SECTION 01 57 13
STORM WATER POLLUTION PREVENTION PLAN

PART I - GENERAL

1.1 SECTION INCLUDES

A. Implementation of Best Management Practices is required.

B. Compliance with local, state and federal regulations.

1.2 REFERENCES

A. Storm Water Pollution Prevention Plans and Specifications (SWPPP) developed specific to this project and included in the contract documents.

B. California Storm Water Best Management Practice (BMP) Handbook for Construction Activity (California Storm Water Quality Association), 2009 Edition.

C. Storm Water Resource Control Board (SWRCB)

D. National Pollutant Discharge Elimination System (NPDES)

1.3 SUBMITTAL REQUIREMENTS

A. Each Prime Contractor shall provide their Best Management Practices Storm Water Pollution Prevention Plan (SWPPP).

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use materials of a class, grade and type needed and identified in the four (4) phases of SWPPP implementation to meet the performance described in the Project specific SWPPP as well as within the BMP Handbook.

PART 3 - EXECUTION

3.1 Bid Categories identified below are responsible for installation, implementation, maintenance, inspection, reporting, and monitoring the Storm Water Pollution Prevention Plan (SWPPP) for their respective construction phases for the purpose of preventing and eliminating the discharge of pollutants from the construction site throughout the duration of this phase of work. The SWPPP plans will be developed by the owner. Implementation and maintenance of SWPPP to include all materials/equipment identified in the SWPPP Drawings, including, but not limited to the following: dust control, street sweeping, stabilized entrances, sandbags, gravel bags, hay bales, wattles, swales, silt fence, plastic sheeting, cleaning of catch basins and piping, etc. as required for maintenance and a complete system in compliance with all Federal, State and Local requirements. The following phases of SWPPP implementation/maintenance periods are tasked to the responsible Bid Categories identified below.

A. All Bid Category Trade Contractors are responsible for maintaining (unless specifically noted herein) all necessary SWPPP measures applicable to the performance of their bid category scope of work, including but not limited to the following:

i. Dust control

a. Provide general dust control except during demolition and mass grading operations, during which time the contractors performing demolition and grading operations will be responsible for dust control.

ii. Trash and debris management

a. All trash and debris is to be contained (in containers, cans, bins, etc.) at all times.

b. All containers are to be covered daily as to prevent wind removal of trash and debris thus preventing storm water pollution.

c. All containers are to be covered by a waterproof, non-porous, cover and sealed to protect from leakage and storm water pollution at the end of each day and in accordance with the new SWRCB regulations.

iii. Construction material management and storage

a. All materials must be stored in a manner as to prevent storm water pollution, including but not limited to the following

1. Materials shall not have direct contact with the ground.

2. Materials shall be covered completely with waterproof covering when not in use.

iv. Equipment management and storage

a. All equipment shall be properly stored, contained and protected while on Site.

b. Heavy machinery and equipment shall be equipped to prevent any dripping, spillage and/or leakage of fluids onsite. Properly store and protect equipment at all times.

v. Stockpile management

a. All stockpiled materials must be protected and covered by water proof covering when not in use.

vi. Repair and replacement of any and all SWPPP measures relocated, removed, and/or damaged by the performance of a bid category's scope of work. Repair and replacement is to be done immediately.

vii. Revisions, Additions and Maintenance as required, specific to the performance of each bid category's scope of work.

viii. Contain on-site storm water at the jobsite. Do not drain on-site water directly into the storm drain.

ix. Maintenance and cleaning of construction entrance and vehicles as to ensure no soil whatsoever is tracked outside the limits of SWPPP measures in place as approved by the QSP and QSD.

B. Bid Category 01 – Site Demo, Earthwork and Grading

i. **Bid Category 01** is to furnish, install and maintain all SWPPP measures identified on the SWPPP, including but not limited to:

a. All perimeter measures

b. All inflow(s), flow line(s) and outflow(s) measures

c. Construction entrance(s). Construction entrances shall be furnished and installed (including Tire Wash Rack) by this trade category.

C. Bid Categories – 02, 07, 08, 09 and 11 – Concrete (Bldg & Site), Miscellaneous Specialties/General Construction, Fire Protection, Site Utilities and Plumbing, and Electrical.

i. **Bid Categories 01, 02, 07, 08, 09 & 11** shall be responsible to install and maintain SWPPP measures in accordance with local Agency requirements through the completion of their site related scope of work including, but not limited to:

a. Revisions to any and all inflow(s), flow line(s) and outflow(s) measures, created due the installation underground utilities (E.g. Trenching, Excavations).

b. Any disturbance to existing SWPPP measures.

D. Bid Category 01 and 07 – Site Demo, Earthwork & Grading, and Miscellaneous Specialties/General Construction

i. During the interim between the completion of the rough grading activities and the start of the building activities **Bid Category 07** is to inspect the SWPPP measures furnished and installed by **Bid Category 01** prior to the start of their work. **Bid Category 07** shall correct any deficient SWPPP Measures and bring them up to acceptable standards in accordance with the established BMP's.

ii. At the end of the Project (and at the Construction Managers direction) **Bid Category 01** shall remove and properly dispose of all BMP's from site, including those install by other trade category contractors (Specifically the Stablished Construction Entrance (including Tire Wash Rack), Perimeter Gravel Bag Barriers, Inlet Sediment Barriers, Silt Fencing, Fiber Rolls etc.).

iii. Prior to turnover of SWPPP measures to the next bid category contractor, **Bid Category 01 and/or 07** shall schedule a site SWPPP inspection with the Construction Manager to address any repairs. A written acceptance correspondence shall be issued by the Construction Manager which will initiate turnover to the next phase of work.

iv. **Bid Category 01** Contractor is responsible for the installation and maintenance of the post construction / final SWPPP.

v. Upon written acceptance by the Construction Manager, of the completed post construction / final SWPPP measures as being complete or an area or phase being complete, SWPPP measures.

E. Additional increased SWPPP measures, not identified upon the SWPPP and required solely by Excessive Rain Events greater than the historical monthly averages, shall be provided immediately as requested by the Construction Manager. The additional measures shall be performed on a Time and Material basis with the tickets acknowledged and verified on a daily basis by the Construction Manager.

i. This does not apply to additional measures and revisions required for the performance of a bid categories scope of work, which may not be performed on a time and material basis as they are not to be an additional cost to the County.

F. Failure to comply with the requirements of the SWPPP, and fines assessed to the County will be reimbursed by the contributing Prime Contractor through a deductive change order.

3.3 TURN OVER OF PHASES

A. Prior to acceptance of each SWPPP Phase, each responsible Bid Category Contractor shall schedule a site inspection walk with the Construction Manager/QSP and verify existing SWPPP conditions. Site walks and verification of SWPPP implementation shall be performed by the responsible SWPPP Phase Bid Category Contractor and the next subsequent SWPPP phase responsible Bid Category Contractor prior to turnover of each said SWPPP Phase. Any corrections and repairs prior to turn over of phase shall be the responsibility of the active responsible Bid Category Contractor.

3.4 MONITORING

A. The County's Construction Manager will provide the monitoring of the SWPPP implementation and maintenance, unless noted otherwise in this specification section which includes information to be provided by the Bid Category contractors.

3.5 LIABILITIES AND PENALTIES

A. Review of the SWPPP and inspection log by the County shall not relieve the Responsible Bid Category Contractor from liabilities arising from non-compliance of storm water pollution regulations.

B. Payment of penalties for non-compliance by the responsible Bid Category Contractor shall be the sole responsibility of said Bid Category Contractor and will not be reimbursed by the County.

C. Any and all fines incurred with regard to pollution through ongoing construction activities will be the responsibility of the Responsible Bid Category Contractor.

D. Compliance with the Clean Water Act pertaining to construction activity is the sole responsibility of the applicable Bid Category. Failure to comply with the regulations of the Regional Water Quality Control Board (RWQCB) or other prosecuting authority may result in significant fines and possible imprisonment. Fines may be assessed up to $32,500 (if not more) per day for each violation. Any fines, penalties levied and any related costs against the Owner due to non-compliance by the responsible bid category contractor shall be the sole responsibility of the said bid category contractor and will NOT be reimbursed by the Owner. Review of SWPPP and inspection logs by the Owner's Representative shall not relieve this contractor from liabilities arising from non-compliance of storm water pollution regulations.

3.6 PROJECT COMPLETION

A. **Bid Category 01** Contractor will be required to do a final project closeout walk through as part of punch list items. At the end of the project or as directed by the Construction Manager, this trade category shall remove and properly dispose of all BMP's from site, including those install by other trade category contractors and in other phases (Specifically the Stablished Construction Entrance, Perimeter Gravel Bag Barriers, Inlet Sediment Barriers, Silt Fencing, etc.).

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Following Administrative and Procedural Requirements:
   1. Selection of products for use in Project
   2. Product delivery, storage, and handling.
   3. Manufacturers standard warranties on products.
   4. Special warranties.
   5. Product substitutions.

1.2 RELATED REQUIREMENTS AND SECTIONS

A. Instructions to Bidders: Procedures for requesting substitutions during bidding period.

B. Division 1: Substitution Procedures

C. Section 01 77 00: Project Closeout Procedures; for submitting warranties for contract closeout.

D. Divisions 2 through 33 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes terms material, equipment, system, and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature that is current as of date of Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise.
      a. Products salvaged or recycled from other projects are not considered new products.

B. Substitutions: Changes in products, materials, equipment, and methods of construction required by Contract Documents and proposed by Contractor; following are not considered substitutions:
   1. Substitutions requested during bidding period, and accepted by written Addendum prior to opening of bids or award of Contract.
   2. Revisions to Contract Documents requested by Owner or Architect.
   3. Specified options of products and construction methods included in Contract Documents.
   4. Compliance with governing regulations and orders issued by governing authorities.

C. Basis-of-Design Product Specification: Where specific manufacturer's product is named and accompanied by words "Basis of Design", including make or model number or other designation, to establish significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for particular product and specifically endorsed by manufacturer to Owner.

E. Special Warranty: Written warranty required by or incorporated into Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.4 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration.
Refer to Specification Section 01 25 00 for Substitution Procedures. The clauses in this Specification is intended to complement the requirements of Specification Section 01 25 00. Where the clauses are in conflict, the more stringent of the two shall apply.

1. Identify product or fabrication or installation method to be replaced.
2. Include Specification Section number and title and Drawing numbers and titles.
    a. Refer to Article 2.02, in this Section.
3. Substitution Request Form: Use form provided the **architect**; other forms will not be accepted.
    a. Requests received without properly completed substitution request form will be rejected without further review.
4. Documentation: Show compliance with requirements for substitutions and following, as applicable:
    a. Statement indicating why specified material or product cannot be provided.
    b. Product identification, including manufacturer's name and address.
    c. Coordination information, including list of changes or modifications needed to other parts of Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    d. Detailed comparison of significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    e. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    f. Structural calculations, where applicable or requested, prepared and signed by Structural Engineer licensed in California.
    g. Samples, where applicable or requested.
    h. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    i. Material test reports from qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    j. Research/evaluation reports evidencing compliance with building code in effect for Project, from model code organization acceptable to authorities having jurisdiction.
    k. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for Work, including effect on overall Contract Time.
        1) If specified product or method of construction cannot be provided within Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
    l. Cost information, including proposal of change, if any, in Contract Sum.
    m. Designation of availability of maintenance services, sources of replacement materials.
    n. Contractor's certification that proposed substitution complies with requirements in Contract Documents and is appropriate for applications indicated.
    o. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce

indicated results.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00.
   1. Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. To fullest extent possible, provide products of same kind, from single source.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle products using means and methods that will prevent damage, deterioration and loss, including theft; comply with manufacturer=s written instructions.
   1. Schedule delivery to minimize long term storage at Project Site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
   3. Deliver products to Project Site in undamaged condition in manufacturer's original sealed container, or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
   4. Inspect products on delivery to ensure compliance with Contract Documents, and to ensure products are undamaged and properly protected.
   5. Store products in manner to facilitate inspection and measurement of quantity or counting of units.
   6. Store materials in manner that will not endanger Project structure.
   7. Store products subject to damage by elements under cover in weathertight enclosure above ground, with ventilation adequate to prevent condensation.
   8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
   9. Protect stored products from damage.

1.7 PRODUCT WARRANTIES

1. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by Contract Documents.
   1. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of Contract Documents.

2. Special Warranties: Prepare written document that contains appropriate terms and identification, ready for execution.
   1. Submit draft for approval before final execution.
   2. Manufacturer's Standard Form: Modified to include Project specific information and properly executed.
   3. Refer to Division 2 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

3. Submittal Time: Comply with requirements in Section 01 77 00.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

A. General: Provide products that comply with Contract Documents, are undamaged, and unless otherwise indicated, that are new (not previously installed) at time of installation.
   1. Provide products complete with accessories, trim, finish, fasteners, safety guards and other items needed for complete installation and indicated use and effect.
   2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
   3. Owner reserves right to limit selection to products with warranties not in conflict with requirements of Contract Documents.
   4. Where products are accompanied by term "as selected", Architect will make selection.
   5. Where products are accompanied by term "match sample", sample to be matched is Architect's.
   6. Descriptive, performance, and reference standard requirements in Specifications establish salient characteristics of products.
   7. Or Equal: Where products are specified by name and accompanied by term "or equal" or "or approved equal" or "or approved", comply with provisions in Product Substitutions Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures: Procedures for product selection include following:
   1. Product: Where Specification paragraphs or subparagraphs titled Product name single product and manufacturer, provide product named.
      a. Substitutions may be considered, unless otherwise indicated.
   2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled Manufacturer or Source name single manufacturers or sources, provide product by manufacturer or from source named that complies with requirements.
      a. Substitutions may be considered, unless otherwise indicated.
   3. Products: Where Specification paragraphs or subparagraphs titled Products introduce list of names of both products and manufacturers, provide one of products listed that complies with requirements.
      a. Where products or manufacturers are specified by name, accompanied by term "or equal", or "or approved equal" comply with provisions in "Product Substitutions" Article to obtain approval for use of an unnamed product.
   4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce list of manufacturers names, provide product by one of manufacturers listed that complies with requirements.
      a. Where manufacturers are specified by name, accompanied by term "or equal", or "or approved equal" comply with provisions in Product Substitutions Article to obtain approval for use of an unnamed product.
   5. Product Options: Where Specification paragraph titled Product Options indicate that size, profiles, and dimensional requirements on Drawings are based on specific product or system, provide either specific product or system indicated or comparable product or system by another manufacturer.
      a. Comply with provisions in Product Substitutions Article to obtain approval for use of unnamed product and/or manufacturer.
   6. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled Basis-of-Design Product are included and also introduce or refer to list of manufacturers names, provide either specified product or comparable product by one of other named manufacturers.
      a. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on product named.
      b. Comply with provisions in Product Substitutions Article to obtain approval for use of unnamed product.
      c. Substitutions may be considered.

7. Visual Matching Specification: Where Specifications require matching established Sample, select product and manufacturer that complies with requirements and matches Architect's sample.
   a. Architect's decision will be final on whether proposed product matches satisfactorily.
   b. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of Contract Documents on substitutions for selection of matching product.
8. Visual Selection Specification: Where Specifications include phrase as selected from manufacturer's colors, patterns, textures, or similar phrase, select product and manufacturer that complies with other specified requirements.
   a. Standard Range: Where Specifications include phrase standard range of colors, patterns, textures or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
   b. Full Range: Where Specifications include phrase full range of colors, patterns, textures or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.
9. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with requirements, and are recommended by manufacturer for application indicated.
   a. General overall performance of product is implied where product is specified for specific application.
   b. Manufacturer's recommendations may be contained in product literature, or by manufacturer's certification of performance.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Substitutions are restricted to before bid opening if stated in the bidding documents. Acceptable substitutions prior to bid shall be communicated **ONLY** through addenda.
   1. Requests for substitutions received after that time may be considered or rejected at discretion of Architect.
   2. Requests for substitutions **MAY** be considered if received within 15 days after award of Contract, subject to specified submittal requirements and following:
      a. Architect will consider request for substitution after commencement of Work, within 15 days after award of Contract, only if specified product or construction method cannot be provided within Contract Time, cannot receive necessary approvals, cannot be provided in manner compatible with or coordinate with other materials or cannot provide required warranty.
      b. Contractor's base bid **MUST** include the specified product. If the substitution is accepted after the Notice of Award, the owner receives full benefit of the cost reduction.
      c. Requests received more than 15 days after award of contract will only be considered in case of substantiated product unavailability, or conditions beyond control of Contractor.

B. Conditions: Contractor's substitution request will be received and considered by Architect when following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action except to record noncompliance with these requirements; burden of proof of merit of proposed substitution is upon proposer.
   1. Extensive revisions to Contract Documents are not required Requested substitution is consistent with Contract Documents and will produce indicated results.
   2. Request is timely, fully documented and properly submitted.
   3. Request is directly related to "or equal" clause or similar language in Contract Documents.
   4. Request is directly related to "or equal" clause or similar language in Contract Documents.
   5. Specified product or construction method cannot be provided within Contract Time.

a. Request will not be considered if product or method cannot be provided as result of failure to pursue Work promptly, failure to identify items requiring long lead times, or failure to coordinate activities properly.

6. Specified product or construction method cannot receive necessary approval by governing authority, and requested substitution can be approved.
7. Substantial advantage is offered Owner, in cost, time, energy conservation, or other considerations of merit, after deducting additional responsibilities Owner must assume.
   a. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner or separate Contractors, and similar considerations.
8. Specified product or construction method cannot be provided in manner that is compatible with other materials, and where Contractor certifies that requested substitution will overcome incompatibility.
9. Specified product or construction method cannot be coordinated with other materials, and where Contractor certifies that requested substitution can be coordinated.
10. Specified product or construction method cannot provide warranty required by Contract Documents and where Contractor certifies that requested substitution provide required warranty.
11. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of Work, is uniform and consistent, is compatible with other products, and is acceptable to contractors involved.

C. Architects Action: If necessary, within one week of receipt of request for substitution, Architect will request additional information or documentation for evaluation of request for substitution.
   1. Within 2 weeks of receipt of request, or one week of receipt of additional information or documentation, whichever is later, Architect will notify Contractor of acceptance or rejection of requested substitution.
   2. Use product specified if Architect cannot make decision on use of proposed substitution within time allocated.
   3. Architect will not be responsible for locating or securing information which is not included in substantiating data.
   4. Architect's decision of acceptance or rejection of requested substitution shall be final.

D. Architect's cost for evaluating substitutions requested by Contractor, including making subsequent revisions to drawings, specifications and other resulting documentation, will be paid by Owner with reimbursement from Contractor by deductive change order.

E. Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

F. Forms of Acceptance for Substitutions:
   1. During Bidding Process: Addendum
   2. After Award of Contract: Change Order.

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 01 66 00

PRODUCT HANDLING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work Included: Provide products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

1.03 QUALITY ASSURANCE

Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.04 MANUFACTURERS' RECOMMENDATIONS

Except as otherwise accepted by the Architect, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

1.05 PACKAGING

A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.

2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with materials meeting the specified requirements, at no additional cost to the Owner.

B. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

1.06 PROTECTION

A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.

B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.

C. Maintain existing surfaces to remain and finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.07 REPAIRS AND REPLACEMENTS

A. In event of damage, promptly make replacements and repairs to the acceptance of the Architect and at no additional cost to the Owner.

B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

***** END OF SECTION *****

SECTION 01 71 23
FIELD ENGINEERING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDE:

A. Quality control

B. Field engineering & staking is to be furnished and paid for by Bid Category #05 Miscellaneous Specialties/General Construction as identified below.

C. Field engineering & staking in addition to what is identified below to be paid for by the Bid Category Contractor requiring same.

D. Survey reference points

E. Staking requests and procedures

1.2 QUALITY CONTROL

A. In order to maintain continuity, clarity, and simplicity throughout the course of the project, ALL surveying, staking and field engineering listed in item 1.3 below will be provided by the Bid Category #05 Miscellaneous Specialties/General Construction. Said surveying shall be performed by a certified licensed surveyor.

B. It is each individual Bid Category Contractor's responsibility to understand, double check, and verify the placement of the Bid Category #05 Miscellaneous Specialties/General Construction stakes prior to beginning work and notify the Construction Manager of any discrepancies, questions, and/or problems before proceeding with the work. Staking will be performed once. The maintenance of the stakes for the Bid Category Contractor who has requested / required said staking shall be the responsibility party. Cost to replace lost, damaged, and/or negligence is at the expense of the Bid Category Contractor. Bid Category Contractor will provide any additional surveying, staking, and field engineering he requires at his expense.

1.3 FIELD ENGINEERING & STAKING FURNISHED AND PAID FOR BY Bid Category #05 Miscellaneous Specialties/General Construction.

A. PROPERTY BOUNDARIES (if applicable)
   1. Property lines
   2. Property corners

B. ROUGH GRADE STAKING
   1. Swales.
   2. Ridge lines.
   3. Establish temporary bench control.
   4. Site at 50 ft. grid, grade breaks, angle points, B.C.'s and E.C.'s.
   5. Building pad corners (establish pad finish and/or subgrade elevations).
   6. Layout of all depressions for floor finishes.
   7. Post rough grade survey.
      a. Establish and record 25 topo points for contour confirmation.
      b. Establish and record 100 topo points around and in between buildings and paving and hardscape areas to establish existing grades prior to start of site and building improvements.

C. FOUNDATION CONSTRUCTION
1. Establish horizontal and vertical control.
2. Building pad certification and As-builts for County.
3. Layout of building and canopy structure - perimeter and major grid lines for line only, and all radius points.
4. Bench marks at building (for vertical control). Two (2) each per building at opposite corners, as directed by the Construction Manager.
5. Over Excavation: Vertical & Horizontal location

D. STORM DRAIN SYSTEM
1. Staked at +/- 25' intervals. (Lines & Grades)
2. Catch basins.
3. Manholes; including rim & invert elevations.
4. Drainage structures, angle points, transitions, manholes, and inlets.
5. Invert elevations at all grade breaks.
6. Bio Retention Basins

E. CURB, CURB & GUTTER, "V" GUTTER
1. Set stakes at +/- 50' centers.
2. Beginning of curve and /or radius.
3. End of curve and/or radius.
4. Grade breaks.
5. Angle points.
6. Radius points.
7. Curb and gutter, cross gutter, v-gutter, swales, aprons, drive approaches headers, B.C.'s E.C.'s grade breaks and curb face/local depressions.

F. SEWER / ELECTRIC STAKES
1. Manholes; including rim & invert elevations.
2. Sewer main (25 ft. intervals-line and grade), manholes, cleanouts, angle points, grade breaks and laterals.
3. Stake main utility lines and all vaults.

G. DOMESTIC, FIRE WATER & GAS LINES
1. +/- 50' intervals – line and grade, angle points, laterals, appurtenance, and devices.

H. RETAINING / PLANTING / SEAT WALL STAKING
1. +/- 50' intervals, angle points, and radius points.
2. Top of wall.
3. Top of footing.

I. SITE & OFF-SITE WORK STAKES
1. Redwood header and edge of pavement at 25 ft. intervals.
2. Light standards - two stakes each.
3. Site certification and As-Builts for County.
5. Subgrade staking for site concrete, asphalt paving, ramps and stairs.
6. Chain link and ornamental fencing and gate – line and grade.
7. Temporary power pole locations.
8. Flagpoles
9. Fountains

J. CUT SHEETS PROVIDED DAILY
1. Provide cut sheets after each survey, no later than the close of business the same day.

1.4 FIELD ENGINEERING & STAKING TO BE PAID FOR BY THE BID CATEGORY CONTRACTOR REQUIRING SAME

A. Any and all required field engineering and staking which is not specifically noted as being furnished by the Bid Category #05 above, must be done by the Bid Category Contractor's surveyor and paid for by the applicable Bid Category Contractor requiring and/or requesting same. The Bid Category Contractor may have additional surveying done by the Bid Category #05's Surveyor, a licensed land surveyor, or a registered civil engineer at his expense.

1.5 SURVEY REFERENCE POINTS

A. Each Bid Category Contractor shall locate and protect survey control and reference points.

B. Control datum for survey is that established by the Bid Category #05 Miscellaneous Specialties/General Construction.

C. The applicable Bid Category Contractor shall protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to the Construction Manager's job site Superintendent the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice from the Architect through the Construction Manager.

1.6 STAKING REQUESTS AND PROCEDURES

A. All staking request shall be made in writing through the Construction Manager's Project Superintendent a **MINIMUM of 48 HOURS** prior to need of staking. Should the area to be staked be found not ready or clear for staking, or the requested staking date changed, the surveyor shall have up to 48 hours additional time to begin work.

B. Staking requests shall be made for a minimum of 8 hours of survey time per request, unless Surveyor and Bid Category Contractor mutually agree to a shorter requested time per request.

C. Arrangement and payment for any and all staking (done by the Bid Category #05) not specifically included in item 1.03 above, shall be made as follows:

1. Lump sum quote
   a. Bid Category Contractor shall request a lump sum quotation in writing from the Bid Category #05 Miscellaneous Specialties/General Construction's Surveyor through the Construction Manager for the specific staking required.
   b. Bid Category #05 Miscellaneous Specialties/General Construction shall provide a written lump sum quotation to the Bid Category Contractor through the Construction Manager for the requested work.
   c. If acceptable, Bid Category Contractor shall sign quote and submit to the Construction Manager for processing. If unacceptable, Bid Category Contractor shall negotiate final price with Bid Category #05 Miscellaneous Specialties/General Construction or authorize Bid Category #05 Miscellaneous Specialties/General Construction's Surveyor to proceed on an hourly rate basis as noted below. Construction Manager shall endeavor to assist Bid Category Contractor to ensure that **ALL** lump sum quotes from Bid Category #05 Miscellaneous Specialties/General Construction's Surveyor are competitive.

2. Hourly rate
   a. Bid Category Contractor shall request the specific staking required in writing through the Construction Manager on a form provided by the Bid Category #05. Bid Category Contractor shall sign this request.
   b. Construction Manager shall forward staking request on to the Bid Category #05's Surveyor.
   c. Bid Category #05's Surveyor shall perform requested work and shall record survey and staking time on Bid Category Contractor's signed staking request form.
   d. Bid Category #05's Surveyor shall present staking request form to Bid Category Contractor for a second signature to document survey hours each day the work is performed for the Bid Category Contractor to sign. Bid Category Contractors are urged to remain on the site during the survey work and to sign for their own daily survey work, however, if Bid Category Contractor's Foreman is not on the project at the completion of the Surveyor's staking, then the Bid Category Contractor automatically authorizes the Construction Manager's Superintendent to sign on Bid Category Contractor's behalf to document the hours charged for the day.

3. Bid Category Contractors shall pay the Bid Category #05's Surveyor direct for all survey work requested in writing on a monthly basis. All charges for requested staking done by the Bid Category #05's Surveyor, shall be tallied and automatically deducted from the applicable Bid Category Contractor's pay request each month. Upon completion of all requested survey and staking work on the project, Construction Manager shall issue a formal deductive change order to the Bid Category Contractor's Contract to provide a final accounting of the staking charges.

D. Staking requests shall consider continuity of survey work (example).
   1. Survey staking of a complete area of site.
   2. Survey staking of total sewer/storm drain line or large segments of continuous work.
   3. There is no minimum or maximum number of move-ins required by the surveyor to perform their work. However, CM shall attempt to utilize the least amount of move-ins possible.

E. After the stakes are set, it shall be the Bid Category Contractor who requested said staking's sole responsibility to protect the stakes from any damage. Any re-staking shall be charged to the Bid Category Contractor who ordered said staking if the party damaging the staking cannot be determined or verified.

F. Should a discrepancy occur and the Surveyor's stakes are missing, then the Surveyor's field notes shall be relied on as to how the object was staked. A set of field notes will be provided to the Construction Manager and the Bid Category Contractor related to the specific staking after the staking is complete. The field notes and the stake markings shall be used together, and any differences shall be immediately brought to the attention of the Construction Manager.

G. The Bid Category Contractor responsible for building foundations shall verify the Surveyor's staking for building layout and immediately notify the Construction Manager of any discrepancies. The Construction Manager will then take the appropriate action. Should said Bid Category Contractor fail to make the above verification, he shall assume responsibility for the accuracy of the layout.

END OF SECTION

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

1.3 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or those results in increased maintenance or decreased operational life or safety.

1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Fire-protection systems.
4. Control systems.
5. Communication systems.
6. Electrical wiring systems.

C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Exterior curtain-wall construction.
4. Equipment supports.
5. Piping, ductwork, vessels, and equipment.
6. Noise- and vibration-control elements and systems.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize interruption of services to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in the technical specifications where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Where directed by drawings or specifications, cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
   3. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.

END OF SECTION

SECTION 01 74 00

CLEANING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work Included: Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.

1.03 QUALITY ASSURANCE

A. Conduct daily inspection, and more if necessary, to verify that requirements for cleanliness are being met.

B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

PART 2 -- PRODUCTS

2.01 CLEANING MATERIALS AND EQUIPMENT

Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.02 COMPATIBILITY

Use only the cleaning materials and equipment that are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 -- EXECUTION

3.01 PROGRESS CLEANING

A. General:

1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this work.
3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:

1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on site. Re-stack, tidy, or otherwise service arrangements to meet the

requirements above.

3. Maintain the site in a neat and orderly condition at all times.

C. Structures:

1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.

2. Weekly, and more often if necessary, sweep interior spaces clean.

a. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.

3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.

4. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials are installed.

a. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material that, in the opinion of the Architect, may be injurious to the finish floor material.

3.02 FINAL CLEANING

A. "Clean," for the purpose of this article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.01 above.

C. Site:

1. Unless otherwise specifically directed by the Architect, broom clean paved areas on the site and public paved areas adjacent to the site.

2. Completely remove resultant debris.

D. Structures:

1. Exterior:

a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.

b. Remove all traces of splashed materials from adjacent surfaces.

c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.

d. In the event of stubborn stains not removable with water, the Architect may require light sandblasting or other cleaning at no cost to the Owner.

2. Interior:

a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.

b. Remove all traces of splashed material from adjacent surfaces.

c. Remove paint drippings, spots, stains, and dirt from finished surfaces.

3. Glass: Clean inside and outside.

4. Polished surfaces: To surfaces requiring routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.

E. Schedule final cleaning as accepted by the Architect to enable the Owner to accept a completely clean Work.

3.03 CLEANING DURING OWNER'S OCCUPANCY

A. Prior to the Owner occupying the Work or any portion thereof prior to the completion of the total project by the Contractor, the Contractor shall perform final cleaning for the area to be turned over in accordance with the General Requirements of the Contract.

B. The Owner and Architect shall walk the limits of the area to be occupied and determine a punch list with expressly identified limits of area to be released. Once the area is accepted and occupied, the contractor shall be released from general cleaning except as required by the completion of the punch list items.

***** END OF SECTION *****

SECTION 01 77 00
PROJECT CLOSEOUT

PART 1 – GENERAL

1. DESCRIPTION

A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1. Inspection procedures.
2. Project record document submittal.
3. Operating and maintenance manuals submittal.
4. Submittal of warranties.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in the technical specification sections.

C. Refer to section 01 99 99 for an acceptable binder cover page template.

2. SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Price.

    a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
2. Advise the Construction Manager of pending insurance change-over requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
4. Obtain and submit releases enabling the District unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
5. Deliver tools, spare parts, extra stock, and similar items.
6. Complete start-up testing of systems, and instruction of the District's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mockups, and similar elements.
7. Complete final clean up requirements.

B. Inspection Procedures: On receipt of request for inspection, the Architect and/or Engineer will either proceed with inspection or advise the Contractor of unfulfilled requirements. The Architect and/or Engineer will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Architect and/or Engineer will repeat inspection when requested and assured that the Work has been substantially completed.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

3. RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect and/or Engineer's reference during normal working hours.

B. As-Built Drawings: Produce and maintain a clean, undamaged set of "E" size Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies from the Work as originally shown. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark changes to the Documents caused by RFI responses with RFI designation.
2. Mark changes to the Documents caused by Bulletins with Bulletin designation.
3. Mark new information that is important to the District, but was not shown on Contract Drawings or Shop Drawings.
4. Note related Change Order numbers where applicable.
5. Organize As-Built drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written Construction Documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

1. Upon completion of the Work, submit record Specifications to the District's Representative for approval and corrections. Upon acceptance, resubmit for the District's use.

D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation. Note related Changes Orders and markup of record drawings and Specifications.

1. Upon completion of markup, submit complete set of record Product Data to the District's Representative for approval and correction. Upon acceptance, resubmit for the District's use.

E. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous recordkeeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the District's Representative for approval and correction. Upon acceptance, resubmit for the District's use.

F. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2 inch, 3-ring vinyl covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Submit one complete set of original manufacturer's maintenance and operational manuals to the District's Representative for approval and corrections. Upon acceptance, resubmit for the District's use a minimum of four (4) complete original manufacturer's sets. Include the following types of information:

1. Emergency instructions.
2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Recommended "turn around" cycles.
6. Inspection procedures.
7. Shop Drawings and Product Data.
8. Manufacturer Contact Information
9. Prime Contractor Contact Information

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the District's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.

END OF SECTION

SECTION 01 78 36
WARRANTIES AND BONDS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

B. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.

C. Provide one (1) year warranty for workmanship, product and materials **unless** noted differently in the respective specification section.

D. Certifications and other commitments and agreements for continuing services to the District are specified elsewhere in the Contract Documents.

E. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

F. Further to Item E above, it is specifically required and acknowledged by this Contractor that warranty periods on all equipment commences from date of **County's acceptance of the equipment and/or from the date of Substantial Completion**, whichever is later. Therefore, startup of equipment and/or the use of equipment during construction shall not be construed as the qualifier for warranty period start.

1.2 DEFINITIONS

A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the District.

B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the District.

1.3 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the District has benefited from use of the Work through a portion of its anticipated useful service life.

D. District's Recourse: Written warranties made to the District are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the District can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The District reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

E. The District reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entitles required to countersign such commitments are willing to do so.

1.4 SUBMITTALS

A. Submit written warranties to the District's Representative prior to the date certified for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Engineer.

1. When a designated portion of the Work is completed and occupied or used by the District, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within fifteen days of completion of that designated portion of the Work.

B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the District through the District's Representative for approval prior to final execution.

C. Form of Submittal: At Final Completion compile four (4) copies of each required warranty and bond properly executed by the Contractor, or by the Contractor's subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual. Use a form acceptable to the District.

D. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½ inch by 11-inch paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.

2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the Project title or name, and the name of the Contractor. Refer to section 01 99 00 for an acceptable closeout cover page template.

3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION NOT USED

END OF SECTION

SECTION 01 99 99
FORMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Certificate of Stored Materials
B. Change Order Request (COR) for Prime Contractors
C. Change Order Request (COR) for Subcontractors
D. Guarantee Form
E. Safety Orientation Form
F. Submittal Cover Sheet
G. SWPPP Inspection Log
H. Systems Shutdown / Off Hour Work Request
I. Testing & Inspection Request
J. Time & Material Daily Report - for Added Work
K. Closeout Document For (Cover Sheet)
L. Jobsite Safety Meetings/Inspection Report

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION

3.1 Certificate of Stored Materials

A. This form must be notarized, executed and submitted with Application for Payment when Contractor is billing for stored materials.

3.2 Change Order Request (COR) for Prime Contractors

A. All COR's must be submitted on this form. No other form will be accepted.

3.3 Change Order Request (COR) for Subcontractors

A. All COR's must be submitted on this form. No other form will be accepted.

3.4 Guarantee Form

A. This form must be submitted with the final payment application and provides the Contractor's guarantee that the Work was completed as specified and will remain so.

3.5 Safety Orientation Form

A. The Safety orientation form is included as a sample and not necessarily all inclusive. Contractor shall have each construction worker fill in and sign a Contractor **generated** form before they start work. Each form shall be submitted to the County Representative monthly.

3.6 Submittal Cover Sheet

A. All submittals shall be submitted on this form. No other form will be accepted. Submittals will be returned to Contractor for compliance.

3.7 SWPPP Inspection Log

A. Required monthly for inspection of Storm Water Pollution Prevention Plan status.

3.8 System Shutdown/Off Hour Work Request

A. This form is used to request Systems Shutdown / After Hours Work. One (1) week notice required.

3.9 Testing & Inspection Request

A. This form must be submitted to the Inspector of Record at least forty-eight (48) hours in advance of any necessary Testing and Inspection on the project.

3.10 Time & Material Daily Report – For Added Work

A. Complete this Form each day for work assigned to a Field Work Directive. All labor, equipment and materials must be identified daily to be considered for a Change Event.

3.11 Closeout Documents Form (Cover Sheet)

A. Contactor must use/submit this form with their closeout package

3.12 Jobsite Safety Meeting/Inspection Report

A. This is a sample form only. Contractor may use their own.

END OF SECTION

Certificate of Stored Materials

To: County of Riverside
c/o Tilden-Coil Constructors

The below listed materials, supplies and equipment (hereinafter defined as material) are stored at

_____
Address

and can be inspected upon reasonable notification:

Stored Material Item - Description	Stored Location	Quantity	Invoice Value *

*Invoice copy attached (Attach additional sheets as needed.)
Contractor's Material Cost.....$
Total Cost (Invoice Value Plus Handling Cost).....$

Upon receipt of payment (payment defined as invoiced cost plus material handling cost without overhead and profit) as petitioned by Contractor's Application For Payment No. Item(s) , dated , the undersigned hereby certifies the following:

1. Full, clear and unencumbered title and ownership of the material is transferred, assigned and vested to County.
2. The material is to be held in trust for the benefit of County and for the exclusive use of County until such time as the materials are incorporated into the work. The Contractor reaffirms his continued obligation to store and protect the material until completion of the work. All cost related to the procuring, transporting, insuring and improving, repairing or leasing facilities for storage of material is the sole cost of the Contractor.
3. A current Certificate of Insurance coverage is attached or presently on file with County.
4. The Certificate of Stored Materials shall constitute a Bill of Sale if accompanied by proof of payment for the referenced materials.

As evidence and surety of this obligation and for the protection of County, the Contractor (see County Contract) will provide and maintain an "ALL RISKS" insurance policy for the invoice value of material. Further, the Contractor agrees to be responsible and accountable for any and all damage to or destruction of the material, insurance coverage notwithstanding.

Sworn to and subscribed before me this
_____ day of _____, _____
Day *Month* *Year*

_____
Notary Public

My commission expires: _____

Contractor:

_____
Company Name

By: _____
Authorized Signature

Title: _____

Date: _____

Change Order Request (COR) for Prime Contractors

Project: **NUVIEW LIBRARY REPLACEMENT PROJECT**

Date: _____

Reference: IB #: _____ FWD #: _____ RFI #: _____

Description of Work: _____

Contractor: _____ **Contractor's Reference #:** _____

1. Material Cost (attach backup)		_____
3. Sales Tax	_____ %	_____
4. Freight and Delivery Expense (Attach Backup)		_____
Subtotal:		
Mark up (15% max - Not Allowed on Allowance Allocations):		
Material/Equipment/Tools Subtotal:		_____
5. Direct Labor (attach backup)		
Classification _____		
Man Hours @ $ _____		_____
6. Overtime (attach backup)		_____
7. Payroll Taxes and Insurance (Liability & Property Damage Insurance, Worker's Comp., Social Security, and Unemployment Taxes) - (attach backup) Refer to labor wage break down form		_____
Subtotal:		
Mark up (15% max - Not Allowed on Allowance Allocations):		
Labor Subtotal:		_____
8. Subcontract Work (attach backup)		_____
Subtotal:		
Mark up (5% max - Not Allowed on Allowance Allocations):		
Subcontract Subtotal:		_____
CHANGE REQUEST SUBTOTAL:		_____
9. Payment & Performance Bonds @ 1% (do not add for changes paid from Allowance)		_____
CHANGE REQUEST GRAND TOTAL:		_____

Notes: Prices Firm for _____ days

A Contract Time Extension of _____ days is requested (attach schedule analysis)
Time extension will be granted for critical path related activities.

Prepared by: _____ *Date:* _____

Approval: _____ *Date:* _____

Change Order Request (COR) for Subcontractors

Project: NUVIEW LIBRARY REPLACEMENT PROJECT

Date: _____

Reference: IB #: _____ FWD #: _____ RFI #: _____

Description of Work: _____

Contractor: _____ **Contractor's Reference #:** _____

1. Material Cost (attach backup)		_____
3. Sales Tax	_____ %	_____
4. Freight and Delivery Expense (Attach Back-up)		_____
Material/Equipment/Tools Subtotal:		_____
6. Direct Labor (attach backup)		
Classification	_____	
Man Hours @	$ _____	_____
7. Overtime (attach backup)		_____
8. Payroll Taxes and Insurance (Liability & Property Damage Insurance, Worker's Comp., Social Security, and Unemployment Taxes) - (attach backup) Refer to labor wage break down form)		_____
Labor Subtotal:		_____
Misc. Subtotal:		_____

CHANGE REQUEST SUBTOTAL:

Mark Up (15% max): _____

CHANGE REQUEST GRAND TOTAL: _____

Notes: Prices Firm for _____ days

A Contract Time Extension of _____ days is requested (attach schedule analysis)

Prepared by: _____ *Date:* _____

Approval: _____ *Date:* _____

County of Riverside

GUARANTEE FORM

_____ (Contractor's Name) hereby unconditionally guarantees that the work performed for the **NUVIEW LIBRARY REPLACEMENT PROJECT** has been done in accordance with the requirements of the Contract and therefore further guarantees the work of the contract to be and remain free of defects in workmanship and materials for a period of one (1) year from the date of completion of the contract, unless a longer guarantee period is called for by the Contract Documents, in which case the terms of the longer guarantee shall govern. The Contractor hereby agrees to repair or replace any and all work, together with any other work which may have been damaged or displaced in so doing, that may prove to be not in accordance with the requirements of the Contract or that may be defective in its workmanship or materials within the guarantee period specified, without any expense whatsoever to the County, ordinary wear and tear and unusual abuse and neglect only excepted. The Contractor has provided contract bonds which will remain in full force and effect during the guarantee period.

The Contractor further agrees that within ten (10) calendar days after being notified in writing by the County of any work not in accordance with the requirements of the contract or any defects in the work, he will commence and prosecute with due diligence all work necessary to fulfill the terms of this guarantee, and to complete the work within a reasonable period of time. In the event he fails to so comply, he does hereby authorize the County to proceed to have such work done at the Contractor's expense and he will pay the cost thereof upon demand. The County shall be entitled to all costs, including reasonable attorneys' fees, necessarily incurred upon the Contractor's refusal to pay the above costs.

Notwithstanding the foregoing paragraph, in the event of an emergency constituting an immediate hazard to the health or safety of the employees of the County, or its property or licensees, the County may undertake at the Contractor's expense without prior notice, all work necessary to correct such hazardous condition when it was caused by the work of the Contractor not being in accordance with the requirements of this contract, or being defective, and to charge the same to the Contractor as specified in the preceding paragraph.

The guarantee set forth herein is not intended by the parties, nor shall it be construed, as in any way limiting or reducing the County's rights to enforce all terms of the contract referenced hereinabove or the time for enforcement thereof. This guarantee is provided in addition to, and not in lieu of, the County's rights on such contract.

_____
CONTRACTOR'S SIGNATURE

Representative to be contacted for services:

Name: _____

Address: _____

_____

Office No.: _____

Mobile No.: _____

Fax No.: _____

SAFETY ORIENTATION FORM

1. Mandatory that all employees attend Weekly jobsite safety meetings.
2. Subcontractors are to have their own weekly safety meeting or toolbox meeting.
3. Drug free workplace. The use, possession or distribution of drugs, and or alcohol and or being under the influence is not permitted on jobsite. Weapons are not permitted. May be the cause of immediate termination.
4. Hard hats are required and must be worn at all times with bill forward for eye and face protection. No metal hard hats.
5. Long pants, shirts with minimum 4 inch sleeves, (no tank tops, belly shirts or sleeveless shirts) and work boots are mandatory.
6. Employee shall use eye protection, safety protection, safety glasses, providing side protection at all times. Person wearing corrective eye lens glasses must wear side protection.
7. Employees shall be trained in and shall use safe lifting techniques. Use moving equipment, hand truck, forklift, etc.
8. Employees shall be provided by employer with any Personal protective equipment (PPE) to maintain their exposure within acceptable limits.
9. Report all injuries to your supervisor immediately and on site safety manager (Herb Sollars).
10. MSDS are required for all chemical used on jobsite.
11. Entertainment radios are not permitted on this site period.
12. All equipment must have working seat belts fire extinguisher, back up alarm, and equipment must be in working condition.
13. All equipment operators will be wearing seat belts at all times.
14. No riders on equipment or in the back or tail gates of truck, NO SEAT BELTS! NO RIDE!
15. All material shall be properly stored, secured and be protected from the weather and winds.
16. All cranes shall be equipped with anti-two block device and have current certifications for crane and operator.
17. All operators must be certified.
18. Report any fuel, hydraulic fluid or other hazardous substance spills to supervisor, for prompt proper clean up disposal.
19. Use only O.S.H.A. approved fuel containers with self-sealing lids. No jerry or plastic cans. Turn off equipment before refueling.
20. Fuel tanks and bulk chemicals shall be stored in prepared containment area.
21. Protruding nails in scrap boards and planks shall be removed, hammered in or bent over flush with the wood.
22. Housekeeping, work areas and means of access shall be maintained daily and continually. Properly dispose of trash, including lunch, debris, bottles, cans, bag etc.
23. Graffiti will not be tolerated. Do not urinate on jobsite or in building, violator will be terminated. Use portable restrooms.
24. Contractors to supply their workers with cool drinking water. Common water containers must be supplied with paper cups dispenser and cups with waste containers for used cups. No one is to drink directly from common water.
25. All electrical supplies must have GFCI (Ground Fault Circuit Interrupter). No defective electrical power cords or cable, no cuts, patch repairs, tape, oil-soaked and exposed wire, shall be used. Protect power cord from vehicles traffic.
26. Power and air tools are to be in good working condition. All safety devices are to be intact and in working order. No modifications.

27. Powder actuated (explosive tools: only qualified operators shall operate tools. Trained passed written test, & possesses card. Operator will ensure proper signage is visible in areas being worked on and fellow workers are notified prior to work being conducted
28. 100%fall protection is required for all elevations of six feet (6') or more. Full body harness shall be worn and lanyard attached to the boom or basket, when working from an aerial lift. Tie off points must withstand 5,0001b.impact.
29. Delineate 6 feet from roof leading edges warning systems for workers on roof. Outside delineation requires fall protection.
30. Fall recovery plan, for person falling off building in harness.
31. Barricading and delineating below work areas.
32. Lock out tag out -electric, gas, and others.
33. Welding and cutting systems utilizing cylinder-hose-torch shall have reverse flow check valve, on each hose between the torch and the regulator. Gas cylinders shall be secured in an. upright position at all times. Fire extinguisher shall be available
34. Compressor: hose shall be equipped with anti whip check devices and quick make up connections shall be secured with a safety lashing. Wire is not acceptable. Defective hoses shall be removed from service.
35. Scaffolding to be inspected daily by competent person. Handrails, mid rails and 4 inch toe boards are to be placed. Fully planked. Secured to scaffolding access ladders shall be secured and or stairways are to be provided. No climbing on scaffolding framing scaffold to be secured to structure. Housekeeping shall be continually.
36. Ladders are to be inspected and in good condition, properly secured- tied off. Use only wooden or fiberglass ladders, no aluminum ladders. Potential for electrical shock. Extend three feet (3') over platform. Defective ladders tagged and removed. Always face the ladder when using it keeping a three point of contact at all times. DO NOT carry tools in hand, use both hands to ascend and descend ladder. Do not use an "A" frame ladder to lean against a wall vertical structure.
37. Violators of safety and health requirements will be written up and repeated violators will be removed from jobsite.
38. NO SMOKING ONSITE. NO EXCEPTIONS!

REQUIRED SAEFTY PPE	YES	NO	INITIAL
Hard Hats			
Safety Glasses			
Safety Vests			
Safety Gloves			
Safety Boots			

THIS IS A WRITTEN CONTRACT ENSURING I HAVE A FULL UNDERSTANDING OF THE SAFETY RULES AND REGULATIONS SET FORTH BY TCC AND I AGREE TO ABIDE ALL REGULATIONS WHILE ON JOBSITE. I ALSO UNDERSTAND I MAY BE REMOVED FROM JOBSITE FOR REPEATED OR SERIOUS VIOLATION(S).

Print: _____

Signature: _____ Date: _____

Company: _____

Title: _____

COUNTY OF RIVERSIDE
SUBMITTAL COVER SHEET

PROJECT NAME: NUVIEW LIBRARY REPLACEMENT PROJECT

Contractor: _____ **Date:** _____

Product Manufacturer: _____

Specification Section: _____

Sub Section No:	_____	Section Description:	Product Data
Sub Section No:	_____	Section Description:	Samples
Sub Section No:	_____	Section Description:	_____
Sub Section No:	_____	Section Description:	_____
Sub Section No:	_____	Section Description:	_____

* Submittal item noted as required and is forthcoming

CHECK ONE OF THE FOLLOWING:

____ Specified Material (7 copies + as required by Contractor)

____ Proposed Equal (Attach Substitution Request Form)

CONTRACTOR'S REVIEW

The Contractor has reviewed and approved the field dimensions and construction criteria of the attached submittal. The Contractor has verified that the submittal includes notations of any portion of the work depicted in the submittal which is not in strict conformity with the contract documents. The information in the attached submittal has been reviewed and coordinated by the Contractor with information included in other submittals.

REVIEWED AND SUBMITTED BY: _____

(Signature) (Date)

OWNER'S REPRESENTATIVE REVIEW

Reviewed By _____ Date_____

Project Name _____

TCC Submittal No. _____

_____ Reviewed for Completeness
_____ Incomplete Submittal
_____ Not Reviewed

Comments _____

SWPPP Inspection Log

Project Name & Contract No: NUVIEW LIBRARY REPLACEMENT PROJECT - Contract No. _____

Contractor Name:

Date	Inspection Type				Comments / Signature
	Pre-Storm	Storm	Post-Storm	Weekly	

Pre-Storm - Inspect site prior to forecast storm - using inspection checklist Attachment H
Storm - Inspect site 24-hour intervals during rain events - using inspection checklist Attachment H
Post-Storm - Inspect site after a rain event that causes runoff from construction site - using Inspection Checklist Attachment H
Weekly - Inspect site weekly - using Inspection Checklist Attachment H

County of Riverside
NUVIEW LIBRARY REPLACEMENT PROJECT
Systems Shutdown / Off Hour Work Request

Contractor Name: _____

Bid Category No./Name:_____

Instructions:

Complete this form one (1) week prior to the planned operation. Approved by the Company indicated above and the County or County's representative must be received **PRIOR** to executing the requested event. The approval of this request does not in any way authorize or approve additional project costs associated with these activities. This Form is used to assist in planning, scheduling and coordinating construction activities required by the project located on the County site without disruption to normal County activities.

Date Submitted: _____ **Requested Start Date / Time :** _____ **End Date / Time:** _____
Estimated Duration: _____**Hrs**

This Request is for: Site Utility Shutdown ☐ Active Site Utilities Shut Down ☐ Off Hours Work ☐

Utility status during activity: Active ☐ Inactivate ☐ **Construction Trades Involved**: _____

OSHA and **Site** Safety requirements discussed, reviewed and acknowledged to be in place: Yes ☐ No ☐

Event Description in Detail

Scope of Work	
Supervision Requirements	
Location of Work	
Utility / Systems Impacted	
Work to Complete prior to shutdown activities	
Special Materials or Equipment	
Impacted Trades	

Submitted by _____ Title: _____ Contractor: _____

Additional Information Attached: Yes ☐ No ☐

Approvals:

Tilden-Coil: By: _____ Title_____ Date: _____

County of Riverside: By: _____ Title_____ Date: _____

TESTING AND INSPECTION REQUEST

TO BE SUBMITTED 24 HOURS IN ADVANCE

Request No. _____ **Date of Issuance:** _____

County of Riverside

Contractor: _____ Inspection Required By: _____
(DATE AND TIME)

P. O. No.: _____ Inspection Required By: _____
(LAB, DSA INSPECTOR, OTHER)

Contract For: _____ Engineer / Architect: _____

We are hereby requesting the following Test and / or Inspection:

Description of Test / Inspection required:

Method of Testing and Inspection Performed:

Testing and Inspection Performed by:

- ☐ Testing and Inspection Laboratory
- ☐ DSA Inspector
- ☐ Bovis Lend Lease Superintendent
- ☐ Other

Results of Tests / Inspection:

Attachments / supporting documents:

- ☐ Contractor is hereby released to proceed with work in area(s) indicated above
- ☐ Contractor is hereby ordered to correct work as described above before proceeding with work in areas(s) indicated above
- ☐ Other: _____

_____

Date: _____

Time & Materials Daily Reports - For Added Work

County of Riverside
NUVIEW LIBRARY REPLACEMENT PROJECT

Contractor Name: _____

Bid Category No./Name: _____

Instructions:
Complete this form each day for work (Time and Materials) assigned to a Field Work Directive (FWD). All labor, equipment and materials must be identified daily to be considered for a Change Event. This Form must be signed by the designated Tilden-Coil Representative or Inspector of Record, each day, to be a valid representation of work performed on this day and associated with the issued FWD.

Contractor: _____ **Date Submitted:** _____

Issued FWD # _____

Brief Description of Work Performed Today:

Labor

Total Men	List by Trade	Man Hours	Work Area Designation / Location

Equipment

Type	Description	Hours Used

Time & Materials Daily Reports - For Added Work

Materials

Qty	Description	Trade

Remarks:

Additional Information Attached: Yes ☐ No ☐

Approvals:

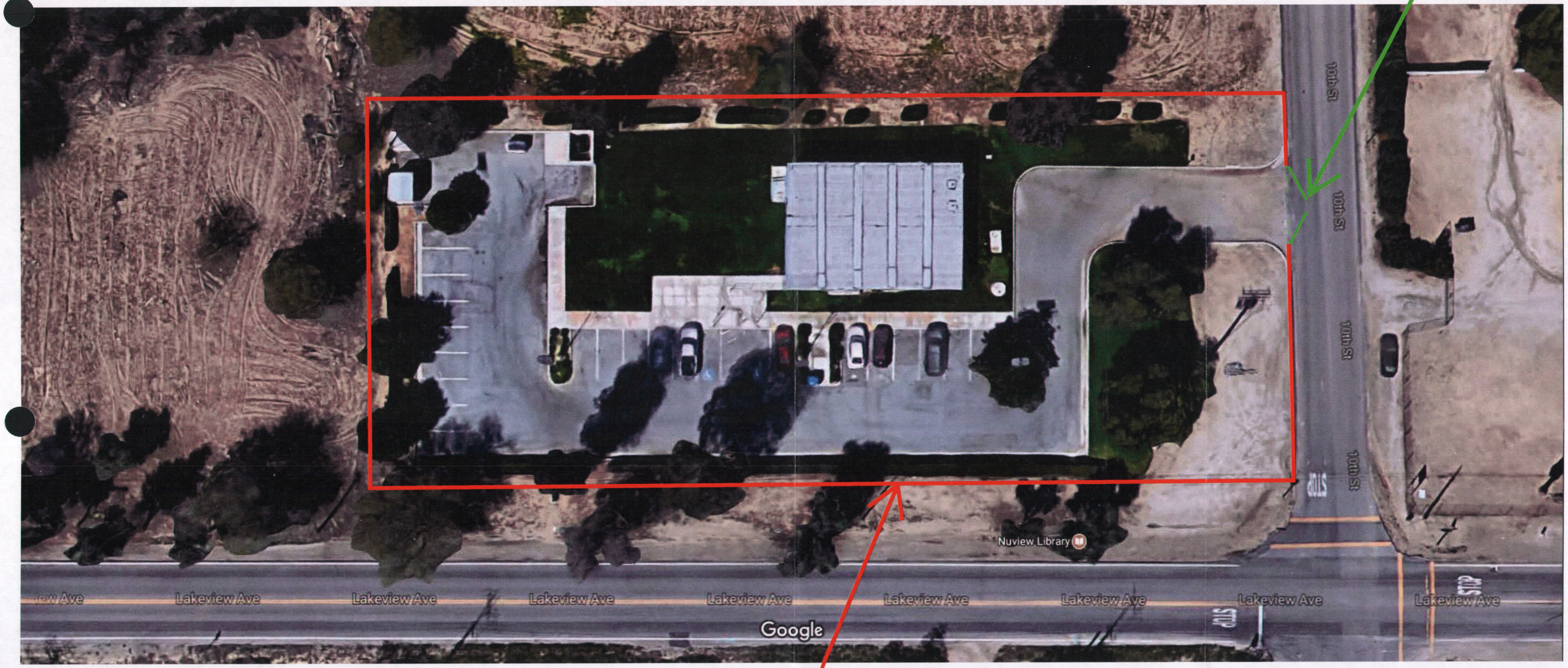
Tilden-Coil: By:_____ Title_____

Date:_____

Inspector of Record: By:_____ Title_____

Date:_____

Appendix C - Logistics Plan



NUVIEW LIBRARY REPLACEMENT PROJECT
COUNTY OF RIVERSIDE

CLOSEOUT DOCUMENTS FOR:

SPECIFICATION SECTION(S): _____

DATE:_____

- **Bid Category Contractor #:** _____
- **Submitted By:** _____

Prepared by: _____
Verified for Completeness by: _____
Signature/Date: _____

JOBSITE SAFETY MEETING/INSPECTION REPORT

Project Name: COUNTY OF RIVERSIDE – NUVIEW LIBRARY REPLACEMENT PROJECT

Bid Category Contractor: _____
Date:_____

Time Start:_____
Time Finish_____

Topics Discussed_____

_____

_____

_____

Comments& Suggestions_____

_____

_____

Corrections Made_____

_____

_____

Inspection and meeting report by:_____

_____

- **Inspection to be performed every 5 working days (weekly) by the Superintendent**
- **All participants in safety meeting to sign at bottom of this form.**
- **Weekly report to be forwarded to Construction Manager.**
- **Use additional paper if required to describe incidents, hazards, near misses or corrections made or other items inspected.**

Inspection
Date_____ **Location**_____

Job#_____

For each "NO" entered there should be a follow up with the correction column checked upon completion of the correction

SAFETY CHECKLIST

General	**Y/N**	**Corr.**	**N/A**
Osha log #300 posted in field office			
State required posters are displayed in field office			
MSDS Manual is maintained in the office			
Properly supplied first aid kit			
Fire extinguisher in field office and on site			
Emergency procedures and phone numbers posted			
Hospital map posted in field office			
Flammable liquids clearly marked and properly stored			
Site and General Liability	**Y/N**	**Corr.**	**N/A**
Hard hats/Safety Vests being worn			
Barricades and fencing installed			
General area illumination			
Public traffic patterns in place and controlled			
Signs, flagmen and other controls used			
Housekeeping and Miscellaneous	**Y/N**	**Corr.**	**N/A**
Material neatly piled			
Passageways and aisles kept clear			
Debris well controlled and being disposed of properly			
Combustibles properly stored			
Oil or grease on floors removed			
Adequate sanitary facilities provided			

Drinking water provided for employees			
Tools and Equipment	**Y/N**	**Corr.**	**N/A**
Defective tools turned in and tagged as unsafe			
Personal protective equipment inspected			
Personal protective equipment used			
Power tool guards in place			
Ladders, Stairs and Walkways	**Y/N**	**Corr.**	**N/A**
Ladders extends 36" above landing and is tied off			
Ladder shoes set properly			
Ladders set at proper pitch of 4:1			
All stairways equipped with handrail			
All walkways over 6' in height equipped with guardrail			
Steps and landings clear of debris			
Ladders in trenches 4' deep or more and spaced at least every 25'			
Fall Protection	**Y/N**	**Corr.**	**N/A**
All roof and floor openings are protected with effective covers or railings and toeboards			
All roof and floor covers are properly marked and secured down			
Guardrails on all open sided floors and floor runways			
Scaffold inspection, bases, rails, planking, x-bracing, tie-off to building			
Personal fall restraint system being used as required			
Inspection of Personal fall restraint system			
Bar guards or approved protection installed on impalement hazards			
Excavations	**Y/N**	**Corr.**	**N/A**
Soil type has been identified by competent person			
Ladders in trenches 4' deep or more and spaced no more than every 25'			
Excavation properly sloped or shored			
Soil stockpile safe distance from excavation			
Shoring and shield systems in place			
Electrical	**Y/N**	**Corr.**	**N/A**
Light strings have bulb guards in place			

Ground fault receptacles at all temporary power locations			
Danger high voltage signs placed at electrical rooms			
Electrical panels energized have been tagged/locked off to unauthorized access			
Cords and wires regularly inspected and unmodified			
Construction areas illuminated			
Additional Inspections	**Y/N**	**Corr.**	**N/A**

Attendee Name/Signatures:

NAME	SIGNATURE

Check list completed by
[PRINT]:_____

Signature of Responsible/Competent Person:_____

SECTION 02 41 13

SELECTIVE DEMOLITION AND RECONSTRUCTION

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Requirements apply to this section.

1.02 SCOPE OF WORK

A. Work included:

1. Carefully demolish and remove from the site those items scheduled to be so demolished and removed. Furnish materials and perform labor required to execute this work as required by the Drawings and/or as specified and as necessary to complete the Contract, including, but not limited to, these major items:

    a. Protection of existing work to remain.

    b. Barricades, lights, signs and safety precautions required by governing codes.

    c. Removal and disposition of all material resulting from this work, except materials to be stored for Owner.

    d. Patching as necessary to match existing.

    e. Saw-cutting existing concrete and asphalt concrete.

    f. Cleaning existing items to remain.

    g. Relocation of existing items as necessary to provide for new construction and as required by the Drawings.

    h. Removal and/or relocation of utility lines (water, electric, sewer) as required by the Drawings, and such lines not shown but encountered in the course of the work.

    i. Removal and/or relocation of existing irrigation lines.

B. Related scope: All new work

1.03 GENERAL REQUIREMENTS

A. Codes: Perform all work in accordance with the Codes listed in the Contract Documents and as required by local governing authority.

B. All bidders submitting bids for this work shall first examine the site and all conditions and limitations thereon and thereabouts. Bid shall take into account all such conditions and limitations, whether or not the same are specifically mentioned in any of the contract documents and every bid shall be construed as including whatever sums are needed to complete the work in every part as shown, described, or reasonably required or implied, and attain the completed conditions contemplated by the Contract. The demolition drawings, including demolition work shown on construction drawings, shall be considered as a guide only. The exact extent of the demolition and reconstruction work shall be determined by a site visit and investigation.

C. Partial removal: Items scheduled to be removed and of salvageable value to Contractor, excluding those items to be retained by the Owners, may be removed from the structure as work progresses. Salvaged items must be transported from site as they are removed.

Storage or sale of removed items on site will not be permitted.

D. Noise control: Carry on all work in a manner which will produce the least amount of noise.

Instruct all workmen in noise control procedures.

E. Items of existing work indicated to remain upon completion of the Contract, but which require removal to complete the work, shall be carefully removed and replaced upon completion. The replaced work shall match its condition at the start of the work.

1.04 QUALITY ASSURANCE

Use adequate numbers of skilled workmen 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.

1.05 SUBSTITUTIONS

Substitutions will be considered Section 01 25 00.

1.06 SUBMITTALS

Provide in accordance Section 01 33 00.

PART 2 -- PRODUCTS

Provide as necessary for proper completion of this Work.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 GENERAL PROVISIONS

A. By careful study of the Contract Documents, determine the location and extent of selective demolition to be performed.

B. In company with the Architect and Owner, after receiving Notice to Proceed, visit the site and verify the extent and location of selective demolition required.

1. Carefully identify limits of selective demolition.

2. Mark interface surfaces as required to enable workmen also to identify items to be removed and items to be left in place intact.

C. Take into consideration as necessary work, all obvious existing conditions and installations on the site as though they were completely shown or described. Accept the site of the work as it exists and clear obstructions to the work shown.

D. Examine the site and all conditions and limitations thereon and thereabouts. Take into account all such existing conditions and limitations whether or not the same are specifically shown or mentioned in any of the Contract Documents and include whatever is needed to complete the work in every part as shown, described or reasonably required or implied to attain the completed condition contemplated by the Contract.

E. Prepare and follow an organized plan for demolition and removal of items.

1. Shut off, cap, and otherwise protect existing public utility lines in accordance with the requirements of the public agency or utility having jurisdiction. Review plans, and

confer with the Architect, to determine which lines are to be abandoned and which are to be kept active.

2. Completely remove items scheduled to be so demolished and removed, leaving surfaces clean, solid, and ready to receive new materials specified in other Sections of these Specifications.

3. In all activities, comply with pertinent regulations of governmental agencies having jurisdiction.

F. Demolished material shall be considered to property of the Contractor and shall be completely removed from the job site. Do not store or permit debris to accumulate on the site. Burning of removed materials from demolished operations will not be permitted on site.

3.03 POLLUTION CONTROLS

A. Use temporary enclosures and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

B. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations, as directed by Architect or governing authorities. Return adjacent areas to condition existing prior to start of work.

3.04 PROTECTION

A. Site security: Erect wire or solid wood fences, barricades, warning lights and signs as required by the governing building code, to protect all manner of person from injury, to prevent trespassing, and to prevent theft or damage to the work.

B. Protection of work to remain: Use stakes, barricades, and such other means of protection as required to prevent damage to existing work and equipment to remain.

C. Protect all landscaping scheduled to remain.

D. Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.

1. Erect temporary covered passageways as required by authorities having jurisdiction.

2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of building structure to remain.

3.05 TRAFFIC

A. Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

B. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

3.06 UTILITY SERVICES

A. Maintain existing utilities, keep in service, and protect against damage during demolition operations.

B. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

3.07 REPLACEMENTS

A. In the event of demolition of items not so scheduled to be demolished, promptly replace such items to the acceptance of the Architect and at no additional cost to the Owner.

B. Patch and fill holes caused by removal of piping and conduit in concrete slabs, and concrete walls with 3,000 psi concrete; level flush with adjacent surfaces.

3.08 ASPHALT CONCRETE PAVEMENT

All asphalt concrete pavement damaged, cut, trenched, etc. and any base material under the pavement shall be replaced and/or repaired using same specifications as existing pavement.

3.09 REMOVED MATERIALS TO BE SALVAGED OR REUSED

A. Materials to be salvaged will be noted as such on the Construction Drawings. Existing Vertical blinds shall be included in salvage. Where room sizes match blind sizes, Contractor to include reinstallation of blinds as directed by Owner. Blinds shall be cleaned prior to reinstallation.

B. Exercise extreme care when removing materials to be salvaged or reused. Use only mechanics skilled in the appropriate crafts.

C. Store and protect salvaged materials until needed to be re-installed on the project, or deliver to Owner in good condition.

3.010 DEMOLITION

A. Asphalt Concrete: Remove existing asphalt concrete and base material scheduled to be removed and prepare surface in accordance with Section 02510. All edges shall be saw-cut in straight and true lines.

B. Concrete: Exercise due caution in cutting and/or patching concrete so as not to damage or deface that portion of the existing structure which is to remain. Should any such impairment occur, immediately clean or restore to original condition at no cost to Owner.

3.011 RECONSTRUCTION - GENERAL

A. By careful study of the Contract Documents, determine the location and extent of reconstruction to be performed.

B. In company with the Architect, visit the site and verify the extent and location of reconstruction required.

C. Inspect existing surfaces to determine required surface preparation procedures.

D. Plumbing and Electrical: In any case where a new line may tie into and extend existing line within the limits of the reconstruction Work, Contractor shall examine the entire existing line and determine whether the new Work will be adversely affected by it, and notify Architect of any such defect before tying in.

3.012 IN ALL RECONSTRUCTION WORK

Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

*****END OF SECTION*****

SECTION 03 50 80

UNDERSLAB VAPOR BARRIER

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

A. Division 0, Contract requirements and Division 1, General Conditions apply to this section.

B. This Section describes the requirements for furnishing and installing moisture barrier and sand under concrete slabs-on-grade.

C. Related Sections:

1. Prepare subgrade according to Section 02 20 00 and/or the Soils Report.
2. Concrete is specified in Section 03 30 00.

1.02 SUBMITTALS

A. Provide in accordance with Section 01 33 00.

B. Product Data: Include independent laboratory test results showing compliance with ASTM and ACI Standards. Include manufacturer's installation instructions for placement, seaming, and pipe boot installation.

1.03 SUBSTITUTIONS

Substitutions will be considered per Section 01 25 00.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

Protect products against damage during field handling and installation.

PART 2 -- PRODUCTS

2.01 MANUFACTURERS

A. Stego Wrap Vapor Retarder by Stego Industries

B. Vapor-Block by Raven Industries

C. Architect approved equal

2.02 MATERIALS

A. Vapor Retarder must have the following qualities:

1. 10 mil thickness minimum.
2. Permeance of 0.01 UP perms as tested by ASTM E154.
3. Puncture resistance of 2,600 grams per ASTM D1709, Method B.
4. ASTM E 1745 Class A (Plastics) after conditioning testing.

B. Vapor Retarder Tape:

1. Water Vapor Transmission Rate :ASTM E 96, 0.3 perms or lower
2. Minimum 8-mils thick
3. Minimum 4 inches wide
4. Manufactured from High Density Polyethylene
5. Pressure Sensitive Adhesive

C. Pipe Boots: Construct from vapor barrier sheeting material and pressure sensitive tape in accordance with manufacturer's instructions.

D. Sand: Clean yard sand, free from excessive dirt, debris, organic matter, and fines smaller than No. 200 sieve size.

PART 3 -- EXECUTION

3.01 INSPECTION

A. Below grade and grading work and items penetrating moisture barrier shall be completed prior to start of installation.

B. Examine the areas and conditions under which work of this Section will be performed.

C. Correct conditions detrimental to timely and proper completion of the Work.

D. Do not proceed until unsatisfactory conditions are corrected.

E. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION REQUIREMENTS

A. Vapor Barrier Sheeting:

1. Install in accordance with manufacturer's instructions and ASTM E1643.
2. Unroll with the longest dimension parallel with the direction of the pour.
3. Lap vapor barrier over footings and seal to foundation walls.
4. Overlap joints 6-inches and seal with pressure sensitive tape.
5. Seal penetrations, including pipes, with pipe boot.
6. Penetrations through vapor barrier sheeting except for reinforcing steel and permanent utilities are not permitted.
7. Repair damaged areas by cutting patches of vapor barrier sheeting, overlapping damaged area 6-inches and taping all four sides with pressure sensitive tape.

B. Sand Cushion:

1. Provide 2-inch layer over moisture barrier, unless otherwise indicated.
2. Spread over surfaces required and work to fill voids; leave in stable condition with finished surfaces reasonably uniform at established grade.

*****END OF SECTION*****

SECTION 03 10 00

CONCRETE FORMWORK AND ACCESORIES

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

A. Design, furnish and install forms for concrete as indicated on drawings and specified here. Remove forms and shores at specified time. Clean up.

1.03 RELATED WORK (See also Table of Contents)

A. Rough Carpentry: Section 06 10 00.

B. Structural Steel: Section 05 12 00.

C. Metal Fabrications: Section 05 50 00.

D. Items relating solely to mechanical or electrical work are included under those Divisions, except as specifically indicated otherwise on Drawings.

E. Reinforcing Steel: Section 03 20 00.

F. Cast-In-Place Concrete: Section 03 30 00.

1.04 QUALITY ASSURANCE

A. General:

1. Conform to all requirements of ACI 347 and CBC Section 1906.1 and 1906.2.

2. Concrete formwork shall be designed and constructed to safely support fluid concrete and superimposed construction loads without excessive deflection or concrete leakage. Provide bracing to maintain accurate alignment and to resist all anticipated lateral loads. Forms shall conform with drawings as to shape, line, and dimension. Design, engineering and construction of forms shall be Contractor's responsibility. Formwork for exposed concrete shall be constructed to tolerances indicated in ACI 303R.

3. Cooperate and coordinate with other trades who furnish and/or install piping, conduit, reglets, anchors, inserts, sleeves, hangers, etc., as their work requires; including provisions for recesses and chases.

B. Submittals:

1. Product Data. Provide manufacturers data and installation instructions for the following:

a. Tie rods and spreaders.

b. Formwork for exposed concrete.

c. Form coatings and release agents.

C. Standards and References: (Latest Edition unless otherwise noted)

1. Current California Building Code (CBC).

2. "Recommended Practice for Concrete Formwork", ACI 347, American Concrete Institute, latest edition.

3. Standard Grading and Dressing Rules #17, West Coast Lumber Inspection Bureau (For Douglas Fir Form Lumber).

4. U.S. Product Standard PS 1-83 (For Plywood Form Lumber).
5. "Guide to Cast-In-Place Architectural Concrete Practice", ACI 303R, American Concrete Institute, latest edition.

1.05 SUBSTITUTIONS

Substitutions will be considered per Section 01 25 00.

1.06 SUBMITTALS

Provide in accordance with Section 01 33 00.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Form Material:
   1. Smooth Concrete exposed to view: 5/8 inch minimum APA Plyform or steel.
   2. Concrete concealed from view: 5/8 inch minimum APA Plyform, steel or clean and sound 1 x 8 Standard Grade Douglas Fir.

B. Fiber Forms: Tubular column forms spirally constructed of laminated plies of fiber. Plies shall be laminated using a non-water sensitive adhesive and surface wax impregnated for moisture protection. Forms shall give a smooth and seamless appearance to the cast concrete. Provide reveals, as shown on the drawings, as supplied by the form manufacturer. Forms shall be as manufactured by Sonoco Products, plastic lined; Burke Smoothtube by Burke Co.; or approved equal.

C. Form Clamps: Assembly to have cone washers, (1 inch break back) 3/8" inch center rod.

D. Form Ties:
   1. Concrete exposed to view: Snap ties allowing full 1 inch break back.
   2. Concrete concealed from view: Snap ties or wire.
   3. Verify special spacing requirements with architectural drawings at exposed concrete.

E. Spreaders: Metal (no wood).

F. Form Coating: Non-grain and non-staining types of form coating that will not leave a residual matter on the face of the concrete or adversely affect proper bonding of any subsequent paint or other surface applications.
   1. Form coating containing mineral oils or other non-drying materials will not be permitted for any concrete work.

G. Joint Tape: No. 471 plastic film tape 3 inches wide, as manufactured by the Industrial Tape Division of 3M Company.

H. Expansion Joint Filler (Preformed): ½ inch thick; Flexcell by Celotex Corporation, Elastic Fiber Expansion Joint by Phillip Carey Mfg. Co., or Sealtight Fiber Expansion Joint by W.R. Meadows, Inc.

I. Extruded Polystyrene Foam: ASTM C578 type IV. Dow Chemical Corp. "Styrofoam", UC Industries "Foamular", or approved equal.

PART 3 – EXECUTION

3.01 FORM CONSTRUCTION

A. Construct substantial forms to the shapes, lines, grades and elevations shown, sufficiently tight to prevent leakage of mortar, and tied, clamped and braced to prevent spreading, shifting or settling. Plywood joints shall be square and tight; plywood shall be arranged in such manner as to minimize number of joints and to provide a smooth, attractive finished concrete surface.

B. Apply form coating to forms before reinforcing steel is in place.

C. Sleeves, anchors and bolts, including those for angle frames, supports, ties and other materials in connection with concrete construction, shall be secured in position before the concrete is placed.

D. Proper provisions shall be made for openings, blockouts, sleeves, offsets, sinkages, recesses and depressions required by other trades and suppliers prior to placing concrete.

1. The Contractor shall also see that sleeves have been installed and other provisions have been made for the installation of mechanical, electrical and other equipment.

2. Coordinate with all trades to insure proper placement of all items in forms and to provide proper blockouts wherever required.

E. Concrete work out of alignment, level or plumb will be cause for rejection of the whole work affected and, if so rejected, such work shall be removed and replaced, as directed by Architect, with no additional cost to the Owner.

F. Form Not Required: Concrete footings may be poured directly against cut earth where feasible and when the Architect's approval has been obtained.

1. See structural drawings for requirements for placing concrete footings directly against earth without forms.

G. Use ¾ inch minimum wood chamfer strips typical at all exposed corners unless noted otherwise on drawings.

3.02 CLEANING OF FORMS

A. All dirt, chips, sawdust, rubbish, water, etc. shall be completely removed from form by water hosing and air pressure before any concrete is deposited therein. No wooden ties or blocking shall be left in concrete except where indicated for attachment of other work.

B. Thoroughly clean and patch all holes in formwork and re-coat as required before reusing. Forms not suited to obtain concrete surfaces and tolerances in conformity with Contract requirements will be rejected by Architect.

1. Reuse of forming materials shall be limited only as required to produce the finishes as specified, free from blemishes and other defects unless covered by other building materials in which case blemish free concrete is not required.

3.03 INSPECTION OF FORMS

A. Notify the Architect at least 48 hours in advance of the beginning of pouring operations and at the completion of formwork and location of all construction joints. An inspection of forms and joints will be made for approval of finished work and general layout only. The foregoing inspection shall in no way relieve the Contractor of responsibility of design and safety or formwork, bulkheads and shorings.

3.04 REMOVAL OF FORMS AND SHORING

A. Do not remove forms until concrete has attained sufficient strength to support its weight and any construction loading. Concrete must be allowed to cure long enough to avoid damage during form removal. Contractor or his representative in charge of concrete construction shall

be present during removal of forms and shores, and shall be personally responsible for safety of this operation at all times and under all conditions.

B. As a minimum, formwork and shoring shall remain in place for the following periods:

1. Concrete on grade: 24 hours
2. Walls and Columns: 3 days
3. Formwork may be removed and reshores installed before the times indicated above, provided the concrete has cured sufficiently to avoid damage when formwork is removed. Shores must be immediately replaced with reshores in a sequence designed to avoid inducing stress in the concrete member.

3.05 ADJUSTING AND CLEANING

A. Upon completion of this Work, clean up and remove from Site all equipment and debris resulting from this work.

B. Surfaces to be painted shall be smooth and free of substances such as dirt, wax, excessive latence, grease or materials that would prevent proper bonding of finishes.

1. Removal of foregoing contaminants, and complete removal of parting and curing compounds affecting proper paint bond, shall be responsibility of this Section of Work. Sandblast cleaning shall not be employed without specific approval of Structural Engineer.

***** END OF SECTION *****

SECTION 03 20 00

REINFORCING STEEL

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

A. Unless noted otherwise, furnish and install reinforcing for all concrete, including dowels, chairs, spacers, bolsters, etc., necessary for supporting and fastening reinforcement in place as shown on the Drawings and specified herein.

1.03 RELATED WORK (See also Table of Contents)

A. Concrete Formwork: Section 03 10 00.

B. Cast-In-Place Concrete: Section 03 30 00.

1.04 QUALITY ASSURANCE

A. General:

1. Acceptable Manufacturers: Regularly engaged in the manufacture of steel bar and welded wire fabric reinforcing.
2. Installer Qualifications: Installation shall be done only by an installation firm normally engaged in this business. All work shall be performed by qualified mechanics working under an experienced supervisor.
3. Welding Qualifications: Welding procedures, welding operators and welders shall be qualified in accordance with AWS D1.4 - "Structural Welding Code Reinforcing Steel".
    a. Welders whose work fails to pass inspection shall be re-qualified before performing further welding.
4. Reinforcement Work shall conform to ACI 301 and CBC Section 1907, as minimum standards.
5. Allowable Tolerances:
    a. Fabrication:
        1) Sheared length: 1 inch.
        2) Depth of truss bars: Plus 0 minus ½-inch.
        3) Ties: Plus or minus ½-inch.
        4) All other bends: Plus or minus 1 inch.
    b. Placement:
        1) Concrete cover to form surfaces: Plus or minus ¼-inch.
        2) Minimum spacing between bars: Plus or minus ¼-inch.
        3) Crosswise of members: Spaced evenly within 2 inches of stated separation.
        4) Lengthwise of members: Plus or minus 2 inches.
    c. Maximum bar movement to avoid interference with other reinforcing steel, conduits, or embedded items: 2 bar diameters.

B. Standards and References: (Latest Edition unless otherwise noted):

1. American Concrete Institute (ACI).
    a. ACI 301 - "Specifications for Structural Concrete for Buildings".
    b. ACI 315 - "Details and Detailing of Concrete Reinforcing".
    c. ACI 318 – "Building Code Requirements for Reinforced Concrete"
2. American Society for Testing and Materials (ASTM).
    a. ASTM A82 - "Cold Drawn Wire for Concrete Reinforcement".
    b. ASTM A185 - "Welded Steel Wire Fabric for Concrete Reinforcement".
    c. ASTM A615 - "Deformed and Plain Billet-Steel Bars for Concrete Reinforcement".
    d. ASTM A706 – "Low Alloy Steel Deformed Bars for Concrete Reinforcement".
3. Concrete Reinforcing Steel Institute (CRSI) - "Manual of Standard Practice".
4. Current California Building Code (CBC).

C. Submittals:
1. Shop Drawings: Prepare in accordance ACI 315. Indicate bending diagrams, assembly diagrams, splicing and laps of bars and shapes, dimensions and details of bar reinforcing and assemblies. Correctness of all reinforcing requirements and work is the responsibility of Contractor. Identify such shop drawings with reference thereon to sheet and detail numbers from Contract Drawings.
    a. Do not use scaled dimensions from Contract Drawings in determining the lengths of reinforcing bars.
    b. No reinforcing steel shall be fabricated without approved shop drawings.
    c. Any deviations from the contract documents must be clearly indicated as a deviation on the shop drawings.
    d. Areas of high congestion, including member joints and embed locations shall be fully detailed to verify clearances and assembly parameters and coordination with other trades.
2. Certified mill test reports of supplied reinforcing indicating chemical and physical analysis. Tensile and bend tests shall be performed by the mill in accordance with ASTM A615.
3. Product Data:
    a. Manufacturer's specifications and installation instructions for splice devices.
    b. Bar Supports.
4. Certificates of Compliance with specified standards:
    a. Reinforcing bars.
    b. Welded wire fabric.
    c. Welding electrodes.
5. Samples: Only as requested by Architect.

D. Tests and Inspections:
1. A testing program is required prior to start of construction. Testing program to be done in compliance with the Current CBC requirements and in collaboration with Testing Laboratory, Design team, contractor, owner and submitted for review by the agency in charge of building enforcement. Requirements below are minimum requirements; additional requirements may be required in final testing program.
2. All reinforcing steel whose properties are not identifiable by mill test reports shall be

tested in accordance with ASTM A615. One Series of tests for each missing report to be borne by the Contractor.

3. When inspections are indicated for reinforcement placement on the Structural drawings, a special inspector shall be employed to inspect reinforcing placement per CBC Section 1704.
4. When tests are indicated for reinforcing steel on the structural drawings, the reinforcing steel used shall be tested in accordance with ASTM A615. One tensile and one bend test for each 2-1/2 tons of steel or fraction thereof, shall be made.
5. Inspect shop and field welding in accordance with AWS D1.4, including checking materials, equipment, procedure and welder qualification as well as the welds. Inspector will use non-destructive testing or any other aid to visual inspection that he deems necessary to assure himself of the adequacy of the weld.
6. Tests and inspection shall be performed by Owners testing agency except when needed to justify rejected work, in which case the cost of retests and reinspection shall be borne by the Contractor.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement to project site in bundles marked with metal tags indicating bar size and length.

B. Handle and store materials to prevent contamination.

1. Store reinforcement in a manner that will prevent excessive rusting or coating with grease, oil, dirt, and other objectionable materials. Storage shall be in separate piles or racks so as to avoid confusion or loss of identification after bundles are broken.

C. Deliver and store welding electrodes in accordance with AWS D12.1.

1.06 SUBSTITUTIONS

Substitutions will be considered per Section 01 25 00.

1.07 SUBMITTALS

Provide in accordance with Section 01 33 00.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Reinforcement Bars: ASTM A615, Grade 60 for all bars.

1. Bar reinforcement to be welded shall meet chemical requirements of ASTM A706.
2. Longitudinal reinforcement in column and beams of special moment-resisting frames shall meet the chemical requirements of ASTM A706.

B. Stirrups and Ties: ASTM A615, Grade 60 for all bars.

C. Steel Dowels: Same grade as bars to which dowels are connected.

D. Welded wire Fabric: ASTM A185.

E. Tie Wires: FS-QQ-W-461, annealed steel, black, 16 gauge minimum.

F. Welding Electrodes: AWS D1.4, low hydrogen, E70XX series.

G. Bar Supports:

1. Typical, unless noted otherwise; CRSI Class 2 wire supports.

a. Do not use wood, brick or other objectionable materials.

b. Do not use galvanized supports.

2. Supports placed against ground: Pre-cast concrete blocks not less than 4 inches square with embedded wire.

H. Mechanical Couplers: Comply with ACI 318 section 12.14.3.

PART 3 – EXECUTION

3.01 FABRICATION

A. Shop fabricate reinforcement to meet requirements of Drawings.

B. Fabricate reinforcement in accordance with the requirements of ACI 315 where specific details are not shown or where Drawings and Specifications are not more demanding.

C. Steel reinforcement shall not be bent or straightened in a manner that will injure the material. Bars with kinks or bends not shown on the Drawings shall not be used. Heating of bars for bending will not be permitted.

D. Reinforcing shall not be field bent or straightened without structural engineer's review.

E. Provide offsets in rebar (1:6 maximum) where required to maintain clearances.

3.02 CONDITION OF SURFACES

A. Examine surfaces and conditions receiving or affecting the work. Do not proceed until unsuitable conditions have been corrected.

3.03 GENERAL

A. Concrete shown without reinforcing shall be reinforced as similar parts shown with reinforcing except where concrete is specifically noted to be unreinforced.

3.04 PLACEMENT

A. All reinforcement shall be accurately set in place, lapped, spliced, spaced rigidly and securely held in place and tied with specified wire at all splices and crossing points. All wire tie ends shall point away from the form. Carefully locate all dowel steel to align with wall and column steel.

1. Bars shall be in long lengths with laps and splices as shown. Offset laps in adjacent bars. Place steel with clearances and cover as shown. Bar laps shall be as indicated on the Drawings. Tie all laps and intersections with the specified wire.

2. Maintain clear space between parallel bars not less than 1-1/2 times nominal diameter, but in no case shall clear space be less than 1-1/2 times maximum size concrete aggregate.

3. Reinforcing dowels for slabs shall be placed as detailed. Sleeves may be used if reviewed by the Structural Engineer before installation. Install dowel through all construction and expansion joints for all slabs on grade.

B. Bar Supports: Support and securely fasten bars with chairs, spacers and ties to prevent displacement by construction loads or placement of concrete beyond the tolerances specified. Conform to CRSI as a minimum standard.

C. Steel Adjustment:

1. Move within allowable tolerances to avoid interference with other reinforcing steel, conduits, or embedded items.

2. Do not move bars beyond allowable without concurrence of Structural Engineer.

3. Do not heat, bend, or cut bars without concurrence of Structural Engineer.

4. Reinforcement shall not be bent after being embedded in hardened concrete.

D. Splices:

1. Splice reinforcing as shown.
2. Lap Splices: Tie securely with wire to prevent displacement of splices during placement of concrete.
3. Splice Devices: Install in accordance with manufacturer's written instructions. Obtain Structural Engineer's review before using.
4. Do not splice bars except at locations shown without concurrence of Structural Engineer.
    a. Where splices in addition to those indicated are required, indicate location on shop drawings clearly and highlight "for Engineer's approval".

E. Welding:

1. Welding is not permitted unless specifically detailed on Drawings or approved by Engineer.
2. Employ shielding metal-arc method and meet requirements of AWS D1.4.
3. Welding is not permitted on bars where the carbon equivalent is unknown or is determined to exceed 0.55.
4. Welding shall not be done within two bar diameters of any bent portion of a bar which has been bent cold.
5. Welding of crossing bars is not permitted.

F. Welded Wire Fabric: Install in long lengths, lapping 24 inches at end splices and one mesh at side splices. Offset laps in adjacent widths. Place fabric in approximately the middle of the slab thickness unless shown otherwise on the Drawings by dimension. Wire tie lap joints at 12-inch centers. Use concrete blocks to support mesh in proper position.

G. Reinforcement shall be free of mud, oil or other materials that may reduce bond at the time concrete is placed. Reinforcement with tightly adhered rust or mill scale will be accepted without cleaning provided that rusting has not reduced dimensions and weights below applicable standards. Remove loose rust.

H. Protection against rust:

1. Where there is danger of rust staining adjacent surfaces, wrap reinforcement with impervious tape or otherwise prevent rust staining.
2. Remove protective materials and clean reinforcement as required before proceeding with concrete placement.

I. Drawing Notes: Refer to notes on Drawings for additional reinforcement requirements.

J. Mechanical and Electrical Drawings: Refer to Mechanical and Electrical Drawings for formed concrete requiring reinforcing steel. All such steel shall be included under the work of this Section.

***** END OF SECTION *****

SECTION 03 21 00

SYNTHETIC FIBER REINFORCEMENT

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SECTION INCLUDES

A. Polypropylene fibers used as concrete secondary reinforcement.

1.03 RELATED SECTIONS

A. Section 03 20 00 - Reinforcing Steel.

B. Section 03 30 00 - Cast-in-Place Concrete.

1.04 REFERENCES

A. ASTM C 94 - Standard Specification for Ready-Mixed Concrete.

B. ASTM C 1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.

C. Southwest Certification Services (SWCS), Omega Point Laboratories No. 8662-1.

D. UL Report File No. R8534-11.

1.05 SUBSTITUTIONS

Substitutions will be considered per Section 01 25 00.

1.06 SUBMITTALS

A. Provide in accordance with Section 01 33 00.

B. Product Data: Submit manufacturer's product data, including application rate and mixing instructions.

C. Samples: Submit manufacturer's sample of synthetic fiber reinforcement.

D. Manufacturer's Certification:

1. Submit manufacturer's certification that synthetic fiber reinforcement complies with specified requirements.

2. Submit evidence of manufacturer's ISO 9001:2000 certification.

3. Submit evidence of satisfactory performance history of synthetic fiber reinforcement.

1.07 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Synthetic fiber reinforcement manufactured in ISO 9001:2000 certified facility.

2. Minimum 10-year satisfactory performance history of specified synthetic fiber reinforcement.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver synthetic fiber reinforcement in manufacturer's original, unopened, undamaged containers and packaging, with labels clearly identifying product name,

unique identification number, code approvals, directions for use, manufacturer, and weight of fibers.

B. Storage:

1. Store synthetic fiber reinforcement in clean, dry area indoors in accordance with manufacturer's instructions.

2. Keep packaging sealed until ready for use.

C. Handling: Protect synthetic fiber reinforcement during handling to prevent contamination.

PART 2 -- PRODUCTS

2.01 MANUFACTURER

A. Basis of Design: Propex Operating Company, LLC, PO Box 22788, Chattanooga, Tennessee 37422. Toll Free (800) 621-1273. Website: www.fibermesh.com

E-mail: fibermesh@propexglobal.com.

2.02 SYNTHETIC FIBER REINFORCEMENT

A. Synthetic Fiber Reinforcement: Fibermesh 300.

1. Material: 100 percent virgin homopolymer polypropylene multifilament fibers, containing no reprocessed olefin materials.

2. Conformance: ASTM C 1116, Type III.

3. Fire Classifications:

a. UL Report File No. R8534-11.

b. Southwest Certification Services (SWCS), Omega Point Laboratories No. 8662-1.

4. Fiber Length: Graded and Single-cut lengths.

5. Alkali Resistance: Alkali proof.

6. Absorption: Nil.

7. Specific Gravity: 0.91.

8. Melt Point: 324 degrees F (162 degrees C).

PART 3 -- EXECUTION

3.01 MIXING

A. Add synthetic fiber reinforcement to concrete mixture in accordance with manufacturer's instructions.

B. Add synthetic fiber reinforcement into concrete mixer before, during, or after batching other concrete materials.

C. Application Rate: Add synthetic fiber reinforcement at standard application rate of 1.5 pounds per cubic yard (0.90 kg/m^3) of concrete.

D. Mix synthetic fiber reinforcement in concrete mixer in accordance with mixing time and speed of ASTM C 94 to ensure uniform distribution and random orientation of fibers throughout concrete.

E. Concrete shall be as specified in Section 03 30 00.

3.02 PLACING AND FINISHING

A. Placing and finishing concrete shall be as specified in Section 03 30 00.

*****END OF SECTION*****

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

A. Furnish, place and finish cast in place concrete and related work as indicated on the Drawings and specified here.

1. Install miscellaneous metal and other items furnished by other trades to be installed in concrete work.
2. Provide facilities for job curing of test cylinders and transporting to Testing Laboratory.

B. Provide grouting of steel base plates as indicated on the Drawings and specified here.

1.03 RELATED WORK (See also Table of Contents)

A. Concrete Formwork: Section 03 10 00.

B. Reinforcing Steel: Section 03 20 00.

C. Structural Steel: Section 05 12 00.

D. Metal Fabrications: Section 05 50 00.

1.04 QUALITY ASSURANCE

A. Standards and References: (Latest Edition unless otherwise noted)

1. Current California Building Code (CBC).
2. AMERICAN CONCRETE INSTITUTE (ACI)

	ACI 117	Standard Tolerances for Concrete Construction and Materials
b.	ACI 211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
c.	ACI 211.2	Standard Practice for Selecting Proportions for Structural Lightweight Concrete
d.	ACI 301	Structural Concrete for Buildings
e.	ACI 302	Guide for Concrete Floor and Slab Construction
f.	ACI 305R	Hot Weather Concreting
g.	ACI 318	Building Code Requirements for Reinforced Concrete
h.	ACI 360	Design of Slabs-On-Ground

3. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

a.	ASTM C 31	Making and Curing Concrete Test Specimens in the Field
b.	ASTM C 33	Concrete Aggregates
c.	ASTM C 39	Compressive Strength of Cylindrical Concrete Specimens

d.	ASTM C 42	Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
e.	ASTM C 94	Ready-Mixed Concrete
f.	ASTM C 109	Test of Hydraulic Cement Concrete
g.	ASTM C 143	Slump of Hydraulic Cement Concrete
h.	ASTM C 150	Portland Cement
i.	ASTM C 172	Sampling Freshly Mixed Concrete by the Volumetric Method
j.	ASTM C 192	Making and Curing Concrete Test Specimens in the Laboratory
k.	ASTM C 260	Air-Entraining Admixtures for Concrete
l.	ASTM C 330	Lightweight Aggregates for Structural Concrete
m.	ASTM C 494	Chemical Admixtures for Concrete
n.	ASTM C 618	Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
o.	ASTM C685	Volumetric Batching and continuous mixing
p.	ASTM C1157	Hydraulic-Cement

B. Submittals

1. Concrete mix designs. See "Mix Design" below. Include results of test data used to establish proportions.
2. Certificates of Compliance from Manufacturer
   a. Cement certificates
   b. Aggregates
   c. Admixtures.
3. Data regarding hardeners and sealers.
4. Grout samples for sacked surface textures and colors upon Architects request only.
5. Layout drawings for construction, control and expansion joints.
6. Transit-mix delivery slips:
   a. Keep record at the job site showing time and place of each pour of concrete, together with transit-mix delivery slips certifying contents of the pour.
   b. Make the record available to the Architect for his inspection upon request.
   c. Upon completion of this portion of the work, deliver the record and the delivery slips to the Architect.
7. See Section 03 20 00 for reinforcing steel submittals.

C. Tests and Inspections:

1. A testing program is required prior to start of construction. Testing program to be done in Compliance with the Current CBC requirements and in collaboration with Testing Laboratory, Design team, contractor, owner and submitted for review by the agency in charge of building enforcement. Requirements below are minimum requirements; additional requirements may be required in final testing program.

2. The following tests shall be made by a recognized testing laboratory selected by the Owner and approved by the governing agency. All tests shall be in accordance with the previously mentioned standards and ACI 318 Section 5.6. A complete record of all tests and inspections shall be kept.

   a. Compressive Strength: Make and cure in accordance with ASTM C-31. Test in accordance with ASTM C-39 and ACI 318 section 5.6.

      1) A record shall be made of time and of locations of concrete from which samples were taken.

      2) Four identical cylinders shall be taken from each pour of 150 cubic yards or 5000 square feet or part thereof, being placed each day per ACI 318 5.6.2.1. One cylinder shall be tested at age 7 days, and two at age 28 days unless otherwise specified. Preserve remaining cylinder for future use.

   b. Drying Shrinkage: (applies to lightweight concrete only unless noted otherwise)

      1) A record shall be made of time cylinders and of locations of concrete from which samples were taken.

      2) Three identical 4" x 4" x 11" specimens shall be made from same concrete as used in structure. Percent of shrinkage shall be reported at 21 days after 7 day moist curing period. Average results of 3 specimens shall be used as the accepted value. The value for laboratory cast specimens shall not exceed .075%. If field test specimens are used in lieu of laboratory specimens, a tolerance of +33% may be used.

      3) Test specimens in accordance with ASTM C157.

   c. Concrete consistency (slump) shall be tested in accordance with ASTM C143.

3. Provide full time inspection during the taking of test specimens and during the placing of all concrete and embedded steel.

4. See Section 03 21 00 for reinforcing steel tests and inspections.

5. Provide concrete batch plant inspections per ASTM C685.

1.05 SUBSTITUTIONS

Substitutions will be considered per Section 01 25 00.

1.06 SUBMITTALS

Provide in accordance with Section 01 33 00.

PART 2 – PRODUCTS

2.01 MATERIAL

A. Portland Cement: ASTM C 150, Type II. One brand of cement shall be used throughout to maintain uniform color for all exposed concrete.

B. Concrete Aggregate: Fine and coarse aggregates shall be regarded as separate ingredients. Each size of coarse aggregate, as well as combination of sizes when two or more are used, shall conform to grading requirements of appropriate ASTM Standards and ACI 318.

   1. Concrete Aggregates for Standard Weight Concrete: ASTM C 33. Aggregate shall be crushed granite or Perkins type.

   2. Concrete Aggregates for Lightweight Concrete: ASTM C330 to produce concrete weighing no more than 115 pcf at 28 days. Aggregate shall be vacuum saturated expanded shale as produced through the rotary kiln method.

C. Water: Clean and free from injurious amounts of oil, acids, alkali, organic matter and other deleterious substances; suitable for domestic consumption.

D. Admixtures shall be subject to prior approval by the Architect, in accordance with ACI 318, Calcium Chloride is not permitted.

1. Water Reducing
    a. ASTM C494 Type A - for use in cool weather.
    b. ASTM C494 Type D - for use in hot weather.
2. Air Entraining
    a. Conform to ASTM C 260
3. Fly Ash
    a. Conform to ASTM C 618
4. Mid-Range Water-Reducers
    a. Master Builders "Polyheed" or approved equal.
5. Fly Ash Pozzolan
    a. Conforming to ASTM A-618 Class F

E. Slab on Grade Vapor Retarder

1. Vapor Retarder must have the following qualities:
    a. 10 mil thickness minimum
    b. WVTR less than 0.008 as tested by ASTM E 96
    c. ASTM E 1745 Class A (Plastics)
2. Vapor Retarder Products
    a. Stego Wrap Vapor Retarder by STEGO INDUSTRIES LLC.
    b. W.R. Meadows Premoulded Membrane with Plasmatic Core.
    c. Zero-Perm by Alumiseal.
3. Vapor Retarder Tape
    a. Water Vapor Transmission Rate :ASTM E 96, 0.3 perms or lower
    b. Minimum 8-mils thick
    c. Minimum 4 inches wide
    d. Manufactured from High Density Polyethylene
    e. Pressure Sensitive Adhesive

F. Sand: Clean, dry, well graded.

G. Abrasive aggregate for non-slip finish: Fused aluminum oxide grits, graded 12/30. Use factory-graded rustproof and non-glazing material that is unaffected by freezing, moisture and cleaning materials.

1. Products offered by manufacturers to comply with the above requirements include: A-H Alox; Anti-Hydro Waterproofing Co., Toxgrip; Toch Div. - Carboline, or approved equal.

H. Expansion Joint Filler:

1. Joint fill shall be a preformed non-extruded resilient filler, saturated with bituminous materials and conforming to ASTM D 1751. Products shall be equivalent to Burke "Fiber Expansion Joint", W.R. Meadows "Fibrated Expansion Joint Filler", or approved equal.

I. Bonding Agent: Sonneborn "Sonobond"; the Euclid Chemical Company "Euco-Weld"; Larsen Products Corp., "Weld-Crete" or approved equivalent.

J. Concrete Sealer: Cure and Seal, as manufactured by the Euclid Chemical Company "Aqua-Cure VOX", Sonneborn "Kure-N-Seal WB", Burke "Spartan-Cote",W.R. Meadows "Intex" or approved equal conforming to ASTM C-309, Type I, Class B requirements, and conforming to State of California Air Resources Board VOC Regulations.

K. Concrete Hardener/Sealer: Clear, water soluble, sprayable in-organic silicate based hardener/sealer or acrylic co-polymer resin. Products shall be equal to Euclid Chemical Company "Eucosil", Burke "Spartan-Cote", Sonneborn "Sonosil", W.R. Meadows "Pena-Lith", or approved equal and must conform to State of California Air Resources Board VOC Regulations.

L. Concrete Cure: Water based curing compound conforming to ASTM C-309, Type 1, Class A and B, and AASHTO Specification M-148; Type 1, Class A and B requirements, and State of California Air Resources Board VOC Regulations. Product shall be equivalent to Euclid Chemical Company "Kurez VOX", Burke "No. 1127" or "Aqua-Resin Cure", W.R. Meadows "1100 Clear", or approved equal.

M. Non-Shrink Grout: See Section 2.02.A.4

2.02 CONCRETE

A. Concrete Mixes:

1. Type A Concrete:

Strength: 4000 lbs. per square inch at 28 days.

Maximum Aggregate Size: 1-1/2 inch.

Cement Content: As required by mix design (ACI 318 Section 5.2).

6.0 sacks per yard minimum.

Maximum Water to Cement Ratio: 0.52

Admixture: Water Reducing.

Weight: 145 lbs. per cubic foot

Use for unexposed foundation concrete except as otherwise specified. At Contractor's option, Type B concrete may be substituted for this.

2. Type B Concrete:

Strength: 4000 lbs. per square inch at 28 days.

Maximum Aggregate Size: 1 inch.

Minimum Cement Content: As required by mix design. (ACI 318 Section 5.2).

6.0 sacks per yard minimum.

Maximum Water to Cement Ratio: 0.45

Admixture: Water reducing.

Weight: 145 lbs. per cubic foot

Use for building slab on grade

Maximum Fly Ash content as a percentage of total cementitious material: 15%

3. Type C Concrete:

   Strength: 2500 lbs. per square inch at 28 days.

   Maximum Aggregate Size: 1 inch.

   Minimum Cement Content: As required by mix design (ACI 318 Section 5.2).

   6.0 sacks per cubic yard.

   Maximum Water to Cement Ratio: 0.60

   Admixture: Water reducing.

   Weight: 145 lbs. per cubic foot.

   Use for concrete sidewalks, mechanical and electrical pads, miscellaneous non-structural slabs on grade.

4. Grout shall be non-shrink, non-metallic, flowable Type "713" or "928" by Master Builders.

   a. Metallic grout equivalent to Master Builders "Embeco" may be used only where covered by earth, concrete, or masonry.

   b. Acceptance by Architect required before using.

B. Consistency of Concrete: Concrete slump, measured in accordance with ASTM C 143, shall fall within following limits.

   1. For General concrete placement: 3 inch plus or minus 1 inch.

   2. Mixes employing the specified mid-range water reducer shall provide a measured slump not to exceed 7 inch $\pm$1 inch after dosing, 2 inch $\pm$1 inch before dosing.

   3. Concrete slump shall be taken at point of placement. Use water reducing admixtures as required to provide a workable consistency for pump mixers. Water shall not be added at the jobsite without written review by the structural engineer.

C. Mix Design:

   1. Initial mix design shall be prepared for all concrete in accordance with ACI 318 section 5.2. Mix proportions shall be determined in accordance with ACI 318 Section 5.3 or ACI 318 section 5.4. In the event that additional mix designs are required due to depletion of aggregate sources, aggregate not conforming to Specifications, or at request of Contractor, these mixes shall be prepared as above.

   2. Contractor shall notify the Testing Laboratory and Architect of intent to use concrete pumps to place concrete so that mix designs can be modified accordingly.

   3. Fly ash shall not exceed fifteen percent of the total cementitious material.

   4. Provide 3% air entrainment typical, 6% for mixes exposed to freeze-thaw cycles.

   5. Owner's testing laboratory shall review all mix design before submittal.

D. Mixing:

   1. Equipment: All concrete shall be machine mixed. Provide adequate equipment and facilities for accurate measurement and control of materials.

   2. Method of Mixing:

      a. Transit Mixing: Comply with ASTM C 94. Ready mixed concrete shall be used throughout, except as specified below.

      b. On-Site Mixing: Use only if method of storing material, mixing of material and type of mixing equipment is approved by Architect. Approval of site mixing does not relieve Contractor of any other requirements of Specifications.

c. Mixing shall be in accordance with ACI 318 5.8.

3. Mixing Time: After mix water has been added, concrete shall be mixed not less than 1-1/2 minutes nor more than 1-1/2 hours. Concrete shall be rejected if not deposited within the time specified.

4. Admixtures:

   a. Air entraining and chemical admixtures shall be charged into mixer as a solution and shall be dispensed by an automatic dispenser or similar metering device. Powdered admixtures shall be weighed or measured by volume as recommended by manufacturer. Accuracy of measurement of any admixture shall be within plus or minus 3%.

   b. Two or more admixtures may be used in same concrete, provided such admixtures are added separately during batching sequence, and provided further that admixtures used in that combination retain full efficiency and have no deleterious effect on concrete or on properties of each other.

   c. All admixtures are to be approved by Structural Engineer prior to commencing this work.

5. Retempering:

   a. Concrete shall be mixed only in quantities for immediate use. Concrete which has set shall be discarded, not retempered.

   b. Indiscriminate addition of water to increase slump is prohibited.

   c. When concrete arrives at project with slump below that suitable for placing, water may be added only if neither maximum permissible water-cement ratio nor maximum slump is exceeded. Water shall be incorporated by additional mixing equal to at least half of total mixing time required. Any addition of water above that permitted by limitation of water-cement ratio shall be accompanied by a quantity of cement sufficient to maintain proper water-cement ratio. Such additions shall only be used if approved by Architect. In any event, with or without addition of cement, not more than 2 gallons of water per cubic yard of concrete, over that specified in design mix, shall be added.

6. Cold Weather Batching: When temperature is below 40 degrees F or is likely to fall below 40 degrees F during 24 hour period after placing, provide adequate equipment for heating concrete materials. No frozen materials or materials containing ice shall be used. Temperatures of separate materials, including mixing water, when placed in mixer shall not exceed 100 degrees F. When placed in forms concrete shall have a temperature between 50 degrees F and 85 degrees F.

7. Hot Weather Batching: Concrete deposited in hot weather shall have a placing temperature below 85 degrees F. If necessary, ingredients shall be cooled to accomplish this.

2.03 FLOOR LEVELING AND FILL MATERIALS

A. Epoxy Concrete Mortar: Floor leveling, non-shrink trowel applied epoxy concrete mortar; TPM 115 General Polymers Corp., A-H Emery Epoxy Topping #170 Anti-Hydro Corp., or approved equal, where areas to fill are less than 1/4 inch thick.

B. Concrete Mortar: Floor leveling, patching and repair, non-shrink trowel applied concrete mortar; Master Builders EMBECO 411-A, Euclid EUCO, or approved equal, where areas of fill are greater than 1/4 inch thick.

C. Cementitious Floor Leveling Material: Shall be self-leveling or trowelable with a minimum 28 day compressive strength of 3000 psi in accordance with ASTM C-109. Material shall be equal to Quickrete No. 1249, Ardex V-800/K-55, Mapei "Ultra/Flex" or approved equal.

PART 3 – EXECUTION

3.01 PLACEMENT

A. Before any concrete is placed, the following items of work shall have been completed in the area of placing.

1. Forms shall have been erected, adequately braced, cleaned, sealed, lubricated if required, and bulkheaded where placing is to stop.
2. Any wood forms other than plywood shall be thoroughly water soaked before placing any concrete. The wetting of forms shall be started at least 12 hours before concreting.
3. Reinforcing steel shall have been placed, tied and supported.
4. Embedded work of all trades shall be in place in the forms and adequately tied and braced.
5. The entire place of deposit shall have been cleaned of wood chips, sawdust, dirt, debris, hardened concrete and other foreign matter. No wooden ties or blocking shall be left in the concrete except where indicated for attachment of other work.
6. Reinforcing steel, at the time the concrete is placed around it, shall be cleaned of scale, mill scale or other contaminants that will destroy or reduce bond.
7. Concrete surfaces to which fresh concrete is to be bonded shall be brush cleaned to remove all dust and foreign matter and to expose the aggregate, and then coated with the bonding adhesive herein specified.
8. Prior to placing concrete for any slabs on grade, the moisture content of the subgrade below the slabs shall be adjusted to at least optimum moisture.
9. No concrete shall be placed until formwork and reinforcement has been approved by Architect. Clean forms of all debris and remove standing water. Thoroughly clean reinforcement and all handling equipment for mixing and transporting concrete. Concrete shall not be placed against reinforcing steel that is hot to the touch. Notify Architect 48 hours in advance of concrete pour.

B. Conveying: Handle concrete from mixer to place of final deposit by methods which will prevent separation or loss of ingredients. Deposit concrete in forms as nearly as practicable at its final position in a manner which will insure that required quality is obtained. Chutes shall slope not less than 4 inches and not more than 6 inches per foot of horizontal run.

C. Depositing: Deposit concrete into forms in horizontal layers not exceeding 24 inches in thickness around building, proceeding along forms at a uniform rate and consolidating into previous pour. In no case shall concrete be poured into an accumulation of water ahead of pour, nor shall concrete be flowed along forms to its final place of deposit. Fresh concrete shall not be permitted to fall from a height greater than 6 feet without use of adjustable length pipes or, in narrow walls, of adjustable flexible hose sleeves. Concrete shall be scheduled so that placing is a continuous operation for the completion of each section between predetermined construction joints. If any concreting operation, once planned, cannot be carried on in a continuous operation, concreting shall stop at temporary bulkheads, located where resulting construction joints will least impair the strength of the structure. Location of construction joints shall be as shown on the drawings or as approved by Structural Engineer. The rate of rise in walls shall not be less than 2 feet per hour.

1. Consolidation: Concrete shall be thoroughly compacted and worked to all points with solid continuous contact to forms and reinforcement to eliminate air pockets and honeycombing. Power vibrators of approved type shall be used immediately following pour. Spading by hand, hammering of forms or other combination of methods will be allowed only where permitted by Structural Engineer. In no case shall vibrators be placed against reinforcing steel or used for extensive shifting of deposited fresh concrete. Provide and maintain standby vibrators, ready for immediate use.

2. Hot Weather Concreting: Unless otherwise directed by the Architect, perform all work in accordance with ACI 305 when air temperature rises above 75 degrees F and the following:

   a. Mixing Water: Keep water temperature as low as necessary to provide for the required concrete temperature at time of placing. Ice may be required to provide for the design temperature.

      Aggregate: Keep aggregate piles continuously moist by sprinkling with water.

      Temperature of Concrete: The temperature of the concrete mix at the time it is being placed in the forms shall not exceed 85 degrees F. The method employed to provide this temperature shall in no way alter or endanger the design mix or the design strength required.

      Dampen subgrade and formwork before placing concrete. Remove all excess water before placing concrete. Keep concrete continuously wet when air temperature exceeds 85 degrees F for a minimum of 48 hours after placing concrete. For slab on grade construction, see Section 3.1.E.

      Protection: Minimize evaporation from concrete in place by providing shade and windbreaks. Maintain such protection in place for 14 days minimum.

3. Cold Weather Concreting: Follow recommended ACI 306 procedures when air temperature falls below 40 degrees F., as approved by Architect. Concrete placed in freezing temperatures shall have a temperature of not less than 50 degrees F. Maintain this temperature for at least 7 days. No chemicals or salts shall be used to prevent freezing and no accelerating agents shall be used without prior approval from Architect.

D. Construction Joints: Install only as indicated and noted on Drawings. Joints not indicated on Drawings shall be so located, when approved, as to least impair strength of structure, and shall conform to typical details. Construction joints shall have level tops, vertical sides. Horizontal construction joints shall be thoroughly cleaned and roughened by removing entire surface film and exposing clean aggregate solidly embedded in mortar matrix. Joints between concrete and masonry shall be considered construction joints. Vertical construction joints need not be roughened. See Drawings for doweling and required keys.

   1. Roughen construction joints by any of following methods:

      a. By sandblasting joint.

      b. By thoroughly washing joint, using a high pressure hose, after concrete has taken initial set. Washing shall be done not less than 2 hours nor more than 4 hours after concrete has been poured, depending upon setting time.

      c. By chipping and wire brushing.

   2. All decisions pertaining to adequacy of construction joint surfaces and to compliance with requirements pertaining to construction joints shall be reviewed with the Structural Engineer.

   3. Just before starting new pour, horizontal and vertical joint surfaces shall be dampened (but not saturated).

   4. Before placing regular concrete mix, horizontal construction joint surfaces shall be covered with a layer of mortar composed of cement and fine aggregate of same proportions as that used in prescribed mix, but omitting coarse aggregate.

   5. For slabs, construction joints shall be in locations shown on plan. If not shown, locate at intervals not exceeding 150 feet in each direction. Refer to drawings for proper details for reinforcing at construction joints.

E. Concrete Slabs on Grade:

   1. Exterior and interior concrete slabs on grade shall be poured as required under this Section. Base shall be accurately leveled and compacted prior to placing of concrete.

2. Typically, interior slabs on grade shall be poured over a minimum of four (4 inch) inches of compacted crushed rock, unless otherwise indicated, over a vapor retarder.
3. Protect slab on grade subbase from moisture prior to placing concrete. Avoid wetting rock layer to allow adequate concrete curing and avoid future vapor transmission. If the subbase has been wet excessively, verify that water has been eliminated prior to placement of concrete.
4. Vapor Retarder installation shall be in accordance with manufacturer's instructions and ASTM E 1643-98.
    a. Unroll Vapor Retarder with the longest dimension parallel with the direction of the pour.
    b. Lap Vapor Retarder over footings and seal to foundation walls.
    c. Overlap joints 6 inches and seal with specified tape.
    d. Seal all penetrations (including pipes) per manufacturer's instructions.
    e. No penetration of the Vapor Retarder is allowed except for reinforcing steel and permanent utilities.
    f. Repair damaged areas by cutting patches of Vapor Retarder, overlapping damaged area 6 inches and taping all four sides with tape.

F. Control Jointing - Slabs on Grade:
1. Joints shall be in locations indicated on Drawings, or as directed by Architect.
2. Joints in interior slabs shall be made by one of following methods:
    a. By use of construction joints laid out in checkerboard pattern; pour and allow alternate slabs to set; fill out balance of checkerboard pattern with second pour.
    b. By use of dummy groove joints at least 1/4 depth of slab, and at least 1/8 inch wide. These joints may be sawcut as soon as wet concrete can support the weight of the equipment and operator. Delaying sawcutting past this point will make jointing ineffective.
3. Control jointing in exterior paving slabs shall be laid out in a checkerboard pattern; pour as described above, but with joint edges tooled to provide a uniform joint at least 3/8 inch in depth.
4. Slab reinforcing need not be terminated at control joints.
5. Construction and expansion joints shall be counted as control joints.

G. Expansion Joints:
1. Unless otherwise indicated, use 3/8 inch thick expansion joint filler. See Section 2.1 H
2. Joints in interior slabs on grade shall be only in locations indicated.
3. Joints in exterior slabs on grade shall be installed at each side of structures, at curb transitions opposite apron joints, at ends of curb returns, at back of curb when adjacent to sidewalk, and at uniformly spaced intervals not exceeding 20 feet.
4. Edges of concrete at joints shall be edger finished to approximately 3/8 inch radius.
5. Interrupt reinforcing at all expansion joints.

H. Score markings on exterior slabs on grade shall be located as indicated. Where not indicated, mark slabs into rectangles of not less than 12 square feet nor more than 20 square feet using a scoring tool which will leave edges of score markings rounded.

3.02 CURING AND PROTECTION

A. Curing: Exposed surfaces of all concrete used in structure shall be maintained in a moist condition for at least 7 days after placing. The following final curing processes shall normally be considered to accomplish this. Concrete shall be maintained at not less than 50 degrees F nor more than 100 degrees F for a period of 72 hours after being deposited.

1. Flatwork to be exposed, stained, or painted shall have curing process submitted and approved by the architect prior to construction.

2. Initial Curing Process - Flat Work:

   a. Mist Spraying: As soon as troweling of concrete surfaces is completed, exposed concrete shall be sprayed continuously with a special atomizer spray nozzle, capable of producing a fine mist. Spraying shall be done without any dripping of water from nozzle. Amount of spraying shall be such as to maintain surface of concrete moist without any water accumulating on surface. Maintain spraying for a minimum of 12 hours, or until such time as hereinafter described curing process is applied. Mist spraying will not normally be required when the ambient air temperature is below 90 degrees F.

3. Final Curing Process - Flatwork: Except as noted, use any of following:

   a. Water Curing: Concrete shall be kept wet by mechanical sprinklers or by any other approved method which will keep surfaces continuously wet.

   b. Saturated Burlap Curing: Finished surfaces shall be covered with a minimum of two layers of heavy burlap which shall be kept saturated during the curing period.

   c. Curing Compounds: Membrane curing compounds of chlorinated rubber or resin type conforming to ASTM C309 may be used only if specifically approved by Architect. Use of membrane curing compound will not be permitted on surfaces to be painted, or to receive ceramic tile, membrane water-proofing or hardeners and sealers. Membrane curing compound may be used in areas to receive resilient floor tile, provided it is wax-free, compatible with adhesive used and approved by adhesive manufacturer. Agitate curing compounds thoroughly by mechanical means continuously during use and spray or brush uniformly in accordance with manufacturer's recommendations. Apply immediately following final finishing operation. All curing compounds shall conform to State of California Air Resources Board VOC Regulations.

   d. Waterproof paper conforming to ASTM C 171, or opaque polyethylene film, may be used. Concrete shall be covered immediately following final finishing operation. Anchor paper or film securely and seal all edges in such a manner as to prevent moisture escaping from concrete.

4. Curing Process - Formed Surfaces: Forms heated by sun shall be kept moist during curing period. If forms are to be removed during curing period, curing as described for flatwork shall be commenced immediately.

B. Refer to Drawings for areas of concrete slab not to receive curing compounds or hardening compounds. Where concrete floors are to receive heavy duty coatings, waterproof coatings and the like, verify with coating installer the type of finish required for specified coating.

C. Protection: Contractor shall be responsible for protection of finished concrete against injury by rain, cold, vibration, animal tracks, marking by visitors, vandalism, etc.

D. Provide additional curing agents or compounds, not necessarily listed herein, but as recommended and or required for use with shake type hardeners or other special coatings and coverings by their manufacturers for a complete and proper installation.

3.03 FINISHES

A. Formed Surfaces:

1. Rough Form Finish: Surfaces shall be reasonably true to line and plane with no specified requirements for selected facing materials. Tie holes and defects shall be patched and fins exceeding 1/4 inch in height shall be rubbed down with wooden blocks. Fins and other rough spots at surfaces to receive membrane waterproofing shall be completely removed and the surfaces rubbed smooth. Otherwise, surfaces shall be left with the texture imparted by forms.

   a. Rough finish shall be used for the following areas:

      1) Below grade and unexposed surfaces.

2.. Smooth Plywood Form Finish: Finish shall be true to line and plane. Tie holes and defects shall have been patched and ground with surface fins removed. Arrangement of plywood sheets shall be orderly, symmetrical, as large as practical and free of torn grain or worn edges. Surface concrete shall be treated with 1 part muriatic acid, in three parts water solution, followed immediately by a thorough rinsing with clear water. Surfaces which are glazed, have efflorescence, or traces of form oil, curing compounds or parting compounds shall be cleaned or treated to match other formed surfaces, except as otherwise indicated or specified.

   a. Smooth Plywood Form Finish shall be used for the following areas:

      1) All surfaces above grade unless otherwise specified.

      2) At Contractor's option, may also be used in lieu of rough form finish.

3. Smooth Plastic Liner Finish: Surface shall be smooth, concrete free of honeycombing, air pockets larger than 1/8 inch in diameter, and fins.

   a. This finish shall be used only where indicated on the Drawings.

B. Flatwork:

1. Unless otherwise indicated or specified, flatwork shall have an integral monolithic finish.

2. Integral Monolithic Finish: Apply as soon as freshly poured concrete slabs will bear weight of workers. Pour slabs full thickness to finish floor elevations indicated. At proper time, tamp surface repeatedly with a wire mesh or grid tamper in a manner to force aggregate down below surface and to bring sufficient mortar to surface to provide for a smooth coating of cement mortar over entire surface. Allow surface mortar to partially set, then float with wooden floats and finish with one of following, as required.

   a. Broom Finish: Steel trowel surface to a smooth dense surface free of lines, tool marks, cat faces and other imperfections. After troweling, and before final set, give surface a broom finish, brushing in direction noted on Drawings, or as directed. Broom finish shall be used typically on exterior flatwork except as otherwise indicated or specified and shall be "medium" texture as approved by Architect.

   b. Smooth Steel Trowel Finish: Apply 2 steel trowelings to obtain hard, smooth surface. All lips, irregularities, uneven levels, etc. shall be worked out before last troweling. All interior flatwork shall have a smooth steel trowel finish unless specified otherwise.

3. Tolerances:

   a. For tolerances not indicated, refer to ACI 117.

   b. Slabs on grade – Comply with F_F & F_L as specified by Architect, or at a minimum shall be sufficiently even to contact a 10' long straightedge with a tolerance of 1/8 inch.

c. Concrete over metal deck – Refer to Section 05 30 00 for minimum requirements, or at a minimum shall be sufficiently even to contact a 10' long straightedge with a tolerance of 1/8 inch.

d. Elevated slabs – Comply with Architectural requirements.

e. Finished surfaces of exterior integral finished flatwork shall not vary more than 1/4 inch from a 10' long straightedge, except at grade changes.

C. Sacked Surfaces: Exposed surfaces that are unacceptable in appearance to the Architect shall be sacked.

1. Prepare concrete surfaces in accordance with the referenced standards. Remove any form release materials by stoning by hand, power grinding or other method approved by the Architect.

2. Prepare concrete surfaces to receive sack finishing with a light sand blasting.

3. For best results, grout application and rubbing should be performed when areas to be treated are shaded and during cool, damp weather. When work is to be performed in hot and dry weather, a fog spray should be available for continuous use.

4. Prepare grout samples for matching of concrete surfaces for approval by the Architect. These shall be made in the following proportions of gray cement to white cement to sand: 1:1:2, 1:2:3, and 2:1:3, etc. until the correct matching color is obtained on the test areas. Sand should be fine enough to pass the Number 30 sieve. Mixes should be made to a good workable consistency in a clean container and the mix with the best color chosen, or modified if needed.

5. Provide sufficient qualities of sand and cement from the same source for the complete work at the job site.

6. Mixing and Application:

a. Mixing of grout on the job should be timed for it to be used up within 1 to 1-1/2 hours.

b. Let the grout stand 20 to 30 minutes after mixing, and then remixed before applying.

c. Soak the concrete surface thoroughly with water at least 15 minutes before applying grout and again just before application so that the surface is adequately wet during the operation.

d. Apply grout with plasterer's trowel or sponge rubber float in sweeping strokes from the bottom up. Brush or spray gun applications may be used when approved by the Architect.

e. Work in freshly applied grout vigorously with a sponge rubber float, then let sit until some of its plasticity is gone but not until it loses its damp appearance. At this point it shall be rubbed with clean, dry burlap to remove the excess grout, leaving no visible film on the surface but filling all air holes.

f. Keep the surface wet for a day after grouting and sack rubbing are completed.

7. Alternate methods of application and materials shall be subject to the approval of the Architect.

3.04 PATCHING

A. Formed Surfaces:

1. Promptly upon removal of contact forms and after concrete surfaces have been inspected, form ties shall be removed and all necessary patching and pointing shall be expertly done.

2. Honeycombed areas shall be removed down to sound concrete, coated with a bonding grout or approved compound and patched using a low shrinkage high bond mortar. Patched areas shall be cured by being kept damp for at least 5 days.

3. Tie holes shall be cleaned, dampened and filled solid with patching mortar or cement plugs of an approved variety.

B. Slabs on Grade: After entire slab is finished, shrinkage cracks that may appear shall be patched as follows:

1. Where slab is not exposed or where appearance is not important, cracks larger than 1/32 inch wide shall be filled with cement grout and struck off level with surface.

2. Where slab is exposed and appearance is important, unsightly cracks shall be repaired in a manner satisfactory in appearance to Architect. If this cannot be accomplished, concrete shall be considered defective.

3.05 DEFECTIVE CONCRETE

A. Defective concrete shall mean any of the following:

1. Concrete not meeting 100 percent of the specified 28 day compressive strength.

2. Concrete exhibiting rock pockets, voids, spalls, streaks, cracks, exposed reinforcing to extent that strength, durability, or appearance is adversely affected.

3. Concrete significantly out of place, line, or level.

4. Concrete not containing the required embedded items.

B. Upon determination that concrete strength is defective:

1. Should cylinder tests fall below minimum strength specified, concrete mix for remainder of work shall be adjusted to produce required strength. Core samples shall be taken and tested from cast-in-place concrete where cylinders and samples indicate inferior concrete with less than minimum specified strength.

a. Cores of hardened concrete shall be taken and tested in accordance with ASTM C 42 and C 39. Number and location of such cores shall be subject to the approval of Architect.

b. Cost of core sampling and testing will be paid for by the Contractor.

c. "85 percent" reduction in ACI 318 5.6.5.4 will not justify low cylinder tests.

C. Upon determining that concrete surface is defective, Contractor may restore concrete to acceptable condition by cutting, chipping, pointing, patching, grinding, if this can be done without significantly altering strength of structure. Permission to patch defective areas will not be considered a waiver of the right to require removal if patching does not, in the opinion of the Architect, satisfactorily restore quality and appearance.

D. If core tests indicate that concrete is below the strength specified, or if patching does not restore concrete to specified quality and appearance, the concrete shall be deemed defective, and shall be removed and replaced without additional cost to the Owner.

E. No repair work shall begin until procedure has been reviewed by the Architect and Structural Engineer.

3.06 SURFACE HARDENER AND SEALER

A. Seal all interior exposed flatwork with clear sealer, except surfaces receiving ceramic tile, quarry tile, poured flooring or other special finishes specified, or as scheduled on the Drawings.

1. Apply sealer in 2 or 3 coats, in accordance with manufacturer's directions, using the maximum quantity recommended.

a. Concrete floors must be thoroughly cured for a minimum of 30 days and completely dry before treatment.

b. Surfaces to be treated must be clean, free of membrane curing compounds, dust, oil, grease and other foreign matter.

c. Upon completion, concrete surfaces shall be clean and without discoloration or traces of excess hardener left on the surface.

B. Apply sprayable hardener/sealer at locations as scheduled or as indicated on the Drawings. Apply in accordance with the manufacturer's favorably reviewed application instructions and recommendations.

3.07 GROUTING

A. Prepare and place grout materials at locations as indicated on the Drawings in accordance with the manufacturer's recommendations and installation instructions.

B. Pack grout materials solidly between bearing surfaces and bases or plates as indicated and to ensure no voids.

3.08 ADJUSTING AND CLEANING

A. Remove all debris, excess materials, tools and equipment resulting from or used in this operation at completion of this work.

***** END OF SECTION *****

SECTION 03 32 00

CONCRETE SEALERS

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

A. Work included: Seal, harden or color concrete surfaces where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Concrete floor sealer/hardener/densifier shall react with concrete surfaces to produce a dense, hydrophobic, insoluble, moisture barrier to seal out contaminants, while hardening and densifying concrete surface.

C. Related work:

1. Documents affecting work of this Section included, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications.
2. Section 03 30 00: Cast-In-Place Concrete
3. Section 03 35 00: Concrete Finishing

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen 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.

B. Use an applicator currently approved in writing by the manufacturer of the specified product.

1.04 SUBSTITUTIONS

Substitutions will be considered per Section 01 25 00.

1.05 SUBMITTALS

A. Provide in accordance with Section 01 33 00.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Sufficient technical data to prove compliance with the specified requirements.
2. Evidence satisfactory to the Architect that the proposed applicator is currently approved by the manufacturer of the specified product.

1.06 JOB CONDITIONS

A. Ensure concrete has been cured a minimum of 3-days, is free of curing compounds and other sealers, and is free of laitance, grease, oil, and contaminants.

B. Protect adjacent surfaces/areas from damage due to over-spray

1.07 EXTENDED WARRANTY

Warranty sealed concrete floors to be free of dusting from abrasion for a period of 10-years from date of Substantial Completion. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 -- PRODUCTS

2.01 SEALER

A. Wherever the Drawing indicates concrete with sealer, the surface shall be treated with ready-to-apply clear sealing compound. Where a sealer is used in conjunction with a hardener with color, use only a product recommended by the manufacturer of the hardener as accepted by the Architect.

B. Comply with ASTM C 309, Type I, Class B.

C. Acceptable products:

1. Curcrete Chemical Company Inc. (Springville, Utah) "Ashford Formula".
2. "Industrial Concrete Sealer" by Burke Company, San Mateo, California, (213) 724-6690.
3. "Sealtight Intex" by W.R. Meadows, Inc., Benica, California, (714) 759-5006.
4. "Lithothane Concrete Sealer" by L.M. Scofield Company, Los Angeles, California, (213) 723-5285.

2.02 HARDENER

A. Wherever the Drawings indicate concrete with hardener, the surface shall be treated with a non-metallic dust-on floor hardener.

B. Acceptable products:

1. "Non-metallic Floor Hardener" by Burke Company.
2. "Mastercron" by Master Builders, Inc., Anaheim, California, (714) 978-6961.
3. "Lithocrome" by L.M. Scofield.

2.03 HARDENER WITH COLORS

A. Wherever the Drawings indicate colored concrete floor hardener, the surface shall be treated with a non-metallic dust-on hardener in colors selected by the Architect.

B. Acceptable products:

1. "Lithocrome Color Hardener" by L.M. Scofield Company.
2. "Colorcron" by Master Builders, Inc.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which the work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 APPLICATION OF SEALER

A. Preparation:

1. On freshly finished concrete surfaces, no additional surface preparation is required.

2. On areas where forms are recently removed, remove all form oil and breaking compound residue to assure penetration of the product in to the pores of the material to be treated.

3. On existing concrete, vertical surfaces, and masonry surfaces:

   a. Sweep all areas to be treated, using a fine bristle broom, or hose off with water and let dry to remove all surface dust and dirt.

   b. Free the surface from all contaminants which would inhibit penetration of the product into the pores of the material to be treated.

   c. Remove all curing, sealing, and coating agents by use of chemical or mechanical means as necessary.

   d. If acid is used to remove surface coatings, flush the surface with water sufficiently to remove all acid and acid residue.

4. When applying near windows, mask the glass.

5. Avoid contact with plant life, glass, aluminum, and other finished surfaces. Where contact occurs, immediately wipe a damp cloth or flush with water.

6. Avoid contact with asphaltic concrete.

B. Application:

1. On freshly finished surfaces, spray the product with a low pressure sprayer immediately following the finishing operation.

   a. To assure proper curing, apply the product to the entire surface as soon as the surface is firm enough to walk on, and before checking and temperature cracking begins.

   b. Keep the entire surface wet for 30 minutes by brooming excess product on to the dry spots, or by re-spraying the dry spots immediately.

   c. As the product begins to dry into the surface and becomes slippery underfoot, lightly sprinkle the surface with water to aid penetration and to bring alkali to the surface.

   d. As the product again begins to dry into the surface and become slippery underfoot, flush the surface with water and squeegee the surface totally dry, removing all excess product and alkali or other impurities brought to the surface.

2. On broom-finished surfaces, no flushing is required, but squeegee or broom the excess product form surface after 30 to 40 minutes.

3. On cured concrete surfaces, saturate the surface with the specified product.

   a. If dry spots appear, broom excess material onto the dry spots or re-spray them immediately.

   b. Keep the entire surface wet with the product for 30 minutes.

   c. If, after 30 to 40 minutes, the majority of the product has not been absorbed into the surface, broom or squeegee the excess product from low spots and puddles so it will be absorbed into the surface, or remove such excess product from the surface.

   d. If, after 30 to 40 minutes, the majority of the product is still on the surface, wait until the surface becomes slippery underfoot and then flush the entire surface with clear water and squeegee completely dry. If no water is available, squeegee the excess product from the surface after 30 minutes so that the surface is completely dry.

3.03 APPLICATION OF HARDENER

Apply the hardener after the surface of the concrete has reached the stage where no excess moisture shows, but while still plastic.

1. Hardener shall be applied at the rate of 40 pounds per 100 square feet of surface for the initial application.

2. Hardener shall be evenly distributed and thoroughly floated into the surface mortar with a wood float. 20 pounds of additional hardener shall be applied over each uniform color and texture.

3. All hardener and/or colored concrete floors shall be cured and protected with concrete curing paper or plastic until just prior to final cleaning.

4. Before applying curing paper or plastic, interior floors treated with colored hardener shall be given a heavy protective coat of colored wax left unpolished, and then immediately covered with the paper. If wax is not applied within two (2) hours after final troweling, the concrete shall be sprayed with a fine water mist and kept continuously moist until wax is applied, unless spraying is not recommended by the manufacturer of the hardener.

5. Cleaning and finishing: After all other work including plastering and painting has been completed, the curing paper shall be removed and waxed floors cleaned of protective wax coating. Clean all floors to remove dirt, stains or blemishes, and repair and restore damaged floors to their original condition. The hardener manufacturer's recommendations, directions, and recommended materials and methods shall be used for the protective wax coating, cleaning and finishing work.

*****END OF SECTION*****

SECTION 03 35 00

CONCRETE FINISHING

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

Work included: Provide finishes on cast-in-place concrete as called for on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen 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.

B. Except as may be modified herein or otherwise directed by the Architect, comply with ACI 301, "Specifications for Structural Concrete for Buildings".

1.04 SUBSTITUTIONS

Substitutions will be considered per Section 01 25 00.

1.05 SUBMITTALS

A. Submit in accordance with Section 01 33 00.

B. Product data, submit:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.06 PRODUCT HANDLING

Comply with pertinent provisions of Division 1.

1.07 CLOSE-OUT: also comply with the requirements of Section 01 77 00 – Contract Closeout.

A. Reports: None required.

B. As-Builts: Not required

C. Operation and Maintenance Data: None required.

D. Extra Materials: None required.

E. Extended Warranty: Comply with the requirements of General Conditions.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. General:

1. Carefully study the Drawings and these Specifications, and determine the location, extent, and type of required concrete finishes.

2. As required for the Work, provide the following materials, or equals accepted in advance by the Architect.

B. Liquid bonding agent: "Weld-Crete," manufactured by the Larsen Products Corporation.

C. Curing and protection paper:

1. Comply with ASTM C171, Type 1, regular.

2. Accepted products:

a) "Sisalkraft, Seekure 896";

b) Equal non-staining products faced with polyethylene film.

D. Slip-resistant abrasive aggregate:

1. Provide aluminum oxide grains, uniformly graded, screen size 12-13, 14-36 or 16-30.

2. Acceptable product:

a) Emerchrome Floor Hardener by L.M. Scofield Company.

b) Frictex H by Sonneborn.

c) or approved equal.

2.02 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 FINISHING OF FORMED SURFACES

A. General:

1. After removal of forms, give exposed concrete surfaces the finish specified below.

2. Revise the finish as needed to secure the acceptance of the Architect.

B. Rubbed finish:

1. Do not start cleaning operations until all contiguous surfaces to be cleaned are completed and accessible.

2. Do not permit cleaning as the work progresses.

3. Mix one part portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having the consistency of thick paint.

4. Substitute white portland cement for part of the gray portland cement as required to produce a color matching the color of surrounding concrete, as determined by a trial patch.

5. Wet the surface of the concrete sufficiently to prevent absorption of water from the grout, and apply the grout uniformly with brushes or spray gun.

6. Immediately after applying the grout, scrub the surface vigorously with a cork float or stone to coat the surface and fill all air bubbles and holes.

7. While the grout is still plastic, remove all excess grout by working the surfaces with a rubber float, sack, or other means.

8. After the surface whites from drying (above 30 minutes at normal temperatures), rub vigorously with clean burlap.

9. Keep the surface damp for at least 36 hours after final rubbing.

3.03 FINISHING SLABS

A. Definition of finishing tolerances:

1. "Class A": True plane within 1/8" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.

2. "Class B": True plane within 1/4" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.

B. Scratched finish: For surfaces scheduled to receive bond-applied cementitious applications.

1. After the concrete has been placed, consolidated, struck off, and leveled to a Class B tolerance, roughen the surface with stiff brushes or rakes before the final set.

C. Floated finish: For surfaces intended to receive roofing.

1. After the concrete has been placed, consolidated, struck off, and leveled, do not work the concrete further until ready for floating.

2. Begin floating when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation.

3. During or after the first floating, check the planeness of the surface with a ten foot straightedge applied at not less than two different angles.

4. Cut down high spots and fill low spots, and produce a surface with a Class B tolerance throughout.

5. Refloat the slab immediately to a uniform sandy texture.

D. Troweled finish:

1 Provide a floated finish as described above, followed by a power troweling and then a hand troweling which is relatively free from defects, but which still may show some trowel marks.

a. Monolithic Trowel Finish: For all floor surfaces not otherwise specified. Steel trowel and retrowel to smooth surface. After concrete has set enough to ring true, retrowel to a burnished impervious finish, free of trowel marks or other blemishes.

b. Steel Float Finish: for all slabs to receive resilient tile, waterproof membrane, or carpeting. Same as monolithic finish except omit burnish retroweling.

c. Fine Swirl Finish (when shown on the Drawings): Prepare same as steel float finish. When ready, perform such finishing operations as necessary to produce Architect-selected fine textured, non-slip finish. Construct sample panel for Architect's acceptance prior to placement. Sample panel shall consist of tooled edges and have a tooled joint within field of panel.

2 Provide a finished surface essentially free from trowel marks, uniform in texture and appearance, and in a plane of Class A tolerance.

E. Broom finish: For slabs to receive thin set tiles, apply steel float finish followed by very fine broom finish. For surfaces to receive mortar setting beds and for exterior concrete driveway ramps, curbs and gutters, spandrels, etc.

1. Provide a finished surface uniform in texture and appearance, and in a plane of Class A tolerance. Roughen surface with coarse broom.

F. Rock Salt finish: Exterior walkways and pavings except where non-slip finish is specified.

1. Provide a floated finish as described above.

2. While the surface is still plastic, broadcast rock salt into the surface and embed uniformly into the surface by light tamping.

3. Float the surface until it has been brought to a true plane with Class B tolerance.

4. After the concrete has completely set, flood the surface with water to dissolve the rock salt, using a fine bristle brush as necessary to remove the salt.

5. Provide a sample panel at the site of the proposed finish and receive the acceptance of the Architect of that finish prior to placing of the paving.

G. Non-slip finish: For exterior platforms, steps, and landings; and Interior and exterior pedestrian ramps.

1. Provide a floated finish as described above.

2. While the surface is still plastic, broadcast abrasive aggregate as specified in Paragraph 2.01.F above and work into the surface according to the manufacturer's recommendations.

3. Complete finishing surface as described above for a troweled finish, and as recommended by the aggregate manufacturer.

3.04 CURING AND PROTECTION

A. Beginning immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures, and mechanical injury.

B. Preservation of moisture:

1. Unless otherwise directed by the Architect, apply one of the following procedures to concrete not in contact with forms, immediately after completion of placement and finishing.

a. Ponding or continuous sprinkling;

b. Application of absorptive mats or fabric kept continuously wet;

c. Application of sand kept continuously wet;

d. Continuous application of team (not exceeding 150° F) or mist spray;

e. Application of waterproof sheet materials specified in Part 2 of this Section;

f. Application of other moisture-retaining covering as accepted by the Architect.

g. Where forms are exposed to the sun, minimize moisture loss by keeping the forms wet until they can be removed safely.

2. Cure concrete by preserving moisture as specified above for at least ten days.

C. Temperature, wind, and humidity:

1. Cold weather:

a) When the mean daily temperature outdoors is less than 40° F, maintain the temperature of the concrete between 50° F and 70° F for the required curing period.

b) When necessary, provide proper and adequate heating system capable of maintaining the required heat without injury due to concentration of heat.

c) Do not use combustion heaters during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.

2. Hot weather: When necessary, provide wind breaks, fog spraying, shading, sprinkling, ponding, or wet covering with a light colored material, applying as quickly as concrete hardening and finishing operations will allow.

3. Rate of temperature change: Keep the temperature of the air immediately adjacent to the concrete during and immediately following the curing period as uniform as possible and not exceeding a change of 5° F in any one hour period, or 50° F in any 24 hour period.

D. Protection from mechanical injury:

During the curing period, protect the concrete from damaging mechanical disturbances such as heavy shock, load stresses, and excessive vibration.

1. Protect finished concrete surfaces from damage from construction equipment, materials, and methods, by application of curing procedures, and by rain and running water.

2. Do not load self-supporting structures in such a way as to over stress the concrete.

*****END OF SECTION*****

SECTION 04 05 13

MORTAR AND GROUT

PART 1 -- GENERAL

1.01 SUMMARY

In the event of conflicts between the information below and any article of the General Conditions, the General Conditions shall always take precedence.

1.02 SCOPE OF WORK

Work included in this Section: Mortar and grout for masonry.

1.03 SUBSTITUTIONS

Substitutions will be considered per Section 01 25 00.

1.04 SUBMITTALS

Provide in accordance with Section 01 33 00.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site.

B. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Maintain materials and surrounding air temperatures to minimum 40° F prior to, during, and 48 hours after completion of masonry work.

B. Protect construction from direct exposure to wind and sun when erected in ambient air temperature of 99° F in the shade, with relative humidity less than 50%.

1.07 MIX TESTS

A. Testing of Mortar Mix: in accordance with ASTM C780. Test mortar mix for compressive strength. Refer to structural drawings for required strength.

B. Testing of Grout Mix: in accordance with ASTM C1019. Test grout mix for compressive strength. Refer to structural drawings for required strength.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Type I or II (Type I for glass block).

B. Mortar Aggregate: ASTM C144, standard masonry type.

1. Provide clean, sharp, well-graded aggregate free from injurious amounts of dust, lumps, shale, alkali, surface coatings, and organic matter complying with UBC Standards.

2. Not less than 3% shall pass the No. 100 sieve.

C. Hydrated Lime: ASTM C207, Type S.

D. Grout "Course": 1 part Portland cement to 2-1/4 parts minimum to 3 parts maximum of damp loose sand to 1/10 part lime putty and 2 parts coarse of maximum 3/8 inch aggregate with sufficient water to achieve fluid consistency per ASTM C476. Not less

than 5% of the sand shall pass No. 100 sieve. Use in grout spaces 2 inches wide or more and in all filled cell construction.

E. Grout "Fine": 2-1/4 to 3 parts maximum damp, loose sand to 1/2 to 1/4 part lime putty with 1 part Portland cement and sufficient water to achieve fluid consistent per ASTM C476. Not less than 5% of the sand shall pass No. 100 sieve. To be used where shown on Drawings and where grout space is less than 2" in least dimension.

F. Water: Clean, potable and free from deleterious amounts of acids, alkalis and organic materials.

G. Lime Putty: Shall be made from pulverized (processed) quick lime or from hydrated lime.

2.02 COLOR

Mortar and Grout Color: Provide pre-ground mineral oxides, non-fading and alkali proof as manufactured by L.M. Scofield or approved equal. The Architect shall select color.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270 - Type S.

B. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

C. Do not use anti-freeze compounds to lower the freezing point of mortar. Do not use any admixtures unless specifically accepted in advance by the Architect through the submittal process.

D. Use mortar within two hours after mixing at temperatures of 80° F, or two-and-one-half hours at temperatures under 50° F.

E. Mechanically mix in a batch mixer for not less than three minutes, using only sufficient water to produce a mortar that is spreadable and of a workable consistency.

F. Re-temper mortar with water as required to maintain high plasticity. Do not re-temper mortar after 1-1/2 hours following initial mixing.

2.04 GROUT MIXING

A. Mix concrete in accordance with ASTM C94.

B. Add admixtures in accordance with manufacturer's instructions when previously approved. Provide uniformity of mix.

a. Waterproofing admixture shall be A.C. Horn's "Hydratite" or approved equal.

b. To reduce early water loss and produce expansive action admixture shall be Sika Grout Aid.

C. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

E. Request inspection of spaces to be grouted. Do not proceed until all sub-surfaces and spaces are acceptable.

3.02 INSTALLATION

A. Install mortar and grout to requirements of the specific masonry Sections.

B. Work grout into masonry cores and cavities to eliminate voids.

C. Do not displace reinforcement while placing grout.

D. Remove grout spaces of excess mortar.

*****END OF SECTION*****

SECTION 04 05 16

REINFORCED UNIT MASONRY SYSTEM

PART 1 -- GENERAL

1.01 SUMMARY

In the event of conflicts between the information below and any article of the General Conditions, the General Conditions shall always take precedence.

1.02 SCOPE OF WORK

The work under this section includes furnishing all labor, materials and equipment, and performing all operations in connection with all masonry work, concrete block and glass block, indicated on the Drawings, specified herein, or reasonably required to complete all masonry work. Coordinate with other trades and install all embeds and inserts required.

1.03 SUBSTITUTIONS

Substitutions will be considered per Section 01 25 00.

1.04 SUBMITTALS

A. Provide in accordance with Section 01 33 00.

B. Submit shop drawings indicating bar sizes, spaces, locations, quantities of reinforcement, bending and cutting schedules and spacing devices.

C. Submit product data on masonry units.

1.05 QUALITY CONTROL

A. Company specializing in performance of work of this Section for a minimum of 5 years. Use adequate numbers of skilled workmen 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.

B. Design engineered masonry work under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of California.

1.06 DELIVERY AND STORAGE

All materials shall be delivered, stored and handled so as to prevent the inclusion of foreign materials and/or damage. Packaged materials shall be delivered and stored in original packages until ready for use. Packages or materials showing evidence of damage shall be rejected.

PART 2 -- PRODUCTS

2.01 MASONRY UNITS

A. Concrete Block shall be hollow concrete masonry units conforming to the requirements for Grade N units, Type I under ASTM Specification C-90.

B. Masonry Units shall be 8"x8"x16" nominal as manufactured by Orco Block Co. or approved equal (909) 849-7891.

1. Block types, sizes, and patterns as indicated on the drawings.

2.02 MORTAR AND GROUT

A. Mortar shall be as specified in Section 04100 and shall develop a compressive strength of not less than 750 lbs. per square inch at seven (7) days or less than 1800 pounds per

square inch at twenty-eight (28) days or as specified on the Structural Drawings. The total clay content, including that in the sand, shall not exceed 2 percent of the sand content or 6 percent of the cement content.

B. Grout fill for cells shall consist coarse grade as specified in Section 04100. Minimum grout strength to be 2000 pounds per square inch (psi) unless otherwise specified on the Structural Drawings.

2.03 REINFORCEMENT AND ANCHORAGE

A. Single wythe joint reinforcement for CMU: Truss type; hot dip galvanized after fabrication cold-drawn steel conforming to ANSI/ASTM A82.

B. Reinforcing Steel for CMU: Deformed bar billet type, specified in Section 03200; size as shown on Drawings, unprotected finish.

C. Strap anchors for CMU: Bent Steel shapes as shown on Drawings or required for complete and proper installation of this Work.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Verify items provided by other Sections of work are properly sized and located.

E. Verify that built-in items are in proper location, and ready for roughing into masonry work.

F. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied to other Sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

C. Preparation. Concrete surface to receive masonry shall be free from all dirt, oil, curling compound, or other deleterious substance. All such surfaces shall be thoroughly washed with water before laying block and shall be in a condition to provide maximum suction at the time the mortar bed is placed.

D. Verify that Channel and Anchor placement for Glass Block is at all head and jambs.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Lay concrete masonry units in running bond. One Course is one unit and one mortar joint and is equal to 8 inches. Form flush mortar joints. Do not use chipped or broken units.

3.04 ENVIRONMENTAL CONDITIONS

A. Do not place masonry units when air temperature is below 40 degrees F.

B. Protect masonry from direct exposure to wind and sun. When erected in ambient air temperature of 99 degrees F in the shade, with relative humidity less than 50%.

3.05 PLACING AND BONDING – CMU

A. General:

1. Do not commence installation of the work of this Section until horizontal and vertical alignment of foundation is within 1/2" of plumb and the lines shown on the Drawings.
2. Use masonry saws to cut and fit masonry units.
3. Set units plumb, true to line, and with level courses accurately spaced.
4. Clean the top surface of foundation free from dirt, debris, and laitance, and expose the aggregate prior to start of installing first course of sandblasting or water blasting.
5. Accurately fit the units to plumbing, ducts, openings, and other interfaces, neatly patching all holes.
6. Keep the walls continuously clean, preventing grout and mortar stains. If grout does run over, clean immediately.
7. All bolts embedded in masonry shall be grouted in place with not less than one inch of grout between the bolt and a masonry unit and shall be accurately set with templates.

B. Do not use chipped or broken units. If such units are discovered in the finished wall, the Architect may require their immediate removal and replacement with new units at no additional cost to the Owner.

C. Laying up: Pattern shall be running bond.

1. Place units in mortar with full shoved bed and head joints.
2. Align vertical cells of hollow units to maintain a clear and unobstructed system of flues.
3. Hold racking to an absolute minimum.
4. Provide running bond with vertical joints located at center of masonry units in the alternate course below.
5. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
6. Interlock intersections and external corners.

D. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

E. Remove excess mortar as Work progresses.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Cut mortar joints flush where resilient base is scheduled. Joints shall be 3/8" thick. Split block joints shall be raked.

I. Isolate masonry partitions from vertical structural framing members with a control joint.

J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 REINFORCEMENT AND ANCHORAGES -- CONCRETE UNIT MASONRY

A. Install horizontal joint reinforcement 16 inches unless structural plans note otherwise.

B. Place joint reinforcement continuous in first joint below top of walls.

C. Lap joint reinforcement ends minimum 40 bar diameters. Install reinforcement in first horizontal course above openings. Extend minimum 24 inches each side of openings.

D. Support and secure reinforcing bars from displacement. Maintain position with 1/2 inch of dimensioned position. Provide metal accessories to ensure adequate alignment of steel during grout filling operations.

E. Embed anchors attached to structural steel members. Embed anchorages in every second block joint.

F. Reinforce joint corners and intersections with strap anchors 16 inches OC.

3.07 GROUTED COMPONENTS

A. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

B. Place and consolidate grout fill without displacing reinforcing. Solidly fill all cells and courses unless otherwise indicated on the Drawings. Maximum grout lift shall be 24 inches.

C. Consolidate grout at time of pour by puddling with mechanical vibrator to completely fit all voids and interstices in the masonry work.

3.08 ENGINEERED MASONRY

A. Lay masonry units with core cells vertically aligned clear of mortar and unobstructed.

B. Place mortar in masonry unit bed joints back 1/4 inch from edge of unit grout spaces, bevel back and upward. Permit mortar to cure seven (7) days before placing grout.

C. Reinforce masonry unit cores with reinforcement bars and grout as indicated.

D. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters. Splice reinforcement in accordance with Section 03200. See Drawings for indication of locations where splicing is unacceptable.

E. Wet masonry unit surfaces in contact with grout just prior to grout placement.

F. Grout spaces less than 2 inches in width with fine grout using low lift grouting techniques. Grout spaces equal to or greater than 2 inches in width with course grout using high or low lift grouting techniques.

G. When grouting is stopped for more than one hour, terminate grout 1-1/2 inch below top of upper masonry unit to form a positive key for subsequent grout placement.

H. Low Lift Grouting: Place first lift of grout to a height of 16 inches and rod for grout consolidation. Place subsequent lifts in 8-inch increments and rod for grout consolidation.

3.09 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control joints.

B. Install performed control joint devices in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions. Control joints shall be 12'-0" O.C. maximum.

C. Size control joint in accordance with Section 07900 for sealant performance.

3.10 BUILT-IN WORK

A. As work progresses, build in metal doorframes, anchor bolts, plates, and other items furnished by other Sections.

B. Build in items plumb and level.

C. Bed anchors of metal doorframes in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

D. Do not build in organic materials subject to deterioration.

3.11 DEFECTIVE MASONRY OR MATERIALS

Any masonry materials delivered to the job site that do not conform to the requirements of these Specifications, shall be immediately removed from the work. Completed masonry that does not conform to the requirements of the Drawings and these Specifications shall be deemed defective materials and/or workmanship, and the Contractor shall remove it from the site, at no extra cost to the Owner.

3.12 CURING

All masonry work shall be kept continuously moist until and for not less than three (3) days after grouting. Curing water shall not be permitted to pond around buildings or structures.

3.13 TOLERANCES

A. Maximum Variation From Alignment of Columns: 1/4 inch.

B. Maximum Variation From Unit to Adjacent Unit: 1/32 inch.

C. Maximum Variation From Plane of Wall: 1/4 in. in 10 feet and 1/2 in. in 20 feet or more.

D. Maximum Variation From Plumb: 1/4 inch per story non-cumulative.

E. Maximum Variation From Level Coursing: 1/8 inch in 3 feet, 1/4 inch in 10 feet, and 1/2 inch in 30 feet.

F. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

3.14 CUTTING AND FITTING

A. Cut and fit for pipes, conduits, sleeves, and grounds. Coordinate with other Sections of work to provide correct size, shape, and location.

B. Obtain Architect approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.15 CLEANING

A. Clean surfaces of masonry as required for proper application of the specified finishes.

B. Concrete Unit Masonry:

1. Use all means necessary to prevent staining of the exposed face by mortar, grout, and other material.

2. Remove mortar and grout stains as the work progresses.

3. Upon completion of the work of this Section, clean all exposed veneer surfaces with a 10% solution of muriatic acid in clear water, using fiber bristle brooms or brushes, followed by thorough rinsing with clear water.

4. In the event ordinary cleaning is not adequate, use a light sandblasting or other means as directed by the Architect, and at no additional cost to the Owner.

5. Replace defective mortar. Match adjacent work.

3.16 TEST & INSPECTIONS

A. Refer to structural drawings.

B. Mortar shall be tested as per U.B.C. Standards.

C. Grout shall be tested as per U.B.C. Standards.

3.17 PROTECTION OF FINISHED WORK

A. Protect finished installation.

B. Without damaging completed work, provide protective boards at exposed external corners, which may be damaged by construction activities.

*****END OF SECTION*****