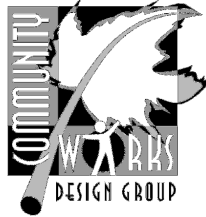


PROJECT
SPECIFICATIONS

FOR

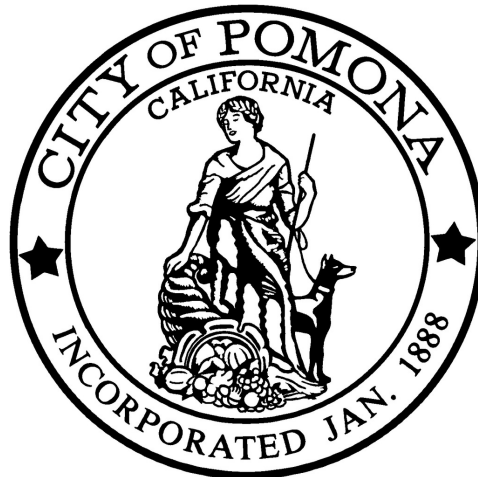
GARFIELD PARK – ADA RAMPS

Prepared by



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For



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GARFIELD PARK – ADA RAMPS
CITY OF POMONA
TECHNICAL SPECIFICATIONS

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SECTION 01000 - MOBILIZATION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

The provisions of *The “Greenbook” Standard Specifications for Public Works Construction* shall apply except as modified herein.

1.02 SCOPE OF WORK:

The Work of this Section shall consist of furnishing all labor, materials, equipment, appliances and services necessary for the execution and completion of all Mobilization Work as shown on the Plans and as described in the Specifications including, but not necessarily limited to, the following:

- Preparatory operations including, but not limited to those efforts necessary for the movement of personnel, equipment, supplies, and incidentals to the Work site;
- All other operations which must be performed or costs incurred prior to beginning Work on the site;
- Provision and installation of Construction Fence per Technical Specification Section **02445 Temporary Chainlink Fence**;
- Provision of temporary utilities;
- Secure all required permits;
- Obtain temporary construction water & electrical service
- Submittals per Special Provisions Section **2-5.3.3 Shop Drawings and Submittals** and Technical Specifications Section **01300 Submittals**.

1.03 SUBMITTALS:

As a part of mobilization, all submittals as specified in various individual Sections of the Specifications shall be submitted for approval by the City in the format specified in Technical Specifications Section **01300 Submittals** and within the time-frames specified in Special Provisions Section **2-5.3.3 Shop Drawings and Submittals**. Submittals shall include all Materials Lists, Catalog Cuts, Shop Drawings, material and color samples, and Construction Schedule all as specified.

PART 2 - MATERIALS

2.01 TEMPORARY UTILITIES:

The permanent potable domestic water meter is already in place and available for use on the Project. Contractor shall furnish temporary water (if need exceeds safe rate of flow through existing water meter), and power complete with connecting piping, wiring, lamps, meters and similar equipment as required for the Work. Install, maintain, and remove temporary lines upon completion of the Work. All expenses in connection with temporary services and facilities shall be paid for by Contractor.

PART 3 – EXECUTION

3.01 GENERAL:

- A. Payment: Payment for mobilization will be at the lump sum price bid for mobilization. Payment shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing

all the Mobilization and De-mobilization Work as herein specified. The 10% retention shall apply to all Mobilization Work.

3.02 CLEAN-UP:

Contractor shall provide trash receptacles for collecting debris, shall remove debris from the job site at regular intervals not less than weekly and shall dispose of same in a legal manner.

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

The provisions of the *The "Greenbook" Standard Specifications for Public Works Construction* shall apply except as modified herein.

1.02 SCOPE OF WORK:

The Work of this Section shall consist of furnishing all labor, materials, equipment, appliances and services necessary for the execution and completion of all Submittals Work as shown on the Plans and as described in the Specifications including, but not necessarily limited to, the following:

- Preparation of Submittals Schedule;
- Submittals Planning;
- Submittals Preparation, Distribution and Transmittal, to include all of the following:
 - Materials Lists;
 - Samples;
 - Record Drawings;
 - Turn-over Items;
- Submittals Schedule updating and distribution;

1.03 RELATED WORK SPECIFIED ELSEWHERE:

Shop Drawings and Submittals
Construction Schedule

Special Provisions Section 2-5.3.3
Special Provisions Section 6-1.1

1.04 SUBMITTAL PLANNING:

- A. Processing Lead Time: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
1. Allow two (2) weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The City representative will promptly advise Contractor when a submittal being processed must be delayed for coordination.
 2. If a resubmittal is necessary due to corrections or revisions, process the resubmittal in the same manner as the initial submittal.
 3. Allow two (2) weeks for processing each resubmittal.
 4. No extension of Contract Time will be authorized because of failure to transmit submittals to the City representative sufficiently in advance of the Work to provide the two week processing time specified.

B. Coordination and Completeness:

1. Contractor shall coordinate preparation and processing of submittals with the performance of the related Work. Transmit each submittal allowing sufficient lead time to obtain appropriate reviews and approvals and to avoid delays in the related Work.
2. Coordinate the submittal date for each submittal with the lead time needed for fabrication, purchasing, testing, delivery, review of other related submittals, and related Work that require sequential processing/completion.
3. Coordinate the transmittal dates for each different type of submittal so processing will not be delayed. Ensure concurrent transmittal of submittals for related portions of the Work that need concurrent review to allow the PA to verify that a coordinated work effort is being provided. City and PA each reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
4. Contractor is responsible to verify completeness of all submittals. Incomplete submittals will be rejected.

1.05 SUBMITTALS SCHEDULE:

- A. Concurrently with the development of Contractor's Construction Schedule (per Special Provisions Section 6-1.1 CONSTRUCTION SCHEDULE), prepare a complete "Submittals Schedule" for all submittals. Submit the Submittals Schedule together with the Construction Schedule at the Pre-Construction meeting.
 1. Coordinate the Submittals Schedule with all subcontractors, with the schedule of values, with the Materials Lists and with the Construction Schedule.
 2. Itemize items on the Submittals Schedule in the chronological sequence planned for submission; include all submittals required by the Contract Documents. Provide the following information:
 - a) Scheduled date for the initial submittal for each item.
 - b) Related Specification Section number.
 - c) Submittal category (i.e. Product Data, Samples, Record Documents, Shop Drawing, etc.).
 - d) Name of subcontractor or supplier as applicable.
 - e) Description of the portion of the Work covered by the submittal.
 - f) Record successive date(s) of any resubmittal(s).
 - g) Record date of City approval of each submittal.
- B. Submittals Schedule Updating: Update the Submittals Schedule after each meeting or activity where revisions have been recognized or made.
- C. Distribution: Following receipt of review comments to the initial Submittals Schedule, on a monthly basis thereafter issue updated copies of the Submittals Schedule. Distribute copies to the Landscape Architect, the City representative, all subcontractors, and all other parties required to comply with scheduled submittal dates. Keep an up to date copy of the Submittals Schedule posted in the Construction Office. Parties may be deleted from the distribution upon completion of all portion(s) of the Work assigned to such parties and such parties are no longer involved in construction activities.

1.06 SUBMITTALS PREPARATION AND TRANSMITTAL:

- A. Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record Contractor's review and approval markings and the action taken.
 2. Include the following information on the label for processing and recording action taken.
 - a) Project name.
 - b) Date.
 - c) Name and address of PA.
 - d) Name and address of Contractor.
 - e) Name and address of subcontractor (as applicable).
 - f) Name and address of supplier.
 - g) Name of manufacturer.
 - h) Number and title of related Specification Section.
 - i) Drawing number and detail references, as appropriate.
- B. Transmittal: Forward one electronic copy of each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to the City representative using a transmittal form. Submittals received from sources other than Contractor may be returned without action. If a submittal is rejected, submit one electronic copy of the resubmittal.
1. When transmitting submittals, record relevant information and requests for data on the transmittal form. Include a Contractor's certification that information submitted complies with the Contract Document requirements as a part of each submittal. If the submittal is not in full accordance with the Contract Documents, record specific deviations from the Contract Document requirements, including minor variations and limitations, either on the transmittal form or on a separate attached sheet that is referenced on the form.
 2. Transmittal Form: Use AIA Document G 810, or City approved equal.

1.07 SUBMITTALS PROCESSING AND DISTRIBUTION:

- A. Processing: Upon receipt of the submittals, the City representative will retain one copy and forward an electronic copy to the PA who will retain one, and will return an electronic copy marked with action taken. Electronic copies will be forwarded to the PA who will return an electronic copy with action taken.
1. Except for submittals for record information or similar purposes, where action and return is required or requested the City or Landscape Architect will review each submittal, mark to indicate action taken, and return promptly.
 2. Verification of the submittals compliance with characteristics specified in the Contract Documents is Contractor's responsibility.
 3. Action Stamp: The City or Landscape Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

- a) "No Exception Taken": When submittals are marked "No Exception Taken," that part of the Work covered by the submittal may proceed.
- b) "Make Corrections Noted": When submittals are marked "Make Corrections Noted," that part of the Work covered by the submittal may proceed provided it complies with the notations and corrections marked on the submittal as well as the requirements of the Contract Documents.
- c) Returned for Resubmittal: Submittals may be returned for resubmittal for various reasons. When a submittal is marked either "Submit Specified Item," "Rejected," or "Revise and Resubmit," Contractor shall not proceed with any part of the Work covered by the submittal, including purchasing, fabrication, delivery, or any other associated activity. Instead, the submittal shall either be revised to comply with the Contract Documents and resubmitted, or a new submittal shall be prepared in accordance with the notations and submitted; resubmit without delay.
- d) Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".
- e) Contractor shall repeat the submittal process as specified above for all submittals as necessary to obtain an action mark that will allow the Work to proceed.

B. Distribution: Upon receipt of marked copies of the submittals from the Landscape Architect, the City representative will forward four hard copies or one electronic copy of the marked submittal to the Prime Contractor for further distribution to the Subcontractor(s) and/or Supplier(s).

- 1. Do not proceed with the Work until an appropriately marked copy of the applicable submittal has been received from the City and is in the installer's possession.
- 2. Do not permit use of unmarked copies of submittals in connection with construction.
- 3. Contractor shall not permit submittals marked "Rejected," "Submit Specified Item," or "Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

1.08 PRODUCT DATA ("CATALOG CUTS"):

A. Submittal: Assemble Product Data submittals into a single submittal package for each construction trade or system (e.g. Plumbing, Electrical Lighting, Concrete, HVAC, etc.). Submittals shall consist of one electronic copy. Product Data submittals shall include all available printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

- 1. Mark the copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to delete inapplicable information. Product Data submittals, as a minimum, shall include the following information:
 - a) Manufacturer's printed recommendations.
 - b) Compliance with recognized trade association standards.
 - c) Compliance with recognized testing agency standards.

- d) Application of testing agency labels and seals.
 - e) Notation of dimensions verified by field measurement.
 - f) Notation of coordination requirements.
2. Do not submit Product Data until Contractor has confirmed the product's compliance with requirements of the Contract Documents.

1.09 SAMPLES:

- A. General: Submit full-size, fully fabricated Samples cured and finished as specified, in the quantity specified in the respective Technical Specification section, and physically identical with the material or product proposed. Where quantities are not specified in the Technical Specification, submit a minimum of three samples, one will be returned marked with the action taken. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
- 1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Sample Submittals to match the PA's Sample when available. Include the following:
 - a) Generic description of the Sample.
 - b) Sample source.
 - c) Product name or name of manufacturer.
 - d) Certification of compliance with the specified standards.
 - e) Availability and delivery time.
 - 2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.
 - 3. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product. Preliminary submittals will be reviewed and returned with the PA's mark indicating selection and other action.
 - 4. Maintain appropriately marked sets of Samples, as returned by the City, at the Project site for quality comparisons throughout the course of construction.
- B. Distribution of Samples: If additional sets of samples are needed for distribution to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work, Contractor shall submit samples in sufficient quantities for such distribution. Do not distribute unmarked copies of sample to others involved in the Work.

1.10 "RECORD" PRINTS:

- A. Changes: Record accurately on one set of blue-line prints all changes in the Work constituting departures from the original Contract Plans. For example, changes in pressure and non-pressure irrigation line locations.

- B. Legibility and Approval: The changes and dimensions shall be recorded in a legible and workmanlike manner to the satisfaction of the City. Prior to final inspection of the Work, submit "record" prints to the City representative for approval.
- C. Reference Points: Dimension from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavement, etc.). Data to be shown on "record" prints shall be recorded day-to-day as the project is being installed.
- C. As-built Items: Show locations and depths of the following types of underground items:
1. Point(s) of connection for irrigation, domestic water, gas, sewer, electric and similar underground utilities.
 2. Routing of underground conduits, irrigation pressure lines and utility lines (dimension maximum 100 feet on center along routing).
 3. All types of valves in various piping systems, including gate valves, quick coupler and remote control valves.
 4. Routing of irrigation control wires.
 5. Related equipment (as may be directed).
- D. Maintain record prints on site at all times.

PART 2 - MATERIALS (See 'MATERIALS' part of each specification section.)

PART 3 - EXECUTION (See 'EXECUTION' part of each specification section.)

END OF SECTION

SECTION 02050 - SITE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

The provisions of *The "Greenbook" Standard Specifications for Public Works Construction* shall apply except as modified herein.

1.02 SCOPE OF WORK

A. Furnish materials, labor, transportation, services, and equipment necessary to perform all site demolition work as indicated on the Drawings complete as shown and as specified herein.

1.03 REFERENCES

A. Comply with the applicable reference specifications as specified in the GENERAL PROVISIONS and in accordance with applicable laws, codes and regulations required by the City.

B. Comply with the current provisions of the following Codes and Standards:

1. ASTM - American Society for Testing and Materials.
2. Standard Specifications - Agency Specified
3. Uniform Building Code

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Demolish existing site improvements as indicated on the Drawings, in an orderly and careful manner. Comply with all local codes and ordinances.

B. Equipment: Use equipment specifically designed for the demolition of each type of material.

C. Labor: Employ workmen skilled in the use of the equipment being utilized for demolition.

1.05 DELIVERY, STORAGE, AND DISPOSAL

A. Delivery and Storage: Do not deliver to the job site nor store thereon demolition equipment and materials prior to receiving written notice to proceed. Confine storage to areas approved by the City Representative.

B. Disposal: Legally dispose of off site products of demolition during or at end of each day's work. Contractor shall pay all disposal costs associated with the project.

1.06 PROJECT CONDITIONS

A. Existing Conditions: Inspect site prior to commencing work. Determine scope of applicable site conditions.

B. Acceptance: Commencing work constitutes Contractor's acceptance of site conditions, both surface and subsurface. No extra payment shall accrue to Contractor by virtue of unknown conditions or difficulties of performing this demolition work.

1.07 PROTECTION

- A. Prior to commencement of demolition activities, Contractor shall photograph all existing conditions, including, without limitation, sidewalks, curbs, trees, fencing, and other elements. Digital copies of all photos, at a size no smaller than 8" x 10" at 150 dpi minimum resolution, shall be provided to the City and Project Landscape Architect for future reference.
- B. Protection of Existing Site Improvements
 - 1. References: Verify and maintain benchmarks, monuments and other reference points. Replace if disturbed or destroyed.
 - 2. Protection: Protect existing improvements noted to remain within designated limit(s) of work. Supply shoring, bracing, reinforcing and barricades as required. Refer to drawings for limit of work.
 - 3. Utilities: Keep in operation existing utility circuits and piping to remain, including sprinkler irrigation, except at the direction of the City Representative. Provide 48-hour notice of interruption of service. Notify City Representative should utilities not shown on Drawings be found during demolition.
 - 4. Repair: If damage to site improvements to remain occurs during the course of the work, restore to the satisfaction of the City Representative at no additional cost.

PART 2 - EXECUTION

2.01 PREPARATION

- A. Verification: Verify with City Representative items to be removed prior to commencement of work.
- B. Compliance: Proceed with demolition in an orderly and careful manner, in compliance with local codes and ordinances.
- C. Disposal: Legally dispose of demolished materials off site unless otherwise directed by the City Representative.

2.02 DEMOLITION

- A. Utilities:
 - 1. Capping: Disconnecting and capping of utilities must be in accordance with the regulations of the utility company affected.
- B. Paving:
 - 1. Sawcutting: Accurately and cleanly sawcut existing concrete paving as shown on Drawings. Confine cuts to areas shown. Avoid damage to adjacent improvements.

2. Finishing: Rough grade excavated areas as necessary to achieve the final line. Compact the grade to the density of the surrounding area. The final surface shall be smooth, even and tight, free from loose or soft areas.
- C. Subgrade: Fill depressions made by demolition and restore excavated areas to a smooth and even grade. Compact the grade to the density of the surrounding soil.

2.03 DE-WATERING

- A. General: Provide and operate equipment and do ditching and pumping necessary to keep the project area free from water.
- B. Storm Water: Pump off storm runoff or other water until such time as new work in other Sections shall effectively remove such water.
- C. Protection: Take measures required to dispose of surface and subsurface water in compliance with municipal requirements.
- D. Debris: Prevent transport of soil, aggregate or debris off site where practical.

END OF SECTION

SECTION 02515 - CONCRETE PAVING AND CURBS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

The provisions of *The "Greenbook" Standard Specifications for Public Works Construction* shall apply except as modified herein.

1.02 SCOPE OF WORK:

Exterior walks and slabs as shown on drawings
Cement, finish, joints, sawcutting, and patching
Reinforcement dowels for masonry work
Curing
Testing
Miscellaneous concrete items
Curbs and gutters

1.03 STANDARDS:

Testing, materials, and workmanship shall conform to the requirements of the applicable Building Code, except that requirements specified herein shall govern where they exceed those in the Building Code.

1.04 SMOOTHNESS TOLERANCE:

Cement finish surfaces shall be of such smoothness and evenness that they shall contact the entire length of a 10-foot straight edge laid in any direction, with an allowable tolerance of 1/8 inch. Any operations necessary to achieve this result should be performed by the contractor at no additional cost to the City. No patching will be permitted to correct defective work; defective sections shall be removed and replaced. No extensions of time will be allowed for correcting defective work.

1.05 INSPECTIONS:

Inspections will be required. Contractor shall call for inspection a minimum of 48 hours (two working days) prior to need.

The contractor shall call for inspection during specific phases of construction. They shall include the following each prior to pour:

- All Form Work
- All Footings
- Subgrade
- Steel Reinforcing

Contractor shall notify the City Representative 48 hours prior to each concrete pour.

Any work covered prior to inspection shall be opened to view by the Contractor at his expense.

1.06 TESTING:

All testing shall be as required by the Standard Specifications.

PART 2 - MATERIALS

2.01 All materials shall conform to Section 201 of the Standard Specifications, except as noted below:

2.02 CONCRETE:

Concrete shall conform to Concrete Class Use Table, Section 201-1, of the Standard Specifications and shall be a 5-sack mix, with a maximum 4-inch slump, 2,500 pounds per square inch ultimate compressive strength at 28 days. No admixtures will be allowed.

2.03 REINFORCING STEEL:

Shall be in accordance with the Standard Specifications.

2.04 EXPANSION JOINTS:

Shall be as shown on plans and details. Submit samples of preformed material and sealant for approval of City.

2.05 CONCRETE CURING COMPOUND:

Shall be Type 1, as called for in Section 201-4 of the Standard Specifications.

2.06 CRACK JOINT CONTROL:

Shall be as shown on the drawings and details. Submit samples of preformed materials for approval of the City Representative.

PART 3 - EXECUTION

3.01 GENERAL:

All work shall conform to the requirements of Sections 303 of the Standard Specifications.

All concrete slabs shall slope to drain. Depressions in the slab surface that hold water ("bird baths") will not be acceptable.

Install concrete and cement finish work true to lines, dimensions and levels.

Protect all finished concrete from graffiti. Contractor shall be responsible for providing concrete watchmen. A graffitied finish will not be acceptable.

Remove and replace defective concrete or cement work with new materials. Permission to patch any defective area shall not be a waiver of the City's right to require complete removal of defective work if patching does not restore quality and appearance of work.

No advertising impression, stamp, or mark of any description will be permitted on surface of concrete or cement finish.

3.02 PLACING CONCRETE:

Transport, place and spread in a manner to prevent segregation of aggregate. Reinforcing shall be supported by metal or plastic chairs; concrete supports shall not be used. Reference Section 303-1.7.1.

3.03 CEMENT FINISH:

Exterior slabs and walks - non-slip, uniform medium broom surface, transverse to direction of slab, unless otherwise shown on the plans.

3.04 CURING:

Initial curing shall be moist curing or moisture cover curing, and shall continue for at least 168 cumulative hours (not necessarily consecutive), during which the concrete has been exposed to air temperatures above 50 degrees F. Avoid rapid drying at the end of the curing period.

Use water that is free of impurities which could etch or discolor concrete surfaces.

Do not use liquid membrane curing compounds on surfaces which are to be covered with a coating material applied directly to the concrete or with a covering material bonded to the concrete, such as other concrete, liquid floor hardener, waterproofing, damp-proof flooring, painting, and other coatings and finish materials, unless otherwise acceptable to the inspector.

END OF SECTION

SECTION 03010 - CONCRETE

PART 1 - GENERAL

1.01 QUALITY ASSURANCE:

- A. Codes and Standards: Comply with the provisions of the following codes, specifications and standards, except where more stringent requirements are shown or specified:
 - 1. ACI 301 "Specifications for Structural Concrete for Building."
 - 2. ACI 318 "Building Code Requirements for Reinforced Concrete."
 - 3. ACI 347 "Recommended Practice for Concrete Formwork."
 - 4. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete."
 - 5. Concrete Reinforcing Steel Institute, "Manual of Standard Practice."
 - 6. California Building Code (CBC), 2013 Edition.
- B. Testing: Owner's testing laboratory will perform sampling and testing during concrete placement, which may include the following, as directed by the Landscape Architect. Comply with LABC Section 91.2604.3.
 - 1. Sampling: ASTM C 172.
 - 2. Slump: ASTM C 173, one test for each load at point of discharge.
 - 3. Air Content: ASTM C 173, one for each set of compressive strength specimens.
 - 4. Compressive Strength: ASTM C 39, one set for each 50 cu. yds. of each grade of structural concrete; and at least one test for each day's concreting for each grade of concrete used, two specimens tested at 28 days.

1.02 SUBMITTALS:

- A. Comply with pertinent provisions of Section 01300.
- B. For all concrete, a signed copy of batch plant's certificate stating the quantity of each material, amount of water, admixtures, departure time and date shall accompany each load of materials or concrete.
- C. Submit test results as required by the City.
- D. Product Data: Submit manufacturer's product data with installation instructions for proprietary materials including reinforcement and forming accessories, admixture, joint materials, hardeners, curing materials and others as requested by the Landscape Architect.

- E. Laboratory Reports: Submit laboratory test or evaluation reports for concrete materials and mix designs as required by the City.

PART 2 - PRODUCTS

2.01 FORM MATERIALS:

- A. Unless otherwise indicated, construct formwork for exposed concrete surfaces with 2x lumber or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form materials with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

2.02 CONCRETE MATERIALS:

- A. Portland Cement: ASTM C 150, type I or type II.
- B. Aggregates: ASTM C 33, except local aggregates of proven durability may be used when acceptable to the Landscape Architect. Provide aggregates from a single source for exposed concrete.
- C. Water: Potable.

2.03 CONCRETE ADMIXTURES:

- A. General: Provide admixtures produced by established reputable manufacturers and use in compliance with the manufacturer's printed directions. Do not use admixtures which have not been incorporated and tested in accepted mixes, unless otherwise authorized in writing by the Landscape Architect.
- B. The following admixtures may be used with written approval of the Landscape Architect. Conform to manufacturer's recommendations for use.
 - 1. Water Reducing: ASTM C 494. Shall provide a minimum of 5% water reduction, 10% increase of 28 day compressive strength, drying shrinkage at 21 days shall be less than concrete without admixture.
 - 2. Acceleration or Retarding: ASTM C 494.
- C. Waterproofing Admixture: SIKA CHEMICAL CORPORATION "Sika Red Label" (Sikamix 198).
- D. Calcium chloride not permitted.

2.04 JOINT MATERIALS:

- A. Keyed Metal Joint: BURKE CONCRETE ACCESSORIES "Keyed Kold" 24 gauge galvanized steel joint form with steel "Keyed Kold" stakes.
- B. Fiber Joint Filler: ASTM D 1751 non-extruding premolded bituminous impregnated fiberboard units. Plain or punched for dowels as required.

- C. Plastic Joint Insert: "Quickjoint" T-shaped 1/16" plastic strip, 1 inch minimum depth as distributed by J.A. CRAWFORD CO., phone (213) 698-0901.

2.05 VAPOR BARRIER:

- A. Provide vapor barrier cover over prepared base material where shown on drawings. Use only materials which are resistant to decay when tested in accordance with ASTM D 154, as follows:
 - 1. Provide polyethylene sheet not less than 10 mils thick.

2.06 FINISH MATERIALS:

- A. Sealer: A.C. HORN "Horntraz."

2.07 CURING MATERIALS:

- A. Liquid Curing Compound: ASTM C 309, type 1 non-staining, approved standard product resin type.
 - 1. Gray Cement: Free of wax or oil, compatible with subsequently applied finishes or coverings, delivered in unopened labeled containers.
- B. Concrete Curing Paper: ASTM C 171, non-staining reinforced type.

2.08 PATCHING MATERIAL:

- A. Bonding Agent: LARSON PRODUCTS "Weldcrete," W.R. GRACE "Daraweld" or SONNEBORN-CONTECH "Soncrete."
- B. Patching Mortar: Latex modified Portland Cement mortar. Provide CUSTOM BUILDING PRODUCTS "Fix-a-crete."

2.09 PROPORTIONING:

- A. Proportioning shall be by weight of loose, dry material, 94 pounds of cement shall be considered 1 cubic foot. Fine aggregate volume shall be at least 35% of the sum of the separate fine and coarse aggregate volumes.

Weighing equipment shall be accurate to within 1 pound and be adjustable for varying aggregate moisture content. A beam auxiliary shall register any part of the last 100 pounds of each aggregate. The aggregate hopper shall have a volume adjustment.

- B. Accurately control the proportions, water content, and air content.
- C. Waterproofing Admixture: Add to all concrete used for exposed roof slabs, slabs on grade and walls against grade. Add in accordance with manufacturer's instructions.
- D. Admixture (other than waterproofing and integral color): If admixture is used, conform to type specified. Quantity per sack of cement and method of using admixture shall be

in accordance with recommendations of manufacturer and laboratory furnishing mix design.

- E. Non-shrink Grout: Pre-proportioned, or job mixed. For job-mix: one part, by weight, metallic aggregate mix; one part Portland cement; one part fine aggregate; and enough water for flowable consistency.
- F. Cement Grout: One part by volume Portland cement and 2 1/2 parts fine aggregate. Mix dry. Add just enough water to make mixture flow under its own weight.
- G. Dry Pack: One part by volume Portland cement and 2 1/2 parts fine aggregate, mixed dry. Add just enough water to dampen mix to a cohesive packing or tamping consistency.
- H. Patching Mortar: Mix liquid. Combine dry mix with liquid and add water in proportions recommended by manufacturer.

2.10 MIX DESIGN:

- A. Prepare design mixes for each type and strength of concrete indicated on plans.
 - 1. Proportions: For each material including admixtures and water, state water-cement ratio and maximum allowable water content, using not less than the minimum cement content required in paragraphs "proportioning."
 - 2. Materials: Manufacturer's name, designation and source of each material.
 - 3. Aggregate: Conform to LABC Section 91.2603.3.
 - 4. Modified Mix: Same as other concrete types except remove 50% of the coarse aggregate.

2.11 CONCRETE TYPES:

- A. Refer to structural drawings for specific uses and locations.
- B. Specified strengths measured at 28 days.
 - 1. Standard Weight Concrete: 2500 psi. minimum unless otherwise specified.

2.12 MIXING CONCRETE:

- A. Ready-Mixed Concrete: Concrete shall be supplied by an established commercial ready-mix plant conforming to ASTM C 94.
 - 1. Truck Mixers: Minimum 2 cu. yd. capacity, equipped with accurate revolution counter. Operate at rated speed. Discontinue use of mixers producing unsatisfactory concrete or showing more than 10% difference in sand-cement or water-cement ratios in samples taken from front, center and back of mixer.

2. Mixing Time: Total at least 15 minutes, with at least 5 minutes immediately after addition of water, and at least 10 minutes just before discharging.
 3. Mixing Water: Withhold 2 1/2 gallons per cubic yard from predetermined water content. All or part thereof may be added at site, as directed.
- B. Re-tempered Concrete: Concrete not placed within 90 minutes after water is introduced into mix or which has stood for 30 minutes after leaving mixer shall not be used.

PART 3 - EXECUTION

3.01 FORMS:

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position. Comply with ACI 347.
- B. Design and fabricate formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Provide temporary opening where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement and for placement of concrete.
- D. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- E. Form Ties: Factory fabricated, adjustable length, removable or snap-off metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.
- F. Provide openings in formwork to accommodate work of other trades. Accurately place and securely support items build into forms.

3.02 VAPOR BARRIER:

- A. Place interior slabs on grade over vapor barrier consisting of 2 inch bed of washed natural sand over vapor barrier sheet. Turn up edges of vapor barrier 2 inches. Lap edges 6". Tape and seal all edge laps and penetrations. Roll sub-grade smooth prior to placing vapor barrier.
 1. Omit stakes at metal joints occurring over vapor barrier. Use screed pads to hold screed posts. Do not pierce vapor barrier.
 2. Do not disturb or damage vapor barrier while placing metal formed joints and concrete reinforcing. If damage does occur, repair areas before placing concrete. Use vapor barrier material, lapped over damaged areas minimum 6" in all directions and seal.

3.05 JOINTS:

- A. Provide construction, isolation, and control joints as indicated or required. Locate construction joints so as to not impair the strength and appearance of the structure. Place isolation and control joints in a slabs-on-ground to stabilize differential settlement and random cracking.
- B. Metal Formed Joint: "Key-Kold" type metal joint form. Set top of stakes 3/8" below slab surface elevation, spaced at 2'-0" o.c.. When concrete is not poured continuously over both sides of joint, the knockout anchors shall be bent at 45 degree angle into the pour. Finish the concrete to the top of the joint and burn in with hand trowel.

3.06 INSTALLATION OF EMBEDDED ITEMS:

- A. Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by cast-in-place concrete. Use setting diagrams, templates and instruction provided by others for locating and setting.

3.07 CONCRETE PLACEMENT:

- A. Pre-placement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
- B. Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.
- C. Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.
- D. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into all part of forms.
- E. Maintain reinforcing in proper position during concrete placement operations.
- F. Tolerances: Variations in finish surfaces shall not exceed 1/8 inch in any direction along a 10 foot straightedge.
- G. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement and curing.
 - 1. In cold weather comply with ACI 306.
 - 2. In hot weather comply with ACI 305.

3.08 FINISH OF FORMED SURFACES:

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp-proofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

3.09 SLAB FINISH:

- A. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete paving.
 - 1. Immediately after trowel finishing, slightly roughen concrete surface by brooming with hair bristle broom perpendicular to main traffic route. Coordinate required final finish with the Landscape Architect before application.
- B. Sealer: Apply to scheduled areas in accordance with manufacturer's printed instructions.

3.10 CONCRETE CURING:

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
 - 1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
 - 2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
- B. Curing Methods: Perform curing of concrete by moist curing, by moisture retaining cover curing, by curing compound, and by combination thereof, as herein specified.
- C. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, damp-proofing, membrane roofing, flooring, painting, and other coatings and finish materials, unless otherwise acceptable to the Landscape Architect.
- D. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surface by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- E. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and

other flat surfaces by application of appropriate curing compound.

3.11 REMOVAL OF FORMS:

- A. Time: Remove forms after concrete has developed sufficient strength to sustain its own weight and superimposed loads, but not before the time listed below:
 - 1. Slabs: 1 day.

3.12 RE-USE OF FORMS:

- A. Clean and repair surfaces of forms to be re-used in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete contact surfaces as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to the Landscape Architect.

3.13 MISCELLANEOUS CONCRETE ITEMS:

- A. Equipment Bases: Form concrete bases for all mechanical and electrical equipment indicated on the drawings, including architectural, structural, mechanical, electrical, and plumbing drawings, in accordance with approved shop details furnished by the various trades. Corners shall be bullnosed and bases shall be coved.
 - 1. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
- B. Pits, Trenches, Curbs: Form and pour pits for valves, trenches, curbs, and miscellaneous concrete items. Steel trowel surfaces hard, dense and smooth with corners, intersections, and terminations rounded. Where structural details for minor structures listed above do not specify otherwise, walls, floors and covers shall be 6" thick, reinforced with #3 bars, 6" o.c. both ways at center of members.

3.14 CONCRETE SURFACE REPAIRS:

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to the City representative.
- B. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of the City representative.
- C. Do not leave exposed steel ties, clamps, in concrete. Solid pack holes resulting from form construction after flushing them with water. Fill tie wire, nail, bolt, nut, separator and core sample holes, which will be exposed within 24 hours after forms are stripped.
 - 1. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less

than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

2. Match surrounding architectural concrete surfaces in color and texture. Make trial patch to determine color match.

3.15 FIELD QUALITY CONTROL:

- A. Slump Tests: Measure concrete consistency by the "Standard Method of Test for Slump of Portland Cement Concrete," ASTM Designation C 143. Make this test at point of discharge twice each day or partial day's run. A complete and accurate record of these tests shall be kept by the inspector. Maximum slump shall be as follows:
 1. Walls 4" to 5".
 2. Floor slab on grade, 3" to 4".
- B. Cylinder Samples: Make concrete test cylinder samples in accordance with ASTM C 31.

3.16 DEFECTIVE CONCRETE:

- A. Mix Proportions: If ultimate compressive strength of test cylinders fall below minimum assumed in design, proportions of concrete mixes for remaining portion of structure shall be adjusted as required to produce concrete of design strength.
- B. Test Cores: Should the required test cylinders fail to show design compressive strength, test cores shall be taken at locations designated by the Landscape Architect. Cores shall be tested complying with LABC Section 91.2604.3.5.1. If results show compressive strength to be less than design stress, concrete shall be deemed defective and shall be replaced in a manner acceptable to the City representative, and the Building Department. Cost of cores, tests, and patching shall be paid by Contractor. Coring holes shall be dry-packed.
- C. Concrete work not formed as indicated, not true to intended alignment, not plumb, level, or true to intended grades, with embedded sawdust or debris, and not fully conforming to the provisions of these specifications shall be deemed defective and shall be removed from the job site as directed by the City representative and shall be replaced with concrete complying with specification requirements.

END OF SECTION

SECTION 03380 - CONCRETE CURING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

The provisions of *The "Greenbook" Standard Specifications for Public Works Construction* shall apply except as modified herein.

1.02 SCOPE OF WORK:

Furnish materials, labor, transportation, services, and equipment necessary to install all Concrete Curing related to the park as indicated on the Drawings complete as shown and as specified herein.

Related Work:

Concrete Paving & Curbs	Section 02515
Concrete	Section 03010

1.03 REFERENCES:

Comply with the applicable reference specifications as specified in the Special Provisions and in accordance with applicable laws, codes and regulations required by the City of Pomona, CA. Comply with the current provisions of the following Codes and Standards:

ASTM - American Society for Testing and Materials:

- ASTM C94 - Ready-Mixed Concrete.
- ASTM C150 - Portland Cement.
- ASTM C271 - Sheet Materials for Curing Concrete.
- ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

ACI - American Concrete Institute:

- ACI 301 - Specifications for Structural Concrete for Buildings.
- ACI 305 - Recommended Practice for Hot Weather Concreting.
- ACI 306 - Recommended Practice for Cold Weather Concreting.
- ACI 318 - Building Code Requirements for Reinforced Concrete.

CBC - 2013 Edition of the California Building Code

1.04 SUBMITTALS:

In accordance with Contract Documents, General and Technical Provisions.

Submit product data and manufacturer's instructions for:

1. Curing compound.
2. Proprietary cleaning agents.
3. Plastic film for curing.
4. Surface retarders.

1.05 DELIVERY, STORAGE, AND HANDLING:

Store materials in dry and protected locations and protect from damage.

1.06 SITE CONDITIONS:

Environmental Requirements: Protect concrete against extreme cold and heat, frost, rapid drying, and damage by rain.

PART 2 - PRODUCTS

2.01 MATERIALS:

Curing Compound: ASTM C 309, non-staining, all resin type, white-pigmented, compatible with color admixture.

Acceptable Product: Burke Spartan-Cote Cure or equal. Curing Compound Application Rate: 350 sq. ft./U.S. Gallon (12.5m sq./L)

PART 3 - EXECUTION

3.01 CURING:

Protect concrete surfaces against rapid drying. Keep sealed with cure agent for necessary amount of time to reach concrete strength and inhibit moisture loss after placing per manufacturer's recommendation.

Apply to exposed surface of concrete as soon as manufacturer recommends with an airless sprayer.

Apply to sides of concrete paving upon removal of form boards.

Meet requirements of manufacturer's current printed application instructions.

Uniformly apply 2 coats and apply the second coat at right angle to first coat.

Apply compound to form a continuous, uniform, coherent film that will not check, crack, or peel.

Do not apply to concrete that is still bleeding, or has a visible water sheen on the surface.

Protect paving surfaces from foot traffic with scuff-proof paper.

Immediately re-coat damaged areas of curing compound.

Protect surface from water, adjacent concrete work and debris.

3.02 CLEANUP:

Contractor to remove all cure agent from concrete surface with power washing equipment and soft brush not causing abrasion to finish work surface prior to final inspection. No Cure Agent shall be

present on any surfaces for final inspection acceptance. Remove debris and trash resulting from specified work.

END OF SECTION