CONT. SPECOFOCATION

8. COORDINATION:
   No extra compensation allowed for extra work resulting from lack of coordination with existing condition. or failure to verify locations and measurements on the job.
9. MATERIALS GENERAL:
   A. All material new, packed in original containers, installed and turned over free of rust, corrosion or defects.
   B. Materials require Underwriter's Laboratories label except for equipment which UL does not list or provide label service.
10. RACEWAYS:
   A. All wiring in raceways.
   B. Installation Schedule:
      1. Interior concealed in ceiling (EMT), in wall or exposed.
   C. Raceway materials as manufactured by Walker, National or Appleton:
      1. Electric Metallic Tubing with set screw fittings.
      2. Flexible conduit, galvanized steel with "Jake" fittings.
11. CABLE:
   A. All wire; as manufactured by: Anaconda, General Cable, General Electric, Rome or Simplex, or equal. All wires No. 10 and smaller: Type THHN/THWN 600 volt, copper. No. 8 and larger: THW/THWN copper. Color code all cables to match existing otherwise as follows:

Phase	120/240V
A	Black
B	Red
C	Blue
Neutral	White
All ground wires	Green

12. OUTLET AND JUNCTION BOXES:
   A. Acceptable manufacturers: Steel City, Appleton, Raco, Pyle National, Killark and Hope. or equal.
   B. Outlet boxes: interior one piece stamped steel galvanized. Minimum box size: 4-inch octagon or square. Plaster rings, extensions provided where necessary.
13. PULL BOXES:
   A. Acceptable manufacturers: Steel City, Appleton, Raco, Pyle National, Killark and Hope. or equal.
   B. Outlet boxes: interior one piece stamped steel galvanized. Minimum box size: 4-inch octagon or square. Plaster rings, extensions provided where necessary.
14. SUPPORT SYSTEMS: EMT and AC Cable
   Raceway supported at intervals not 10 ft. for EMT and 4 ft. for AC cable. feet and 10-feet, respectively. Provide one support not over 12-inches from each change in direction. Provide support within 3 ft. of boxes in cabinet Clamps: one hole malleable iron with clampback in exposed areas, 2 hole pipe straps in concealed areas.
15. GROUNDING:
   A. Per N.E.C.
   B. Provide grounding bushings at all feeder conduit entrances to panels and equipment enclosures.
   C. Provide separate ground wire at all flexible connections.
   D. Provide ground continuity throughout system.
   E. Provide separate ground wire in all feeders.
16. BRANCH CIRCUIT BREAKERS:
   A. Circuit Breakers: Thermal magnetic, molded case, bolt-on type to match existing. Sized as shown on drawings.
17. CLEANING AND PROTECTION:
   A. Keep the building clean and free of refuse from the work under this Section. Refuse and waste material must be removed from the building immediately.
   B. All parts of the equipment to be thoroughly cleaned and free from cement, paint, grease, plaster and dirt. Surfaces to be painted must be thoroughly smooth and clean. All surfaces free of rust.
   C. All equipment and all work under other sections of the specifications must be kept free from damage and dirt from the work under this Section.
18. TESTING AND ADJUSTING:
   A. After installation is complete, voltage and ampere readings shall be taken at the mains of each panel with all connected equipment turned on. Any phase unbalance shown from these tests shall be corrected by the Contractor.
   B. Final test of the electrical installation will be made upon a date approved by the Owner.
   Reports all anomalies found to owner prior to correction. this test must be made under the observation of the owner and engineer or record defects which it discloses must be corrected.
   C. For other test requirements, Refer to General Notes #9.
19. GUARANTEE:
   The Contractor shall leave the entire installation in complete working order, free from any defective material, workmanship or finish. He shall guarantee to repair or replace, without charge, defects due to faulty workmanship or material for a period of one year from date of filing Notice of Completion.

END OF SECTION

DEMOLITION NOTES

1. THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL EXISTING ELECTRICAL EQUIPMENT DEVICES AND WIRING WITHIN THE AREA OF RENOVATION PRIOR TO BID.
2. THE CONTRACTOR SHALL REMOVE ALL WIRING DEVICES, LIGHT FIXTURES, ETC. ON CEILINGS AND WALLS WHICH ARE UNDER THE AREA TO BE RENOVATED. DEVICES WHICH ARE TO BE REMOVED MAY REQUIRE REWORKING CONDUIT AND WIRING IN ORDER TO MAINTAIN SERVICE TO OTHER DEVICES. IF REMOVED DEVICES ARE ON WALLS OR CEILINGS WHICH ARE TO REMAIN, PROVIDE BLANK COVER PLATES ON OUTLET BOXES TO REMAIN.
3. WHERE REMODELING INTERFERES WITH CIRCUITS IN AREAS WHICH ARE OTHERWISE UNDISTURBED, CIRCUITS SHALL BE REWORKED TO MAINTAIN POWER CONTINUITY. WIRING SHALL BE INTERCEPTED IN ACCESSIBLE AREA AND RE-ROUTED IN SUCH A MANNER THAT INTERFERENCE WITH THE NEW WORK IS AVOIDED.
4. REMOVE, RELOCATE, AND/OR REWORK ANY ELECTRICAL EQUIPMENT, DEVICES, OR CONDUIT/WIRING AFFECTED WITHIN THE AREA OR RENOVATION (WHETHER INDICATED OR NOT) DUE TO REMOVAL OR REWORKING OF EXITING WALLS, CEILINGS, ETC. THE ELECTRICAL CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH ALL WORK TO BE DONE BY OTHER TRADES BY REVIEWING THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING DRAWINGS, AND EXAMINING THE SITE FOR ACTUAL CONDITION OF PROJECT.
5. ALL EQUIPMENT, FIXTURES, DEVICES, ETC. WHICH ARE REMOVED SHALL BE DELIVERED TO THE OWNER FOR DISPOSITION. ALL ITEMS NOT REUSED SHALL BECOME THE PROPERTY OF THE ELECTRICAL CONTRACTOR AND SHALL BE REMOVED FROM THE SITE.
6. THE COST OF CUTTING AND PATCHING NECESSARY FOR THE INSTALLATION OR REMOVAL OF ELECTRICAL WORKS SHALL BE INCLUDED IN HE ELECTRICAL CONTRACT. COORDINATE WITH THE GENERAL CONTRACTOR.
7. THE CONTRACTOR SHALL REMOVE AND REPLACE LIGHTING FIXTURES; REWORK, RELOCATE, OR REPLACE CONDUIT AND WIRING, AND DO OTHER WORK REQUIRED BY THE INSTALLATION OF NEW DUCTWORK, PIPING, ETC., ABOVE EXISTING CEILING. COORDINATE WITH OTHER CONTRACTORS AND VERIFY THE EXTENT OF THE WORK.
8. THE CONTRACTOR SHALL OBTAIN WRITTEN AUTHORIZATION FROM THE OWNER 7 CALENDAR DAYS PRIOR TO ALL POWER SHUTDOWN.
9. ALL CONDUIT AND WIRING NOT TO BE USED SHALL BE REMOVED BACK TO THE PANELS.
10. EXISTING CONDUIT AND WIRING WHICH ARE TO BE REUSED SHALL MEET THE REQUIREMENTS OF NEW CIRCUITS AND TO REMAIN IN GOOD CONDITION.

PLOT DATE:

CONT. GENERAL NOTES

p. The location of all accessories, conduit routing, trenching, saw cutting and coring on these drawings are shown diagrammatically. Coordinate exact location with owner/architect prior to rough in. accuracies resulted from failure to comply with this requirements, shall be corrected without additional cost to the owner.

q. Exposed exterior conduit installation shall be coordinated with architect and engineer. Contractor shall submit drawings showing the proposed location of conduit and boxes to architect for review and approval prior to rough in.

r. Conductors for circuiting shall be color-coded solid copper with minimum size no. 12 AWG, THWN insulation.

s. Provide insulated green equipment grounding conductor in feeders and all branch circuits, including lighting circuits. Isolated ground conductor shall be green with yellow stripes.

t. Provide 12 inches separation between power and signal raceways.

u. Supports for all conduits shall be in accordance with NEC and the latest SMACNA "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Systems".

4. Branch circuit wiring

a. Upsize wire size to next higher size for 120-volt system circuit homeruns exceeding 100 feet run from the first device to the respective panel.

b. Provide grounding wire in all feeders and branch circuits. Grounding wire size per NEC. Code size grounding wire shall be from panel and carried through to last device or equipment.

c. Provide a maximum of three (3) circuit conductors (from different phases) in a homerun with common neutral unless other wise noted. Homeruns shall be conduit from the first junction box to the panel. Multi conductor cable is not allowed. This is considered as multi-wire branch circuits requiring simultaneous disconnection. Provide individual single pole breakers with common handle tie. Refer to 2008 NEC 210.4(A)(B).

d. Group all wires of multi-wire branch circuits with cable tie or similar means in the panelboard.

e. Provide a maximum of three (3) circuit conductors (from different phases) in a homerun with common neutral unless other wise noted. Homeruns shall be conduit from the first junction box to the panel. Multi conductor cable is not allowed.

f. Identify branch circuit in all wires and junction boxes with black permanent markers. Use red color for emergency circuit, black for normal and blue for isolated circuit.

g. Unless otherwise noted, all light fixtures with three (3) or four (4) lamps shall be controlled by two level switching. Switch two (2) outer lamps separately from one (1) or two (2) inner lamps. Quantity of fixture ballast shall match switching configuration.

h. Branch circuit wiring guide: Install individual neutral wire of same size as the phase wires for every three (3)-branch circuits in common raceway from panel to the last device. For data power outlet, install individual #10 neutral wire per #12 phase wire circuit or size to the next higher rating from the phase wires.

i. All home runs designated to the panelboard shall be assumed as starting from the nearest outlet and continuing in the general direction of the panel. Continue such circuits to the panel as though the routes are completely indicated. Home runs require upsizing circuit conductors for voltage drop (ie: #10 wire on 20-Ampere circuit breaker) shall have the conductor size carried throughout the run up to the last device.

j. All wiring for branch circuits shall be #12 AWG protected by 20-ampere circuit breaker unless otherwise indicated. If distance from panel to the first outlet is 100 feet or greater, provide #10 AWG. For derating factor for wire ampacity regarding wire quantity in a raceway refer to NEC Table B-310-11and, provide the correct wire size of the same insulation.

5. Electrical test

a. Submit all test results to the engineer for review and approval. Submit test procedure prior to testing for review. Testing shall be performed by independent testing agency certified by NETA.

b. Test ground system using fall-of-potential method. Ground shall have a minimum resistance of 25 ohms.

c. Megger all the feeder cables in accordance with NETA latest standard procedure.

d. Test all breakers rated 100 amperes and above with current injection method.

e. Field-test all electrical equipment using NETA standard procedures.

SPECIFICATION NOTES

1. SCOPE:
   A. Furnish all labor, equipment, material and perform all operations in connection with the complete installation, testing and adjusting of the electrical work.
2. RULES AND REGULATIONS:
   All work and material shall be in full accordance with the latest rules and regulations of the California Administrative City of Alameda.
3. FEES AND PERMITS: Obtain and pay for all licenses, permits and fees required to complete the work.
4. INSTALLATION – GENERAL:
   A. Work installed to Owner's satisfaction. Work not acceptable to him shall be corrected or replaced.
   B. Wiring shall be installed concealed wherever possible.
   C. All work installed neatly, raceways, fittings and equipment level plumb and straight. Connectors, locknuts, screws, clamps, joints made up tightly.
   D. Conduit, outlets and equipment: Clear beams of obstructions. Do not cut into or reduce the size of any load-carrying member without the approval of the Architect. Check drawings and work of others to prevent interference. Deviations of work to avoid obstructions performed without additional cost. All conduits shall run parallel or at right angles to building walls, ceilings or beams.
   E. Sleeves, coring, chases and concrete expansion anchors:
      1. This Section shall provide, to cause no delay, all required sleeves, coring, chases, concrete expansion anchors, etc., before rough-in, be responsible for correct locations, installation or same.
      2. Sleeves, chases are prohibited in structural
5. EXAMINATION OF SITE:
   Examine the site and premises prior to bidding, to determine the conditions under which the work is to be performed. No allowances will be made for extra expense incurred due to failure to examine the premises or to discover site conditions which affect the work.
6. CHANGES TO ELECTRICAL WORK:
   A. Owner reserves the right to order, in writing, any changes which they may desire to make in the work or materials herein specified, or shown on the drawings. Such changes shall not alter the terms of the contract. The true value of such changes, whether additions or deletions, shall be added to or deducted from the original price. All additional conduit, outlets, switches, fixtures and other material and labor added to the electrical work, not indicated on the drawings or in the specifications, and involving additional cost, shall be submitted to the Owner and a price agreed upon, in writing, before proceeding with work.
   B. If, at any time the Contractor believes that he cannot secure proper results through the use of materials and procedures specified, it shall be his obligation to notify the Owner, in writing, setting forth his reasons and proposed method of accomplishing the intended purpose.
7. WORK IN EXISTING BUILDING;
   A. Existing building electrical equipment may be reused to the fullest extend possible to accomplish the work indicated. Contractor shall make corrections as found and complete the work without additional cost to the owner The existing systems which are to remain shall be maintained or returned to original operating condition. Such portions of the existing systems damaged during the course of this construction shall be restored to original condition.

GENERAL NOTES

1. General Coordination Requirements

a. Contractor shall comply with the most stringent requirements indicated either by drawings or by the general notes.

b. Contractor shall visit the job site, verify field conditions, review construction documents and shall include all cost to construct the project in accordance with this construction documents and applicable codes.

c. All electrical work indicated on the construction documents, as a minimum shall comply with all the applicable provisions of the latest edition of the NEC, local applicable codes and authority having jurisdiction. These applicable code requirements whether indicated or not on the construction documents constitute as part of the contract and shall be furnished without cost to the contact and owner.

d. Contractor shall bring to the attention of the architect any discrepancies or conflicts in the construction documents or the site conditions. The architect must approve all construction document revisions due to such discrepancies and conflicts in writing prior to commencing work.

e. Contractor shall obtain and pay all permits and fees required for the work.

f. All materials and equipment furnished and installed shall be new, free from defects and guaranteed for a period of one year from the date of the final acceptance by the owner. Should any problem arises within the guaranteed period due to faulty workmanship and material, the contractor shall furnish all necessary materials and labor to rectify the problem without additional cost to the owner.

g. Notify the owner representative at least three (3) weeks prior to commencing work in a particular area. Before any cutting or demolition work, contractor shall carefully survey the existing condition and review the construction documents to determine the scope of work. Contractor shall take all the necessary precaution not to damage any existing work to remain, reused or to remain as property of the owner. Repair or replace any damage to such at no additional cost to the owner. Provide required structural supports to elements because of cutting, removal or demolition work performed under any part of this contract.

h. Coordinate and schedule all work with all necessary consideration for the owner and the public. Avoid interference with the use of and passage to and from adjacent areas and facilities designated to remain in use during demolition. Maintain all existing circuits to items required to remain in use. Provide abandoned outlet boxes with blank cover plates painted to match wall finished.

i. These plans are refer to existing electrical facilities and based upon the best information available at this time. Contractor shall field verify the information contained herein and report any accuracies, code violations, omissions and other unforeseen conditions affecting the indicated work to the Architect. Report to the Architect in writing all conditions found which will prevent proper provisions of this work. Commencing work without reporting such, conditions constitute acceptance of condition by the contractor. Therefore, required removal, repair and replacement due to such conditions shall be a sole responsibility of the contractor with no additional cost to the owner.

j. For existing facility only: Prior to submitting proposal, bidder shall examine the complete construction documents thoroughly and visit the site for familiarity of the existing conditions under which he will have to operate and any which way can affect the work on this contract. Failure to adhere to this note shall constitute as a miscoordintation resulted to additional work without cost to the owner.

k. Contractor shall be responsible for verifying the electrical characteristics and additional requirements all equipment. Provide all necessary accessories for a complete code compliant electrical wiring and an approved manner by manufacturer.

l. For existing facility only: Rework all existing outlets, equipment and associated wiring and conduit system(s) required to maintain system operation that interferes with the work of the other trades.

2. Drawing Description

a. Drawings in general are diagrammatic. Intention is to show size, capacity, approximate location, direction, and general relationship of one work phase to another, but not exact detail or arrangement.

b. Scaled and figured dimensions are approximate and are for estimating purposes only. Indicated dimensions are limiting dimensions.

c. Refer to architectural reflected ceiling plans for the actual layout of light fixtures, cable trays location and ceiling types. In case quantity discrepancies arise between electrical lighting layout and architectural ceiling plan, the most stringent requirement should take precedent.

d. Before proceeding with the work, check and field verify all dimensions.

e. Contractor shall assume complete responsibility for fitting all materials and equipment to other parts of equipment and architectural and structural elements. Make adjustments that may be necessary or requested in order to resolve space problems, preserve headroom, and avoid architectural openings, structural members and work of other trades at no cost to the owner.

f. For exact locations of building elements, refer to dimensional architectural/structural drawings. Location shown on architectural ceiling drawings or on wall elevations shall take precedence over electrical drawing locations.

g. Confirm exact mounting height and placement of all wall-mounted devices, etc with engineer and architectural interior elevation prior to rough in.

h. Review architectural drawings for electrical devices. Consider electrical devices indicated in the architectural drawings not shown in electrical drawings as part of the electrical systems and need to be included in the bid cost under separate items. Assume dedicated wiring and circuit for these devices to the nearest panel, signal cabinet or control panel. The design team will review these items for inclusion or exclusion to the project.

i. If documents interpretation is requested, contractor shall propose solution in accordance with all affected sub-contractors. Clearly identify areas requiring engineer's review by circling the area on coordinated shop drawings/contract documents and write questions that requires resolution.

3. Wiring

a. General wiring shall be in EMT conduit. 1/2" minimum, unless otherwise noted or required by code

b. Route all surface raceways shown along the walls, unless otherwise architect or existing condition does not permit. (Across the ceiling as approved) Installation shall be as tight to corners as possible and perpendicular to building elements. Paint to match wall finished. Refer to architectural specification section 01300.

c. Install a separate conduit for each home run indicated in the drawings.

d. Do not run conduit closer than 6 inches to any hot water pipe, steam pipe, heater flue or vent.

e. Install "EYS" conduit seals in all conduits entering or leaving hazardous areas, refrigerated rooms and clean rooms.

f. Holes for conduits through existing concrete floors or walls shall be made by "core-drill" method. Prior to core drilling, determine conditions of the existing floor structure by X-ray, pacometer of other methods approved by the engineer of record.

g. Provide nylon pull rope and identification tag to all empty conduits regardless of sizes. Provide 3'-0" slacks at each end.

h. Exposed conduit installed within 8 feet above finished floor: Rigid steel conduit with compression fittings.

i. Conductor color-coding shall match existing color-coding.

j. Provide raceways penetrating fire rated walls, floors and ceilings with U.L listed fire seals approved by Authority Having Jurisdiction. For additional information, refer to detail sheets and architectural drawings for identifying rated walls.

k. Raceways passing thru structural expansion joints shall have expansion/deflection fittings (OZ Gedney AX/DX) or convert to flexible conduit with external ground bonding jumper strip. Flexible conduit shall have a minimum of 12 inches slack and allow seismic movement required by the structural engineer.

l. Major raceways requiring elbow installation in the tight condition shall be provided with "Erickson coupling".

m. Interior exposed raceway in finished walls or ceilings shall be metal surface raceway (conduit not allowed) unless otherwise noted. Route all new raceway tight to the structure, perpendicular to building lines. Install raceway in a manner to avoid conflict with other elements.

n. Paint all exposed metal surface raceways, conduits, pullboxes, junction boxes, supports etc with paint type and color approved by the owner/architect. Paint color to match wall paint color.

o. Provide all carpentry, cutting and patching for proper installation of electrical equipment, devices and raceways. Do not cut or drill structural elements without consent of architect. All cutting and repairing shall conform to title 24 of California Code of regulations.

LEGEND

(E) PANELBOARD SURFACE MOUNTED, FLUSH MOUNTED
(E) TELEPHONE TERMINAL BACK BOARD
(E) MAIN SWITCHBOARD
(E) CONDUIT RUN
CONDUIT TO BE ABANDONED
PANELBOARD SURFACE MOUNTED, FLUSH MOUNTED

RACEWAY/WIRING

EQUIPMENT CONNECTION
HOMERUN CONDUIT AND WIRES CONCEALED IN CEILING OR WALL
CONDUIT RUN CONCEALED IN CEILING OR WALL, NUMBER OF WIRES AS REQUIRED. (NOTE: SEE GENERAL NOTE #14 WHERE WIREMOLD ARE TO BE USED WHEN EXPOSED).
—P— POWER CONDUIT, 1/2"C. U.O.N.

DETAIL/REFERENCE TAG

SHEET NOTES IDENTIFICATION TAG – SEE SHEET NOTES
MECHANICAL EQUIPMENT IDENTIFICATION TAG
DETAIL OR DIAGRAM IDENTIFICATION TAG
(E), (N) INDICATES EXISTING OR NEW

ABBREVIATIONS

AC	=	ALTERNATING CURRENT
AFF	=	ABOVE FINISH FLOOR
AMPS	=	AMPERES
CB	=	CIRCUIT BREAKER
CKT OR cT	=	CIRCUIT
CU	=	COPPER
EMT	=	ELECTRICAL METALLIC TUBING
ES	=	ELECTRICAL SECTION OF THIS CONTRACT.
FA	=	FIRE ALARM
FACP	=	FIRE ALARM CONTROL PANEL
HP	=	HORSE POWER
JB	=	JUNCTION BOX
KV	=	THOUSAND VOLTS
KVA	=	KILOVOLT AMPERES
KW	=	KILOWATT
MAX	=	MAXIMUM
MIN	=	MINIMUM
MLO	=	MAIN LUG ONLY
MS	=	MECHANICAL SECTION OF
MTG. HT	=	MOUNTING HEIGHT
N.I.C.	=	NOT IN CONTRACT
N.T.S.	=	NOT TO SCALE
P	=	POLE
PB	=	PULL BOX
PH	=	PHASE
PNL	=	PANEL
SAD	=	SEE ARCHITECTURAL DRAWING
SCD	=	SEE CIVIL DRAWING
SLD	=	SINGLE LINE DIAGRAM
RSC	=	RIGID STEEL CONDUIT
SW	=	SWITCH
SWBD	=	SWITCHBOARD
U.O.N.	=	UNLESS OTHERWISE NOTED
V	=	VOLTS
W	=	WATTS – WIRE
WP	=	WEATHERPROOF

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Issuances and Revisions

No.	Date	Description
1	04-04-13	REVISION 1
2	07-03-13	PHASE 1 & 2

Date

Sheet Title

LEGEND, SYMBOLS, ABBREVIATION AND GENERAL NOTES

Scale: NTS

Project No. 1301.00

E0.1

Sheet No. Revision