable and necessary. The cost and expense of said labor and material, together with the cost and expense of such repairs as may be deemed necessary, shall be borne by the Contractor. Failure of the City however, to take such precautionary measures, shall not relieve the Contractor of his full responsibility for public safety.

- 7-1.125        Legal Action Against the Department (not adopted)
- 7-1.165        Damage by Storm, Flood, Tidal Wave or Earthquake (not adopted)

**Section 11-7 (1.17) Acceptance of Contract**

When the Engineer has made the final inspection as provided in Section 5-1.13 "Final Inspection," the developer shall furnish the Engineer with letters of acceptance from all agencies having utilities or facilities within the project, one set of reproducible "Record Drawings" plans - originals or a mylar copy - and a copy of the recorded "Notice of Completion." If at this time the Engineer determines that the contract has been completed in all respects in accordance with the plans and specifications, he will recommend that the City formally accept the project.

- 7-1.21        Repair of Equipment (not adopted)
- 7-1.22        Material Plants (not adopted)

**SECTION 11-8 PROSECUTION AND PROGRESS (NOT ADOPTED)**

**SECTION 11-9 MEASUREMENT AND PAYMENT (NOT ADOPTED)**

**SECTION 11-10 DUST CONTROL**

The Standard Specifications are incorporated herein.

**SECTION 11-11 MOBILIZATION**

The Standard Specifications are incorporated herein.

**SECTION 11-12 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES**

The Standard Specifications are incorporated herein.

**Section 11-12 (2.02) Flagging Costs (not adopted)**

Whenever the contractor's operations create a condition hazardous to traffic or the public, it shall at its expense and without cost to the City, furnish, erect and maintain such fences, barricades lights, sign, and other devices and take such other protective measures as are necessary to prevent accidents, damage or injury to the public. The permittee shall also furnish such flaggers as are necessary to give adequate warning to traffic or to the public of any dangerous condition to be encountered. Signs, lights, flags, flaggers, and other warning and safety devices shall conform to the requirements set forth in the current editions of the Work Area Traffic Control Handbook (WATCH) or Part VI of the Manual on Uniform Traffic Control Devices (MUTCD). Two-way traffic will be maintained at all times during hours of darkness and where practical, during daylight hours. Road Closures cannot occur without the written permission of the Engineer.

**SECTION 11-13** **(BLANK)**

**SECTION 11-14** **(BLANK)**

**SECTION 11-15** **EXISTING HIGHWAY FACILITIES**

The Standard Specifications are incorporated herein.

**SECTION 11-16** **CLEARING AND GRUBBING**

The Standard Specifications are incorporated herein by this reference except as noted:

**Roadway clearing, grubbing, excavation, removals, and grading**

This item includes the removal of all unacceptable material from within the right-of-way lines or project limit lines and disposal of said material off the job site, in accordance with applicable Local, State, and Federal requirements. This includes but is not limited to any earthen material containing vegetative matter or organic silt, topsoil, frozen material, trees, stumps, man-made deposits, industrial waste, sludge or landfill. Existing structures, to be preserved, shall be lowered and protected and restored upon completion of the work. Also included is all removal, excavation, embankment and grading to finished subgrade within catch points of slopes outside of right-of-way lines as shown on typical sections. Import of approved subgrade material is also included if required to meet original subgrade. Stumps and root systems of trees, clay and other organic material shall be removed to a depth of twenty-four inches (24") below the subgrade. Existing aggregate and asphalt roadway materials may be reused for embankments after being reduced in size to particles of three inches (3") maximum diameter. Pulverizing and replacement of this material is part of this work. All embankment and fill, and areas over excavated shall be compacted to a relative density of ninety five percent (95%) within the roadway and shoulder prism, and ninety (90%) in ditch and slope areas.



(95%) as measured by California Test Method No. 216 or by calibrated nuclear density instrument.

### **Imported Sub Base**

Subsequent to removal of defective material, an equal quantity of approved material shall be imported. The imported select material will be specifically designated or approved by the City. The materials, method of application, and compaction shall comply with the Standards.

### **Section 11-19.3 Structure Excavation and Backfill**

The Standard Specifications are incorporated herein except as noted:

#### **Section 11-19 (3.01A) Trench Excavation**

Unless boring is required, trench excavation shall be in accordance with Standard Plans and Drawings. When the trench is in an existing paved area, the pavement shall be sawed or scored and broken ahead of the trenching operations. The proper tools and equipment shall be used in marking and breaking so that the pavement will be cut accurately on neat and parallel lines. When water is encountered, the trench shall be kept dry in a manner approved by the Engineer until the placing of the bedding material, laying and jointing of the pipe, and placing of the shading material has been completed and approved. Ground water pumped from the trench shall be disposed of in such manner as will not cause injury to public or private property or constitutes nuisance or menace to the public. The manner employed to dispose of water pumped from an excavation shall be subject to the approval of the Engineer and shall conform to Section 7-1.01G, "Water Pollution." Whenever the bottom of the trench is soft, yielding, or in the opinion of the Engineer otherwise unsuitable as a foundation for the pipe, the unsuitable material shall be removed to a depth such that when replaced with suitable material as specified in Section 19-3.06A(l) of these Standard Specifications, it will provide a stable and satisfactory foundation. Compaction of the imported material shall be 90 percent relative compaction or as shown on the plans or detailed in the project specifications.

Trenches shall not be left open farther than 200 feet in advance of pipe laying operations or 200 feet to the rear thereof, unless otherwise permitted by the Engineer. When left unattended by the contractor, no more than 100 feet of trench shall be left open.

#### **NOTE:**

Attention is directed to Section 5-1.02A, "Trench Excavation Safety Plans" of these Standard Specifications.

Unless otherwise specified the period of time set forth in the following table after which the Contractor may place fill or backfill against or over the top of any cast in place structures are predicated on the use of concrete to which no admixture for the purpose of obtaining a high early strength.

#### **Operation**

#### **Location**

	Against sides of structures	Over top of structures
	<u>(days)</u>	<u>(days)</u>
Placement of Loose backfill	5	21
Densification of Backfill	7	28

### **Section 11-19 (3.062) Slurry Cement Backfill**

At the option of the contractor slurry backfill maybe used as structural backfill for pipe culverts, except for aluminum pipes. Slurry backfill may be used as a substitute for aggregate base with the approval of the Engineer. When slurry backfill is used as structural backfill, the width of the excavation may be reduced so that the clear distance between the outside of the pipe and the side of the excavation of the pipe is a minimum of six inches.

### **Section 11-19 (3.062A-1)Trench Bedding and Initial Backfill**

Bedding and initial backfill shall consist of material placed from the bottom of the trench to 1.0 foot above the top of pipe or as required by the Utility owner. This material shall have a minimum sand equivalent of 30 and all material shall pass the 3/4 inch screen. All exceptions shall be approved by the Engineer.

When determined by the Engineer that the foundation material is wet or rocky, bedding material shall be placed to a depth of at least 6.0 inches below the pipe or one-fourth the outside diameter of the pipe barrel, whichever is greater. This material shall be washed rock 100% passing the 3/4 inch screen.

In excessively wet areas a special foundation design shall be required by the Engineer.

In fill areas and sag points in the profile, cross trenches for services and additional cross drain trenches may be required by the Engineer. The trenches shall be daylighted to the fill slope at a minimum slope of 0.5 percent and the lower one foot backfilled with bedding and initial backfill material.

### **Section 11-19 (3.062A-2) Trench Intermediate Backfill**

Intermediate backfill shall consist of material placed from 1.0 foot above the pipe to subgrade. All intermediate backfill shall be free of debris and organic matter and shall be free of any rocks over 3.0 inches in diameter. Utilities and culverts placed with less than 2.0 feet of intermediate backfill shall be encased in 2-sack cement slurry or other method approved by the Engineer.

Trench intermediate backfill shall be compacted to 90% relative density. Utilities or culverts placed with less than one (1) foot of intermediate backfill cover shall be encased in concrete,

provided with a concrete cover, cemented with slurry, or protected by any other method approved by the City Engineer (CALTRANS 19-3.06).

### **Section 11-19 (3.062A-3) Trench Compaction**

The required compaction for utility trenches within the roadway shall be a minimum of 90 percent from the bottom of the trench to 0.50 foot below subgrade, and a minimum of 95 percent from 0.50 foot below subgrade to finished grade or as shown on the plans or in the project specifications. Compaction shall be obtained by mechanical means in layers not to exceed 8 inches in thickness. Trench jetting will not be allowed within the roadway prism.

### **Section 11-19 (3.062A, 3-a) Trench Restoration**

Final resurfacing shall be performed in conjunction with the other operations of the contractor so that no more than 1000 lineal feet (in aggregate) of trench has not been resurfaced and accepted by the City at any time. This limit may be reduced to 500 feet or increased to 2000 feet by written direction of the Engineer, if warranted in the Engineer's sole judgment.

The trench surface shall be cold patched if the trench has not been paved within 48 hours of the excavation unless otherwise approved by the City Engineer in writing. Contractor shall maintain the cold patch until final paving has been completed.

Also see section 11-19 (3.23) for additional trench restoration requirements.

### **Section 11-19 (3.10) Completion of Work**

**ALL PERMANENT PAVING WORK SHALL BE COMPLETED WITHIN TWENTY (20) WORKING DAYS OF THE BACKFILL OF THE EXCAVATION OR REPAIR, BETWEEN MAY 1 AND OCTOBER 15, AND WITHIN THREE (3) WORKING DAYS OUTSIDE OF THOSE CALENDAR DATES.** This time may be reduced by the City Engineer due to inclement weather, seasonal weather unsuitable for paving operations, or the provisional calendar restraints by agencies superior to the City of South Lake Tahoe. Failure of the contractor to comply with schedules shall be cause for suspension of encroachment permits upon written notice by the City Engineer. In that instance, except for emergency repairs, NO further work whatsoever shall be performed in City rights-of-way until the City Engineer is satisfied that proper closure activities are complete. If, after notification, the contractor still fails to complete work in a timely manner, the City of South Lake Tahoe reserves the right to have the work completed at the direct expense of the contractor or its successor in interest, plus 15% administrative fee.

### **Section 11-19 (3.11) Noncompliance**

Failure to comply with ANY of the provisions of these standards, instructions from the City Engineer or designee, or to perform timely repairs may result in revocation of permits. Additionally, non-compliance may subject the contractor to established fines imposed for violations of [Ordinance 95-11 \(13.01.360\)](#).

### **Section 11-19 (3.12) Maintenance of Excavations**

Contractor shall perform continuing maintenance to all excavations during the course of construction to ensure a safe environment for the public.

### **Section 11-19 (3.13) Safety**

All work shall be done in accordance with the State of California Safety Orders, CAL OSHA, and/or the requirements of Federal OSHA Rule 29 CFR 1926, Subpart P, Trenching and Excavation Safety, Soil Analysis and Classification, Protective Systems, and "Competent Person" Responsibilities. Contractor must provide a certified "Competent Person" to comply with these aforementioned regulations regarding trenching and excavation.

### **Section 11-19 (3.14) Snow Removal**

The City will remove snow on all roads that are safe for the operation of snow removal equipment. If the conditions are such as to endanger equipment (sunken trenches, irregular paving, or other hazards), the City will cease snow removal. Permittee and/or its contractor shall then be responsible for removal of snow and ice on the surface of the road for a minimum width of 20 feet.

### **Section 11-19 (3.15) Relocation**

It is further required that if any part of an installation interferes with the use of roads by the general public, or needs adjusting to match the grade of the roadway, or is in conflict with future City road improvement projects, it must be removed or relocated, as designated by the City Engineer, at the expense of the contractor or its successor in interest.

### **Section 11-19 (3.16) Pavement Cut**

Existing pavement shall be cut full depth to a neat straight line or grinded out if the pavement surface condition allows. Cracked pavement caused by the construction adjacent to the excavation shall be removed. Streets with extreme fatigue cracking (alligator) are exempt from this standard. Asphalt removal limits will be agreed upon by the developer and Engineer prior to removal. Any sunken or damaged area due to a utility break shall also be repaired as part of leak repair. This damaged area includes the length and width of the water traveling either upon or under the roadway and is subject to inspection by the City. Curb, gutter, and sidewalks shall be restored to pre-construction condition if damaged or removed. The Engineer may make arrangements for optional alternatives if situation warrants. Utility cuts/trenching through paved driveways shall be repaired the same as paved roadways. Unpaved driveways shall be restored to a preconstruction condition. Misaligned or vacated sawcuts or grooves shall be repaired as any other damaged pavement caused by the construction. Point/pothole repair excavations shall be over cut by one foot wider and deeper than the point in question.

### **Section 11-19 (3.17) Material Storage**

No material shall be stored within five (5) feet of a road surface during the summer season or within the right-of-way from October 15 to May 1. Excess earth materials from trenching or other operations shall be removed from the pavement, traveled way, or shoulder as the excavation is back-filled or other work carried forward, unless otherwise approved by the Engineer.

### **Section 11-19 (3.19) Test Reports**

Compaction tests shall be taken by a licensed engineer or testing laboratory and test reports submitted to the Engineer on a weekly basis. Compaction shall be determined by using the California Test Method No. 216 or calibrated nuclear density instrument. Compaction tests shall be taken at 250 foot intervals on centerline and 20% of the laterals, and shall be taken at varying depths for trenches over thirty (30) inches deep. Point repairs shall be tested randomly to show evidence of compliance (at least one test per 10 repairs). When using the Nuclear Method, backfill shall be placed in lifts no greater than the length of the probe used in testing. All right-of-way work shall be guaranteed by the contractor for a five (5) year period regardless of compaction tests.

### **Section 11-19 (3.20) Compaction**

Tests will be waived if contractor uses two (2) sack PCC Slurry as backfill material.

### **Section 11-19 (3.22) Tack Coat**

Edges of existing pavement being joined and surface being overlaid shall receive a tack coat of bituminous. Application by a spray method to insure complete coverage of the surfaces is preferred.

### **Section 11-19 (3.23) Temporary Paving**

Where pavement has been removed, a minimum of two (2) inch thickness of temporary asphalt concrete paving shall be placed and maintained within the excavation area. BACKFILL OF EXCAVATIONS AND PLACEMENT OF TEMPORARY PAVEMENT BY THE END OF EACH WORK DAY IS PREFERRED. Without exception, all excavations SHALL be backfilled and temporary paving SHALL be in place prior to Saturdays, Sundays, and City recognized holidays. Until temporary paving is in place, safety signing advising the public must be in place.

### **Section 11-19 (3.24) Manhole Adjustments**

Manholes, valve cans, clean-outs, lids, hand holes, utility vaults, etc., shall not be constructed to final grade until final paving has been completed. When adjusted to pavement grade, they shall be no less than one-eighth (1/8) inch and no greater than one-quarter (1/4) inch below adjacent pavement surface.

In earth shoulder areas, asphalt concrete shall be placed to a minimum of two (2) feet around the manhole and paved out at 45 degrees to the edge of existing pavement if the structure is within two (2) feet of the existing pavement.

**Section 11-19 (3.25) Traffic Control Fee**

**Should the contractor fail to provide adequate traffic control or safety barricades, and in the event a responsible individual cannot be located or refuses to perform, the City will, at its option, place needed devices or engage a private firm to place and maintain said barricades, which will be charged to the contractor. If a private firm is engaged, all charges will be directly billed to the contractor, plus fifteen percent (15%).**

If the City must place the necessary devices during regular work hours (7:00 AM to 3:30 PM), \$250.00 will be assessed per occurrence for delivery and pickup of barricades, plus \$20.00 per day per barricade.

After City work hours (Saturday, Sunday, and City recognized holidays), \$300.00 will be assessed per occurrence for delivery and pickup of barricades, plus \$20.00 per day per barricade.

**SECTION 11-20 EROSION CONTROL AND HIGHWAY PLANTING**

Additional requirements by the Tahoe Regional Planning Agency and the California Regional Water Quality Control Board, Lahontan Region, are incorporated herein by this reference, but may be omitted by the City Engineer in writing on a case by case basis.

**SECTION 11-21 BLANK**

**SECTION 11-22 FINISHING ROADWAY**

The Standard Specifications are incorporated herein except as noted. See Section 11-19 Earthwork, for additional information.

**SECTION 11-23 BLANK**

**SECTION 11-24 LIME STABILIZATION**

The Standard Specifications are incorporated herein.



**SECTION 11-36** **BLANK**

**SECTION 11-37** **BITUMINOUS SEALS**

The Standard Specifications are incorporated herein.

**SECTION 11-38** **BLANK**

**SECTION 11-39** **ASPHALT CONCRETE**

See section 19 for additional information.

The Standard Specifications are incorporated herein except as noted.

**Section 11-39 (1.0) General**

Asphalt concrete shall be Type B and shall conform to the provisions in Section 39, "Asphalt Concrete," of the Standard Specifications and these Special Provisions.

The grade of asphalt binder to be mixed with aggregate for Type B asphalt concrete shall be PG 64-28 Polymer Modified conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications. At the option of the Contractor, the grade of asphalt binder used for patching may be PG 70-10 or PG 64-22 provided at least one layer of asphalt concrete mixed with PG 64-28, and conforming to these Special Provisions is placed over the patch. Unless otherwise approved by the Engineer, leveling and miscellaneous areas will not be considered as patching.

**Slurry Seal**

The City Engineering standard for slurry is to be Type II emulsion aggregate slurry applied at a minimum rate of 11-15 pounds per square yard min, and in accordance with sections 302-4.1 through 302-4.3.3 of the SSPWC.

**Maintenance and Patch/Point Repairs**

Normal maintenance surface repairs in paved road surfaces shall be made by over-cutting the area to be repaired horizontally by one foot wider than the repair hole, and excavating vertically by one (1) inch deeper than the bottom of the point in question. Trenching or larger-scale excavations and encroachments, and their respective maintenance and repairs, are addressed in the excavation/trenching standards sections, encroachment permits, and/or the associated contracts and documents.

### **Shoulders/Shoulder Backing**

Shoulders on roadways, where called for, shall be constructed/re-constructed during road base/shoulder grading, from imported Class II,  $\frac{3}{4}$  inch maximum aggregate base, or equivalent, to the same cross-section/slope as the road base. The Engineer shall approve minimum width and compaction. Shoulder backing, where called for in roadway paving/repaving and normal maintenance operations, shall be imported Class II,  $\frac{3}{4}$  inch maximum aggregate base, or equivalent, with minimum width and compaction approved by the Engineer.

### **Raise and Lower Frames and Covers**

The Contractor shall be responsible for raising or lowering all existing frames for valve box covers, monument covers, manhole covers, environmental test well covers, vault boxes, hand holes, etc., to the final paving grade, where applicable, and expenses incurred shall be borne by the Contractor. Any other arrangements are to be made in the advanced planning stages of the project and approved by the Engineer.

### **Aggregate Quality**

Aggregates shall be clean and free from decomposed or organic materials and other deleterious substances. Visual evidence of organic materials in the aggregate shall be sufficient cause for rejection of the aggregate. Coarse aggregate is material retained on the No. 4 sieve, fine aggregate is material passing the No. 4 sieve, and supplemental fine aggregate is added fine material passing the No. 30 sieve, including, but not limited to, lime, cement and stored fines from dust collectors.

The gradation of the aggregate blend used in the proposed asphalt concrete mix design, including supplemental fine aggregate, shall meet the requirements of Subsection 39-2.02, "Aggregate," of the Standard Specifications for the 12.5-mm {1/2 inch} Maximum, Medium gradation. The symbol "X" shown in the Standard Specification table is the gradation which the Contractor proposes to furnish for the specific sieve. The proposed gradation shall meet the gradation shown in the table under "Limits of Proposed Gradation." Changes from one mix design to another shall not be made during the progress of the work unless permitted by the Engineer. However, changes in proportions to conform to the approved mix design shall not be considered changes in mix design.

During asphalt concrete production, aggregate gradation shall be within the limits specified herein. Conformance with the grading requirements shall be determined by California Test 202, modified by California Test 105 when there is a difference in specific gravity of 0.2 or more between the coarse and fine portions of the aggregate or between the blends of the different aggregates. The percent passing the No. 200 sieve shall be reported to the first decimal place (tenths).

The combined aggregate shall conform to the following quality requirements before the addition of the asphalt binder:

**Table 10-1.01.1 AGGREGATE QUALITY REQUIREMENTS**

Quality	California Test	Asphalt Concrete	
		Type A	Type B
Percent of Crushed Particles Coarse Aggregate (Min.) Fine Aggregate (Passing No. 4, Retained on No. 8) (Min.)	205	90% 70%	25% 20%
Los Angeles Rattler Loss at 100 Rev. (Max.) Loss at 500 Rev. (Max.)	211	10% 45%	50%
Sand Equivalent (Min.) <sup>1</sup>	217	47	42
Kc Factor (Max.)	303	1.7	1.7
Kf Factor (Max.)	303	1.7	1.7

Note:

- 1 Reported value shall be the average of 3 tests split from a single sample.

Aggregate for asphalt concrete dikes, gutters, gutter flares, overside drains and aprons at the ends of drainage structures shall conform to the 3/8-inch maximum grading specified in Section 39-2.02, "Aggregate," of the Standard Specifications.

**11-39 (1.01) Asphalt Concrete Mixture**

The asphalt concrete mixture, composed of the proposed aggregate blend, antistrip additives, and the proposed asphalt binder content as determined by California Test 367, shall conform to the following requirements:

**Table 10-1.01.2 ASPHALT CONCRETE MIXTURE REQUIREMENTS**

Design Parameters	California Test	Asphalt Concrete Type	
		Type A	Type B
Hveem Stabilometer Value (Min)	366 <sup>1,2</sup>	37	35
Percent air voids (Mix Design) (3 briquettes at Mix Design) <sup>4</sup> (Start-Up Production Evaluation) <sup>5</sup>	367 <sup>1</sup>	4 <sup>3</sup>	3 <sup>3</sup>
		3 - 5	2-4
		Design Value $\pm 2.0$	
Swell <sup>4</sup> (mm) (Max)	305	0.76	0.76
Tensile Strength Ratio (TSR) <sup>6</sup>	371	report	report

Notes:

1. Reported value shall be the average of 3 tests from a single split sample.
2. A set of 3 briquettes shall be prepared and tested separately. If the range of stability for the 3 briquettes is more than 12 points, the briquettes shall be discarded and new samples shall be fabricated and tested.
3. California Test 367, Paragraph C5, is modified to "4%" for Type A and "3%" for Type B. California Test 309 shall be used to determine the theoretical maximum specific gravity of each asphalt content in conformance with the requirements in "Determination of Theoretical Maximum Specific Gravity of Mixtures with Different Asphalt Contents" (LP-1) located at: <http://www.dot.ca.gov/hq/esc/Translab/fpmlab.htm>
4. Mix design submittal shall include test results for percent air voids for 3 briquettes constructed using the submitted aggregate and asphalt blended at the proposed target values. Result shall be average for the 3 briquettes.
5. For production evaluation of air voids, California Test 309 shall be used to measure theoretical maximum specific gravity instead of calculating maximum specific gravity in California Test 367. Determine the theoretical maximum specific gravity once for a single split sample. For bulk specific gravity, the reported value shall be the average of 3 tests from a single split sample.
6. The tensile strength ratio of the mixture both with and without the use of a liquid antistrip shall be determined and reported as part of the mix design submittal. These results are for information only, and the use of liquid antistrip will be required regardless of the results of this testing.

The use of a liquid antistrip agent will be required for all asphalt concrete except that used for asphalt concrete dikes, gutters, gutter flares, overside drains and aprons at the ends of drainage structures.

During production and placement, the asphalt concrete mixture shall conform to the requirements of this Section. Changes in cold feed or hot bin proportions to conform to the aggregate grading requirements shall not be considered changes in the mix design. Changes from one mix design to another shall not be made during the progress of the work, unless approved by the Engineer. Changes in target asphalt content of placed asphalt concrete, in aggregate grading target values, or in aggregate sources shall be considered to be a change in the asphalt concrete mixture and shall require a new mix design proposal. Changes in the asphalt content or aggregate grading target values approved by the Engineer will not be applied retroactively for acceptance or payment. Adjustment to the control setting at the plant to achieve target asphalt concrete properties in the field is allowed and shall not be considered as a change in the asphalt concrete mixture.

The amount of asphalt binder used in asphalt concrete placed in dikes, gutters, gutter flares, overside drains and aprons at the ends of drainage structures shall be increased one percent by weight of the aggregate over the amount of asphalt binder determined for use in asphalt concrete placed on the traveled way. This additional asphalt binder shall be considered as included in the prices paid for the material and work associated with paving of miscellaneous areas and dikes and no additional compensation will be allowed therefore.

### **Contractor Mix Design Proposal**

The Contractor shall submit for the Engineer's review a proposed asphalt concrete mix design for each asphalt concrete mixture to be used at least 7 days before production of that asphalt concrete mixture. The asphalt concrete mix design shall be prepared by a laboratory (or laboratories) whose proficiency has been reviewed and qualified in conformance with the California Department of Transportation's Independent Assurance Program, has been AASHTO accredited, or is otherwise approved by the Engineer. Aggregate quality and asphalt concrete mix design test results shall be no more than one year old when production of the asphalt concrete mixture starts.

The Contractor shall submit a mix design letter that indicates the target values proposed for gradation, asphalt content, and percent air voids. This submittal shall include test results and raw test data for aggregate quality and asphalt concrete mixture requirements; plots of the combined gradings; plots of unit weight, stability, theoretical maximum specific gravity, and percent air voids versus asphalt content for the asphalt contents considered in the design process. In addition, this submittal shall include test results for stability, percent air voids, and swell for 3 briquettes constructed using the submitted aggregate and asphalt blended at the proposed target values for each asphalt concrete mixture to be used.

The Contractor shall provide the following in the asphalt concrete mixture submittal:

1. Aggregate and supplemental fine aggregate;

2. Target values for percent passing each sieve size for the aggregate blend;
3. Source of each aggregate to be used including producer and location;
4. Percentage of each aggregate stockpile, cold feed or hot bin to be used; and
5. Gradation of each aggregate stockpile, cold feed or hot bin to be used.

The Contractor shall provide the following in the asphalt binder submittal:

1. Asphalt binder source and target value;
2. Type and grade of binder;
3. Recommended storage, mixing, and compaction temperatures; and Material Safety Data Sheets.

The Contractor shall provide the following in the antistrip additive(s) (required):

1. Name of product, manufacturer, manufacturer's designation and proposed rate, location, and method of addition;
2. Certification of compatibility of the proposed liquid antistrip and all other modifiers (certified test results of the asphalt binder after the addition of all proposed additives and modifiers shall be included in the certification of compatibility); and
3. Material Safety Data Sheets.

The proposed asphalt concrete mix design submittal will be considered complete only when the submittal items, including the mix design letter, test results (including TSR results), and plots, have been received by the Engineer.

## **SECTION 11-39 (2.0)                      STORING, PROPORTIONING AND MIXING MATERIALS**

Storing, proportioning, and mixing materials shall conform to the requirements of Subsection 39-3, "Storing, Proportioning, and Mixing Materials," of the Standard Specifications, except that the first four paragraphs of Subsection 39-3.03, "Proportioning," shall not apply, and the asphalt concrete shall be mixed within the range of mixing temperatures recommended by the asphalt binder supplier.

Storage or stockpiling of completed asphalt concrete mixtures in any manner other than through the use of a batch plant pugmill or storage silo discharging directly into a haul vehicle, and discharging of the haul vehicle directly into the paving operation shall not be allowed unless approved by the Engineer. Any request to store or handle the mixture in any manner not specifically allowed for in these Special Provisions and in the Standard Specifications shall address temperature control, mechanical and thermal segregation control, and contamination control for any proposed change.

### **Section 11-39 (2.1.0)    Subgrade, Prime Coat, Paint Binder (Tack Coat), and Pavement Reinforcing Fabric**

#### **General**

Subgrade, prime coat, paint binder (tack coat), and pavement reinforcing fabric shall conform to the requirements of Subsection 39-4, "Subgrade, Prime Coat, Paint Binder (Tack Coat), and Pavement Reinforcing Fabric," of the Standard Specifications except as modified herein.

### **Paint Binder (Tack Coat)**

Paint binder (tack coat) shall be applied to existing surfaces to be surfaced and between layers of asphalt concrete, except when eliminated by the Engineer. Paint binder (tack coat) shall be, at the option of the Contractor, either slow-setting asphaltic emulsion, rapid-setting asphaltic emulsion, or paving asphalt. Slow-setting asphaltic emulsion and rapid-setting asphaltic emulsion shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 94, "Asphaltic Emulsions," of the Standard Specifications. When paving asphalt is used for paint binder, the grade will be determined by the Engineer. Paving asphalt shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 92, "Asphalts," of the Standard Specifications.

Paint binder (tack coat) shall be applied at a rate that provides for adequate adhesion between the asphalt concrete being placed and the surface to which the paint binder (tack coat) has been applied. The rate of application shall be as approved by the Engineer.

Prime coat or paint binder (tack coat) shall be applied in advance of placing the surfacing only as far as shall be approved by the Engineer. When asphaltic emulsion is used as paint binder (tack coat), asphalt concrete shall not be placed until the applied asphaltic emulsion has cured (completely changed color from brown to black).

The area to which paint binder has been applied shall be closed to public traffic. Care shall be taken to avoid tracking binder material onto existing pavement surfaces beyond the limits of construction.

Immediately in advance of placing asphalt concrete, additional prime coat or paint binder (tack coat) shall be applied as directed by the Engineer to areas where the prime coat or paint binder (tack coat) has been damaged. Loose or extraneous material shall be removed and no additional compensation will be allowed therefore.

## **Section 11-39 (2.2.1) Spreading and Compacting Equipment**

### **Spreading**

Asphalt concrete shall be handled, spread, and compacted in a manner which is in conformance with the provisions in this Section.

Asphalt concrete shall be placed in such a manner that cracking, shoving, and displacement will be avoided.

Plant mix bituminous base course or surface course shall not be placed unless the following criteria are met during suitable weather:

Air Temperature

50F

Ground Temperature

40F

Asphalt concrete shall not be placed when the underlying layer or surface is frozen or not dry or when weather conditions will prevent proper handling, finishing or compaction of the mixture.

Unless otherwise designated on the plans or allowed by the Engineer asphalt concrete shall be spread and compacted in the layers and thicknesses indicated in the following table:

**Table 10-1.01.3 Asphalt Concrete Layers and Thickness**

Total Thickness Shown on the Plans*	Minimum Number of Layers	Top Layer Thickness (Inches)		Next Lower Layer Thickness (Inches)		Other Lower Layers Thickness (Inches)	
		Min.	Max.	Min.	Max.	Min.	Max.
3" or less	1	----	-----	----	----	----	----
3.1" through 3.5"	2	1.5	2	1.5	2	----	----
3.51" through 5.3"	2	2	2.5	2	3	----	----
5.31" or more	**	2	2.5	2	3	2	5

Notes:

\* When pavement reinforcing fabric is shown to be placed between layers of asphalt concrete, the thickness of asphalt concrete above the pavement reinforcing fabric shall be considered to be the "Total Thickness Shown on the Plans" for the purpose of spreading and compacting the asphalt concrete above the pavement reinforcing fabric.

\* At least 3 layers if total thickness is more than 5.5 inches and less than 10 inches. At least 4 layers if total thickness is 10 inches or more.

Layers shall be spread with an asphalt paver, unless otherwise specified or approved by the Engineer. Asphalt pavers shall be operated in such a manner as to ensure continuous and uniform movement of the paver.

A layer shall not be placed over a layer that exceeds 3 inches in compacted thickness until the temperature of the layer being covered is less than 160° F at mid-depth unless approved by the Engineer.

Asphalt concrete to be placed on shoulders, and on other areas off the traveled way having a width of 5 feet or more, shall be spread in the same manner as specified above.

Asphalt concrete surfacing shall be placed on existing surfacing, including curve widening, chain control lanes, turnouts, left turn pockets, and public and private road connections shown on the plans, unless otherwise directed by the Engineer.

Unless otherwise shown in the plans or directed by the Engineer, additional asphalt concrete surfacing material shall be placed along the edge of the surfacing at road connections and private drives, hand raked, if necessary, and compacted to form smooth tapered conforms. Full compensation for furnishing all labor and tools and doing all the work necessary to hand rake said conforms shall be considered as included in the contract prices paid per ton for the various contract items of asphalt concrete surfacing involved and no additional compensation will be allowed therefore.

The completed mixture shall be deposited on the roadbed at a uniform quantity per linear yard, as necessary to provide the required compacted thickness without resorting to spotting, picking-up or otherwise shifting the mixture. During transporting, spreading and compacting, petroleum products such as diesel fuel and kerosene shall not be used as a release agent on trucks, spreaders or compactors in contact with the asphalt concrete.

Mechanical and thermal segregation shall be avoided. Surfacing shall be free from pockets of coarse or fine material. Asphalt concrete containing hardened lumps shall not be used.

Unless otherwise provided herein or approved by the Engineer, the top layer of asphalt concrete for shoulders, tapers, transitions, road connections, private drives, curve widenings, chain control lanes, turnouts, left-turn pockets, and other areas shall not be spread before the top layer of asphalt concrete for the adjoining through lane has been spread and compacted. At locations where the number of lanes is changed, the top layer for the through lanes shall be paved first. When existing pavement is to be surfaced and the specified thickness of asphalt concrete to be spread and compacted on the existing pavement is 3 inches or less, the shoulders or other adjoining areas may be spread simultaneously with the through lane provided the completed surfacing conforms to the provisions of this Section. Tracks or wheels of spreading equipment shall not be operated on the top layer of asphalt concrete until final compaction has been completed.

At those locations shown on the plans, as specified in these Special Provisions, or as directed by the Engineer, the asphalt concrete shall be tapered or feathered to conform to existing surfacing or to other highway and non-highway facilities.

At locations where the asphalt concrete is to be placed over areas inaccessible to spreading and rolling equipment, the asphalt concrete shall be spread by practical means to obtain the specified results and shall be compacted thoroughly to the required lines, grades, and cross sections by means of pneumatic tampers or by other methods that will produce the same degree of compaction as pneumatic tampers. Care shall be taken to insure that adequate temperature for compaction of the asphalt concrete is maintained until compaction is complete.

In advance of spreading asphalt concrete over an existing base, surfacing or bridge deck, if there is a contract item for asphalt concrete (leveling) or if ordered by the

Engineer, asphalt concrete shall be spread by mechanical means that will produce a uniform smoothness and texture. Asphalt concrete (leveling) shall include, but not be limited to, the filling and leveling of irregularities and ruts and changing the cross slope or profile of an existing surface.

Paint binder (tack coat) shall be applied to each layer in advance of spreading the next layer.

Unless otherwise allowed by the Engineer, asphalt paving equipment shall be equipped with automatic screed controls and a sensing device or devices.

When placing asphalt concrete to lines and grades established by the Engineer, the automatic controls shall control the longitudinal grade and transverse slope of the screed. Grade and slope references shall be furnished, installed, and maintained by the Contractor. Should the Contractor elect to use a ski device, the minimum length of the ski device shall be 30 feet. The ski device shall be a rigid one piece unit and the entire length shall be utilized in activating the sensor.

When placing the initial mat of asphalt concrete on existing pavement, the end of the screed nearest the centerline shall be controlled by a sensor activated by a ski device not less than 30 feet long. The end of the screed farthest from centerline shall be controlled manually when this edge of the mat must conform with existing features. Otherwise, the end of the screed farthest from centerline shall be controlled by an automatic transverse slope device set to reproduce the cross slope designated by the Engineer.

When paving contiguously with previously placed mats, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously placed mat and will reproduce the grade in the new mat within a 0.01-foot tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same manner the screed was controlled when placing the initial mat.

If the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the provisions, including straightedge tolerance, of these special provisions, the paving operations shall be discontinued and the Contractor shall modify the equipment or methods, or furnish substitute equipment.

If the automatic screed controls fail to operate properly during a day's work, the Contractor may use manual control of the spreading equipment for the remainder of that day. However, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the requirements in this section before starting another day's work.

### **Longitudinal Joints**

Longitudinal joints in the top layer of asphalt concrete shall correspond with the edges of planned traffic lanes. Longitudinal joints in other layers shall be offset not less than 6 inches nor more than 12 inches alternately each side of the edges of traffic lanes.

Longitudinal joints may be constructed in any manner that provides for a minimum relative compaction of not less than 89.0 percent of the theoretical maximum density AND to not less than 92.0 percent of laboratory test maximum density (LTMD), provided the method(s) employed provide for the geometric, conveyance of public traffic, and safety requirements of the project.

The Engineer may, at their discretion, test the density of the longitudinal joint with a calibrated nuclear density gauge or through the use of 6-inch diameter cores obtained directly on the longitudinal joint.

If approved by the Engineer in writing, the Contractor may use rubberized asphalt crack sealer, Crafcro Pavement Joint Adhesive or a similar approved product in accordance with the manufacturer's recommendations and the longitudinal joint density requirements will be waived.

### **Compaction Equipment**

A sufficient number of rollers shall be provided to obtain the specified compaction and surface finish required by this Section. Rollers shall be sized to achieve the required results.

Rollers shall be equipped with pads and water systems that prevent sticking of the asphalt concrete mixtures to the pneumatic or steel-tired wheels. A parting agent that will not damage the asphalt concrete mixture may be used to aid in preventing the asphalt concrete mixture from sticking to the wheels. Pneumatic-tired rollers shall be skirted to retain heat in the pneumatic tires.

Asphalt concrete shall be compacted to not less than 92.0 percent or more than 97.0 percent of theoretical maximum density AND to not less than 95.0 percent of laboratory test maximum density (LTMD) and shall be finished to the lines, grades, and cross sections shown on the plans. The asphalt concrete shall be produced and compacted within the temperature ranges recommended by the asphalt binder supplier. No rolling will be permitted after the asphalt concrete temperature is below 160° F.

Percent of theoretical maximum density and LTMD shall be determined in conformance with the requirements in California Test 375 except the test maximum density requirements in Part 5, "Determining Test Maximum Density," shall include California Test 309 requirements for theoretical maximum density in addition to LTMD, and the selection of testing locations will be as determined by the Engineer. At the option of the Engineer, acceptance testing for compaction may be performed using cores only in accordance with California Test 308.

Asphalt concrete placed in dig outs, as a leveling course, for slope correction, for detours not included in the finished roadway prism, in areas where in the judgment of the Engineer compaction or compaction measurement by conventional methods is impeded or on the uppermost lift of shoulders with rumble strips shall be compacted by a method approved by the Engineer.

The completed surfacing shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities. Ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other suitable means. The use of equipment that leaves ridges, indentations or other objectionable marks in the asphalt concrete shall be discontinued. Inasmuch as maintaining the quality of longitudinal riding surfaces incidental increases in asphalt tonnage and depth during overlay of deteriorated/rounded-off edges of streets, paving contractors are required to re-dress edge drop-offs greater than three (3) inches with approved shoulder backing material. The respective contractor or agency performing this work, prior to project termination, MUST mitigate paved and unpaved driveway aprons in rights-of-way that are abnormally and unreasonably impacted during the street paving operations. City of South Lake Tahoe Engineer has final authority in these matters.

When a straightedge 12 feet  $\pm 0.2$ -foot long is laid on the finished surface and parallel with the centerline, the surface shall not vary more than 0.1-inch from the lower edge of the straightedge. The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 0.20-inch are present when tested with a straightedge 12 feet  $\pm 0.2$ -foot long in a direction transverse to the centerline and extending from edge to edge of a 12-foot wide traffic lane.

When abrasive grinding is used to bring the top surface of the uppermost layer of asphalt concrete surfacing within the specified surface tolerances, additional abrasive grinding shall be performed as necessary to extend the area ground in each lateral direction so that the lateral limits of grinding are at a constant offset from, and parallel with, the nearest lane line or pavement edge, and in each longitudinal direction so that the grinding begins and ends at lines normal to the pavement centerline, within a ground area. Ground areas shall be neat rectangular areas of uniform surface appearance and shall be sealed with an asphaltic emulsion at a rate approved by the Engineer.

## **Acceptance of Work**

### **General**

Work determined to be in conformance with the provisions of this Section will be accepted and paid for at the contract price per ton for asphalt concrete.

The Engineer may reject a quantity of material that is determined to be defective based on visual inspection.

If the test results for a quantity of asphalt concrete indicate that the requirements of this Section have not been met, the asphalt concrete represented by that failure may be rejected.

Plant mix asphalt pavement shall be accepted on the basis of surface tolerance, density, thickness, conformance with the tolerances of the job mix formula, and the Marshal properties required in this section.

Asphaltic concrete paving will be accepted for density on a 'lot' basis. A lot will consist of 500 tons of asphaltic concrete or portion thereof exceeding 500 tons for each day's placement, with each day's placement consisting of at least one lot. Each lot will be tested for field density and mix property compliance.

Special attention is made to section 39-3.05, CALTRANS Standard Specifications- When asphalt concrete is stored, and it shall only be stored in appropriate silos. Asphalt concrete shall NOT be stockpiled prior to delivery to the jobsite and shall be cause for rejection. (CALTRANS Section 6-1.04 relates authorization to reject defective materials.)

Each lot of compacted pavement will be accepted, with respect to relative compaction, when the average relative compaction is equal to or greater than 92 percent, using the Theoretical Maximum Rice Specific Gravity in the determination of relative compaction.

If the average relative compaction is less than 92 percent, the completed pavement will be accepted or rejected based on the sliding scale Pay Factor, Table 1, Section 39-9.09 - 'Payment' - unless mitigated in accordance with Section 39-9.06 - 'Mitigation of Unacceptable Asphalt Concrete Pavement.' If allowed by the governing Agency, asphalt concrete pavement may be accepted for density by lot on the basis of relative compaction as compared to Marshall density as determined by ASTM D 1559 (50 blows each face for local residential streets, collector streets, and parking lots; 75 blows each face for arterial or any street with greater than 5 percent truck and/or bus traffic). Relative compaction shall not be less than 95 percent.

### **Mitigation of Unacceptable Asphalt Concrete Pavement**

#### **Unacceptable Surface Tolerance**

Unacceptable surface tolerance shall be corrected by either overlaying or grinding with an application of a Type III slurry seal as directed by the City Engineer. In areas to be corrected with an overlay, grinding may be necessary to provide for a minimum 1.5 inch overlay and butt joints where matching existing pavements.

#### **Unacceptable Density**

Unacceptable density, low asphalt cement content, or high air voids of the in-place pavement shall be corrected as follows:

Rice Theoretical Maximum

Relative Compaction

Mitigation

Less than 92% but greater than 89.5%  
Less than 89.5%

Type II slurry seal and sliding pay factor  
Remove and Replace

**Unacceptable Air Voids**

Air Voids – In Place Pavements

Mitigation

Air void greater than 8 percent but less than  
11 percent

Type II slurry seal

Air void greater than 11 percent

Remove and replace or 1 1/2 inch  
overlay

**Acceptance Testing**

The City Engineer or designee may assure conformance to contract specifications by review of the Contractor's mix design proposal, by inspection of the Contractor's procedures, by oversight of the Contractor's quality control inspection and records, and by independent verification sampling and testing of the asphalt binder, aggregates, and asphalt concrete during asphalt concrete production and placement and after compaction. Acceptance tests will be performed using the same test methods used for quality control testing.

Cut samples taken shall be used to determine conformance with thickness specifications. The average thickness of cores shall be at least equal to the specified minimum thickness of the asphalt concrete pavement with no single core less than 1/2 inch thinner than the specified minimum thickness.

The City Engineer or designee may test the asphalt, aggregates or asphalt concrete mixture to determine conformance with the provisions in this Section at their discretion, including whenever an asphalt concrete mixture or ingredient appears defective or inconsistent or whenever a test result indicates a change in the characteristics of the asphalt concrete mixture or an ingredient.

If the City Engineer or designee performs acceptance testing, the minimum frequency of testing will be one sample and test for each day's or partial day's production.

Asphalt, aggregates or asphalt concrete that does not conform to the requirements of this Section for aggregate quality or gradation, mixture volumetric properties, and/or density, including density of longitudinal joints, may be rejected.

The City Engineer may reject asphalt concrete that has stability test results less than or equal to 26 for Type A or 24 for Type B.

The Contractor may witness assurance sampling and testing. However, the Engineer will not be required to notify the Contractor of anticipated sampling schedules or locations and will not delay sampling or testing if the Contractor is unable to attend. The Contractor shall not use samples taken for assurance testing for testing and submittal as a quality control test result. Asphalt concrete shall conform to the requirements of Section 39.

Asphalt will be tested for density on a lot basis. A "lot" for density determination will consist of 500 tons of bituminous concrete or portions thereof exceeding 500 tons for each day's placement with each day's placement consisting of at least one "lot."

The Theoretical Maximum Specific Gravity of the asphalt concrete shall be used in the determination of relative compaction and shall be performed in accordance with ASTM D 2041.

At least one Theoretical Maximum specific gravity determination shall be made for each "lot" to be tested. Additional Maximum Specific Gravity tests may be performed at the discretion of the City Engineer and at the request of the Contractor and at the Contractor's expense. If more than one determination is made the average for the lot shall be used.

### **Contractor Quality Control**

Quality control, sampling, testing, and inspection shall be provided during asphalt concrete work. Sampling, testing, and inspection shall be performed at a rate sufficient to ensure that the asphalt concrete product conforms to the requirements in this Section.

The Contractor shall obtain a one-quart sample of the asphalt binder in conformance with the provisions in this Section for each day of asphalt concrete production. Modified binders shall be canned in one-quart cylindrical cans with open top, friction lids. The Contractor shall clearly identify the samples with project name, Contractor, Supplier, grade of asphalt, and date(s) sampled; and make the sample(s) available to the City Engineer. Each sample will represent the asphalt concrete produced during the day of sampling, and shall be delivered to the Engineer no later than the next working day unless otherwise approved by the Engineer.

The Contractor shall provide certified test results for theoretical maximum density and LTMD using the methods specified herein as often as necessary to represent the material being produced and placed. The City Engineer retains the option to core, remove the cut aggregate from the core(s), reheat, and determine theoretical maximum density and LTMD values for acceptance testing.

Providing quality control, sampling the asphalt binder, and providing theoretical maximum specific gravity and LTMD values shall be considered as included in the prices paid for asphalt concrete and no additional compensation will be allowed therefore.

## Measurement and Payment

The quantity asphalt concrete of the type(s) designated in the Engineer's Estimate to be paid for shall be the combined weight of the mixture determined in conformance with the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

Insufficient thickness shall be corrected by either removal and replacement, or by placement of a minimum thickness 1 1/2 inch overlay. Grinding may be necessary to eliminate the problems associated with raising of finish grade as determined by the City Engineer, but in all cases, the outside perimeter of the corrective overlay shall be placed as a flush butt-joint formed by grinding of existing pavement.

Quantities of paving asphalt, liquid asphalt, and asphaltic emulsion to be paid for as contract items of work will be determined in conformance with the provisions in Section 92, "Asphalts," Section 93, "Liquid Asphalts," or Section 94, "Asphaltic Emulsions," of the Standard Specifications.

When recorded batch weights are printed automatically, these weights may be used for determining pay quantities if the printed batch weights conform to the following:

1. Total aggregate and supplemental fine aggregate weight per batch shall be printed. When supplemental fine aggregate is weighed cumulatively with the aggregate, the total batch weight of aggregate shall include the supplemental fine aggregate.
2. The total bitumen weight per batch shall be printed. Zero-tolerance weight shall be printed before weighing the first batch and after weighing the last batch of each truckload.
3. A copy of the recorded batch weights shall be certified by a licensed weighmaster and submitted to the Engineer.
4. Pavement reinforcing fabric (when specified) will be measured by the square yard for the actual pavement area covered.

## Payment

Asphalt concrete placed in the work, unless otherwise specified, will be paid for at the contract price per ton for asphalt concrete of the type(s) designated in the Engineer's Estimate.

Unacceptable asphalt concrete pavement that exhibits high air voids from low density and/or low asphalt cement content shall be penalized unless mitigated in accordance with Section 39-9. The City will withhold the penalty portion of asphalt pavement payment with monies or bond deposited with the Agency.

## TABLE 1

## SLIDING SCALE PAY FACTORS

<u>Average Percent Rice</u> <u>Relative Compaction per Lot</u>	<u>Percent Payment</u>
92 and higher	100
91%	95
89.5%	90
Less than 89.5%	0

When there is a contract item for asphalt concrete (leveling), quantities of asphalt concrete placed for leveling will be paid for at the contract price per ton for asphalt concrete (leveling). When there is no contract item for asphalt concrete (leveling), and leveling is ordered by the Engineer, asphalt concrete so used will be paid for at the contract price per ton for asphalt concrete and no additional compensation will be allowed therefore.

The miscellaneous areas to be paid for at the contract price ton for place asphalt concrete (miscellaneous area) in addition to the prices paid for the materials involved shall be limited to ditches, overside drains, aprons at the ends of drainage structures.

When there is a contract item for paint binder (tack coat), the quantity of asphaltic emulsion or paving asphalt used as paint binder (tack coat) will be paid for at the contract price per ton for paint binder (tack coat). When there is no contract item for paint binder (tack coat), full compensation for furnishing and applying paint binder (tack coat) shall be considered as included in the contract price paid per ton for asphalt concrete of the type(s) designated in the Engineer's Estimate and no separate payment will be made therefore.

When there is a contract item for fog seal coat, the quantity will be paid for by the ton as provided in Section 37-1, "Seal Coats," of the Standard Specifications.

No adjustment of compensation will be made for an increase or decrease in the quantities of paint binder (tack coat) or fog seal coat required, regardless of the reason for such increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to the items of paint binder or fog seal coat.

The above contract prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in producing, hauling, and placing asphalt concrete, including preparation of the mix design, treatment with hydrated lime or liquid antistripping if necessary, and all necessary quality control, complete in place, as shown on the plans, as specified in this Section of these Special Provisions, and as directed by the Engineer.

The Standard Specifications are incorporated herein except as noted.

**Portland Cement Concrete**

The standard Portland Cement Concrete (PCC) mix design for paving in the City of South Lake Tahoe shall be as follows: PCC shall be fiber reinforced with a 4 inch maximum slump, minimum 5.5% and maximum 8% air content (air entrainment) and a minimum compressive strength as specified. Place contraction joints at 6-foot intervals and expansion joints at 18-foot intervals. If curb and sidewalk is adjacent to the roadway install 2" PVC snow pole sleeves through the sidewalk at the interface of the sidewalk and curb at expansion joint locations. Sidewalk shall be a minimum depth of 4 inches. Aggregate base minimum depth below curb shall be 8 inches and below sidewalk shall be 6 inches.

**Section 11-40 (2.0) General Requirements**

The work herein provided for is to be done in accordance with the plans, profiles, cross-sections and general and special provisions on file with the City of South Lake Tahoe Engineering Department and with these specifications, which are intended to cover all items necessary for the complete construction of concrete curbs, gutters, sidewalks, driveways, alley approaches and other concrete structures. No plans may be used unless approved by the Engineering Department.

**Section 11-40 (2.1) Material Requirements****A. Portland Cement Concrete-Transit Ready-Mixed**

1. Portland Cement Concrete shall be Transit-Ready-Mixed conforming to Standard Specifications ASTM Designation: C-94.
2. The allowable twenty-eight day (28) compressive strength for concrete shall not be less than:
  - a. Class A=4000 psi (7 sack minimum) for areas exposed to freeze thaw environments;
  - b. Class B=2500 psi (5 sack minimum) for non-exposed areas.
3. The maximum size concrete aggregate shall be 1 inch.
4. The Portland Cement, water, coarse and fine aggregate, shall comply with the applicable ASTM Designations for Portland Cement Concrete.
5. Proportioning of Portland cement, water and coarse and fine aggregate shall be certified by the manufacturer to comply with ASTM Standards for each class specified.

6. Concrete mixers and other equipment determined by the Engineer not to be adequate or suitable for the work shall be removed and suitable equipment provided by the Contractor at their own expense. Pick-up and throw-over blades in the drum of the mixer, which are worn down three-quarter inch (3/4") or more in New blades shall replace depth. The size of batch in truck mixers shall not exceed the rated capacity as determined by the Standard requirements of the Truck Mixer Manufacturers' Bureau. Truck mixers shall be equipped with means by which the number of revolutions of the drum or blades may be readily verified, and there shall be at least fifty (50) revolutions at mixing speed before any part of the batch is released.
7. The total elapsed time between the introduction of mixing water to the batch depositing the complete mix shall not exceed 90 minutes.
8. Admixtures to prevent segregation, to improve workability, or to accelerate the gain in strength of the concrete may be permitted, provided the admixture material proposed and the proportions of admixture to be used have been approved and fixed by the Engineer. Admixtures shall not be used without written permission from the Engineer or unless elsewhere provided for in these specifications or in the special provisions. Admixtures shall not be used to replace cement. If the use of calcium chloride is permitted, it shall comply with the Standard Specifications for Calcium Chloride ASTM Designation: D98. Unless otherwise specified or directed by the Engineer, calcium chloride shall be added at the rate of two percent (2%) by weight of the cement. Calcium chloride shall be dissolved in water and then be introduced with the mixing water.  
Should the Contractor be permitted to use admixtures with the concrete for any purpose for his own benefit, he shall furnish such admixtures and incorporate them in the concrete mix at his own expense and no additional allowance will be made therefore.
9. Air entraining agents may be used, subject to addition of cement, in accordance with the Standard Specifications. The amount of water required for the proper consistency of concrete shall be determined by the method as described as ASTM Designation: C143. The amount of the slump shall be twelve inches (12") minus the height after subsidence. The allowance for slump shall be not more than four inches (4"). The amount of water added at the mixer shall be regulated in accordance with the free water in the aggregates and the requirements for workability within the limits of the slump set forth above. The amount of water, including the free water in the aggregates, shall not exceed six and one-half (6-1/2) gallons per sack of cement in Class A concrete, seven (7) gallons per sack of cement in Class B concrete, or seven and one-half (7-1/2) gallons per sack of cement in Class C concrete.
10. Test Specimens may be taken by the Engineer or Inspector at any time deemed advisable from the transportation unit at the point of discharge and tested in conformance with the Standard Method of Test for Compressive Strength of Molded Concrete cylinders, ASTM Designation: C39, and Test Method No. California-521.

**B. Expansion Joint Material**

Prefabricated asphalt impregnated expansion joints, or equal, of three-eighth inch (3/8") thickness shall be used as shown on the plans and approved by the Engineer and complying with ASTM Designation: D1751.

### **C. Curing Compound**

Use approved curing compound conforming to the Standard Specification ASTM Designation: C309, and approved by the Engineer.

## **Section 11-40 (2.2) Construction Methods**

### **A. Subgrades for Concrete Structures**

The subgrade shall be constructed true to grade and cross-section, as shown on plans, or as specified by the Engineer or his authorized representative. The subgrade shall be thoroughly watered, rolled or hand tamped until hard and solid, before placing concrete. All adobe or soft and spongy material shall be removed to a depth as specified and the resulting void shall be filled with earth, sand or gravel, free of any vegetation or other deleterious material and of a quality that will pack when moistened. The material shall be thoroughly watered and rolled or tamped in layers not to exceed eight inches (8"), until a firm and solid foundation is secured. The entire subgrade shall be tested for grade and cross-section by means of a template extending the full depth and width of the curb, gutter or sidewalk and supported between side forms. The subgrade and forms shall be thoroughly watered in advance of placing concrete and allowed to dry to a damp condition. Compaction shall have a relative density of ninety-five percent (95%) under curbs, sidewalks, gutters and driveways, and other structures. The work shall comply with all the requirements of the Standard Specification for Subgrade.

### **B. Concrete Forms**

1. The width of the forms for the combined curb, gutter and sidewalk shall be not less than the full thickness of the sidewalk on the outside edge of the sidewalk, not less than the full height of the curb face on the outside of the curb, and not less than the full thickness of the gutter on the outside edge of the gutter.
2. Timber forms, if used, shall not be less than one and one-half inches (1-1/2") thick after being surfaced. Warped forms and forms not having a smooth, straight upper edge shall not be used.
3. Rigid forms shall be provided for all curb returns except that benders or thin plank forms, rigidly placed may be used for curbs and curb returns where there are grade changes in the returns or where the central angle is such that a rigid form with a central angle-of ninety degrees (90) cannot be used.
4. Curb, gutter and sidewalk forms shall be carefully set to alignment and grade and to conform to the dimensions on the plan. Forms shall be held rigidly in place by the use of

iron stakes at intervals not to exceed four feet (4'). Clamps, spreaders, and braces shall be used where required to insure rigidity in the forms.

5. The form on the front of the curbs shall not be removed in less than two (2) hours after the concrete has been placed. In no event shall the form be removed while concrete is sufficiently plastic to slump upon removal of form.
6. All forms shall be cleaned thoroughly each time they are used and coated with light oil as often as necessary to prevent the concrete from adhering to them.
7. Forms for the structures shall comply with all provisions of the Standard Specifications.

### **C. Expansion Joints**

Pre-cast asphalt impregnated expansion joints, or equal, of three-eighth inch (3/8") thickness and of the same size and shape as those specified for the individual construction of curbs, gutters and sidewalks shall be fastened with staples or other approved type fastenings, into one unit to conform to the shape of the cross-section of the combination curb, gutter and sidewalk. The expansion joint shall be set flush with the face and to the full depth of the curb, gutter and sidewalk. They shall be placed at right angles and perpendicular to the forms at intervals of not more than eighteen feet (18'). Expansion joints shall also be required at each end of a curb return, utility box, and at each end of constructed combination.

### **D. Concrete Placement**

1. All concrete shall be of the class specified.
2. Any concrete that has had water added to the batch for more than 90 minutes shall be rejected and not placed in any structure. An interval of more than 45 minutes between any two consecutive batches or loads, or a delivery and placing rate of less than eight (8) cubic yards of concrete per hour shall constitute cause for shutting down work for the remainder of the day and, if so ordered by the Engineer or Inspector, the Contractor shall make, at his own expense, a construction joint at the location and of the type directed by the Engineer in the concrete already placed.
3. Concrete shall be placed in the forms for curbs, gutters, sidewalks, driveways, alley approaches, and other structures, directly from the truck mixer, or as approved by the Inspector in a manner which will not permit segregation of the concrete aggregates. Concrete shall be placed in the forms in layers not to exceed six inches (6") in depth until the forms are filled to the top. Each layer shall be thoroughly graded to remove all rock pockets, or concrete may be compacted by means of a mechanical vibrator approved by the Engineer. After tamping and floating, the proper section and grade shall be line and straightedge checked to assure the designed finished line; grade and elevation will result in adequate drainage.

4. Test specimens may be taken by the Engineer or Inspector at any time deemed advisable from the transportation unit at the point of discharge and tested in conformance with the Standard Method of Test for Compressive Strength of Molded Concrete Cylinders, ASTM Designation: C39, and Test Method No. California 521.
5. Concrete placement for structures shall also comply with the Standard Specifications.
6. All concrete shall be protected from damages at the Contractor's expense.

## **E. Concrete Finish**

### **1. Sidewalks**

The surface of the sidewalk shall be finished with a fine hair push broom drawn over the surface transverse to the line of traffic. Water, if necessary, may be applied lightly to the surface immediately in advance of brooming. Before brooming, the surface of the sidewalk shall be marked at right angles to the curb line and at a maximum of six-foot (6') intervals. The mark shall be cut two inches (2") deep with a pointed trowel and then use a double edged tool which will make a groove one-quarter inch (1/4") in depth with one-eighth inch (1/8") rounded edges and insure a free movement weakened plane at the joint. Markings shall coincide and line up with adjoining curb markings, if any. The sidewalk shall also be edged with a suitable tool. The marking and grooving pattern shall be varied in such a way to include marks off the corners of any tree wells or other items constructed within the sidewalk. Uncontrolled cracking will not be acceptable. When sidewalk to be constructed adjoins an existing sidewalk with a troweled smooth finish, the finish of the sidewalk to be constructed shall conform to the finish of the existing sidewalk unless otherwise specified by the Engineer. All blemishes caused by the marking tool, edging tool, or any other blemish shall be removed by smooth troweling the surface prior to finishing with a broom. The finished sidewalk shall be true to grade so that when a straight edge ten feet (10') in length is laid upon the surface of any point except at grade changes, the surface shall at no point vary more than one-eighth inch (1/8") and the finished surface shall be free from blemishes.

### **2. Curbs**

Prior to the removal of the forms, the surface shall be edged with an approved edging tool giving a corner radius of one-half inch (1/2").

The curb shall be given a smooth finish with a steel trowel, free from humps, sags, blemishes or other irregularities. When a straight edge ten feet (10') in length is laid on the top, low line or face of the curb. The surface shall not vary more than one-eighth inch (1/8") from the straight edge except at grade changes or curves.

The top and front of the curb shall be marked at right angles to the curb line and at a maximum of six-foot (6') intervals. The mark shall be cut two inches (2") deep with a

pointed trowel and then use a double edged tool which will make groove one-quarter inch (1/4") radii to the surface of the curb and insure a weakened plane at the mark. Markings shall coincide and line up with adjoining sidewalk markings, if any. Uncontrolled cracking will not be acceptable. After steel troweling and marking the front and top of the curb, it shall be given a final fine brush finish with the brush strokes parallel to the top of curb line.

When the top and face of the curb are finished and the specified time lapsed, the back form of the curb shall be removed and the back of the curb shall be finished the same as the top and face, to a depth of not less than two inches (2") below the curb top.

### 3. Gutters

After tamping, the gutter shall be finished with a float to true grade from humps, sags, blemishes and other irregularities. When a straight edge ten feet (10') in length is placed upon the surface at any point, except at grade changes, the surface shall at no point vary more than one-eighth inch (1/8"). The surface of the gutter shall be marked the same as, and conform to, the markings on the curb. The gutter shall be edged on the outside edge with an approved edging tool having a corner radius of one-half inch (1/2").

### 4. Driveways and Alley Approaches

The finish surface of the sidewalk portion of the driveway shall be as per (1) above. The approach or apron portion shall have a fiber broom finish transverse to the line of traffic. The curbs and gutter portions shall be finished as per (2) and (3) above.

### 5. Concrete structure finishes shall comply with the Standard specifications.

## **F. Curing Concrete**

Use pigmented curing compound in accordance with the Standard Specifications. The curing period shall be for eight (8) days. Care shall be exercised to avoid damage to the seal during the curing period. Should the seal be broken or damaged before expiration of the curing period, the Contractor shall immediately apply liquid membranes over the damaged portions at his own expense.

Traffic shall not be permitted to pass over concrete structures or any loads imposed thereon in less than ten (10) days after the concrete has been placed.

## **G. Contractor's Name Stamping**

The Contractor shall stamp his name and the date (year) on all work done by him once on each job. The letters shall not be less than three-quarters of an inch (3/4") in

height and of a proportional width. They must be set into the work to a depth of not less than one-quarter inch (1/4").

**H. Responsibility for Work**

The Contractor shall repair at his own expense any damage to curbs, gutters, walks or other structures, caused by him in the performance of the work. Any construction or work performed not conforming to these specifications shall be removed and replaced at the Contractor's expense, and any damage caused by failure on the part of the Contractor for not properly protecting said construction, shall also be the Contractor's responsibility.

**I. Thickness Deficiency**

Payment for concrete which is deficient in thickness of not more than 0.05 feet will be adjusted in compliance with the Standard Specification. Concrete which is deficient in thickness of more than 0.05 feet will be removed in compliance with the Standard Specification.

**J. Ramping Curbs and Sidewalks**

All curbs and sidewalks must be accessible to and usable by the physically handicapped. The laws requiring this are in Section 4450, Chapter 7, Division 5 of Title 1 of the California Government Code and Section 19956.5 of the California State Health and Safety Code.

The following criteria shall be used as a guideline:

	<u>Minimum Acceptable</u>
Slope of Ramps	1:12
Width of Ramps at Top	42"
Width of Ramp at Gutter Line	42"
Transition Slope at Curb Face (X-Slope)	1:12
Lip at Gutter	1/2" (maximum)

Ramps should be constructed with a heavy broom finish transverse to the axis of the ramp in order to indicate a change of texture for blind persons and to make them as non-slip as possible. Ramps should have no abrupt changes in elevation or angle of slope. The number of ramps at each corner ideally should be two (2); one adjacent to each beginning of curb return.

**SECTION 11-41 PAVEMENT SUBSEALING AND JACKING**

The Standard Specifications are incorporated herein.









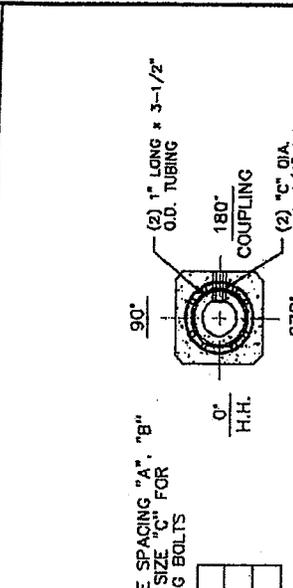




**APPENDIX L** \_\_\_\_\_ **STREET LIGHTING**

**APPENDIX L**  
**STREET LIGHTS**

REV.	DATE	DESCRIPTION	DRN.	APPR.
A	3/03	ADDED MIX & PAINT COLORS	G.C.	



NOTE:  
SPECIFY HOLE SPACING "A", "B"  
& COUPLING SIZE "C" FOR  
FIX. MOUNTING BOLTS

A	
B	
C	

SIDE MOUNT DETAIL

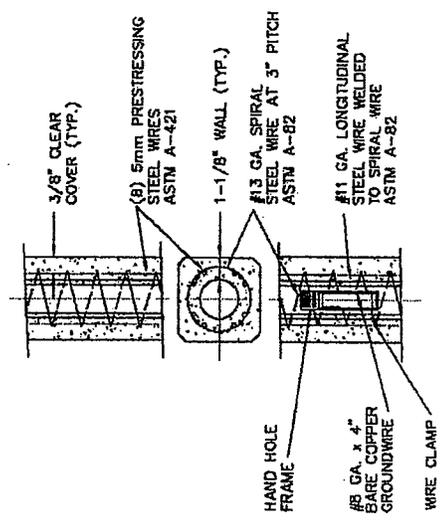
SEQ. SMALL-EMBEDDED-SQUARE

POLE DESIG- NATION	EM- BEDDED DEPTH	OVER- ALL LENGTH	BUTT DIA.	ULTIMATE O.L. MOMENT (ft. lbs.)	WEIGHT (lbs.)
SEQ-5.2	17'-0"	4'-3"	21'-3"	6-1/2"	12,980
					540

( ) POLE REC'D. WITH SINGLE SIDE INSERTS @ 180°.

NOTES:

- (1) FINISH: #5131, BROWN, NATURAL, EXPOSED FINISH WITH AMERSHIELD ANTI-GRAFFITI COATING.
- (2) ASTM C-150 TYPE III GRAY CEMENT.
- (3) f'c @ 28 DAYS=7,000 PSI, USING SPUN CYLINDER TEST.
- (4) f'c @ 28 DAYS=5,000 PSI, USING ASTM C-31 CYLINDER TEST.
- (5) POLES MANUFACTURED TO ASTM C-1089-97 SPECIFICATIONS.
- (6) ALL EXPOSED METAL PAINTED BLACK GREEN RAL 6012 (PH).



POLE SECTION

APPROVED BY

**Amepon** POLE PRODUCTS & SYSTEMS

CITY OF SOUTH LAKE TAHOE, CA.  
SEQ-5.2 (5131) W/SINGLE SIDE INSERTS

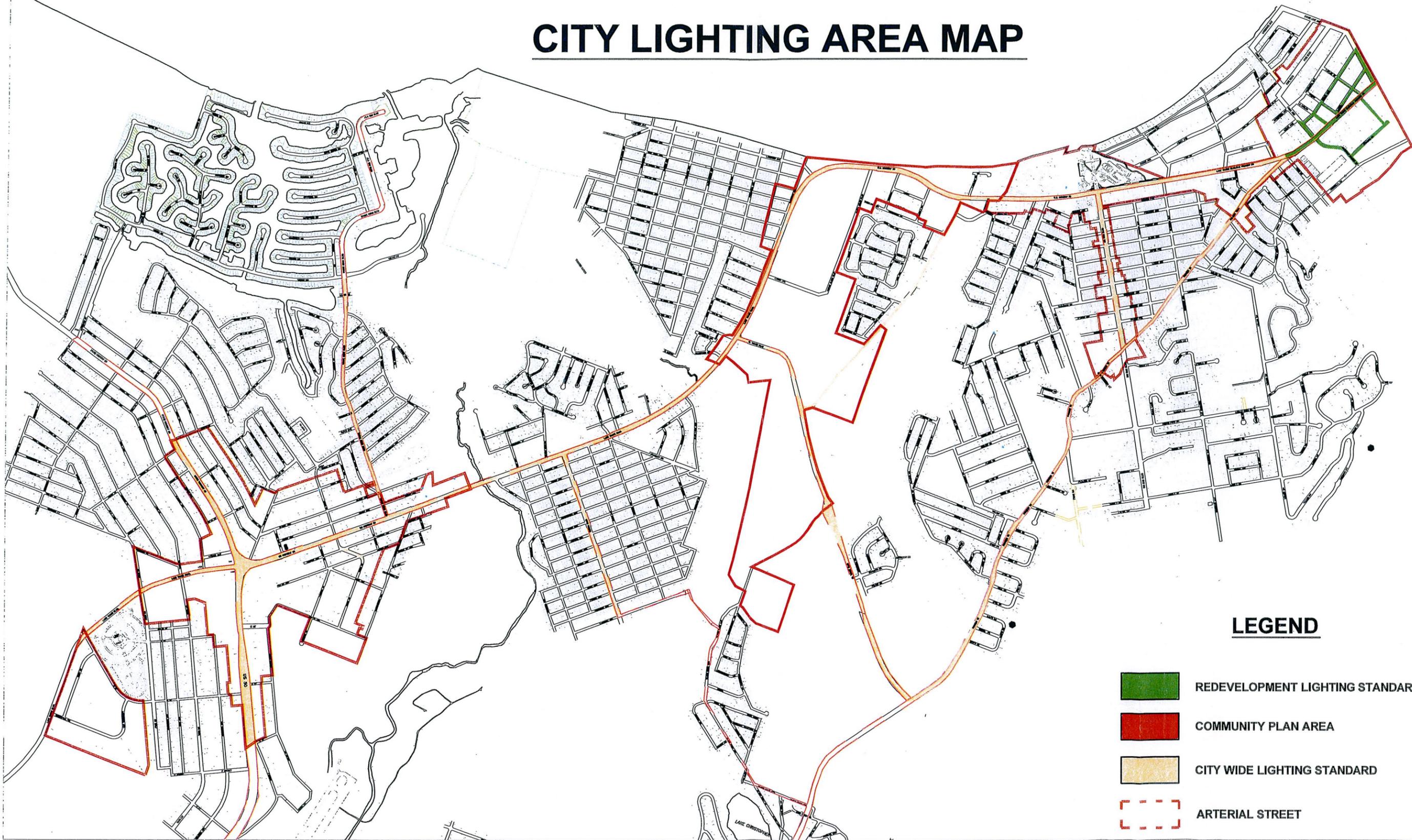
DATE

THE DOCUMENT CONTAINS INFORMATION WHICH IS PROPRIETARY TO AMEPON. IT SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF AMEPON.

DRAWN: G.C. 2/03 SCALE NONE

CHK'D: DWG. NO. SK023003 REV A

# CITY LIGHTING AREA MAP



## LEGEND

-  REDEVELOPMENT LIGHTING STANDARD
-  COMMUNITY PLAN AREA
-  CITY WIDE LIGHTING STANDARD
-  ARTERIAL STREET