

CITY OF HEMET PUBLIC WORKS DEPARTMENT

STANDARD SPECIFICATIONS

JANUARY 2025

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**CITY OF HEMET
PUBLIC WORKS DEPARTMENT**

**STANDAR SPECIAL PROVISIONS FOR USE IN CONJUCTION WITH THE ACG/APWA
STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION**

I. GENERAL PROVISIONS

I.1 DEFINITIONS

Acceptance - The formal written acceptance by the City of Hemet of those public improvements that are specified in the agreement between the City and the Developer to be accepted by the City if constructed in all respects in accordance with the plans and specifications and any modifications thereof previously approved by the City.

Agency - The legal entity to which the work is being performed.

Agreement - The written agreement with the City of Hemet covering the performance of the Developer's improvement work which shall include and refer to plans, specifications, and faithful performance bonds; also, any and all supplemental agreements amending or extending the work contemplated and which may be required to complete the work in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments or extensions to the agreement and may include contract change order.

Assessment Act Contract - A contract financed by special assessments authorized under a State Act or procedural ordinance of the City or County.

Board - The officer or body constituting the awarding authority of the City Council.

Cash Contract - A contract financed by means other than special assessments.

City Council - Board

City Engineer - Engineer or their appointed representative.

Code - The terms of Government Code, Labor Code, etc. refer to codes of the State of California.

Contract - The written agreement covering performance of the work including, but not limited to, the formal contract, notice inviting bids, instructions to bidders, affidavit, proposal, specifications, special provisions, bonds, and plans.

Contract Price - The total amount of money for which the contract is awarded.

Contract Unit Price - The Contractor's original bid for a single unit of an item of work in the proposal.

Contractor - The individual, Developer, partnership, corporation, joint venture, or other legal entity entering into 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.

County Sealer - The Sealer of Weights and Measures of the county in which the contract is let.

Days - Days shall mean consecutive calendar days unless otherwise specified.

Developer - The person or persons, firm partnership, corporation, joint venture, or combination thereof, who have entered into an agreement with the City of Hemet to construct public improvements.

Electrolier - Street light assembly complete, including foundation, standard, lumina arm, luminaire, etc.

Engineer - The City Engineer or other person designated by the City Council acting either directly or through authorized agents.

Greenbook - The Standard Specifications for Public Works Construction (SSPWC), latest edition.

House Connection Sewer - A sewer, within a public street or right-of-way, proposed to connect any parcel, lot, or part of a lot with the main sewer line.

House Sewer - A sewer, wholly within private property, proposed to connect any building to a house connection sewer.

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

Major Bid Item - A single contract item constituting 10 percent or more of the original contract price.

Person - Any individual, firm, association, partnership, corporation, trust, joint venture, or other legal entity.

Plans - The drawings, profiles, cross sections, working drawings, and supplemental drawings, or reproductions thereof, approved by the Engineer, which show the location, character, dimension or details of the work.

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

Proposal - The offer of a bidder when submitted on the proposal form properly signed and guaranteed.

Proposal Guaranty - The cash, certified check or bidder's surety bond accompanying the proposal as a guaranty that the bidder will enter into a contract with the Board for the performance of the work.

Referenced Documents - The following documents form a part of these specifications:

- A. Standard Specifications, and Standard Plans for Public Works Construction, latest edition, authored by the American Public Works Association, Southern California Chapter, and the Associated General Contractors of California, Southern California Districts as a Joint Cooperative Committee.
- B. Standard Landscape Specifications and Design Guidelines, latest edition, authored by Valley-Wide Recreation and Park District.
- C. Those portions of the State of California Department of Transportation (Caltrans), Standard Specifications, latest edition, which do not conflict with the same Greenbook's specifications.
- D. The Development Plans prepared by the Developer's Engineer and approved by the City Engineer.
- E. The Conditions of Approval for the project, approved by the Planning Commission.
- F. The City-Developer Agreements setting forth the requirements for construction of the work shown on the Development Plans.

Reference Specifications - Those 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.

Roadway - The portion of a street reserved for vehicular use.

Service Connection - Service connections are all or any portion of the conduit, cable or duct, including meter, between a utility distribution line and an individual consumer.

Sewer - Any conduit, intended for the reception and transfer of sewage and fluid industrial waste.

Special Provisions - Any provisions, which supplement or modify these specifications.

Specifications - Standard specifications, reference specifications, Special Provisions and specifications in supplemental agreements between the Contractor and the Board.

Standard - The shaft or pole used to support street lighting luminaires, traffic signal heads, mast arms, etc.

Standard Plans - Details of standard structures, devices, or instructions referred to on the plans or in specifications by title or number.

State - The State of California

Storm Drain - Any conduit and appurtenances intended for the reception and transfer of storm water.

Street - Any road, highway, parkway, freeway, alley, walk, or way.

Subcontractor - The individual, partnership, corporation, or other legal entity entering into a contract with the Contractor to perform a portion of the work.

Supervision - Supervision, where used to indicate supervision by the City 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 superintendence of details of the work.

Surety - Any individual, firm or corporation, bound with and for the Contractor for the acceptable performance, execution, and completion of the work, and for the satisfaction of all obligations incurred.

Utility - Tracks, overhead or underground wires, pipe lines, conduits, ducts, or structures, sewers or storm drains owned, operated, or maintained in or across a public right of way or private easement.

Work - That which is proposed to be constructed or done under the contract or permit, including the furnishing of all labor and materials.

II. CONSTRUCTION MATERIALS

II.1 ROCK PRODUCTS

GENERAL:

The following specifications set forth the requirements for crushed rock, rock dust, gravel, sand and stone for riprap. Sieve analyses and sand equivalents shall be determined as prescribed in Section 200 of the SSPWC.

All rock products shall be clean, hard, sound, durable, uniform in quality, and free of any detrimental quantity of soft, friable, thin, elongated, or laminated pieces, disintegrated material, organic matter, oil, alkali, or other deleterious substance. Unless otherwise specified, all percentages referred to in Section 200 of the SSPWC shall be determined by weight.

II.2 PIPE

PLASTIC PIPE:

Water mains shall be polyvinyl chloride (PVC) pressure pipe and shall meet the minimum standards set forth in American Water Works Association (AWWA) C-900 and American Society of Testing Materials (ASTM) C-1784, **200 PSI minimum rating, Class 20.**

Sewer mains shall be polyvinyl chloride (PVC) pipe SDR 35 and shall meet the minimum standards set forth in ASTM 3034 and F-679.

COATING:

All flange bolts and nuts shall be lubricated and coated with No-ox-id rust protection coating as manufactured by Dearborn Chemical Company or equal and then given a Bituminous Coating conforming to the requirements of AASHO M-190.

GENERAL:

Unless otherwise specified, all pipe appurtenances shall comply with the appropriate standard drawings of the City of Hemet.

GATE VALVES:

Gate valves shall equal or exceed the requirements established by AWWA Specification C-515 and shall be resilient-seated per AWWA Standard C-509. All gate valves shall be of the same size as the mains in which they are installed, unless otherwise indicated on the plans approved by the City Engineer. Valves four inches (4") and over shall be iron bodied, solid bronze internal working parts, resilient wedge gate valve, bottom wedging with non- rising

stem, and shall open by turning counter-clockwise. The valves shall be furnished with triple "O" ring stem seal, with cadmium-plated bolts, hub or flanged. Rubber ring ends shall conform to the pipe manufacturer's specifications. Where hub and flange valves are designed on the plans, the Contractor may of his option, install flanged valves with hub and flange adaptors, Smith-Blair or approved equal. Valves installed at end of mains shall be capped or blind flanged after test. Valves smaller than four-inch are not used in the system.

Four Inch (4") and Larger gate Valves: Valves shall be iron body, bronze mounted, resilient wedge gate valve, bottom wedging with non-rising stem and shall open by turning counter-clockwise. Bronze for interior parts of valves shall be ASTM B-62 (85% copper, 5% tin, 5% zinc, 5% nickel) bronze and shall contain no more than two percent (2%) aluminum nor more than seven percent (7%) zinc. Stems shall meet the strength requirements specified below.

Minimum Tensile Strength	60,000 psi
Minimum Yield Strength	32,000 psi
Maximum % elongation in 2"	10%

BUTTERFLY VALVES:

Butterfly valves shall be equal to or exceed the requirements established by the specifications of AWWA C-504. Unless otherwise specified, they shall be manually operated valves with enclosed operator, and if installed in a vault, shall be equipped with a handwheel and indicator. Valves shall have positive 100% shutoff and shall withstand a 450 ft./lb. input torque in fully opened and closed position without damage.

The shafts shall be hexagonal, fabricated from 18-8 stainless steel or other approved material and shall be connected to the disc without the use of pins or keys.

VALVE BOXES:

Valve boxes shall be Brooks Products, Inc., Valve Box No. 3RT or approved equal. All buried valves not in vaults shall be provided with valve boxes. Eight-inch round gate caps, marked "Water", with galvanized slip cans may be used with Water Superintendent's approval.

VICTAULIC COUPLINGS:

Unless otherwise specified, victaulic couplings shall be designed for a working pressure of not less than 150 psi. They shall be equipped with rubber gaskets for water service and shall be designed for use with pipe, which has been banded and machined to the dimensions of Class A shoulder-end cast iron pipe. Bolts used in buried victaulic couplings shall be of stainless steel.

SLEEVE-TYPE COUPLINGS:

Unless other specified, all sleeve-type couplings shall be cast iron and if buried, shall be provided with stainless steel bolts, or bolts otherwise protected from corrosion in a manner

suitable to the City Engineer.

THRUST BLOCKS:

Concrete thrust blocks shall be installed in every instance where the direction of the pipe changes 11-¼ degrees or more at any joint or fitting, at all fire hydrants, at stub-ends of pipes and at other locations as shown on the plans and standard drawings. Bearing areas of thrust blocks shall normally be computed on the basis of a 225 psi internal pipe pressure and soil bearing value of 2000 psf.

The dimensions of all thrust blocks shall be subject to the approval of the City Engineer. All concrete thrust blocks shall be constructed in such a manner that concrete does not cover any joint or cover any bolts or bear against any adjacent pipe. Thrust blocks shall be placed against undisturbed soil.

Concrete for thrust blocks shall be 5.5-G-2500 and shall be cured a minimum of three days before any loads are applied.

LOCATOR WIRE:

When nonmetallic pipe is installed, an electrically continuous locator wire shall be installed with appropriate access to be used for locating pipe with an electronic pipe locator after installation. The wire shall be a minimum of 14 gauge with suitable insulation for direct burial.

STEEL PIPE:

Design Criteria - Steel cylinder pipe shall be fabricated in accordance with AWWA C-200 and C-205 and shall be cement mortar-lined and coated. The cross-sectional area of steel in the wall of the pipe cylinder shall be computed on the basis of a minimum design safety factor of 2.0 of the ratio of yield point stress for that particular type steel used in the fabrication of the pipe, to the maximum design working stress in the pipe cylinder wall. Steel pipe shall be designed and installed per AWWA M11.

Steel cylinders shall have a wall thickness of not less than 10 gauge (0.135 inch).

II.3 ASPHALTIC CONCRETE PAVEMENT

GENERAL:

Asphalt concrete pavement shall consist of one or more courses of a mixture of paving asphalt and graded aggregate as specified in Subsection 203-6, placed upon a prepared roadbed or base, or over existing pavement. The courses shall be of the type of mixture and the dimensions shown on the plans or Special Provisions.

Bituminous pavement shall be removed in accordance with Subsection 401-2

All testing of underground installations at any given point shall be completed before the surface course is placed at that point.

COMPACTION

Asphalt concrete, 1.5" (0.125') in thickness or greater after the completion of rolling, shall be compacted to not less than 95 percent and not more than 97 percent of the theoretical maximum density (TMD) as determined in accordance with AASHTO T 209 Method A.

TACK COAT:

See Standard Specifications for Public Works Construction (latest Edition) Section 302-5.8.

SEAL COAT:

A fog seal in accordance with Section 37-1 of the latest edition of the Division of Highways Standard Specifications shall be applied to all new asphaltic concrete surfaces.

DISTRIBUTION AND SPREADING:

Full depth construction of asphalt concrete shall be laid in two or more courses according to plans approved by the City Engineer.

WAIVER OF REQUIREMENT:

The requirement in Subsection 302-5.14.5 for the weighmaster's certificate to be signed by a representative of the City Engineer at the plant is waived unless specifically requested by the City Engineer.

II.4 UNTREATED BASE MATERIALS

REQUIREMENTS:

The requirements of Subsection 200-2 shall apply except as hereafter provided.

BASE MATERIAL:

When base material, without further qualification or qualified as "Class II", is specified, the Contractor shall supply crushed aggregate base.

CRUSHED AGGREGATE GRADING:

The material shall conform to the following gradations:

Sieve Sizes	Percentage Passing
1-1/2"	100
3/4"	90-100
3/8"	50-80
#4	35-55
#30	10-30
#200	2-9
ASTM C131 Test Grading	B

QUALITY REQUIREMENTS:

The material shall also conform to the following requirements:

	Test Method No.	Requirements
R-Value	Calif. 301	80 Minimum
Sand Equivalent	Calif. 217	50 Minimum
Percentage Wear	ASTM C131	
100 Revolutions		15 Maximum
500 Revolutions		52 Maximum
Specific Gravity	ASTM C127	2.58 Minimum

III. CONSTRUCTION METHODS

III.1 PUBLIC CONVENIENCE AND SAFETY

STREET CLOSURES, DETOURS, BARRICADES:

Traffic controls shall be in accordance with the California Manual on Uniform Traffic Control Devices (CAMUTCD) latest edition, published by the State of California, Department of Transportation (Caltrans) a. In the event that the Contractor fails to install barricades or such other warning devices as may be required by the City Engineer, the City may, at its sole option, install the warning devices and charge time and materials to the Contractor, for each warning device.

All trenches shall be backfilled and compacted at the end of each workday. All trenches shall be paved with temporary A.C. prior to any weekend or holiday.

At least 48 hours in advance of closing, or partially closing, or of reopening any street, alley or other public thoroughfare, the Contractor shall notify the Police, Fire, Traffic and Engineering Departments of jurisdictional agencies involved and comply with their requirements. Deviations must first be approved in writing by the City Engineer.

HOURS OF WORK:

Shall be approved by the City Engineer on a case by case basis in accordance with the City's Municipal Code.

III.2 COMPACTION TESTS

Compaction tests shall be required on all trench lines, street sub-base, street base material and under curbs and gutters, sidewalk, drive approaches and parking lots at locations designated by the inspector. All expenses incurred for compaction testing shall be borne by the Developer/Contractor.

The top five feet shall be compacted to 90 percent minimum relative compaction except that the top 12-inches of subgrade material shall be compacted to 95 percent minimum theoretical compaction. The City Engineer may approve 90 percent compaction under sidewalk on a case by case basis.

III.3 OPEN TRENCH OPERATIONS

MAXIMUM AND MINIMUM WIDTH OF TRENCH:

For pipe, the minimum and maximum width of trench permitted shall be as indicated on the plans or standard plans.

If the maximum trench width is exceeded, the Contractor shall provide, at no additional cost to the Agency, additional bedding, another type of bedding, or a higher strength of pipe, as shown on plans approved by the Engineer.

Additional payments or deductions from the contract price for trench excavation for conduits will be based upon a calculated volume. The width used in calculating the volume of excavation for prefabricated conduit will be the maximum width of the trench shown on the plan and measured at the top of the pipe. In the case of sewers or storm drains formed and cast in place, such volume will be based upon the outside width of the structure being constructed plus three feet.

Additional payment or deductions from contract price for trench resurfacing will be based upon an area determined by the maximum width of trench as specified herein.

Unless specifically authorized by the City Engineer, trench width, measured at the top of the pipe, shall not exceed the outside diameter of the pipe plus 24-inches, nor shall it measure less than the outside diameter plus 12-inches.

All underground pipes to be abandoned, 6-inches or larger in diameter, shall be removed or crushed in place. Asbestos concrete pipe must always be removed in accordance with all federal, state and local regulations.

FIELD JOINTING OF STEEL PIPE:

All field-welded joints shall be in accordance with the Standard Specifications for Field Welding of Steel Water Pipe Joints: AWWA C-206.

III.4 BACKFILL AND DENSIFICATION

GENERAL:

Backfill shall be considered as starting one foot above the pipe or conduit, or at the top of concrete bedding over the pipe or conduit. All material below this point shall be considered as bedding.

Backfill, or fill as the case may be, for cast-in-place structures such as, but not limited to, manholes, transition structures, junction structures, vaults, valve boxes and reinforced concrete box conduits shall start at the subgrade for the structure.

Except where the pipe must remain exposed for force main leakage tests and subject to the provisions herein, the Contractor shall proceed as soon as possible with backfilling operations. Care shall be exercised so that the conduit will not be damaged or displaced. If the pipe is supported by concrete, bedding placed between materials shall be placed to one foot over the top of the conduit. The backfill above the concrete bedding shall not be placed nor sheeting pulled until at least the minimum time after placement provided by the optional classes of concrete designated in Subsection 201-1 for such concrete bedding. 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 has been added for the purpose of obtaining a high early strength:

OPERATION	LOCATION	
	Over Top Structure (Days)	Against Sides of Structure (Days)
Placement of Loose Backfill	21	5
Densification of Backfill	28	7

The City Engineer may permit the use of admixtures or the use of additional cement in various parts of the structure in accordance with Subsection 201-1.2.4.

Rocks greater than 6 inches in any dimension will not be permitted in backfill placed between one foot above the top of any pipe or box and one foot below pavement subgrade.

When the trench is wider than three feet, rocks not exceeding 12-inches in greatest dimension, which originate from the trench, will be permitted in the backfill from one foot above the top of any pipe or box to five feet below the finished surface.

Rocks greater than 2-½ inches in any dimension will not be permitted in backfill placed within one foot of pavement subgrade.

Where rocks are included in the backfill, they shall be mixed with suitable excavated materials so as to eliminate voids.

Subject to the provisions specified herein, the material obtained from project excavations may be used as backfill provided that all organic material, rubbish, debris and other objectionable materials are first removed.

Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, the voids remaining after the removal of the boulders shall be backfilled with suitable material and densified as approved by the City Engineer.

It shall be understood that the removal of all boulders or other interfering objects and the

backfilling of voids left by such removals shall be at the expense of the Contractor and no district payment for the cost of such work will be made. The cost of such work shall be included in the prices bid for the various items of work.

Voids left by the removal of sheeting, piles and similar sheeting supports shall be immediately backfilled with clean sand which shall be jetted into place to assure dense and complete filling of the voids.

After the placing of backfill has started, the Contractor shall proceed as soon as practicable with densification. The top five feet of all trench backfill and all bedding shall be compacted to 90 percent minimum relative compaction except that the top 12-inches of subgrade material shall be compacted to 95 percent minimum relative compaction. Backfill below five feet shall be compacted to 85 percent minimum relative compaction.

III.5 WATER PRESSURE TEST

WATER PRESSURE TEST:

The Contractor shall furnish all equipment, labor and materials, and water, for testing and disinfecting the pipelines. The Contractor shall provide the necessary piping to deliver water from the nearest available connection to the points of use. All tests of pressure piping shall be made in the presence of the City Engineer. All pipelines and piping shall be thoroughly flushed out with water prior to testing.

Testing of water mains shall be done as follows:

Pressure and Leakage Test: After the pipe has been laid, backfilled and compacted as specified in Section 306-1.1 through 306-1.3, all pipe shall be subjected to hydrostatic pressure of 200 pounds per square inch. Tests shall be made only after complete backfill as previously specified and not until at least 36 hours after the last concrete thrust or reaction blocking has been cast, using High Early strength concrete or at least seven days after last concrete thrust or reaction blocking has been cast with standard cement.

The duration of the pressure test shall be four hours. The line shall be held within ten (10) psi of required pressure for the entire period. During filling of line and before applying the specified test pressure, all air shall be expelled from the line.

To accomplish this, taps shall be made, if necessary, at the point of highest elevation; such taps shall be tightly plugged upon completion of tests. Each selection of pipeline shall be slowly filled with water and the specified test pressure shall be applied at the point of lowest elevation. Such application shall be by means of a pump connected to the pipe through a corporation cock.

The pump, pipe connection and all measuring apparatus shall be furnished by the Contractor and approved by the Engineer. During test, all exposed pipes, fittings, valves, hydrants, and asbestos cement pipe couplings will be carefully examined. The Contractor shall replace any

cracked or defective material with sound material without cost to the City and the satisfaction of the Engineer. The test shall then be repeated until no defects remain.

The water lost due to leakage shall be replaced immediately by pumping into the line water from calibrated tank. The maximum length of the line to be tested shall be as directed by the Engineer.

Preparatory to testing, the selection of the pipeline to be tested shall be filled with water and placed under slight pressure for at least 48 hours. The pipelines shall then be brought up to the test pressure specified and maintained on the section under test period of not less than four hours.

Accurate means shall be provided for measuring the quantity of water required to maintain full pressure on the line for the test period, which volume shall not exceed:

$$L = \frac{C N D P}{1850}$$

Where:

- L = Maximum allowable leakage in gallons per hour for section of pipeline tested.
- N = Number of joints in length tested.
- D = Diameter of pipe in inches.
- P = Test pressure in psi.
- C = 1.0 for reinforced concrete pressure pipe with rubber joints, cylinder type.
- C = 3.0 for reinforced concrete pressure pipe with rubber joints, non-cylinder type.
- C = 0.50 for cast iron pipe with mechanical or rubber gasket joints.
- C = 1.0 for other types of cast iron joints (caulked) and other types of pipe.

No leakage is allowed for welded steel pipe with welded joints.

WATER EXFILTRATION TEST:

Water exfiltration test shall not be allowed except with prior approval of the City Engineer.

III.6 MANDREL TEST OF ABS AND PVC PIPE

MANDREL TEST OF ABS AND PVC PIPE:

Rigid mandrel shall have nine blades.

III.7 DISINFECTING PIPELINES

DISINFECTING PIPELINES:

When hydrostatic pressure testing is complete, disinfection of the pipelines shall be performed by the Contractor. The Contractor shall take every precaution to keep the interior of pipelines clean during installation. Disinfection will be performed in accordance with AWWA Standard C-651-23 "Standard for Disinfecting Water Mains" as currently amended.

- A. General: Disinfection shall be accomplished by chlorination either at the same time or after the pipe has been tested, but the disinfection shall be completed before the pipe has been connected to the existing system.
- B. Connections to Existing System: Where connections are made to the existing system or valves are installed on existing lines, H.T.H. shall be added at the points where the existing mains are cut.
- C. Preliminary Flushing: Prior to chlorination, the piping and pipelines shall be thoroughly flushed.
- D. Chlorination: a chlorine-water mixture shall be applied by means of a solution- feed chlorinating device. The chlorine solution shall be applied at one end of the piping or pipeline through a tap in such manner that the pipeline is filled with the chlorine solution, the dosage applied to the water entering the pipe shall be at least 50 ppm. Care shall be taken to prevent the strong chlorine solution in the line being treated from flowing back into the line supplying the water. Calcium hypochlorite tablets or powder may be used in short lengths under the supervision of the Engineer, provided the 50 ppm minimum dosage is maintained.
- E. Retention Period: Chlorinated water shall be retained in the pipeline long enough to destroy all nonspore-forming bacteria. This period shall be at least 24 hours. At the end of this 24-hour period, the treated water shall contain no less than 25 ppm chlorine throughout the length of the main.
- F. Chlorinating Valves: During the process of chlorinating the piping and pipelines, all valves and other appurtenances shall be operated while the pipeline is filled with the heavily chlorinated water.
- G. Final Flushing: After the chlorine-treated water has been retained for the required time, all treated water shall be thoroughly flushed from piping and pipelines at there extremities. The chlorine residual at the pipe extremities and at other representative points shall be at least 1.0 ppm. Should the initial treatment fail to produce satisfactory disinfection of the piping and pipelines, as evidence by the chlorine residual, the chlorination procedure shall be repeated until acceptable results are obtained. All bacteria and chlorine residue testing shall be done by a certified laboratory.

The Contractor shall provide all water used to sterilize the line.

MARKER POSTS:

The location of water lines and appurtenances located on the than in public streets shall be

designated with marker posts as shown in the standard drawings.

III.8 LANDSCAPING AND IRRIGATION

TREE SPECIFICATIONS:

Trees to be located in the public right-of-way shall be in accordance with the approved tree list shown on Section IV.10, Table "B".

Trees, vines, shrubs, and groundcover to be located in public parks shall be in accordance with the approved list shown in Valley-Wide Recreation and Park District's Standard Landscape Specifications and Design Guidelines, latest edition.

Tree sizes desired by the City shall be listed on the bid sheet and/or plans. Trees shall be well formed, single stemmed, unless otherwise specified, for the size specified and provided as follows:

- A. 1.5 Gallon Tree: Minimum ¾-inch caliper measured at 6-inches above ground level, with good taper for a strong trunk. Tree height shall be comparable with what is commonly available in the nursery trade, as solely determined by the City.
- B. 24-inches Box Tree: Minimum 1-¾-inch caliper (or larger) measured at 12-inches above ground level, with good taper for a strong trunk. Tree height shall be comparable with what is commonly available in the nursery trade, as solely determined by the City.
- C. 36-inches Box Tree: Minimum 3-inches caliper (or larger) measured at 12-inches above ground level, with good taper for a strong trunk. Tree height shall be comparable with what is commonly available in the nursery trade, as solely determined by the City.
- D. Brown Trunks (Palms): Height is measured from the ground up to the base of the first green/live frond. All portions of the trunk must be clean and free of any leaf parts. Additionally, the trunk should be straight and free of defects (i.e.: spike wounds, depressions).

The root ball of each tree must hold intact during planting and sized to contain adequate roots for good tree growth. Trees must not exhibit signs of being root bound. Additionally, all trees shall be certified insect and disease free by the nursery, have a clean even trunk, symmetrical, well balanced crown and be capable of standing without the nursery stake upon final inspection. At the time of final inspections, all trees shall be staked per City specifications.

Wounds from previously pruned branches should be calloused over, or well on their way to proper callousing. Branches should be distributed evenly throughout the tree, or otherwise displaying good scaffolding. Trees which are found to be root bound, or otherwise defective during or after planting shall be replaced by the Contractor, at no expense to the City, with an acceptable tree either before the project is completed or during any required warranty period.

PLANTING MATERIALS:

The City, prior to their delivery to the site, shall approve planting materials, unless inspection is waived by the City, in writing. Waiving inspection rights shall not preclude non-acceptance of the tree at any time during the project or within the warranty period at the end of the project. Trees found to be defective or not meeting City specifications after planting shall be removed at Contractor's expense regardless of any previous City inspections and approvals. Materials to be approved are:

- A. Trees: Trees in broken or damaged containers, root bound or with broken branches or injured trunks will be rejected. All plant material must be healthy, vigorous, pest free, void of any cambial wounds and otherwise fulfill all specifications. All trees must be established in their containers in which they are sold, however, trees with circling roots or poor root structure will be rejected. The tree trunk should not move independently of the root ball.

Root condition of trees furnished by the Contractor in containers may be determined by the removal of earth from the roots of not less than two trees nor more than two percent (2 %) of the total number of plants of each species, except than when container-grown stock are from several sources. The roots of not less than two trees may be inspected. Established container stock is defined as a tree transplanted into a container and grown in the container for a length of time sufficient to develop new fibrous roots so that the root mass will retain its shape and hold together when removed from the container.

Trees shall be true to name and variety and meet or exceed all requirements and recommendations of ANSI Z60.1 "Standard for Nursery Stock". In all cases, the botanical name shall take precedence over common name. The City shall make final determination of species or variety, and whether the tree meets specifications.

- B. Topsoil: Pulverized topsoil (or native soil) free from subsoil, noxious weeds, and/or seeds, stones or other foreign matter.
- C. Root Control Planters: The deep root control planter for installation in planting hole shall be manufactured by Deep Root Corp. (Westminster, CA), or an approved equal, as determined by the City. Root barriers must have a root deflection rib and a top edge. The root control panels or planters must not be altered without written approval from the City.
- D. Tree Stakes: The tree stakes shall be ten-foot (10') long and two-inch (2") diameter treated lodge pole stakes.
- E. Staking Ties: Ties shall be fastened to the stakes with an approved twist tie brace in a manner, which permits tree movement and supports the tree.
- F. Trunk Guard: An approved trunk guard shall be placed around the base of all trees planted, whenever the tree is planted in a turf area or other location where string trimmer damage is possible.

Prior to installation, the City shall inspect all planting materials. Contractor shall pay for all expenses relating to any plan material inspections that are outside the City limits. Payment for topsoil, root control planters or barriers, tree stakes, staking ties, trunk guard and other supplies needed for complete and proper tree planting shall be included in the bid item for the trees that they are installed with. Contractor shall pay for any returns necessary.

LAYOUT AND PLANT LOCATION:

The location for all tree planting shall be spotted and marked in the field by the City, and/or be as indicated on the construction drawings. Spotting is usually done with green paint mark on the curb for street trees. No work shall be done in any area where there is a discrepancy, until approval has been given by the City.

Where a consecutive order of trees is shown, stock shall be selected for uniform height and spread to assure symmetry in planting.

TREE PLANTING SPECIFICATIONS:

- A. All trees shall be planted immediately after the trees are removed from containers. Containers shall not be cut or otherwise damaged prior to delivery of the trees to the planting area. Circling roots are prohibited and will be cause for rejection. Nursery stakes, ties, and ribbons shall be removed. No stakes shall remain in the root ball after planting.
- B. Contractor shall immediately remove from the site, plants that are not true to name and materials, which do not comply with the specified requirements, and promptly, replace with plants and materials meeting the specified requirements. The Contractor shall return all plants and supplies, not accepted by the City, at no additional cost to the City.
- C. Trees shall not be placed in dry soil. Soil in muddy condition shall not be used for backfilling. Fill all plant pits with water and allow leach-out before adding the prepared soil mix for backfill.
- D. When planting container stock, position the plant in the hole so that the tree root crown shall be slightly exposed above the grade (not to exceed one inch) without exposing any roots or the root ball. Then backfill with native clean soil no higher than halfway up the root ball. Tamp in soil to remove air pockets. Complete the backfilling to finish grade, again tamping soil to remove air pockets.
- E. When planting 15-gallon trees, slice root ball two to three inches deep, in a downward direction on four sides. Smooth top, sides and bottom of root ball to take off any edges. After the hole is dug, where the tree is to be placed, utilize hand tools to aerate sides and bottom of hole to encourage outward and downward growth.
- F. Form a water basin (twelve inches outside of the root ball) with soil berms and immediately water. After preliminary watering, the trees shall again be watered. A trunk guard shall be placed around the base of the tree immediately after planting if tree is located in a grass or planted area. The well basin shall be left at least through the entire landscape maintenance period, unless otherwise specified.
- G. Trees will be staked and tied with two lodge pole pine stakes and a "V" twists brace or other acceptable product specified by the City.

PALM PROCUREMENT AND PLANTING:

All palms shall be procured from or by a State licensed nursery and shall be handled with the best and most current horticultural practices.

- A. Palms will be inspected, by the City, for health girth and overall form in meeting with the design intent of the project. The City reserves the right to reject any palms that do not meet the design intent of the project.
- B. All palms shall be insect and disease free with clean trunks void of any trunk injuries, such as spike wounds.
- C. An adequate number of live fronds shall remain to adequately shelter the apical meristem of the palm, and shall be lifted up and tied together in two locations around the crown in an upright manner. Due caution shall be taken not to bind or injure the crown. A lightweight cotton rope, twine or cord (biodegradable), not less than 1/8-inch diameter, shall be used in tying up the fronds. Pruning and tying up the remaining fronds shall be completed prior to digging the root ball.
- D. All trees shall be safely loaded and transported, taking care not to damage any part of the tree or soil ball. All consideration shall be given in the selection of the largest possible crane to facilitate loading, unloading and setting. This consideration shall vary based on any given site situation and is solely the liability and responsibility of the Contractor.

All excavated palm planting holes have vertical sides, roughened surfaces and shall be of size that is twice the diameter, and two (2) feet minimum to four (4) feet maximum deeper in the ground than the depth of the root ball. The palm shall be centered in the planting hole and in alignment with any other palms. The palms shall be set plum and held rigidly in position until the backfill has been tamped firmly around the root ball. The top of the root shall be equal to the level of the existing or proposed soil grade. The backfill mix for palms shall be 100 % washed concrete sand. Newly planted palms shall be immediately watered thoroughly and protected from compaction.

HOMEOWNER NOTIFICATION:

For street tree planting, the Contractor shall deliver, when planting each tree, a flyer supplied by the City that reviews the project and outlines basic tree care, especially the need for proper aftercare.

TREE PRUNING:

All trees shall be properly pruned prior to final City inspection. The spacing, balance and attachment of limbs should be evaluated prior to pruning. All pruning cuts should be made to promote upright growth and minimize future branching that may impede vehicular or pedestrian traffic, or for structural stability or appearance. Properly pruned shall mean:

- A. Prune only what it needs to be pruned. No more than 20-percent of the live wood may be removed.
- B. All broken or otherwise damaged limbs shall be removed.
- C. All dead limbs or portions thereof shall be removed.
- D. All limbs less than two (2) feet from the ground shall be removed, unless doing such would cause irreparable damage or leave the tree unbalanced.
- E. All pruning cuts shall be made at the branch collar.
- F. The primary terminal bud shall not be removed.

G. Any tree improperly pruned will be subject to removal and replacement by the Contractor, at no additional cost to the City.

1. Palms shall not be pruned after planting until established. The string tying the fronds shall be cut 45 to 60 days after planting during the summer months and after 90 days during the winter months. Do not prune palms for at least 30 days after untying the fronds.

LANDSCAPE ESTABLISHMENT AND MAINTENANCE PERIOD:

The landscape establishment period is hereby defined as starting with completion of planting operations and acceptance by the City, and continuing for 30 calendar days thereafter. Acceptance by the City shall be in writing in order for the establishment period to begin. At completion of the establishment period, trees shall not show evidence of die back, wilt or other signs or symptoms of decline. Where landscape dies or shows evidence of decline, weakness or damage, the Contractor shall promptly replace with new, vigorous and healthy selections, at no additional cost to the City.

When the Contractor believes he/she has completed the plant establishment period and the entire project is ready for acceptance, he/she shall request inspection for the project. The City will inspect the project for acceptance in a timely manner. Deficiencies noted during inspections shall extend the planned establishment period until all are corrected. Acceptance shall occur only upon written acceptance of the project by the City.

The landscape maintenance period is hereby defined as starting with completion of planting operations and acceptance by the City, and continuing for 60 calendar days thereafter. Acceptance by the City shall be in writing in order for the maintenance period to end. During the contract period, the Contractor shall provide all watering, weeding, fertilizing, cultivating and spraying necessary to keep the plants in a healthy growing condition and to keep the planted areas neat, edged and attractive. It is anticipated that the City shall inspect the work during the landscape maintenance, and the Contractor shall conduct all maintenance operations in such manner as to minimize inconvenience to the City and general public. The Contractor shall provide a level of maintenance, which presents a pleasing and desirable appearance at all times. The City may extend the landscape maintenance period beyond the specified period, when in the opinion of the City, landscapes or plantings have not reached establishment in accordance with the specifications. Final payment to the Contractor shall not be made until the end of the landscape maintenance period, and upon final acceptance by the City and finalizing the Notice of Completion process. All pest control, fertilizers or other materials used by the Contractor, in carrying out work related to the project, shall be approved by the City prior to its use.

Where landscape dies or shows evidence of decline, weakness or damage, the Contractor shall promptly replace with new, vigorous and healthy selections, at no additional cost to the City. At the end of the landscape maintenance period all plant materials shall be established and in a healthy growing condition and spaced as indicated in the plans or directed by the City. All areas shall be substantially clean and free of any debris and weeds. The Contractor shall obtain written approval and release from the City before ending maintenance

obligations. Trees shall be under warranty for a period of one (1) year after the designated maintenance period has been completed and approved by the City, in writing. Any tree found to be dead or in poor condition, as determined by the City, shall be replaced by the Contractor, at no cost to the City. There is no appeal to this decision.

TREE GUARANTEE AND REPLACEMENT:

All trees planted shall be guaranteed to be in excellent health and condition at least twelve (12) months after planting is complete (twenty-four months for palm trees) or after the landscape maintenance period is complete, whichever occurs latter. Trees that die or are damaged as a result of vandalism or lack of care by the City are exempt from this specification. All replacement trees shall likewise be guaranteed to be in excellent health and condition at least twelve (12) months after planting, or twenty-four (24) months for palms.

IRRIGATION SYSTEM:

Irrigation systems shall be in accordance with the Valley-Wide Recreation and Park District's Standard Landscape Specifications and Design Guidelines, latest edition. The City Engineer shall approve any deviation from these standards.

All electrical wiring between valves and time clock/controller shall be placed inside an underground conduit. The conduit shall be a one inch (min.) inside diameter, grey PVC Schedule 40 pipe.

III.9 MONUMENTS

MATERIALS:

The concrete portion of monuments shall be constructed in accordance with the provisions in Sections 201-1 and 303 of the Greenbook.

PAYMENT:

The unit price paid for survey monuments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the survey monuments, complete in place, including necessary excavation and backfill as shown on the plans or directed be the City Engineer.

IV. DESIGN CRITERIA

IV.1 GENERAL

This criteria shall apply to all design for work within the City of Hemet, which is subject to the review of the City Engineer.

All drawings shall be on standard size sheets (24" x 36" or 8 ½ x 11") with standard City title block. All lettering shall be 1/8" or larger to permit photographic reduction.

All title sheets shall have an index or key map clearly indicating the sheet numbers issued.

Each sheet is to be signed by a Registered Civil Engineer. Complex structural, electrical, or mechanical installations shall also be signed by the Registered Engineer doing the design. When a soil report is required, grading plans shall be signed by the Soils Engineer and/or Geologist.

Revisions made after original approved by the City Engineer shall be initialed by a Registered Civil Engineer and submitted to the City Engineer for approval. Revisions shall be presented in the form outlined in Standard Drawing G-807.

All improvements are to be designed and constructed in accordance with this design criteria, City of Hemet Standard Specifications and appropriate standard drawings.

Large tracts shall have small scale maps showing overall layout of the water, sewer, storm drain, and street lighting systems. Public utility layout shall be shown on the as-builts for all tracts (gas, telephone, electric, television).

Profiles shall be shown on the top of sheets. Vertical curves shall show curve length and P.I. elevation, in addition to normal stationing and elevations.

Normally the scales for improvement plans shall be 1"= 40' for the horizontal and 1"=4' for the vertical. The vertical scale should be changed to 1"= 8' or other appropriate scale where grades are steep. For complex plans, the scale shall be 1"= 20' or larger as necessary for clarity.

Improvement plans shall be submitted digitally as a binded plan set in pdf format, and shall be stamped and signed by a California registered professional.

Easements shall be a minimum of 15-feet in width unless a lesser width is specifically authorized by the City Engineer. Approved means of obtaining access to the easement must be provided. Utility and drainage easements parallel to side lot lines shall be laid out so that the easement is all on one lot.

Water, sewer, and drainage calculations and maps shall accompany all plans submitted for checking, unless the requirement is specifically waived

All plans are to be checked by the Engineer of work for consistency, accuracy, clarity and conformance with City Standard Specifications, drawings, and design criteria before submission for approval. If this obviously has not been done, the plans will be returned unchecked by the City.

A letter of transmittal shall accompany plans submitted for checking.

The original check prints shall accompany revised plans resubmitted for checking.

The design engineer shall submit a detailed cost estimate to the City Engineer prior to final approval of the plans if the project requires improvement security.

Original drawings shall become the property of the City upon being signed by the City Engineer.

The original drawing shall be revised to reflect as-built conditions by the Engineer of work prior to final acceptance of the work by the City.

The Engineer of work shall submit a reduced copy of the map (8-1/2" x 11") for any proposed subdivision, prior to City approval of the final map.

The number of sheets submitted should normally be limited to that required for clarity of presentation. Separate drawings for streets, water and sewers will not be necessary.

Improvement plans shall show all existing trees, power poles, gas boxes, electrical boxes, water meter boxes, street lights, telephone poles, telephone risers, traffic signal poles and boxes, electrical lines, water lines, gas lines, irrigation lines, telephone lines, and sewer lines within the street right-of-way and within 5 feet outside the right-of-way and specifically designate those to be removed, relocated, or adjusted.

All expenses incurred for the checking of tract maps, parcel maps and other engineering functions shall be borne by the Developer/Contractor.

AS-BUILTS:

When a project is completed, the Contractor and project engineer shall submit to the City "As-Built" drawings indicating all changes on the original plans. The plans shall be certified as to its accuracy and completion by the project engineer. The "As-Built" plans shall be submitted prior to the final acceptance of the project, by the City Engineer.

IV.2 STREETS

WIDTHS:

- A. All street classification shall conform to the latest adopted Circulation Element of the City's General Plan.
- B. Street widths shall be in accordance with Table "A" (Section IV.9) and the appropriate Standard Drawing ST-101 through ST-109B.
- C. Intersection of arterial, depending on estimated traffic volumes, may require special design. The use of single and double left turn pockets, free right turn lanes, right turn islands, raised medians, etc., shall be investigated.
- D. When streets are improved for only one-half widths, the unimproved half shall drain away from the paved section and shall be provided with a paved ditch.

GRADES:

- A. Longitudinal curb slopes shall be 0.5% (minimum).
- B. Vertical curves are required when grade breaks exceed 0.60%.
- C. Normal crown slope on asphalt concrete (AC) pavement shall be 2.0%.
- D. Grades of 15% or greater shall not exceed 400-feet in length and shall be constructed of portland cement concrete unless otherwise approved by the City Engineer. A rough textured surface shall be provided.

ALIGNMENT:

Streets shall normally intersect at right angles. Where feasible, local streets shall have at least 50-feet of tangent adjacent to an intersection, measured from **the beginning/end of curb return (BCR/ECR)**. Collectors should have at least 100-feet. Arterials will require a special design. An angle of intersection more than 10° from a right angle requires a special approval and design.

The centerline of streets entering upon opposite sides of any given street shall normally be offset by at least 150-feet for local residential streets and 300-feet for all other streets. Local streets shall normally be designed at "T" type intersections.

Cul-de-sacs shall not exceed 660-feet in length without special approval and shall have a 42-foot minimum curb line radius at the turnaround.

Minimum length of tangent between reversing curves shall be 50-feet. A lesser length may be used for local streets with the approval of the City Engineer.

STRUCTURAL SECTION:

Design shall be in accordance with the California Division of Highways stabilometer method.

Design may be based on results of soil tests made before plans are prepared. The “R” value **for the subgrade** shall be verified after rough grading and prior to paving.

The structural section shall then be modified if necessary. *In no case shall the structural section be less than 4" AC over 6" AB, Class II.*

CURBS:

- A. Use 6-inches curb face with 24-inches gutter, unless 8-inches curb face is required to handle drainage.
- B. Normally, 6-inches curb face will be used on North/South streets and 8-inches curb face will be used on East/West streets and streets with right-of-way equal to or greater than 88-feet.
- C. The use of roll type curb shall be avoided.

SIDEWALKS:

Sidewalks shall be installed at a maximum cross fall grade of 2.0% towards the curb along both sides of all streets and shall be located contiguous with the curb unless otherwise approved or conditioned.

A. Minimum widths:

- 1. Restricted local residential streets.....5'-0"
- 2. Arterial Highway.....9'-4"
- 3. Major Highway (scenic route).....6'-4"
- 4. Secondary Highway (w/bike lane).....8'-6"
- 5. All other streets.....6'-0" min

B. Minimum thickness:

- 1. At residential driveway approaches: 6-inches
- 2. At commercial driveway approaches: 8-inches
- 3. All other locations: 4-inches

SIGHT DISTANCE:

All sight distances shall be in accordance with Caltrans’ Highway Design Manual.

For local streets, maintain triangular corner cut-off at intersection, established by connecting the points where the radial lines through the BCR and ECR intersect the right-of-way lines, free of any obstructions in excess of 30-inches in height measured from top of curb. Any variations will require the specific approval of the City Engineer.

For intersections involving collector or arterial streets provide clear sight distance as recommended in AASTHO “A Policy on Geometric Design of Rural Highways.”

PRIVATE STREETS:

These roads shall be designed and constructed following the same requirements applied to public streets.

Items such as, but not limited to, widths, alignment, curb and gutter, sidewalk, street name signs, and pavement thickness shall conform to City standards.

FRONTAGE ROADS:

Frontage roads shall enter arterial streets through intersections capable of storing at least four cars between frontage road and major streets.

STREETLIGHTS:

Streetlights shall be shielded to protect adjacent houses from direct light, as required by the City Engineer. Street light systems shall be designed, by a Registered Electrical Engineer, to meet standards established in ASA D12.1-1963 “American Standard Practice for Roadway Lighting” and the Department of Public Works Street Lighting Design Criteria. Examples of installations, which have provided satisfactory lighting, are included in Section IV.9, Table “A”.

At intersections, the light shall be placed on the far-right corners of the major street.

Streetlights shall normally be located on the outside of curves. Lights shall be located behind sidewalk when curb and sidewalk are contiguous.

MONUMENTATION:

A standard surveyor monument, per Standard Drawings M-901 and M-900A, shall be installed at all section and quarter section corners and locations deemed necessary by the City Engineer. Standard centerline monuments, per Standard Drawings M-900 and M-900A, shall be installed at the B.C. and E.C. of all curves and at the P.I. of all intersecting streets.

STREET NAME SIGNS:

Street name signs shall be provided and installed by the Contractor. Street name signs shall be mounted on Telespar poles or approved equal, per Standard Drawings G-**810A**, and installed prior to construction of the sidewalks.

STREET TREES:

Street trees, of the variety and size shown on the current street tree list, shall be placed in front of each residential lot (two, at corner lots), and every 40-feet in commercial, industrial, and residential developments along collector or higher designation streets.

Street trees shall be 24-inch box, minimum, unless otherwise approved by the City.

FENCES:

A fence at least three and one half (3-½) feet in height shall be constructed at the top of any vertical cut or retaining wall exceeding four (4) feet in height, or at the top of any cut or fill exceeding fifteen (15) feet in height.

DRIVEWAYS:

	<u>Maximum</u>	<u>Minimum</u>	<u>Type</u>
Commercial	40-feet	20-feet	8" P.C.C.
Residential	28-feet	14-feet	6" P.C.C.

- A. Maximum Frontage:
 - 1. Residential, commercial and manufacturing - 50%
 - 2. Garages and service stations - 50%
- B. Minimum clear distance between driveways on same property: 20-feet.
- C. Minimum clear distance from property line: 2 ½-feet.
- D. Minimum clear distance from curb return:
 - 1. Local Streets (Residential): 25-feet
 - 2. Arterial Roads (Commercial): 200-feet
- E. Minimum clear distance from utilities, fire hydrant, power pole & street light: 5-feet.
- F. No driveways will be permitted in curb returns.
- G. All dimensions are to top of "X" unless otherwise noted.
*Clear width measured at bottom of "X."

Any deviations from the above dimensions must be approved by the City Engineer.

IV.3 WATER SYSTEM

GENERAL:

- A. Design shall conform to requirement of American Insurance Association. Calculations supporting network design shall be submitted
- B. Distribution lines shall be constructed of polyvinyl chloride (PVC) pressure pipe in compliance with the American Water Works Association (AWWA) Standard C-900.
- C. Minimum steel plate thickness shall be 10 gauge for mortar lined and coated pipe, and 12 gauge for steel concrete cylinder pipe.
- D. Cast iron and ductile pipe shall not be used without special permission.

DEMANDS:

- A. Domestic Demands: In residential areas assume 200 gallons per capita per day and 2.5 persons per unit for average day.

Maximum day = average day x 2.25. Peak hour = maximum day x 2.50 - 24

- B. Industrial and commercial demands require special design.
- C. Fire demands (To be determined by Fire Marshall in accordance with the adopted fire code.).
- D. Pressure:
 - 1. Minimum residual pressure shall be 20 psi at design fire flow plus maximum daily domestic demand.
 - 2. Minimum residual pressure shall be 40 psi at peak hour domestic demand. Maximum design static pressure shall be 125 psi.
 - 3. When static pressure exceeds 125 psi, reducing valves will be required.
 - 4. When the area requiring pressure reduction includes 25 or more residential lots, a pressure reducing valve and bypass shall be installed in the main.
 - 5. When the area requiring reduction includes less than 25 or more residential lots, individual pressure reducing valve shall be installed and maintained by property owners.

MAINS:

- A. Minimum size shall be 8-inches, inside diameter.
- B. Locations shall be in accordance with the appropriate Standard Drawing. All lines are to be looped. There are to be no dead-end lines.
- C. If approved by Water Superintendent and/or City Engineer, temporary dead ends are to be capped and extended beyond pavement. Depth of cover (measured from top of finish grade to top of pipe):
 - 1. Pipes 12-inches and smaller require 36-inches of cover.
 - 2. Pipes larger than 12-inches require 42-inches of cover.
- D. Design shall be based on maximum day requirements plus fire flow; or peak hour, whichever is greater. For trunk water mains 12-inches or larger, design head loss shall not exceed 5-feet per 1000-feet. For distribution mains 8-inches or smaller, design velocity shall not exceed 5 F.P.S.
- E. Thrust blocks shall be installed in accordance with appropriate Standard Drawing. If not applicable, special design is required.
- F. All mains 12-inches and larger shall have profile shown on improvement plans accompanied with soils tests and engineering calculations. Smaller mains shall be shown where crossing other lines.
- G. Pipe deflections for short radius curves and angle points shall normally be accompanied by means of standard fittings, the locations of which shall be detailed

on the plans.

VALVES:

A. Maximum valve spacing allowed:

1. 600-feet in residential areas.
2. 300-feet in commercial value areas.
3. ¼-mile on arteries and secondary feeders.
4. ½-mile on supply lines.
5. ½-mile for combination artery and supply lines.

B. Valve locations required:

1. Flanged to main at street intersections.
2. Fire hydrant control valves shall be at least 4' out from curb line.

C. Resilient-seated gate valves shall be used for mains 12" and smaller.

D. Butterfly valves shall normally be used for mains 16" and larger if operation pressures do not exceed 150 psi. Pressures in excess of 150 psi require special design.

E. Valves 16-inches and larger are to be located in concrete vaults unless requirement is specifically waived. Vaults shall be detailed on the plans.

F. All high points shall be equipped with air vacuum and release valves. A release shall normally be placed on the downhill side of all valves. All low points and dead ends shall be equipped with blow offs. Fire hydrants may be substituted for blow off valves if approved by the City Engineer.

G. Blow off assemblies shall be 2-inches diameter for 4-inch to 10-inch diameter mains and 4-inch diameter for mains 12-inch and larger. Blow off assemblies must have valves installed between the main and the assembly.

H. Valves and fittings shall be wrapped in 8 mil thick polyethylene encasement tubing to prevent corrosion prior to being buried.

VAULTS:

A. Vaults shall be concrete and equipped with the following:

1. Access opening and ladder.
2. Removable cover adequate for equipment removal. Vents (high and low).
3. Floor drainage.
4. Victualic or flexible coupling
5. Lifting eyes.

B. Vaults to receive thrust require special design.

FIRE HYDRANTS:

A. Hydrant spacing required:

1. 300-feet maximum spacing for residential (offsite)
2. 300-feet spacing maximum for commercial and industrial (offsite)
3. Onsite spacing shall be in accordance with fire code.

B. Hydrant locations:

1. On the prolongation of the B.C. radial or property line.
2. Near side of main.
3. Off largest main at intersection of mains.
4. Hydrants shall be installed in accordance with Std. Drawing W-700. If not applicable, special design is required.
5. If cul-de-sac is over 150-feet long, a fire hydrant is required on the cul-de-sac street; location approved by Fire Marshall.

C. Hydrants shall be painted by the Contractor with an approved reflective paint. Blue reflective fire hydrant spotters shall be placed per Standard Drawing W-700B and shall comply with specifications thereon.

SERVICES:

A. One separate service shall be installed to each lot.

B. Minimum size shall be 1-inch copper unless otherwise specified.

C. Services shall be installed in accordance with Drawing No. W-701 & W-701A. If not applicable, special design is required.

D. No service shall be installed in a driveway. No service shall be connected to a main within 24" of a fitting.

E. When future lot widths are not known, a service shall be installed every 60-feet if street is to be paved.

PRESSURE BOOSTING STATIONS:

A. Pressure boosting stations may be permitted only as temporary installation. The use of variable speed pumping shall be investigated.

B. Hydro-pneumatic pumping systems requirements:

1. Tank shall be 10% full by volume at low water level.
2. Tank shall be 40% full volume at high water level.
3. Pump to operate at 6 pumping cycles per hour at average day.
4. Must have approved backflow device installed.

IV.4 SEWER SYSTEM

MAINS:

A. General:

1. Minimum size shall be 8 inches, inside diameter
2. Material shall be SDR 35 PVC or approved equal.
3. Joints shall be gasket joint unless otherwise specified.
4. Submit design calculations to verify line size and bedding design. Normally a Manning "N" = 0.009 will be satisfactory.
5. Sewer pipe must maintain a minimum of 10' horizontal and 1' elevation from water and be encased when crossing.
6. Underground sewer marking tape shall be placed 12" above the pipe.
7. All sewer mains must be inspected using an approved television inspection company using a color video system. The sewer main must be approved prior to paving of the street or City Engineer accepting the project.

B. Locations:

1. Alley: mains shall be offset 3' min. from centerline to clear alley gutter.
2. Street: main locations shall be in accordance with appropriate Standard Drawing and State of California, Department of Health requirements.
3. Streets with more than 84' of R/W require special design.
4. Extend and cap all dead ends beyond pavement.
5. Sewers shall normally be placed at least 4' below finished grade.

C. Minimum Slopes:

Maintain minimum velocity of 2 FPS (minimum). Special attention should be given to maintaining adequate velocities at low flows.

Minimum Grades:

- | | |
|--------------|-------|
| 1. 8-inches | 0.40% |
| 2. 10-inches | 0.32% |
| 3. 12-inches | 0.32% |

D. Domestic Demands:

1. In residential areas, assume 200 gallons per capita per day and 2.5 persons per unit for average day.
2. Maximum flows should be based on ratio of 2.50 peak to average flows.
3. Industrial and commercial demands require special design.

MANHOLES:

Sewer manholes shall be located as follows:

A. At all changes of slope.

- B. At all changes of direction unless a special design is required by field conditions.
- C. At intersections of mains - match crown lines.
- D. Required spacing: 300-feet. Maximum spacing allowed: 400 feet.
- E. At ends of line unless a cleanout is provided.
- F. All manholes shall be numbered on the plans.
- G. Covers shall be Alhambra Foundry Co. A-1264 or approved equal marked "Hemet Sewer".

CLEAN OUT LOCATION:

Permanent ends of line, not excess of 200' beyond last manhole.

LATERALS:

- A. Size:
 - 1. Single family: Minimum 4-inches.
 - 2. All others: Minimum 6-inches.

- B. Locations:
 - 1. Right angle or radial to street right-of-way.
 - 2. Center of lot to 5' above downstream lot line (shown on as-built plans).
 - 3. When future lot widths are not known, a service shall be installed every 60 feet in residential areas.
 - 4. Service shall not be located in driveway without prior approval of City Engineer.

- C. Depth: 4-feet (min.) at property line, or as approved by the City Engineer.
- D. Taps: All taps shall be made by the "Saddle" method or approved equal.

PUMP STATIONS:

- A. General:
 - 1. Wet wells shall be physically separated from pump area.
 - 2. Provide an approved high-water and power failure alarm system.
 - 3. Paint interior of structure, all machinery, and piping and exterior below grade in accordance with table of paint systems in Section 210 of the Standard Specifications.
 - 4. The use of variable speed pumping shall be investigated.
 - 5. City to be provided with complete manufactures' brochures, technical data, etc., for all equipment and controls.
 - 6. An emergency bypass connection shall be provided adjacent to receiving manholes.
 - 7. Investigating ejectors for flows less than 500 G.P.M. and 60-feet T.D.H.
 - 8.

B. Structural:

1. Permanent structures shall be concrete.
2. In residential areas, structures shall be below ground.
3. Provide access other than vertical ladders for permanent stations.
4. Spring-loaded roof hatches with stainless steel or corrosion-proof hinges are required for entry.
5. Provide roof hatch adequate for replacement and removal of major equipment components.
6. Where applicable, provide lifting eyes in roof of station.
7. All structures shall have ample working room around machinery; minimum clearance to wall shall be 24' or greater, as needed for adequate maintenance.
8. Design of structures shall provide for adequate waterproofing.
9. Interior steel shall be hot dip galvanized after fabrications.

C. Pumps:

1. Minimum desirable size: 4-inches
2. Max. velocity in suction: 5 FPS.
3. Max. velocity in discharge: 8 FPS.

D. Mechanical and Piping:

1. All design shall satisfy minimum requirements of State Health Code.
2. An air gap is required on all domestic water connections
3. Provide an automatic blower system for all underground areas to exchange air each 6 minutes, minimum. Design system to exhaust air from lowest point in station.
4. Provide an automatic sump pump (slope floor to sump).
5. Provide standby capacity equal to largest single unit.
6. Use DeZurik or equal plug valves instead of gates.
7. Provide 2" metered fresh water service adjacent to each station.
8. In case of power failure or other emergency, make provision to bypass station.
9. Sump pumps and blowers should be easily removable for maintenance.
10. Metal structures and supports shall not be mounted directly on floor; provide concrete pedestals.
11. From each pump to sump, provide 1-inch diameter P.V.C. stuffing box drain line.
12. Piping layout shall provide for easy access to pumps for maintenance. Locate flexible coupling between valve and pump.
13. Provide guards for all moving parts of equipment, which are a safety hazard.
14. Use valves on both suction and discharge.

E. Actuation of Pumps:

1. Provide manual switch to alternate lead pump in system.
2. The control system to actuate pumps is subject to approval of a specific design.
3. Bubbler pressure type controls shall be used.

F. Electrical:

1. All electrical installation shall comply with Division of Industrial Safety requirements.
2. Use enclosed, prefabricated electrical panels.
3. Provide running-time meters for all motors (reset type).
4. Provide explosion-proof electrical appurtenances below ground or approved type disconnect and time delay.
5. Provide separate blower system within all electrical panels located below ground.
6. Provide an approved type alternator.
7. A manual switch adjacent to motors, which will override the control panel, shall be provided.
8. Adequate lighting shall be provided.
9. Color-code all wiring.

G. Painting:

1. All painting work shall consist of three (3) coat minimum system, approved by the Engineer, and be applied in a manner to provide a uniform thickness and smooth appearance. The paints shall be both sulfide and mildew-resistant. All surfaces to receive paint shall be properly cleaned, washed, sand blasted, etched, and dry.
2. Interior walls - cream colored, semi-gloss enamel with dado 5 ½' consisting of light green semi-gloss enamel.
3. Exterior walls - below grade, three (3) coats hot mopped asphalt; above grade, cream colored, exterior masonry paint.
4. Ceiling - cream-colored, semi-gloss enamel.
5. All equipment and machinery including electrical conduit and fittings, motors, pumps, fans, sewage pipes, valves, etc. - light green, semi-gloss enamel.
6. Special treatment for floors shall be investigated.

H. Force Mains:

1. Require special design.
2. Material shall be mechanical joint cast iron pipe or Class 150 polyvinyl chloride pipe.
3. Minimum cover shall be 36-inches. The top of main elevation and profile shall be shown on the improvement plans.
4. Sulfide buildup in force mains should be investigated and provision for aeration and other protective measures taken as necessary.

IV.5 DRAINAGE

GENERAL:

All drainage design and requirements shall be in accordance with the latest City of Hemet “Master Flood Control and Drainage Plan”, and the “Storm Drain Development Standards, Storm Drain Criteria, and Drainage Design Manual”.

Design calculations and flow maps for all tributary areas shall be submitted with the plans.

The use of underground storm drain systems, in addition to standard curb and gutter, shall be required:

1. When flooding or street overflow will cause serious damage.
2. When future up-stream development will cause drainage problems.
3. When existing drainage facilities are adjacent to proposed development.
4. When more than one travel lane of arterial and collector streets would be obstructed by storm water based on “10-year storm”
5. In all street segments that have tributary flow from other street segments that cumulatively exceed 660-feet, the storm drain does not need to be larger than 18-inches diameter unless a larger size is required to meet the conditions listed above.

The use of underground storm drain systems shall be investigated:

1. When the water level in streets at the design storm reaches top of curb.
2. When velocity of water in streets exceeds 8 F.P.S.

Permanent open drainage ditches shall not be permitted in public right-of-way.

The type of drainage facility shall be selected on the basis of physical and cultural adaptability to the proposed land use. Open channels may be considered in lieu of underground systems when the peak flow exceeds the capacity of a 48-inch diameter reinforced concrete pipe (RCP).

Permanent drainage facilities and right-of-way shall be provided from development to point of satisfactory disposal.

The use of cross gutters on collectors and arterials requires special approval.

Where the development density is one lot per acre or greater, all drainage channels shall be improved.

Concentrated drainage shall not be discharged to City streets unless specifically approved by the City Engineer.

Open channels shall be fenced.

DESIGN:

The methods outlined in the Riverside County Flood Control and Water Conservation District will be used when applicable.

CATCH BASINS:

All catch basins shall have a manhole opening in the top, unless access through the grate section satisfactory to the City Engineer is provided.

Side-opening catch basins with rounded, bulb face angle inlets shall be used. Local depressions in pavement area and grates may be used only with the approval of the City Engineer.

Catch basins shall be located so as to eliminate, whenever possible, open concrete cross gutters.

Minimum size connector pipe shall be 18-inches **RCP**.

Inlet sizing shall be done by use of City of Los Angeles design charts.

City of Hemet standard designs shall be used unless otherwise specified. Reinforced steel in all walls and slabs is required and shall be detailed on the drawing.

STORM DRAINS:

Location shall be in accordance with appropriate Standard Drawing.

Minimum pipe size, in public right-of-way, shall be 18-inches.

The material for storm drains shall be reinforced concrete pipe, or cast-in-place pipe designed in conformance with Riverside County Flood Control and Water Conservation District design criteria, as modified by Hemet Standard Specifications; additionally, for onsite privately maintained stormwater facilities, HDPE shall be allowed.

The use of cast-in-place pipe shall be subject to the specific approval of the City Engineer.

The pipe invert elevations, slope, hydraulic grade line (HGL), D-load, and pipe profile shall be shown on the improvement plans.

RETENTION/DETENTION BASINS:

See the City of Hemet Storm Drain and Drainage Design Manual "Section 7- Retention and Detention".

IV.6 STREET LIGHTING

INTRODUCTION:

These specifications are a supplement to the latest edition of the Standard Specifications for Public Works Construction “Green Book”. In case of conflict with the Green Book or Hemet Standard Specifications, these specifications shall take precedence.

GENERAL:

New or relocated streetlights located within City R/W or City easements are required to include light emitting diode (LED) luminaries and shall be constructed per City Standards, Per Plan, and field inspected and approved prior to requesting energizing or acceptance.

INDUSTRY STANDARDS:

LED streetlight luminaries shall meet the applicable requirements of the following industry standards:

- A. ANSI/NEMA/ANSI C78.377-2011-Specifications for the Chromaticity of Solid-State Lighting (SSL) Products
- B. IES LM-79-08 – Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products
- C. IESNA LM-80-08 – Approved Method measuring Lumen Maintenance of LED chips / Fixture Manufacturer must provide extrapolation explanation for Lumen Maintenance derived from In- Situ testing upon request.
- D. IEEE C62.41.2-2002-IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits
- E. IESNA TM-15-11 & Addendum A (replaces TM-15-07 and TM-15-07 Addendum A) – Luminaire Classification System for Outdoor Luminaires; Backlight, Uplight, and Glare (BUG) Ratings
- F. ANSI/UL 1598 – Poles & luminaires; UL
- G. ANSI/UL 8750: Additional requirements for LED luminaires as well as drivers and LED arrays

Test data that establishes compliance with the requirements of ANSI/UL 1598 and the other industry standards listed above shall be provided upon request.

REFERENCE:

- A. Project Plans and Specifications – Location and project –specific details
- B. California Electric Code – As applicable by the Building Department
- C. SCE Standards – As applicable
- D. City Standard Drawings
- E. Standard Specifications for Public Works Construction (Greenbook) (latest edition) –

Subsections 700 and 701 and all included cross references.

LOCATION OF STREETLIGHTS:

- A. Intersections:
 - 1. One (minimum), where streets have a curb separation of less than 64-feet.
 - 2. Two (one each on opposite corners), where both streets have a curb separation of 64-feet or greater.
- B. Between intersections: Staggered spacing, in accordance with Table "A" of Standard Specifications.
- C. Alleys: Where warranted by extreme situations resulting in severe problems.

STREETLIGHT TYPE:

All City street light installations shall be Evolve™ LED Streetlight as manufactured by GE Lighting on prestressed concrete poles. Except in special cases and as approved by the City Engineer, all services shall be 240-volt, single phase and metered.

LUMINAIRES:

Fixtures shall be LED, dimmable, and one of the following or as approved by City Engineer:

Arterial Highway*, ** (114' Rd/W in 134' R/W or 110 R/W)	ERL1-0-09-B3-30-A-GRAY-L (84w, Type II narrow Photometric Option)
Minor Arterial	ERL1-0-09-C3-30-A-GRAY-L (84w, Type II wide Photometric Option)
Major Highway*, ** (86' Rd/W in 100' R/W)	ERL1-0-09-C3-30-A-GRAY-L (84w, Type II wide Photometric Option)
Secondary Highway*, ** (64' Rd/W or 70' Rd/W in 88' R/W)	ERL1-0-05-B3-30-A-GRAY-L (39w)
Express Collector* (3 lanes undivided)	ERL1-0-05-B3-30-A-GRAY-L (22w)
Collector* (2 lanes undivided)	ERL1-0-05-B3-30-A-GRAY-L (22w)
Local Street** (44' Rd/W and 48' Rd/W in 66' R/W)	ERL1-0-05-B3-30-A-GRAY-L (22w)
Local (Residential) Collector Street (66' R/W)	ERL1-0-05-B3-30-A-GRAY-L (22w)
General Local** (Residential) Street (60'R/W)	ERL1-0-03-B3-30-A-GRAY-L (22w)
Residential Loop Street	ERL1-0-03-B3-30-A-GRAY-L (22w)
Restricted Local Street** (36' Rd/W in 56' R/W)	ERL1-0-03-D3-30-A-GRAY-L (22w)
Residential Cul-de-sac (36' Rd/W in 56' R/W)	ERL1-0-03-D3-30-A-GRAY-L (22w)

Frontage Road** (Residential) (36' Rd/W in 52' R/W)	ERL1-0-03-D3-30-A-GRAY-L (22w)
Estate Lots** Street Lighting	ERL1-0-03-D3-30-A-GRAY-L (22w) or as approved by the City Engineer
Industrial/Commercial Street	ERL1-0-05-B3-30-A-GRAY-L (39w) or as approved by the City Engineer
Frontage Road (Commercial/Industrial)	ERL1-0-05-B3-30-A-GRAY-L (39w) or as approved by the City Engineer
Signalized Intersections	ERL1-0-09-D3-30-A-GRAY-L (84w)
<p>* Indicates roadway classifications shown per General Plan ** Indicates roadway included in Standard Drawings</p>	

General description of LED Streetlight – Standard fixture utilizes terminal block for power input suitable for #6 - #14 AWG wire operates at 700mA. Drive current is not field switchable. A three-pole terminal block capable of accepting #14 to #10 AWG shall be mounted to the housing inside the electrical compartment. Luminaire shall be provided with capability for optional backlight control. Complete assembly weight shall not exceed 45 lbs. Fixture is designed to mount on a schedule 40, 2" nominal pipe size (NPS) horizontal tenon (minimum 8" in length) and is adjustable +/- 5 degrees to allow for fixture leveling (includes two axis T-level to aid in this process). Fixture, including the LEDs, drivers and electrical components, shall carry a limited ten-year warranty and housing paint and finish shall carry a ten-year warranty.

Color temperature and CRI: 4000K color temperature for Safety Lighting, minimum 70 CRI.
3000K color temperature for Street Lighting, minimum 70 CRI

OPTICAL DISTRIBUTION METHOD & CONFIGURATIONS:

Optical configurations shall meet the following criteria:

- A. No reflectors or single lensed fixture accepted. Close contact refractors to be employed for optical distribution.
- B. Refractors are to be polymeric material rated 5VA, f1 rating
- C. Lumen maintenance at 50,000 hours of life to be no less than 88% of initial lumen output
- D. Shall have 95% survival rate at 50,000 hours
- E. Integral 10K surge suppressor for diode and entire system protection

Fixture Application (@100 hours)	LED Fixture Wattage	Color Temp	Minimum Lumens	Distribution Type
Residential Streets	22 Watts	3000 K	4,900 Lumens	IESNA Type II distribution
Collector	22 Watts	3000 K	4,900 Lumens	IESNA Type II distribution
Major Streets	84 Watts	4000 K	10,000 Lumens	IESNA Type III distribution
Signalized Intersections	84 Watts	4000 K	10,000 Lumens	IESNA Type III distribution

Note: The items in the table are recommended values and may be changed per direction of City.

LUMINAIRE HOUSING:

Luminaire housing shall be furnished with an optical assembly, be powder-coated silver, include a level bubble to facilitate installation, allow for tool-less entry and shall include an integral twist-lock type receptacle for photoelectric cell control in accordance with the latest EEI-NEMA standards which is adjustable with respect to north and prewired to the terminal board. Photocell control shall be for a 7- pin receptacle per ANSI C136.41.

Luminaire external housing shall have a minimum rating of IP66 as specified in IEC 60529, with the ability to shed water from inside the housing (i.e. weep holes).

The LED luminaire shall be designed for horizontal mounting. The LED assembly shall have a slip-fitted mounting bracket capable of attaching to a two-inch (2”) pipe without the need for special mounting parts. They shall be installed in a horizontal position with leveling and clamping to the mast arm pipe accomplished by tightening mounting bolts, which are externally or internally accessible. Bolts shall be minimum 5/8” x2” size and stainless steel.

Luminaire circuitry shall include quick connect / disconnects to allow easy separation and removal of driver and power door. Grounding requirements: ANSI/UL Standards and NFPA 70.

The luminaire power unit assembly shall consist of an integral driver, capacitor, 10K surge suppressor, and heavy-duty terminal block. The power unit assembly shall be mounted on a separate component of the luminaire to facilitate replacement.

The luminaire optical chamber shall have a minimum rating of IP66 as specified in IEC 60529.

The luminaire housing cooling system shall consist of a passive heat sink with no fans, pumps, or liquids and shall be designed and constructed to accept a standard plug type, locking, three-pole, three-wire, streetlight photocontrol. The fixture and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117.

All fasteners shall be stainless steel and all polycarbonate components shall be UV stabilized.

An easily-viewable nameplate shall be permanently affixed to the inside of each luminaire housing. The nameplate shall contain the following information: manufacturer's name, manufacturer's catalog number, date of manufacture (month and year), plant location, input power consumption, driver output current, IEC IP Rating, correlated color temperature (CCT), IES light distribution type, IESNA TM-15 BUG ratings, and serial number. Utility approved luminescent name plate with light source and wattage shall be permanently affixed on the exterior of the Luminaire to be visible from the ground.

The driver assembly shall be enclosed in a separate compartment from the optical assembly. The entire fixture shall be "wet listed" with the optical assembly compartment being rated at IP66. The LED Luminaire shall be constructed to provide the required light distribution with the lower edge of the Luminaire housing below the entire light source close contact refractors. **The Luminaire must be Dark Sky Compliant with U0 bug rating.** The light distribution pattern shall be per the FIXTURE table shown above.

Luminaire head shall be equipped with a shorting cap.

DRIVERS:

Light Emitting Diode (LED) drivers shall be component-type consisting of precision wound coils and welded magnetic steel laminations assembled together and impregnated with baked-on, insulating, weatherproof varnish; and metal-cased, hermetically-sealed capacitor, suitable for use on multiple distribution circuits with 60Hz, 120 or 240 Volt rating. The operating sound pressure noise level shall not exceed the ambient noise level by more than five (5) decibels at 30-feet when measured by a sound level meter conforming to the American Standards for Sound Level Meters. Where the ambient noise level is less, a minimum of 40 decibels shall be assumed.

Power supply / driver shall be field replaceable by means quick-disconnect connectors and easy access mounting hardware. Power supply / driver shall be wet-listed in the US and Canada, UL, ROHS compliant, meet Caltrans 611 vibration testing and GR-63-CORE section 4.4.1/5.4.2 earthquake zone 4.

DRIVER SPECIFICATIONS:

Electronic; voltage range = universal 120 – 277 v +/- 10%; frequency = 50/60 Hz; power factor > 90% @ full load; THD < 20% @ full load; output ripple < 10%; output shall be isolated; case temperature rated for

-40 to 60C; fully encased and potted; overheat protection, self-limited short circuit protection, and overload protected – minimum integral 10k surge protection tested in accordance with IEEE C62.41 and ANSI standard 62.41.2; Driver Life Rating not less than 100,000 hours.

PHOTOELECTRIC CONTROL UNIT FOR SERVICE CABINET:

Fisher-Pierce # TRS-2 105-305 VAC LED control or approved equal.

The photoelectric unit shall consist of a photoelectric cell in a weatherproof housing which plugs

into an EEI-NEMA twist-lock receptacle integral with the luminaire and shall be installed with the clear UV- stabilized photocell window facing north, with an external light shield, or remotely mounted facing north. The control unit shall contain a uniformly coated cadmium-sulfide photoelectric cell suitable for operation with 120 or 240 volt line supply with surge protection to prevent damage and made to fail in the "ON" position. The unit shall have a HID load rating of 1,800 VA with a Tungsten load rating of 1,000 watts. The unit shall have time-delay capabilities.

The response level of the unit to changing light levels shall remain stable throughout the life of the unit (5,000 operations). The "turn-on" level shall be nominal 1 foot-candle and the "turn-on: turn-off" ratio shall be 1.5.

FUSES:

Fuses shall be slow blow 13/32" x 1 1/2" in-line type in 5 amp size (unless specified otherwise by the City). The fuse shall be installed in the hot leg of the lighting conductor. The circuit shall be fused in the base of the pole – not in the pull box. 240-volt installations require each leg to be fused using a double fuse holder and two fuses of appropriate size. Fuses shall be Bussmann Series type FNQ or approved equal.

FUSEHOLDERS:

Fuse holders shall be completely waterproof, shall grip the fuse in the load side section when opened, and be able to take a 13/32" x 1 1/2" fuse, with crimp-type tubular terminals of a proper size for the cable in the particular light. Heat shrink both crimp ends. Fuse holders shall be Bussmann Series type HEB or HEX with insulating boots or approved equal.

MAST ARMS:

Mast arms shall be minimum two-inch (2") I.P.S. galvanized steel or aluminum and shall be self-supporting without braces, scrolls or rods. Mounting shall be perpendicular to the street centerline unless otherwise directed by the City Engineer. They shall have a minimum of six inches (6") of horizontal straight section at the end of the arm to mount to a I.P.S. slipfitter type luminaire mount.

Mast arms shall be per City Standard Drawing No. G-808 note #2 for all luminaires unless otherwise specified in the plans and shall be capable of handling the EPA and weight of the luminaire. Steel arms shall conform to ASTM A 120. Aluminum arms shall be corrosion resistant alloys such as Aluminum Association wrought alloys 6061 or 6062 or cast alloys 319 or 356.

All exposed hardware shall be stainless steel. All protected hardware not visible after installation shall be cast aluminum and / or stainless steel, hot-dipped galvanized. Anti-seize shall be used.

FOUNDATIONS:

Footing, anchor bolt dimensions, and materials per manufacturers specifications. Concrete for footing shall be 560-C-3250.

CONCRETE POLES:

- A. RESIDENTIAL STREETS: Ameron 1C123 Pole
- B. COLLECTOR AND ARTERIAL STREETS: Ameron 1C128 Pole

(Note: arms on poles shall be per City Standard Drawing No. G-808 note #2)

Concrete poles shall be tapered, centrifugally cast and pre-stressed. Poles shall be black and white marble aggregate or natural exposed aggregate. Pole shape and color shall be uniform for any one project. Replacement poles shall match existing.

Hand hole cover plates shall be aluminum and securing bolts shall be stainless steel tamper-proof bolts of the type installed with a pent-head wrench. Anti-seize shall be used.

All concrete poles shall be provided with a clear, factory applied Amershield Anti-Graffiti coating.

PULL BOXES:

Pull boxes shall be #3 1/2 Pull Boxes or approved equal. Pull boxes shall be installed per CALTRANS Standard Plan ES-8 as follows:

- A. The pull box that feeds into SCE service point shall be a #5 pull box and be within 5' of the service pedestal.
- B. Located within five feet (5') of each street light.
- C. Located at conduit interval runs of not more than 200 LF. Additional #3 1/2 pull boxes will be required for conduit runs over 200 LF long.

Pull boxes shall be installed within the sidewalk near the street light pole with the short side parallel to the curb. They shall not be installed in any part of a driveway or other traveled way, unless approved by the City Engineer and provided with a metal traffic cover. Pull box covers shall be inscribed "STREET LIGHTING" and shall be secured with bolts, cap screws or studs and nuts made of stainless steel. Pull boxes shall be tamper resistant and utilize a special key tool for opening. Anti-seize shall be used.

For more information on City standard pull boxes, see Traffic Signal Specifications and Installation Guidelines and City Standard Plan No. G-808A.

CONDUIT AND TRENCH:

All conduit shall be two-inch (2") UL approved heavy wall polyvinyl chloride (PVC) Schedule 80. Conduit shall be encased in a minimum of three inches (3") of sand on all sides. Location tape shall be installed above the sand layer along the length of the conduit trench. The minimum sweep radius shall be twenty-four inches (24"). The maximum length of a conduit run shall be two hundred feet (200'). The Contractor may, at his expense, use conduit or a larger size, provided the larger size is used for the entire length of the conduit runs between pull boxes (reducing couplings shall not be allowed).

Conduit shall be laid to a depth of not less than thirty inches (30") unless placed under sidewalk in which case only eighteen inches (18") shall be required. Conduit laid in open trench shall not be covered nor shall trench or inspection hole be backfilled until accepted by the City Engineer or his designated representative.

SPLICING:

Splices shall be permitted in pull boxes and lighting standard bases ONLY. All splices shall be waterproofed with Penetrox (or approved equal) with butt splice and heat shrink tubing.

CONDUCTORS AND SERVICE RUNS:

All conductors shall be stranded copper, XHHW-2, #8 AWG minimum. Maximum wire size shall be #6 AWG. Neither aluminum (unless aluminum is approved by the City Engineer) nor direct-burial cable shall be accepted. All street light system shall be provided with 240V metered service.

Wire shall conform to the applicable portion of ASTM B3 and B8. Wire connectors shall be approved by the City Engineer or his designated representative and shall bear the UL seal of approval. The installation procedure, connector size and crimping tools shall conform to the manufacturer's recommendations.

Wire from the base of the pole to the luminaire shall be #10. For 120-volt installations (if approved by city engineer), the wires shall be black and white, with black being the hot wire and fused. For 240-volt installations, one hot wire shall be black and the other shall be red. Both hot wires shall be fused. Any ground wires shall be green and connected to a clamp attached to an anchor bolt.

Service runs parallel to the street shall be installed under the sidewalk where new sidewalk is being constructed or directly behind the existing sidewalk. Street light circuits shall alternate from light to light. Voltage drop shall not exceed five percent (5%).

SERVICE CABINETS:

See Hemet Standard No. G-808A for service cabinet information. All service cabinets shall be single meter service cabinets. City may require dual meter service with unmetered section at discretion of city engineer.

Service cabinets shall also meet the following specifications:

- A. All cabinets shall be stainless steel Strong Box or approved equal.
- B. Single meter service (Strong Box Model CSB-B116-22K or most applicable model number).
- C. Shall include a photoelectric socket and control unit with time delay capabilities.
- D. Shall include factory installed photocell shield.
- E. Shall include test block switches.
- F. Shall be anodized aluminum or stainless steel.
- G. Shall include branch circuits per project design plans.

CONNECTION TO SCE SERVICE POINT:

Contractor shall contact SCE for a service point. SCE will identify what service is available and where it is located. In rare cases, a new streetlight can be connected to an existing streetlight circuit, but not without written permission from the City Engineer. New voltage drop calculations shall be required to verify that existing circuit can handle additional load.

The service point shall be in the City's right-of-way; otherwise, the City will require an easement to the service point.

PRE-INSTALLATION:

- A. Contractor shall set up a pre-construction meeting prior to ordering of any materials or any work taking place.
- B. Contractor shall provide material submittal drawings for city review and approval prior to ordering of any material.
- C. Obtain a City R/W permit for any work performed within a City R/W or City easement. Attached to the R/W permit are the construction requirements applicable to all work performed within the City R/W.
- D. Call underground Service Alert at 800-422-4133 at least 72 hours before excavating.

INSTALLATION AND INSPECTION:

- A. Concrete and/or asphalt removal & replacement shall be per City of Hemet Standards or as directed by the City Engineer. A sidewalk extension may be required to meet ADA access requirements.
- B. Conduit depth shall be as described in the CONDUIT AND TRENCH section. All trenches shall be compacted per the City of Hemet Standards or as directed by the City Engineer.
- C. Street Lights shall be located per City approved plan and shall not be relocated without prior City approval.
- D. Minimum Engineering Department Inspections Required:
 - 1. Schedule an Engineering Department Inspection 72 hours in advance by calling 951-765-3860
 - 2. All work performed within a Public Right-Of-Way
 - 3. All conduit placement
 - 4. Prior to and during any concrete foundation placement
 - 5. Pole installation
 - 6. Construction "As-Built" drawings shall be submitted prior to final inspection
- E. Public Works inspection is required for final wiring and splicing prior to energizing. Contact the Public Works Department for inspection 72 hours in advance at 951-765-3860.

- F. Pedestrian and vehicle traffic control and access shall be maintained per the Plans, Specifications, City Traffic Control Standards, CA MUTCD, and as otherwise required or directed by the City.

ACCEPTANCE AND ENERGIZING:

- A. Upon completion of all street light construction, the Engineer of Record shall submit two (2) sets of professionally drafted streetlight “As-Built” plans on 11” x 17” size sheets to the Engineering Department.
- B. After “As-Built” plans have been accepted by the City, the Contractor or Developer shall anticipate a minimum of five (5) working days for the City to contact SCE for streetlight energizing. Release of a Building Occupancy requires that streetlights be energized.

STREET LIGHT DESIGN PLANS:

(APPLIES TO CITY STANDARD STREET LIGHTS ONLY, NON-STANDARD STREET LIGHTS WILL BE REVIEWED ON A PROJECT-BY-PROJECT BASIS):

- A. The Design Engineer preparing plans and specifications for street lights shall adhere to the following design and plan preparation criteria:
 - 1. Include a title sheet with street light general notes, general construction notes, engineer declaration of responsible charge, quantity table, legends and abbreviations, vicinity map, sheet index. Cover sheet or the second sheet shall contain a large view of the street light locations with service pedestal locations. Max size of this street light location shall be 1:100’ scale unless size of project necessitates larger scale.
 - 2. Design plan sheets shall:
 - a. Be drawn at a scale of 1”=40’.
 - b. Include north arrow and scale.
 - c. Include R/W and centerline stationing.
 - d. Conform to the latest edition of Hemet Street and Safety Light Standards and Guidelines.
 - e. Reference appropriate Hemet standard drawing details or include detail sheet with Hemet standard drawings. See Hemet Standard Drawings No. G-808 through G-808B.
 - f. Include appropriate construction notes.
 - g. Show existing/proposed utilities and driveways.
 - 3. Design plans shall include the following information:
 - a. Street light pole type and fixture information.
 - b. Street light call out indicating street station and circuit information.
 - c. Street light size (watts).
 - d. Street light circuits shall alternate from street light to street light.
 - e. SCE service point and stationing. Indicate serving voltage (240v).
 - f. Street light service pull box.
 - g. Size of conduit (2” minimum) Schedule 80 PVC.
 - h. Indicate trench depth.

- i. Size and numbers of wires.
 - j. When laying conduits across a street, they shall be at right angles to the curb line.
 - k. Include voltage drop calculations.
 - l. Include service meter panel information.
- B. Voltage Drop calculations for wire sizing are required for every circuit run which has more than (2) street lights and whenever the service from the service point is more to the last (furthest) street light exceeds 500’.
- C. The Engineer of record shall be responsible for providing final “As-Built” drawings once the lighting system is installed and approved by the inspector. The construction “As-Built” drawings will be the basis for providing the final drawings. The final drawings are to be CAD drafted and shall be signed off by the engineer of record.
- D. All non-standard City street lights shall be approved by Engineering Department. Non-standard street lights will be required to provide photometric analysis along roadways.
- E. Structural pole base calculations are required to be submitted as a supporting document when nonstandard streetlights are approved for installation. Calculations shall be prepared by licensed California registered engineer and shall be wet-stamped.
- F. Design submittals not containing full electrical designs during first submittal will be rejected.

STREET LIGHT PLAN GENERAL NOTES:

For City of Hemet Street Light General Notes, see City General Notes section of the City website.

IV.7 PARKING LOTS

GENERAL:

Structural pavement section shall be based on results of soils test made before plans are approved.

The "R" value shall be verified after rough grading and prior to paving. The structural section shall then be modified, if necessary.

In no case shall the structural section be less than:

Parking areas:	3-inches of A.C. over 4-inches of A.B. (Class II)
Drive aisles:	3-inches of A.C. over 6-inches of A.B. (Class II)

All parking lot subgrade and A.B. material shall be compacted to 95% relative density. Compaction test shall be taken at locations designated by the City's Public Works Inspector.

All A.C. paving shall be fog sealed at a rate of 0.05 gallon per square-yard.

Asphalt concrete used in parking lots shall comply with Section 92 of Caltrans Specifications, latest edition. Mix shall be PG 70-10 (AR 8000).

The final paving course for A.C. surface shall be one tenth (0.10) of a foot in thickness and a minimum of eight (8) feet in width. The final paving course shall be laid with a self-propelled mechanical spreading and finishing machine, equipped with tamper bars and an automatic screed (Barber-Green, or approved equal).

All parking lots shall drain through an approved drainage structure.

Parking lot striping shall be in accordance with Standard Drawing No. P-401.

IV.8 TRAFFIC SIGNALS

DESIGN CRITERIA:

Traffic signals shall be designed in accordance with the requirements of Caltrans, except for the type of controller to be used.

Dedicated right turn lanes shall be included, wherever possible.

Loop, radar, or video detectors are acceptable.

New traffic signals shall be interconnected with existing signals. If there are no existing signals in the proximity, the construction of new traffic signals shall include all necessary underground conduits for future interconnection.

All traffic signals within the city limits shall include, but not limited to, the following items:

- A. LED indicators
- B. Emergency vehicle pre-emptying device
- C. Reflectorized street name signs
- D. Reflective backplates.
- E. Controller type NEMA TS2 McCain ATC eX2
- F. Pedestrian countdown heads

IV.9 TABLE "A"

CITY OF HEMET ENGINEERING DEPARTMENT SUMMARY OF MINIMUM STREET DESIGN STANDARDS

Design Criteria		Arterial Highway	Major Highway	Secondary Highway	Collector	Local Street	Restricted Local Street	
1.	Estimated 24 hr. traffic (volume)	14,000 to 30,000	10,000 to 24,000	10,000 to 20,000	5,000 to 10,000	4,000 to 8,000	Max. 20 dwellings	
2.	Design Speed (MPH)	55	55	50	40	30	25	
3.	Spacing of Intersections	1,320	660	330	200	200	150	
4.	Right of Way (ft.)	130-140	98-108	94	64-74	60	56	
5.	Access to adjoining property	Intersection only	Intersection only	Intersection only	Avoid where possible	OK	OK	
6.	Curb to Curb (ft.)	102-112	78	64	44	40	36	
7.	Median	0' – 12'	0' – 12'	0' – 14'	-	-	-	
8.	Traffic Index TI	Special (9.5 min.)	Special (9.0 min.)	Special (8.5 min.)	7.0	5.5	.5.5	
9.	Min. Thickness of Pavement (inches)	4AC/8AB	4AC/6AB	4AC/6AB	4AC/6AB	4AC/6AB	4AC/6AB	
10.	Stopping sight dist. (summits) (feet)	660	525	350	275	200	160	
11.	Head Light dist. (sags) (feet)	600	475	350	275	200	160	
12.	Min. Horizontal Radius (feet)	1,500	1,200	1,000	600	500	200	
13.	Max. Grade (%)	AC	6	7	7	7	9	12
		PCC	6	7	7	7	9	16
14.	Min. Grade (%)	0.5	0.5	0.5	0.5	0.5	0.5	
15.	Street lights							
	Mounting height	40'	35'	31'	28'	26'	26'	
	Lamp Capacity (lumens)	22,500	22,500	22,500	8,000	8,000	8,000	
	LED Wattage	84 W	84 W	84 W	22 W	22 W	22 W	
	Spacing (ft.)	160'	160'	250'-300'	280'-300'	200'	250'	

TABLE "A" (cont.)

**CITY OF HEMET ENGINEERING DEPARTMENT SUMMARY
OF MINIMUM STREET DESIGN STANDARDS**

Design Criteria		Residential Loop Street	Residential Cul-de-sac	Industrial Street	Frontage Road	Hillside or dbl. Frontage Lots	Alley	
1.	Estimated 24 hr. traffic (volume)	-	-	-	-	-	-	
2.	Design Speed (MPH)	25	25	25	25	25	25	
3.	Spacing of Intersections	250	-	250	250	250	-	
4.	Right of Way (ft.)	52	52	64-74	52	52	Res.- 20' Com- Ind-30'	
5.	Access to adjoining property	OK	OK	OK	OK	OK-1 ftg.	OK	
6.	Curb to Curb (ft.)	36	36	special 44	36	36	Res.- 20' Com- Ind-30'	
7.	Median	-	-	-	-	-	-	
8.	Traffic Index	5.5	5.5	special (8.5) min.	5.5	5.5	5.5	
9.	Min. Thickness of Pavement (inches)	4AC/6AB	4AC/6AB	4AC/6AB	4AC/6AB	4AC/6AB or 6" PCC	4AC/6AB or 6" PCC	
10.	Stopping sight dist. (summits) (feet)	160	160	160	160	160	-	
11.	Head Light dist. (sags) (feet)	160	160	160	160	160	-	
12.	Min. Horizontal Radius (feet)	200	200	300	300	150	-	
13.	Max. Grade (%)	AC	12	12	6	8	12	-
		PCC	16	16	6	8	16	16
14.	Min. Grade (%)	0.5	0.5	0.5	0.5	0.5	0.5	
15.	Street lights:							
	Mounting height	26'	26'	30'	30'	26' or special	special	
	Lamp Capacity in lumens	8,000	8,000	8,000	8,000	8,000	4,500	
	LED Wattage	22 W	22 W	22 W	22 W	22 W		
	Spacing (ft.)	250'-300'	250'-300'	250'-300'	250'-300'	250'-300'	250'-300'	

IV.10 TABLE “B”

APPROVED STREET TREE LIST

COMMON NAME	BOTANICAL NAME	EVERGREEN	DECIDUOUS	FALL COLOR	3' x 3' CUTOUT	5' x 5' CUTOUT	2' to 3' PARKWAY.	5' INTERIOR PKWY	5' EXTERIOR PKWY	4' FROM SIDEWALK (MIN.)	AGE 55+ COMMUNITIES	BENEATH UTILITY WIRES	MIN. TREE CALIPER AT 1' FROM GROUND (INCHES)
African Sumac	Rhus Lancea	X				X		X	X		X	X	1.75
Australian Willow	Geijera Parviflora	X				X		X	X		X		1.75
Bottle Brush	Callistemon Citrinus or Viminalis	X							X				1.75
Camphor Tree	Cinnamomum Camphora	X								X			1.75
Chinese Elm	Ulmas Parvifolia		X					X	X				1.75
Chinese Flame Tree	Koelreuteria Integrifolia		X	X					X				1.75
Chinese Pistache	Pistachia chinensis		X	X		X		X	X				1.75
Crapemyrtle	Lagerstroemia Indica		X	X	X		X				X	X	1
Desert Willow (White)	Chitalpa Tashkentensis		X		X	X	X	X	X		X	X	1.75
Flowering Pear	Pyrus Calleryana “Aristocrat”		X	X	X	X	X		X		X		1.75
Goldenrain Tree	Koelrueteria Paniculata		X	X					X			X	1.75
Honey Locust	Gleditsia Tricanthus “Sunburst”		X			X			X				1.75
Liquidambar	Liquidambar Styraciflua		X	X					X	X			1.75
Magnolia Grandiflora “Alta”		X				X		X	X				1.75
Photinia	Photinia Fraseri	X		X	X		X				X	X	1
Raywood Ash	Fraxinus Angustifolia		X	X	X		X	X			X	X	1.75
Ulmus Paravifolia “Alle’e”			X	X									1.75