Skate Park
Technical Specifications
In Association with Construction Documents

Berkeley Harrison Skate Park

Berkeley, California

Prepared for:
City of Berkeley, California

Specification Issue Date:
May / 20 / 2016

Plans & Specifications Prepared By:

SITE Design Group, Inc.
Skate Park Planning & Design • Construction Services
2777 Loker Avenue W. Suite D
Carlsbad, CA 92010
[t] 760.438.2450 [f] 760.438.2394
www.sitedesigngroup.com

100% Submittal
### TABLE OF CONTENTS (SKATE PARK)

**DIVISION 2 – GENERAL SITE WORK**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 41 00</td>
<td>SITE DEMOLITION</td>
<td>(SKATE PARK)</td>
</tr>
</tbody>
</table>

**DIVISION 3 – CONCRETE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 11 00</td>
<td>CONCRETE FORMWORK</td>
<td>(SKATE PARK)</td>
</tr>
<tr>
<td>03 20 00</td>
<td>CONCRETE REINFORCEMENT</td>
<td>(SKATE PARK)</td>
</tr>
<tr>
<td>03 30 00</td>
<td>CAST-IN-PLACE CONCRETE</td>
<td>(SKATE PARK)</td>
</tr>
<tr>
<td>03 37 00</td>
<td>SHOTCRETE</td>
<td>(SKATE PARK)</td>
</tr>
<tr>
<td>03 39 00</td>
<td>CONCRETE CURING</td>
<td>(SKATE PARK)</td>
</tr>
</tbody>
</table>

**DIVISION 5 – METALS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 50 00</td>
<td>METAL FABRICATION</td>
<td>(SKATE PARK)</td>
</tr>
</tbody>
</table>

**DIVISION 9 – FINISHES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 91 00</td>
<td>PAINTING</td>
<td>(SKATE PARK)</td>
</tr>
</tbody>
</table>
SECTION 02 41 00 – SITE DEMOLITION (SKATE PARK)

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. Requirements of the Contract Documents, including but not limited to, the General, Special, and Technical Provisions, apply to work in this Section with the same force and effect as though repeated in full herein.

1.2 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.

1.3 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 City of Berkeley, California.

B. Comply with the current provisions of the following Codes and Standards:
   2. Standard Specifications – CITY Specified
   3. IBC - International Building Code

1.4 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.

1.5 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 of Berkeley, California.

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.

1.6 PROJECT CONDITIONS

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

B. Access and Testing: Make test excavations and borings required to determine existing conditions, subject to OWNER's convenience. Refer to Geo-Technical report available upon request from the OWNER.
C. 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.

1.7 PROTECTION

A. Protection of Existing Plants to Remain
   1. Operations: Do not store materials or equipment, permit burning, or operate or park equipment under the branches of existing plants to remain except as actually required for construction in those areas.
   2. Barriers: Provide barricades, fences or other barriers as necessary at the drip line to protect existing plants to remain from damage during construction.
   3. Notification: Notify OWNER when CONTRACTOR feels construction activities may damage existing plants to remain.
   4. Replacement of Damaged Plants:
      a. Replace existing plants to remain that are damaged during construction with accepted plants of the same species and size as those damaged at no cost to OWNER.
      b. Project OWNER will determine extent of damage and value of damaged plants.

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 OWNER. Provide 48-hour notice of interruption of service. Notify OWNER 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 OWNER at no additional cost.

PART 2 – (Not Applicable)

PART 3 – EXECUTION

3.1 PREPARATION

A. Verification: Verify with OWNER 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 OWNER.

3.2 DEMOLITION

A. Utilities:
   1. Capping: Disconnecting and capping of utilities must be in accordance with the regulations of the utility company affected.

B. Paving and Walls:
   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 and grade as called for in other Sections of this work. 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 and per the project’s soil report.

3.3 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 02 41 00

Prepared By SITE DESIGN GROUP, Inc. (5/20/2016)
PART 1 – GENERAL

1.0 SPECIALTY SKATE PARK CONSTRUCTION

A. All work contained in this Section is considered specialty skate park construction. Only those firms that meet the minimum experience requirements contained in the QUALITY ASSURANCE Section may perform this work as specified herein.

1.1 GENERAL CONDITIONS

A. Requirements of the Contract Documents, including but not limited to, the General, Special, and Technical Provisions, apply to work in this Section with the same force and effect as though repeated in full herein.

1.2 SCOPE OF WORK

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

B. Provide all formwork and accessories for construction of Portland Cement Concrete paving for the skate park.

C. Related Work:
   1. Section 03 20 00 – Concrete Reinforcement (Skate Park)
   2. Section 03 30 00 – Cast-In-Place Concrete (Skate Park)
   3. Section 03 37 00 – Shotcrete (Skate Park)

1.3 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 City of Berkeley, California.

B. Comply with the current provisions of the following Codes and Standards:
   3. ACI – American Concrete Institute.

1.4 QUALITY ASSURANCE

A. Design Criteria: Conform to ACI 347, Chapter I.

B. Allowable Tolerances: Conform to ACI 117 and 347.

C. CONTRACTOR Samples:
   1. CONTRACTOR shall prepare 4-foot x 4-foot samples for each paving type indicated on Drawings. CONTRACTOR may pour each type as part of the finished project, and if approved by the OWNER may remain in place as finished product. If the sample is not approved, CONTRACTOR must remove and replace another sample for approval.
2. Mock-Ups shall be completed to the satisfaction of the OWNER including aggregates, texture, color, and finishes.
3. These mock-ups will become the standard of quality by which future paving samples and work will be judged.
4. Mock-ups to remain on-site and be protected during the course of construction, as a means to compare work in progress. If Mock-ups are damaged or removed, CONTRACTOR shall repair/replace in-kind immediately.

D. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

E. CONTRACTOR Experience: Provide evidence to indicate successful experience in providing cast-in-place concrete work for skate park renovations similar in scope to that specified herein and can demonstrate successful experience through past project documentation and references.
   1. Required Experience: CONTRACTOR or Subcontractor must have completed 2 public concrete skate park renovations with a similar complexity to this project, in the last 2 years. Parks must be open and in good operating condition for at least one year. Only those projects where the complete construction of the facility has been the sole responsibility of your firm will be considered acceptable projects.
   2. Evidence of Experience: CONTRACTOR or Subcontractor shall submit to OWNER satisfactory documentation of the aforementioned experience and qualification. If a CONTRACTOR cannot provide this information or if it is unverifiable, work under this Section and any other related Section cannot be completed by CONTRACTOR. This submission must contain the Project Name & Location, OWNER's Name & Contact Information, OWNER Name & Contact Information, Project Size, Contract Value, Completion Date, and Supervisor and/or Key Personnel responsible for this experience for each of the qualifying projects.
   3. Installer: Provide evidence to indicate successful experience in providing cast-in-place concrete work for skate parks similar to that specified herein and can demonstrate successful experience through past project documentation and references.
   4. Skilled Workers: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

Safety and Performance Guidelines: Comply with all safety and performance requirements and all applicable references as specified in the ASTM F2480 Standard Guide for In-ground Skate Parks.

1.5 STORAGE OF MATERIALS

A. Store materials on and under protective sheeting.

1.6 COORDINATION

A. Notify responsible trades of schedules of concrete pours to allow time for installation and coordination.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Forms:
1. Flatwork and Bond Beam: 1” Exterior Masonite Siding for all Tangents. 7/16” Exterior Masonite Siding for all radii. Create true arc to tangent connections as per layout plan. No kinks will be accepted.

2. Vertical and Custom Work: Exterior grade Standard Douglas Fir (or equal plywood), minimum three ply, one smooth side sufficiently thick to sustain loads, or steel forms.

B. Form Oil: Non staining, paraffin-base oil having a specific gravity of between 0.8 and 0.9.

C. Form Ties: Bolts, rods, or patented devices having tensile strength of 3000 lbs., adjustable length, free of lugs which would leave a hole larger than 5/8” diameter and having a full one-inch depth of break-back.

PART 3 – EXECUTION / CONSTRUCTION

3.1 CONSTRUCTION AND ERECTION

A. Construct forms in accordance with ACI 347.

B. Build forms to shapes, lines and dimensions of detailed members of concrete construction. Set to line and grade, brace and secure to withstand placing of concrete and maintain their shape and position.

C. Construct forms with care to produce concrete surfaces without unsightly or objectionable form marks in exposed concrete surfaces.

D. Thoroughly clean surfaces of form material and remove nails before reuse. Do not reuse damaged or worn forms. Coat contact surfaces of forms with non-staining form oil prior to placing metal reinforcement.

E. Immediately before placing concrete, clean forms of chips, sawdust, and debris. Immediately after removal of forms, remove form ties, wires, and defects and patch.

3.2 INSERTS AND ACCESSORIES

A. Make provisions for required installation of accessories, bolts, hangers, sleeves, anchor slots and inserts cast in concrete. Obtain suitable templates or instructions for installation of items. Place expansion joints where detailed and required.

3.3 REMOVAL OF FORMS AND SHORING

A. Remove forms and shores in accordance with ACI 347.

3.4 CLEANUP

A. Upon completion of the concrete formwork, remove surplus construction materials, loose earth, trash and debris so that the job site is left in a neat and orderly condition.

END OF SECTION 03 11 00

Prepared By SITE DESIGN GROUP, Inc. (5/20/2016)
SECTION 03 20 00 – CONCRETE REINFORCEMENT (SKATE PARK)

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. Requirements of the Contract Documents, including but not limited to, the General, Special, and Technical Provisions, apply to work in this Section with the same force and effect as though repeated in full herein.

1.2 SCOPE OF WORK

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

B. Provide all steel reinforcement for construction of Portland Cement Concrete paving for the skate park.

C. Related Work:
   1. Section 03 20 00 – Concrete Reinforcement (Skate Park)
   2. Section 03 30 00 – Cast-In-Place Concrete (Skate Park)
   3. Section 03 37 13 – Shotcrete (Skate Park)

1.3 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 City of Berkeley, California.

B. Comply with the current provisions of the following Codes and Standards:
   2. Standard Specifications – Agency Specified
   3. IBC – International Building Code

C. American Concrete Institute (ACI):
   2. ACI 318, Building Code Requirements for Reinforced Concrete.

   1. ASTM A233 - Mild Steel Arc Welding Electrodes.
   2. ASTM A615 - Deformed Billet-Steel Bars for Concrete Reinforcement.
   3. ASTM A706 - Low-Alloy Steel Deformed Bars for Concrete Reinforcement.


F. American Welding Society (AWS): Reinforcing Steel Welding Code, D1.4, including latest revisions.
1.4 DELIVERY AND STORAGE

A. Store materials in dry and protected locations and protect from damage. Stack reinforcing steel in staggered tiers. Mark each length, size, shape and location. Maintain reinforcement free of dirt, mud, paint or rust.

1.5 SUBMITTALS

A. In accordance with the Contract Documents, General, Special and Technical Provisions.

B. Shop Drawings: Indicate complete reinforcing method for each concrete member including materials, sizes, bends, dimensions, stirrup spacing, and placing details not shown on drawings. Architect may elect to waive this requirement if necessary.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel Reinforcement: Conforming to ASTM A615, Grade 60, clean and free of rust, dirt, grease or oils.

B. Welded Steel Reinforcement: Deformed low-alloy steel, ASTM A706, carbon content not exceeding 0.30% and manganese content not exceeding 0.60%. Identify and tag with manufacturer's heat identification number.

C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars in place.

2.2 FABRICATION

A. Fabricate to sizes, shapes, and lengths detailed in accordance with requirements of ACI 318 and ACI 315.

PART 3 – EXECUTION / CONSTRUCTION

3.1 INSTALLATION

A. Comply with Concrete Reinforcing Steel Institute’s recommended practice for “Placing Reinforcing Bars” for placing and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover over reinforcement.

D. Accurately place reinforcing steel in accordance with drawings. Thoroughly clean reinforcement of any coating which would reduce bonding. Do not heat, cut, or bend bars without the Skate Park Designer's approval. Do not splice reinforcement at points of maximum stress. Stagger splices in adjacent bars and provide a minimum overlap of 30-bar diameters at splices unless specifically noted otherwise on Drawings.

E. Securely saddle tie intersections with No. 18 gauge black annealed wire. Rigidly secure reinforcement in place. Provide concrete coverage as shown on Drawings.
3.2 WELDING REINFORCEMENT

A. Weld deformed steel reinforcement bars in strict accordance with AWS 12.1, using recommended pre-heat temperature and electrode for type of steel being welded.

B. Do not weld steel reinforcement bars without proper heat identification of bars.

3.3 CLEANUP

A. Upon completion of the concrete reinforcement work, remove surplus construction materials, loose earth, trash and debris so that the job site is left in a neat and orderly condition.

END OF SECTION 03 20 00

Prepared By SITE DESIGN GROUP, Inc. (5/20/2016)
SECTION 03 30 00 – CAST-IN-PLACE CONCRETE (SKATE PARK)

PART 1 – GENERAL

1.0 SPECIALTY SKATE PARK CONSTRUCTION

A. All work contained in this Section is considered specialty skate park construction. Only those firms that meet the minimum experience requirements contained in the QUALITY ASSURANCE Section may perform this work as specified herein.

1.1 GENERAL CONDITIONS

A. Requirements of the Contract Documents, including but not limited to, the General, Special, and Technical Provisions, apply to work in this Section with the same force and effect as though repeated in full herein.

1.2 SCOPE OF WORK

A. Furnish materials, labor, transportation, services, and equipment necessary to install all Portland Cement Cast-In-Place Concrete related to the skate park as indicated on the Drawings complete as shown and as specified herein.

B. Related Work:
1. Section 03 11 00 – Concrete Formwork (Skate Park)
2. Section 03 20 00 – Concrete Reinforcement (Skate Park)
3. Section 03 37 00 – Shotcrete (Skate Park)
4. Section 03 39 00 – Concrete Curing (Skate Park)

1.3 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 City of Berkeley, California. Comply with the current provisions of the following Codes and Standards:

B. ASTM - American Society for Testing and Materials:
1. ASTM C33 – Concrete Aggregates.
2. ASTM C94 – Ready-Mixed Concrete.
3. ASTM C143 – Test for Slump of Portland Cement Concrete.
5. ASTM C260 – Air-Entraining Admixtures for Concrete.
6. ASTM C494 – Chemical Admixtures for Concrete.
7. ASTM C618 – Fly Ash and Raw or Calcined Natural Pozzalans for Use in Portland Cement Concrete

C. ACI – American Concrete Institute:
1. ACI 211.1– Recommended Practice for Selecting Proportions for Normal-Weight Concrete.
2. ACI 211.2 – Recommended Practice for Selecting Proportions for Lightweight Concrete.
3. ACI 301 – Specifications for Structural Concrete for Buildings.
4. ACI 305 – Recommended Practice for Hot Weather Concreting.
5. ACI 306 – Recommended Practice for Cold Weather Concreting.
6. ACI 318 – Building Code Requirements for Reinforced Concrete.
D. IBC – International Building Code
E. AWS – American Welding Society
   1. AWS 3.0 – Standard Qualifications Procedure.
   2. AWS D1.4 – Structural Welding Code – Reinforcement.
   3. AWS D12.1 – Reinforced Concrete Construction.
F. CRSI – Concrete Reinforcing Steel Institute: MSP-1 – Manual of Standard Practice

1.4 SUBMITTALS

A. Design of Concrete Mixes:
   1. CONTRACTOR shall be responsible for and pay for design of concrete mixes. Design of concrete mixes shall be performed by a Testing Laboratory selected by CONTRACTOR and approved by the OWNER. Design methods to be in accordance with ACI 318.
   2. Make three trial mixes using aggregate proposed.
   3. Make advance tests of trial mixes with proposed materials. Test four cylinders in accordance with ASTM C39 at 7 days and 28 days. Do not place concrete on project until laboratory reports and breaks of confirmations cylinders indicate that the proposed mixes will meet the strength requirements as indicated on the drawings.
   4. Check mix design and revise, if necessary, wherever changes are made in aggregate or in surface water content of aggregate or workability of concrete. Slump shall be the minimum to produce workable mix. Laboratory shall prescribe minimum quantity of water.
   5. If Portland Cement reducers or other additives are used, submit control mix design without reducers or additives as well as mix exactly proposed to be used. Submit W.R. Grace Co. recommendations for retarder and shrinkage compensation of slab on grade.
   6. Sample of Workmanship: Provide on-site, minimum 48”x48” sample (not part of finished project) of each flatwork finish.
   7. Forward two copies of design mix to OWNER for approval.

B. Submit product data and manufacturer’s instructions for:
   1. Color admixture.
   2. Expansion joint fill material.
   3. Curing compound.
   4. Dowel aligners/caps.
   5. Waterstop.
   7. Form facing materials.
   8. Proprietary cleaning agents.
   10. Surface retarders.

C. Samples:
   1. Samples for Color Selection: Submit color additive manufacturer’s color chart & sample chip set; indicate color additive number and required dosage rate. Samples indicate general color and may vary from concrete finished in field according to Specifications.
   2. Expansion Joint Fill Material: Submit one 12-inch length.

D. Test Reports: Compressive strength of concrete test cylinders taken upon delivery of concrete.

E. Delivery Documentation: Batch tags for each load of concrete, for informational purposes.

1.5 QUALITY ASSURANCE

A. Pre-Bid Conference (if applicable): Prior to submitting bid, attend pre-bid conference with OWNER to review mock-up requirements and artistic effect desired.
B. Regulatory Requirements: Meet requirements of applicable laws, codes, and regulations required by authorities having jurisdiction over Work.

C. CONTRACTOR Mock-ups:
   1. CONTRACTOR shall prepare 4-foot x 4-foot samples for each paving type indicated on Drawings. CONTRACTOR may pour each type as part of the finished project, and if approved by the OWNER may remain in place as finished product. If the sample is not approved, CONTRACTOR must remove and replace another sample for approval.
   2. Mock-Ups shall be completed to the satisfaction of the OWNER including aggregates, texture, color, and finishes.
   3. These mock-ups will become the standard of quality by which future paving samples and work will be judged.
   4. Mock-ups to remain on-site and be protected during the course of construction, as a means to compare work in progress. If Mock-ups are damaged or removed, CONTRACTOR shall repair/replace in-kind immediately.

D. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

E. CONTRACTOR Experience: Provide evidence to indicate successful experience in providing cast-in-place concrete work for skate park renovations similar in scope to that specified herein and can demonstrate successful experience through past project documentation and references.
   1. Required Experience: CONTRACTOR or Subcontractor must have completed 2 public concrete skate park renovations with similar complexity to this project, in the last 2 years. Parks must be open and in good operating condition for at least one year. Only those projects where the complete construction of the facility has been the sole responsibility of your firm will be considered acceptable projects.
   2. Evidence of Experience: CONTRACTOR or Subcontractor shall submit to OWNER satisfactory documentation of the aforementioned experience and qualification. If a CONTRACTOR cannot provide this information or if it is unverifiable, work under this Section and any other related Section cannot be completed by CONTRACTOR. This submission must contain the Project Name & Location, OWNER’s Name & Contact Information, OWNER Name & Contact Information, Project Size, Contract Value, Completion Date, and Supervisor and/or Key Personnel responsible for this experience for each of the qualifying projects.
   3. Installer: Provide evidence to indicate successful experience in providing cast-in-place concrete work for skate parks similar to that specified herein and can demonstrate successful experience through past project documentation and references.
   4. Skilled Workers: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

Safety and Performance Guidelines: Comply with all safety and performance requirements and all applicable references as specified in the ASTM F2480 Standard Guide for In-ground Skate Parks.

F. ACI Requirements: Meet all requirements of ACI 301.

1.6 DELIVERY, STORAGE, AND HANDLING

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

B. Do not change brand of cement or source of aggregate during course of Work, without prior approval from the OWNER.
1.7 SITE CONDITIONS

A. Environmental Requirements:
   1. Submit plan to monitor wind velocity, relative humidity, temperature, and concrete
temperature in order to maintain specified maximum rate of evaporation.
   2. Do not place concrete when sub base surface temperature is less than 40 degrees F, nor
when surface is wet.
   3. Protect concrete against extreme cold and heat, frost, rapid drying, and damage by rain.

B. Coordination:
   1. Coordinate schedules of concrete placement to allow adequate time for installation of other
related work.
   2. Verify that anchor bolts and other embedded steel items to be cast into concrete are properly
placed.
   3. Coordinate size and location of mechanical and electrical equipment concrete pads.
   4. Coordinate earthwork and soils report requirements with placement requirements.
   5. Coordinate with form-work and finishes sections to provide finish floor levelness and flatness
as specified herein. Slope to drains at grades and percent slope shown on contract
documents.
   6. Ensure that irrigation sleeves, electrical conduit, drainage lines and other utility elements are
accommodated and as-built located prior to placing concrete.

1.8 WARRANTY

A. General Description: In addition to manufacturer’s warranties, warrant Work for a period of one
year from the Date of Final Completion against defects in materials and workmanship.

B. Additional Items Covered: Warranty shall also cover repair of damage to other materials and
workmanship resulting from defects in materials and workmanship.

C. Exceptions: CONTRACTOR shall not be held responsible for failures due to ordinary wear,
egregate by OWNER, vandalism, or other causes beyond the CONTRACTOR’s control.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Ready Mixed Concrete: Batched, mixed and transported in accordance with ASTM C94 –
Specifications for Ready Mixed Concrete.

B. Portland Cement: Refer to Drawings for specific paving type and finish required and conform to
ASTM C-150, Type II. Use same brand of cement from single source throughout entire project
for each paving type, unless approval from OWNER states otherwise.

C. Fine Aggregate (washed concrete sand): Clean, hard, durable, uncoated washed natural sand,
free from silt, loam or clay, and conforming to ASTM C33.

D. Coarse Aggregate: Clean, hard, durable, un-coated coarse aggregate conforming to ASTM C33.
Use same coarse aggregate from single source throughout entire project.

E. Water: Potable and free from deleterious materials such as oils, acids, and organic matter.
F. Admixture: Cement-dispersing, water-reducing compound, ASTM C 494, Type A, as made by Master Builders, Sika, or Gifford-Hill Co., or equal. Depending upon weather conditions at time of placing, ASTM C 494, Type D (water-retarding) or Type E (water-reducing, accelerating) may be used if approved by OWNER.

G. Curing Materials:
   1. Water: Domestic Quality, clear and potable with no chemical content.
   3. Curing Compounds/Sealer: Curing compound shall comply with ASTM C309 and be approved by color additive manufacturer for use with colored concrete

2.2 PROPORTIONS AND MIXING

A. Proportions and Design: In accordance with approved mix design. Minimum allowable compressive strength at 28 days is 4000 psi (as marked per plan).

B. Admixture: No admixtures without approval. Introduce admixtures in quantities and according to methods recommended by admixture manufacturer. Add air-entraining agent to concrete as scheduled.

C. Slump: Not to exceed 3 ½"

D. Mixing: Ready mixed concrete in accordance with ASTM C-94. Do not transport or use concrete after 1-1/2 hours have elapsed from time of initial mixing. Supplier of transit-mixed concrete shall have a plant of sufficient capacity, and adequate transportation facilities to assure continuous delivery at required rate, to provide continuous concrete placement throughout a pour.

E. Grout and Dry Pack: Non-Shrink, Non-Metallic: U.S. Grout Corp or equal. “Five Star Grout” ASTM C-877, C-191, and C-109, 5,000 PSI.

PART 3 – EXECUTION / CONSTRUCTION

3.1 INSPECTION

A. Inspect subgrade, forms, reinforcing steel, pipes, conduits, sleeves, hangers, anchors, inserts, and other work required to be built into concrete and report any discrepancies. Notify OWNER at least 5 working days in advance of scheduled placement.

B. Correct unsatisfactory work prior to placing concrete.

C. Remove rubbish from formwork immediately prior to placing concrete.

3.2 INSTALLATION

A. Placing Concrete:
   1. Convey and place concrete allowing no separation of ingredients in accordance with ACI 304 and as specified below.
   3. Regulate rate of placement to maintain plasticity and flow into position.
   4. Deposit concrete continuously until panel or section is completed.
   5. Place concrete in horizontal layers 18” maximum thickness.
B. Consolidation:
   1. Use mechanical vibrating equipment for consolidation.
   2. Vertically insert and remove hand-held vibrators at 18'' O.C. for 10 to 15 seconds.
   3. Do not use vibrators to transport concrete in forms.
   4. Provide vibrators with minimum speed of 8000 RPM and with amplitude to consolidate effectively.
   5. Thoroughly consolidate concrete and work around reinforcement, embedded items and into corners of forms. Thoroughly consolidate layers of concrete with previous layers.

C. Construction Joints:
   1. Unless otherwise shown on Drawings, each footing, wall, beam, and slab shall be considered as a single unit of operation and shall be monolithic in construction.
   2. Where construction joints are absolutely unavoidable, locate joints at or near quarter points of spans where approved by OWNER and/or shown on plan.

D. Expansion Joint Fillers:
   1. Refer to Drawings for Expansion Joint locations and details.
   2. Finish joint material flush with concrete surface.

E. Hot Weather Placement:
   1. Prevent high temperature in fresh concrete during hot weather in accordance with ACI 305.
   2. Use water reducing set retarding admixtures in such quantities as especially recommended by manufacturer to assure that concrete remains workable and lift lines will not be visible.

F. Flatwork:
   1. Cast slabs-on-grade in alternate sections, unless permanent forms are used. Wait 48 hours between all adjacent concrete castings.
   3. Maximum 1:500 slope from indicated plane at any point.

G. Finish:
   1. Smooth Trowel finish to match approved Mock-Up finish.
   2. After surface water disappears and floated surfaces have sufficiently hardened, steel trowel then retrowel the surface to a smooth and consistent finish.
   3. After concrete has set enough to provide edge troweling, retrowel edges to a smooth and uniform finish.

H. Cracking:
   1. Cracking from inadequate curing is not allowed. Sawcut joints and construction joints are shown on drawings. CONTRACTOR may, with approval of OWNER, recommend and detail other joints required to prevent cracking.

3.3 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, defective, or does not meet the requirements of this Section or conformance with ASTM F 2480 - Standard Guide for In-ground Skate Parks.

B. Protect concrete from damage until Final Payment. Exclude traffic from paving for at least 28 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
C. Maintain concrete paving free of stains, discoloration, dirt, wax, and other foreign material until Final Payment.

3.5 TOLERANCES

A. Minor variations in appearance of colored concrete, which are similar to natural variations in color and appearance of uncolored concrete, are acceptable but subject to approval by OWNER.

3.6 CLEAN UP

A. At completion of Work, remove concrete stains from adjacent work, including but not limited to dissimilar paving types, walls, columns, railing posts, light fixtures, plant materials, to satisfaction of OWNER.

END OF SECTION 03 30 00

Prepared By SITE DESIGN GROUP, Inc. (5/20/2016)
SECTION 03 37 00 – SHOTCRETE (SKATE PARK)

PART 1 – GENERAL

1.0 SPECIALTY SKATE PARK CONSTRUCTION

A. All work contained in this Section is considered specialty skate park construction. Only those firms that meet the minimum experience requirements contained in the QUALITY ASSURANCE Section may perform this work as specified herein.
   1. Provide sprayed-on concrete (concrete conveyed into place by air pressure through a flexible tube or gun with controlled nozzle) referred to herein as shotcrete, complete as shown and as specified.
   2. Application, cutting, and sculpting and finish work related to this Work is deemed sole source specialty work within the Contract Documents.
   3. All work related to this application, cutting, sculpting, and installation shall be coordinated with OWNER of Record prior to project start.

1.1 GENERAL CONDITIONS

A. Requirements of the Contract Documents, including but not limited to, the General, Special, and Technical Provisions, apply to work in this Section with the same force and effect as though repeated in full herein.

1.2 SCOPE OF WORK

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

B. Refer to Drawings for specific locations of shotcrete.

C. Related Work:
   1. Section 03 11 00 – Concrete Formwork (Skate Park)
   2. Section 03 20 00 – Concrete Reinforcement (Skate Park)
   3. Section 03 30 00 – Cast-In-Place Concrete (Skate Park)
   4. Section 03 39 00 – Concrete Curing (Skate Park)

1.3 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 City of Berkeley, California. Comply with the current provisions of the following Codes and Standards:

B. ASTM - American Society for Testing and Materials:
   1. ASTM C33 – Concrete Aggregates.
   2. ASTM C39 – Test Method of Compressive Strength of Cylindrical Concrete Specimens.
   4. ASTM C143 – Test for Slump of Portland Cement Concrete.
   5. ASTM C150 – Portland Cement.
   6. ASTM C260 – Air-Entraining Admixtures for Concrete.
   7. ASTM C494 – Chemical Admixtures for Concrete.
   8. ASTM C979 – Pigments for Integrally Colored Concrete.
9. ASTM C618 – Fly Ash and Raw or Calcined Natural Pozzalans for Use in Portland Cement Concrete.

C. ACI – American Concrete Institute:
1. ACI 211.1 – Recommended Practice for Selecting Proportions for Normal-Weight Concrete.
2. ACI 211.2 – Recommended Practice for Selecting Proportions for Lightweight Concrete.
3. ACI 301 – Specifications for Structural Concrete for Buildings.
4. ACI 305 – Recommended Practice for Hot Weather Concreting.
5. ACI 306 – Recommended Practice for Cold Weather Concreting.
6. ACI 318 – Building Code Requirements for Reinforced Concrete.

D. IBC – International Building Code

E. AWS – American Welding Society
1. AWS 3.0 – Standard Qualifications Procedure.
2. AWS D1.4 – Structural Welding Code – Reinforcement.
3. AWS D12.1 – Reinforced Concrete Construction.

F. CRSI – Concrete Reinforcing Steel Institute: MSP-1 – Manual of Standard Practice

1.4 SUBMITTALS

A. Manufacturer's Data: Current printed specifications with application and installation instruction for proprietary materials including concrete admixtures.

B. Shop Drawings: Radial templates cut to exact radii shown on drawings to insure exact radii from flat bottom of Skate Park to face of coping. Template shall be fabricated from steel or ¾” Plywood. OWNER may elect to waive this requirement if necessary.

C. Design of Concrete Mixes:
1. CONTRACTOR shall be responsible for and pay for design of concrete mixes for each type of concrete specified. Design of concrete mixes shall be performed by a Testing Laboratory selected by CONTRACTOR and approved by the OWNER. Design methods to be in accordance with ACI 318.
2. Make three trial mixes using aggregate proposed.
3. Make advance tests of trial mixes with proposed materials. Text four cylinders in accordance with ASTM C-39 at 7 days and 28 days. Do not place concrete on project until laboratory reports and breaks of confirmation cylinders indicate that proposed mixes will develop required strengths.
4. Check mix design and revise, if necessary, wherever changes are made in aggregate or in surface water content of aggregate or workability of concrete. Slump shall be the minimum to produce workable mix. Laboratory shall prescribe minimum quantity of water.
5. If Portland cement reducers or other additives are used, submit control mix design without reducers or additives as well as mix exactly proposed to be used. Submit W.R. Grace Co. recommendations for retarders and shrinkage compensation of slab on grade.
6. Sample of Workmanship: Provide on-site, minimum 48”x48” sample (not part of finished project) of each flatwork finish and color.
7. Forward two copies of design mix to OWNER for approval.

D. Submit product data and manufacturer's instructions for:
1. Color admixture.
2. Expansion joint fill material.
3. Curing compound.
4. Dowel aligners/caps.
5. Crack repair materials.
6. Form facing materials.
7. Form release agents.
8. Proprietary cleaning agents
10. Surface retarders.

E. Shotcrete Sample:
1. Provide representative samples of materials for material testing, mix proportion testing, and finish.
2. Provide onsite, minimum (1) 6’ x 6’ x 6” sample of shotcrete with a radius and the same reinforcement and coping type as the highest elevation and largest radii on the project for finish inspection and approval. Sample may be part of the finished product and if approved by the OWNER may remain in place as finished product. If the sample is not approved, CONTRACTOR must remove and replace another sample for approval.

F. Placement Schedule:
   a. CONTRACTOR to indicate on plans the locations to be shot within a day’s work and not exceeding 40 cubic yards per day for quality control and inspection schedules.
   b. Schedule and sequence to be reviewed and approved by OWNER prior to starting this Work.

G. Test Reports: Compressive strength of concrete test cylinders taken upon delivery of concrete.

H. Delivery Documentation: Batch tags for each load of concrete, for informational purposes.

1.5 QUALITY ASSURANCE

A. Concrete Testing:
   1. Prepare test specimens by each application crew using the equipment, materials and mix proportions proposed for the OWNER shall observe preparation of test panels noting placement of shotcrete by applications crew.
   2. Test panel shall be at least 6’x6’x6’ with the same reinforcement as in the proposed structure. A testing CITY shall take at least (3) cores from the specimen and test them in accordance with ASTM C42.
   3. Secure and protect Test Panels during construction and test for compliance with Specifications.
   4. Test strength of the shotcrete as work progresses as follows:
      a. Cut cores from the structure and test in accordance with ASTM C42.
      b. A set of three (3) cores shall be taken not less than once each shift nor less than one for each 50 cubic yards of shotcrete placed through the nozzle.
      c. Cores shall be soaked in water for a minimum of 40 hours before testing.
   5. When the length of a core is less than twice the diameter, apply the correction factors given in ASTM C42 to obtain the compressive strength of individual cores. The average compressive strength of three cores taken from the structure, representing a shift or 50 cubic yards of shotcrete, must equal or exceed 0.85f’c with no individual core less than 0.75f’c.

B. Certification: Nozzleman certification shall be in accordance with ACI 506.3R

C. Pre-Bid Conference (if applicable): Prior to submitting bid, attend pre-bid conference with OWNER to review sample requirements and artistic effect desired.

D. Regulatory Requirements: Meet requirements of applicable laws, codes, and regulations required by authorities having jurisdiction over Work.

E. CONTRACTOR Mock-Ups:
6. CONTRACTOR shall prepare a mock-up for each paving type indicated on Drawings, prior to installation.
7. Mock-Ups shall be completed to the satisfaction of the OWNER, Landscape OWNER, and OWNER including aggregates, texture, color, and finishes.
8. These mock-ups will become the standard of quality by which future paving samples and work will be judged.
9. Mock-Ups to remain on-site and be protected during the course of construction, as a means to compare work in progress. If mock-ups are damaged or removed, CONTRACTOR shall repair/replace in-kind immediately.

F. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

G. CONTRACTOR Experience: Provide evidence to indicate successful experience in providing cast-in-place concrete work for skate park renovations similar in scope to that specified herein and can demonstrate successful experience through past project documentation and references.
   1. Required Experience: CONTRACTOR or Subcontractor must have completed 2 public concrete skate park renovations with similar complexity to this project, in the last 2 years. Parks must be open and in good operating condition for at least one year. Only those projects where the complete construction of the facility has been the sole responsibility of your firm will be considered acceptable projects.
   2. Evidence of Experience: CONTRACTOR or Subcontractor shall submit to OWNER satisfactory documentation of the aforementioned experience and qualification. If a CONTRACTOR cannot provide this information or if it is unverifiable, work under this Section and any other related Section cannot be completed by CONTRACTOR. This submission must contain the Project Name & Location, OWNER's Name & Contact Information, OWNER Name & Contact Information, Project Size, Contract Value, Completion Date, and Supervisor and/or Key Personnel responsible for this experience for each of the qualifying projects.
   3. Installer: Provide evidence to indicate successful experience in providing cast-in-place concrete work for skate parks similar to that specified herein and can demonstrate successful experience through past project documentation and references.
   4. Skilled Workers: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

Safety and Performance Guidelines: Comply with all safety and performance requirements and all applicable references as specified in the ASTM F2480 Standard Guide for In-ground Skate Parks.

H. ACI Requirements: Meet all requirements of ACI 506, Chapter 13, Wet Method and Chapter 5, Shotcrete Crew.

1.6 DELIVERY, HANDLING, AND STORAGE

A. Properly deliver and handle materials to prevent contamination, segregation or damage to materials.
B. Store cement in weathertight enclosures to protect against dampness and contamination.
C. Prevent segregation and contamination of aggregates by proper arrangement and use of stockpiles.
D. Store admixtures properly to prevent contamination, evaporation, or other damage.
F. Do not change brand of cement or source of aggregate during course of Work.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

A. Portland Cement: ASTM C150, Type I or II, one brand only.

B. Normal Weight Aggregates: ASTM C33 and as herein specified. Aggregate shall comply with gradation No. 2 as shown in ACI 506R Table 2.1. If the CONTRACTOR can show satisfactory performance of an alternate grading under similar conditions of use, the OWNER may waive the requirement for gradation No. 2.

Combined gradation of coarse and fine aggregate as follows:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>U.S. Standard Percent by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square Mesh</td>
<td>Passing Individual Sieves</td>
</tr>
<tr>
<td>3/8 in</td>
<td>90-100</td>
</tr>
<tr>
<td>No. 4</td>
<td>70-85</td>
</tr>
<tr>
<td>No. 8</td>
<td>50-70</td>
</tr>
<tr>
<td>No. 16</td>
<td>35-55</td>
</tr>
<tr>
<td>No. 30</td>
<td>20-35</td>
</tr>
<tr>
<td>No. 50</td>
<td>8-20</td>
</tr>
<tr>
<td>No. 100</td>
<td>2-10</td>
</tr>
</tbody>
</table>

2. Batch fine coarse aggregates separately to avoid segregation.
3. Aggregates shall be free from clay, mud, loam, or other deleterious substances.
4. Dune sand, bank run sand, and manufactured sand are not acceptable for fine aggregate.
5. Coarse aggregate shall be clean, un-coated, heavy media processed aggregate of crushed stone or river washed aggregate.

2.2 ACCESSORIES

A. Water: Fresh, clean, potable, and free of deleterious acids, mixing, and curing water, as available from OWNER. Transport as required.

B. Admixtures: Use only accepted admixtures meeting the following requirements:
   1. Chemical Admixtures: ASTM C494
   2. Water reducing, retarding or accelerating admixtures shall conform to ASTM C.
   3. Air-entraining Admixtures: ASTM C1141. Air entraining prior to shooting shall be 7% with a +/- 1-1/2% tolerance.
   4. The use of Calcium Chloride shall not be permitted. The CONTRACTOR shall submit details of proposed admixtures with the concrete mix design.

C. Key-Joints: See Cast-In-Place Concrete - Section 03310.

2.3 PROPORTIONING AND DESIGN OF CONCRETE MIXES

A. Mix: Prepare design mix to achieve an in-place 28 day compressive strength of 4,000 pounds per square inch and an air content of 4% at 28 days. Maximum aggregate size shall not exceed 3/8 inch. Unit weight of in-place shotcrete shall be 494 pounds per cubic yard. Use an
independent Testing CITY acceptable to the County to prepare and report the proposed mix design. Testing is at the cost of the CONTRACTOR.

B. Test Data: Submit for acceptance proportioning and test data from prior experience if available. If data from prior experience are not available or accepted, make and have tested specimens from three or more different mix proportions in accordance with pre-construction testing requirements of this Specification.

C. Strength: Selected mix proportions on the basis of compressive strength tests of specimens shall be cut from the shotcrete test panels not earlier than 5 days after placing. For mix acceptance purposes, average core strengths shall be least equal to f'c for cores with L/D of 2.0. For cores with L/D between 1.0 and 2.0, use correction factors given in ASTM C42.

D. Review: Mix design shall be reviewed for acceptance by OWNER.

2.4 CONCRETE APPLICATION EQUIPMENT

A. For Wet Mix Shotcrete:
   1. Mixing Equipment: Capable of thoroughly mixing aggregate, cement and water in sufficient quantity to maintain continuous placement.
   2. Ready-mixed Concrete: ASTM C94, except that it may be delivered to the site in the dry state if the equipment is capable of adding the water and mixing it satisfactorily with the dry ingredients.
   3. Air Supply: Clean air adequate for maintaining sufficient nozzle velocity for parts of work, and for simultaneous operation of blow pipe for cleaning away rebound.
   4. Delivery Equipment: Capable of discharging aggregate-cement-water mixture accurately, uniformly, and continuously through delivery hose.

PART 3 –EXECUTION / CONSTRUCTION

3.1 INSPECTION

A. Examination: Examine concrete formwork and verify that it is true to line and dimension, adequately braced against vibration, and constructed to permit escape of air and rebound but to prevent leakage during shotcreting. Correct deficiencies.

B. Inspection: Inspect reinforcement steel and items to be embedded in concrete. Correct any deviations from the accepted shop drawings.

C. Notification: Notify other trades involved in ample time to permit the proper installation of their work. Cooperate in setting such work.

D. Existing Surfaces: Examine existing concrete surfaces for unsound material. Correct deficiencies.

3.2 PREPARATION FOR INSTALLATION OF CONCRETE

A. Forms: Use a form-coating material on removable forms to prevent absorption of moisture and to prevent absorption of moisture and to prevent bond with shotcrete.
3.3 CONCRETE BATCHING AND MIXING

A. Proportions: Mix proportions shall be controlled by weight batching. CONTRACTOR's Testing Laboratory shall maintain quality control records during shotcrete production and make those records available to OWNER.

3.4 CONCRETE PLACEMENT

A. Placement: Use suitable delivery equipment and procedures that will result in shotcrete in place meeting the requirements of this Specification. Determine operating procedures for placement in, extended distances, and around any obstructions where placement velocities and mix consistency must be adjusted.

B. Placement Techniques: Do not place shotcrete if drying or stiffening of the mix takes place at any time prior to delivery to the nozzle.

1. Control thickness, method of support, air pressure, and/or water content of shotcrete to preclude sagging or sloughing off. Discontinue shotcreting or provide suitable means to screen the nozzle stream if wind or air currents cause separation of the nozzle stream during placement.

2. Hold nozzle as perpendicular to surface as work will permit, to secure maximum compaction with minimum rebound.

3. In shotcreting walls, begin application at bottom. Ensure work does not sag.

4. Layering:
   a. Build up layers by making several passes of nozzle over work area.
   b. Broom or scarify the surface of freshly placed shotcrete to which, after hardening, additional layers of shotcrete are to be bonded. Dampen surface just prior to application of succeeding layers.
   c. Allow each layer of shotcrete to take initial set before applying succeeding layers.
   d. Use radial templates to insure exact radii from flat bottom of Skate Park to face of coping. Template shall be fabricated from steel or ¾” Plywood. Check every horizontal foot when applying shotcrete for conformance of intended wall radii. Brace template and place levels at arc to tangent connections to insure no kinks will be formed. Kinks at the bottom of bowls will not be acceptable. Slumping of the shotcrete causing coping setback will not be acceptable.

5. Placement Around Reinforcement:
   a. Hold the nozzle at such distance and angle to place materials behind reinforcement before any material is allowed to accumulate on its face. In the dry-mix process, additional water may be added to the mix when encasing reinforcement to facilitate a smooth flow of material behind the bars.
   b. Test to ascertain if any void or sand pockets have developed around or behind reinforcement by probing with an awl or other pointed tool after the shotcrete has achieved its initial set, by removal of randomly selected bars, or coring or other suitable standards.

C. Access: Allow easy access to shotcrete surfaces for screening and finishing, permitting uninterrupted application.

3.5 REMOVAL OF SURFACE DEFECTS IN CONCRETE

A. General: Remove and replace shotcrete which lacks uniformity, exhibits segregation honeycombing, or lamination, or which contains any dry patches, slugs, voids, or pockets. Remove defective areas.

B. Sounding: Sound work with hammer for voids. Remove and replace damaged in-place Shotcrete.
3.6 CONCRETE FINISH
   A. Finish-General: Smooth form finish shall consist of a smooth, hard, uniform texture with a
      minimum of seams

   B. Radial Wall Finish: Float finish on radial face of wall shall consist of a smooth, hard, uniform
      surface of smooth steel trowel. Level to a tolerance of ¼” inch in 10 feet when tested with a 10-
      foot steel straightedge placed on the surface horizontally and vertically with radial template with
      the appropriate radii. Grinding the surfaces will not be an acceptable means of achieving the
      intended radii. Concrete finish work shall match the approved sample poured on site.

3.7 CONCRETE JOINTS
   A. Cleaning: The entire joint shall be thoroughly cleaned and wetted prior to the application of
      additional shotcrete.

   B. Reinforcement: Make joints perpendicular to the main reinforcement. Continue reinforcement
      across joints.

3.8 CONCRETE CURING AND PROTECTION
   A. Curing Agent: Apply curing agent, blankets, or plastic after final finish is achieved. Submit
      proposed product to OWNER for approval. CONTRACTOR to remove cure agent at end of cure
      period and power wash all walls prior to final acceptance.

3.9 CLEAN UP
   A. At completion of Work, remove concrete stains from adjacent work, including but not limited to
      dissimilar paving types, walls, columns, railing posts, light fixtures, plant materials, to satisfaction
      of OWNER.

   B. Efflorescence: Remove efflorescence [as soon as practical after it appears] as part of final
      cleaning.

   C. Use least aggressive cleaning techniques possible.

   D. Wear protective eye wear, gloves, and clothing suitable to work and as required by cleaner
      manufacturer.

   E. If proprietary cleaning agents are used, pre-wet wall, test cleaning agent on a small,
      inconspicuous area, and check effects prior to proceeding. Begin cleaning at the top and work
      down. Thoroughly rinse wall afterwards with clean water. Follow cleaner manufacturer's
      instructions.

   F. Do not use muriatic (hydrochloric) acid on colored concrete.

END OF SECTION 03 37 00

Prepared By SITE DESIGN GROUP, Inc. (5/20/2016)
SECTION 03 39 00 – CONCRETE CURING (SKATE PARK)

PART 1 – GENERAL

1.0 SPECIALTY SKATE PARK CONSTRUCTION

A. All work contained in this Section is considered specialty skate park construction. Only those firms that meet the minimum experience requirements contained in the QUALITY ASSURANCE Section may perform this work as specified herein.

1.1 GENERAL CONDITIONS

A. Requirements of the Contract Documents, including but not limited to, the General, Special, and Technical Provisions, apply to work in this Section with the same force and effect as though repeated in full herein.

1.2 SCOPE OF WORK

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

B. Related Work:
   1. Section 03 30 00 – Cast-In-Place Concrete (Skate Park)
   2. Section 03 37 13 – Shotcrete (Skate Park)

1.3 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 City of Berkeley, California. Comply with the current provisions of the following Codes and Standards:

B. ASTM - American Society for Testing and Materials:
   1. ASTM C94 – Ready-Mixed Concrete.
   3. ASTM C271 – Sheet Materials for Curing Concrete.
   4. ASTM C309 – Liquid Membrane-Forming Compounds for Curing Concrete.
   5. ASTM F2480 – Standard Guide for In-ground Concrete Skate Park.

C. ACI – American Concrete Institute:
   1. ACI 301 – Specifications for Structural Concrete for Buildings.
   2. ACI 305 – Recommended Practice for Hot Weather Concreting.
   3. ACI 306 – Recommended Practice for Cold Weather Concreting.
   4. ACI 318 – Building Code Requirements for Reinforced Concrete.

D. IBC – International Building Code

1.4 SUBMITTALS

A. In accordance with Contract Documents, General, Special and Technical Provisions.
1.5 QUALITY ASSURANCE

A. Concrete Testing:
   1. Prepare test specimens by each application crew using the equipment, materials and mix proportions proposed for the OWNER shall observe preparation of test panels noting placement of shotcrete by applications crew.
   2. Test panel shall be at least 6’x6’x6’ with the same reinforcement as in the proposed structure. A testing CITY shall take at least (3) cores from the specimen and test them in accordance with ASTM C42.
   3. Secure and protect Test Panels during construction and test for compliance with Specifications.
   4. Test strength of the shotcrete as work progresses as follows:
      a. Cut cores from the structure and test in accordance with ASTM C42.
      b. A set of three (3) cores shall be taken not less than once each shift nor less than one for each 50 cubic yards of shotcrete placed through the nozzle.
      c. Cores shall be soaked in water for a minimum of 40 hours before testing.

   5. When the length of a core is less than twice the diameter, apply the correction factors given in ASTM C42 to obtain the compressive strength of individual cores. The average compressive strength of three cores taken from the structure, representing a shift or 50 cubic yards of shotcrete, must equal or exceed 0.85f’c with no individual core less than 0.75f’c.

   6. Shotcrete core grade 2 required.

B. Acceptance: Final acceptance of the shotcrete will be based upon the results obtained from cores. A mean core grade of 2.5 or less is acceptable. Individual shotcrete cores with a grade greater than 3 are unacceptable. Use of data obtained from impact devices will not be permitted for final acceptance of the shotcrete. However, this data may be useful for determining uniformity of the shotcrete.

C. Certification: Nozzleman certification shall be in accordance with ACI 506.3R

D. Regulatory Requirements: Meet requirements of applicable laws, codes, and regulations required by authorities having jurisdiction over Work.

1.6 DELIVERY, STORAGE, AND HANDLING

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

1.7 SITE CONDITIONS

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

B. Acceptable Product: Burke Spartan-Cote Cure or Evercrete Deep Penetrating Sealer (DPS). Curing Compound Application Rate: 350 sq. ft./U.S. Gallon (12.5m sq./L)
PART 3 – EXECUTION / CONSTRUCTION

3.1 CURING

A. 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.

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

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

D. Meet requirements of manufacturer’s current printed application instructions.

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

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

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

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

I. Immediately re-coat damaged areas of curing compound.

J. Protect surface from water, adjacent shotcrete work and debris.

3.2 CLEANUP

A. 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 03 39 00

Prepared By SITE DESIGN GROUP, Inc. (5/20/2016)
SECTION 05 50 00 – METAL FABRICATIONS (SKATE PARK)

PART 1 – GENERAL

1.1 GENERAL CONDITIONS

A. Requirements of the Contract Documents, including but not limited to, the General, Special, and Technical Provisions, apply to work in this Section with the same force and effect as though repeated in full herein.

1.2 SPECIALTY CONSTRUCTION

A. Custom Coping/ Metal Fabrication:
   1. The custom coping and specialty metal fabrication consisting of rolling to specified radii, cutting, piecing, sleeves, anchors, welding and setting to horizontal and vertical elevations is deemed sole source specialty work within the Contract Documents.
   2. All work related to the custom coping, metal fabrication and installation shall be coordinated with OWNER, the Skate Park Designer, and the pre-qualified “Sole Source Specialty Builder,” prior to project start.
   3. All custom fabricated steel coping and rails to be manufactured and supplied by Raw Edge Steel, (Available at Thompson Building Materials, Fontana, CA) or approved equal.

1.3 SCOPE OF WORK

A. Furnish materials, labor, transportation, services, and equipment necessary to install all Metal Fabrications for the skate park as indicated on the Drawings complete as shown and as specified herein.

B. Related Work:
   1. Section 03 11 00 – Concrete Formwork (Skate Park)
   2. Section 03 21 00 – Concrete Reinforcement (Skate Park)
   3. Section 03 30 00 – Cast-In-Place Concrete (Skate Park)
   4. Section 03 37 13 – Shotcrete (Skate Park)

1.4 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 City of Berkeley, California. with the current provisions of the following Codes and Standards:

B. ASTM - American Society for Testing and Materials:
   1. ASTM A36 – Structural Steel.
   2. ASTM A120 – Steel Pipe and Tubing.

C. IBC – International Building Code

D. AWS – American Welding Society
   1. AWS D1.1 – Structural Welding Code (latest edition)


1.5 QUALITY ASSURANCE

A. Qualifications of Fabricators: Experienced in fabrication of miscellaneous metals.

B. Qualifications of Welders: Welding shall be done only by certified welding operators currently qualified according to AWS D1.1.

C. Qualifications of Workmen: Provide at least one person who shall be present at all times during execution of this portion of the Work, and who shall be thoroughly familiar with the type of materials being installed, the referenced standards, the requirements of this Work, and who shall direct all work performed under this Section. Welds indicated may be made in shop or field with approval.

1.6 SUBMITTALS

A. Shop Drawings:
1. Submit shop drawings for all custom fabricated items under this section. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories. Indicate welded connections using standard AWS welding symbols.
2. Verification: Verify all measurements at the job. Show dimensions, sizes, thicknesses, gauges, finishes, joining, attachments, and relationship of work to adjoining construction. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from drawings.

B. Samples: Required for all Coping and Edging of concrete work. Submit finish metal samples for final finish selection. Submit prior to delivery to site. Attach name, address of manufacturer and/or supplier to each sample.

1.7 DELIVERY, STORAGE AND HANDLING

A. Storage of Materials: Materials which are stored at the project site shall be above ground on platforms, skids, or other supports. Protect steel from corrosion. Store other materials in a weather-tight and dry place until ready for use.

B. Protection:
1. Use all means necessary to protect miscellaneous metals before, during and after installation and to protect the installed work and materials of all other trades.
2. Protect any adjacent materials or areas below from damage due to weld splatter or sparks during field welding.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the OWNER and at no additional cost to the OWNER.

1.8 JOB CONDITIONS

A. Examine existing conditions in which the work is to be installed. Notify OWNER if conditions are unacceptable to begin work.

B. Do not proceed with the work until unsatisfactory conditions have been corrected.
1.9 COORDINATION

A. Templates and Built-ins: Furnish all anchors, fastenings, sleeves, setting templates and layouts affecting or installed in the work of other trades.

B. Delivery: Where items must be incorporated or built into adjacent work, deliver to trade responsible for such work in sufficient time that progress of work is not delayed. Be responsible for proper location of such items.

C. Coordination: Coordinate with work of Cast-In-Place Concrete Section 03 30 00.

1.10 JOB SITE SAMPLE

A. CONTRACTOR to provide fabricated, onsite sample of metal item(s), complete with approved finish, for review by OWNER before fabrication of total quantities. Any fabrication of project item(s) by CONTRACTOR before OWNER review and approval is subject to rejection.

B. Approved sample(s) shall be used as the standard of workmanship and shall remain on site until work has been completed and approved by the OWNER.

PART 2 - PRODUCTS

2.1 MATERIALS

A. 2-1/2" ROUND STEEL PIPE COPING: HSS 2.875 X 0.203, ASTM A-500 GRADE B, (FY=46 KSI).

B. 3" STEEL FLAT PLATE: HSS 3.000 X 0.125, ASTM A-36, Hot Rolled Steel Plate.

C. 6" STEEL C-CHANNEL: HSS 6.000 X 1.920 X 0.200, ASTM A-36, Hot Rolled Steel.

D. 8" STEEL FLAT PLATE: HSS 8.000 X 0.125, ASTM A-36, Hot Rolled Steel Plate.

E. WELDING RODS: E-70 series low hydrogen unless otherwise noted on drawings.

2.2 GROUT: Non-shrinking Master Builder's "Embedco", Conrad Sovig's "Metal-Mxs Grout", Sonneborn's "Ferrolith G Redi-Mixed Grout" or approved equal.

2.3 OTHER MATERIALS: All other materials, not specifically described but required for a complete and proper installation of miscellaneous metals, shall be new, first quality of their respective kinds and subject to the approval of the OWNER.

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

A. Inspection: Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Discrepancies: In the event of discrepancy, immediately notify the OWNER.
3.2 COORDINATION

A. General: Carefully coordinate with all other trades to insure proper and adequate interface of the work of other trades with the Work of this Section.

B. Delivery: Insure timely delivery of all metal fabrications which must be installed in other work so as not to delay that work.

3.3 INSTALLATION

A. General:
1. Install metal fabrications in strict accordance with the Drawings, the approved Shop Drawings, and all applicable codes, regulations and standards.
2. Obtain OWNER review prior to site cutting or making adjustments which are not parts of the scheduled work.
3. Install items square and level, accurately fitted and free from distortion or defects.
4. Align all metal fabrications as shown on the Drawings, and where vertical or horizontal members are shown. Align them straight, plumb and level within tolerance.
5. Make provisions for erection stresses by temporary bracing. Keep work in alignment.
6. Replace items damaged in course of installation.
7. Perform field welding in accordance with AWS D1.1
8. After installation, grind smooth and touch-up field welds.

3.4 WORKMANSHIP

A. Layout: Set all work plumb, true, rigid, and neatly trimmed out. Miter corners and angles of exposed molding and frames unless otherwise noted.

B. Fitting: Fit exposed connections accurately together to form tight hairline joints.

C. Labor: Employ only workmen specifically skilled in such work.

3.5 FABRICATION

A. Shop assemble in largest practicable dimensions, making members true to length so assembling may be done without fillers.

B. Provide all surfaces free of file marks, dents, hammer marks, wire edges or any unsightly surface defects.

C. STEEL PIPE COPING: Roll pipe to conform with top radius curve of each bowl and ledge as shown on drawings. Refer to drawings for relational tolerance to concrete surface and other steel.

3.6 ATTACHMENTS AND REINFORCEMENTS

A. Do all cutting, shearing, drilling, punching, threading, tapping, etc., required for site metalwork or for attachment of adjacent work. If applicable, drill or punch holes; do not use cutting torch.

3.7 OTHER CONNECTORS: Make all permanent connections in ferrous metal surfaces using welds where at all possible; do not use bolts or screws.
3.8 WELDING

A. Preparation: Remove all rust, paint, scale and other foreign matter. Wire brush all flame-cut edges. Clamp members as required and alternate welds, all as necessary to prevent warping or misalignment.

C. Exposed Welds: Uniformly grind smooth (no tolerance) all welds normally exposed to view and feel in the finished work.

D. Faulty and Defective Welding: Chip out and replace all welding showing cracks, slag inclusion, lack of fusion, bad undercut or other defects ascertained by visual or other means of inspection. Replace and re-weld at no cost to OWNER.

E. Field Welding:
   1. Procedure: Comply with AWS code of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.
   2. Protection: Protect all adjacent surfaces from damage due to weld sparks, spatter, or tramp metal.

3.9 SURFACE TREATMENT AND PROTECTIVE COATINGS

A. Cleaning:
   1. Thoroughly clean all mill scale, rust, dirt, grease and other foreign matter from ferrous metal prior to any galvanizing, or painting.
   2. Conditions which are too severe to be removed by hand cleaning, shall be cleaned using appropriate methods for solvent cleaning, power tool cleaning and brush-off blast cleaning.

B. Exterior Ferrous Metal:
   1. Grind smooth all welds, burrs, and rough surfaces. Clean all coping from grease.
   2. Shop coat iron metal items; using anti-rust primer (red color).
   3. All welds to be painted with primer after appropriate connections and grinding has taken place. Touch-up all scratched primer prior to shotcrete application.

3.10 CLEAN-UP

A. Keep all areas of work clean, neat and orderly at all times. Keep paved areas clean during installation.

B. Clean up and remove all debris from the entire work area prior to Final Acceptance to satisfaction of OWNER.

END OF SECTION 05 50 00

Prepared By SITE DESIGN GROUP, Inc. (5/20/2016)
SECTION 09 91 00 – PAINTING (SKATE PARK)

PART 1 – GENERAL

1.1 GENERAL CONDITIONS

A. Requirements of the Contract Documents, including but not limited to, the General, Special, and Technical Provisions, apply to work in this Section with the same force and effect as though repeated in full herein.

1.2 SCOPE OF WORK

A. Furnish materials, labor, transportation, services, and equipment necessary to install all Painting for the skate park as indicated on the Drawings complete as shown and as specified herein.

B. This Section includes surface preparation and field painting of the following:
   1. Miscellaneous exposed exterior items and surfaces.

C. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the OWNER will select from standard colors and finishes available.
   1. Painting includes field painting of exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
   1. Finished metal surfaces include the following if used:
      a. Stainless steel.
      b. Bronze and brass.
      c. Iron
   2. Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

B. Related Work:
   1. Section 05 50 00 – Metal Fabrications (Skate Park)

1.3 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 City of Berkeley, California. Comply with the current provisions of the following Codes and Standards:

B. ASTM - American Society for Testing and Materials

C. IBC – International Building Code

1.4 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
2. Eggshell refers to low-sheen finish with a gloss range between 5 and 20 when measured at a 60-degree meter.
3. Satin refers to low-sheen finish with a gloss range between 15 and 35 when measured at a 60-degree meter.
4. Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
5. Full gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60-degree meter.

1.5 SUBMITTALS

A. Product Data: For each paint system specified. Include block fillers and primers.

1. Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of finish-coat material indicated.

C. Samples for Verification: Of each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
2. Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.
3. Submit Samples on the following substrates for the OWNER's review of color and texture only:
   a. Ferrous Metal: Provide two 4-inch- (100-mm-) square samples of flat metal and two 8-inch- (200-mm-) long samples of solid metal for each color and finish.

D. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of OWNERs and OWNERs, and other information specified.

1.6 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
   1. Product name or title of material.
   2. Product description (generic classification or binder type).
   3. Manufacturer’s stock number and date of manufacture.
   4. Contents by volume, for pigment and vehicle constituents.
   5. Thinning instructions.
   6. Application instructions.
   7. Color name and number.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

C. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.8 PROJECT CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 deg F (10 and 32 deg C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 and 95 deg F (7.2 and 35 deg C).

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.9 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to the OWNER.
   1. Quantity: Furnish the OWNER with an additional 5 percent, but not less than 1 gal. (3.785 L) or 1 case, as appropriate, of each material and color applied.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in the paint schedules.

2.2 MATERIALS

A. Material Compatibility: Provide fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
   1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: Provide color selections made by the SKATE PARK DESIGNER.

PART 3 – EXECUTION / CONSTRUCTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
   1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
   2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
   1. Notify the OWNER about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.
   1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
   1. Provide barrier coats over incompatible primers or remove and reprime.
   2. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
      a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
   3. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.
a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.

D. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
   1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
   2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
   3. Use only thinners approved by paint manufacturer and only within recommended limits.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
   1. Paint colors, surface treatments, and finishes are indicated in the schedules.
   2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
   3. Provide finish coats that are compatible with primers used.
   4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, covers, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
   5. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
   1. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
   2. Omit primer on metal surfaces that have been shop primed and touchup painted.
   3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
   4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
   1. Brushes: Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.
   2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
   3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
E. Fillers: Apply fillers at a rate to ensure complete coverage of pores filled.

F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.

G. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

H. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

B. After completing painting, clean paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by OWNER.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.6 EXTERIOR PAINT SCHEDULE

A. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.

1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a rust-inhibitive primer.
   a. Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils (0.033 mm).
      1) Dura Clad 55 High Solids Universal Alkyd Primer by Duron.
      2) 433 RustPlate Rust Inhibitive Primer by Kurfees Coating.
      3) Fuller: 621-04 Blox-Rust Alkyd Metal Primer.
      4) Glidden: 5205 Glid-Guard Tank & Structural Primer, Red.
      6) PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.
   b. First and Second Coats: Semigloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils (0.066 mm).
      2) Fuller: 664-XX Weather King II Semi-Gloss House & Trim Paint.
4) Moore: MoorGlo Latex House & Trim Paint #096.
5) PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.

END OF SECTION 09 91 00

Prepared By SITE DESIGN GROUP, Inc. (5/20/2016)