Tumon Bay Street Lighting Improvement Phase II Installation Project

APPENDIX B

TECHNICAL SPECIFICATIONS

TUMON BAY STREET LIGHTING IMPROVEMENT PHASE II PROJECT

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DIVISION 01 GENERAL REQUIREMENTS

SECTION 01 11 00

SUMMARY OF WORK

1 PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

The purpose of the project is to upgrade the existing Tumon Bay Street Lighting System to energy efficient and reliable LED fixtures, and perform all work as outlined in the Scope of Work.

This is a time sensitive project and no time extension will be granted. In order to speed up this project GVB is furnishing "Long Lead Materials" for the contractor to install in addition to contractor supplied materials. Contractor requirements for installing Owner-furnished products, including providing miscellaneous items and accessories for a complete, functioning installation.

Protection: Contractor shall use means necessary to protect the materials of this Section before, during, and after installation and to protect completed Work, including products installed by others.

Products scheduled for use under this contract by means including, but not necessarily limited to, those described in this Section.

1.1.2 Replacements

In the event of damage, Contractor shall immediately replace all damaged furnished materials and defective Work to satisfaction of CM at no change in Contract Time and Contract Sum for GVB.

a. The Contractor shall be responsible for all broken, scratched and cracked glass, regardless of cause and no matter by whom damaged, from the time construction has begun until the project is accepted by CM. He shall replace all damaged glass and deliver the entire job with all glazing intact and clean.

1.1.3 Purpose

Replace all eighteen existing Street Lighting Panels (SLPs) and Median Panels stainless steel enclosure, replace all conduits entering the new enclosures with Myers Hub, and use new stainless steel brackets for the enclosure installation, modify existing foundations including as may be necessary. Install provided lighting fixtures in size and number indicated in the Light Fixture and Poles Circuit Table for each SLP, re-use existing conduits as much as possible and replace as required. Install provided new conductors for lighting circuits. Provide and install new photo control devices for each individual SLP. Remove and replace all conductors from the SLPs to the light poles and from the SLPs to the Medians.

- Submit Schedule

- Replace all non LED lighting fixtures with new LED energy efficient lighting fixtures complete with housing. (Smaller size fixtures for sidewalk and larger size fixtures for street).
- Replace all other lighting fixtures with LED energy efficient lighting fixtures complete with housing. (Smaller size fixtures for sidewalk and larger size fixtures for street).
- Clean all concrete footing at SLPs to remove overgrown vegetation and other dirt.
- Remove all overgrown vegetation's at the SLPs and Street Lighting Fixture.
- Replace all damaged concrete footing at Median as required. Place new concrete footing central and as far away from traffic as possible on Median. Install two red retro reflective safety devices (cat eyes or similar) on each side of the concrete footing in each driving direction.
- Replace all conductors from the SLPs to all street lighting concrete poles and conduits as required. Contractor needs to determine total conductor length.
- Replace all lighting conductors at SLPs.
- Replace all wiring inside of all street lighting concrete poles. From wire cover plate to lighting fixture.
- Replace all conductors from the SLPs to all Median Panels and conduits as required. Contractor shall supply all conductors for the medians.
- Install new circuit breakers into new Median panels.
- Replace all conductors from the Median panel to all spotlights on median and conduits as required.
- Install new fused lighting connectors for every lighting fixture at each concrete pole. There are
- Replace all deteriorated hardware from enclosures, conduits to bolts and replace all corroded framing hardware.
- Replace all SLP stainless steel enclosures (reuse internal panels and enclosures). Install new rigid conduit entering from concrete footing to enclosure and use Myers Hub to connect to the enclosure. Replace all lighting contactors. Reuse all other materials inside the SLP.
- Replace all Median stainless steel enclosures. Install new rigid conduit and use Myers Hub to connect to the enclosure.
- Replace all conduits entering the SLPs and use only Myers hub.
- In addition, replace all photocells and install locking type photo control devises and mating receptacles in compliance with ANSI C136.10 and UL 773.
- Replace one damaged concrete pole and two missing poles.
- Replace damaged and missing concrete pole base plate covers.
- Replace missing wire cover plate at concrete poles as required.
- Install conduit sealant/putty on all new and existing conduits to prevent intrusion of water.
- Install new fused inline watertight connector's at all concrete poles.
- Install new conductors and other wiring system as deemed necessary. Use for each wiring connection in addition two layers of rubber mastic tape.
- Provide concrete pole numbering per SLP. Provide one-line diagram for each SLP. Base concrete pole numbering on one-line diagram.
- Any other work and materials not listed here that are required to have a full functioning Street Lighting System. Be aware to purchase wire between SLP and median locally.
- Provide any equipment and tools required for this project.

- As a separate second bid item provide a quote replacing damaged underground conduits as required.
    - Concrete encase conduit all around 3” with 2500 PSI concrete. 24” minimum depth under roadway/driveway, install detectable warning tape at 12” below finish grade. Provide selected backfill no larger than 2”. Provide compaction at 95%. Repair pavement to existing condition.
    - Sand cushion (sand backfill) conduit all around 4” with selected sand (sieve size of 3/8” or less). 24” minimum depth sidewalk (no roadway/driveway), install detectable warning tape at 12” below finish grade. Provide selected backfill no larger than 2”. Provide compaction at 95%. Repair finished grade to existing condition.
- As a separate third bid item provide a quote for a maintenance program for SLPs 1, 2, 3, 4 and 5 for 3 years broken down annually after the contractual 1-year warranty expired. Inspect street lighting system at a minimum once per week that all light fixture and photocell are working correctly and provide findings to GVB for review. Get additional work authorization and materials approvals immediately the next working day. Include cost for replacement of defective LED lighting fixtures under warranty. The LED fixtures are coming with a 7 years’ warranty if installed and maintained correctly in confirmation with manufacturer installation and maintenance recommendation. Provide maintenance of LED lighting fixtures in confirmation with manufacturer recommendations. Be proactive and be able to react in a timely fashion in order to upkeep a working street lighting system. Maintain proper maintenance, repair and inventory records providing details on the state of the lighting system. Submit these records at the first Monday of every month. Identify shortcomings and implement best practice maintenance standards. Keep maintenance and repair records together with the lighting systems operation and maintenance documentation. Ensures that repairs or replacements are carried out in compliance with industry standards and that materials are installed within manufacturer’s recommendations.

Routine Maintenance, Inspection, and Repair Reports for all routine work and shall contain the following:

1. SLP and Pole number
2. Date, time, and reported by
3. Short description of defect
4. Troubleshooting performed
5. Work performed
6. Materials replace/used
7. Materials on order
8. Date, time, work completed

1.2. Location

The work shall be located at Tumon Bay San Vitores Road (Hotel Road). The exact location is shown on the contract drawings.

1.3 EXISTING WORK

a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.

b. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the CM. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

1.4 LOCATION OF UNDERGROUND FACILITIES

Hand-dig around existing foundations, manholes and hand holes. It is the responsibility of the contractor to ensure that no other underground utilities are being damaged while digging or closing trenches.

1.5 LONG LEAD MATERIALS
CONTRACTOR INSTALLED AND GVB-FURNISHED LONG LEAD MATERIALS(OFCI)

a. GVB will furnish the long lead materials (long lead materials total cost of approximately $1.4 million) during the performance of the work under this section.
b. Contractor shall coordinate delivery/purchase of long lead materials from storage. Material Manager will furnish products to coincide with construction schedule.
c. Contractor will receive long lead materials from material manager.
d. Contractor must require long lead materials from material manager with Construction Manager(CM) approved quantities 3 days in advance.
e. Receive products at site and give written receipt for product at time of delivery, noting visible defects and omissions; if such declaration is not given, the Contractor shall assume responsibility for such defects and omissions.
f. Store products until ready for installation and protect from loss and damage.
g. Contractor shall protect all materials under this contract from damage until Contract Completion.
h. In the event of damage, Contractor shall immediately replace all damaged furnished materials and defective Work to satisfaction of CM at no change in Contract Time and Contract Sum for GVB.
i. Except as otherwise approved by the CM, determine and comply with manufacturers' recommendations on product handling, storage and protection.
j. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
k. Maintain packaged materials with seals unbroken and labels intact until time of use.
l. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements at no additional cost to the Owner.
m. The Owner may reject as non-compliant such material and products that do not bear identification satisfactory to the Owner as to manufacturer, grade, quality and other pertinent information.
n. In the event of discrepancy, Contractor shall immediately notify CM.

GVB-Furnished LONG LEAD MATERIALS for all 18 SLPs. Contract documentations details materials for each SLP.

ITEM NO.	DESCRIPTION	MAT. SPEC. REF.	UNIT	QUANTITY
1.00	THWN-2, 8 AWG Stranded Copper Conductor, 600V, Black, 5000 ft. Reel	1	FT	75000
2.00	CN35BN4AC, Cutler Hammer, NEMA Lighting Conductor, 20 Amp, 4 Pole, Electrically Held, Open, 600V Rated, 120 VAC/60Hz,	2	EA	60
3.00	CN35GN4AC, Cutler Hammer, NEMA Lighting Conductor, 60 Amp, 4 Pole, Electrically Held, Open, 600V Rated, 120 VAC/60Hz,	3	EA	20
4.00	Myers Hub 1 1/4, Insulated, Threaded Ridgid Gasketed Conduit Hub	4	EA	130
5.00	Myers Hub 3/4, Insulated, Threaded Ridgid Casketed Conduit Hub	4	EA	50
6.00	NEMA 4X (SSLP) Stainless Steel Single door, continuous hinge, with padlock and optional back panel for internal mount of accessories 48"x48"x12"	5	EA	18
7.00	NEMA 4X (SSLP) Stainless Steel Single door, continuous hinge, with padlock and optional back panel for internal mount of accessories 16"x12"x8"	5	EA	18
8.00	Surge Protection Device, 1 Phase, 120 Volts, UL 1449 3rd Edition, Test 3,000A/6KV, VPR	6	EA	36
9.00	K803 (150 W) complete fixture with LED Array, #K803-P4SH-III-150W(ssl)-8084-120:277V-S/F KPL10	7	EA	201
10.00	K703 (150 W) complete fixture with LED Array, #K703-P4SH-III-75W(SSL)-7030-120:277V-S/F KPL10	8	EA	204
11.00	Concrete Pole, #KTT25-G-Exx-FBP c/w GFI, BANNER ARS, POLE TOP FINIAL & BASEPLATE COVER	9	EA	6
12.00	Base Plate Covers for Concrete Poles	9	EA	15
13.00	KA30-S-8' (8' Arms) (Street)	9	EA	5
14.00	KA40-S-4' (4' Arms) (Sidewalk)	9	EA	5
15.00	1" Anchor Bolt Sets for Concrete Pole	9	EA	6
16.00	SLK 6, Stranded #8, Flood-Seal® Street and Highway Lighting Compression Fuse Kits — In-Line, Single Housing	10	EA	160
17.00	SLT 6, Stranded #8, Flood-Seal® Street and Highway Lighting Compression Fuse Kits — In-Line, Twin Housing	10	EA	180
18.00	Flood-Seal® Installation Tool, T&B WT111M, C Die or Equal	10	EA	5
19.00	10 Amp Fuse, Time Delay, Terminal Type: Cartridge, Rejection, Dimensions: 13/32 Diameter x 1 1/2 Length Inch, Voltage Rating: 600 VAC/300 VDC, Features: Time Delay for items 16.00 and 17.00	11	EA	530

1.6 PRODUCTS, MATERIALS, ITEMS AND EQUIPMENT

a. GENERAL DEFINITIONS

- The word "Product, Material, Item and Equipment" as used in the Contract Documents, is defined to include purchased items for incorporation into the Work, regardless of whether specifically purchased for the project or taken from Contractor's stock of previously purchased products. The word "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form Work. The word "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this paragraph are not intended to negate the meaning of other terms used in the Contract Documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.

b. Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying, and erection of the Work.

1.7 REFERENCES TO MANUFACTURES

References to a particular manufacturer in the Bid Documents is solely intended by GVB to assist the Bidder in identifying a supplier that GVB knows, or believes, manufactures products that meet the specifications and design requirements for the particular item, or items, although, GVB does not guarantee or warrant in any way that the manufacturers listed provide conforming goods. Thus, by using the name of a proprietary item or the name of a particular manufacturer, GVB is intending to assist the bidder to provide the correct type, function and quality for all products, materials, or equipment required under this Bid. Please note that reference to a particular manufacturer is not meant to limit in any way the Bidders ability to provide substantially equivalent goods which meet the specifications set forth herein. Regardless of whether or not the goods are manufactured by the manufacturer identified herein, the Bidder is solely responsible for ensuring that all specifications within this bid are met. As such, the Bidder must be mindful of the following requirements relative to providing products, material or equipment:

- The burden of proof as to the type, function, and quality of any product, material or equipment shall be upon the Contractor.

- GVB will be the sole judge as to the type, function, and quality of all products, materials or equipment and GVB’s decision shall be final.

- GVB may require the Contractor to furnish additional data about the proposed products, materials or equipment.

- GVB may require the Contractor to furnish a special performance guarantee or other surety with respect to any proposed products, materials or equipment, if GVB deems it appropriate given the circumstances.

- Acceptance by GVB of any proposed products, materials or equipment shall not relieve the Contractor of its responsibility to comply with bid specifications.

1.8 QUALITY ASSURANCE

a. Source Limitations: To the greatest extent possible for each unit of Work, the Contractor shall provide products, materials, and equipment of a singular generic kind from a single source of high quality and which meet or exceed the requirements of the Buy American Act.
b. Compatibility of Options: Where more than one choice is available as options for Contractor's selection of a product, material, or equipment, the Contractor shall select an option which is compatible with other products, materials, or equipment. Compatibility is a basic general requirement of product, material and equipment selections.
c. The Contractor shall be responsible to properly safeguard all materials paid for by GVB against damage and loss. Damaged materials are replaced at the contractor cost.

1.9 PRODUCT DELIVERY AND STORAGE

a. The Contractor shall deliver and store the materials for this Work in accordance with manufacturer's written recommendations and by methods and means, which will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of products at the Site and overcrowding of construction spaces. In particular, the Contractor shall ensure coordination to ensure minimum holding or storage times for flammable, hazardous, easily damaged, or sensitive materials to deterioration, theft, and other sources of loss.

1.10 TRANSPORTATION AND HANDLING

a. Products shall be transported by methods to avoid damage and shall be delivered in undamaged condition in manufacturer's unopened containers and packaging.
b. The Contractor shall provide equipment and personnel to handle products, materials, and equipment by methods to prevent soiling and damage.
c. The Contractor shall provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.

1.11 STORAGE AND PROTECTION

a. Products shall be stored in accordance with manufacturer's written instructions and with seals and labels intact and legible. Sensitive products shall be stored in weather-tight climate controlled enclosures and temperature and humidity ranges shall be maintained within tolerances required by manufacturer's recommendations.
b. For exterior storage of fabricated products, products shall be placed on sloped supports above ground. Products subject to deterioration shall be covered with impervious sheet covering and ventilation shall be provided to avoid condensation.
c. Loose granular materials shall be stored on solid flat surfaces in a well-drained area and shall be prevented from mixing with foreign matter.
d. Storage shall be arranged to provide access for inspection. The Contractor shall periodically inspect to assure products are undamaged and are maintained under required conditions.
e. Storage shall be arranged in a manner to provide access for maintenance of stored items and for inspection.

1.12 MAINTENANCE OF PRODUCTS IN STORAGE

a. Stored products shall be periodically inspected on a scheduled basis. The Contractor shall maintain a log of inspections and shall make the

log available on request.

b. The Contractor shall comply with manufacturer's product storage requirements and recommendations.
c. The Contractor shall maintain manufacturer-required environmental conditions continuously.
d. The Contractor shall ensure that surfaces of products exposed to the elements are not adversely affected.

1.13 REFERENCES TO MANUFACTURES

a. References to a particular manufacturer in the Bid Documents is solely intended by GVB to assist the Bidder in identifying a supplier that GVB knows, or believes, manufactures products that meet the specifications and design requirements for the particular item, or items, although, GVB does not guarantee or warrant in any way that the manufacturers listed provide conforming goods. Thus, by using the name of a proprietary item or the name of a particular manufacturer, GVB is intending to assist the bidder to provide the correct type, function and quality for all products, materials, or equipment required under this Bid. Please note that reference to a particular manufacturer is not meant to limit in any way the Bidders ability to provide substantially equivalent goods which meet the specifications set forth herein. Regardless of whether or not the goods are manufactured by the manufacturer identified herein, the Bidder is solely responsible for ensuring that all specifications within this bid are met. As such, the Bidder must be mindful of the following requirements relative to providing products, material or equipment:
    a. The burden of proof as to the type, function, and quality of any product, material or equipment shall be upon the Contractor.
    b. GVB will be the sole judge as to the type, function, and quality of all products, materials or equipment and GVB’s decision shall be final.
    c. GVB may require the Contractor to furnish additional data about the proposed products, materials or equipment.
    d. GVB may require the Contractor to furnish a special performance guarantee or other surety with respect to any proposed products, materials or equipment, if GVB deems it appropriate given the circumstances.
    e. Acceptance by CM of any proposed products, materials or equipment shall not relieve the Contractor of its responsibility to comply with bid specifications to provide a complete, reliable and finished product for the designed purpose.

2 PART 2 PRODUCTS

Not used.

3 PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

1 PART 1 GENERAL

1.1 SUBMITTALS

GVBs approval is required for all submittals prior to proceeding with related activity. In general, the Construction Manager (CM) will be responsible for processing submittals on behalf of the GVB. The following shall be submitted in accordance with

Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Progress and completion pictures
Supervisor Master Electrician Guam License Number

The CMs review of submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to any errors in submittals. The Contractor shall be responsible for the dimensions and of adequate connections and details.

1.2 VIEW LOCATION MAP

Prior to or with the first digital photograph submittals, submit a sketch or drawing indicating the required progress photograph locations. Update as required if the locations are moved.

1.3 PROGRESS AND COMPLETION PICTURES

Photographically document site conditions prior to start of construction operations. Provide monthly, and within one month of the completion of work, in JPEG file format showing the sequence and progress of work. Take a minimum of 20 digital photographs each week throughout the entire project. Submit with the monthly invoice two sets of digital photographs each set on a separate CD-R, cumulative of all photos to date. Photographs for each month shall be in a separate monthly directory and each file shall be named to indicate its location on the view location sketch. The view location sketch shall also be provided on the CD as digital file. All file names shall include a date designator. Cross reference submittals in the appropriate daily report. Photographs shall be provided for unrestricted use by the GVB.

Submit progress reports signed by master electrician with license number and list of work performed certifying that work was performed in compliance to the contract.

1.4 SUPERVISION

All work shall be done by at least one qualified Guam licensed Master Electrician or under his direct supervision.

1.5 PRECONSTRUCTION CONFERENCE

After award of the contract and prior to commencement of any work at the site, the CM will organize a Preconstruction Conference to include GVB officials the Contractor and principal Subcontractors to discuss and develop a mutual understanding relative to administration of the value engineering and safety programs, the Contractor's schedule of work, the Contractor's accident prevention plan, the contractors quality control plan, submittal procedures and similar subjects of mutual interest.

1.6 AVAILABILITY OF PDF DRAWING FILES

After award and upon request, the electronic "PDF" drawing files will only be made available to the Contractor for use in preparation of construction data related to the referenced contract subject to the following terms and conditions.

Data contained on these electronic files shall not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the GVB or the CM. The Contractor shall make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the GVB, its agents or consultants that may arise out of or in connection with the use of these electronic files. The Contractor shall, to the fullest extent permitted by law, indemnify and hold the GVB and its agents harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic PDF files are not construction documents. GVB makes no representation regarding the accuracy or completeness of the PDF files, nor does it make representation to the compatibility of these files with the Contractors hardware or software. The Contractor is responsible for determining if any conflict exists. Use of these PDF files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project.

If the Contractor uses, duplicates and/or modifies these PDF files for use in producing construction drawings and data related to this contract, all previous indicia of ownership (seals, logos, signatures, initials and dates) shall be removed.

1.7 ELECTRONIC MAIL (E-MAIL) ADDRESS

The Contractor shall establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments in Microsoft, Adobe Acrobat, and other similar formats. Within 10 days after contract award, the Contractor shall provide the CM a single (only one) e-mail address for electronic communications from the GVB and the CM related to this contract including, but not limited to contract documents, Requests for Information (RFI's), submittal processing, progress billing, and other correspondence. The GVB and its CM may also use email to notify and to reply to the Contractor. Multiple email addresses will not be allowed.

It is the Contractor's responsibility to make timely distribution of all GVB and the CM initiated e-mail with its own organization including field

office(s). The Contractor shall promptly notify the GVB, in writing, of any changes to this email address.

1.8 UTILITIES

The contractor shall power electrical equipment (power tools, etc) used for this project using contractor-provided portable generators. Minimal amounts of water, used for work on this project, is to be provided by the contractor. Should larger quantities of water and power be required, the contractor shall coordinate with the CM for requirements and procedures.

1.9. CLOSEOUT

Incomplete or unacceptable work by the contractor shall constitute sufficient justification to retain payments due the Contractor.

2 PART 2 PRODUCTS

Not Used

3 PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 32 16.00 20

CONSTRUCTION PROGRESS
DOCUMENTATION

1 PART 1 GENERAL

1.1 SUBMITTALS

GVB approval is required for all submittals prior to proceeding with related activity. In general, the Construction Manager (CM) will be responsible for processing submittals on behalf of the GVB. The following shall be submitted in accordance with

Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction schedule

1.2 ACCEPTANCE

Prior to the start of work, prepare and submit to the CM for acceptance, a construction schedule in the form of Critical Path Network diagram and a Bar Chart. Acceptance of the Baseline Schedule and updates is a condition precedent to processing the Contractor's pay requests.

1.3 SCHEDULE FORMAT

1.3.1 Critical Path Method (CPM) Schedule

The CPM schedule shall include time required for submittal processing, material/equipment delivery, utility outages, on-site construction, inspection, testing, and closeout activities. The schedule shall be time scaled and generated using an electronic program.

1.4 UPDATED SCHEDULES

Update the Construction schedule at bi-weekly intervals or when the schedule has been revised. The updated schedule shall be kept current, reflecting actual activity progress and plan for completing the remaining work. Submit copies of purchase orders and confirmation of delivery dates as directed.

1.5 3-WEEK LOOK AHEAD SCHEDULE

The Contractor shall prepare and issue a 3-Week Look Ahead schedule to provide a more detailed day-to-day plan of upcoming work identified on the Construction Schedule. The work plans shall be updated each week to show the planned work for the current and following two-week period. Additionally, include upcoming outages, closures, and meetings. Identify critical path activities on the Three-Week Look Ahead Schedule. The detail work plans are to be bar chart type schedules, maintained separately from the Construction Schedule on an electronic spreadsheet program and printed on 8 ½ by 11 sheets. Activities shall not exceed 5 working days in duration and have sufficient level of detail to assign crews, tools and equipment required to complete the work. Three hard copies and one electronic file of the 3-Week

Look Ahead Schedule shall be delivered to CM no later than 8 a.m. each Monday and reviewed during the weekly Coordination Meeting.

1.6 CORRESPONDENCE AND TEST REPORTS:

All correspondence (e.g., letters, Requests for Information (RFIs), e-mails, meeting minute items, Production and QC Daily Reports, material order and delivery tickets, photographs, etc.) shall reference Schedule activities that are being addressed. All test reports (e.g., concrete, soil compaction, weld, pressure, etc.) shall reference schedule activities that are being addressed.

2 PART 2 PRODUCTS

Not used.

3 PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES

1 PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Approving Authority

The Construction Manager (CM) is the designated person authorized to approve submittal.

1.1.2 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.1.3 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles. Descriptions of the various potential types of submittals as well as format requirements are included in this section at Part 2. (NOTE: Some of the submittal types may not be used for this project):

1.1.4 Submittal Register

An initial Submittal Register has been provided at the end of this Section. Detailed instructions are provided in this section at Part 3.

The GVB will provide the initial submittal register in electronic format. This list may not be all inclusive and additional submittals may be required. The Contractor will verify that all submittals required for the project are listed and add as required to insure the Register is complete. Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the CM.

1.2 SUBMITTALS

CM approval is required for all submittals prior to proceeding with related activity. In general, The Construction Manager (CM) will be responsible for processing submittals on behalf of the GVB. The following shall be submitted in accordance with

Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Submittal Register

The CM's review of submittals shall not relieve the Contractor of the entire

responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to any errors in submittals. The Contractor shall be responsible for the dimensions and the design of adequate connections and details.

1.3 FORWARDING SUBMITTALS

1.3.1 Submittals Required from the Contractor

As soon as practicable after award of contract, and before procurement of materials, forward to the CM the submittals required in the technical sections of this specification, including shop drawings, product data and samples. The CM will review and approve submittals to verify submittals comply with the contract requirements.

1.3.1.1 O&M Data

Submit data specified for a given item within 3 calendar days after the item is delivered to the contract site.

1.4 PREPARATION

1.4.1 Transmittal Form

Transmit submittals with transmittal form prescribed and standard for project. On the transmittal form identify Contractor, indicate date of submittal, and include information prescribed by transmittal form and required in paragraph entitled, "Identifying Submittals," of this section.

1.4.2 Identifying Submittals

When submittals are provided by a Subcontractor, the Prime Contractor is to prepare, review and stamp with Contractor's approval all specified submittals prior to submitting for CM approval.

Identify submittals, except sample installations and sample panels, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:

a. Project title and location.
b. Construction contract number.
c. Date of the drawings and revisions.
d. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other subcontractor associated with the submittal.
e. Section number of the specification section by which submittal is required.
f. Submittal description (SD) number of each component of submittal.
g. When a resubmission, add alphabetic suffix on submittal description, for example, submittal 18 would become 18A, to indicate resubmission.
h. Product identification and location in project.

1.5 QUANTITY OF SUBMITTALS

1.5.1 Submit one copies of SD-03 Product Data and SD-08 Manufacturer's Instructions

1.5.2 Number of Samples SD-04 Samples

a. Submit one sets of samples showing range of variation, of each required item. Item will be returned to Contractor.
b. Submit one copy of SD-06 Test Reports and SD-09 Manufacturer's Field Reports, other than field test results that will be submitted with QC reports.
c. Submit one copy of SD-10 Operation and Maintenance Data for review and approval.
d. Unless otherwise specified submit one set of SD-01 Preconstruction Submittal and SD-11 Closeout Submittals.

1.6 VARIATIONS

Variations from contract requirements require GVB approval, through the CM, and will be considered where advantageous to the GVB.

1.6.1 Considering Variations

Discussion with the CM prior to submission will help ensure functional and quality requirements are met and minimize rejections and re-submittals.

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in rejection and removal of such work at no additional cost to the GVB.

1.6.2 Proposing Variations

When proposing variation, deliver written request to the CM with documentation of the nature and features of the variation and why the variation is desirable and beneficial to the GVB. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

1.6.3 Warranting That Variations Are Compatible

When delivering a variation for approval, Contractor warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.6.4 Review Schedule Is Modified

In addition to normal submittal review period, a period of 5 working days will be allowed for CM consideration of submittals with variations.

1.7 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals.

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed

by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the approving authority does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate bi-weekly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

e. Except as specified otherwise, allow review period, beginning with receipt by approving authority that includes at least 5 working days for submittals for CM approval. Period of review begins when the CM receives submittal from contractor.

f. Period of review for each resubmittal is the same as for initial submittal.

1.7.1 Constraints

Conform to provisions of this section, unless explicitly stated otherwise for submittals listed or specified in this contract.

Submit complete submittals for each definable feature of work. Submit at the same time components of definable feature interrelated as a system.

When acceptability of a submittal is dependent on conditions, items, or materials included in separate subsequent submittals, submittal will be returned without review.

Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.7.2 Contractor's QC Organization Responsibilities

a. Note date on which submittal was received from Contractor on each submittal.

b. Review each submittal; and check and coordinate each submittal with requirements of work and contract documents.

c. Review submittals for conformance with project design concepts and compliance with contract documents.

d. Act on submittals, determining appropriate action based on QC organization's review of submittal. Forward submittal to the CM with certifying statement or return submittal marked "not reviewed" or "revise and resubmit" as appropriate. The QC organization's review of submittal determines appropriate action.

e. Ensure that material is clearly legible.

f. Stamp each sheet of each submittal with QC certifying statement or approving statement, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only. QC organization will certify submittals forwarded to the CM with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number , is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is submitted for approval.

Certified by Submittal Reviewer, Date _____
(Signature when applicable)

Certified by QC Manager_____, Date
_____" (Signature)

g. Sign certifying statement. The QC organization member designated in the approved QC plan is the person signing certifying statements. The use of original ink for signatures is required. Stamped signatures are not acceptable.

h. Update submittal register as submittal actions occur and maintain the submittal register at project site until final acceptance of all work.

i. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

1.8 APPROVING AUTHORITY

(CM) The CM will:

a. Note date on which submittal was received.

b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned Submittals with one of the actions defined in Paragraph entitled, "Review Notations," of this section and with markings appropriate for action indicated.

Upon completion of review of submittals, stamp and date approved submittals. 1 copy of the approved submittal will be retained by the CM and 1 copy of the submittal will be returned to the Contractor.

1.8.1 Review Notations

The CM review will be completed within 5 working days after date of submission. Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize the Contractor

to proceed with the work covered.

b. Submittals marked "approved as noted" "or approved except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.

c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.

d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.9 DISAPPROVED SUBMITTALS

Contractor shall make corrections required by the CM. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the clause entitled, "Changes," is to be given to the CM. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the GVB requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, the Contractor shall make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.10 APPROVED SUBMITTALS

CM approval or acceptance of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing and other information are satisfactory.

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Quality Control requirements of this contract is responsible for dimensions, the design, adequate connections and details, and the satisfactory construction of all work.

After submittals have been approved or accepted by the CM, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.11 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor is to assure that the materials or equipment will be available in quantities required in the project. No

change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. The CM reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the CM for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples does not relieve the Contractor of his responsibilities under the contract.

PART 2 SUBMITTAL DESCRIPTIONS AND FORMAT

2.1 SD-01 PRECONSTRUCTION SUBMITTALS

2.1.1 SD-01 Description and Examples

Submittals which are required prior to start of construction activity, such as:

a. List of proposed Subcontractors
b. List of proposed materials to be used in the work other than Long lead Materials
c. Construction Progress Schedule
d. Submittal register
e. Health and safety plan
f. Quality Control(QC) plan
g. Environmental protection plan

2.1.2 Format of SD-01 Preconstruction Submittals

When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.

2.2 SD-02 SHOP DRAWINGS

2.2.1 SD-02 Description and Examples

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and

interdisciplinary work will be coordinated.

2.2.2 Format for SD-02 Shop Drawings

Shop drawings are not to be less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless other form is required. Drawings are to be suitable for reproduction and be of a quality to produce clear, distinct lines and letters with dark lines on a white background.

Present 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.

Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph entitled, "Identifying Submittals," of this section.

Number drawings in a logical sequence. Contractors may use their own number system. Each drawing is to bear the number of the submittal in a uniform location adjacent to the title block. Place the contract number in the margin, immediately below the title block, for each drawing.

Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.

Include the nameplate data, size and capacity on drawings. Also include applicable federal, industry and technical society publication references.

2.3 SD-03 PRODUCT DATA

2.3.1 SD-03 Description and Examples

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

2.3.2 Format of SD-03 Product Data

Present product data submittals for each section as a complete, bound volume. Include table of contents, listing GVBe and catalog item numbers for product data.

Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.

Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project, with information and format as required for submission of SD-07 Certificates.

Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, submit as specified for SD-07 Certificates.

Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the CM. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

Collect required data submittals for each specific material, product, unit of work, or system into a single submittal and marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted for expedition of construction effort.

Submit manufacturer's instructions prior to installation.

2.4 SD-04 SAMPLES

2.4.1 SD-04 Description and Examples

Fabricated or un-fabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

2.4.2 Format of SD-04 Samples

Furnish samples in sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately same size as specified:

a. Sample of Equipment or Device: Full size.
b. Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.
c. Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.
d. Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or

materials are conduit and handrails.

e. Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.

f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.

g. Sample Panel: 4 by 4 feet.

h. Sample Installation: 100 square feet.

Samples Showing Range of Variation: Where variations in color, finish, pattern, or texture are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range. Mark each unit to describe its relation to the range of the variation.

Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples are to be in undamaged condition at time of use.

Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final cleanup of project.

When color, texture or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

2.5 SD-05 DESIGN DATA

2.5.1 SD-05 Description and Examples

Design calculations, mix designs, analyses or other data pertaining to a part of the work.

2.5.2 Format of SD-05 Design Data and SD-07 Certificates

Provide design data and certificates on 8 1/2 by 11 inches paper. Provide a bound volume for submittals containing numerous pages.

2.6 SD-06 TEST REPORTS

2.6.1 SD-06 Description and Examples

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

a. Investigation reports.
b. Daily logs and checklists.
c. Final acceptance test and operational test procedures.

2.6.2 Format of SD-06 Test Reports and SD-09 Manufacturer's Field Reports

Provide reports on 8 1/2 by 11 inches paper in a complete bound volume.

Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

2.7 SD-07 CERTIFICATES

2.7.1 SD-07 Description and Examples

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or Subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

a. Confined space entry permits.
b. Text of posted operating instructions.

2.7.2 Format of SD-07 Certificates

Provide design data and certificates on 8 1/2 by 11 inches paper. Provide a bound volume for submittals containing numerous pages.

2.8 SD-08 MANUFACTURER'S INSTRUCTIONS

2.8.1 SD-08 Description

Preprinted material describing installation of a product, system or material, including special notices and (MSDS) concerning impedances, hazards and safety precautions.

2.8.2 Format of SD-08 Manufacturer's Instructions

Present Manufacturer's Instruction submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data.

Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.

Supplement the submittal with material prepared for project to satisfy submittal requirements not included in Manufacturer's Instructions. Identify this material as developed specifically for project, with information and format as required for submission of SD-07 Certificates.

Include the manufacturer's name, trade name, place of manufacture, and

catalog model or number on product data. Also include applicable federal, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, submit as specified for SD-07 Certificates.

Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the CM. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

Collect required data submittals for each specific material, product, unit of work, or system into a single submittal and marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted for expedition of construction effort.

Submit manufacturer's instructions prior to installation.

2.9 SD-09 MANUFACTURER'S FIELD REPORTS

2.9.1 SD-09 Description and Example

Documentation of the testing and verification actions taken by manufacturer's representative at the job site, in the vicinity of the jobsite, or on a sample taken from the job site, on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency and must state the test results; and indicate whether the material, product, or system has passed or failed the test.

Factory test reports.

2.9.2 Format of SD-09 Manufacturer's Field Reports

Provide reports on 8 1/2 by 11 inches paper in a complete bound volume.

Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

2.10 SD-10 OPERATION AND MAINTENANCE DATA

2.10.1 SD-10 Description

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

2.10.2 Format of SD-10 Operation and Maintenance Data (O&M)

Comply with the requirements specified in Section 01 78 00 for O&M Data format.

2.11 SD-11 CLOSEOUT SUBMITTALS

2.11.1 SD-11 Description and Example

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Special requirements necessary to properly close out a construction contract. For example:

a. Record Drawings
b. Operation and maintenance manuals for installed systems
c. Punch list completed

2.11.2 Format of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.

3 PART 3 SUBMITTAL REGISTER

3.1 SUBMITTAL REGISTER

Prepare and maintain submittal register as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by the GVB; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. The GVB will provide the initial submittal register in electronic format with the following fields completed, to the extent that will be required during subsequent usage.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the CM.

3.1.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register

submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of Submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

3.1.2 Contractor Use of Submittal Register

Update the following fields in the GVB-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive Numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

3.1.3 Approving Authority Use of Submittal Register

Update the following fields in the GVB-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive Numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

3.1.4 Action Codes

Entries for columns (j) and (o), are to be used are as follows (others may be prescribed by Transmittal Form):

CM Review Action Codes

NR - Not Received

AN - Approved as noted

A - Approved

RR - Disapproved, Revise, and Resubmit

3.1.5 Copies Delivered to the CM

Deliver one copy of submittal register updated by Contractor with each invoice request.

-- End of Section --

SECTION 01 35 26

SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.32	(2004) Fall Protection
ASSE/SAFE A10.34	(2001; R 2005) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

AMERICAN NATIONAL STANDARDS INSTITUE (ANSI)

ANSI A92.2	For Vehicle-Mounted Elevating and Rotating Platforms
	Vehicle and Operator records
	Maintenance records and certifications

ASME INTERNATIONAL (ASME)

ASME B30.22	(2005) Articulating Boom Cranes
ASME B30.3	(2009) Tower Cranes
ASME B30.5	(2007) Mobile and Locomotive Cranes
ASME B30.8	(2010) Floating Cranes and Floating Derricks

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2010) Standard for Portable Fire Extinguishers
NFPA 241	(2009) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 306	(2009) Standard for Control of Gas Hazards on Vessels
NFPA 51B	(2009; TIA 09-1) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work

NFPA 70	(2008; TIA 08-1) National Electrical Code
NFPA 70E	(2009; Errata 09-1) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008) Safety and Health Requirements Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1919	Gear Certification
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.500	Fall Protection

1.2 SUBMITTALS

CM approval is required for all submittals prior to proceeding with related activity. In general, The Construction Manager (CM) will be responsible for processing submittals on behalf of the CM. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP)
Activity Hazard Analysis (AHA)
Crane Critical Lift Plan
Proof of qualification for Crane Operators

SD-06 Test Reports

Accident Reports
Crane Reports

SD-07 Certificates

Confined Space Entry Permit
Hot work permit
Contractor Safety Self-Evaluation Checklist
Crane Compliance

1.3 DEFINITIONS

a. Competent Person for Fall Protection. A person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.

b. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.

c. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

d. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers and crane walkers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).

e. Qualified Person for Fall Protection. A person with a recognized degree or professional certificate, and with extensive knowledge, training and experience in the field of fall protection; who is capable of performing design, analysis, and evaluation of fall protection systems and equipment.

f. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;
(2) Days away from work (any time lost after day of injury/illness onset);
(3) Restricted work;
(4) Transfer to another job;
(5) Medical treatment beyond first aid;
(6) Loss of consciousness; or
(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

g. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; and/or collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.) Any mishap meeting the criteria described above shall be documented in the Contractor Significant Incident Report (CSIR).

1.4 CONTRACTOR SAFETY SELF-EVALUATION CHECKLIST

The "Contractor Safety Self-Evaluation checklist" will be completed monthly by the Contractor and submitted with each requestfor payment voucher. Additionally, monthly exposure reporting to the CM is required to be attached to the monthly billing request. This report is a compilation of employee-hours workedeach month for all site workers, both prime and subcontractor. The CM will provide copies of any special forms. An acceptable score of 90 or greater is required. Failure to submit the completed safety self-evaluation

checklist or achieve a score of at least 90, will result in a retention of up to 10 percent of the voucher.

1.5 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent addition of USACE EM 385-1-1, and the applicable federal, state, and local, laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

The contractor shall provide a Safety oversight team that includes a minimum of one (1) Competent Person at each project site to function as the Safety and Health Officer (SSHO). The SSHO shall be at the work site at all times, unless specified differently in the contract, to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor, and their training, experience, and qualifications shall be as required by EM 385-1-1 paragraph 01.A.17 and all associated sub-paragraphs. A Competent Personal shall be provided for all of the hazards identified in the Contractor's Safety and Health Program in accordance with the accepted Accident Prevention Plan, and shall be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. The credentials of the Competent Persons(s) shall be approved by the CM in consultation with the Safety Office.

The Contractor Quality Control (QC) person can be the SSHO on this project.

1.6.1.2 Construction Safety Hazard Awareness Training

The training requirements for the Site Safety and Health Officer (SSHO) must include the successful completion of the course entitled "Construction Safety Hazard Awareness Training for Contractors". If the SSHO does not have a current certification, they must obtain the course certification within sixty (60) calendar days from award. This course is periodically offered by Guam Contractors Association.

1.6.1.3 Competent Person for Confined Space Entry

Provide a competent person for confined space meeting the definition and requirements of EM 385-1-1.

1.6.1.4 Crane Operators

Meet the crane operators’ requirements in USACE EM 385-1-1, Section 16 and Appendix I. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacitates of 50,000 pounds or greater, designate crane operators as qualified by a source that qualifies crane operators (i.e., union, a GVB agency, or and organization that tests and qualifies

crane operators). Provide proof of current qualification.

1.6.2 Personnel Duties

1.6.2.1 Site Safety and Health Officer (SSHO)

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.
b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.
c. Maintain applicable safety reference material on the job site.
d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.
e. Implement and enforce accepted APPS and AHAs.
f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. Post a list of unresolved safety and health deficiencies on the safety bulletin board.
g. Ensure sub-contractor compliance with safety and health requirements.
h. Maintain a list of hazardous chemicals on site and their material safety data sheets.

Failure to perform the above duties will result in dismissal of the superintendent, QC Manager, and/or SSHO, and a project work stop by GVB The project work stop by GVB will remain in effect pending approval of a suitable replacement.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the CM's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.

c. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

1.6.3.2 Safety Meetings

Conduct and document meetings. Attach minutes showing CONTRACT Title, signatures of attendees and a list of topics discussed to the Contractors daily production report.

1.7 ACCIDENT PREVENTION PLAN (APP)

Use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan". Specific requirements for some of the APP elements are described below. The APP shall be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and made site-specific. The GVB considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer, the Contractor Quality control Manager, and any designated CSP and/or CIH.

Submit the APP to the CM 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

Once accepted by the CM, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the CM, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the CM, project superintendent, SSHO and quality control manager. Should any severe hazard exposure, i.e. imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the CM within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34,) and the environment.

Copies of the accepted plan will be maintained at the job site.

Continuously reviewed and amended the APP, as necessary, throughout the life of the contract. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered.

1.7.1 Contents

In addition to the requirements outlines in Appendix A of USACE EM 385-1-1,

the following is required:

a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel to be used such as CSPs, CIHs, STSs, CHSTs. Specify the duties of each position.

b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

c. Confined Space Entry Plan. Develop a confined and/or enclosed space entry plan in accordance with USACE EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. If there is no confined space work, include a statement that no confined space work exists and none will be created.

d. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. Submit 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.H. and the following:

e. Fall Protection and Prevention (FP&P) Program Documentation. The program documentation shall be site specific and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A qualified person for fall protection shall prepare and sign the program documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Revise the Fall Protection and Prevention Program documentation for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Program documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Program documentation in the Accident Prevention Plan (APP).

f. Site Demolition Plan. The safety and health aspects prepared in accordance with Section 02 41 00 DEMOLITION and referenced sources.

1.8 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1, Section 1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHAs as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Develop the activity hazard analyses using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the CM.

1.9 DISPLAY OF SAFETY INFORMATION

Within 1 calendar days after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the CM, that is accessible and includes all mandatory information for employee and visitor review, shall be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, section 01.A.06. Additional items required to be posted include:

a. Confined space entry permit.
b. Hot work permit.

1.10 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturer's manuals.

1.11 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. GVB has no responsibility to provide emergency medical treatment.

1.12 REPORTS

1.12.1 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, as defined in 1.3.h and property damage accidents resulting in at least $2,000 in damages, to establish the root cause(s) of the accident, complete the Contractor Significant Incident Report (CSIR) from USACE Accident Report Form 3394 and provide the report to the CM within 5 calendar days of the accident. The CM will provide copies of any required or special forms.

b. Conduct an accident investigation for any weight handling equipment accident (including rigging gear accidents) to establish the root causes of the accident, complete the WHE Accident Report (Crane and Rigging Gear) form and provide the report to the CM within 30 calendar days of the accident. Do not proceed with crane operations until

cause is determined and corrective actions have been implemented to the satisfaction of the CM. The CM will provide a blank copy of the accident report form.

1.12.2 Accident Notification

Notify the CM as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $2,000, or any weight handling equipment accident. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the GVB investigation team arrives on-site and GVB investigation is conducted.

1.12.3 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix I and as specified herein with Daily Reports of Inspections.

1.12.4 Certificate of Compliance

Provide a Certificate of Compliance for each crane entering an activity under this contract. State within the certificate that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance comply with 29 CFR 1926 and USACE EM 385-1-1 Section 16 and Appendix I. Certify on the Certificate of Compliance that the crane operators is qualified and trained in the operation of the crane to be used. Also certify that all of its crane operators working on the area have been trained in the proper use of all safety devices (e.g., anti-two block devices). Post certifications on the crane.

1.13 HOT WORK

Submit and obtain a written permit prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, from the GVB Safety Division. The Contractor will provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site for a minimum of 30 minutes after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency GVB Safety Division phone number. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE RESPONSIBLE GVB SAFETY DIVISION IMMEDIATELY.

1.14 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the GVB shall not be closed or obstructed without written permission from the CM.

1.15 HIGH NOISE LEVEL PROTECTION

Operations performed by the Contractor that involve the use of equipment with output of high noise levels shall be scheduled. Use of any such equipment shall be approved in writing by the CM prior to commencement of work.

1.16 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

1.17 CONFINED SPACE ENTRY REQUIREMENTS.

Contractors entering and working in confined spaces performing shipyard industry work are required to follow the requirements of OSHA 29 CFR Part 1915 Subpart B. Contractors entering and working in confined spaces performing general industry work are required to follow the requirements of OSHA 29 CFR Part 1926.

PART 2 PRODUCTS

2.1 CONFINED SPACE SIGNAGE

Provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER -" in bold letters a minimum of one inch in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 5 feet.

2.2 FALL PROTECTION ANCHORAGE

Leave in place fall protection anchorage, conforming to ASSE/SAFE Z359.1, installed under the supervision of a qualified person in fall protection, for continued customer use and so identified by signage stating the capacity of the anchorage (strength and number of persons who may be tied-off to it at any one time).

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

Comply with USACE EM 385-1-1, NFPA 241, the APP, the AHA, Federal and/or State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

3.2 PRE-OUTAGE COORDINATION MEETING

Contractors are required to apply for utility outages at least 5 days in advance. As a minimum, the request should include the location of the

outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the CM to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Contractor shall ensure that each employee is familiar with and complies with these procedures and USACE EM 385-1-1, Section 12, Control of Hazardous Energy.

CM will, at the Contractor's request, apply lockout/tagout tags and take other actions that, because of experience and knowledge, are known to be necessary to make the particular equipment safe to work on for GVB owned and operated systems.

No person, regardless of position or authority, shall operate any switch, valve, or equipment that has an official lockout/tagout tag attached to it, nor shall such tag be removed except as provided in this section. No person shall work on any energized equipment including, but not limited to activities such as erecting, installing, constructing, repairing, adjusting, inspecting, un-jamming, setting up, trouble shooting, testing, cleaning, dismantling, servicing and maintaining machines equipment of processes until an evaluation has been conducted identifying the energy source and the procedures which will be taken to ensure the safety of personnel.

When work is to be performed on electrical circuits, only qualified personnel shall perform work on electrical circuits.

A supervisor who is required to enter an area protected by a lockout/tagout tag will be considered a member of the protected group provided he notifies the holder of the tag stub each time he enters and departs from the protected area.

Identification markings on building light and power distribution circuits shall not be relied on for established safe work conditions.

Before clearance will be given on any equipment other than electrical (generally referred to as mechanical apparatus), the apparatus, valves, or systems shall be secured in a passive condition with the appropriate vents, pins, and locks.

Pressurized or vacuum systems shall be vented to relieve differential pressure completely.

Vent valves shall be tagged open during the course of the work.

Where dangerous gas or fluid systems are involved, or in areas where the environment may be oxygen deficient, system or areas shall be purged, ventilated, or otherwise made safe prior to entry.

3.3.1 Tag Placement

Lockout/tagout tags shall be completed in accordance with the regulations

printed on the back thereof and attached to any device which, if operated, could cause an unsafe condition to exist.

If more than one group is to work on any circuit or equipment, the employee in charge of each group shall have a separate set of lockout/tagout tags completed and properly attached.

When it is required that certain equipment be tagged, the GVB will review the characteristics of the various systems involved that affect the safety of the operations and the work to be done; take the necessary actions, including voltage and pressure checks, grounding, and venting, to make the system and equipment safe to work on; and apply such lockout/tagout tags to those switches, valves, vents, or other mechanical devices needed to preserve the safety provided. This operation is referred to as "Providing Safety Clearance."

3.3.2 Tag Removal

When any individual or group has completed its part of the work and is clear of the circuits or equipment, the supervisor, project leader, or individual for whom the equipment was tagged shall turn in his signed lockout/tagout tag stub to the CM. That group's or individual's lockout/tagout tags on equipment may then be removed on authorization by the CM.

3.4 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

Establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with USACE EM 385-1-1, Section 21.B.

3.4.2 Fall Protection Equipment and Systems

Enforce use of the fall protection equipment and systems designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21. Through 21.N.04. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel. Fall protection must comply with 29 CFR 1926.500, Subpart M, USACE EM 385-1-1 and ASSE/SAFE A10.32.

3.4.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ASSE/SAFE Z359.1. Only a full-body harness with a shock-absorbing

lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment shall not exceed 1.8 m(6 feet). The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall shall always be taken into consideration when attaching a person to a fall arrest system.

3.4.3 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1 and 29 CFR 1926 Subpart M.

3.4.4 Rescue and Evacuation Procedures

When personal fall arrest systems are used, the contractor must ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP).

3.5 PPE REQUIREMENTS

All personnel who enter the Construction Area shall wear mandatory personal protective equipment (PPE) at all times and comply with PPE postings of shops both inside and outside the CIA. PPE is governed in all other areas by the nature of the work the employee is performing. They will also use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Mandatory PPE includes:

a. Hard Hat
b. Safety Glasses
c. Appropriate Safety Shoes
d. Reflective Vests

3.6 SCAFFOLDING

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Access scaffold platforms greater than20 feet maximum in height by use of a scaffold stair system. Do not use vertical ladders commonly provided by scaffold system manufacturers for accessing scaffold platforms greater than 20 feet maximum in height. The use of an adequate gate is required. Ensure that employees are qualified to perform scaffold erection and dismantling. Do not use scaffold without the capability of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward. Give special care to ensure scaffold systems are not overloaded.

Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material is prohibited. The first tie-in shall be at the height equal to 4 times the width of the smallest dimension of the scaffold base. Place work platforms on mud sills. Scaffold or work platform erectors shall have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.7 EQUIPMENT

3.7.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.7.2 Weight Handling Equipment

a. Equip cranes and derricks as specified in EM 385-1-1, section 16.

b. Notify the CM 5 days in advance of any cranes entering the activity so thatnecessary quality assurance spot checkscan be coordinated. Contractor's operator shall remain with the crane during the spot check.

c. Comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.

e. Under no circumstance shall a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.

f. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and follow the requirements of USACE EM 385-1-1 Section 11 and ASME B30.5 or ASME B30.22 as applicable.

g. Do not crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane.

h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

i. All employees must keep clear of loads about to be lifted and of suspended loads.

j. Use cribbing when performing lifts on outriggers.

k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

l. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

m. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by CM personnel.

n. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by CM personnel.

o. Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. Prior to conducting lifting operations set a maximum wind speed at which a crane can be safely operated based on the equipment being used, the load being lifted, experience of operators and riggers, and hazards on the work site. This maximum wind speed determination shall be included as part of the activity hazard analysis plan for that operation.

3.7.3 Equipment and Mechanized Equipment

a. Proof of qualifications for operator shall be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment shall be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.8 EXCAVATIONS

Perform soil classification by a competent person in accordance with 29 CFR 1926.

3.8.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

3.8.2 Utility Location Verification

The Contractor must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent

construction work is expected to come within three feet of the underground system. Digging within 2 feet of a known utility must not be performed by means of mechanical equipment; hand digging shall be used. If construction is parallel to an existing utility expose the utility by hand digging every 100 feet if parallel within 5 feet of the excavation.

3.8.3 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on-site for review. Job-made shoring or shielding must have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

3.8.4 Trenching Machinery

Operate trenching machines with digging chain drives only when the spotters/laborers are in plain view of the operator. Provide operator and spotters/laborers training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Keep documentation of the training on file at the project site.

3.9 UTILITIES WITHIN CONCRETE SLABS

Utilities located within concrete slabs or pier structures, bridges, and the like, are extremely difficult to identify due to the reinforcing steel used in the construction of these structures. Whenever contract work involves concrete chipping, saw cutting, or core drilling, the existing utility location must be coordinated with station utility departments in addition to a private locating service. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.

3.10 ELECTRICAL

3.10.1 Conduct of Electrical Work

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the CM and Station Utilities for identification. The CM will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When work requires Contractor to work near energized circuits as defined by the NFPA 70, personnel must use personal protective equipment that includes, as a minimum, safety shoes, insulating gloves with leather protective sleeves, and safety glasses.

3.10.2 Portable Extension Cords

Size portable extension cords in accordance with manufacturer ratings for the tool to be powered and protected from damage. Immediately removed from service all damaged extension cords. Portable extension cords shall meet the requirements of NFPA 70E and OSHA electrical standards.

3.11 WORK IN CONFINED SPACES

Comply with the requirements in Section 34 of USACE EM 385-1-1, OSHA 29 CFR and OSHA 29 CFR 1926.21(b)(6). Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 34 of USACE EM

   385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained

   to ensure exposure to any hazardous atmosphere is kept below its' action level.

c. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

-- End of Section --

SECTION 01 45 00.10 20

QUALITY CONTROL

PART 1 GENERAL

1.1 SUBMITTALS

CM approval is required for all submittals prior to proceeding with related activity. In general, The CM will be responsible for processing submittals on behalf of the GVB. The following shall be submitted in accordance with

Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

QC Plan

Submit a QC plan within 5 calendar days after receipt of Notice of Award.

1.2 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program as described in this section. The QC program consists of a QC Manager, a QC plan, a Coordination and Mutual Understanding Meeting, QC meetings, submittal review and approval, testing, and QC certifications and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this contract. The QC program shall cover on-site and off-site work and shall be keyed to the work sequence. No work or testing may be performed unless the QC Manager is on the work site.

1.3.1 Preliminary Work Authorized Prior to Acceptance

The only work that is authorized to proceed prior to the acceptance of the QC plan is mobilization of storage and office trailers, temporary utilities, and surveying.

1.3.2 Acceptance

Acceptance of the QC plan is required prior to the start of construction. The CM reserves the right to require changes in the QC plan and operations as necessary, including removal of personnel, to ensure the specified quality of work. The CM reserves the right to interview any member of the QC organization at any time in order to verify the submitted qualifications.

1.3.3 Notification of Changes

Notify the CM, in writing, of any proposed change, including changes in the QC organization personnel, a minimum of seven calendar days prior to a proposed change. Proposed changes shall be subject to CM acceptance.

1.4 QC ORGANIZATION

1.4.1 QC Manager

1.4.1.1 Duties

Provide a QC Manager at the work site to implement and manage the QC program. In addition to implementing and managing the QC program, the QC Manager may perform the duties of project superintendent. The QC Manager is required to attend the Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform submittal review and submission, ensure testing is performed and provide QC certifications and documentation required in this contract

1.4.1.2 Qualifications

An individual with a minimum of 3 years combined experience as a superintendent, inspector, QC Manager, project manager, or construction manager on similar size and type construction contracts which included the major trades that are part of this contract. The individual must be familiar with OSHA requirements and have experience in the areas of hazard identification and safety compliance.

1.4.2 Alternate QC Manager Duties and Qualifications

Designate an alternate for the QC Manager to serve in the event of the designated QC Manager's absence. The period of absence may not exceed two weeks at one time, and not more than 30 workdays during a calendar year. The qualification requirements for the Alternate QC Manager shall be the same as for the QC Manager.

1.5 QC PLAN

1.5.1 Requirements

Provide, for CM acceptance, a QC plan submitted in a three-ring binder that covers both on-site and off-site work and includes the following with a table of contents listing the major sections identified with tabs.

I. QC ORGANIZATION: A chart showing the QC organizational structure and its relationship to the production side of the organization.

II. NAMES AND QUALIFICATIONS: In resume format, for each person in the QC organization.

III. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONAL: Of each person in the QC organization.

IV. OUTSIDE ORGANIZATIONS: A listing of outside organizations such as architectural and consulting engineering firms that will be employed by the Contractor and a description of the services these firms will provide.

V. APPOINTMENT LETTERS: Letters signed by an officer of the firm appointing the QC Manager and Alternate QC Manager and stating that they are responsible for managing and implementing the QC program as described in this contract. Include in this letter

the QC Manager's authority to direct the removal and replacement of non-conforming work.

VI. SUBMITTAL PROCEDURES AND INITIAL SUBMITTAL REGISTER: Procedures for reviewing, approving and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval.

VII. TESTING LABORATORY INFORMATION: Testing laboratory information required by the paragraphs "Accredited Laboratories" or "Testing Laboratory Requirements", as applicable.

VIII. TESTING PLAN AND LOG: A Testing Plan and Log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test.

IX. PROCEDURES TO COMPLETE REWORK ITEMS: Procedures to identify, record, track and complete rework items.

X. DOCUMENTATION PROCEDURES: Use GVB formats.

XI. LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task, which is separate and distinct from other tasks, has the same control requirements and work crews. The list shall be cross-referenced to the Contractor's Construction Schedule and the specification sections. The list of definable features of work shall include but not be limited to all items of work on the schedule.

XIV. PROCEDURES FOR COMPLETION INSPECTION: See the paragraph entitled "COMPLETION INSPECTIONS".

1.6 COORDINATION AND MUTUAL UNDERSTANDING MEETING

During the Pre-Construction conference and prior to the start of construction, discuss the QC program required by this contract. The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, and the coordination of the Contractor's management, production and the QC personnel. Contractor's personnel required to attend shall include the QC Manager, project manager, and superintendent. Minutes of the meeting will be prepared by the QC Manager and signed by both the Contractor and the CM. The Contractor shall provide a copy of the signed minutes to all attendees. Repeat the coordination and mutual understanding meeting when a new QC Manager is appointed.

1.7 QC MEETINGS

After the start of construction, the QC Manager shall conduct QC meetings once every week at the work site with the superintendent and the foreman responsible for the ongoing and upcoming work. The QC Manager shall prepare the minutes of the meeting and provide a copy to the CM within two working days after the meeting. As a minimum, the following shall be accomplished at each meeting:

a. Review the minutes of the previous meeting;
b. Review the schedule and the status of work and rework;
c. Review the status of submittals;
d. Review the work to be accomplished in the next two weeks and documentation required;
e. Resolve QC and production problems (RFIs, etc.);
f. Address items that may require revising the QC plan; and
g. Review Accident Prevention Plan (APP).

1.8 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review, and approval of submittals are described in the submittal section of the specification.

1.9 TESTING

Except as stated otherwise in the specification sections, perform sampling and testing required under this contract.

1.9.1 Test Results

Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the CM immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results shall be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the signed reports, certifications, and other documentation to the CM.

1.10 QC CERTIFICATIONS

1.10.1 Contractor Quality Control Report Certification

Each CQC Report shall contain the following statement: "On behalf of the Contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report."

1.10.2 Invoice Certification

Furnish a certificate to the CM with each payment request, signed by the QC Manager, attesting that as-built drawings are current and attesting that the work for which payment is requested, including stored material, is in compliance with contract requirements.

1.10.3 Completion Certification

Upon completion of work under this contract, the QC Manager shall furnish a certificate to the CM attesting that "the work has been completed, inspected, tested and is in compliance with the contract."

1.11 COMPLETION INSPECTIONS

1.11.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Contract clause "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager shall conduct an inspection of the work and develop a punch list of items which do not conform to the approved drawings and specifications. Include in the punch list any remaining items of the "Rework Items List", which were not corrected prior to the Punch-Out inspection. The punch list shall include the estimated date by which the deficiencies will be corrected. A copy of the punch list shall be provided to the CM. The QC Manager or staff shall make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the CM that the facility is ready for the GVB "Pre-Final Inspection".

1.11.2 Pre-Final Inspection

The GVB and QC manager will perform this inspection to verify that the facility is complete and ready to be occupied. A GVB pre-final punch list may be developed as a result of this inspection. The QC Manager shall ensure that all items on this list are corrected prior to notifying the GVB that a "Final" inspection with the customer can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in a timely manner and shall be accomplished before the contract completion date for the work or any particular increment thereof if the project is divided into increments by separate completion dates.

1.11.3 Final Acceptance Inspection

The QC Manager, the superintendent, or other Contractor management personnel, The CM and the GVB will be in attendance at this inspection. Additional personnel may be in attendance. The final acceptance inspection will be formally scheduled by the CM based upon results of the "Pre-Final Inspection". Notice shall be given to the CM at least 14 days prior to the final inspection. The notice shall state that all specific items previously identified to the Contractor as being unacceptable will be complete by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the CM to bill the Contractor for additional inspection cost in accordance with the contract clause "Inspection of Construction".

1.12 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities. Reports are required for each day work is performed. Account for each calendar day throughout the life of the contract. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces. The superintendent and the QC Manager must prepare and sign the Contractor Production and CQC Reports, respectively. The reporting of work shall be identified by terminology consistent with the construction schedule. In the "remarks" section in this report which will contain pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site. For each remark given, identify the Schedule Activity No. that is associated with the remark.

1.12.1 Quality Control Validation

Establish and maintain the following in a series of three ring binders. Binders shall be divided and tabbed as shown below. These binders shall be readily available to the GVB's Quality Assurance Team during all business hours.

a. All milestone inspections, arranged by Activity/Event Number.
b. A current up-to-date copy of the Testing and Plan Log with supporting field test reports, arranged by specification section.
c. Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.
d. A current up-to-date copy of the Rework Items List.
e. Maintain up-to-date copies of all punch lists issued by the QC Staff on the Contractor and Sub-Contractors and all punch lists issued by the CM.

1.12.2 As-Built Drawings

The QC Manager is required to review the as-built drawings, required by Section 01 78 00 CLOSEOUT SUBMITTALS, are kept current on a daily basis and marked to show deviations, which have been made from the Contract drawings. Ensure each deviation has been identified with the appropriate modifying documentation, e.g. PC number, modification number, RFI number, etc. The QC Manager shall initial each deviation or revision. Upon completion of work, the QC Manager shall submit a certificate attesting to the accuracy of the as-built drawings prior to submission to the CM.

1.13 NOTIFICATION ON NON-COMPLIANCE

The CM will notify the Contractor of any detected non-compliance with the foregoing requirements. The Contractor shall take immediate corrective action. If the contractor fails or refuses to correct the non-compliant work, the CM will issue a non- compliance notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the GVB may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall make no part of the time lost due to such stop orders the subject of claim for extension of time, for excess costs, or damages.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 57 19.00 20

TEMPORARY ENVIRONMENTAL CONTROLS

1 PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program

40 CFR 271	Requirements for Authorization of State Hazardous Waste Programs
40 CFR 272	Approved State Hazardous Waste Management Programs
40 CFR 273	Standards For Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 355	Emergency Planning and Notification
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings

1.2 DEFINITIONS

1.2.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.2 Solid Waste

Garbage, refuse, debris, sludge, or other discharged material, including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations. Types of solid waste typically generated at construction sites may include:

a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.

c. Debris: Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.

e. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.

g. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans may not be included as recyclable if sold to a scrap metal company.

h. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have additional regulatory controls and must be handled separately. They are thus defined separately in this document.

Material not regulated as solid waste are: nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

1.2.3 Hazardous Debris

As defined in Solid Waste paragraph, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

1.2.4 Chemical Wastes

This includes salts, acids, alkalizes, herbicides, pesticides, and organic chemicals.

1.2.5 Garbage

Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2.6 Hazardous Waste

Any discarded material, liquid, solid, or gas, which meets the definition of hazardous material or is designated hazardous waste by the Environmental Protection Agency or State Hazardous Control Authority as defined in 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 271, 40 CFR 272, 40 CFR 273, 40 CFR 279, and 40 CFR 280.

1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that:

a. Is regulated as a hazardous material per 49 CFR 173, or

b. Requires a Material Safety Data Sheet (MSDS) per 29 CFR 1910.120, or

c. During end use, treatment, handling, packaging, storage, transpiration, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D.

Designation of a material by this definition, when separately regulated or controlled by other instructions or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this instruction for "control" purposes. Such material include ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs). Nonetheless, the exposure may occur incident to manufacture, storage, use and demilitarization of these items.

1.2.8 Waste Hazardous Material (WHM)

Any waste material which because of its quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment and which has been so designated. Used oil not containing any hazardous waste, as defined above, falls under this definition.

1.2.9 Oily Waste

Those materials which are, or were, mixed with used oil and have become separated from that used oil. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludge’s, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, used oil and may be appropriately tested and discarded in a manner which is in compliance with other State and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that:

a. It is not prohibited in Guam regulations or ordinances

b. It is the result of minor leaks or spills resulting from normal process operations

c. All free-flowing oil has been removed to the practical extent possible

Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, a hazardous waste determination must be performed prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.10 Regulated Waste

Those solid waste that have specific additional Federal, state, or local controls for handling, storage, or disposal.

1.3 SUBMITTALS

CMs approval is required for all submittals prior to proceeding with related activity. In general, The CM will be responsible for processing submittals on behalf of the GVB. The following shall be submitted in accordance with

Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environment Protection Plan

SD-11 Closeout Submittals

Disposal Documentation for Hazardous and Regulated Waste
Solid Waste Management Permit
Contractor Hazardous Material Inventory Log
Regulatory Notifications

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal and Guam regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

The Contractor may be required to promptly conduct tests and procedures for the purpose of assessing whether construction operations are in compliance with Applicable Environmental Laws. Analytical work shall be done by qualified laboratories; and where required by law, the laboratories shall be

certified.

1.4.1 Conformance with the Environmental Management System

The Contractor shall perform work under this contract consistent with the policy and objectives identified in the Guam Environmental Protection Agency (GEPA). The Contractor shall perform work in a manner that conforms to objectives and targets, environmental programs and operational controls identified by the GEPA. The Contractor will provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, the Contractor shall take corrective and/or preventative actions. In addition, the Contractor shall ensure that its employees are aware of their roles and responsibilities under the EMS and how these EMS roles and responsibilities affect work performed under the contract.

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey

Perform a Preconstruction Survey of the project site, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record.

1.5.2 Regulatory Notifications

The Contractor is responsible for all regulatory notification requirements in accordance with Federal and Guam regulations. The Contractor shall submit copies of all regulatory notifications to the prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all inclusive): demolition, renovation, NPDES defined site work, remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.5.3 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the activity; types and quantities of wastes/wastewater that may be generated during the contract. Discuss the results of the Preconstruction Survey at this time.

2 PART 2 PRODUCTS

Not Used

3 PART 3 EXECUTION

3.1 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

No historical or archaeological items are expected in the construction area. If items are discovered, carefully protect in-place and report immediately to the CM historical and archaeological items or human skeletal remains discovered in the course of work. Upon discovery, notify the CM. Stop work in the immediate area of the discovery until directed by the CM to resume work. The GVB retains ownership and control over historical and archaeological resources.

3.2 SOLID WASTE MANAGEMENT PLAN AND PERMIT

As may be required by GEPA, provide to the CM written notification of the quantity of solid waste/debris that is anticipated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance or as applicable, submit one copy of a State and local Solid Waste Management Permit or license showing such GEPA's approval of the disposal plan before transporting wastes off GVB property.

3.2.1 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and can be coordinated with the CM and the activity recycling coordinator. Remove all solid waste (including non-hazardous debris) from GVB property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent Guam and Federal requirements including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage spent hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, as per environmental law.

3.3 Disposal Documentation for Hazardous and Regulated Waste

Manifest, pack, ship and dispose of hazardous or toxic waste and universal waste that is generated as a result of construction in accordance with the generating facilities generator status under the Recourse Conservation and

Recovery Act. Contact the CM for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or Guam permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifest must be reviewed, signed, and approved by the before the Contractor may ship waste.

3.4 WHM/HW MATERIALS PROHIBITION

No waste hazardous material or hazardous waste shall be disposed of on GVB property. No hazardous material shall be brought onto GVB property that

does not directly relate to requirements for the performance of this contract. The GVB is not responsible for disposal of Contractor's waste material brought on the job site and not required in the performance of this contract. The intent of this provision is to dispose of that waste identified as waste hazardous material/hazardous waste as defined herein that was generated as part of this contract and existed within the boundary of the Contract limits and not brought in from offsite by the Contractor. Incidental materials used to support the contract including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive. The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or to the river or conduct waste treatment or disposal on GVB property without written approval of the CM.

3.5 HAZARDOUS MATERIAL MANAGEMENT

No hazardous material shall be brought onto GVB property that does not directly relate to requirements for the performance of this contract.

Include hazardous material control procedures in the Safety Plan. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Submit a MSDS and estimated quantities to be used for each hazardous material to the prior to bringing the material on site. Typical materials requiring MSDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. At the end of the project, provide the CM with the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used. Ensure that hazardous materials are utilized in a manner that will minimize the amount of hazardous waste that is generated. Ensure that all containers of hazardous materials have NFPA labels or their equivalent. Keep copies of the MSDS for hazardous materials on site at all times and provide them to the CM at the end of the project. Certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

3.6 PETROLEUM PRODUCTS AND REFUELING

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. Manage all used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while on-site exhibits a characteristic of hazardous waste. Used oil containing 1000 parts per million of solvents will be considered a hazardous waste and disposed of at Contractor's expense. Used oil mixed with a hazardous waste will also be considered a hazardous waste.

3.6.1 Oily and Hazardous Substances

Prevent oil or hazardous substances from entering the ground, drainage areas, or navigable waters. In accordance with 40 CFR 112, surround all temporary fuel oil or petroleum storage tanks with a temporary berm or containment of sufficient size and strength to contain the contents of the tanks, plus 10 percent freeboard for precipitation. The berm will be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs.

3.6.2 Inadvertent Discovery of Petroleum Contaminated Soil or Hazardous Wastes

If petroleum contaminated soil or suspected hazardous waste is found during construction that was not identified in the contract documents, the contractor shall immediately notify the CM. The contractor shall not disturb this material until authorized by the CM.

3.7 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated by environmental law. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Base or Activity Fire Department, the activity's Command Duty Officer, and the CM. If the contractor's response is inadequate, the Navy may respond. If this should occur, the contractor will be required to reimburse the GVB for spill response assistance and analysis.

The Contractor is responsible for verbal and written notifications as required by the federal 40 CFR 355 and GEPA regulations. Spill response will be in accordance with 40 CFR 300 and applicable GEPA regulations. Contain and clean up these spills without cost to the GVB. If GVB assistance is requested or required, the Contractor will reimburse the GVB for such assistance. Provide copies of the written notification and documentation that a verbal notification was made within 20 days.

Maintain spill cleanup equipment and materials at the work site. Clean up all hazardous and non-hazardous (WHM) waste spills. The Contractor shall reimburse the GVB for all material, equipment, and clothing generated during any spill cleanup. The Contractor shall reimburse the GVB for all costs incurred including sample analysis materials, equipment, and labor if the GVB must initiate its own spill cleanup procedures, for Contractor responsible spills, when:

a. The Contractor has not begun spill cleanup procedure within one hour of spill discovery/occurrence, or

b. If, in the GVB's judgment, the Contractor's spill cleanup is not adequately abating life threatening situation and/or is a threat to any body of water or environmentally sensitive areas.

-- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS

1 PART 1 GENERAL

1.1 SUBMITTALS

CM approval is required for all submittals prior to proceeding with related activity. In general, The CM will be responsible for processing submittals on behalf of the GVB. The following shall be submitted in accordance with

Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data
As-Built Record of Equipment and Materials
Warranty Management Plan
Spare Parts Data

SD-08 Manufacturer's Instructions

Preventative Maintenance

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals

SD-11 Closeout Submittals

1 Working Record and Final Record Drawings

Revise 2 sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. Keep these working as- built marked drawings current on a weekly basis and at least one set available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. Prepare final record (as-built) drawings after the completion of each definable feature of work as listed in the Contractor Quality Control Plan. The working as-built marked prints and final record (as-built) drawings will be jointly reviewed for accuracy and completeness by the CM and the Contractor prior to submission of each pay estimate. If the Contractor fails to maintain the working and final record drawings as specified herein, the GVB will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the record drawings. This monthly deduction will continue until an agreement can be reached between the CM and the Contractor regarding the accuracy and completeness of updated drawings. Show on the working and final record drawings, but not limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

c. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, dimensions of equipment foundations, etc.

d. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

e. Changes or modifications which result from the final inspection.

f. Where contract drawings or specifications present options, show only the option selected for construction on the final as-built prints.

g. Modifications (include within change order price the cost to change working and final record drawings to reflect modifications) and compliance with the following procedures.

   i. Follow directions in the modification for posting descriptive changes.

   ii. Place a Modification Circle at the location of each deletion.

   iii. For new details or sections which are added to a drawing, place a Modification Circle by the detail or section title.

   iv. For minor changes, place a Modification Circle by the area changed on the drawing (each location).

   v. For major changes to a drawing, place a Modification Circle by the title of the affected plan, section, or detail at each location.

   vi. For changes to schedules or drawings, place a Modification Circle either by the schedule heading or by the change in the schedule.

   vii. The Modification Circle size shall be 1/2 inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.2 Drawing Preparation

Modify the record drawings as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such

additional drawings as may be necessary. These working as-built marked prints must be neat, legible and accurate. These drawings are part of the permanent records of this project and must be returned to the CM after approval by the GVB. Any drawings damaged or lost by the Contractor must be satisfactorily replaced by the Contractor at no expense to the GVB.

1.2.2 As-Built Record of Equipment and Materials

Furnish one copy of preliminary record of equipment and materials used on the project 5 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with GVB comments. Submit two sets of final record of equipment and materials 10 days after final inspection. List the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.3 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

b. Supply 5% items each part of lighting fixture for spare parts inventory. Provision of spare parts does not relieve the Contractor of responsibilities listed under the contract guarantee provisions.

1.4 PREVENTATIVE MAINTENANCE

Submit Preventative Maintenance, Condition Monitoring (Predictive Testing) and Inspection schedules with instructions that state when systems should be retested.

a. Define the anticipated length of each test, test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a signoff blank for the Contractor and CM for each test feature; e.g., liter per second, rpm, kilopascal (gpm, rpm, psi). Include a remarks column for the testing validation procedure referencing operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventative maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize corrective maintenance and repair.

b. Repair requirements must inform operators how to check out, troubleshoot, repair, and replace components of the system. Include electrical and mechanical schematics and diagrams and diagnostic

techniques necessary to enable operation and troubleshooting of the system after acceptance.

1.5 WARRANTY MANAGEMENT

1.5.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction. At least 10 days before the planned pre-warranty conference, submit one set of the warranty management plan. Include within the warranty management plan all required actions and documents to assure that the GVB receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the CM for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the GVB upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contractor, CM and the Customer Representative. Include within the warranty management plan, but not limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, sub-Contractors, manufacturers or suppliers involved.

b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

c. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

d. A list for each warranted equipment, item, feature of construction or system indicating:
   i. Name of item.
   ii. Model and serial numbers.
   iii. Location where installed.
   iv. Name and phone numbers of manufacturers or suppliers.
   v. Names, addresses and telephone numbers of sources of spare parts.
   vi. Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
   vii. Cross-reference to warranty certificates as applicable.
   viii. Starting point and duration of warranty period.
   ix. Summary of maintenance procedures required to continue the warranty in force.
   x. Cross-reference to specific pertinent Operation and Maintenance manuals.

xi. Organization, names and phone numbers of persons to call for warranty service.

xii. Typical response time and repair time expected for various warranted equipment.

e. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the GVB.

f. Procedure and status of tagging of all equipment covered by extended warranties.

g. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.5.2 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the GVB, meet with the GVB to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the GVB for the execution of the construction warranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and be responsive to GVB inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.5.3 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the CM, respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List". Submit a report on any warranty item that has been repaired during the warranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the GVB will perform the work and back charge the construction warranty payment item established.

1.6 OPERATION AND MAINTENANCE MANUALS

Submit 6 copies of the project operation and maintenance manuals 30 calendar days prior to testing the system involved. Update and resubmit data for final approval no later than 30 calendar days prior to contract completion.

1.6.1 Configuration

Operation and Maintenance Manuals must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions. Bind information in manual format and grouped by technical sections. Test data must be legible and of good quality. Light-sensitive reproduction techniques are acceptable provided finished GVBes are clear, legible, and not subject to fading. GVBes for vendor data and manuals must have 0.3937-inch holes and be bound in 3-ring, loose-leaf binders. Organize data by separate index and tabbed sheets, in a

loose-leaf binder. Binder must lie flat with printed sheets that are easy to read. Caution and warning indications must be clearly labeled.

2 PART 2 PRODUCTS

Not Used

3 PART 3 EXECUTION

Not Used

-- End of Section --

DIVISION 02 EXISTING CONDITIONS

SECTION 02 41 00

DEMOLITION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)

AHRI Guideline K	(2009) Guideline for Containers for Recovered Non-Flammable Fluorocarbon Refrigerants

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 145	(1991; R 2004) Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
AASHTO T 180	(2009) Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6	(2006) Safety Requirements for Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008) Safety and Health Requirements Manual

U.S. DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25	(June 2000) Storage and Handling of Liquefied and Gaseous Compressed Gases and Their Full and Empty Cylinders

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M	(2004) Military Standard Requisitioning and Issue Procedures
MIL-STD-129	(2007; Rev P; Change 4) Military Marking for Shipment and Storage

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1	(2007; Rev K) Obstruction Marking and Lighting

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 82	Protection of Stratospheric Ozone
49 CFR 173.301	Shipment of Compressed Gases in Cylinders and Spherical Pressure Vessels

1.2 PROJECT DESCRIPTION

1.2.1 Demolition Plan

Prepare a Demolition Plan and submit proposed salvage, demolition, and removal procedures for approval before work is started. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Identify components and materials to be salvaged for reuse or recycling with reference to paragraph Existing Facilities to be removed. Append tracking forms for all removed materials indicating type, quantities, condition, destination, and end use. Coordinate with Waste Management Plan. Provide procedures for safe conduct of the work in accordance with EM 385-1-1. Plan shall be approved by CM prior to work beginning.

1.2.2 General Requirements

Do not begin demolition until authorization is received from the CM. The work of this section is to be performed in a manner that maximizes salvage and recycling of materials. Remove rubbish and debris from the project site; do not allow accumulations. The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Remove rubbish and debris from GVB property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the CM. In the interest of occupational safety and health, perform the work in accordance with EM 385- 1-1, Section 23, Demolition, and other applicable Sections.

1.3 ITEMS TO REMAIN IN PLACE

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the GVB. Repair or replace damaged items as approved by the CM. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract. Do not overload structural elements or pavements to remain. Provide new supports
and reinforcement for existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural

replacement require approval by the CM prior to performing such work.

1.3.1 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily.

1.3.2 Weather Protection

For portions of the building to remain, protect building interior and materials and equipment from the weather at all times. Where removal of existing roofing is necessary to accomplish work, have materials and workmen ready to provide adequate and temporary covering of exposed areas.

1.3.3 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the CM.

1.3.4 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the GVB and disconnected and sealed by the Contractor.

1.3.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, must remain standing without additional bracing, shoring, or lateral support until demolished or deconstructed, unless directed otherwise by the CM. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract.

1.4 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted. Where burning is permitted, adhere to federal, state, and local regulations.

1.5 AVAILABILITY OF WORK AREAS

Areas in which the work is to be accomplished will be available. However, Contractor to submit phasing plan prior start of any work

1.6 SUBMITTALS

CM approval is required for all submittals prior to proceeding with related activity. In general, the Construction Manager (CM) will be responsible for processing submittals on behalf of the CM. The following shall be submitted in accordance with Section 01 33
00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals
Demolition Plan

1.7 QUALITY ASSURANCE

Furnish timely notification of demolition projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the Guam Environmental Protection Agency (GEPA) and the CM in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSE/SAFE A10.6. Comply with the Environmental Protection Agency requirements specified. Use of explosives will not be permitted.

1.7.1 Dust and Debris Control

Prevent the spread of dust and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, flooding, or pollution.

1.8 PROTECTION

1.8.1 Traffic Control Signs

a. Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights.

1.8.2 Protection of Personnel

Before, during and after the demolition work continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the project site. No area, section, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.9 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Items to be relocated which are damaged by the Contractor shall be repaired or replaced with new undamaged items as approved by the CM.

1.10 EXISTING CONDITIONS

Before beginning any demolition work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the CM showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document.

PART 2 PRODUCTS

2.1 FILL MATERIAL

Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill basements, voids, depressions or excavations resulting from demolition or deconstruction of structures. Fill material shall be waste products from demolition or deconstruction until all waste appropriate for this purpose is consumed.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures onsite for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse onsite whenever possible.

3.1.1 Structures

a. Remove existing structures indicated to be removed as shown in the drawings.

b. Demolish structures in a systematic manner from the top of the structure to the ground.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the CM. Do not interrupt existing utilities serving facilities occupied and used by the GVB except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition or deconstruction work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.2.2 Disconnecting Existing Utilities

Remove existing utilities, as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the CM. When utility lines are encountered but are not indicated on the drawings, notify the CM prior to further work in that area. Remove meters and related equipment and deliver to a location in accordance with instructions of the CM.

3.1.3 Paving and Slabs

Remove sawcut concrete and asphaltic concrete paving and slabs as indicated below existing adjacent grade. Provide neat sawcuts at limits of pavement removal as indicated. Pavement and slabs designated to be recycled and utilized in this project shall be moved, ground and stored as directed by the CM. Pavement and slabs not to be used in this project shall be removed from the Installation at Contractor's expense.

3.1.4 Concrete

Saw concrete along straight lines to a depth of a minimum 2 inch. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.

3.1.5 Structural Concrete Poles

Dismantle concrete poles at field connections. Transport dismantled concrete poles to a disposal area.

3.1.6 Electrical Equipment and Fixtures

Salvage motors, motor controllers, and operating and control equipment that are attached to the driven equipment. Salvage wiring systems and components. Box loose items and tag for identification. Disconnect primary, secondary, control, communication, and signal circuits at the point of attachment to their distribution system.

3.1.6.1 Fixtures

Remove and dispose electrical fixtures after CM approval.

3.1.6.2 Electrical Devices

Remove and dispose any other item as deemed necessary.

3.2 DISPOSITION OF MATERIAL

3.2.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Government of Guam property. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is vested in the Contractor upon approval by the CM of the Contractor's demolition, deconstruction, and removal procedures, and authorization by the CM to begin demolition and deconstruction. The GVB will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.2.2 Salvaged Materials and Equipment

Remove materials that are shown in the drawings and specified to be removed by the Contractor and that are to remain the property of the GVB, and deliver to a designated storage site.

a. Salvage items and material to the maximum extent possible.

b. Store all materials salvaged for the Contractor as approved by the CM and remove from GVB property before completion of the contract. Material salvaged for the Contractor shall not be sold on the site.

c. Remove salvaged items to remain the property of the GVB in a manner to prevent damage. Items damaged during removal or storage must be repaired or replaced to match existing items. P. Deliver the following items reserved as property of the GVB to the areas designated.

3.4 CLEANUP

Remove debris and rubbish from construction site. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

3.5.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other no salvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified in the GVB approved disposal area. Disposal, tipping fees/charges and other related charges shall be at Contractor’s expense.

3.5.2 Removal from Government of Guam Property

Transport waste materials removed from demolished, except waste soil, from Government of Guam property for legal disposal. Dispose of waste soil as directed.

-- End of Section --

DIVISION 03 CONCRETE

SECTION 03 30 53

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

Perform all work in accordance with ACI MCP PACK Parts 2 and 3.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)

ACI MCP PACK	(2010) Manual of Concrete Practice

ASTM INTERNATIONAL (ASTM)

ASTM A185/A185M	(2007) Standard Specification for Steel Welded Wire, Plain, for Concrete Reinforcement
ASTM A615/A615M	(2009b) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM C 150/C 150M	(2011) Standard Specification for Portland Cement
ASTM C 171	(2007) Standard Specification for Sheet Materials for Curing Concrete
ASTM C 309	(2007) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 31/C 31M	(2010) Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C 33/C 33M	(2011) Standard Specification for Concrete Aggregates
ASTM C 39/C 39M	(2010) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C 685/C 685M	(2010) Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C 94/C 94M	(2011) Standard Specification for Ready-Mixed Concrete

ASTM C172/C172M	(2010) Standard Practice for Sampling Freshly Mixed Concrete
ASTM D 75/D 75M	(2009) Standard Practice for Sampling Aggregates

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 400	(1963) Requirements for Water for Use in Mixing or Curing Concrete

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.3 SYSTEM DESCRIPTION

The CM retains the option to sample and test aggregates and concrete to determine compliance with the specifications. Provide facilities and labor as may be necessary to assist the CM in procurement of representative test samples. Obtain samples of aggregates at the point of batching in accordance with ASTM D 75/D 75M. Sample concrete in accordance with ASTM C172/C172M. Prepare, cure, and transport compression test specimens in accordance with ASTM C 31/C 31M. Test compression test specimens in accordance with ASTM C 39/C 39M. Take samples for strength tests not less than once each shift in which concrete is produced. Provide a minimum of three specimens from each sample; two to be tested at 28 days for acceptance, and one will be tested at 7 days for information.

1.3.1 Strength

Acceptance test results are the average strengths of two specimens tested at 28 days. The strength of the concrete is considered satisfactory so long as the average of three consecutive acceptance test results equal or exceed the specified compressive strength, f'c, and no individual acceptance test result falls below f'c by more than 500 psi.

1.3.2 Construction Tolerances

Apply a Class "C" finish to all surfaces except those specified to receive a Class "D" finish. Apply a Class "D" finish to all post-construction surfaces which will be permanently concealed. Surface requirements for the classes of finish required are as specified in Part 4 of ACI MCP PACK.

1.3.3 Concrete Mixture Proportions

Concrete mixture proportions are the responsibility of the Contractor. Mixture proportions shall include the dry weights of cementitious material(s); the nominal maximum size of the coarse aggregate; the specific gravities, absorptions, and saturated surface-dry weights of fine and coarse aggregates; the quantities, types, and names of admixtures; and quantity of water per cubic yard of concrete. Provide materials included in the mixture proportions of the same type and from the same source as will be used on the project. Specified compressive strength f'c shall be 3000 psi at 28 days.

Submit the Mix Design Data with applicable test reports and mixture proportions that will produce concrete of the quality required, ten days prior to placement of concrete.

1.4 SUBMITTALS

CM approval is required for all submittals prior to proceeding with related activity. In general, The Construction Manager (CM) will be responsible for processing submittals on behalf of the CM. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Installation Drawings

SD-03 Product Data

Curing Materials
Formwork
Forms
Ready-Mix Concrete
Mix Design Data
Accessories Curing
Compound

SD-06 Test Reports

Aggregates
Concrete Mixture Proportions
Compressive Strength Testing

SD-07 Certificates

Bill of Lading
Cementitious Materials
Aggregates

1.5 QUALITY ASSURANCE

Indicate specific locations of Concrete Placement, Forms, Steel Reinforcement, Accessories, Construction Joints on installation drawings and include, but not be limited to, square feet of concrete placements, thicknesses and widths, plan dimensions, and arrangement of cast-in-place concrete section.

PART 2 PRODUCTS

2.1 MATERIALS

Submit manufacturer's literature from suppliers which demonstrates compliance with applicable specifications for the specified materials.

2.1.1 Cementitious Materials

Submit Manufacturer's certificates of compliance, accompanied by mill test reports, attesting that the concrete materials meet the requirements of the specifications in accordance with the Special Clause "CERTIFICATES OF COMPLIANCE". Also, certificates for all material conforming to EPA's Comprehensive Procurement Guidelines (CPG), in accordance with 40 CFR 247. Provide cementitious materials that conform to the appropriate specifications listed:

2.1.1.1 Portland cement

ASTM C 150/C 150M, Type II.

2.1.2 Aggregates

Fine and coarse aggregates shall meet the quality and grading requirements of ASTM C 33/C 33M Class Designations 4M or better. Submit certificates of compliance and test reports for aggregates showing the material(s) meets the quality and grading requirements of the specifications under which it is furnished.

2.1.3 Water

Use fresh, clean, potable water for mixing and curing, free from injurious amounts of oil, acid, salt, or alkali, except that unpotable water may be used if it meets the requirements of COE CRD-C 400.

2.1.4 Formwork

The design and engineering of the formwork as well as its construction, will be the responsibility of the Contractor. Submit formwork design prior to the first concrete placement.

2.1.5 Form Coatings

Coat forms, for exposed surfaces, with a non-staining form oil to be applied shortly before concrete is placed.

2.1.6 Curing Materials

Provide curing materials conforming to the following requirements.

2.1.6.1 Impervious Sheet Materials

Impervious sheet materials, ASTM C 171, type optional, except polyethylene film, if used, shall be white opaque.

2.1.6.2 Membrane-Forming Curing Compound

ASTM C 309, Type 1-D or 2.

2.2 READY-MIX CONCRETE

a. Concrete shall be ready-mix concrete with mix design data conforming to ACI MCP PACK Part 2. Bill of Lading for each ready-mix concrete delivery shall be in accordance with ASTM C 94/C 94M.

b. Non-exposed concrete elements: 3000 psi minimum compressive strength.

c. Portland Cement conforming to ASTM C 150/C 150M, Type II.

2.3 STEEL REINFORCEMENT

2.3.1 Deformed Steel Bars

Provide steel bars conforming to ASTM A615/A615M, Grade 40 ksi ACI MCP PACK Parts 2 and 3. Details of reinforcement not shown shall be in accordance with ACI MCP PACK Part 3, Chapters 7 and 12.

2.4 FORMS

Forms shall be of wood, steel, or other approved material and conform to ACI MCP PACK, Parts 2 and 3.

Provide form release conforming to ACI MCP PACK, Part 4.

PART 3 EXECUTION

3.1 PREPARATION

Prepare construction joints to expose coarse aggregate. The surface shall be clean, damp, and free of laitance. Construct ramps and walkways, as necessary, to allow safe and expeditious access for concrete and workmen. Remove snow, ice, standing or flowing water, loose particles, debris, and foreign matter. Earth foundations shall be satisfactorily compacted. Ensure spare vibrators are available. The entire preparation shall be accepted by the GVB/CM prior to placing.

A. Embedded Items

Secure reinforcement in place after joints, anchors, and other embedded items have been positioned. Arrange internal ties so that when the forms are removed the metal part of the tie is not less than 2 inches from concrete surfaces permanently exposed to view or exposed to water on the finished structures. Embedded items shall be free of oil and other foreign matters such as loose coatings or rust, paint, and scale. The embedding of wood in concrete is permitted only when specifically authorized or directed. All equipment needed to place, consolidate, protect, and cure the concrete shall be at the placement site and in good operating condition.

B. Formwork Installation

Forms shall be properly aligned, adequately supported, and mortar-tight. Provide smooth form surfaces, free from irregularities, dents, sags, or holes when used for permanently exposed faces. Chamfer all exposed joints and edges, unless otherwise indicated.

C. Production of Concrete

3.1.C.1 Ready-Mixed Concrete

Provide ready-mixed concrete conforming to ASTM C 94/C 94M except as otherwise specified.

3.1.C.2 Concrete Made by Volumetric Batching and Continuous Mixing

Concrete made by volumetric batching and continuous mixing shall conform to ASTM C 685/C 685M.

3.2 CONVEYING AND PLACING CONCRETE

Concrete placement is not permitted when weather conditions prevent proper placement and consolidation without approval. When concrete is mixed and/or transported by a truck mixer, deliver the concrete to the site of the work completing the discharge within 1-1/2 hours or 45 minutes when the placing temperature is 86 degrees F or greater unless a retarding admixture is used. Convey concrete from the mixer to the forms as rapidly as practicable by methods which prevent segregation or loss of ingredients. Concrete shall be in place and consolidated within 15 minutes after discharge from the mixer. Deposit concrete as close as possible to its final position in the forms and regulate it so that it may be effectively consolidated in horizontal layers 18 inches or less in thickness with a minimum of lateral movement. Carry on the placement at such a rate that the formation of cold joints will be prevented. Submit Methods and equipment for transporting, handling, depositing, and consolidating the concrete prior to the first concrete placement. Perform conveying and placing concrete in conformance with the following:

3.2.1 Consolidation

Consolidate each layer of concrete by rodding, spading, or internal vibrating equipment. External vibrating equipment may be used when authorized. Systematically accomplish internal vibration by inserting the vibrator through the fresh concrete in the layer below at a uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1.5 times the radius of action of the vibrator and overlay the adjacent, just-vibrated area by approximately 4 inches. Ensure that the vibrator penetrates rapidly to the bottom of the layer and at least 6 inches into the layer below, if such a layer exists. Hold vibrator stationary until the concrete is consolidated and then withdraw it slowly at the rate of about 3 inches per second.

3.2.2 Hot-Weather Requirements

When the rate of evaporation of surface moisture, as determined by use of Figure 1 of ACI MCP PACK Part 2, is expected to exceed 0.2 psf per hour, provisions for windbreaks, shading, fog spraying, or covering with a light-colored material shall be made in advance of placement, and such protective measures taken as quickly as finishing operations will allow.

3.2.3 Lifts in Concrete

Deposit concrete in horizontal layers not to exceed 24 inches in thickness. Carry on placement at a rate that prevents the formation of cold joints. Place slabs in one lift.

3.3 FORM REMOVAL

Do not remove forms before 24 hours after concrete placement, except as otherwise specifically authorized. Do not remove supporting forms and shoring until the concrete has cured for at least 5 days. When conditions require longer curing periods, forms shall remain in place.

3.4 FINISHING

3.4.1 Finishing Unformed Surfaces

Float finish all unformed surfaces that are not to be covered by additional concrete or backfill, to elevations shown, unless otherwise specified. Surfaces to receive additional concrete or backfill shall be brought to the elevations shown and left as a true and regular surface. Slope exterior surfaces for drainage unless otherwise shown. No water or cement is to be added to the surface during finishing.

3.5 CURING AND PROTECTION

Beginning immediately after placement, and continuing for at least 7 days, cure and protect all concrete from premature drying, extremes in temperature, rapid temperature change, mechanical damage, and exposure to rain or flowing water. Provide all materials and equipment needed for adequate curing and protection at the site of the placement prior to the start of concrete placement. Accomplish moisture preservation of moisture for concrete surfaces not in contact with forms by one of the following methods:

a. Continuous sprinkling or ponding.
b. Application of absorptive mats or fabrics kept continuously wet.
c. Application of sand kept continuously wet.
d. Application of impervious sheet material conforming to ASTM C 171.
e. Application of membrane-forming curing compound conforming to ASTM C 309, Type 1-D, on surfaces permanently exposed to view. Accomplish Type 2 on other surfaces in accordance with manufacturer's instructions.

Accomplish the preservation of moisture for concrete surfaces placed against wooden forms by keeping the forms continuously wet for 7 days. If forms are removed prior to end of the required curing period, use other curing methods for the balance of the curing period. Do not perform protection removal if the temperature of the air in contact with the concrete may drop more than 60 degrees F within a 24 hour period.

3.6 TESTS AND INSPECTIONS

3.6.1 Field Testing Technicians

The individuals who sample and test concrete, as required in this specification, shall have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to the ACI minimum guidelines for certification of Concrete Field Testing Technicians, Grade I.

3.6.2 Inspection Details and Frequency of Testing

3.6.2.1 Preparations for Placing

Inspect foundation or construction joints, forms, and embedded items in sufficient time prior to each concrete placement by the Contractor to certify that it is ready to receive concrete.

3.6.2.2 Consolidation and Protection

Ensure that the concrete is properly consolidated, finished, protected, and cured.

3.6.3 Action Required

3.6.3.1 Placing

Do not permit placing to begin until the availability of an adequate number of acceptable vibrators, which are in working order and have competent operators, has been verified. At least one additional vibrator shall be on site, to act as a back-up. Do not continue placing if any pile is inadequately consolidated.

3.6.4 Reports

Report the results of all tests and inspections conducted at the project site informally at the end of each shift. Submit written reports weekly. Deliver within 3 days after the end of each weekly reporting period.

3.7 FORM WORK

Form work shall conform to ACI MCP PACK Parts 2 through 5.

3.7.1 Preparation of Form Surfaces

Forms shall be true to line and grade, mortar-tight, and sufficiently rigid to prevent objectionable deformation under load. Form surfaces for permanently exposed faces shall be smooth, free from irregularities, dents, sags, or holes. Chamfer exposed joints and exposed edges. Arrange internal ties so that when the forms are removed, the form ties are not less than 2 inches from concrete surfaces permanently exposed to view or exposed to water on the finished structure.

3.7.2 Form Coating

Coat forms, for exposed surfaces, with a non-staining form release coating applied shortly before concrete is placed. Forms for unexposed surfaces may be wetted in lieu of coating immediately before the placing of concrete, except that in freezing weather form release coating shall be used.

3.7.3 Removal of Forms

Remove forms carefully to prevent damage to the concrete. Forms are not to be removed until at least 24 hours after concrete placement.

3.8 STEEL REINFORCING

Reinforcement shall be free from loose, flaky rust and scale, and free from oil, grease, or other coating which might destroy or reduce the reinforcement's bond with the concrete.

3.8.1 Fabrication

Shop fabricate steel reinforcement in accordance with ACI MCP PACK Parts 2 and 3. Shop details and bending shall be in accordance with ACI MCP PACK Parts 2 and 3.

3.8.2 Splicing

Perform splices in accordance with ACI MCP PACK Parts 2 and 3.

3.8.3 Supports

Secure reinforcement in place by the use of metal or concrete supports, spacers, or ties.

3.9 EMBEDDED ITEMS

Before placing concrete, take care to determine that all embedded items are firmly and securely fastened in place. Provide embedded items free of oil and other foreign matter, such as loose coatings of rust, paint and scale. Embedding of wood in concrete is permitted only when specifically authorized or directed.

3.10 FIELD TESTING

a. Provide samples and test concrete for quality control during placement. Sampling of fresh concrete for testing shall be in accordance with ASTM C172/C172M.

b. Test concrete for compressive strength at 7 and 28 days for each design mix. Concrete test specimens shall conform to ASTM C 31/C 31M. Perform Compressive strength testing conforming to ASTM C 39/C 39M.

-- End of Section --

DIVISION 26 ELECTRICAL

SECTION 26 00 00.00 20

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 709	(2001; R 2007) Laminated Thermosetting Materials

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 100	(2000; Archived) the Authoritative Dictionary of IEEE Standards Terms
IEEE C2	(2007; TIA 2007-1; TIA 2007-2; TIA 2007-3; TIA 2007-4; TIA 2007-5; Errata 2006-1; Errata 2007-2; Errata 2009-3) National Electrical Safety Code

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250	(2008) Enclosures for Electrical Equipment (1000 Volts Maximum)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2008; TIA 08-1) National Electrical Code

1.2 NOT USED

1.3 DEFINITIONS

a. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, shall be as defined in IEEE 100.

b. The technical sections referred to herein are those specification sections that describe products, installation procedures, and equipment operations and that refer to this section for detailed description of submittal types.

c. The technical paragraphs referred to herein are those paragraphs in PART 2 - PRODUCTS and PART 3 - EXECUTION of the technical sections that describe products, systems, installation procedures, equipment, and test methods.

1.4 ELECTRICAL CHARACTERISTICS

Electrical characteristics for this project shall be 277/480 volts secondary, three phase, and four wire. Final connections to the power distribution system at the existing electrical rooms shall be made by the Contractor as shown in the drawings.

1.5 QUALITY ASSURANCE

1.5.1 Regulatory Requirements

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the CM. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

1.5.2 Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in the technical section.

1.5.2.1 Alternative Qualifications

Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

1.5.2.2 Material and Equipment Manufacturing Date

Products manufactured more than 1 year prior to date of delivery to site shall not be used, unless specified otherwise

1.6 WARRANTY

The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of 1 year from the date of project acceptance.

1.7 POSTED OPERATING INSTRUCTIONS

Provide for each system and principal item of equipment as specified in the technical sections for use by operation and maintenance personnel. The operating instructions shall include the following:

a. Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.

b. Required proper aiming adjustment.

c. Safety precautions.

d. The procedure in the event of lighting failure.

e. Other items of instruction as recommended by the manufacturer of each system or item of equipment.

Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions where directed. For operating instructions exposed to the weather, provide weather-resistant materials or weatherproof enclosures. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.8 MANUFACTURER'S NAMEPLATE

Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.9 FIELD FABRICATED NAMEPLATES

ASTM D 709. Provide laminated plastic nameplates for each equipment enclosure, relay, switch, and device; as specified in the technical sections or as indicated on the drawings. Each nameplate inscription shall identify the function and, when applicable, the position. Nameplates shall be melamine plastic, 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be one by 2.5 inches. Lettering shall be a minimum of 0.25 inch high normal block style.

1.10 NOT USED

1.11 ELECTRICAL REQUIREMENTS

Electrical installations shall conform to IEEE C2, NFPA 70, and requirements specified herein.

1.12 INSTRUCTION TO GVB PERSONNEL

Where specified in the technical sections, furnish the services of competent instructors to give full instruction to designated GVB personnel in the adjustment, operation, and maintenance of the specified systems and equipment, including pertinent safety requirements as required. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after

the equipment or system has been accepted and turned over to the GVB for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section.

PART 2 PRODUCTS

2.1 FACTORY APPLIED FINISH

Electrical fixture shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA 250 corrosion-resistance test and the additional requirements specified in the technical sections.

PART 3 EXECUTION

3.1 FIELD FABRICATED NAMEPLATE MOUNTING

Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of two sheet-metal screws or two rivets.

-- End of Section --

SECTION 26 00 00.00 40 - WIRES AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes building wire and cable.

B. Related Sections:

1. SECTION 33 00 00 SITE UTILITY WORK: Requirements for trench and backfill to be placed by this system.
2. SECTION 26 00 00.00 20 - BASIC ELECTRICAL MATERIALS AND METHODS: Product requirements for street lighting panel (SLP) and concrete pole identification.

REFERENCES

A. International Electrical Testing Association:
   1. ANSI/NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
      Note: Submit testing requirements for CM approval.
B. National Fire Protection Association:
C. NFPA 70 - National Electrical Code.
D. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
E. Underwriters Laboratories, Inc.:
F. UL 1277 - Standard for Safety for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.

1.2 SYSTEM DESCRIPTION

A. Product Requirements: Provide products as follows:
   1. Solid conductor for feeders and branch circuits 10 AWG and smaller.
   2. Stranded conductors furnished by GVB for lighting controller connection to concrete pole.
   3. Stranded conductors for control circuits.
   4. Conductor not smaller than 12 AWG for power and lighting circuits.
   5. Conductor not smaller than 14 AWG for control circuits.
   6. Increase wire size in branch circuits to limit voltage drop to a maximum of 3 percent.

B. Wiring Methods: Provide the following wiring methods:
   1. Conductors shall be UL-listed Type suitable for wet locations and for operation at 600 volts or less at temperatures not to exceed 90°C. Conductors shall be annealed copper.

1.3 Wet or Damp Interior Locations: Use only building wire, Type THWN and XHHW.

A. Exterior Locations: Use only Type THWN and XHHW insulation in raceway.

B. Underground Locations: Use only Type THWN and XHHW insulation in raceway.

C. DESIGN REQUIREMENTS

i. Conductor sizes are based on copper.

B. SUBMITTALS

i. Submittal Procedures: Requirements for submittals.

ii. Product Data: Submit for building wire and cable assembly type.

C. CLOSEOUT SUBMITTALS

i. Project Closeout: Requirements for submittals.

ii. Project Record Documents: Record actual locations of components and circuits.

D. QUALITY ASSURANCE

i. Perform Work in accordance with State Municipality of Guam Public Work's standard.

E. QUALIFICATIONS

i. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.

F. FIELD MEASUREMENTS

i. Verify field measurements.

G. COORDINATION

i. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.

ii. Wire and cable routing indicated is approximate unless dimensioned.

PART 2 – PRODUCTS

2.0 WIRE

A. Manufacturers with products that GPA believes meet the above specifications are provided below. These brand names are provided only as examples and any manufacturer providing substantially equivalent products that meet these specifications will be considered.

1. AETNA.
2. American Insulated Wire Corp.
3. Colonial Wire Model.
4. Encore Wire Model.
5. General Cable Co.
6. Republic Wire.
7. Rome Cable.
8. Service Wire Co.
9. Southwire.
10. Superior Essex.

B. Product Description: Single conductor insulated wire.
C. Conductor: Copper.
D. Insulation Voltage Rating: 600 volts.
E. Insulation Temperature Rating: 75 degrees C.
F. Insulation Material: Thermoplastic.
G. Conductor: Copper.
H. Insulation: Flame-retardant.
I. Overall Jacket: Polyvinyl Chlorine (PVC) in accordance with UL 1277.
J. Insulation Voltage Rating: 600 volts.
K. Insulation Temperature Rating: 90 degrees C.
L. Listings: Finished cable UL listed as Type TC, and sunlight resistant.

2.1 WIRING CONNECTORS

A. Split Bolt Connectors
B. Solderless Pressure Connectors
C. Spring Wire Connectors
D. Compression Connectors
E. Fused Breakaway Single Pole and Double Pole Street Light Kits

PART 3 – EXECUTION

3.1 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.
B. Contractor’s responsibility to determine conduit quality.

3.2 EXISTING WORK

A. Remove old damaged and brittle wire and conductor.
B. Replace damaged underground conduit as required.
C. Disconnect abandoned circuits and remove circuit wire and cable.
D. Provide access to existing wiring connections remaining

active and requiring access. Modify installation or install access panel.

E. Extend existing circuits using materials and methods as specified.
F. Clean and repair existing wire and cable remaining or wire and cable to be reinstalled.
G. Install circuit breakers as required.

3.3 INSTALLATION

A. Route wire and cable to meet Project conditions.
B. Neatly train and lace wiring inside boxes, equipment, and panel boards.
C. Identify and color code wire and cable under provisions of Section 16075. Identify each conductor with its circuit number or other designation indicated.
D. Special Techniques--Building Wire in Raceway:
   i. Pull conductors into raceway at same time.
   ii. Install building wire 4 AWG and larger with pulling equipment.

E. Special Techniques - Cable:
   i. Protect exposed cable from damage.
   ii. Use suitable cable fittings and connectors.

F. Special Techniques - Wiring Connections:
   i. Clean conductor surfaces before installing lugs and connectors.
   ii. Make splices, taps, and terminations to carry full capacity of conductors with no perceptible temperature rise.
   iii. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
   iv. Install split bolt connectors for copper conductor splices and taps, 6 AWG and larger.
   v. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
   vi. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

G. Install stranded conductors for branch circuits 10 AWG and smaller. Install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.

H. Install terminal lugs on ends of 600 volt wires unless lugs are furnished on connected device, such as circuit breakers.

I. Size lugs in accordance with manufacturer’s recommendations terminating wire sizes. Install 2-hole type lugs to connect wires 4 AWG and larger to copper bus bars.

J. For terminal lugs fastened together such as on motors, transformers, and other apparatus, or when space between studs is small enough that lugs can turn and touch each other, insulate for dielectric strength of 2-1/2 times normal potential of circuit.

3.4 WIRE COLOR

A. General:
   1. For wire sizes 10 AWG and smaller, install wire colors in

accordance with the following:
a. Black and red for single phase circuits at 120/240 volts.
b. Black, red, and blue for circuits at 120/208 volts single or three phase.
c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.

2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
   a. Black and red for single phase circuits at 120/240 volts.
   b. Black, red, and blue for circuits at 120/208 volts single or three phase.
   c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
   d. Except for connection from lighting controller concrete poles.

B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
D. Feeder Circuit Conductors: Uniquely color code each phase.
E. For the lighting circuit conductor from lighting controller to pole use black color for each phase.
F. Ground Conductors:
   1. For 6 AWG and smaller: Green.
   2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.5 FIELD QUALITY CONTROL

A. Quality Control: Field inspecting and testing of all wiring, to be witnessed and approved by CM.
B. Provide isolation (Megger) test report for all new to install conductors.

END OF SECTION

SECTION 26 56 13.00 40

LIGHTING POLES AND STANDARDS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ALLIANCE FOR TELECOMMUNICATIONS INDUSTRY SOLUTIONS (ATIS)

ATIS ANSI O5.1	(2008) Wood Poles -- Specifications & Dimensions

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO LTS-5	(2009; Errata 2009) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C136.20	(2008) American National Standard for Roadway and Area Lighting Equipment - Fiber Reinforced Composite (FRC) Lighting Poles

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA C1	(2003) All Timber Products - Preservative Treatment by Pressure Processes
AWPA C25	(2003) Sawn Crossarms - Preservative Treatment by Pressure Processes
AWPA C4	(2003) Poles - Preservative Treatment by Pressure Processes
AWPA M6	(2007) Brands Used on Forest Products
AWPA P1/P13	(2001) Standard for Creosote Preservative
AWPA P8	(2005) Standard for Oil-Borne Preservatives
AWPA P9	(2003) Standards for Solvents and Formulations for Organic Preservative Systems

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M	(2009) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153/A 153M	(2009) Standard Specification for Zinc

	Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 36/A 36M	(2008) Standard Specification for Carbon Structural Steel
ASTM A 575	(1996; R 2007) Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades
ASTM A 576	(1990b; R 2006) Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality
ASTM B 108/B 108M	(2008) Standard Specification for Aluminum-Alloy Permanent Mold Castings
ASTM C 1089	(2006) Standard Specification for Spun Cast Prestressed Concrete Poles
ASTM E 2129	(2005) Standard Practice for Data Collection for Sustainability Assessment of Building Products
ASTM G 154	(2006) Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA)

IESNA HB-9	(2000; Errata 2004; Errata 2005; Errata 2006) IES Lighting Handbook

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 100	(2000; Archived) The Authoritative Dictionary of IEEE Standards Terms
IEEE 81	(1983) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System
IEEE C135.1	(1999) Standard for Zinc-Coated Steel Bolts and Nuts for Overhead Line Construction
IEEE C135.30	(1988) Standard for Zinc-Coated Ferrous Ground Rods for Overhead or Underground Line Construction
IEEE C2	(2007; TIA 2007-1; TIA 2007-2; TIA 2007-3; TIA 2007-4; TIA 2007-5; Errata 2006-1; Errata 2007-2; Errata 2009-3) National Electrical Safety Code

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 261	(1998) ISO General Purpose Metric Screw Threads - General Plan
ISO 262	(1998) ISO General Purpose Metric Screw

	Threads - Selected Sizes for Screws, Bolts and Nuts
ISO 263	(1973) ISO Inch Screw Threads - General Plan and Selection for Screws, Bolts and Nuts - Diameter Range 0.06 to 6 inch

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI C136.13	(2004; R 2009) American National Standard for Roadway Lighting Equipment, Metal Brackets for Wood Poles
ANSI C136.21	(2004; R 2009) American National Standard for Roadway and Area Lighting Equipment - Vertical Tenons Used with Post-Top-Mounted Luminaires
ANSI C136.3	(2005) American National Standard for Roadway and Area Lighting Equipment Luminaire Attachments

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2008; TIA 08-1) National Electrical Code

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC SP 10/NACE No. 2	(2007) Near-White Blast Cleaning

U.S. DEPARTMENT OF AGRICULTURE (USDA)

RUS Bull 345-67	(1998) REA Specification for Filled Telephone Cables, PE-39

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-P-38	(Rev E) Paint, Aluminum, Ready-Mixed
FS TT-P-645	(Rev B) Primer, Paint, Zinc-Molybdate, Alkyd Type

UNDERWRITERS LABORATORIES (UL)

UL 467	(2007) Grounding and Bonding Equipment

1.2 DEFINITIONS

Groundline section is that portion between one foot above and 2 feet below the groundline. Refer to IEEE 100 for additional related definitions and terminology.

1.3 SUBMITTALS

CM approval is required for all submittals prior to proceeding with related activity. In general, The Construction Manager (CM) will be responsible for processing submittals on behalf of the CM. The following shall be submitted in accordance with Section 01 33
00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Poles
Installation Details SD-03

Poles and Accessories Provided by GVB

SD-08 Manufacturer's Instructions

Mounting details

SD-10 Operation and Maintenance Data

Operational Service

Submit documentation that includes contact information, summary of procedures, and the limitations and conditions applicable to the project.

SD-11 Closeout Submittals

Warranty

1.4 QUALITY ASSURANCE

1.4.1 Material Inspection

Inspect all materials supplied by GVB and keep quality records.

1.4.2 Pre-Installation Conference

After submittals are received and approved but before work, including associated work, is performed, the CM will hold a pre-installation conference to review the following:

a. The drawings, including Poles, showing complete installation details, and specifications. Include details for the following for review:

i. foundation requirements
ii. anchorage systems
iii. manufacturer's catalog data including mounting and bracket details

b. Finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

c. Methods and procedures related to pole and luminaire installation, including manufacturer's written instructions.

d. Safety plan review must include applicable Material Safety Data Sheets.

e. Temporary protection requirements for pole assembly during and after installation.

f. Pole system observation and repair procedures after complete installation. Include review of sample Galvanizing Repair Paint.

g. Sample Warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver, store, and handle poles[and] [standards], and all related accessories and other manufactured items in a manner to prevent damage or deformation.

1.5.1 Steel Poles

Do not store poles on ground. Support poles so they are at least one foot above ground level and growing vegetation. Do not remove factory-applied pole wrappings until just before installing pole.

1.6 WARRANTY

Provide support for the equipment items by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

PART 2 PRODUCTS

2.1 PRODUCT COORDINATION

Ensure that all materials are coordinated with Sections 26 00 00.00 20, 26 27 29 and 26 56 23.00 40.

2.2 LIGHTING STANDARDS

Lighting standard, includes pole, anchor base, transformer base, brackets, and accessories, designed to withstand vertical and horizontal loading on the entire structure and supported equipment without damage or permanent deformation to any component of the lighting standard.

2.3 CONCRETE POLES

Follow manufacturer installation instructions to install GVB provided concrete pole.

2.3.1 Pole Mounting

Follow manufacturer installation instructions to install GVB provided anchor bolt mount and base plate cover.

2.3.2 Accessories

Follow manufacturer installation instructions to install GVB provided accessories, including pole-top cap, cover plate and arms.

2.3.3 Pole Identification Plates

Provide for all poles a numbered identification nameplate securely mounted in a visible location out of normal reach. Sample: SLP1/1 for Pole number 1 of Street Lighting Panel 1. SLP1/2 for Pole number 2 of Street Lighting Panel 1, etc. Provide submittal to CM for approval.

Identification numbers shall be clearly die-stamped with 1/2-inch numbers on 16-gauge stainless steel plate or similar approved by CM.

2.6 FOUNDATIONS FOR LIGHTING STANDARDS

Provide foundations if required for lighting standards in accordance with manufacturer's recommendations. Submit Equipment Foundation Data in accordance with referenced standards in this section.

PART 3 EXECUTION

3.1 INSTALLATION

Provide electrical installations conforming to IEEE C2, NFPA 70, and to the requirements specified herein.

3.2 INSTALLATION OF STANDARD FOUNDATIONS

3.2.1 Setting of Anchor Bolts

Set anchor bolts or rods with exposed threaded ends vertically positioned in the concrete using a template supplied by the pole manufacturer or in accordance with the lighting standard manufacturer's recommendations.

3.2.2 Concrete Placement

Level and steel trowel concrete bearing surface to a smooth, hard, dense finish surface. After form work is removed, protect the exposed concrete with impervious paper or burlap material and keep wet for the full curing period.

3.2.3 Record Drawings

Maintain and keep up to date, a separate set of drawings and one-line diagram for each Street Lighting Panel (SLP), elementary diagrams and wiring diagrams of the lighting to be used for "record" drawings, showing all changes and additions to the lighting system. In addition to being complete and accurate, keep this set of drawings separate and do not use for installation purposes. Upon completion of the record drawings, a representative of the GVB will review the as-built work with the Contractor. If the as-built work is not complete, the Contractor will be so advised and complete the work as required.

-- End of Section --

SECTION 26 56 23.00 40

AREA LIGHTING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA)

IESNA HB-9	(2000; Errata 2004; Errata 2005; Errata 2006) IES Lighting Handbook

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 100	(2000; Archived) The Authoritative Dictionary of IEEE Standards Terms
IEEE C2	(2007; TIA 2007-1; TIA 2007-2; TIA 2007-3; TIA 2007-4; TIA 2007-5; Errata 2006-1; Errata 2007-2; Errata 2009-3) National Electrical Safety Code

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI ANSLG C78.42	(2007) For Electric Lamps: High-Pressure Sodium Lamps
ANSI C78.1381	(1998) American National Standard for Electric Lamps - 250-Watt, 70 Watt, M85 Metal-Halide Lamps
ANSI C82.4	(2002) American National Standard for Ballasts for High-Intensity-Discharge and Low-Pressure Sodium (LPS) Lamps (Multiple-Supply Type)
ANSI/ANSLG C78.43	(2007) American National Standard for Electric Lamps - Single-Ended Metal-Halide Lamps
NEMA 250	(2008) Enclosures for Electrical Equipment (1000 Volts Maximum)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2008; TIA 08-1) National Electrical Code

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

Energy Star	(1992; R 2006) Energy Star Energy Efficiency Labeling System

UNDERWRITERS LABORATORIES (UL)

UL 1029	(1994; R thru 2009) High-Intensity-Discharge Lamp Ballasts
UL 1598	(2008; R 2010) Luminaires

1.2 DEFINITIONS

Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, are as defined in IEEE 100.

Average life is the time after which 50 percent will have failed and 50 percent will have survived under normal conditions.

1.3 SUBMITTALS

CM approval is required for all submittals prior to proceeding with related activity. In general, The Construction Manager (CM) will be responsible for processing submittals on behalf of the GVB. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings
One-Line diagram for each SLP

SD-03 Product Data

Energy Efficiency
Luminaires
Lamps
Ballasts

SD-05 Design Data

Design Data for luminaires
Aiming Plan

SD-06 Test Reports

Operating test

Submit operating test results as stated in paragraph entitled "Field Quality Control."

SD-08 Manufacturer's Instructions

Mounting Details

Submit instructions prior to installation.

SD-10 Operation and Maintenance Data

Operational Service

Submit documentation that includes contact information, summary of procedures, and the limitations and conditions applicable to the project. Indicate manufacturer's commitment to reclaim materials for recycling and/or reuse.

1.4 QUALITY ASSURANCE

1.4.1 Drawing Requirements

1.4.1.1 Luminaire Drawings

Include dimensions, effective projected area (EPA), accessories, and installation and construction details. Accompany shop drawings with photometric data, including zonal lumen data, average and minimum ratio, aiming diagram, and candlepower distribution data.

1.4.1.2 Aiming plan

Light aiming point plan showing focus points.

1.4.2 Design Data for Luminaires

a. Distribution data according to IESNA classification type as defined in IESNA HB-9.

b. Computerized horizontal illumination levels in foot-candles at ground level, taken every 20 feet. Include average maintained foot-candle level and maximum and minimum ratio.

1.4.3 Regulatory Requirements

In each of the publications referred to herein, consider the advisory provisions to be mandatory, for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the CM. Provide equipment, materials, installation, and workmanship in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

1.4.4 Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship, which have been in satisfactory commercial or industrial use for 2 years prior to bid opening under similar circumstances and of similar size. The product is to have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, provide products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

1.4.4.1 Alternative Qualifications

Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

1.4.4.2 Material and Equipment Manufacturing Date

Products manufactured more than 3 years prior to date of delivery to site are not allowed, unless specified otherwise.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver, store, and handle fixtures, lamps, and all related accessories and other manufactured items in a manner to prevent damage or deformation.

1.6 SUSTAINABLE DESIGN REQUIREMENTS

1.6.1 Energy Efficiency

Comply with National Energy Policy Act and Energy Star requirements for lighting products. Submit data indicating lumens per watt efficiency and color rendition index of light source.

1.7 WARRANTY

Provide support for the equipment items by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

PART 2 PRODUCTS

2.1 NOT USED
2.2 NOT USED

2.3 FACTORY APPLIED FINISH

Factory apply painting system to electrical equipment other than furnished materials which as a minimum, meets the requirements of NEMA 250 corrosion-resistance test.

PART 3 EXECUTION

3.1 INSTALLATION

Provide electrical installations conforming to IEEE C2, NFPA 70, and to the requirements specified herein.

3.1.1 Not used

3.1.2 GROUNDING

Ground noncurrent-carrying parts of equipment including metal poles, luminaires, mounting arms, brackets, and metallic enclosures as specified in Section 26 27 29. Where copper grounding conductor is connected to a metal other than copper, provide specially treated or lined connectors suitable for this purpose.

3.1.3 FIELD APPLIED PAINTING

Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria. Painting is as specified in Section 09 90 00 PAINTS AND COATINGS.

3.2 FIELD QUALITY CONTROL

Upon completion of installation, verify that equipment is properly installed, connected, and adjusted. Conduct an operating test in the presence of the CM to show that the equipment operates in accordance with the requirements of this section.

-- End of Section --

DIVISION 33 SITE WORK

SECTION 33 00 00

SITE UTILITY WORK

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D 1140	(2000; R 2006) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D 1556	(2007) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 2487	(2010) Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 4318	(2010) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 6938	(2010) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.2 SYSTEM DESCRIPTION

Work covered by this specification includes trenching, placing conduit, encasing the conduit with flowable concrete, backfilling as required, and paving the surface to match existing.

1.3 DEFINITIONS

1.3.1 Satisfactory Fill Materials

For the purposes of this project, satisfactory fill materials comprise any materials classified by ASTM D 2487 as GW, GP, GM, SW, or a combination of these group symbols.

1.3.2 Unsatisfactory Fill Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic

matter or frozen material. Notify the CM when encountering any contaminated materials.

1.3.3 Select Granular Material

1.3.3.1 General Requirements

Select granular material consist of materials classified as GW, GP, GM, or SW, by ASTM D 2487 where indicated. The liquid limit of such material must not exceed 35 percent when tested in accordance with ASTM D 4318. The plasticity index must not be greater than 12 percent when tested in accordance with ASTM D 4318, and not more than 35 percent by weight may be finer than No. 200 sieve when tested in accordance with ASTM D 1140.

1.3.4 Initial Backfill Material

Initial backfill consists of select granular material or satisfactory materials free from rocks 1 inch or larger in any dimension.

1.4 SUBMITTALS

CM approval is required for all submittals prior to proceeding with related activity. In general, The Construction Manager (CM) will be responsible for processing submittals on behalf of the CM. The following shall be submitted in accordance with Section 01 33
00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Utilization of Excavated Materials
Hot-Mix Asphalt Mix Design Warning
Tape

SD-06 Test Reports

Testing

SD-07 Certificates

Testing

PART 2 PRODUCTS

2.1 HOT-MIX ASPHALT MIX DESIGN

a. Coarse Aggregate: The coarse aggregate is that part of the aggregate retained on a No. 10 sieve and shall consist of clean, tough, durable particles.
b. Fine Aggregate: Sharp edged natural sand or sand prepared from stone, properly cured blast furnace slag, gravel, or combinations thereof.
c. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with ASTM D 242.
d. Asphalt Cement: ASTM D 3381 for viscosity graded material; ASTM D 946 for penetration-graded material.
e. Prime Coat: Cutback asphalt type, ASTM D 2027; MC_70 or RC_250.

f. Tack Coat: Emulsified asphalt Grade RS-2; ASTM D 977
g. Asphalt Aggregate Mixture: Provide plant mixed, hot laid asphalt aggregate mixture complying with Guam road standards.

2.2 REQUIREMENTS FOR OFFSITE SOILS FOR BACKFILL

Test offsite soils brought in for use as backfill for Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX) and full Toxicity Characteristic Leaching Procedure (TCLP) including ignitability, corrosivity and reactivity. Do not bring material onsite until tests have been approved by the CM.

2.3 BURIED WARNING AND IDENTIFICATION TAPE

Provide polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inches minimum width, color coded Red with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED ELECTRICAL LINE BELOW" or similar wording. Provide permanent color and printing, unaffected by moisture or soil.

PART 3 EXECUTION

3.1 GENERAL EXCAVATION

3.1.1 Trench Excavation Requirements

Prior to excavation, identify and mark existing utilities in the area. Mark and saw-cut the edges of the area to be trenched. Excavate the trench as indicated on the contract drawings. Locate existing conduit for connection of new conduit run.

3.1.1.1 Excavation for Handhole

Provide excavation for handholes sufficient to leave at least 12 inches clear between the outer structure surfaces and the face of the excavation. Remove loose disintegrated rock and thin strata. Specify removal of unstable material.

3.1.2 Underground Utilities

The Contractor is responsible for movement of construction machinery and equipment over pipes and utilities during construction. Excavation made with power-driven equipment is not permitted within two feet of known GVB-owned utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the CM. Report damage to utility lines or subsurface construction immediately to the CM.

3.2 UTILIZATION OF EXCAVATED MATERIALS

Dispose of unsatisfactory materials removing from excavations into designated waste disposal or spoil areas. Use satisfactory material removed from excavations, insofar as practicable as bedding or as backfill, and for similar purposes. Submit procedure and location for disposal of unused satisfactory material. Do not waste any satisfactory excavated material without specific written authorization. Dispose of satisfactory material, authorized to be wasted, in designated areas approved for surplus material storage or designated waste areas as directed.

3.3 SUBGRADE PREPARATION

Finish compaction by vibratory compactors, or other approved equipment. Compact subgrade for pavements to at least 98 percentage laboratory maximum density for the depth below the surface of the pavement shown.

3.4 CONDUIT

Before pouring concrete, anchor conduit to prevent floating during concrete pouring. Anchoring shall be done by driving reinforcing rods adjacent to duct spacer assemblies and attaching the rods to the spacer assembly.

3.5 FLOWABLE CONCRETE

Encase conduit in 500 psi flowable concrete, as shown on contract drawings. Water content shall be the minimum that will provide a flowable mixture and completely fill the space without segregation, bleeding, or reduction of strength.

3.6 ELECTRIC HANDHOLES

Handholes shall be located approximately as shown. Handholes shall be of the type noted on the drawings and shall be constructed in accordance with the details shown. Cables shall be securely supported from walls by hot-dip galvanized cable racks with a plastic coating over the galvanizing and equipped with adjustable hooks and insulators. The number of cable racks indicated shall be installed in each manhole. Insulators shall be made of high-glazed porcelain.

3.7 BACKFILLING AND COMPACTION

Place backfill adjacent to any and all types of structures, and compact to at least 98 percent laboratory maximum density.

3.7.1 Trench Backfill

Backfill trenches to the grade shown. Provide utility identification tape. Locate tape as indicated on contract drawings. <MET> 150 mm</MET> Place backfill material and compact it with approved tampers to height as indicated on contract drawings

3.7.2 Backfill for Handhole

After the handhole has been placed, place backfill in such a manner that the structure is not be damaged by the shock of falling earth. Deposit the

backfill material, compact it as specified for final backfill, and bring up the backfill evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.8 TESTING

Perform testing by a validated commercial testing laboratory. Submit qualifications of the commercial testing laboratory.

a. Determine field in-place density in accordance with ASTM D 6938. Check the calibration curves and adjust using only the sand cone method as described in ASTM D 1556. ASTM D 6938 results in a wet unit weight of soil in determining the moisture content of the soil when using this method.

b. Check the calibration curves furnished with the moisture gauges along with density calibration checks as described in ASTM D 6938; check the calibration of both the density and moisture gauges at the beginning of a job on each different type of material encountered and at intervals as directed by the CM. When test results indicate, as determined by the CM, that compaction is not as specified, remove the material, replace and recompact to meet specification requirements.

c. Perform tests on recompacted areas to determine conformance with specification requirements. Appoint a registered professional civil engineer to certify inspections and test results. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

3.8.1 Fill and Backfill Material Gradation

One test per 2 cubic yards stockpiled or in-place source material. Determine gradation of fill and backfill material in accordance with ASTM C 136.

3.8.2 In-Place Densities

One test per 10 square feet, or 10 linear feet, or fraction thereof, of each lift of fill or backfill areas.

3.8.3 Check Tests on In-Place Densities

If ASTM D 6938 is used, check in-place densities by ASTM D 1556 as follows:

One check test per lift for each 10 square feet, or fraction thereof, of each lift of fill or backfill.

3.8.4 Moisture Contents

In the stockpile, excavation, or borrow areas, perform a minimum of two tests per day per type of material or source of material being placed during

stable weather conditions. During unstable weather, perform tests as dictated by local conditions and approved by the CM.

3.8.5 Optimum Moisture and Laboratory Maximum Density

Perform tests for each type material or source of material to determine the optimum moisture and laboratory maximum density values. One representative test per 2 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.9 DISPOSITION OF SURPLUS MATERIAL

Surplus material or other soil material not required or suitable for filling or backfilling, is to be removed from GVB property as directed by the CM.

3.10 HOT-MIX ASPHALT

3.10.1 PLACING

3.10.1.1 Placing

Provide hot-mix asphalt patch to completed trench to match thickness of existing adjacent pavement. Place and compact the mix at a temperature suitable for obtaining density, surface smoothness, and other specified requirements. Do not place the hot-mix asphalt upon a wet surface. The mixture may be spread and luted by hand tools.

3.10.2 COMPACTION OF MIXTURE

After placing, the mixture shall be thoroughly and uniformly compacted. Compact the surface as soon as possible without causing displacement, cracking or shoving. Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or is in any way defective shall be removed full depth, replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching will not be allowed.

3.10.3 STRAIGHTEDGE TESTING

Straightedge Testing: The finished surfaces of the pavements shall have no abrupt change of 1/4 inch or more, and all pavements shall be within the tolerances of 1/4 inch in both the longitudinal and transverse directions, when tested with an approved 12 feet straightedge.

-- End of Section --

SD-11

PROJECT CLOSEOUT / COMMISSIONING

SD-11 - PROJECT CLOSEOUT & COMMISSIONING
PART 1 -- GENERAL

1.1 FINAL CLEANUP

A. The Contractor shall promptly remove from the vicinity of the completed Work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by CM will be withheld until the Contractor has satisfactorily performed the final cleanup of the Site.

- Inspection and Testing

  Assure that all applicable tests, special inspections, and observations required by the contract are performed and approved by Construction Manager.

  Perform and participate in Pre-Final and Final Inspection. Submit a list of deficiencies to the Contracting Officer for each inspection. Correct all deficiencies prior to the Final inspection. Notify Contracting Officer prior to final inspection to establish a schedule date acceptable by the Contracting Officer.

  Contractor shall maintain a testing plan and log. Ensure that all testing is performed in accordance with the U.S. Department of Transportation Federal Highway Administration FHWA Lighting Handbook August 2012 and the manufactures recommendations. Review all test reports notify the Contracting Officer of all deficiencies, along with a proposal for corrective actions.

- CLOSEOUT TIMETABLE

  The Contractor shall establish dates for equipment testing and acceptance periods. Such dates shall be established not less than one week prior to beginning any of the foregoing items, to allow CM, sufficient time to schedule attendance at such activities.

- COMMISIONING

  All street lighting panels shall be operated in auto mode and be monitored for three (3) days to ensure that all new street lighting LEDs and Median lighting fixtures are operational and are turning on and off automatically at photocells preset values.
  Contractor to schedule commissioning 5 days in advance.

- FINAL ACCEPTANCE

Final acceptance is when the punch list items are 100% and all inspections are complete, and commissioning is approved by CM.

- FINAL SUBMITTALS

The Contractor, prior to requesting final payment, shall obtain and submit the following items to the CM:

1. Written guarantees, where required.
2. Technical Manuals and instructions

The Contractor shall make all repairs and replacements promptly upon receipt of

written order from CM. If the Contractor fails to make such repairs or replacements promptly GVB reserves the right to do the Work and the Contractor shall be liable to GVB for the cost thereof.

PART 2 -- PRODUCTS (NOT USED)

PART 3 -- EXECUTION (NOT USED)

--END OF SECTION--