

Airport Guideway and Stations

PROJECT SPECIFIC REQUIREMENTS

September 1, 2015

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1.0 GENERAL

1.1 INTRODUCTION

Chapter 1, Section 1.1, of the Compendium of Design Criteria (CDC) is hereby supplemented with the addition of the following sections after the last paragraph:

1.1.1 General Contents of PSR

This document titled the "Project-Specific Requirements" (PSR) for the Airport Guideway and Stations Design-Build (AGS) Contract ("DB Project" or "Project") herewith contains:

- A. Requirements and clarifications that amend and supplement HART's Compendium of Design Criteria (CDC); and
- B. Requirements and clarifications that amend and supplement the AGS Prescriptive Drawings, Guidance Drawings, and other Guidance Materials.

1.1.2 Section Numbering in the PSR

The section numbers in the PSR are correlated to the section numbers in the CDC. In the event that similar topical material is contained in both and there is a conflict, the Contractor shall immediately notify and seek clarification from HART.

1.3 APPLICATIONS

Chapter 1, Section 1.3, of the CDC is hereby supplemented with the addition of the following section to the end of the second paragraph:

- 1.3.1 Application shall be made in writing to HART for any design values that fall within the "Desirable Minimum" and "Absolute Minimum" of a criterion for approval prior to its use by the Designer.

1.4 PROJECT GOALS

Chapter 1, Section 1.4, of the CDC is hereby supplemented with the addition of the following section after the last paragraph:

1.4.4 AGS Project-Specific Goals:

- A. Quality: Satisfy Contract requirements for design, construction, maintainability, operability, safety, and reliability, including the seamless interface and design integration with Core Systems and adjoining construction by other contractors.
- B. Schedule: Complete Contract work in an expedient fashion to minimize impacts to the public and third parties and to enable commencement of systems operational testing at guideway and station facilities as soon as practicable.
- C. Cost: Complete the Contract work within the project budget.
- D. Stakeholders: Satisfy HART's commitments to all third-party stakeholders, including minimizing impacts to the citizens of the City and County of Honolulu.

- E. Safety: Achieve an exemplary safety record.

Chapter 1 of the CDC is hereby supplemented with the addition of the following Sections 1.5 through 1.19:

1.5 DESIGN BASIS

1.5.1 Summary Scope Statement

The AGS Contract includes the design and construction of approximately 5.15 miles of elevated guideway, four stations, and associated elements necessary for a rail transit system. The guideway segment begins at eastbound track Station 989+00 near the Arizona Memorial and ends at eastbound track Station 1260+98.91 in the median of Kamehameha Highway, on the Koko Head side of the Middle Street Transit Center Station. The four stations within this segment consist of the Pearl Harbor Naval Base Station (Pearl Harbor Station), the Honolulu International Airport Station (“HIA Station” or “Airport Station”), the Lagoon Drive Station, and the Middle Street Transit Center Station (Middle Street Station). See PSR Attachment 1-C, Summary of Work.

1.5.2 Scope of Design

The Scope of Design is as summarized in Attachment 1-A, Design Scope of Work.

1.5.3 Design and Construction Conditions

The AGS Project comprises the third guideway segment for the Honolulu Rail Transit Project (H RTP) and the four stations in the Airport Stations Group. The Contractor shall coordinate design and construction, interface, and share use of the Project site with other design and construction contractors as described herein. The Contractor shall coordinate and interface with the Kamehameha Highway Guideway (KHG) DB Contract on the Ewa end and with the City Center Guideway and Stations DB Contract on the Koko Head end, and with the Elevator & Escalator (E&E) Design-Furnish-Install-Maintain (DFIM) Contractor that will install the elevators and escalators at each station. Design and interface will also be required with the Design-Build-Operate-Maintain (DBOM) Core Systems Contractor that will install Electrical, Fire Detection and Alarm, Intrusion Detection, and Communication systems within the guideway and station work sites, and the Airport Section Utilities Construction Contractor that will be relocating utilities within the work site.

In addition to the H RTP projects mentioned above, the Contractor shall also be required to coordinate with ongoing construction projects for the Honolulu International Airport (HIA) Modernization Project, including but not limited to the Interisland Terminal Expansion - Mauka Concourse and the Consolidated Rental Car Facility (CONRAC). The HIA Modernization will include new roadway facilities under the guideway and adjacent to the HIA Station site.

1.5.4 Explanation of Prescriptive Requirements and Guidance Materials

- A. Refer to GCDB 1.2 for Contract Order of Precedence.
- B. Refer to GCDB 2.1 for Definitions.
- C. The “Prescriptive Requirements” as described in GCDB 1.2 are comprised of the following:

1. **Project-Specific Requirements (PSR):** The PSR, including its Attachments and Appendices, is a Prescriptive Requirement. The PSR amends the CDC with additional technical and procedural requirements for design and construction for the Airport Guideway & Stations Contract. Also see PSR 1.1.
 2. **Compendium of Design Criteria (CDC):** The CDC, as modified by the PSR, is a Prescriptive Requirement. The CDC establishes the criteria for the design of the Honolulu Rail Transit Project.
 3. **Prescriptive Technical Specifications:** The AGS Contract does not include Prescriptive Technical Specifications.
 4. **Prescriptive Drawings:** Prescriptive Drawings are comprised of those RFP drawings that are designated as Prescriptive Drawings in PSR Attachment 1-E, RFP Drawings Designations. The RFP Drawings are specific to the Airport Guideway & Stations Contract.
- D. The "Guidance Materials" as described in GCDB 1.2 are comprised of the following:
1. **Guidance Technical Specifications:** The Guidance Technical Specifications consist of Guideway Technical Specifications, Stations Technical Specifications, and HART Standard Specifications.
 - a. **Guideway Technical Specifications:** The Guideway Technical Specifications apply to the scope of work defined in RFP Drawing Volumes 1, 2, 3 and 9. The Guideway Technical Specifications are specific to the Airport Guideway & Stations Contract.
 - b. **Stations Technical Specifications:** The Stations Technical Specifications apply to the scope of work defined in RFP Drawings Volumes 4, 5, 6, 7 and 8. The Stations Technical Specifications are specific to the Airport Guideway & Stations Contract.
 - c. **HART Standard Specifications:** HART Standard Specifications apply to any scope of work not otherwise defined in the Guideway or Stations Technical Specifications. HART Standard Specifications are for application throughout the Honolulu Rail Transit Project.
 2. **Guidance Drawings:** Guidance Drawings are comprised of those RFP drawings that are designated as Guidance Drawings in PSR Attachment 1-E, RFP Drawing Designations. The RFP Drawings are specific to the Airport Guideway & Stations Contract.
 3. **HART Standard Drawings:** HART Standard Drawings depict requirements for work throughout the Honolulu Rail Transit Project. Where applicable to the Airport Guideway & Stations scope of work, HART Standard Drawings are Guidance Drawings.
 4. **HART Directive Drawings:** HART Directive Drawings depict requirements for work throughout the Honolulu Rail Transit Project. Where applicable to the Airport

Guideway & Stations scope of work, HART Directive Drawings are Guidance Drawings.

- E. It is the Contractor's responsibility to ensure that the final design conforms to the Prescriptive Requirements and Guidance Materials during design and preparation of the Construction Specifications and Construction Drawings.
- F. The design concepts presented in the RFP Drawings and Technical Specifications were prepared based on HART's CDC Rev. 2.0. However, HART's updated CDC Rev. 3.0 is the basis for this Airport Guideway & Stations Contract. Fourteen of the twenty-six CDC chapters were updated between Rev. 2.0 and 3.0. For the Contractor's information and convenience, redlined copies of the fourteen updated chapters are included in the Reference Materials to allow the Contractor to assess the differences.
- G. Prescriptive Drawings as so designated in PSR Attachment 1-E contain Prescriptive Requirements that are topical to those drawings, with all background information being considered Reference Materials. Several types of Prescriptive Drawings, and the Prescriptive Requirements contained therein, are listed here for clarification:
 - 1. Prescriptive Drawings for "Right-of-Way" contain Prescriptive Requirements that define the limits of HART-Obtained Right-of-Way (ROW).
 - 2. Prescriptive Drawings for "Track Alignment" contain Prescriptive Requirements that are the track vertical and horizontal alignments, upon which the Core Systems design and operations are based.
 - 3. Prescriptive Drawings for Pier "Aesthetics" contain Prescriptive Requirements that are architectural specifications for concrete guideway column relief patterns, and the minimum locations at which the relief patterns must be applied.
- H. Guidance Drawings as so designated in PSR Attachment 1-E contain Guidance Requirements that are topical to those drawings, with all background information being considered Reference Materials. Several types of Guidance Drawings, and the Guidance Requirements contained therein, are listed here for clarification:
 - 1. Guidance Drawings for "Structural Plan & Profiles" depict Guidance Requirements that are the plan view locations of guideway piers.
 - 2. Guidance Drawings for "Trackwork" depict Guidance Requirements that are the configurations and details to be coordinated with HART-furnished materials and with the Core Systems contractor during design and construction.
 - 3. Guidance Drawings for systems facilities such as "Systems Sites," "Raceways," "Traction Power," "Communications" and other systems elements depict Guidance Requirements for the general scope and configurations of facilities to be coordinated with, and provided in support of, the Core Systems Contractor.
 - 4. Guidance Drawings for "Composite Plan Existing Utilities" depict Guidance Materials that are the horizontal locations of underground utilities. These horizontal locations are considered Utility Information as described in SP-7.3.2.

5. Guidance Drawings for “Utility Relocation” depict (1) the relocation of existing utilities, and (2) the installation of new utilities and systems facilities. Only the installations of new utilities and systems facilities are Guidance Requirements.
6. Guidance Drawings for “Stations” contain Guidance Requirements such as site layouts, building configurations, room sizes, vertical circulation, ancillary spaces, patterns, material types, finishes, hardware, and other elements that define the functionality, durability, maintainability, and aesthetic qualities of the passenger stations and appurtenances. Structural callouts and details are not Guidance Requirements, except to the extent that they describe aesthetic characteristics.
- I. With respect to PSR 1.5.4.H.4 above, where “Composite Plan Existing Utilities” drawings depict vertical elevations of existing utilities, these vertical elevations are Reference Materials. Also see SP-7.3.2.
- J. With respect to PSR 1.5.4.H.5 above, where “Utility Relocation” drawings depict the relocation of existing utilities, these relocation design concepts are Reference Materials. As such, the Contractor does not require HART approval to deviate from the design concepts depicted for the relocation of existing utilities. Also see PSR 8.2.6.
- K. The Contractor has full responsibility for the engineering design, including the design of all structures. The Contractor shall modify structural elements and details in the Guidance Drawings as necessary to achieve design compliance.
- L. Technical Specifications are subject to the requirements in PSR 1.10.19, Construction Documents. The Contractor shall submit Construction Specifications that directly govern the Contractor’s proposed means and methods. The Contractor shall be responsible for demonstrating to HART’s satisfaction that the Construction Specifications meet or exceed the requirements of the Guidance Technical Specifications. The Contractor’s Responsible Engineer shall sign and seal the Construction Specifications.
- M. Prescriptive Drawings and Guidance Drawings in the RFP Drawings are considered “substantially complete” or “incomplete,” and still require the Contractor to confirm or verify data, adapt such drawings as needed to the Contractor’s design and project-specific requirements of the Contract and Interfacing Partners, and in such case the Contractor’s Responsible Engineer or Responsible Architect shall sign and seal such drawings and associated specifications prior to submission to HART for review and acceptance.
- N. Final Design or Construction Drawings prepared by the Contractor, prior to submission to HART, shall be signed and sealed by the Contractor’s Responsible Engineer or Responsible Architect regardless of the extent to which the Contractor has incorporated design concepts and details depicted on, or contained in CAD files for, Prescriptive Drawings, Guidance Drawings, or Reference Materials.
- O. In the case of conflict between the explanations in this PSR 1.5 and the Prescriptive Requirements and/or Guidance Materials, the Contractor shall request written clarification from the HART in accordance with GCDB 2.7.1.4 prior to its use in the design.

- P. Any discrepancies identified on or between the Prescriptive Requirements or Guidance Materials shall be promptly brought to the attention of HART, and the Contractor shall request written clarification from HART in accordance with GCDB 2.7.1.4 prior to their use in design.

1.5.5 Reserved**1.5.6 Reserved****1.5.7 Reference Drawings and Reference Materials**

"Reference Drawings" are those RFP Drawings that are designated as Reference Materials ("R") in PSR Attachment 1-E, RFP Drawings Designations. Reference Drawings and any CAD files associated therewith are not to be considered Contract Documents.

The terms "Reference Materials" or "Reference Documents" are defined in GCDB 2.1, Definitions.

Reference Materials such as Reference Drawings and their supporting CAD files may contain discretionary information that the Contractor elects to incorporate into its Construction Drawings or Construction Specifications, depending on the Contractor's design-build approach. In such cases, the Contractor is solely responsible for the verification of adequacy, accuracy, and applicability of such information in said Reference Materials and its usage and incorporation into Construction Drawings and Construction Specifications, including conformance to the CAD requirements in PSR 1.19.

1.5.8 Deviations

- A. Proposed deviations may be submitted to HART by the Contractor. The Contractor shall identify the request as follows:
1. A proposed deviation from the Prescriptive Requirements or Guidance Materials of the Contract Documents, in accordance with GCDB 2.7.1.2.
 - a. For proposed deviations from the CDC, the Contractor shall submit a Request for Deviation (RFD).
 - b. For proposed deviations from the PSR, a completed Request for Variance (RFV) form shall be submitted, together with the Contractor's submittal affected by the proposed deviation.
- B. The Contractor shall provide the following information with all RFDs and RFVs:
1. Specific sections and requirements of the Prescriptive Requirements or Guidance Materials from which the Contractor seeks to deviate.
 2. Description of the deviation.
 3. Proposed alternative requirements.
 4. Justification for the deviation.
 5. Due date for a response.
 6. Rough order-of-magnitude cost analysis reflecting the impact of the deviation, including life-cycle and maintenance costs.

7. Responsible Engineer's opinion of whether the deviation affects safety and/or security criteria.
- C. If the RFV is deviating from safety and/or security criteria, then a safety analysis shall be completed by the Contractor in a format provided by HART.
- D. The Contractor shall allow 45 days for HART review and response to proposed deviations RFVs and RFDs.

1.6 THIRD-PARTY AGREEMENTS AND DESIGN REVIEWS

The Contractor shall prepare the Final Design in accordance with third-party requirements and shall be responsible for coordinating design reviews with third parties, including agency and private utilities reviews. Agency reviews include, but are not limited to, those with the State of Hawaii and City and County of Honolulu agencies.

The Contractor's Design and Construction Drawings and Specifications shall conform to the technical requirements of third parties, including site adaptation of any of the third party's standard design and details.

The Final Design prepared by the Contractor shall also be in compliance with all laws, ordinances, rules, and regulations bearing on the conduct of the Work and the permit conditions for the Project (see PSR Chapter 3.0).

In addition to the specific activities listed in this section, the Contractor is advised that the Hawaii Department of Transportation (HDOT) Highways Division, HDOT Airports Division, City and County of Honolulu, and private utility companies and property owners may have various projects ongoing in and around the project area during the duration of this contract. The Contractor must coordinate with others in sharing the site as described herein. No additional compensation will be made for costs or schedule delays arising from this coordination and sharing of the site.

The Contractor is responsible for scheduling and allowing access for third-party inspectors. The Contractor is responsible for payment of third-party inspection fees and there will be no additional compensation from HART for these fees.

1.6.1 U.S. Federal Agencies

The design concepts depicted in the Guidance Drawings have been preliminarily coordinated with the Federal Transit Administration, the Federal Highways Administration, the Federal Aviation Administration, the Department of Defense (U.S. Naval Base Pearl Harbor), and other Federal agencies listed in the Final Environmental Impact Statement (FEIS), including the United States Postal Service (USPS) (Tax Map Key [TMK] 1-1-2:001). The Contractor shall prepare the Final Design such that no action or inaction results in non-compliance with any agreements reached with these agencies.

The Contractor shall coordinate design reviews and schedule construction access directly with the United States Navy (Navy) and the USPS. The following are restrictions to work site access that shall be coordinated:

- A. For Work within Navy and USPS Properties.

Work in Secured Areas. The Contractor shall comply with the following security protocols when working at the properties controlled by the Navy or the USPS.

1. For Navy-secured areas, meet requirements for construction within Department of Defense secure areas. Work schedules and security measures must be coordinated with the Naval Facilities Engineering Command (NAVFAC) Hawaii Assistant Public Works Officer (APWO) responsible for the relevant area.
2. For USPS-secured areas, the Contractor shall be responsible for all costs associated with working in the secured areas, including, but not limited to, the cost of temporary fencing, agency escorts, badging, inspections, and the like. No additional compensation will be provided for complying with agency security requirements.
3. Work within the secured areas is anticipated to include but is not limited to the work described in the following table.

Table 1.6.1 – Work within Federal Property Secured Areas

Eastbound Track Station and Side	Property Owner	Work Description
1005+25 Lt	Navy	Straddle Bent Foundation/Column
1046+80 Rt	Navy	Street Light Pole
1048+30 Rt	Navy	Street Light Pole
2+00 Lt (Radford Drive)	Navy	Electric manhole (MH) and underground (UG) lines to utility poles
1057+50 Rt	Navy	Electric MH and UG lines to utility pole.
1059+70 Rt	Navy	Remove overhead electric line and new electric UG lines and MH.
1126+00 – 1130+00 LT and RT	USPS	Guideway Foundations, Piers and Superstructure and wet utilities

B. For Work within Navy Property.

Restrictions at Joint Base Pearl Harbor-Hickam Access Gates. Closure or restriction of access to the Naval gates along Kamehameha Highway (Makalapa Gate, Pearl Harbor Naval Station Gate, or Halawa Gate) shall be coordinated with Joint Base Pearl Harbor-Hickam. Any closure or restriction of access requires a minimum of three (3) weeks' notice. During construction, full access shall be maintained at two of the three Navy gates on Kamehameha Highway, while partial restrictions are applied to the third. Full closure are expected to only be allowed for short durations as coordinated by the Contractor with the Navy. All closures and partial closures shall be reviewed and approved by Joint Base Pearl Harbor-Hickam.

C. For Work within USPS Property.

1. Work within the USPS property at Aolele Street and Nimitz Highway (between approximate eastbound track stations 1124+00 and 1129+80) is not anticipated to be permitted between November 1st through the first Monday after New Year's Day.
2. Work impacting USPS operations (site work, substructure work, and segment delivery) is anticipated to be permitted only during the hours indicated in Section 7.2.3.
3. The Contractor shall coordinate with the Honolulu USPS Senior Plant Manager and maintain roadway access to USPS-required facilities at all times.

D. See PSR Appendix N for additional requirements regarding the USPS property.

1.6.2 State Agencies

Contractor shall coordinate design reviews with multiple State of Hawaii agencies including but not limited to the Hawaii Department of Health (HDOH), HDOT Harbors Division, HDOT Highways Division, and HDOT Airports Division.

- A. HART and HDOT Highways and Airports Divisions have entered into a Master Agreement (MA), which is available in the Reference Materials. The Contractor shall design and construct HDOT facilities and maintain the "City Maintained State Highways" in accordance with the MA. Contractor's scope shall include the services of the "CITY's Contractor" and "CITY's Consultant" (sometimes collectively referred to as "CITY" as governed by the context in which such words are used).
- B. HART has procured the services of consultants to assist HDOT in performing design reviews. The Contractor shall coordinate design reviews directly with HDOT and these consultants.
- C. The design concepts depicted in the RFP Drawings have been preliminarily coordinated with the HDOT Airports Division. Specific items of coordination included:
 1. Coordination with the HIA Modernization.
 2. Coordination with CONRAC Facility.
 3. HIA Station pedestrian bridge connection to 4th floor of Overseas Parking Structure and 6th floor of the International Parking Structure.
 4. HIA Station ground access pathways and site improvements.
 5. Use of Lot J. Bus stop, Handi-Van stop, and ancillary building locations.
- D. Design documents shall be submitted to HDOT Highways Division for review in accordance with the HDOT Permit to Perform Work on State Highways Plan Requirements Checklist.
- E. For Work at the Honolulu International Airport ("Airport").

1. The Contractor shall coordinate construction activities with HDOT Airports Division, including those items listed below.
2. Honolulu International Airport operates 24 hours per day, 7 days per week. Construction activities shall not restrict access to the Inter-Island or Overseas Terminals.
3. Access to the temporary rental car return (Aolele Street) must be maintained.
4. No construction activities shall occur during the week of spring break for the University of Hawaii at Manoa and the week of spring break for schools run by the Hawaii Department of Education.
5. No construction activities shall occur on July 4th.
6. No construction activities shall occur during the week of Thanksgiving, from the Tuesday prior to Thanksgiving to the Monday after Thanksgiving.
7. No construction activities shall occur between the dates of December 15th through January 15th.
8. Construction times and durations within the Airport's CONRAC expansion project must be coordinated with HDOT Airports Division and the affected rental car companies.
9. The Contractor shall coordinate access with HDOT Airports Division.
10. The Contractor must obtain a work permit or approved "outage request" from the HDOT Airports Division prior to commencing with any work within HDOT Airports Division property.
11. See PSR Appendix M for additional requirements regarding work at the Honolulu International Airport.

F. Restriction to Work Site Access

The Contractor shall schedule construction access directly with HDOT Airports Division and share the work site with other contractors as described herein. The following are restrictions to work site access that shall be coordinated:

1. The protocols for access to Honolulu International Airport secured areas are outlined in the Honolulu International Airport Contractor's Training Guide. The guide can be accessed at:

<http://hidot.hawaii.gov/airports/files/2012/12/Contractors-Training-Guide-July-2013.pdf>

In addition to work within their security fence lines, the Airport maintains a secure zone up to 4 feet outside their fence lines.

2. Access to foundation, substructure, and site work within HDOT Airports Division property between eastbound track stations 1120+20 and 1122+80 shall be

coordinated with HDOT Airports Division construction of the Mauka Concourse expansion.

3. If Contractor’s Work activities are concurrent with those of the Mauka Concourse Contractor, construction activities shall also be coordinated with the Mauka Concourse Contractor. Prior to the construction of the foundations for Piers 522 through 525, the Contractor shall construct a temporary USPS service road that allows direct, secured access from the USPS facility located on the Koko Head side of Aolele Street to the Airport tarmac. Design and construction of the service road is subject to the approval of both HDOT Airports Division and the USPS. The Contractor shall coordinate the security of this road with HDOT Airports Division, the Transportation Security Administration (TSA), and the USPS. Construction of the service road must be coordinated with HDOT Airports Division's Mauka Concourse Modernization Project. The conceptual design shown in Airport Guideway RFP Drawings RP1026 through RP1027A presumes that the current commuter terminal and its parking lot are not in service at time of construction, and that the Contractor would be allowed access to the site three months prior to the Mauka concourse Contractor having full access. The schedule for the Mauka Concourse is not known at time of issuance of this RFP. If otherwise, the Contractor shall provide an alternate solution subject to the approval of HDOT Airports Division, USPS, and HART.
4. If Contractor’s work activities occur prior to those of the Mauka Concourse expansion or if the Contractor elects to work while the existing commuter terminal is still operational, the Contractor shall find an alternate solution that maintains full operations of the secured Post Office Service Road, commuter terminal, parking lot (Lot B), the vehicular circulation roadway, and the commuter terminal. The design of the temporary Post Office Service Road is subject to review and approval by HDOT Airports Division, TSA, USPS, and HART.
5. Exact dates available for Contractor access may change as the HIA Modernization - Mauka Concourse Contractor’s work progresses. Contractor shall coordinate with HDOT Airports Division to confirm dates.
6. The Contractor shall repave areas damaged by the Contractor. For areas with multiple closely spaced trenches or other pavement disturbances, the Contractor shall provide continuous pavement resurfacing.
7. Work within secured areas is anticipated to include but is not limited to the work described in the following table.

Table 1.6.3.1 – Work within HDOT Airports Division Secured Areas

Eastbound Track Station and Side	Property Owner	Work Description
1119+00 Rt	HDOT-A	Relocate security fencing at tie-in to temporary Post Office Bypass Road
1124+50 Rt	HDOT-A	Relocate security fencing at tie-in to temporary Post Office Bypass Road

HDOT Airports Division will have three major projects under construction within the scheduled period of this contract. The Contractor is advised that HDOT Airports Division has indicated that should a conflict in scheduling arise, HDOT Airports Division's contractor will have precedence over HART's Contractor in access to the site. All work must be scheduled and access permissions acquired through outage requests approved by the HDOT Airports Division.

1. The HIA Modernization - Mauka Concourse Project involves work that is likely to restrict the Contractor's activities both in the vicinity of the Nimitz Highway/Aolele Street intersection (between approximate eastbound track stations 1111+00 to 1124+00) and between Aolele Street and the Overseas Parking Garage (between approximate eastbound track stations 1134+00 to 1142+00).
2. The HIA Modernization - CONRAC Project involves work that will impact the Contractor's activities between the HIA parking garage exit lanes and the Aolele Street/Paiea Street intersection (between approximate guideway stations 1144+00 and 1161+00).
3. The HIA Modernization - Roadway Facilities associated with the CONRAC will involve work adjacent to the station site on the Ewa and mauka sides.

1.6.3 City-Maintained State Highways

The Contractor shall be responsible for the maintenance, operation, inspection and repair of City-Maintained State Highways within the AGS Project limits in accordance with the MA. The City-Maintained State Highways consist of Kamehameha Highway and Pearl Harbor Interchange, and Keehi Interchange, within the limits shown in Exhibit E Pages 2-4 of the MA. The work shall include, but is not limited to the following:

- A. The Contractor shall perform the maintenance, operation, and repair in accordance with current State policies, standards and guidelines. The Contractor shall not only be responsible for work directly related to the AGS Project, but also for the general maintenance, operation and repair of the highway not related to the Work.
- B. The Contractor shall perform a pre-construction survey of existing ROW conditions with photos and field notes indicating visual identification of existing conditions.
- C. Maintenance and repair work will be logged and reported to HDOT on a regular basis. HDOT or their consultant shall have the right to conduct audits or quality assurance (QA) inspections of the maintenance work.
- D. Maintenance and repair work within the State ROW shall be according to applicable HDOT Standards.
- E. Upon turnover of the assigned State ROW, the Contractor shall provide all maintenance records and a close-out survey that returns the roadway condition in similar condition as was initially documented in the Pre-construction survey. If betterments were authorized by HART through change orders, such betterments will be so noted.
- F. Notwithstanding the above, any work included in the Contractor's scope that improves the HDOT ROW, including but not limited to drainage, signs, roadway surfacing,

lighting, signing and striping, traffic signals, and the ITS systems shall carry applicable agency, HDOT, and City warranties / guarantees. The Contractor's guarantee shall extend for a period of 2 years upon final acceptance of the HDOT ROW Work by HART's Officer-in-Charge.

1.6.4 City Agencies

The Contractor shall design and construct City facilities in accordance with the City and County of Honolulu standards and coordinate design reviews directly with the City and County of Honolulu agencies, including but not limited to the Department of Planning and Permitting (DPP), the Department of Transportation Services (DTS), the DPP Wastewater Division, the Department of Design and Construction (DDC), and the Board of Water Supply. The Contractor shall schedule construction access directly with the appropriate agency. The following are restrictions to work site access, design clarifications, and requirements for City fiber optic cables that shall be coordinated:

- A. Maintenance of Access to Keehi Lagoon Park Tennis Courts. No work shall impact public access to the lighted tennis courts mauka of the eastbound track alignment between Stations 1223+50 and 1226+50. See PSR 3.13 regarding Ke'ehi Lagoon Beach Park De Minimis Letter.
- B. Maintenance of Bus Operations at the Middle Street Intermodal Center. The Contractor shall coordinate with the City and County of Honolulu DTS and Oahu Transit Services, Inc. and implement provisions such that bus operations can continue within the Middle Street Intermodal Center during the construction of the Middle Street Transit Center Station facilities.
- C. Several letters from the DPP are available in the Reference Materials that provide clarification on the applicability of certain codes and standards to elements of the H RTP:
 - 1. National Fire Protection Association (NFPA) 130 Standard adopted as part of Building Code (see multiple letters in the Reference Materials).
 - 2. Interpretation regarding fire resistive construction along property lines.
 - 3. Interpretation regarding station platform type of construction and occupancy.
 - 4. Interpretation of Ala Moana Center Station fire-resistive construction requirements (sample code interpretation documentation letter).
- D. HART memorandum CMS-AP00SAFE-00011 Station Fire Sprinklers documenting the decision to not include fire sprinklers in the station designs is included in the Reference Materials.
- E. Design, procure, and install raceways on the Guideway and conduit drops at stations for City fiber optic cables as indicated in PSR Appendix B.01, City Fiber.

1.6.5 Public and Private Utilities

The Contractor shall coordinate design reviews directly with all of the public and private utility organizations as necessary to perform all Utility Work required to construct the Project. A list of utility agencies and corresponding responsibilities relating to who is performing the Work is provided in PSR Appendix A, Utilities Design and Construction Responsibility Matrix.

1.6.6 Property Owners - AM Antenna

In the vicinity of Middle Street Station, the alignment is adjacent to an existing AM antenna site; the current AM antenna is in conflict with the elevated guideway. At the time of this RFP, the owners of the antenna are in the process of designing and relocating the AM antenna to a site away from the guideway alignment and Middle Street Station.

Prior to relocation and during the Contractor's construction in this area, the two stations (KHKA and KLHT) will be serviced via a temporary antenna located adjacent to the existing antenna. The Contractor is advised of the following work sequence and construction constraints:

1. The Contractor shall be responsible for coordination and demolition of the existing AM antenna as necessary to facilitate guideway construction.
2. Contractor must stage all work within the vicinity of the temporary AM tower such that the existing stations can continue to broadcast, with the exception of nighttime power reductions between 8:00 PM and 4:00 AM. Contractor shall work with the operators of the radio stations to schedule any outages at mutually agreeable times.
3. Radio station operators may agree to operate at a reduced power at other times in order to allow the Contractor to perform work safely at the site. Contractor shall coordinate with the operators of the radio stations to schedule the period(s) of reduced power operation in order to minimize inconvenience to the station operators and their operations. The Contractor shall comply with the requirements indicated in the Special Provisions for work in the vicinity of the operating antenna.
4. Both the existing radio tower and the temporary radio tower incorporate underground radial ground cables that cover the entirety of the site between Nimitz Highway westbound, Kamehameha Highway, and Kalihi Stream. The existing ground system must stay intact in order for the temporary tower to remain operational. Therefore, any existing radial ground cables cut during the installation of the new radial ground system must be repaired in a timely manner. No more than 3 radial cables shall be severed and left unrepaired at any given time. See Airport Guideway RFP Drawings, drawing RP5712 for more details.
5. The Contractor shall assume that the AM antenna will be located by the antenna owner ultimately to an offsite location. The Airport RFP Drawings were developed based on the assumption that the AM antenna would be relocated at the existing sites. All notes regarding the relocation or the need for a Faraday shield shall be disregarded and not part of the Contract. See Airport RFP Drawings, drawings GD2053, GP026, and GP027 as examples.
6. The AM antenna owner (Blow Up Radio) shall be responsible for:

- Design, permitting, and construction of the temporary antenna and its connection with the existing antenna ground grid;
 - Design and permitting of the permanent new antenna at an offsite location; and
 - Demolition of temporary antenna.
7. The Contractor shall be responsible for:
- Demolition of the existing (original) antenna; and
 - Repair damage and resolve any construction conflicts with the existing antenna ground grid.

During construction in the vicinity of the AM antenna, Radio Frequency (RF) safety awareness is vitally important. Workers shall be trained in RF safety awareness before performing work in the vicinity of the AM antenna.

1.7 Design Constraints and Information

1.7.1 Airport Guideway

A. Design Review

PSR Appendix C, HDOT Open Comments, includes a list of open review comments. The Contractor shall coordinate with HART, HDOT, and HECO; perform Work necessary to resolve the open comments; and obtain design acceptance prior to construction.

B. Update to the AGS RFP Drawings

1. Regardless of the information in the RFP Drawings, the Contractor shall not be responsible for above-grade building demolition. Above-grade building demolition will be directed by HART and performed by others. The Contractor shall notify HART no less than 90 days prior to performing work requiring the demolition of an existing building structure identified for demolition in the RFP Drawings. The Contractor shall coordinate site access for HART and demolition contractor.
2. Notwithstanding PSR 1.7.1.B.1 above, the Contractor shall be responsible for demolition and removal of existing building foundations to the extent required to accomplish the Work under this Contract. The Contractor shall be responsible for restoring the site to eliminate potential hazards.
3. The Contractor shall modify the conceptual design shown in the Airport Guideway RFP Drawings, as indicated in the following Appendices:
 1. PSR Appendix B.01, City Fiber
 2. PSR Appendix B.04, System Site #28 Modification
 3. PSR Appendix B.05, Pier 535 Modification

4. PSR Appendix B.06, Airport Section Transition to City Center Section
5. PSR Appendix B.07, Radford Drive/Pearl Harbor Naval Base Station: Underground Electrical Service Ductbank and Easement
6. PSR Appendix B.08, Reconstruction of Manhole #999

The Contractor shall also refer to PSR 6.6, PSR 8.3, and PSR 9.10 for other modifications to the design concepts shown in the Airport Guideway RFP Drawings.

C. Fluidized Thermal Backfill for Underground Electrical Utilities

Data to assist the Contractor with the design of underground electrical utilities is contained in PSR Appendix D, Fluidized Thermal Backfill.

D. Pre-Approved HART Design Deviations

The Contractor may design the AGS Project based on the design deviations pre-approved by HART described in PSR Appendix E, Pre-Approved HART Design Deviations.

E. Pre-Approved HDOT Design Exceptions

The Contractor may design the AGS Project based on the design exception described in PSR Appendix F, Pre-Approved HDOT Design Exceptions.

F. Anticipated HECO Design Variances

HART anticipates that the Contractor will desire design variances for the minimum distances between HECO ductbanks and guideway foundations. Based on preliminary coordination with HECO, HART anticipates that HECO will approve design variance requests similar to those contained in PSR Appendix G, Anticipated HECO Design Variances. For the purpose of preparing its Technical and Price Proposal, the Contractor may assume that similar variances will be allowed by HECO. However, HART anticipates that HECO's approval of similar design variances will be contingent upon the Contractor's coordination with HECO and the Contractor's commitment to specific means and methods at the locations subject to variances. See PSR Appendix G for guidance. All costs associated with required HECO coordination and adherence to specific means and methods, as agreed to between the Contractor and HECO, are included in the Contract Price.

G. Primary Control Report

Survey control data collected by HART is available in PSR Appendix H, Primary Control Report, and on Drawing No. CS001 of the HART Standard Drawings

H. Geotechnical Data Reports

Geotechnical Data Reports provided by HART are available in the following Appendices:

1. PSR Appendix I.3, Geotechnical Data Report Volume 1 - Bent 423 to Bent 516
2. PSR Appendix I.4, Geotechnical Data Report Volume 2 - Bent 517 to Bent 599
3. PSR Appendix I.5, Geotechnical Data Report Volume 3 - Bent 600 to Bent 636
4. PSR Appendix I.6, Geotechnical Data Report Volume 4 - Roadway Pavement from Halawa Drive to Dillingham Boulevard and TPSS #28
5. PSR Appendix I.7, Geotechnical Data Report HHCTCP Airport Segment
6. PSR Appendix I.8, Addendum to Geotechnical Data Report HHCTCP Airport Segment
7. PSR Appendix I.9, Geotechnical Data Report Pearl Harbor Naval Base Station
8. PSR Appendix I.10, DRAFT Geotechnical Data Report Honolulu International Airport Station
9. PSR Appendix I.11, Geotechnical Data Report Lagoon Drive Station
10. PSR Appendix I.12, DRAFT Geotechnical Data Report Middle Street Station

1.7.2 Design Updates Common to All Stations

A. Architectural and Structural

1. The Geotechnical Data Reports provided in the PSR Appendices I.9 through I.12 and the Geotechnical Engineering Reports provided in the Reference Materials were not available during the preparation of the foundation design concepts depicted in the Airport Stations RFP Drawings. Regardless of whether the foundation design concepts depicted in the RFP Drawings appear on Guidance or Reference Drawings, the Contractor is responsible for designing foundations based on the Contractor's project geotechnical engineer's conclusions from the actual geotechnical data and other design inputs.
2. The Contractor shall modify the public stair design shown on the Airport Stations RFP Drawings and design and construct bike ramps along the outer edges of all stairs that connect the station entries to the platforms consistent with HART Directive Drawings sheet AD004.
3. The Passenger Screen Gates (PSG) details, as shown on the Station RFP Drawings, are preliminary and require additional coordination and detailing. The PSG connection (i.e., base plates, openings, etc.) have been shown on the station drawings to indicate the intent and show reference to the PSG. The Contractor shall coordinate with the Core Systems Contractor that will be procuring and installing the PSG system. The Contractor shall design and install base plates to accommodate the PSG and station expansion joints.
4. The dimensions of elevator hoistways over occupiable (accessible) spaces require an increase of approximately 8 inches relative to the dimensions depicted in the RPF drawings to accommodate a counterweight safety device. The Contractor

shall coordinate exact dimensions with the E&E Contractor. Based on the design concepts depicted in the RFP Drawings, revisions to elevator hoistway dimensions are required at the following locations:

- a. Pearl Harbor Naval Base Station: Concourse to Platform elevators.
 - b. HIA Station: Concourse to Platform elevators.
 - c. Lagoon Drive Station: None
 - d. Middle Street Transit Center Station: Concourse to Platform elevators.
5. The Contractor shall modify the details for the end of platform wall, gate, and fence to reflect the details shown in HART Directive Drawings AD500 and AD502.
 6. The Contractor shall incorporate system bonding details as shown in the HART Directive Drawings or propose system bonding to meet this intent, subject to HART written concurrence.
 7. The Contractor shall site adapt HART's Standard Canopy Drawings for use on all four Airport Stations. At a minimum, this site adaptation will require adjustment of the canopy-to-platform connection details.

B. Mechanical, Electrical, and Plumbing Design

1. Delete wet fire sprinkler systems from all Stations.
2. Clean agent fire suppression systems shall be designed and constructed as indicated on the Station RFP Drawings.
3. HART has performed analysis and determined that lightning protection is required at each of the four Airport Stations. The Contractor shall design and install lightning protection systems for each station. The Contractor shall conceal conductors and minimize visual impacts in the design of the lightning protection systems.
4. Location of closed circuit televisions (CCTV), variable message signs (VMS), passenger assistance and public phones, and other Core Systems devices shall be coordinated with the Core Systems Contractor. Fare gates and ticket vending machines (TVMs) require final coordination with the Fare Systems Contractor. Provide power and conduit for data to fare gates and TVMs.

1.7.3 Pearl Harbor Naval Base Station

A. Third-Party Agreements

1. U.S. Navy
 - a. Site utilities within and beyond the station site have been preliminarily coordinated with the Navy as shown on Guidance Drawings for Pearl Harbor Naval Base Station UP001 and UP002. The Contractor shall finalize the design concepts depicted on UP001 and UP002 and modify only as necessary. The Contractor shall prepare Parcel Maps, signed and sealed by a Hawaii-

- b. HART and HDOT Airports Division have agreed to the following revisions to the conceptual design in the Guidance Drawings which are schematically depicted in PSR Appendix J.05:
 - i. Reconfiguration of Ala Onaona Street, Ala Auana Street, and other access roads.
 - ii. Redesign the station site to incorporate a busway and Handi-Van entry.
 - iii. Relocate the Traction Power Substation (TPSS) to be on the station site.
 - iv. Add an accessible and covered walkway between the Station and the existing Airport covered walkway makai of the Station.
 - v. Add a Pedestrian Bridge between the fourth level of the Overseas Parking Structure and the Concourse level of the Station.
 - vi. Add a Pedestrian Bridge between the sixth level of the International Parking Structure and the Platform level of the Station.

B. Update to the RFP Drawings

1. General

- a. The Contractor shall coordinate with HDOT Airports Division, modify the conceptual design shown on the Station RFP Drawings, complete the design of the Station, Site, Site Structures, and Pedestrian Bridges, as identified in the Third-Party Agreements above, and design and construct the HIA Station to include the modifications indicated in PSR Appendix J.05.
- b. The exhibits in PSR Appendix J.05 provide guidance for coordinating and completing the design of the Station, Site, Site Structures, and Pedestrian Bridges, as well as revised vertical circulation throughout.

2. Civil Design and Landscape Design

- a. The Honolulu International Airport's CONRAC project is anticipated to construct roadway improvements adjacent to the HIA Station site. Contractor shall coordinate with HDOT Airports Division regarding the final configuration of the new roadways.
- b. The locations of bus and Handi-Van stops that will service the HIA Station have been preliminarily coordinated. The Contractor shall coordinate and complete the design of these with HDOT Airports Division and DTS and design and construct a concrete busway and bus stop shelters onsite separated by Americans with Disabilities Act (ADA) accessible passenger loading and unloading areas.
- c. Contractor is hereby alerted to the existence of a primary, underground Airport Communications ductbank and other underground obstructions within station site (Lot J) (see PSR Appendix J.05 and PSR 9.7.2). The Contractor shall conduct field investigations to determine the exact location of the underground

facilities and avoid any disruptions to the Airport communication service during construction. The Contractor shall prepare Parcel Maps, signed and sealed by a Hawaii-licensed land surveyor, showing a 10-foot-wide permanent easement for this facility through the station site. Further, identify and provide easements for any other HDOT Airports Division utilities that stay in place or are relocated due to Station construction.

- d. Use the design concept of 'Wayfinding' stars, wind, sea as depicted in the Cultural Paving drawings and modify it to 'flow' through the Station from the makai Handi-Van/Taxi area and entry through the Station and to the Pedestrian Walkway.
- e. Coordinate with HDOT Airports Division to select acceptable landscape plant materials.

3. Architectural and Structural Design

- a. Artwork: Metal and/or glass artwork will be located on the mauka and makai ends of the Concourse Level. Coordinate installation requirements and schedule with the artist and HART.
- b. The Pedestrian Bridges shall not structurally connect to the existing parking structures and shall be supported by columns with foundations that are independent of the parking structures.
- c. Coordinate and confirm the design of the Pedestrian Bridges, supporting structural columns, foundations and any work on or near the existing parking garage with HDOT Airports Division.
- d. During the geotechnical investigation, an approximately 10-inch-thick concrete slab was discovered approximately 6.7 feet below grade. The nature and composition of the slab was confirmed with potholing. The exact extent of the slab is not known. An Exhibit is included in PSR Appendix J.05 depicting the approximate extent of the slab. The Contractor should assume that the slab continues mauka and extends to Ala Onaona.

4. Mechanical, Electrical and Plumbing Design

- a. See requirements in PSR 1.7.2, Design Updates Common to All Stations.

C. Appendix

- 1. PSR Appendix J.05, Honolulu International Airport Station Conceptual Design

1.7.5 Lagoon Drive Station

A. Third-Party Agreements

- 1. Federal Aviation Administration (FAA)

- a. The Lagoon Drive Station is within the Runway Protection Zone (RPZ) of the HIA. Runway Protection Zone and Station Structure Exhibit is available in the

Reference Materials (Design Calculations) and illustrate the relationship between the high points of the Station (canopy and roof structures) and the sloping RPZ. The Station is below the glideslope of the RPZ. However, some of the terminals of the Lightning Protection System are above the glideslope of the RPZ. Based on verbal conversation with the local FAA, the terminals are acceptable since they are not building elements. The Contractor shall presume the terminals are acceptable, but secure written confirmation of this ruling from the FAA.

B. Update to the RFP Drawings

1. Civil Design and Landscape Design

- a. Due to the limited work space adjacent to the Lagoon Drive Station, the Contractor shall take additional precautions and coordinate closely with affected property owners. The Contractor shall develop detailed staging plans to maintain property access during construction.
- b. Underground gas storage tanks were recently removed from a property underlying the proposed Lagoon Drive Station (see PSR Chapter 3). The resulting voids were backfilled with unknown material. The Contractor shall perform field tests on the constructed backfill material to determine the requirements to support the station slabs and foundations and construct the station facilities accordingly. Also see PSR 3.3 for an environmental contaminant screening summary.

2. Architectural and Structural Design

- a. Artwork: Tile mural artwork will be located in the paid area on the wall adjacent to the elevator, outside Elevator Machine Rooms G006 and G012. The Contractor shall coordinate the limits of finishes on this wall with the artist to accommodate the artwork. The finished floor of the Train Control and Communications Room (TCCR) shall be set at elevation 10.33 feet instead of 9.00 feet as shown on the Station RFP Drawings. The elevation of the HECO transformer pad and equipment pad shall be set at elevation 10.33 feet. Adjust grades to accommodate the stated finished floor elevations.
- b. The finished floor elevations of the concrete pads supporting the TPSS building foundation, the trench power backup generator, the transfer switch, the HECO Vista Switch, the harmonic filter, and other electrical equipment at System Site #28 shall be set to a minimum elevation of 10.33 feet.
- c. The Lagoon Drive Station elevators shall be roped hydraulic elevators, as identified in HART's elevator schedule in PSR Appendix S to comply with height restrictions in the RPZ. The overrun height of traction elevators would otherwise extend into the Airport RPZ, which would not be accepted by HART.

3. Mechanical, Electrical and Plumbing Design

- a. The Airport Guideway RFP Drawings show utility sleeves crossing Waiwai Loop within ductbanks/sleeves. The Contractor shall design and construct

underground electrical and communication ductbanks and/or sleeves for station interconnections. Due to the guideway structure's limited clearance above the roadway, conduits suspended beneath the structure, connecting one side of the station to the other side, will not be permitted.

1.7.6 Middle Street Transit Center Station

A. Third-Party Agreements

1. City and County of Honolulu Department of Transportation Services
 - a. The Station entry lies within the existing loading area of the Middle Street Intermodal Center. During Construction of the entry and Station Pedestrian Bridge, buses will need to be re-routed through the Middle Street Intermodal Center parking area. The Contractor shall coordinate construction activities with DTS, and design and implement traffic control plans accordingly.
2. State of Hawaii Department of Health
 - a. There is a high potential that soil in the vicinity of the Middle Street Intermodal Center is contaminated. Refer to the *Environmental Management Work Plan Middle Street Intermodal Center Property 611 Middle Street, Honolulu, Hawaii*. The Contractor shall coordinate with the HDOH, and provide the necessary mitigation measures during construction.
3. First Hawaiian Bank Third-party Agreement
 - a. As part of a third-party agreement for use of the First Hawaiian Bank property on the Koko Head side of Kalihi Stream, HART has agreed to design the station Concourse to accommodate a future rail station entrance. The Contractor shall design the Concourse as shown on the Middle Street Transit Center Station Guidance Drawings.

B. Updates to the RFP Drawings

1. Civil Design and Landscape Design
 - a. The Middle Street Transit Center Station facilities on both the mauka and makai sides of Kamehameha Highway are located within a floodplain. The Contractor shall design the facilities in compliance with flood hazard requirements and permit conditions.
 - b. Security measures such as fencing and area lighting for the facilities on the makai side of Kamehameha Highway, Ewa of Kalihi Stream, have not been completely coordinated with HART and the Core Systems Contractor. The Contractor shall coordinate and design accordingly.
 - c. The Contractor shall complete the design and construct the pedestrian access connecting the existing sidewalk on the mauka side of Kamehameha Highway to the entrance of the Middle Street Transit Center Station.

- i. Add handrails and guardrails on the sloped walk and steps from the highway sidewalk to the Transit Center busway.
 - ii. Confirm if a standard striped walkway is required across the busway in lieu of the decorative crossing as shown in the Guidance Drawings.
 - iii. Add appropriate pedestrian signage prior to entering the busway crosswalk to warn pedestrians of the uncommon crossing of a busway.
 - d. Coordinate the details of the replacement section of the busway to match the existing busway section.
2. Architectural and Structural Design
 - a. Artwork. The Contractor shall furnish and install bronze floor plates and frames as shown on the Stations Guidance Drawings. Prior to installation, the Contractor shall coordinate and deliver bronze plates to a location designated by the artists for etching. The artists will deliver etched bronze plates to the Contractor. The Contractor shall be responsible for plate installation. Coordinate delivery and installation locations with the artists and HART.
 - b. Columns and Structures in Kalihi Stream and the floodplain
 - i. The locations of the three columns shown in the Airport Guideway Guidance Drawings in Kalihi Stream were analyzed as part of a Flood Hazard Analysis. The applications for a 404 Permit and a 401 Water Quality Certification include four columns to provide the Contractor with some flexibility on the design of this station, subject to HART's approval of requisite deviations and Contractor's compliance with flood hazard requirements and the permit conditions.
 - ii. The TCCR and the relocated HECO transformer as shown in the Guidance Drawings are indicated to be placed on elevated concrete structural platforms with a finished floor elevation of approximately 10 feet above adjacent grade to meet flood hazard requirements.
3. Mechanical, Electrical and Plumbing Design
 - a. The Contractor shall coordinate with HECO to ensure that minimum working and constructed clearances from power lines are achieved over the proposed pedestrian bridge. The three lowest levels of lines on the high voltage power pole adjacent to the Middle Street Transit Center shall be removed and relocated. This includes four 12-kilovolt (kV) power lines on the lowest two arms and a fiber optic line on the third arm.

1.8 INTERFACING PARTNERS

1.8.1 Interfacing Partners

The Contractor shall meet with and collaborate with each of their Interfacing Partners in the development of their list of interface points, Requests for Interface Data and Interface Control

Documents, and throughout the execution of the Interface processes. The Contractor's interface points shall incorporate interface points from their Interfacing Partners. These Interfacing Partners include, but are not limited to, the following:

- A. Core Systems Contractor, which is responsible for the design, coordination, supply, testing, and commissioning and maintenance of all systems, including but not limited to automated train control, traction electrification, central communications, SCADA controls, passenger vehicles, station communications, intrusion detection and access control, fire alarm systems, and platform passenger screen gates.
- B. Kamehameha Highway Guideway Contractor, which is responsible for design and construction of the Kamehameha Highway guideway superstructure and substructure, track, civil, and utility elements.
- C. Airport Section Utilities Contractor, which is responsible for the relocation of certain utilities within the Airport Section.
- D. Elevators and Escalators (E&E) Contractor, which is responsible for designing, furnishing, installing, and maintaining elevators and escalators.
- E. Project-wide Fare Systems Design-Furnish-Install-Maintain Contractor, which will be responsible for the supply, installation, and commissioning of the TVMs and fare gates.
- F. City Center Guideway and Stations Contractor, which will be responsible for the design and construction of guideway superstructure and substructure, track, civil, utility elements, installing final track elements Koko Head of the Airport guideway.
- G. HART's On-Call Contractor, responsible for building demolition and building modifications.
- H. Any additional contractors which may be added to the project by HART in the future (e.g., landscaping or utilities contractors).

1.8.2 Interface Points - General

As a function of the interface management and coordination process, the Contractor shall be responsible to coordinate design development with all of the Interfacing Partners to establish interface points such that all systems, guideway, stations, elevator and escalator, and core systems elements are integrated.

The Contractor's design will be reviewed by all Interfacing Partners for interface compliance and coordination. The Contractor's design shall interface with and use any existing constructed conditions of the fixed facility elements and existing utilities of the other Interfacing Partners. The Contractor shall provide designs for coordination with, and for review by, the Interfacing Partners.

- A. Interface Points identified by HART

The Contractor shall coordinate interface activities to incorporate any Interface Points which are given to them by HART for inclusion in the design and obtain documented confirmation from the appropriate Interfacing Partner via Requests for Interface Data

(RFID) and Interface Control Documents (ICDs) prior to the Contractor's Final Design submittal.

B. Interface Points identified by Core Systems Contractor

The Contractor shall coordinate interface activities and designs with the Core Systems Contractor and obtain documented confirmation via RFIDs and ICDs prior to completion of final design. For the guideway, such interfaces will likely include but not be limited to:

1. Guideway alignment, running rail and contact rail design and layout
2. Guideway mainline speeds (operating speed, line speed, overspeed), and third-rail ramp speeds
3. Crossovers
4. Third-rail power connections
5. Switch machines and fouling points
6. Bridgeable and non-bridgeable gaps positions and lengths
7. Rail fastenings to plinths
8. Wayside lubricators
9. Insulated joint locations
10. Temporary buffer stop interfaces at Kamehameha Highway Guideway and City Center Guideway
11. Cableway or raceway requirements in the guideway crosswalks, on guideway and columns
12. Positive and negative traction and electrical power components
13. Traction power substation foundations, grounding grids, and ductbanks
14. Gap breaker station foundations, grounding grids and ductbanks
15. Conduit quantities in guideway columns or hammerhead structures
16. Overhead electrical power lines
17. Longitudinal grounding cables
18. Deck penetration or knockout locations
19. Confirmation for HECO service requests for system sites
20. Emergency generator site layout infrastructure layout (vaults and conduit)

21. System site layouts including HECO transformer locations and operation and maintenance (O&M) for service requests
22. FAA coordination for obstruction lights
23. Crosswalks and distance between crosswalks at crossover locations
24. Wireless mesh access poles
25. System site access requirements
26. Rescue operating load cases
27. Rescue carts

For each station, interfaces will likely include, but will not be limited to, size and type of cables or fibers for conduits or duct banks, pull boxes, junction boxes, and support devices for:

1. Fire detection and alarm systems
2. Emergency phones local area network (LAN)
3. Access control and intrusion detection
4. Communication and recognition systems
5. Public address and variable message signs
6. Platform passenger screen gate anchorages and end of platform shroud
7. Automatic train control systems
8. Seismic and wind monitoring
9. Emergency management panels
10. Communication cabinets on all station levels
11. Blue light stations at ends of platforms
12. Grounding of core systems equipment and devices
13. Uninterruptible power supply (UPS) and UPS room sizes
14. Train control and communication room sizes
15. Automatic external defibrillator (AED) location coordination
16. Power loads
17. Power requirements for systems contractors

18. Connection of portable generator to UPS
19. Vehicle dynamic envelopes
20. Embedded conduits, other embedded components, block outs, structural supports and mountings, other enclosures, infrastructure and finishes for systems equipment and systems integration
21. SCADA input/outputs, from/to heating, ventilation, and air conditioning (HVAC), UPS, elevators and escalators, etc.

C. Interface Points identified by Elevator & Escalator Contractor

The Contractor shall coordinate interfaces and designs with the Elevator & Escalator Contractor and obtain written confirmation via RFIDs and ICDs prior to completion of final design. Interfaces will likely include but will not be limited to:

1. Elevator and escalator types
2. Elevator hoistway cab configurations, dimensions, structural loadings and connections
3. Elevator and escalator power loads
4. Elevator and escalator deflection criteria
5. Escalator end and intermediate support types and loads
6. Elevator and escalator signal and wiring coordination
7. Elevator counter-weight safeties for traction elevator pits above grade level
8. Elevator machine room air conditioning and fan requirements
9. Elevator machine room and elevator pit conduit and hydraulic pipe routing
10. Coordination and access for installation of elevator and escalator units
11. Future elevator and elevator machine room provisions

D. Interface Points identified by Fare Systems Contractor

1. Conduit and trench requirements for fare gates
2. Conduit Requirements for ticket vending machines (TVM)
3. Power requirements for fare gates and TVM systems

1.8.3 File Exchange

The Contractor shall provide current CAD files and other data as requested by Interfacing Partners to facilitate coordination of interfacing designs.

1.8.4 Construction of Interfaces

The Contractor shall coordinate with Interfacing Partners to plan for and ensure seamless construction of interface points. Contractor may add Interfacing Partners to the Contractor's Inspection and Testing Plan (ITP) required under GCDB 7.11.4(e), or devise other mutually agreeable means to verify the acceptability of the Interfacing Partner's work, both before and after construction of each interface point.

1.9 RESERVED**1.10 DESIGN MANAGEMENT****1.10.1 Section Includes**

- A. Requirements for management of design Work, including the management and production of Construction Drawings, Construction Specifications, procurement documents, Shop Drawings, As-Built Drawings, As-Built Specifications, Record Drawings, Record Specifications, Record Calculations, and related design documents; the design submittal and Review Process; design documentation; and Design Support During Construction

1.10.2 Related Contract Sections

- A. Design Scope of Work: PSR 1.5.2
- B. Project Management Requirements: PSR 1.13
- C. Utility Coordination: GCDB 7.3 and GCDB 7.14, CDC 8.0, PSR 1.12, Technical Specifications Division 33
- D. Submittal Procedures: GCDB 7.8, PSR 1.11
- E. Project Schedules: GCDB 7.6, PSR 1.13.10
- F. Monthly Progress Reports: GCDB 7.6, PSR 1.13.10
- G. Shop Drawings, Product Data, and Samples: GCDB 7.9
- H. Environmental Compliance: GCDB 7.22
- I. Construction Documents: PSR 1.17
- J. Quality Assurance: GCDB 7.11
- K. Quality Control: GCDB 7.13
- L. Project Record Documents: GCDB 7.34
- M. Safety and Security Compliance: GCDB 7.10

1.10.3 Contractor Responsibilities

- A. Perform the design Work in accordance with the details as defined in the Contract Documents.
- B. Contractor shall provide Construction Documents in accordance with PSR 1.17, Construction Documents.
- C. Contractor shall provide design Quality Control (QC) for design Work in accordance with GCDB 7.13, Quality Control, and as specified herein.
- D. Manage the design, Construction Documents and design QC of the Work, including the interface with construction to ensure timely identification, discussion and resolution of design issues.
- E. Coordinate with and obtain necessary approvals from authorities and State and City agencies and departments having jurisdiction for roadways and ROW related to shutdowns, temporary detours and traffic diversions, temporary utility relocations, temporary sidewalk closures, bicycle and/or pedestrian detours, haul routes, stormwater management, working hour restrictions, and permit requirements issued by permitting agencies.
- F. Coordinate with and obtain necessary approvals from utility owners and City and State departments having jurisdiction for utilities in accordance with GCDB 7.3 and GCDB 7.14 and PSR 1.12, including but not limited to shutdowns, hold-offs, temporary diversions, temporary relocations, temporary roadway closures for utility work, stormwater management, and working hour restrictions.
- G. Ensure that the Designer properly checks the designs of the Contract and certifies implementation of design QC Procedures in accordance with the provisions of GCDB 7.13, Quality Control, and GCDB 7.11, Quality Assurance.
- H. The procedures for the checking of the design of permanent components also apply to design of major temporary components and construction sequences that affect the permanent components of the Work, as described in the Contract Documents.
- I. Assign qualified personnel to perform the services required herein in accordance with GCDB 7.5.

1.10.4 Contractor's Design Organization and Obligations

- A. Designer
 - 1. The Contractor shall appoint a suitably qualified and experienced Designer, which may be a consultant or an in-house design team of the Contractor or the Engineer of Record, to undertake the design of the permanent components and the major temporary components of the Project. The Contractor shall require the Designer to have or establish an office in the Project area and maintain all necessary representation throughout the duration of the Contract to ensure the Designer can meet all its obligations under the Contract. Refer to PSR 1.13, Project Management Requirements.

2. The Designer may perform production design Work in the Project area or elsewhere. However, design personnel designated as Key Personnel in accordance with GCDB 7.5 shall be in the Project area for the duration of the design and as required to provide specified support during construction.
 3. The Designer shall prepare a Design Work Plan (DWP) in accordance with PSR 1.10.6, herein. The DWP shall be approved by the Design Manager and the Contractor prior to submittal to HART for review.
 4. Design for the project will be considered complete upon HART acceptance of all Record Drawings. HART will require that Contractor obtain approvals from owners of non-HART facilities prior to HART's acceptance of the Record Drawings.
- B. Design Manager
1. The Contractor shall assign a Design Manager, who is an employee of the Contractor or the Engineer of Record, to manage all Work performed by the Designer. The Design Manager shall be in the Project Office for the design Work and shall be present as required thereafter to manage Design Support During Construction (DSDC), design changes, and completion of Record Drawings.
 2. The Design Manager's activities shall include, at a minimum, assessment and evaluation of the following:
 - a. Design reports
 - b. Analytical approach
 - c. Drawing details for conformity to Prescriptive Requirements and Guidance Materials
 - d. Construction Drawings and Construction Specifications for conformity to and implementation of Prescriptive Requirements and Guidance Materials
 - e. Shop Drawings
 - f. Major temporary components' effect on permanent components
 - g. Field design changes
 - h. Design approvals for materials and procedures
 - i. Record Drawings for conformity with final design and Prescriptive Requirements and Guidance Materials
 - j. Effectiveness and completeness of QC and QA reviews
 - k. Scheduling and verification of independent assessment reviews by the Design QC Engineer.
- C. Responsible Engineers and Architects

1. The Design Manager shall designate and assign a Responsible Engineer, or Responsible Architect, for each Contractor-designated Design Unit. The Engineer or Architect in responsible charge shall sign and seal design reports, Construction Drawings, Shop Drawings and Construction Specifications, and final design calculations for the assigned Design Unit(s), in accordance with Hawaii Administrative Rules (HAR) 16-115.
2. Engineers or Architects in responsible charge shall be located and work in the Project Office as necessary to coordinate the Work on assigned Design Units and as required to provide specified support during construction. The Responsible Engineer and the Responsible Architect shall be present in the Project Office to attend all design reviews for assigned Design Unit(s).

D. Design Quality Control Engineer

1. The Designer shall assign a Design QC Engineer who shall report to the Design Manager with additional reporting relationship to the Contractor's Quality Manager, in accordance with the provisions of GCDB 7.11.3.
2. The Design QC Engineer shall assess and evaluate the design QC activities and reviews in order to report to the Contractor's Project Manager the status and effectiveness of the design with respect to quality.
3. The Design QC Engineer shall also perform the following activities:
 - a. Identify and report design discrepancies.
 - b. Track, monitor, and report on the status of outstanding design-related discrepancies and design review comments.
 - c. The Design QC Engineer shall be located and work in the Project Office and/or Field Office as necessary to coordinate the QC items of the Work.

E. Check by the Designer: The Designer shall carry out all the checks and reviews that a professional and prudent Designer would normally carry out on the type of Work that is actually being designed, in accordance with the approved Quality Assurance Plan.

1.10.5 Design Units and Work Packages

- A. Design Units.** The Contractor may split the Work into several well-defined and manageable Design Units. Each Design Unit shall comprise similar and coherent significant parts of the Contract that can be checked and reviewed as a self-contained package with due consideration for accommodating interfaces with other Project components and other active projects in the vicinity of the Project. Examples of Design Units could be guideway, stations, roadway, utilities, etc.
- B. Work Packages.** Each Design Unit may be further broken down into Work Packages, which are smaller and well-defined elements of a Design Unit. Divisions between Work Packages may be made by type of work, location, or other characteristics.

- C. Refer to PSR 1.5.2, Scope of Design, for a further description of Design Units. Refer to GCDB 7.2 and PSR 1.8 for information on interfacing with other active HART contracts.
- D. The Contractor shall maintain the Design Work Plan and Project Schedule to reflect proposed changes to the scope and schedule for Design Units and Work Packages in accordance with GCDB 7.6 and PSR 1.13.10.

1.10.6 Design Work Plan and Design Mobilization Workshop

- A. The Contractor shall prepare and submit a written DWP within 30 days of NTP1 for review by HART. The DWP shall be in conformance with the requirements of the Contract Documents and this Section:
 - 1. Present the proposed Design Unit descriptions, including the scope, limits and interfaces of the design Work (i) between each of the Design Units, (ii) between each Design Unit and other interfacing HART contracts, and (iii) with other adjacent third-party projects. Describe the relationships between Design Units, constraints, and the sequencing and schedules of design reviews.
 - 2. Present the proposed division of Work Packages, if any, and the reasons for splitting out the Work.
 - 3. Present the design management approach for preparation of the design, including but not limited to, Construction Drawings, Construction Specifications, calculations, studies, and reports. Design management approach shall also address, at a minimum, team organization, location where different elements of the work will be performed, and proposed submittals for each Design Unit. The approach shall describe the design preparation processes in full detail and provide the necessary data verification activities.
 - 4. Identify the Responsible Engineer or Architect in responsible charge for each Design Unit and Work Package.
 - 5. Describe the level of design that the Designer will accomplish for each of the planned Design Units at each of the stages of design development. Statements of percent complete will not be acceptable unless supported by additional detail. Contractor shall provide a description and checklist for each Design Unit clearly identifying the design product that will be reviewed.
 - 6. Describe planned review submittals, including specific information to be reviewed, level of review requested from third parties, planned review dates measured from Notice to Proceed (NTP) date(s), and the description of completeness represented by each review.
 - 7. Describe the process and roles for facilitating and maintaining communications with third parties with input to and authority over the design, including over-the-shoulder reviews, meeting, or workshops to facilitate rapid resolution of issues and streamline the design review process.

8. Describe the Contractor's process for resolving issues raised by review comments and non-conformance reports and for reporting results to HART.
9. The DWP and requirements for maintenance of traffic and access shall be directly coordinated to ensure constructability of the Design Unit as proposed and shall comply with requirements in GCDB 7.16, Maintenance of Traffic. A statement verifying said coordination had occurred shall accompany each design review submittal.
10. The DWP shall include QC processes, procedures, checklists, and other information necessary to manage the quality of the design process and production of the design documents. Submittal of design documents shall include documentation that the Quality Assurance Plan was followed.
11. The DWP shall refer to pertinent design criteria, including agency and owner specific criteria for elements of work not under HART's jurisdiction such as City facilities, State facilities, and Utility Relocations to be designed by the Contractor.
12. The DWP shall include applicable codes and standards including ADA requirements as required by applicable Laws, Regulation, and Ordinances.
13. The DWP shall include methods of analysis used to complete elements for the design, which shall consider such items as:
 - a. Structural geometry and modeling components
 - b. Materials and material properties
 - c. Member properties
 - d. Loading intensities
 - e. Foundation loads
 - f. Structural boundary conditions
 - g. Sub-soil interaction to support the loads from above
 - h. Effects of seismicity
 - i. Effects of fatigue
 - j. Durability and maintenance requirements
 - k. Details of required QC procedures, monitoring, and controls
14. The DWP shall include computer software and its validation
15. The DWP shall include interface requirements including but not limited to:
 - a. Core systems facilities installation planning and procedures

- b. Station facilities interface with civil/structural/systems components
 - c. Station interface with elevators and escalators
 - d. Interface with concurrent work including other HART projects
16. The DWP shall include constructability including construction staging.
17. The DWP shall include utility relocations and new service connections.
18. The DWP shall include trackway design and installation constraints.
19. The DWP shall include roadway design and installation constraints.
20. The DWP shall include civil-to-systems integration.
21. The DWP shall include interaction of DWP with other required reports and documentation including but not limited to interface, quality, aesthetics, sustainability, environmental compliance, and fire protection.
- B. Following initial submittal of the DWP, and within 45 days of NTP1, Contractor shall arrange and conduct a Design Mobilization Workshop at the Field Office to familiarize the Designer and HART (and affected third parties, if invited by HART or the Contractor) with the design concepts, issues, status, and review procedures as outlined in the Contractor's DWP.
- C. HART and the Contractor shall jointly develop the agenda of the workshop and how it will be organized (e.g., by Design Unit and engineering discipline).
- D. The intent of the Design Mobilization Workshop is to allow the Contractor to finalize the DWP and to make the subsequent design reviews more effective and efficient for all parties. The DWP shall be resubmitted for acceptance by HART within 21 days of the Design Mobilization Workshop.
- E. All agreements, schedules, and understandings reached during the Design Mobilization Workshop shall be documented in writing in the DWP, which shall be accepted by the Contractor and HART.
- 1.10.7 Relationship of Early Construction Starts to Design Development and Review**
- A. It is the intent of HART to allow construction to begin on a Design Unit prior to completion of that entire Design Unit's Final Design.
- B. Subject to the limitations in any Limited Notice to Proceed (e.g., NTP1), construction of any Work Package may commence at the Contractor's risk upon HART's acknowledgement of the Contractor's certifications specified in PSR 1.10.13, Contractor's Preconstruction Certification. HART's acknowledgement will be provided in the form of a signature on the cover sheet of the Contractor's Construction Drawings.

1.10.8 Stages of Design Development

- A. The Contractor shall make a comprehensive design check and design review for each Design Unit at the stages of Design development specified herein. Submittals shall be prepared and submitted in the general order in which they are specified below. Contractor shall provide responses to all HART comments on prerequisite submittals before making any of the subsequent submittals.
- B. The following are the seven stages of design development, all of which are described in further detail under PSR 1.10.9:
1. Definitive Design (Rev. α)
 2. Interim Design (Rev. α)
 3. Final Design (Rev. α)
 4. Construction Drawings and Construction Specifications (Rev. #)
 5. Shop Drawings and other Construction Documents
 6. As-Built Documents
 7. Record Documents (Rev. #)
- C. The intent of each stage of design development and design review is to:
1. Verify and certify that the design complies with the Prescriptive Requirements and Guidance Materials and previously agreed upon modifications thereto.
 2. Allow individual Work Packages within Design Units to be released for construction when the conditions in PSR 1.10.12.I are satisfied.
 3. In the case of reviews of Shop Drawings, to allow construction to continue.
- D. It is not required that an entire Design Unit proceed through the stages of the design development process simultaneously if the Contractor elects to fast-track specific Work Packages.
- E. Design reviews or design checks shall be completed as specified herein and in GCDB 7.13, Quality Control, for each Design Unit (and for each Work Package within a Design Unit) at each stage of design development, and as defined in the approved Quality Assurance Plan.
- F. Design and Construction Documents shall be version controlled using the following conventions:
- a. Design development drawings. Definitive Design, Interim Design, and Final Design drawings shall use an alpha-based version system (Rev. A, B, C, etc.).

- b. Construction Documents. Construction Drawings and Specifications shall use a numeric-based version system (Rev. 0, 1, 2, etc.). The Contractor shall resolve all HART comments prior to issuing a Rev. 0 submittal.

1.10.9 Design Reviews with HART and Third Parties**A. Design Workshops.**

1. Design workshops, and "over-the-shoulder" reviews are means to facilitate interim design discussions between the Contractor, HART, and other project stakeholders. The intent of the workshops are to provide and discuss "real-time" comments, to demonstrate a continued and uniform consistency in the quality of the work and inform HART and project stakeholders of design progress and direction. Design Workshops are encouraged to be scheduled by the Contractor early in the design development process for each Design Unit or groups of similar Design Units.
2. Design Workshop agendas will be agreed upon in advance of the meeting by the Contractor and HART, and will typically include:
 - a. Describe planned design approach, assumptions for analyses, anticipated changes to preliminary design concepts, and proposed additional exploration and/or field work planned.
 - b. Describe planned design and construction interfaces associated with the Design Unit(s), including interfaces with other design units and design disciplines, utility owner works, interfaces with other HART contracts, and with adjacent projects.
 - c. Describe any major elements requiring focused review or for which early and/or on-going discussions would simplify or expedite the formal review process.
 - d. Schedule for completion and submittal to HART and other reviewing agencies of the various stages of design development forthcoming.
3. HART reserves the right to schedule a Design Workshop to address the above issues at any time during the design process, with a frequency as needed but not to exceed one meeting per month per Design Unit.
4. Contractor will prepare a Design Brief for Design Unit with preliminary basis of design information to include, at minimum, scope or design, basis of design, and preliminary information and highlights as described in paragraphs A.2.a, b, and c above.

B. Pre-Submittal Workshops

1. Within 14 days, but in no case less than 3 days prior to a submittal of a Design Unit for formal review, the Contractor shall conduct a meeting at the Contract Work Area to present the forthcoming review package to HART. The Contractor shall describe the Design Unit and level of completion to be submitted, the desired focus of the review, the specific list of information that will be provided in the package

requiring review, and specific areas of the Design Unit that are incomplete. Multiple Design Units may be addressed in pre-submittal workshops. The Contractor shall provide in-progress Design Brief with updated basis of design information as described in A.4 above.

2. The Contractor or HART may invite other Project stakeholders to participate.

C. Design Review Meetings

1. Design Review Meetings may be called by the Contractor or by HART and shall be conducted by the Contractor in the Project area or at other locations in the Project area as mutually agreed. HART may provide follow-up comments. The Contractor shall document the meetings and disposition of comments and responses as a result of the Design Review Meeting. Comments shall be assembled by the Contractor and responded to in a format agreed upon between Contractor and HART.
2. Follow up Design Review Meetings to address issues not resolved at the initial Design Review Meetings may be called by either the Contractor or HART. The entity calling the meeting shall establish the agenda for said meeting. Follow up Design Review Meetings may address more than one Design Unit or Work Package.
3. In addition to the Contractor and HART in attendance, the Contractor or HART may invite other Project stakeholders to participate.
4. At least 2 working days prior, the Contractor shall make available all applicable design Drawings, Construction Specifications, calculations, design reports, updated Design Brief, test data and other information supporting and justifying the design solution presented for review at any design review. The Contractor shall provide electronic copies of documents as requested by HART or third parties.
5. Review Comments
 - a. The Contractor shall address and resolve HART's and third-party comments in consultation with HART and the third party. A copy of any third-party comments shall be forwarded to HART by the Contractor.
 - b. Design review comments from such reviews shall be recorded by the Contractor in a format agreed upon between the Contractor and HART.
 - c. The Contractor shall address and resolve all design review comments to the satisfaction of HART and third parties prior to submitting the subsequent version of the associated Work Package.
 - d. The Contractor's QAP shall include procedures for responding to design review comments.

D. Definitive Design Review

1. The design review of Definitive Design shall be the first design review and is intended to verify that the design concepts proposed by the Contractor meet

Prescriptive and Guidance requirements including explicit identification of any proposed variances to concepts shown on Prescriptive and Guidance RFP Drawings.

2. The Definitive Design review is intended to address verify the following:
 - a. The design concepts governing future design development are defined consistent and in conformance with Prescriptive Requirements and Guidance Materials.
 - b. The design concepts are substantiated and justified by adequate site investigation and analysis.
 - c. Final ROW requirements.
 - d. The specific standards applicable to the proposed concepts are identified and appropriate.
 - e. The proposed design concepts are constructible.
 - f. The design interfaces have been successfully coordinated with other design units, utility relocations, and other project-related activities.
 - g. The availability of required materials and equipment.
 - h. The design meets Project quality requirements and required design QC procedures have been followed.
 - i. Updated Design Brief provides complete basis of design and is consistent with requirements described in (a) through (h) above.
 3. If the Definitive Design is amended subsequent to the Definitive Design review, the Contractor shall re-check and re-certify the design as an additional Definitive Design review.
 4. See also PSR 1.5.8, Deviations.
- E. Interim Design Reviews
1. The Contractor or HART may choose to hold Interim Design reviews for certain Design Units for complex elements of the Work, where more frequent review by HART or more frequent interface confirmation is deemed necessary or desirable by the Contractor or HART. The Contractor shall schedule such interim reviews at a time when the Definitive Design review comments have been addressed and resolved prior to Final Design.
 2. For systems-related Work, Interim Design reviews, at a minimum will address:
 - a. Coordination of mounting and installation details, non-site specific, for elements provided by interfacing partners.

- b. Coordination of room layouts including room dimensions, approximate locations of equipment and cabinets, raceways, and grounding.
 3. The Contractor shall review the Interim Design, including an updated Design Brief, and submit the design for review and comment and acceptance by HART.
 4. The Contractor and HART shall use the interim design review(s) to verify that the concepts and parameters established and represented by Definitive Design are being followed and that Contract requirements continue to be met.
 5. The Contractor shall specifically highlight, check, and bring to the attention of HART any changes to information presented at Definitive Design. An updated Design Brief shall be included with each submittal.
- F. Final Design Review
 1. The Contractor shall schedule and conduct a pre-submittal workshop for each Final Design package when the Design Drawings and Construction Specifications for a Design Unit are 100% complete.
 2. The Contractor shall submit the Final Design for acceptance by HART.
 3. The Contractor shall ensure that all HART comments from previous design reviews have been addressed to the satisfaction of HART and shall specifically highlight, check, and bring to the attention of HART any changes to information presented at previous design reviews. An updated Design Brief shall be included with each submittal.
- G. Construction Drawings and Specifications
 1. The Contractor shall complete the Construction Drawings and Construction Specifications for submission to HART for review.
 2. The Contractor shall ensure that all HART comments from the Final Design review have been addressed to the satisfaction of HART. Contractor is responsible for highlighting, checking, and bringing to the attention of HART any changes to information presented at previous design reviews. An updated Design Brief shall be included with the Construction Drawings and Specifications submittal.
 3. The Construction Drawings and Construction Specifications shall be considered complete upon resolution of all comments and only when the requirements noted in PSR 1.10.12.I are satisfied as certified by the Contractor.
- H. Shop Drawings, As-Built Drawings, and Record Drawings: Contractors attention is directed to PSR 1.10.15 and PSR 1.10.16 herein for requirements pertaining to Shop Drawings and Record Drawings, respectively.
- I. Systems-related Work means design, installation, and construction that interfaces with Core Systems and Core Systems Contractor's Work, and other specialty suppliers and installers (e.g., Fare Systems Contractor, E&E DFIM contractor), including but not limited to the interface points outlined in PSR 1.8.2.

1.10.10 Schedule for Design Checks, Reviews, and Submission of Checked Design

- A. The Contractor shall schedule and conduct design reviews to meet the design and construction needs of the project schedule.
1. The Contractor's Baseline Project Schedule shall allow 30 days between the date when HART receives each design submittal and the date when HART provides comments and/or disposition of the submittal.
 2. The Contractor shall coordinate third-party utility design and correlated reviews directly with the reviewing entity in accordance with GCDB 7.3 and GCDB 7.14 and PSR 1.12. Contractor shall reflect specified review times and processes in its Project Schedule. Documentation of the schedule coordination, and its correlation to the Design Unit reviews, shall be included in each design review submittal.
 3. It is recognized and anticipated that the design review process and frequency, duration, and intensity of design reviews may vary with the complexity of the individual Design Units and the associated construction activities.
 4. In the event the pre-submittal workshop requirement is waived by HART for a planned design review, the Contractor shall give written notice of scheduled design reviews to HART at least one week prior to submitting the design unit for review.
 5. The Contractor shall include the agreed design review schedule for all Design Units (including their components and elements) in the Project Schedule. The design review schedule shall be reviewed monthly until design Work is complete.
 6. The Contractor shall not schedule the submittal of more than five Design Unit or Work Package reviews within any consecutive 21-day period. If the Contractor seeks to submit more than five Design Unit or Work Package reviews in any consecutive 21-day period, Contractor shall coordinate with HART in advance to establish reasonable HART review times, which will be longer than 30 days.
- B. Submissions for design Review(s). The Contractor shall submit checked design for specified design review submittals in accordance with GCDB 7.13, Quality Control, and PSR 1.11, Submittal Procedures.
1. Submissions shall be complete for each Design Unit, but may be combined for multiple Design Units at any one time upon HART's written concurrence.
 2. The Contractor shall submit each Design Unit in accordance with the Project Schedule and look ahead schedules. HART will use the Contractor's schedule to plan and staff HART's resources to support the Contractor's Design Unit reviews. Failure by the Contractor to submit Design Units in accordance with the Contractor's schedule may prevent HART from completing its reviews within 30 days.
 3. Except for Record Drawings, design review "submissions" or "submittals" shall mean the Construction Drawings, Construction Specifications, Design Briefs, reports, and calculations and required documentation as specified in these Contract Documents, including but not limited to, environmental compliance

documentation, Maintenance of Traffic (MOT) documentation, quality documentation, and utility design and schedule approvals, assembled in the format specified and in sufficient number of copies to accommodate those attending and participating in the design review(s).

- C. The Contractor shall allow time for HART's participation (including invited stakeholders) and input to any design review conducted by the Design Manager in accordance with the accepted Design Work Plan. The Contractor shall incorporate this schedule into the Contractor's Project Schedule.
- D. The Contractor shall keep HART up to date on exact timing of reviews through the weekly progress meetings.

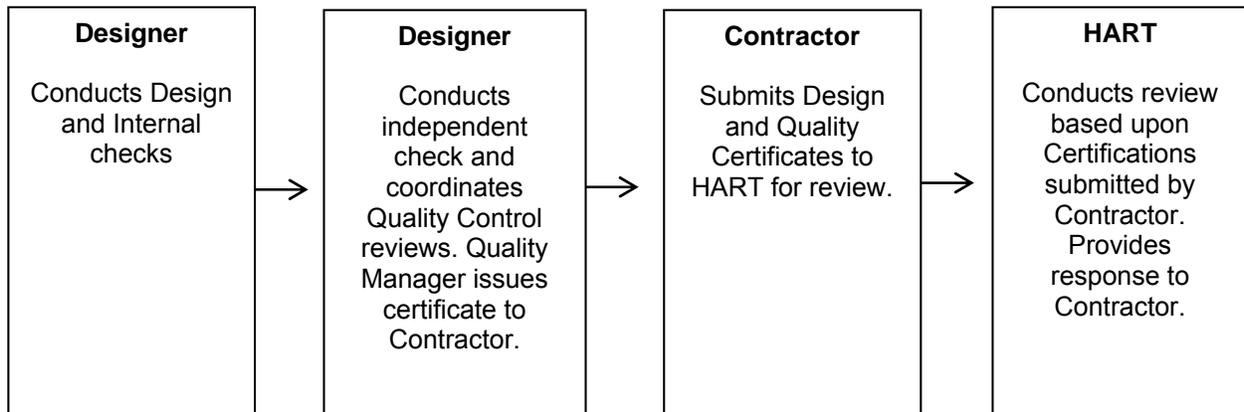
1.10.11 Design Changes

- A. Design changes may occur prior to or during construction or may occur after designs are released for construction, and may be initiated by the Contractor or HART.
- B. For Construction Drawings or Construction Specifications, the Design Manager and Quality Manager shall take all necessary actions and re-certify the design in accordance with PSR 1.10.13.
- C. For Shop Drawings and other Construction Documents, see PSR 1.10.15, Shop Drawings.
- D. For all design changes requiring calculations, the Designer Manager shall conduct a documented check of all calculations for the revised design, with appropriate QC reviews per the approved Quality Assurance Plan.

1.10.12 Design Checks, Reviews, and Certifications by Contractor

- A. The Designer's organization shall check all design documents (drawings, plans, specifications, calculations, and reports) produced by the Contractor's organization. The Design Manager and Contractor's Quality Manager shall certify that these documents have been checked in accordance with PSR 1.10.13 and the Contractor's approved Quality Assurance Plan.
- B. At each stage of design development and with every design submittal to HART, the Contractor shall provide the Contractor's certifications identified in PSR 1.10.13 to the extent practical for the given stage of design development. At a minimum, these certifications will include the (1) Design Manager's and Design Quality Engineer's certifications that the design complies with the Prescriptive and Guidance Requirements, and (2) the Contractor's certification that the design has been checked in accordance with the Contractor's approved Quality Assurance Plan.
- C. The Contractor and HART shall follow the process shown in Figure 1.10-1 for Design Unit packages being submitted for HART's review.

Figure 1.10-1 Design Review Flow Chart



The Contractor shall conduct and complete the design checks, certifications, and reviews for each Design Unit in accordance with the approved Quality Assurance Plan. HART will participate in the review as specified in Table 1.10-1. HART comments must be resolved to the satisfaction of HART prior to releasing the design(s) for construction.

Table 1.10-1 HART Role in Review

Stage of Design Development	HART Role in Review
Definitive Design	Review and Comment
Interim Review(s)	Review participation if desired or requested
Final Design	Review and Comment
Construction Drawings and Specifications	Review and Comment
Other Construction Documents	Review participation if desired
As-Built Drawings	Periodic audits to monitor Contract compliance
Record Drawings and Specifications	Review and Acceptance

D. Contractor's Independent Design Checks.

1. The Contractor shall carry out independent design checks of permanent components, major temporary components, and effects of temporary components on the permanent components by senior engineers not involved in the production of the design being reviewed who have equal or greater qualifications and experience as the Responsible Engineer for the design being checked.
2. Independent design checks shall include, at a minimum, design assessment and analytical checks as specified herein.
3. Design Assessment:
 - a. Design assessment shall be the review of general compliance with the requirements of the contract, taking into consideration the proposed method of construction, and shall, at a minimum, cover the following areas as applicable:

- 1) Loads
- 2) Codes and standards
- 3) Methods of analysis
- 4) Computer software and its validation
- 5) Interface requirements
- 6) Maintenance requirements
- 7) Materials and material properties
- 8) Durability requirements
- 9) Fatigue performance
- 10) Hydrology, Hydraulics and drainage
- 11) Design Flows.

4. Analytical Check:

- a. The independent design check shall include an independent analytical check using separate calculations (and without reference to the Designer's calculations) to establish the structural adequacy and integrity of critical project elements structural members and system components. This shall at a minimum include, but is not limited to, the following:

- 1) Structural geometry and modeling
- 2) Material properties
- 3) Member properties
- 4) Loading intensities
- 5) Verifications of design flows, velocities, capacities.

E. Design Reviews of Resubmittals:

1. The Contractor's time and cost impacts of revisions arising from HART's and third-party participation in design reviews of resubmittals necessitated by the Contractor's non-compliance with Contract requirements shall be borne by the Contractor.

F. Design Reviews Conducted by the Contractor's Design Manager.

1. The Contractor shall notify and invite HART and affected third parties and utility owners to participate in all design reviews conducted by the Design Manager. HART may provide comments on open issues.
2. For design reviews conducted by the Design Manager, the Contractor's Quality Manager shall provide a design review report for each Design Unit at the conclusion of each design review. The design review report will identify any actions arising from the review. The report shall note comments or non-conformance reports (NCRs) requiring corrective action. The Contractor's Quality Manager shall send the design comments and/or NCRs to the Designer and a copy to HART.
3. The Contractor shall conduct design reviews in the offices of the Designer or Contractor in the Project area. The Responsible Engineer and any specialists with significant input to the design or review shall be present. The Contractor shall make available, to HART and other reviewers all drawings, copies of calculations,

reports, or other items pertinent to the design review, at least 2 working days in advance.

G. As-Built Drawings and Specifications Audits

1. Contractor shall produce and actively maintain As-Built Drawings in accordance with GCDB 7.34.2, Record Documents: As-Built Drawings.
2. Contractor shall produce and actively maintain As-Built Drawings in accordance with GCDB 7.34.4, Record Documents: As-Built Specifications.
3. HART's inspection of As-Built Drawings and Specifications shall in no way relieve Contractor of its responsibility for compliance with Contract and the requirements of the Work.

H. Record Drawing and Specification Review

1. Record Construction Drawings and Construction Specifications shall incorporate complete information that defines the Work as constructed to meet the Contract requirements.
2. The Contractor shall submit Record Drawings and Specifications complete for each Design Unit to HART for review and acceptance.
3. HART review of the Record Drawing review package will be one of the processes to determine if the Project has been designed and constructed in accordance with Contract requirements and to see if Record Drawings and Specifications comply with Contract requirements.
4. The Contractor shall make all corrections noted in the review of Record Drawings and Specifications and resubmit the corrected Record Drawings and Specifications to HART for review and written acceptance.
5. Record Drawings and Specifications shall clearly identify changes from the accepted Final Design.

I. Design Review of Major Temporary Components

1. The Design Manager shall conduct a design review of major temporary components that represent complex structures elements and that potentially can affect the safety, quality, and durability of the permanent components and/or the public while the Temporary Components are "active."
2. The review shall include the effect of the major temporary components on the permanent components.
3. The Contractor shall invite HART to participate in the review. HART or the Contractor may invite affected stakeholders to participate in the review(s).

J. Construction Drawings and Construction Specifications:

1. The Contractor may start construction of the permanent Work covered by a certain Design Unit or Work Package as soon as, and only after, HART has approved the Contractor to proceed with that portion of the Work based on the Contractor's certifications provided with the Construction Drawings and Specifications as required under PSR 1.10.13, Contractor's Pre-Construction Certification.
 2. HART's approval will constitute approval for Contractor to proceed with construction in accordance with the Contractor's certification, but shall not constitute final approval or acceptance of the design or subsequent construction.
- K. All design reviews shall include a comment resolution process where unresolved comments are discussed and a written action plan and schedule for resolution of unresolved comments is developed. The Design Manager will lead the process.
1. Comment Resolution. HART comments from design reviews will be transmitted to the Contractor. The Contractor shall record its proposed disposition and response to each comment and meet with HART to resolve outstanding comments and dispositions. Final disposition and resolution will be documented in CMS.
 2. Non-Conformance Reports. If the design review reveals significant discrepancies with Contract requirements or within the design itself, HART's expectation is that the Contractor will issue NCRs to track and document the Contractor's corrective actions. HART may also submit NCRs to the Contractor for action. Upon completion of the corrective action the Contractor shall provide documentation within the non-conformance report in CMS.

1.10.13 Contractor's Pre-Construction Certification

- A. For the submittals of Construction Drawings and Construction Specifications, the Contractor's Quality Assurance Manager shall certify the following in writing:
1. The Construction Drawings and Construction Specifications comply with the Prescriptive Requirements and Guidance Materials, except for any deviations which have been specifically approved in writing by HART.
 2. Within the subject submittal, the Contractor has specifically highlighted all changes from the previous version of the subject submittal.
 3. The Designer has carried out independent design checks in accordance with PSR 1.10.12.C.
 4. The design and all supporting documents have been checked in accordance with the Contractor's approved Quality Assurance Plan.
 5. The Construction Drawings and Construction Specifications are accurate and adequate to control the Work in accordance with PSR 1.17.
 6. The Responsible Engineer has signed and sealed all Construction Drawings and Construction Specifications in accordance with PSR 1.11.5.C.

7. All Construction Specifications applicable to the submitted Design Unit or Work Package are included with the submittal.
8. The design has undergone constructability review and is constructible as represented.
9. Design safety and security certification for the subject submittal has been completed in accordance with GCDB 7.10, Safety and Security Compliance.
10. The Contractor has obtained Interfacing Partner's approval of, and have included with the subject submittal, all related Interface Control Documents (ICDs).
11. The Contractor has performed adequate site investigations to confirm the existing site conditions, and adequate stakes, lines, and monuments necessary to control the Work have been established on site.
12. The design complies with relevant standards of practice, applicable laws, regulations, and ordinances, and the standards of entities affected by the Work.
13. The Contractor has obtained, or will obtain, all required permits for the Work in the subject submittal prior to commencing the work.
14. The design and drawings of stormwater best management practices (BMPs) and environmental measures applicable to the Work are complete.
15. The design and drawings for Maintenance of Traffic applicable to the Work are complete.
16. All third-party comments pertaining to Work in the subject submittal have been resolved.
17. All prior HART review comments and non-conformance reports pertaining to Work in the subject submittal have been resolved and closed.

1.10.14 Design Support during Construction

- A. The Design Manager shall verify during construction that the conditions actually encountered are consistent with the design and related Construction Drawings, Shop Drawings, and Construction Specifications. The Designer shall prepare necessary adjustments in the Construction Drawings, Shop Drawings, and Construction Specifications, and the Contractor shall submit to HART for review.
- B. Reviews:
 1. The Design Manager shall verify any such changes are checked in accordance with the approved Quality Assurance Plan.
 2. The Design Manager shall certify the change in writing as meeting the Prescriptive Requirements and Guidance Materials. The Contractor shall retain copies of the Design Manager's written certifications and submit the certifications to HART.

- C. The Contractor through its Designer shall incorporate the adjustments in the Record Documents.

1.10.15 Shop Drawings

- A. The Contractor shall check, review, certify, and provide Shop Drawings in accordance with the Contract including GCDB 7.9 and the Contractor's approved Quality Assurance Plan prior to their being issued for construction.
1. The Contractor shall verify pertinent dimensions in the field prior to conducting Shop Drawing reviews.
 2. Shop Drawings shall be reviewed and approved by the Responsible Engineer of the respective Final Design to certify compliance with the requirements and intent of the Final Design and Construction Drawings prior to submitting to HART or beginning the construction work and shall not thereafter be amended or altered without prior review and written approval by the Responsible Engineer and submittal to HART.
 3. Contractor shall submit to HART all approved Shop Drawings for record purposes immediately after Contractor's approval. HART reserves the right to audit and review Shop Drawings but is in no way obligated to do so, nor will HART's review relieve the Contractor of its obligation to provide Shop Drawings as required to provide the completed Work in accordance with the Contract and the Construction Drawings and Specifications.
 4. HART will notify the Contractor of Shop Drawings that require review by HART based on the approved Final Designs, in accordance with the provisions of GCDB 7.9, Shop Drawings, Product Data, and Samples. The Contractor shall notify HART at least 14 days prior to the anticipated date when such Shop Drawings will be ready for review. HART or the Contractor may invite affected third parties to participate in reviews of Shop Drawings.
- B. See PSR 1.11, Submittal Procedures, and GCDB 7.9, Shop Drawings, Product Data, and Samples, for additional requirements for the Shop Drawing development and review.
- C. HART may inspect and perform QA program reviews or audits based on the most recent version of Construction Drawings and Specifications that were certified by the Contractor and acknowledged by HART in accordance with PSR 1.10.13.

1.10.16 Record Drawings and Specifications

- A. The Contractor shall submit the Record Drawings and Specifications for each Design Unit for review and acceptance by HART, in accordance with GCDB 7.34 Project Record Documents.
- B. The Designer shall certify that the Record Drawings and Specifications accurately reflect the field changes and are in conformance with the contract and the certified and acknowledged Construction Drawings and Specifications.

1.10.17 Quantity Estimates

- A. Where needed to facilitate determining sampling and testing requirements, the Contractor shall provide quantity estimates for the Work. The quantity estimates shall be in units that facilitate sampling and testing (i.e., the units shall be consistent with the units used to determine frequency of sampling and testing). For example, if “x” numbers of compaction tests are specified to be taken for every “y” cubic yards of embankment, the quantity estimate would need to be in cubic yards of embankment.

1.10.18 Design Documentation

- A. Progress Tracking. The Contractor shall include design progress and changes in its Project Schedule (including Work on any design change).
- B. The Contractor shall prepare and maintain weekly records of design activities using forms acceptable to HART.
- C. Final Design Report: Upon completion of the final design for each Design Unit, including all of its components and elements, the Design Manager shall notify the Contractor, with a copy to HART, of any outstanding monitoring report issues or unresolved review comments.

1.10.19 Construction Documents

- A. The Contractor shall prepare and submit to HART all Construction Documents in accordance with PSR 1.17, Construction Documents.

1.10.20 Reserved**1.10.21 Design Calculations Reports**

- A. Design calculations shall be submitted in the form of a report containing the design calculations along with the relevant criteria including codes, assumptions, input data, explanations and conclusions. Design calculation reports shall meet the following requirements regarding format and content.
1. Cover page. The cover page shall contain, at a minimum, the Contract name and number, the report title, date, submittal number, the name of the department/subcontractor originating the report, and the name and signature of a registered professional engineer in the discipline relevant to the subject matter.
 2. Design Brief that, at a minimum, describes in summary form scope of design, basis of design, design approach, and highlighted design findings and design features; provides commentary on constructability, and provides indication of internal quality control checking and resolution per Contract.
 3. Formulas and Calculations. All formulas shall be furnished with a unique numerical identifier for the purpose of referencing.

4. In design calculations done by hand, all formulas shall be expressed first in symbolic notation, before substituting constants and variables with numerical values.
5. In design calculations done by a computer program, name and version of the program used, the formulas being used by the program and the calculation algorithm shall be provided in the design calculation report.
6. Constants and Coefficients. The values of empirical constants and coefficients shall be stated and justified. If a range of values is associated with a given coefficient, the Contractor shall provide the rationale for using the selected value.
7. References to Manuals, Handbooks, and Other Publications. Pertinent pages containing referenced paragraphs, formulas, graphs, tables, and similar data from books, manuals, and other publications shall be copied and provided in an PSR Appendix to the design calculation report.
8. Descriptive Explanations. Contractor shall furnish adequate explanations for all calculations included in the design calculation report. At a minimum the following information shall be provided:
 - a. Explain the design methodology being used and state its source.
 - b. State the assumptions inherent in the methodology or implicit in the input data set. Explain how these assumptions relate to the project, and what the implications are in terms of performance, reliability, and safety for the Design Unit, system, or device being designed.
 - c. Identify any simplifications or short cuts in the calculation procedure, and assess their impact on the accuracy of the results.
 - d. Explain the choice of numerical values for empirical coefficients and tolerances.
 - e. State the criteria used for evaluation of the results. Explain how and why the results conform to the requirements in the Contract Documents.

1.10.22 Third-Party Reviews and Approvals

- A. Third-party reviews and approvals, for elements of work within their jurisdiction, will be coordinated by the Contractor. The Contractor or HART may invite the third parties to participate in design reviews, meetings, workshops, and other coordination activities. The Contractor shall furnish third parties with documents and materials as requested to expedite and streamline the review and approval process of facilities requiring approvals.

1.11 SUBMITTAL PROCEDURES**1.11.1 Section Includes**

- A. General requirements and procedures for preparing and submitting design and construction documents, reports and compliance certificates, information, and data for information or review.

1.11.2 Related Contract Sections

- A. Project Management Requirements: PSR 1.13
- B. Design Management: PSR 1.10
- C. Project Schedules: GCDB 7.6
- D. Photographic Documentation: GCDB 7.7
- E. Shop Drawings, Product Data and Samples: GCDB 7.9
- F. Environmental Compliance: GCDB 7.22
- G. Water Pollution Control: GCDB 7.19
- H. Sustainable Practices: GCDB 7.23 and PSR 26.0
- I. Construction Documents: PSR 1.17
- J. Quality Control: GCDB 7.13
- K. Quality Assurance: GCDB 7.11
- L. Protection of Water Resources and Temporary Dust and Erosion Controls: GCDB 7.19
- M. Closeout Procedures: GCDB 7.32
- N. Operation and Maintenance Data: GCDB 7.33
- O. Project Record Documents: GCDB 7.34
- P. Demonstration and Training: GCDB 7.36
- Q. Safety and Security Compliance: GCDB 7.10

1.11.3 Draft Submittals List

- A. HART may provide a draft submittals list (see Reference Materials) for the convenience of the Contractor and HART's contract management team. The draft submittals list will serve only as a starting point to be verified and updated by the Contractor based on the actual submittals required under the Contract, which are anticipated to change based on the Contractor's design approach. The draft submittals list will not include all required submittals and will not modify the Contract.

1.11.4 Contract Submittals Schedule

- A. The Initial Submittals Schedule is an early item that shall be submitted by the Contractor within 30 days of the first Limited NTP (not necessarily NTP1). Thereafter, the Contract Submittals Schedules shall be updated and submitted monthly with the Contractor's request for payment.
- B. All submittals shall be subject to HART review and comment. However, HART may indicate certain submittals to be submitted to HART only for information. Contractor shall reflect HART's Review and Comment ("RC") or Information ("I") preferences in the next monthly update to the Contract Submittals Schedules. HART may provide updated designations to the Contractor based on issues, trends, or lessons learned. HART does not intend to perform reviews at a level of detail sufficient to identify all non-conformances with the Contract. Designations on the Contract Submittals Schedule and HART's reviews of the Contractor's submittals do not relieve the Contractor of its requirements under the Contract.
- C. The Contract Submittals Schedules shall be grouped into three major groups: Project Management, Project Support, and Facilities. The Facilities group shall be further broken down into a Design Submittals Schedule and a Construction Submittals Schedule. See PSR 1.10, Design Management, regarding submittals during the design review process.
1. The Project Management group shall include all work required by the Contract Documents for managing the Project.
 2. The Project Support group shall include all work required to support the design and construction of the Project, including but not limited to Maintenance of Traffic and Access, Environmental Mitigation and Monitoring, Remedial Action Plans, Sustainability, and Interface.
 3. Facilities:
 - a. The Design Submittals Schedule in the Facilities group shall include all facilities work covered in Section B, Engineering and Design, of the Schedule of Prices, including Design Documents, Construction Drawings, Construction Specifications, design analyses and calculations, design reports, Record Documents, and O&M Manuals.
 - b. The Construction Submittals Schedule in the Facilities group shall include all facilities work covered in Sections C, D, E & F of the Schedule of Prices, including submittals required during the manufacturing, installation, and construction phase of the Contract.
- D. The Contractor shall develop the detailed Submittals Schedules listing all the submittals specified in the individual Technical Specifications Sections. Submittals shall be listed according to type of submittals on an as per facility and per site basis. Submittals Schedules shall be updated to reflect any changes to submittal requirements based on acceptance of Construction Specifications in the month following said acceptance.

- E. The Design Submittals Schedules shall be prepared and organized into Design Units and Work Packages as specified in PSR 1.10, Design Management, and updated monthly to reflect changes in packaging.
- F. The Contractor shall submit its Design Units to HART in accordance with PSR 1.10, Design Management. Refer to PSR 1.10, Design Management, for descriptions of design levels. The type of submittal and its relationship to subsequent submittals for the same element of the Work shall be indicated in the Contract Submittals Schedule consistent with its Design Units and Work Packages.
- G. Schedule Dates and Sequences: The date on which each submittal will be submitted shall be determined and scheduled in accordance with PSR 1.13.10, Project Schedules, and entered in a column titled "Scheduled Submittal Date" in the Submittals Schedule.
 - 1. The Contractor shall schedule submittals so that resubmittal, if required, will not impact the Contract completion dates.
 - 2. For work corresponding to submittals marked as "RC" (for HART's review and comment), materials shall not be fabricated or shipped and construction shall not commence before HART has acknowledged that all previous comments have been resolved for the corresponding submittals.
 - 3. For work corresponding to submittals marked as "I" (for HART's information), equipment and materials shall not be fabricated or shipped and construction shall not commence before the corresponding submittal has been approved by the Contractor and submitted to HART for information. Each submittal marked as "I" shall be submitted to HART immediately following its approval by the Contractor.

1.11.5 Submittal Requirements

- A. Coordination.
 - 1. See PSR 1.17.5.C.
 - 2. The Contractor shall coordinate each submittal with the requirements of the Work and with the contents of other submittals. Ensure each submittal is complete with all relevant data required for review.
 - 3. The Contractor shall be responsible for the correctness of the drawings, for shop fits and field connections, and for the results obtained by the use of such drawings.
- B. Professional Seal Required: Submittals of Construction Drawings and Specifications, and related submittals involving engineering expertise, such as excavation support structures, falsework for concrete, design calculations, design calculation reports, and other calculations, shall be sealed and signed by the Responsible Engineer, in accordance with HAR 16-115 and equivalent requirements for architects, landscape architects, surveyors, and other licensed professionals. Refer to PSR 1.10, Design Management, for requirements for design submittals.

- C. Review Period: Unless otherwise specified in the Contract, allow 30 days after receipt by HART for review and return of each submittal, except for the following design reviews (see PSR 1.10, Design Management):
1. Unless specifically stated otherwise, the Contractor shall make all submittals directly to third parties, with simultaneous electronic copies to HART, and shall allow sufficient time to meet each party's review time requirements. The Contractor shall provide all third-party review comments to HART for information and records.
- D. Submittal Delivery: Unless requested otherwise by HART, electronically deliver all submittals through CMS.
- E. Transmittal Form: A CMS-generated transmittal form shall accompany all submittals. All applicable field shall be completed by Contractor prior to submittal.
- F. Review of drawings, specifications, and supporting documents by HART shall not relieve the Contractor from the responsibility for errors or omissions in the drawings and associated calculations.
- G. The Contractor shall not deviate from the Design Criteria and other Contract Documents unless such deviation has been specifically requested in writing by the Contractor and approved in writing by HART as provided herein. If such deviation from the Design Criteria and other Contract Documents has not been requested and approved, HART's approval of a submittal will not constitute approval of the deviation therein.
- H. The Contractor shall notify HART verbally at any design review meeting and in writing within 14 days of any review comments or suggested revisions by HART or other entity which the Contractor considers contrary to or in addition to the Contract requirements.
- I. Changes Subsequent to Review: Changes in submittals already reviewed by HART will not be permitted unless those submittals are resubmitted and re-reviewed, in the same manner as the original submittal.
- J. Submittals: All trackwork-related submittals, including product test data and test samples, shall be current. Product testing performed within 6 months of the submittal date will be acceptable; product testing performed more than 6 months before the submittal date will not be acceptable.
- K. HART may request and the Contractor shall provide electronic copies of documents required to support coordination with third parties.
- L. Submittals that involve interfaces between work elements in other submittals shall describe the interfaces. The Contractor shall notify HART of any discrepancies that are identified.

1.11.6 Design Submittals

- A. See PSR 1.10, Design Management.

1.11.7 Construction Submittals

A. Construction Submittal requirements are as follows:

1. Construction Submittals: These submittals are required to be prepared and submitted prior to and during the construction phase of the Contract. The Contractor shall prepare Construction Submittals Schedules based on the submittals required in the Contract. The Contractor shall adjust the Submittals Schedules to reflect the submittal requirements for its design and construction approach. These Schedules shall show all construction-related submittals. When necessary, the Schedules shall be broken down to include such items as individual shop drawings. These Construction Submittals Schedules shall be utilized by the Contractor and HART to identify and track submittals, to replace and mobilize HART's resources for review, and to determine the status of submittals.
2. Construction Submittal Review: HART's review of a separate item will not constitute review of an assembly in which the item functions.

1.11.8 Reserved**1.11.9 Submittals to Other Jurisdictions**

- A. The Contractor shall invite representatives of other jurisdictions to participate in design reviews applicable to their area(s) of responsibility.
- B. The Contractor shall submit Construction Drawings, Construction Specifications, calculations, design analyses, reports, and shop drawings directly to jurisdictional authorities including the City, County, and State agencies, Federal agencies, and utility owners, unless specifically stated otherwise. Contractor shall copy HART electronically on all such submittals.

1.12 UTILITY COORDINATION**1.12.1 Reserved****1.12.2 Related Contract Sections**

- A. Project Meetings: PSR 1.13.9
- B. Project Schedules: PSR 1.13.11
- C. Submittal Procedures: PSR 1.11
- D. Shop Drawings, Product Data, and Samples: GCDB 7.9
- E. Quality Assurance: GCDB 7.11
- F. Quality Control: GCDB 7.13
- G. Maintenance of Traffic: GCDB 7.16
- H. Protection of Water Resources and Temporary Dust and Erosion Control: GCDB 7.19

- I. Permits, Licenses: GCDB 7.1.8
- J. Protect Existing Utilities; Relocation of Utilities; New Connection Services: GCDB 7.3
- K. Cleaning: GCDB 7.30
- L. Construction Waste Management: GCDB 7.31
- M. Discovery of Contaminated Materials: GCDB 7.17
- N. Closeout Procedure: GCDB 7.32

1.12.3 Reserved**1.12.4 Project Requirements**

- A. The Contractor shall coordinate all activities, including but not limited to the following:
 - 1. Survey
 - 2. Design
 - 3. Scheduling
 - 4. Material requirements and procurement
 - 5. Safety, flagging and roadway worker protection
 - 6. Construction access
 - 7. Staking
 - 8. Alignment verification via field survey prior to backfill of all utility lines
 - 9. As-Built and Record Drawings
 - 10. Tracking schedule and payment
- B. The Contractor shall prepare and maintain a Utility status report in a form that lists all Utilities affected or potentially affected by the Project. The Contractor's Utility status report must contain not less than the following information for each Utility listed thereon:
 - 1. The name of the Utility Owner and a unique identification number for tracking;
 - 2. Schedule activity codes corresponding to the Work Breakdown Schedule (WBS);
 - 3. A brief description of the Utility by size and type;
 - 4. The location of the Utility based upon Project control datum and station and offset from the Project alignment;

5. The proposed treatment of the Utility and the date such treatment was approved by the Utility Owner;
 6. The party responsible for performance of Relocation work;
 7. The nature of the Utility Owner's existing right of occupancy for such Utility;
 8. The scheduled start and completion dates of the Relocation work;
 9. The actual start and completion dates of the Relocation work;
 10. The status of the Relocation work, including percentage complete; and
 11. Such other information as HART may request.
- C. The first Contractor's Utility status report must identify all changes from and additions to the information provided in the RFP Drawings. Each subsequent version of the Contractor's Utility status report must identify all changes from the previous version. The Contractor's Utility status report must be sortable so that data can be reported by the following parameters: the utility identification number, station and offset from the Project alignment, the Utility Owner, the scheduled start-of-construction date, and the scheduled completion date. Submit one copy of the Contractor's Utility status report to HART weekly or as otherwise directed by HART.

1.12.5 Utilities Designed and Constructed by Contractor

- A. The Contractor is responsible for the design and construction of all Relocations, except for those assigned to the Utility Owner in PSR 8.0 and the Technical Specifications. The Contractor shall incorporate the Utility Owner's requirements into the Utility Relocations designed by the Contractor.
- B. The Contractor shall coordinate all Work with the work performed by Utility Owners. All Utility Work shall be performed in accordance with the provisions of the Utility Agreements and utility standards.

1.12.6 Utilities Designed and Constructed by Utility Owner

- A. A list of utilities identified and anticipated activities during construction are included in PSR 8.0, which further identifies responsibilities for each utility.
- B. The Contractor shall coordinate directly with the Utility Owner and shall furnish copies to HART of communications therewith. The Contractor shall notify HART of all activities which may affect the requirements of the Utility Agreements.

1.13 PROJECT MANAGEMENT REQUIREMENTS**1.13.1 Section Includes**

- A. This Section specifies project management requirements, including key personnel, document control, workflow plan, and partnering.

1.13.2 Related Contract Sections

- A. Design Management: PSR 1.10
- B. Submittal Procedures: PSR 1.11
- C. Shop Drawings, Product Data, Samples: GCDB 7.9
- D. Construction Documents: PSR 1.17
- E. Quality Assurance: GCDB 7.11
- F. Quality Control: GCDB 7.13
- G. Safety and Security Compliance: GCDB 7.10

1.13.3 Key Personnel

- A. The Contractor shall provide designated key personnel in accordance with GCDB 7.5.2, Key Personnel and Project Organization.
- B. The Contractor's Design Manager, the Responsible Engineers and Architects, and Design QC Engineer shall be present through the completion of Final Design and shall be available as necessary for design changes and other design services during and after construction, including, preparation and review of Record Drawings, all as specified in GCDB 7.5 and PSR 1.10, Design Management.

1.13.4 Communications between HART's and Contractor's Staffs

- A. All instructions, whether formal or informal, shall be documented in writing.

1.13.5 Document Control

- A. The Contractor is responsible for its own document control system.
- B. For management of informal communications and internal documentation, as well as pre-release and draft documentation within its own organization, the Contractor shall maintain its own document control system to record, store, track and retrieve documentation. However, the Contractor shall provide to HART copies of documents and communications retained in the system, as requested.
- C. The following minimum requirements shall be included in Contractor's document control system:
 - 1. A design engineering document control register shall be maintained and checked regularly to ensure that the most recent revision of engineering design documents are available at the jobsite. These registers shall be supplemented as required with construction site logs for site developed design information.
 - 2. Requirements for receipt, distribution, and filing of submittals, specifications, material requisitions, and purchase orders shall be defined.
 - 3. The control of as-built information shall be defined.

4. The method of controlling superseded, voided, and canceled design documents shall be defined.
5. The Contractor shall record, store, track and retrieve Construction Drawings, Shop Drawings, Construction Specifications, calculations, design and construction quality control records, inspection and test reports, Health and Safety Records, meeting minutes, and other information relative to the Contract through its document control system.

D. Document Control Plan

The Contractor shall prepare a Document Control Plan to outline the overall strategy and direction for the management and control of documents relative to the Contract. The plan, at a minimum, shall:

1. Identify the tools to be used for controlling project documents.
2. Describe document control activities and work processes.
3. Include a list of procedures to be developed and implemented.
4. Describe the process for verifying the completeness, accuracy and legibility of design information transmitted to the jobsite to ensure that all documents listed on the transmittal have been received. Include process for rectifying discrepancies.
5. Describe the document distribution matrix and the process for overall control of document distribution.
6. Define the filing system to be utilized.
7. Define the process for receipt, distribution, and filing of submittals, specifications, material requisitions, and purchase orders.
8. Define the process for controlling as-built information.
9. Define the process for controlling superseded, voided, and canceled design documents.
10. Describe the retention requirements for each type of document.
11. Identify and describe interfacing with and utilization of the project portal.

E. Document Deliverable / Turnover Plan

The Contractor shall develop, maintain, and implement a deliverable/turnover plan listing the documents/deliverables identified in the Contract, Agreements, Amendments, or similar documents and to capture information related to the turnover of those documents to HART. The plan shall include instructions to turn over the following:

1. One searchable Acrobat PDF (i.e., with optical character recognition), generated from the native application file, when feasible, and compatible with the latest version of Acrobat.
2. The native file of the document, with the following exceptions:
 - a. As specified in PSR 1.19, all AutoCAD will be turned over to HART. However, when a drawing is contained in a document such as a report, plan, study, etc. the AutoCAD file(s) must be turned over with the other native application files that comprise the document.
 - b. Native files of routine administrative and management documents (e.g., monthly progress reports) need not be provided.
3. The Plan will include a deliverable/turnover list, which will identify at a minimum the following:
 - a. The document type delivered
 - b. The document title
 - c. The unique identifier number of the document
 - d. The revision number, if applicable
 - e. The native file format

1.13.6 Reserved

1.13.7 Reserved

1.13.8 Reserved

1.13.9 Project Meetings

1.13.9.1 Section Includes

- A. Requirements for Project meetings. The Contractor's Project Manager, as a minimum, and other personnel, including third-party representatives and others as designated by HART or the Contractor's Project Manager, shall attend meetings scheduled by HART for the collection, dissemination, and discussion of information and issues related to the Contract.
- B. Unless otherwise noted, the Contractor will be responsible for preparation of the minutes of each meeting, and will distribute the minutes to each of the participants within three working days following the meeting.
- C. Special meetings between HART and the Contractor will be scheduled throughout the course of the Project as HART or the Contractor deem necessary.

1.13.9.2 Pre-Work Conference

- A. HART will consult with the Contractor and arrange and lead a pre-work conference as the first formal meeting between the Contractor and HART's management team within 21 days of the Effective Date, the purpose of which generally will be to introduce key personnel, to familiarize the Contractor with HART Contract requirements and procedures, and to establish the basis for communication between the parties.
1. The Contractor and HART shall be represented by personnel as mutually agreed by HART and the Contractor's Project Manager.
 2. The meeting will take place at a location determined by HART in the Project area.
- B. The agenda of the meeting shall include the following items and may be expanded by the Contractor or HART.
1. Introduction of Contractor's key personnel present and HART's counterparts;
 2. Responsibilities and authorities of HART and its designated representatives;
 3. Submission of the list of intended Subcontractors;
 4. Submission of the plans required under the Contract;
 5. Plans for implementing QA, QC, and Construction Safety, Security, and Health requirements.
 6. Discussion of the draft Baseline Project Schedule;
 7. Discussion of the Schedule of Values and invoicing;
 8. See item A above;
 9. Design mobilization and the design development and design review process, including scheduling of the design workshop per PSR 1.10, Design Management, if not already scheduled;
 10. Pre-construction and construction mobilization actions, including jobsite availability; and
 11. Scheduling of breakout meetings for relevant topics.

1.13.9.3 Design Mobilization Workshop

- A. The Contractor shall coordinate a Design Mobilization Workshop in accordance with PSR 1.10, Design Management, prior to the Contractor initiating design Work.

1.13.9.4 Pre-Construction Meeting

- A. HART will schedule a preconstruction meeting not less than 14 Days before the planned Full NTP, or before any Limited NTP authorizing any construction prior to the

Full NTP. The purpose of this meeting is to introduce HART's construction compliance personnel to their counterparts in the Contractor's organization and to establish lines of communication among these representatives. Personnel designated by HART or the Contractor's Project Manager, including the Construction Manager, Superintendents, Quality Manager, the QC Representative, Safety and Security Specialist, Environmental Compliance Manager, Subcontractors' representatives, and Public Involvement Manager shall attend. Not less than 7 Working Days before the meeting, HART will distribute a notice of this meeting, along with an agenda of subjects to be addressed.

B. The agenda shall include:

1. Construction and public safety, the full-time Safety and Security Specialist, and arrangements for site safety, first aid, and emergency actions;
2. Use of premises by HART and the Contractor;
3. Temporary utilities and facilities;
4. Security and "housekeeping";
5. Pre-construction surveys;
6. Schedule for establishing Work areas, temporary facilities, and facilities and equipment for HART construction compliance personnel;
7. Temporary Works;
8. Plans for initial construction activities;
9. Construction inspection, QC, QA, and acceptance of the Work;
10. Permits and related approvals applicable to the Work;
11. Environmental compliance and mitigation responsibilities;
12. Public interfaces and traffic requirements;
13. Communications protocols regarding issues; and
14. Availability of as-builts during the construction period.

C. The Contractor shall:

1. Introduce the Contractor's Project Manager and key personnel in attendance and briefly describe each person's responsibility and authority;
2. Distribute and discuss the list of major Subcontractors and their areas of responsibility;
3. Discuss the sequence of critical work and Project Schedule relative to construction;

4. Discuss construction methods;
5. Describe construction sequencing for the entire Project, general jobsite layout, erosion and sediment control plans, haul routes, noise abatement, dust abatement, air and water pollution control, temporary street closings and street restoration, and outreach activities as applicable;
6. Describe environmental mitigation and monitoring procedures;
7. Discuss deliveries and priorities for materials and major equipment; and
8. Discuss the role and responsibility of and coordination with the Contractor's engineering staff during construction.

1.13.9.5 Progress Meetings

- A. The Contractor and HART will schedule, invite appropriate third parties and conduct progress meetings on a regular basis, normally weekly unless otherwise mutually agreed between HART and Contractor, to facilitate competent and timely monitoring execution of the Contract.
- B. The Contractor shall identify its personnel to attend these meetings. Progress meetings shall include representatives of Subcontractors who are currently working or will be performing Work during the following 2 weeks.
- C. The agenda for progress meetings will be prepared by HART with input from the Contractor's Project Manager and will generally include as applicable the following:
 1. Introduction of new attendees and areas of responsibility;
 2. Construction safety / security issues;
 3. Analysis of Work accomplished since the previous meeting; engineering issues; offsite fabrication status; product delivery status; schedule changes; issues arising from proposed changes; and other circumstances that might affect progress or quality of the Work. The Contractor shall provide a look ahead schedule in accordance with GCDB 7.6;
 4. Discussion of sequence of work on the critical path using the schedule. Each critical path activity shall have a current status and completion forecast. The Contractor shall report on all items that are forecast to not meet scheduled contract milestones and shall discuss associated recovery actions in detail;
 5. Discussion of engineering and construction Work quality observations, quality control problems and employee work standards;
 6. Discussion of coordination of Work affecting utility work, work relative to all jurisdictional agencies and authorities, and work by outside third parties;
 7. Discussion of changed conditions, plans for schedule recovery, time extensions, and other relevant subjects as they affect the progress of the Work;

8. Discussion of status of HART-furnished materials as applicable;
9. Discussion of corrective measures to meet quality standards and to maintain the Project Schedule, when necessary;
10. Discussion of potential claims and pending disputed issues;
11. Inquiries, Requests For Information (RFIs), and Change Notices/Change Orders;
12. Discussion of the look ahead schedule;
13. Design problems and decisions;
14. Environmental issues;
15. Maintenance of Traffic and Access;
16. Reporting of incidents, public complaints, and outreach activities;
17. Discussion of potential issues, clarifications, and other concerns raised by third parties.

1.13.10 Project Schedules**1.13.10.1 Section Includes:**

- A. Engineering Progress Report
- B. Look Ahead Schedules
- C. Utility Coordination Schedules
- D. Recovery Schedule

1.13.10.2 Engineering Progress Report

- A. Submittal: The initial version of the Engineering Progress Report (EPR) shall be submitted within 30 Days of NTP1 concurrent with the Design Work Plan described in PSR 1.10, Design Management. Subsequent to HART acceptance of the initial version of the EPR, the Contractor shall submit an EPR)monthly.
- B. Content: The EPR shall report actual versus planned progress at the Work Package, Design Unit, and Total Contract level of detail. The EPR shall provide sufficient detail to address all engineering activities being performed, identify issues requiring HART action or input, and identify any constraints pending resolution. The actual progress data incorporated into the Project Schedule shall be consistent with the actual data shown in the EPR. The Contractor's EPR shall be subject to review by HART.

1.13.10.3 Look Ahead Schedules

- A. Refer to GCDB 7.6.6, Look Ahead Schedules.

1.13.10.4 Utility Coordination Schedules

- A. Submittal: Beginning within 30 days of NTP1, and ending no sooner than 30 days after utility owner acceptance of all utility work, the Contractor shall submit monthly updates to the utility coordination schedules to HART.
- B. Content: The Contractor shall coordinate with utility owners to identify mutually agreeable utility coordination schedule formats. Utility coordination schedules shall have sufficient detail to facilitate and document the Contractor's management and coordination of utilities designs, design reviews, utility owners' designs, procurement, mobilization, utilities construction, inspection, and acceptance. Utility coordination schedules shall identify issues requiring HART action or input, and identify any constraints pending resolution.

1.13.10.6 Recovery Schedule

Refer to GCDB 7.6.3, Time Impact Analysis; Recovery Schedule.

1.13.11 Monthly Progress Reports

The Contractor shall review the monthly reporting requirements in the contract and provide monthly progress reports to cover schedule, financials, quality activities, safety and security, photographic documentation, submittals, environmental mitigation activities, permitting, third-party coordination, interface, public outreach, and other significant topics.

1.14 RESERVED

1.15 RESERVED

1.16 RESERVED

1.17 CONSTRUCTION DOCUMENTS**1.17.1 Section Includes**

- A. This section of the PSR defines the general requirements for preparing the Construction Documents, consisting mainly of the Construction Specifications, the Construction Drawings, Shop Drawings, design analyses, and calculations as required to support design assumptions and decisions, and the various reports required to verify suitability of products and methods.

1.17.2 Construction Documents Defined

- A. As used in this PSR, the Construction Documents shall include the following documents, calculations, and reports:
1. Construction Specifications
 2. Construction Drawings

3. Design analyses and calculations required to establish the basis of design and required to provide evidence of conformance with the Design Criteria and sound engineering principles and practices.
 4. Shop Drawings and product data
 5. Detail installation layout and assembly details
 6. Other working drawings
 7. Industry associations' research and test reports, including code approvals, required to verify the suitability of products, methods, and assemblies for the contemplated design.
- B. The Contractor shall provide Construction Drawings and Construction Specifications with the certifications required under PSR 1.10.13.

1.17.3 Reserved**1.17.4 Construction Specifications**

- A. Construction Specifications shall provide a level of quality that meets or exceeds the Contract requirements, including the requirements of the Guidance Technical Specifications.
- B. Construction Specifications shall form a complete set of Specifications that are suitable, appropriate, and adequate to control the Work
- C. Construction Specifications shall be signed and sealed by the Responsible Engineer in responsible charge of the associated Design Unit.
- D. Construction Specifications shall define the type and frequency of QC sampling and testing to be conducted for the Work.

1.17.5 Construction Drawings

- A. The Construction Drawings shall consist of a fully detailed and dimensioned graphic representation of the Work in all its elements and components as required to design, construct, and complete the Work.
- B. The Construction Drawings shall be prepared in accordance with PSR 1.19, Computer Aided Design (CAD) and Electronic Submittal Requirements.
- C. The Construction Drawings shall include graphic representations of the Work, including all applicable Design Criteria of the various disciplines. The Construction Drawings shall provide specific graphic representations and details as required to construct and complete the Work. If the Contractor chooses to use a Design Drawing electronic file in the creation of a Construction Drawing, each such Construction Drawing shall be assigned a Construction Drawing Number, and the title block and title block information shall be changed to reflect the drawing's status as a Construction Drawing.

- D. The Construction Drawings shall include interface and assembly drawings that clearly indicate the physical interrelationship of the various Work items to be constructed or installed, so that construction errors and delays, caused by dimensional conflicts, embedments, block-outs, foundation connections, reinforcement, piping and conduits, and other such concealed features, will not occur. Owner's name, if not HART, and existing work or systems shall be identified to clarify physical interrelationships.
- E. Construction Drawings shall be signed and sealed by the Responsible Engineer in responsible charge of the associated Design Unit.
- F. See PSR 1.10.19, Construction Documents.

1.17.6 Design Analyses and Calculations

- A. Design Analyses: The design analyses shall indicate the basis of design and shall fix and describe the size and character of the Work. The design analyses shall be in written form and shall be complemented with diagrams and graphics as required to fully delineate and illustrate the basis of design and extent of the Work.
- B. Design Calculations:
 - 1. Construction Drawings and Construction Specifications shall be supported by design calculations.
 - 2. Design calculations shall be listed in the Contractor-prepared Design Submittals Schedule for each Design Unit and Work Package and submitted to HART for information or review.
- C. Submittal Requirements: Design analyses and calculations as specified in PSR 1.17.6 herein shall accompany all submittals of Construction Drawings as required to support the structures and items depicted on the Construction Drawings.

1.17.7 Reports

- A. Reports shall consist of all those reports and code approvals involved in verifying the suitability of products, methods, and assemblies for the proposed design, including International Code Council (ICC) Research Reports and Code Approvals, test reports of tests performed by Underwriter's Laboratories and Warnock Hersey on certain materials and assemblies to determine their fire resistance and suitability for use under certain conditions, and the various test reports by certified independent laboratories verifying sound-transmission class of certain assemblies, strength and durability of certain materials, and suitability of certain equipment to perform properly under the imposed conditions.

1.17.8 Staged Construction

- A. Refer to PSR 1.10, Design Management, for explanation of Design Units and Work Packages in regard to staged design and construction.

1.17.9 Revisions to Construction Drawings and Specifications

- A. Changes to the Construction Drawings of Construction Specifications shall be submitted to HART in accordance with PSR 1.10.11, Design Changes and Revisions and PSR 1.18.4.B.3, Construction Engineering Procedures,

1.17.10 Contractor's Responsibilities

- A. The Contractor shall prepare and submit Construction Drawings and Construction Specifications as required to provide a complete and finished, fully operational Work in accordance with the requirements of the Contract Documents.
- B. The Contractor shall not be relieved of fulfilling the requirements of the Contract Documents, or of the responsibility for producing the required results, or of performing the Work, because of circumstances or conditions as follows:
1. Absence of details where essential features, functions, and arrangements are defined or delineated;
 2. Mistakes in description of details which, if not corrected, would interfere with proper performance of the items involved; and
 3. Errors, omissions, discrepancies, and lack of clarity in the Contract Documents that should reasonably have been apparent to an experienced Contractor upon careful and critical review.

1.18 CONSTRUCTION ENGINEERING**1.18.1 Section Includes**

- A. Construction engineering services as specified in PSR 1.18 shall be performed by the Contractor. The Contractor shall be responsible for and provide for all labor, materials, tools, equipment, and facilities for these construction engineering Services in accordance with the requirements of applicable Construction Specifications, or as may be identified herein, as required to execute the Work.

1.18.2 Reserved**1.18.3 Field Survey Control**

- A. State of Hawaii Department of Transportation Standard Specifications (HSS):
1. HSS Section 105.10, Construction Stakes, Lines and Grades
 2. HSS Section 613, Centerline and Reference Survey Monumentation
 3. HSS Section 614, Street Survey Monuments

4. HSS City and County of Honolulu / Federal Projects Special Provisions to Section 613, June 9, 2006

B. General Requirements

1. Survey notes, drawings, and calculations shall be completed as the Work progresses and one copy of each survey document shall be submitted to HART for record purposes on a monthly basis.
2. If requested, provide specific construction survey information to HART and interfacing contractors within 48 hours as requested.
3. Submit maps showing all final centerline, station, and other Contractor-installed monumentation, properly prepared and submitted to HART for acceptance. The Contractor shall submit a certification, signed and sealed by a Hawaii-licensed land surveyor.
4. The Contractor shall submit, no later than 60 days in advance of the proposed construction that will destroy or disturb any existing monuments, its plan for resetting or referencing the destroyed or disturbed existing monuments, except for HART controls. Contractor shall coordinate changes in monumentation with other HART contractors, adjacent projects, and ROW owners.
5. As soon as the survey is complete, but no later than 10 days prior to covering of a utility, the Contractor shall submit the results of the surveys performed under PSR 1.18.3.C herein. Each submittal item specified herein shall bear the seal and signature of the person qualified to practice land surveying in the State of Hawaii and shall include for each utility facility surveyed:
 - a. All of the items specified in PSR 1.18.3.C;
 - b. A list of the spatial coordinates, both horizontal and vertical, of the measurements taken; and
 - c. A plan, at a scale no smaller than 1 inch = 100 feet, depicting the results of the survey conducted.
6. The Contractor shall incorporate the results of all of the surveys conducted under Article 1.03C.2.1 herein with the documents to be prepared, maintained, and submitted pursuant to GCDB 7.34, Project Record Documents.

C. Services Description

1. Qualified Services: Surveying services and field engineering services shall be performed under the direct supervision of a professional land surveyor or civil engineer currently licensed or registered in the State of Hawaii.

2. Contractor's Responsibilities:

- a. The Contractor shall review all survey data provided by HART and shall provide additional field surveys as required for preparation of the Contractor's Construction Documents. All aerial and orthophoto mapping (circa 2011) provided by HART is for preliminary engineering only. This data shall not be used as a basis for conformed engineering nor for construction surveying.
- b. Survey tasks required of the Contractor shall include the following:
 - 1) Verification and protection of horizontal and vertical position of primary and secondary control as provided by HART.
 - 2) Establishment and maintenance of construction staking control, based on the primary and secondary control network, for use in construction staking.
 - 3) Planning for construction control and construction staking, including periodic survey coordination meetings with HART and with Interfacing Contractors.
 - 4) Planning for and completion of ROW surveys.
 - 5) Providing topographic surveys, if required, to augment the surveys and base mapping furnished by HART.
 - 6) Providing drainage surveys, if required, for detailed design of drainage ways and other drainage features.
 - 7) Providing utility locations, if required, to supplement surveys furnished by HART. Potholing and surveying shall be accomplished during the design process and provided for construction use.
 - 8) Coordinating locations of constructed work with other contractors.
 - 9) Planning and completion of final monumentation, including mainline and ROW monumentation as indicated.
- c. Applicable permits shall be obtained by the Contractor prior to beginning field work. A traffic control plan for surveying shall be prepared for all surveying work to be performed in and along existing streets and highways.
- d. The Contractor shall obtain all field measurements required for the accurate fabrication and installation of the Work included in the Contract. Exact measurements are the Contractor's responsibility.
- e. The Contractor shall furnish or obtain templates, patterns, and installation instructions as required for the installation of all Work. All dimensions shall be verified in the field.

- f. The Contractor shall certify the civil alignment and profile of each track. The Contractor shall obtain an independent survey showing the as-built vertical and horizontal civil alignment of each rail throughout the Work, in order to provide this certification. Surveying shall meet the accuracy requirements in accordance with the Construction Specifications.
- g. Survey, Protection, and Replacement of Existing Monuments:
 - 1) The Contractor shall, during the design and preconstruction survey processes, identify all existing monuments controlling the location of subdivisions, tracts, boundaries, roads, streets, and highways, or provide survey control that will or may be destroyed or disturbed by the Work.
 - 2) The Contractor shall prepare a plan showing all monuments required herein.
 - 3) The Contractor shall take every precaution to protect HART survey control points and shall notify HART immediately upon destruction or disturbance of any HART control. All discrepancies that are directly related to project work shall be brought to the attention of HART in writing.
- h. In addition to any other requirement herein, the Contractor shall perform engineering surveys in connection with underground utilities as follows:
 - 1) A survey shall be performed of the installed location of each utility, including utilities located within joint trenches, or situated below the surface of the ground after trenching or other subsurface excavation and installation of the new utility facility but prior to the backfilling of the trench or other excavation.
 - 2) Said survey shall, at a minimum, include the following:
 - a) Type of utility (e.g., water, power, gas, cable, systems, etc.) and facility (e.g., conduit, culvert, duct bank, etc.);
 - b) Horizontal and vertical measurements of all break points, horizontal and/or vertical, including termini and/or junctions, conforming to the accuracy standards of PSR 1.18.3.F;
 - c) Specification of the point of consistent measurement (i.e., invert, top of pipe, etc.); and
 - d) Date of survey.

D. Lines and Grades:

1. Only such primary and secondary control lines, monuments, and bench marks will be set by HART as HART determines to be necessary to control establishment of the lines and grades required for completion of the work. In general, these will consist of the horizontal and vertical control points indicated on the RFP Drawings or the Primary Control Report. Work points shall be established by the Contractor for all major structures, all track alignments, and all roadway alignments. Survey monuments shall be set at each end of station platforms by the Contractor to establish platform finish elevations.
2. Primary and secondary control monuments set by HART shall be carefully preserved by the Contractor. In case such monuments are destroyed or damaged, they will be replaced at HART's earliest convenience. The Contractor will be charged for the cost of replacing or restoring monuments destroyed or damaged by the Contractor's operations. This charge will be deducted from any monies due or that become due the Contractor.
 - a. The Contractor will be responsible for replacement of monumentation of all jurisdictional agencies and authorities that has been destroyed or damaged by the Contractor. The jurisdictional authority or agency may replace their own monumentation within their own property. If so replaced by the jurisdictional authority or agency, the Contractor will be charged for the cost of replacing or restoring monuments destroyed or damaged by the Contractor's operations. This charge will be deducted from any monies due or to become due the Contractor.
3. All other stakes or markers required to establish the lines and grades required for the completion of the Work shall be the responsibility of the Contractor.

E. Surveys for Layout and Performance:

1. **Surveying Requirements:** Perform all surveys for layout and performance of the Work, reduce the field notes, and make all calculations and drawings necessary to carry out such work. The Contractor shall check the relative positions of all monuments and benchmarks to be used and shall report damaged or out-of-position monuments to HART. The Contractor shall check such relative positions each time the Contractor uses the monument or benchmark.
2. **Datum:** The Contractor shall be responsible for correctly locating all lines and grades and for performing all measuring as required for the construction and completion of the Work from established reference points and information as shown on the RFP Drawings or Primary Control Report.
3. **Equipment and Personnel:** The Contractor's instruments and other survey equipment shall be accurate, suitable for the surveys required in accordance with recognized professional standards, and in proper condition and adjustment at all times. Perform all surveys under the direct supervision of a professional land surveyor or civil engineer currently licensed to registered in the State of Hawaii.

4. Field Notes and Records: Furnish the original pages of all survey records to HART at intervals required by HART. Furnish each field notebook to HART when filled or completed.
 5. Use by HART: HART may at any time use line and grade points and markers established by the Contractor. The Contractor's surveys are a part of the Work and may be checked by HART at any time. The Contractor shall be responsible for any lines, grades, or measurements that do not comply with specified or proper tolerances, or that are otherwise defective, and for any resultant defects in the Work. The Contractor shall conduct resurveys or check surveys to correct errors indicated by review of the field notebooks or by check surveys performed by HART.
 - a. HART is not obligated to perform check surveys, and the absence of check surveys shall not relieve the Contractor of responsibility for the accuracy and sufficiency of all survey work.
- F. Surveying Accuracy and Tolerance in Setting Survey Stakes:
1. Project Control Surveys
 - a. Project Control shall be verified and maintained as necessary for the duration of the Contract. Surveys performed to verify and establish project control shall meet Second Order, Class 2, accuracy guidelines (95 percent confidence) as established by the Federal Geodetic Control Subcommittee as specified in herein. Project Control surveys shall reliably establish the project datum locally by direct ties to a minimum of three horizontal and vertical monuments. Existing Project Control values and descriptions will be provided by HART.
 - b. Control surveys shall be performed using appropriate geodetic equipment and techniques, and measured values shall be of sufficient redundancy to establish realistic measurement error estimation at the 95 percent confidence level. Surveys shall be adjusted using least squares adjustment software. Final adjustment listing shall incorporate differences from control "provisional" values, and a summary listing of any residuals. Any measured Project Control Value discrepancies, which fall significantly outside these accuracy guidelines, shall be reported immediately to HART.
 2. Project Survey Control Nominal Accuracy Requirements
 - a. Horizontal Control: Second Order, Class 2, relative positional accuracy: 1:20,000.
 - b. Vertical Control: Second Order, Class 2, maximum misclosure in feet, $e=0.035' \times \sqrt{E}$ where E = total miles in loop
 - c. All units are U.S. Survey Feet.
 3. Lines and Grades

- a. Construction staking and survey accuracies shall be in accordance with Guidance Technical Specification 02 21 00, Surveys.
- b. Rail and platform works construction survey accuracy shall satisfy tolerances for 0.01' +/- horizontally and vertically.

1.18.4 Construction Engineering Procedures

- A. The Contractor shall develop appropriate construction engineering procedures for performing construction engineering duties on the jobsite. The exact content of these procedures may vary depending on the services needed.
- B. As a minimum, the construction engineering procedures shall include the following:
 1. Procedure Development and Approval: Describe how procedures are prepared and controlled, and who, within the Contractor's organization, is responsible for approving the procedures.
 2. Duties and Responsibilities: Describe the specific duties and responsibilities of the construction engineering organization. This procedure shall also address interfaces with work of other HART contracts, and jurisdictional authorities.
 3. Engineering Document Control: Describe the procedures for ensuring effective engineering document control, including baseline configuration control, drawing revision control, Issued for Construction drawing controls, and As-Built drawing development and maintenance.
 4. Constructability Program: Describe the Constructability Program, including reports and documentation, and how lessons learned data shall be assembled, documented, and applied to the Work.
 5. Construction Environmental Control: Describe the methods that shall be implemented to ensure compliance with mitigation requirements specified in GCDB 7.22, Environmental Compliance.
 6. Requisitioning and Site Material Control: Describe controls for preparation, review, and approval of field material requisitions and for storage control of materials on jobsite.
 7. Progress Tracking and Schedule Management: Describe control procedures for implementation of the schedule management work processes, including progress tracking and reporting and schedule revisions, consistent with requirements of GCDB 7.6, Design and Construction Progress Documentation, and PSR 1.13.10, Project Schedules.
 8. Risk Management: Describe work process for risk management activities, including report formats and regular updating.

9. Construction Completion and Turnover: Describe control procedures for construction completion, punch-listing and turnover of the Work to other HART contractors and HART.

1.18.5 Document Control

- A. The construction engineering requirements for document control are applicable to the Contract Documents, Construction Documents prepared by the Contractor's design engineers and architects, documents prepared by vendors and Subcontractors, field design documents, and records retained in accordance with the Contract or corporate policy.
- B. The document control system shall meet HART's requirements as defined in GCDB 7.8.4, and shall include the following elements:
 1. A regular check of the design engineering document control register shall be made to ensure that the most recent revisions of engineering design documents are available at the jobsite. These registers shall be supplemented as required with construction site logs for site-developed design information.
 2. Design information received in the field shall be checked against the transmittal to make sure all listed documents have been received. The document control system shall address how this check is made and documented and the type of follow-up that is made if a discrepancy is noted.
 3. A document distribution matrix and a method that provides overall control for document distribution shall be implemented.
 4. A filing system shall be defined and implemented for the Project.
 5. Requirements for receipt, distribution, and filing of submittals, specifications, material requisitions, and purchase orders shall be defined.
 6. The control of as-built information shall be defined.
 7. The method of controlling superseded, voided, and canceled design documents shall be defined.

1.18.6 Material Control

- A. Construction engineering requirements shall include procedures for material control at the jobsite. This includes providing technical oversight and direction for the control of materials at the jobsite along with controlling materials at the jobsite prior to installation.
- B. Construction engineering requirements shall include the following:
 1. Utilize a tracking log for products and materials to record when fabrication is completed by the vendor/supplier and inspected and approved for shipment; the shipping carrier, shipment date, and shipping number; and the scheduled and actual arrival at the jobsite.

2. Requirements for receiving, warehousing, and issuing all plant material, tools, and equipment for construction and installation. This shall include care and custody of material and equipment until issued for installation.
3. Requirements for developing the format and distribution of material status reports.
4. Site procedures for:
 - a. Receiving of all material, including HART-furnished materials and any third-party-provided materials.
 - b. Storage of permanent materials and equipment.
 - c. Preventative maintenance of permanent materials and equipment.

1.18.7 Reserved**1.18.8 Constructability Program**

- A. Constructability is the optimum use of construction knowledge and experience in planning, design, procurement, and field operations to achieve overall Contract objectives. Construction engineering shall include procedures for the coordination of the Contract constructability program, and shall include both the site construction organization and the design teams in the implementation of constructability efforts. Construction engineering shall also coordinate the collection and implementation of the Contract lessons learned.
- B. The constructability program shall include the following:
 1. A constructability coordinator to develop and implement a Contract Constructability Program.
 2. During the early design phase of the Work, the constructability coordinator shall develop a contract constructability action plan of potential Work improvement items. The action plan shall be reviewed with the design team for adoption.
 3. The constructability plan and ideas developed during the design stage shall be implemented by construction engineering during construction.

1.18.9 Reserved**1.18.10 Reserved****1.18.11 Reserved****1.18.12 Reserved****1.18.13 Construction Completion and Turnover**

- A. Construction engineering shall assist in establishing a plan for the completion and jurisdictional turnover of the Work to other HART contractors and HART.

- B. The turnover plan requirements shall include the following elements:
1. Define who will be responsible for scoping turnover packages or systems.
 2. Define how turnover scoping information will be controlled to identify changes and revisions.
 3. Define how construction completion walkthroughs and documentation reviews will be performed.
 4. Describe how punchlist activities will be controlled and who will be responsible for clearing individual punchlist items.
 5. After construction punchlist items are completed, establish criteria and schedules for final walkthroughs.
 6. Define who will provide the final approval and/or acceptance for the turnover package.
 7. Define any special tagging required to identify the physical boundaries of the turnover.
 8. Describe what documentation is required to accompany the final turnover package.
 9. Define what documentation, including required as-built information, will be submitted, in accordance with the Contract, to HART for its records after the turnover is completed.

1.19 COMPUTER-AIDED DESIGN (CAD) AND ELECTRONIC SUBMITTAL REQUIREMENTS

1.19.1 Section Contents

- A. This Section establishes the overall standards, policies and conventions used to execute CAD production by the Contractor and their subcontractors.

1.19.2 Format of Design Deliverables and Construction Drawings

- A. The Contractor shall prepare design and construction plans, related technical drawings and Record Drawings, utilizing CAD. Such plans and drawings shall strictly conform to HART CAD standards to assure consistency and quality within this Contract and relative to other HART contracts. Unless otherwise specified or pre-approved by HART, all CAD shall comply with HART's CAD Procedures and HART's Plans Standards. These two documents, together, are referred to as "HART's CAD Standards."
- B. Unless otherwise approved by HART, all Design and Construction Documents prepared under this contract shall be developed and presented in English units of measurement in common use in the United States.

1.19.2.1 CAD Standards Orientation

Within 30 days of NTP1 and prior to initiating CAD work, the Contractor shall review HART's CAD Standards and schedule an orientation with HART's CAD personnel.

1.19.2.2 CAD Conformance of All Drawings

The Contractor shall be responsible for conforming all project drawings to HART's CAD Standards. CAD files associated with many Reference Drawings are provided for the Contractor's convenience in the Reference Materials. Regardless of the source and the type of originating drawing from which the Contractor prepares its drawings and plans, the Contractor is responsible for compliance to HART's CAD Standards.

1.19.2.3 CAD Quality as Condition for Acceptance

Conformance to HART CAD standards will be part of the quality review process described in GCDB 7.11, Quality Assurance.

1.19.3 CAD File Management

AutoCAD, release 2014 or later, shall be used to prepare all drawings. All drawings shall be in English only. Translations or conversions from other CAD software to AutoCAD format will not be acceptable. The Contractor shall be responsible for procuring the AutoCAD software and managing the licenses.

1.19.4 Drawing Quality Control

- A. The Contractor will be required to audit their drawings throughout the development cycle and correct any discrepancies prior to submitting documents to HART.
- B. HART will conduct independent audits of the Contractor's CAD files.

1.19.5 CAD Drawing Requirements

- A. Each drawing shall include details necessary for the procurement, installation, maintenance, and repair of all components or facilities equipment provided. Change Order notices that are attached to drawings shall not constitute revised drawings. Each drawing shall include all changes and be updated to reflect the latest configuration. Except for As-Built drawings before they become Record Drawings, manual changes to hardcopy CAD drawings will be unacceptable, and only electronically generated changes are acceptable.

1.19.6 Reserved**1.19.7 Submittals**

- A. Drawing Submittals
 - 1. Drawing submittals shall be made electronically by posting submittal documents to CMS at a location determined by HART (See GCDB 7.8).
 - 2. Compressed files are not acceptable.

1.19.8 Drawing Turnover

Prior to Final Acceptance, the Contractor shall turn over all drawing files to HART, neatly organized.

1.19.9 Reserved**1.19.10 Contract Submittals**

- A. The Contractor shall upload submittals to CMS (see GCDB 7.8) according to dates specified on the Contract Submittals Schedules. The Contractor shall schedule submittals so that resubmittal, if required, will not impact the contract completion date.
- B. Submittals marked as "I" on the Contract Submittals Schedules shall be submitted in accordance with schedule dates to HART for its information. The Submittals marked as "R/C" on the Contract Submittals Schedules shall be submitted for review by HART. See PSR 1.11, Contract Submittals Schedule.

1.19.11 Electronic Review of Contractor Documents

Whenever feasible, submittals and submittal reviews will be handled electronically.

1.19.12 Revision Control

- A. Where revision and resubmittal is required, resubmittals shall retain their original document number and be clearly marked with a new revision number in the revision block. Changes shall be ballooned or a brief description of the change provided. Documents with multiple sheets, such as calculations, manuals, etc., shall be resubmitted as complete documents. Revised single sheets will not be accepted. Documents shall not be resubmitted until HART's comments from the previous submittal have been incorporated and resolved. Also see PSR 1.10.8.F regarding version control.

END OF CHAPTER

2.0 OPERATIONS

2.3 OPERATIONAL OBJECTIVES

Chapter 2, Section 2.3, of the CDC shall be supplemented with the addition of the following after the second paragraph:

The contractor shall refer to Core Systems Interface Reference Drawings, Section ATC, Chapter W-ICDD-Civil Works-Track Alignment for speeds associated with the train control design.

END OF CHAPTER

3.0 ENVIRONMENTAL CONSIDERATIONS

3.1 GENERAL

Chapter 3, Section 3.1, of the CDC shall be supplemented with the addition of the following statements:

The Contractor shall prepare the design and conduct construction activities such that no action or inaction on the part of the Contractor shall result in non-compliance with the requirements of laws applicable to the Project. The Contractor shall follow all of the HHCTCP FEIS and ROD mitigation requirements. The Contractor shall review HART's Mitigation Monitoring Program (MMP), prepare an Environmental Compliance Plan in accordance to the MMP, and monitor the Project throughout design and construction to confirm adherence to regulations, approvals, permits, and environmental performance standards. Where a regulatory agency has determined that no permit is required, the Contractor shall remain responsible for compliance with applicable laws and standards, including the Clean Water Act and Hawaii Administrative Rules (HAR) 11-54, Water Quality Standards. The design Environmental Compliance Plans are provided for your information as a reference document. A list of the pertinent MMIDs for the Airport Guideway and Stations work is also provided for your information as a reference document.

The FEIS was released in June 2010 and a Final Supplemental EIS and Amended Record of Decision (ROD) was released in September 2013. The FEIS, Amended ROD and additional information on the H RTP can be found at: <http://honolulutransit.org>. HART's Mitigation Monitoring Program is provided as Attachment E to the GCDB. In addition, post-ROD documents have been reviewed and approved by FTA and are included in the appendices.

If the Contractor works outside of the environmental constraints specified by the permits in place between HART and regulatory authorities, the Contractor shall identify and conduct any additional studies and inventories needed to address environmental impacts at no additional cost to HART.

3.2 RESERVED

3.3 CONTAMINATED MATERIALS AND WASTE

Chapter 3, Section 3.3, of the CDC is hereby amended by revising its title to "Contaminated Materials and Waste," deleting its contents in their entirety, and replacing its contents with the following PSR Sections 3.3.1 through 3.3.5:

The Contractor shall implement a field screening program to ensure that potentially contaminated materials and hazardous materials/waste as defined in the Contract Documents are identified in accordance with applicable environmental regulations. In conducting field screening for potential contaminated materials, utilize the information and procedures provided in Technical Specification Section 02 26 00, Discovery and Assessment of Suspect Contaminated Materials; the HART Programmatic Environmental Hazard Evaluation and Environmental Hazard Management Plan (EHE-EHMP); and applicable regulatory guidance.

A collection of environmental site assessments (ESAs) applicable to the DB Project are provided in Reference Materials for the convenience of the Contractor. The following is provided for information only and is a brief environmental contaminant screening summary of the known contaminants of potential concern as documented in the collection of site assessments.

3.3.1 Airport Guideway

The work area along the Airport Guideway was preliminarily screened for environmental hazards that may be encountered during intrusive subsurface work. A review of known or suspected contaminated sites within the work area was used for screening, along with information gathered during previous intrusive subsurface work for the HRTTP (i.e., geotechnical borings and Archeological Inventory Survey [AIS] trenches). This review identified four zones where contamination is considered to have a higher likelihood of being encountered see Environmental Screening, Maps of Area of Known Suspected Contamination, for locations of known and suspected contaminations. Consequently, the Contractor should anticipate contamination in these areas and implement specific handling to mitigate the potential for affecting workers and the environment. Contamination may be encountered in other areas along the Airport Guideway though the likelihood of encountering contamination is considered to be lower.

Zone 1 is located on Kamehameha Highway near the intersection with Halawa Drive. Known petroleum contamination associated with a former release from an abandoned Hickam Petroleum, Oils, and Lubricants (POL) pipeline is present within the Zone 1 work area. Petroleum-contaminated vapor, soil, groundwater, and free product is known to occur within the area. Work within the ST13 and ST13A Land Use Control (LUC) boundaries requires prior coordination with HART, NAVFAC, and HDOH. Work must be performed in accordance with requirements identified in the Environmental Hazard Management Plan for Sites ST13 and ST13A (NAVFAC, October 2012), also Appendix D in the Final Environmental Hazard Management Plan for Sites Associated with the Hickam POL Pipeline, Joint Base Pearl Harbor-Hickam, Oahu, Hawaii (NAVFAC, June 2014). During pre-construction activities associated with the Honolulu Rail Transit Project, petroleum contamination was identified in geotechnical borings based on elevated photoionization detector (PID) readings and the presence of free-product in one boring. Chemicals of potential concern (COPCs) are volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH)-diesel range organics (TPH-DRO), TPH-gasoline range organics (TPH-GRO), TPH-residual range organics (TPH-RRO), and metals (cadmium, chromium, lead). Depending on if the depth of the proposed work is above or below the groundwater table, different management plans will need to be completed. Soil and vapor management plans will be required for work conducted from 0 to 14 feet below ground surface (ft bgs) whereas water and free-product management plans will be necessary for work deeper than 14 ft bgs.

Zone 2 is located on Aolele Street between Paiea Street and Ohohia Street. Petroleum contamination was identified during geotechnical drilling and AIS trenching. Elevated PID readings, stained soil, and hydrocarbon odors were observed. It is likely that contamination will be encountered while working in this area. Contaminated soil and groundwater generated within this area must be managed in accordance with the Programmatic EHE-EHMP (HART, July 2014). COPCs are VOCs, PAHs, TPH-DRO, TPH-GRO, TPH-RRO, and metals (cadmium, chromium, and lead). Soil and vapor management plans will be required for work conducted from 0 to 12 ft bgs, whereas water and free product management plans will be necessary for work deeper than 12 ft bgs. Additional forms, such as Form D-3 (Inactive Pipeline and Underground Storage Tank [UST] Management Plan) or Form D-11 (Release Response Plan), may need to be completed if such situations are encountered during work.

Zone 3 is located along Nimitz Highway and Middle Street, near the H-1 freeway interchange. Petroleum contamination was identified during geotechnical drilling. Elevated PID readings, stained soil, and hydrocarbon odors were observed. It is likely that contamination will be

encountered in this area. COPCs are VOCs, PAHs, TPH-DRO, TPH-GRO, TPH-RRO, and metals (cadmium, chromium, lead). Soil and vapor management plans will be required for work conducted from 0 to 2 ft bgs, whereas water and free product management plans will be necessary for work deeper than 2 ft bgs. Additional forms, such as Form D-3 (Inactive Pipeline and Underground Storage Tank [UST] Management Plan) or Form D-11 (Release Response Plan), may need to be completed if such situations are encountered during work.

Zone 4 is located on Kamehameha Highway, just east of the Kalihi Stream. An unusual white powdery substance was identified during AIS trenching. The white powdery substance was encountered at 5 to 6 ft bgs within AIS Trenches 12 and 13. Soil sample analytical results indicated that no COPCs exceeded the HDOH Tier 1 residential environmental action levels (EALs), but the samples did have high pH values and high alkalinity. Crews should wear proper personal protective equipment (PPE) to prevent dermal contact. In addition, investigation of two nearby suspected contaminated Site Discovery and Remediation (SDAR) sites of interest resulted in identifying the following COPCs: VOCs, PAHs, TPH-DRO, TPH-GRO, TPH-RRO, and metals (cadmium, chromium, lead). Soil and vapor management plans will be required for work conducted from 0 to 5 ft bgs, whereas water and free product management plans will be necessary for work deeper than 5 ft bgs.

References:

1. HART. Revision 1 Programmatic Environmental Hazard Evaluation and Environmental Hazard Management Plan, Honolulu Rail Transit Project, Oahu, Hawaii. July 2014.
2. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20120921-0945, Revision 1. February 18, 2015.
3. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20140627-0950. November 21, 2014.
4. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20140701-1000. November 21, 2014.
5. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20140701-0958. November 21, 2014.
6. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20140718-0934. November 21, 2014.
7. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20140703-1054. November 21, 2014.
8. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20140218-1440. March 28, 2014.
9. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130909-1251. November 21, 2013.
10. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130808-1205. September 17, 2013.

11. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130719-1315. September 17, 2013.
12. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130719-1311. September 17, 2013.
13. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130626-1030. July 26, 2013.
14. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130620-1215. July 26, 2013.
15. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130522-0950. July 26, 2013.
16. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130327-1306. May 31, 2013.
17. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130320-1043. May 31, 2013.
18. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130319-1104. May 31, 2013.
19. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health Release ID 20130314-0830. May 31, 2013.
20. NAVFAC. Final Environmental Hazard Management Plan for Sites Associated with the Hickam Petroleum, Oils, and Lubricants System, Joint Base Pearl Harbor- Hickam, Hawaii. June 27, 2013.
21. NAVFAC. Environmental Hazard Management Plan for Site ST13, Subsites ST13 and ST13A, Hickam POL Pipeline, Joint Base Pearl Harbor-Hickam Hawaii. October 2012.

3.3.2 Pearl Harbor Naval Base Station

Based on readily available information, there is a slight potential that contamination will be encountered during construction activities at the future Pearl Harbor Naval Base Transit Station. However, soil and groundwater that cannot be reused on site may require testing and further coordination with HART prior to removal for offsite reuse.

The Station footprint intersects the site boundary of Hickam POL Site ST08. A remedial investigation conducted in 2008 concluded that there is no significant evidence of fuel impacts to subsurface soil or soil vapor (Parsons, 2008).

In addition to the Hickam POL site, there are four SDAR sites in the vicinity of the Station footprint. Navy Military Family Housing (MFH) Hale Moku, PHPWC Makalapa Landfill Area, and Navy MFH Makalapa are not located immediately adjacent and are cross gradient of the Station and are unlikely to impact work at the Station. One SDAR site, the Navy MFH Little Makalapa site, is located within the station footprint, east of Kamehameha Highway, just south of Radford Drive, and upgradient of the station. A review of the 2014 SDAR database indicated that organochlorine pesticides were found in soil at the Navy MFH Little Makalapa site, and that engineering controls

are required to manage the contamination. During pre-construction activities for the HRTP, five Archeological Inventory Survey trenches and three geotechnical borings were advanced within the Station footprint and boundary of the Navy MFH Little Makalapa site, and no visual or olfactory evidence of contamination was observed.

Contaminated soil generated within the Station footprint must be managed in accordance with the Programmatic EHE-EHMP (HART, July 2014). In addition to proper PPE and adherence to best management practices and institutional controls, a separate soil management plan will be required for any work conducted below the ground surface, as required per the programmatic EHMP.



- Geotech Boring Location
- HEER Release Site: Inside 150m zone
- HEER Release Site: Outside 150m zone
- LUST Site
- HART Release Site
- ▲ HPOL Site Boring
- SDAR Site within 150m of Rail
- FEIS Site of Concern
- SDAR and FEIS Area
- HPOL Site Boudnary
- Site with EHE-EHMP or Land Use Control (LUC)
- AIS Trench Location
- ▲ Pothole Location
- Transit Station
- HART Guideway
- Transit Station Footprint
- Guideway Buffer (150m)

References:

1. Environet, Inc. Environmental Baseline Survey to Support the Public-Private Venture of the Department of the Navy Housing, Pearl Harbor Complex, Camp Stover, NCTAMS PAC Wahiawa, Oahu, and PMRF, Kauai, Hawaii. August 2006.
2. Environet, Inc. Finding of Suitability to Support the Public-Private Venture of the Department of the Navy Housing, Pearl Harbor Complex, Camp Stover, NCTAMS PAC Wahiawa, Oahu, and PMRF, Kauai, Hawaii. August 2006.
3. HDOH. HEER Sites of Interest Lookup Spreadsheet (Updated 12/02/2014). Accessed online at: <http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/public-records>
4. Parsons. Final Phase 1 Environmental Site Assessment, Makalapa Naval Family Housing Area. September 2006.
5. Parsons. Final Pesticide Soil Management Plan, Ohana Military Communities, LLC, Public-Private Venture Housing- Hawaii. February 2007.
6. Parsons. Final Remedial Investigation Report for Upper and Lower Sites/Valve Pits, Hickam Petroleum, Oils, and Lubricants, Pipeline Facilities, Hickam Air Force Base, Oahu, Hawaii. June 25, 2009.

3.3.3 Honolulu International Airport Station

There is slight potential for petroleum contaminated soil to be encountered during construction activities at the future Honolulu International Airport Transit Station. However, available data suggests that contaminants present in vicinity are above unrestricted use criteria but below commercial/industrial use criteria suggesting that soil and groundwater does not appear to require special handling if reused on the site. Soil and groundwater will require further testing and coordination with HART prior to removal for offsite reuse.

There are several HDOH Hazard Evaluation and Emergency Response (HEER) release sites within a 150 meter radius of the Station. During pre-construction activities, five AIS trenches were advanced within the Station footprint. Laboratory analytical results for soil at two trenches indicated concentrations of benzo[a]pyrene exceeding the HDOH Tier 1 EAL. Benzo[a]pyrene was detected at trench A43 at 0.34 mg/kg and at trench A46 at 0.42 mg/kg above the EAL for unrestricted land use of 0.15 mg/kg, but below commercial/industrial EAL of 21 mg/kg. Several geotechnical borings were advanced within the Station footprint, and no visual or olfactory evidence of contamination was observed. Contaminated soil generated within this area must be managed in accordance with the Programmatic EHE-EHMP (HART, July 2014). A soil management plan will be required for work conducted from 0 to 6 feet. Additional forms, such as Form D-3 (Inactive Pipeline and Underground Storage Tank [UST] Management Plan) or Form D-11 (Release Response Plan), may need to be completed if such situations are encountered during work.

An environmental due diligence review was performed for the upgradient Leaking Underground Storage Tank (LUST) USPS site located at 3600 Aolele Street. This site has No Further Action (NFA) status and it was determined that the property is of low environmental risk and a Phase I ESA was not warranted.

In addition to the HEER release sites, there is one LUST site in the vicinity known as the FAA-HNL VORTAC site, which is located approximately 100 meters to the south and downgradient of

the station. A review of the 2014 LUST database indicated that site cleanup has been completed and the site has received a NFA status. No environmental hazards associated with the site are anticipated during construction activities at the Station. There are also several SDAR sites in the area, none of which are in the immediate vicinity (i.e., less than 150 meters) of the Station or located upgradient. These sites are unlikely to impact the Station.



- HEER Release Site
- LUST Site
- HART Release Sites
- ▲ HPOL Site Boring
- Hickam POL Pipeline
- HPOL Site
- EHMP/Land Use Control Boundary
- Site with Hazards/Controls
- TMK Boundary
- Site of Interest (SDAR)
- Trench Location
- 🚊 Transit Station
- HART Guideway
- Transit Station Footprint
- Guideway Buffer (150m)

Reference:

1. ASIG. Spill Investigation and Well Installation Report, Release Notification Case Number 20080822-1130, Plant 2 Hawaii Fueling Facilities Corporation (HFFC). May 13, 2009.

2. ERM. Closure Report: Diesel Spill Remediation, UAL Honolulu Cargo Facility, HDOH HEER Release Notification No.: 20051213-1653. March 30, 2006.
3. ERM. HFFC Honolulu International Airport Facility, 2010 Spill Closure Report, Airport Facility Fuel Tank Farm, 3201 Aolele Street, Honolulu, HI 96819. February 2010.
4. ERM. 2013 Annual Report, Groundwater Free-product Monitoring. March 2014.
5. FOPCO. Findings from Soil and Groundwater Samples, Miyazaki Service Station, Honolulu International Airport. March 22, 1999.
6. HART. Memo titled Environmental Due Diligence review of 3600 Aolele Street, Honolulu, HI 96820, Current location of US Postal Services.
7. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health, Release ID 20130207-1804. March 27, 2013.
8. HDOH. HEER Emergency Response Lookup Spreadsheet (Updated 12/02/2014). Accessed online at: <http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/public-records>
9. HDOH. Latest Hawaii UST/LUST data export (Updated Jan 15, 2015). Accessed online at: <http://health.hawaii.gov/shwb/ustlust-data/>
10. Weston Solutions, Inc. Site Assessment Report, Honolulu Intl Airport, Honolulu, Honolulu County, Hawaii. August 2013.

3.3.4 Lagoon Drive Station

There is known contamination within a limited area within the property that may be encountered during construction activities at the future Lagoon Drive Transit Station. Soil and groundwater will require testing and coordination with HART prior to onsite or offsite reuse as described herein and in more detail in the referenced documents.

Several previous environmental investigations have been performed for the Lagoon Chevron LUST site, located at 2604 Waiwai Loop. The site contains residual petroleum contamination in its soil and is managed with LUCs and an EHMP (Arcadis, January 2015). The TMK boundary of the Lagoon Chevron site is within the Station footprint, and it is likely that petroleum contamination will be encountered during construction of the Station. During pre-construction activities associated with the Honolulu Rail Transit Project, two of three geotechnical borings that were drilled on the former Lagoon Chevron site had elevated PID readings.

A Phase I ESA was performed at the Lagoon Chevron in February 2012 that identified seven former USTs located within the property as Recognized Environmental Concerns (RECs) (AECOM, May 2013). Two of the seven former USTs were documented to have leaked. A Phase II ESA was conducted in November 2013 (AECOM, March 2014), and the former gasoline station was subsequently demolished and the site was closed in 2014 (Arcadis, December 1, 2014). Additional delineation was performed after the gasoline station was demolished in 2014 (Arcadis, December 9, 2014). Laboratory analytical results indicate that TPH-DRO and TPH-RRO is present in the soil from 8 to 11 ft bgs at one location at concentrations exceeding the HDOH Tier 1 EAL for unrestricted use, lead is present in soil at 2.5 ft bgs at two locations at concentrations exceeding the HDOH Tier 1 EAL for unrestricted use or commercial/industrial land use, and

benzo[a]pyrene is present in soil from 0 to 5 ft bgs at one location at concentrations exceeding the HDOH Tier 1 EAL for unrestricted use. Petroleum-impacted soil and groundwater has been delineated. Soil and groundwater generated within the LUC boundary must be managed in accordance with the EHMP (Arcadis, 2015).

During the Phase I ESA conducted at the Lagoon Chevron property, the following adjacent property RECs were identified: the property Airport Shell, which has ongoing monitoring as part of a LUST case, and the Al Phillips drycleaners where tetrachlorethane waste was stored in leaking containers (AECOM, May 2013). There are several other LUST sites within 150 meters of the Station, all of which have received NFA status.

Contaminated soil, groundwater, and soil vapor encountered within the Lagoon Chevron property must be managed in accordance with the site-specific EHMP (Arcadis, January 2015). COPCs are VOCs, PAHs, TPH-DRO, TPH-RRO, and lead.

- **Soil Management Plan:** If work is proposed within the LUC boundaries and affected depths as indicated in the EHMP, contaminated soil is likely to be encountered and must be properly handled and managed. Contractor shall identify contaminated soil through visual or olfactory observations, field screening techniques (i.e., PID, x-ray fluorescence, etc.), and/or laboratory testing. Soil that is not suitable for backfill, contains free product, or is grossly contaminated will be removed by the Contractor and treated and/or disposed offsite at a permitted facility. Regular and routine inspections of contaminated soil management practices are required, and detailed records of field observations, excavation conditions, contents of soil stockpiles, waste hauling and disposal, and response activities must be maintained.
- **Groundwater and Free Product Management Plan:** If work is proposed to occur within the LUC boundary and below the groundwater table (7 ft bgs), contaminated groundwater may be encountered that contractor will need to manage in accordance with the groundwater management plan (Arcadis, January 2015). Contractor shall evaluate groundwater in open excavations and bore holes will be evaluated for evidence of contamination and proper handling and safety procedures will be followed by the Contractor during construction activities. If contaminated groundwater is encountered and dewatering becomes necessary, Contractor shall take measures to reduce the amount of sediment entering the pump. If petroleum hydrocarbon sheen or free product on groundwater is encountered, Contractor shall use oil absorbent booms and pads shall be used to create a barrier around the hose inlet to help reduce the amount of free-phase petroleum entering the pump. If contaminated groundwater cannot be re-infiltrated onsite, it must be treated and released in accordance with an approved National Pollution Discharge Elimination System (NPDES) permit, or discharged into appropriate tanks or containers for subsequent treatment and/or disposal. If disposal of groundwater becomes necessary, Contractor shall collect a representative water sample from each tank or container used to store liquid for waste characterization purposes.
- **Vapor Management Plan and Vapor Intrusion Management:** In the event vapor contamination is encountered during excavation work, the Contractor shall implement response actions should be in conformance with HDOH and U.S. Environmental Protection Agency (USEPA) regulatory guidelines. Appropriate response actions include ensuring that onsite workers utilize proper PPE and that the general public is not adversely affected. Air monitoring (using a PID) is required during excavation and handling of contaminated media. Air monitoring will also be required when workers enter excavations where contaminated media or the potential for hazardous atmosphere is present. If VOC vapor concentrations in the workspace atmosphere exceed an 8-hour time-weighted average (TWA) of 20 parts per

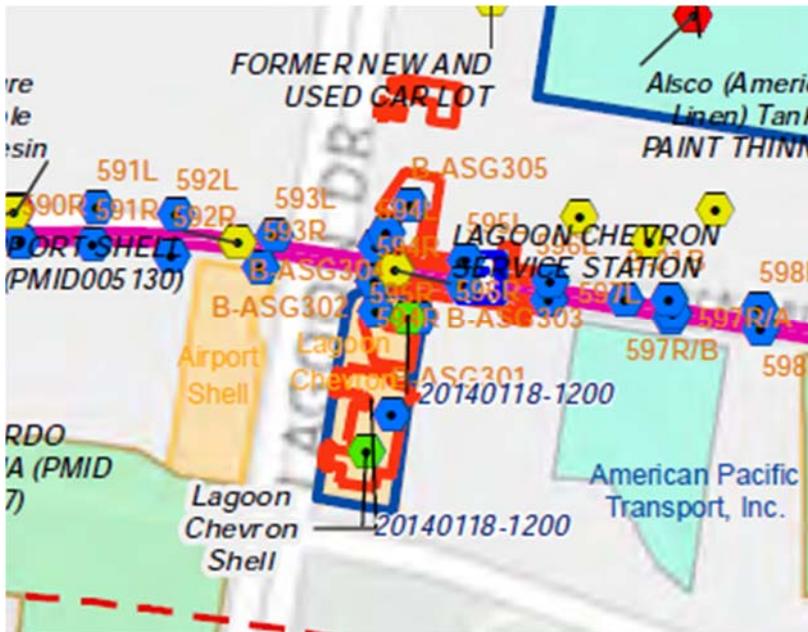
million (ppm) or a 15-minute short-term exposure limit (STEL) of 100 ppm, as PPE requirements, the Contractor shall implement controls including upgrading PPE to Level C and considering a modified work schedule. A soil vapor intrusion study is recommended if any new structures are built at the Site in areas where the potential for vapor intrusion exists (ARCADIS, January 2015). If soil vapor intrusion studies indicate that vapor intrusion is a hazard, HDOH must be consulted to determine adequate protective measures prior to construction, which may include a soil vapor barrier, active or passive venting, or institutional controls (e.g., routine floor inspections and maintenance to ensure the vapor barrier created by the building's floor/slab is maintained adequately).

The Station footprint will also intersect the TMK boundary of the 515 Lagoon Drive property, formerly used as a rental car facility and a dry cleaning facility.

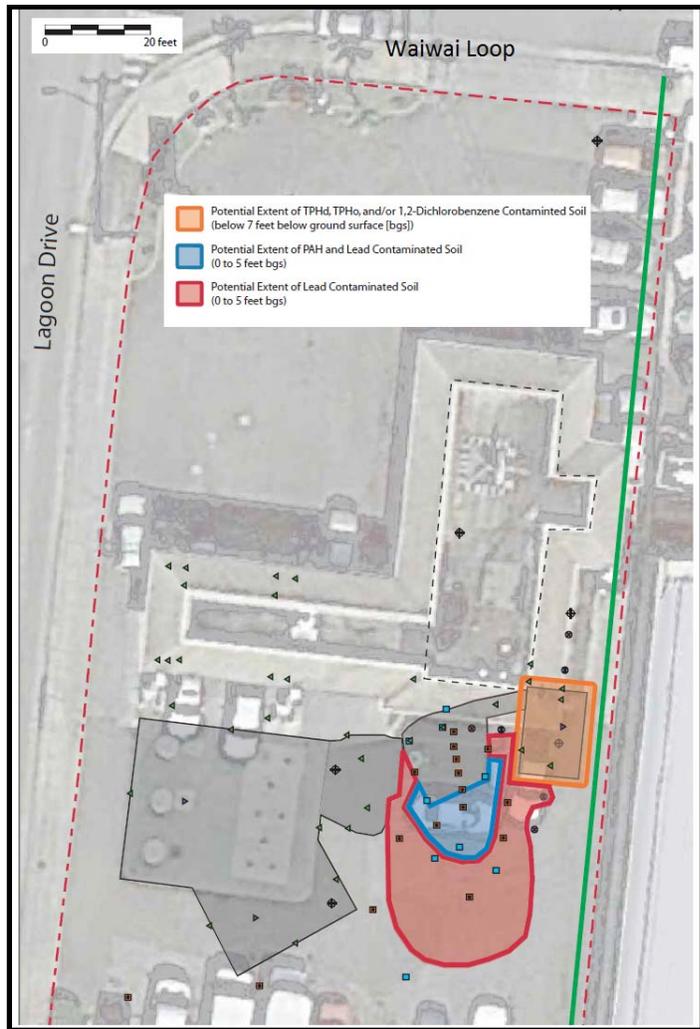
At the 515 Lagoon Drive property, a passive soil vapor survey was conducted in 2002 at the site (a former dry cleaning facility) to evaluate halogenated VOC and TPH-DRO concentrations. Tetrachloroethylene (PCE) vapors were detected in 19 of 24 samples, with two separate hotspots being observed. Trichloroethylene (TCE) vapors were detected in 9 of 24 samples collected, 7 of which were located in the garment cleaning portion of the facility. TPH-DRO was detected in 1 of 24 samples (sample module SV-20) located near the turn in the UST piping in the northeast end of the warehouse. The soil vapor results were acquired using temporary vapor probes, which measure the mass of contaminant adsorbed in the probe but do not provide an accurate estimate of actual soil vapor concentration. The potential for vapor intrusion at this site or the adjacent properties was determined unknown. The risk to future construction workers excavating below the slab of the existing building was also determined unknown.

A Phase I and Phase II ESA were conducted that identified petroleum and dry-cleaning related chemicals in subsurface soil confirming that releases occurred at the site in the past (AECOM, May 2013; AECOM, June 2013). All chemicals in soil and groundwater samples were detected at concentrations below the HDOH Tier 1 EALs for unrestricted land use. However, it was concluded that there is potential significant contamination from halogenated volatile organic compounds (HVOCs) within soil vapor at the site. Based upon the results of the 2002 passive soil vapor survey and the previous limited Phase II ESA, the Phase II ESA (AECOM, June 2013) report concluded that the TPH-DRO contamination was sufficiently delineated; however, the extent of PCE contamination of soil and groundwater in the area of the warehouse and the office was not delineated. The site is currently scoped for the construction of a future HART station. Therefore, it is recommended that an additional subslab soil gas (within the existing structure) and exterior soil vapor (across the site property) investigation be performed to evaluate the potential for vapor intrusion at the site prior to any invasive construction activities taking place.

In addition to the HEER Release Sites and LUST sites, there are several SDAR sites within 150 meters of the Station, all of which have received NFA status. One SDAR site, Alsco (American Linen) Tank, is located upgradient of the Station. Residual petroleum contamination may be present, and the site is managed with land-use controls.



- Geotech Boring Location
- HEER Release Site: Inside 150m zone
- HEER Release Site: Outside 150m zone
- LUST Site
- HART Release Site
- ▲ HPOL Site Boring
- SDAR Site within 150m of Rail
- FEIS Site of Concern
- SDAR and FEIS Area
- - - HPOL Site Boundary
- Site with EHE-EHMP or Land Use Control (LUC)
- ▲ AIS Trench Location
- ▲ Pothole Location
- Transit Station
- HART Guideway
- Transit Station Footprint
- - - Guideway Buffer (150m)



Reference:

1. AECOM. Phase II Environmental Site Assessment, 515 Lagoon Drive, TMK: (1) 1-1-016:015, Honolulu, Oahu, Hawaii. June 2013.
2. AECOM. Phase I Environmental Site Assessment, 479 Lagoon Drive/ 2604 Waiwai Loop, TMK: (1) 1-1-016:014, Honolulu, Oahu, Hawaii. May 2013.
3. AECOM. Phase I Environmental Site Assessment, 515 Lagoon Drive, TMK Number: (1) 1-1-016:015, Honolulu, Oahu, Hawaii. May 2013.
4. AECOM. Hazardous Materials Survey Report, 515 Lagoon Drive, TMK: (1) 1-1-016:015, Honolulu, Oahu, Hawaii. December 2013.
5. AECOM. Phase II Environmental Site Assessment, 479 Lagoon Drive/ 2604 Waiwai Loop, TMK: (1) 1-1-016:014, Honolulu, Oahu, Hawaii. March 2014.

6. Arcadis. Notification for Underground Storage Tank Site Closure, Lagoon Chevron #9-5570, HDOH Facility ID 9-101221, 2604 Waiwai Loop, Honolulu, Oahu, Hawaii. December 1, 2014.
7. Arcadis. Additional Delineation and Remediation Technical Memo, Former Lagoon Chevron #9-5570, 2604 Waiwai Loop, Honolulu, Oahu, Hawaii 96819. December 9, 2014.
8. Arcadis. Environmental Hazard Evaluation, Lagoon Chevron Station #95570, 2604 Waiwai Loop, Honolulu, Oahu, Hawaii 96819. January 6, 2015.
9. Hawaii Hazardous Substance Written Follow-Up Notification, State of Hawaii Department of Health, Release ID 20140118-1200. March 28, 2014.
10. HDOH. HEER Sites of Interest Lookup Spreadsheet (Updated 12/02/2014). Accessed online at: <http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/public-records>
11. HDOH. Latest Hawaii UST/LUST data export (Updated Jan 15, 2015). Accessed online at: <http://health.hawaii.gov/shwb/ustlust-data/>
12. LFR Levine-Fricke. Underground Storage Tank Removal and Long-Term Release Response Report, Lagoon Chevron Service Station, 2604 Waiwai Loop, Honolulu, Hawaii, DOH Facility No. 9-101221, Release No. 980241, Chevron Facility No. 95570. March 2, 2000.

3.3.5 Middle Street Transit Center Station

There is potential for petroleum contaminated soil to be encountered within a limited area in the vicinity of guideway column 626 and within the Middle Street Intermodal Center site during construction activities at the future Middle Street Transit Center Station. Soil and groundwater removed from these areas will require further testing and coordination with HART prior to removal for offsite reuse.

The northernmost tip of the Station footprint will intersect the TMK boundary of the Middle Street Intermodal Center SDAR site. Based on previous investigation findings, subsurface soil at some locations of the project site is expected to be contaminated with TPH, VOCs, PAHs, organochlorine pesticides, dioxins/furans, polychlorinated biphenyls (PCBs), and metals. This residual contamination is present in soil and groundwater at concentrations exceeding HDOH Tier 1 EALs for unrestricted or commercial/industrial land use. This site is managed with institutional controls, and has an Environmental Management Work Plan in place (HART, August 2013). Accordingly, the Contractor shall manage soil, groundwater, and stormwater generated within the site boundary in accordance with the Environmental Management Work Plan:

- **Soil Management Plan:** Contractor must properly handle and manage contaminated soil. Contractor shall identify contaminated soil through visual or olfactory observations, field screening techniques (i.e., PID, x-ray fluorescence, etc.), and/or laboratory testing. Soil that is not suitable for backfill, contains free product, or is grossly contaminated shall be removed and treated and/or disposed of offsite at a permitted facility. Regular and routine inspections of contaminated soil management practices are required, and detailed records of field observations, excavation conditions, contents of soil stockpiles, waste hauling and disposal, and response activities must be maintained.

- Groundwater Management Plan:** The Contractor shall evaluate groundwater in open excavations and bore holes for evidence of contamination and shall follow proper handling and safety procedures during construction activities. If contaminated groundwater is encountered and dewatering becomes necessary, measures must be taken to reduce the amount of sediment entering the pump. If petroleum hydrocarbon sheen or free product on groundwater is encountered, oil absorbent booms and pads shall be used to create a barrier around the hose inlet to help reduce the amount of free-phase petroleum entering the pump. If contaminated groundwater cannot be re-infiltrated onsite, it must be treated and released in accordance with an approved NPDES permit, or discharged into appropriate tanks or containers for subsequent treatment and/or disposal. If disposal of groundwater becomes necessary, the Contractor shall collect a representative water sample from each tank or container used to store liquid for waste characterization purposes.
- Stormwater Management Plan:** Contractor shall take appropriate response actions to verify that stormwater is not exposed to contaminated media. Contaminated soil stored in roll-off boxes or stockpiles must be covered with plastic sheeting to reduce the potential or dust generation and to prevent contact with rainwater and stormwater runoff. The Contractor shall implement engineering controls to prevent stormwater from entering the construction areas, and to capture stormwater that has become contaminated.

Other SDAR sites in the vicinity include the Gaspro Honolulu site, located adjacent to the Station, which has been given NFA status, and the Yee Hop Property site, located upgradient of the Station, which has ongoing assessment and where the hazard is undetermined.

Several Release Sites were identified in the vicinity during pre-construction activities associated with the H RTP. These sites are located cross gradient of the Station and are unlikely to impact the Station.

There are several LUST sites in the vicinity of the Station, all of which have received NFA status.



- Geotech Boring Location
- HEER Release Site: Inside 150m zone
- HEER Release Site: Outside 150m zone
- LUST Site
- HART Release Site
- ▲ HPOL Site Boring
- SDAR Site within 150m of Rail
- FEIS Site of Concern
- SDAR and FEIS Area
- HPOL Site Boudnary
- Site with EHE-EHMP or Land Use Control (LUC)
- AIS Trench Location
- ▲ Pothole Location
- Transit Station
- HART Guideway
- Transit Station Footprint
- Guideway Buffer (150m)

Reference:

1. Ecology and Environment. CERCLA Site Inspection, Gaspro Inc., 2305 Kamehameha Highway, Honolulu, HI 96819, Honolulu County. April 25, 1987.
2. HART. Environmental Management Work Plan. Middle Street Intermodal Center Property, 611 Middle Street, Honolulu, Hawaii, TMK Numbers: 1-2-018:003 and 1-2-018:009. August 2013.
3. HDOH. HEER Sites of Interest Lookup Spreadsheet (Updated 12/02/2014). Accessed online at: <http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/public-records>
4. Masa Fujioka & Associates. Hazardous Materials Survey, Yee Hop Realty, Ltd. Property at Middle St. and Kamehameha Hwy., TMK (1) 1-2-18: Parcels 1, 2, 3, 9, and 10, and TMK (2) 1-2-17: Parcels 3, 4, and 5, Kalihi, Oahu, Hawaii. September 2001.

3.8 NAVIGABLE WATERS AND COASTAL

Chapter 3, Section 3.8, of the CDC shall be supplemented with the addition of the following statements after the last paragraph:

Per the letter from the United States Coast Guard, dated December 23, 2008, Kalihi Stream, Moanalua Stream, and Halawa Stream are navigable and subject to Coast Guard jurisdiction. Pursuant to 33 *Code of Federal Regulations* (CFR) 115.70, the Coast Guard grants advance approval to the location and plans for the guideway. The letter is provided in the Reference Materials for the convenience of the Contractor. Any deviation from the current designs at these locations may require United States Coast Guard re-approval.

Portions of the Airport Guideway and Stations work fall within the Special Management Area (SMA). The SMA permit designates the area near the Aloha Stadium as Area C and Keehi Lagoon

Park as Area D. The Contractor shall comply with all of HART’s SMA permit conditions (included in the Reference Materials).

The following Table 3.8 represents the maximum number of columns that are allowed in the following streams in compliance with the conditions stated in the HART-obtained permits. Any deviation from the conditions stated in the permits will require the Contractor to obtain additional approvals from the United States Coast Guard and United States Army Corps of Engineers. Also refer to PSR 9.2.1.

Table 3.8 – Airport Section Navigable Waters (1)

Navigable Waters	Maximum Number of Columns (or as Permitted)
Halawa Stream	1
Moanalua Stream	3
Aolele Ditch (2)	0
Kalihi Stream (3)	4

1. The Contractor shall obtain other permits necessary for construction work in streams, including Floodway Permit, Flood Hazard District Certification, Flood Fringe District Certification, and Certification of a "No Rise" Determination for a Proposed Floodway Development (see PSR 6.3.7 for additional details).
2. No work shall occur below the Mean Higher Water mark for Aolele Ditch.
3. The Contractor shall comply with mitigation measures and monitoring requirements contained in permit and certification applications and their appended documents. Such documents include, but are not limited to, Site-Specific Construction Best Management Practices (SSCBMPs) and the Applicable Monitoring and Assessment Plan (AMAP). If there is a discrepancy between application material and permit provisions or conditions, the latter shall take precedence.

3.9 ECOLOGICALLY SENSITIVE AREAS

Chapter 3, Section 3.9, of the CDC shall be supplemented with the addition of the following statement after the last paragraph:

Per MMID CON 23 from the MMP, the Contractor shall conduct a pre-construction survey of the large canopy trees for the presence of white tern chicks. The Contractor shall provide documentation of the pre-construction survey for HART’s review prior to the start of construction.

3.9.1 Vegetation and Landscaping

Section 3.9.1 of the CDC shall be supplemented with the addition of the following statement after the last paragraph:

The landscaping designs shown in the Median Landscaping RFP Drawings have been reviewed for compliance with the FEIS and ROD mitigation requirements. Refer to Chapter 11, Landscape Architecture, for additional information.

3.13 HISTORIC PROPERTIES AND PARKLANDS

Chapter 3, Section 3.13, of the CDC shall be supplemented with the addition of the following statements after the last paragraph:

The Section 106 Programmatic Agreement has been provided as Attachment D to the GCDB. The Contractor shall comply with the following stipulations listed below:

- A. Stipulation III.A.1: The Area of Potential Effect (APE) for archaeological resources is defined as all areas of direct ground disturbance by the Project. This APE for archaeology includes any areas excavated for the placement of piers to support the elevated structures, foundations for buildings and structures, utility installation, grading to provide parking, or other construction-related ground disturbance, including preparation of construction staging areas. The APE includes the new location of any utilities that will be relocated by the Project. All work for the Project, including but not limited to staging areas and utility relocations, shall be within the defined APE for archaeological resources.
- B. Stipulation III.C.5: The Airport AIS Plan, Addendum, and Report was accepted by SHPD on August 26, 2013, and is available at the following link: <http://honolulutransit.org/planning/iii-identification-and-protection-of-archaeological-sites-and-burials.aspx>. The Contractor shall comply with the accepted Plans and Report.
- C. Stipulation III.E.1: The Archaeological Monitoring Plan (AMP) dated February 2014, was accepted by SHPD on February 21, 2014, and is available at the following link:
 - 1. Airport AMP: <http://honolulutransit.org/media/230499/20140201-Final-Airport-Arch-Monitoring-Plan.pdf>
 - 2. Airport AMP Acceptance Letter: <http://honolulutransit.org/media/232671/20140221-final-AMP-Airport-dlnr.shpd.Lebo.pdf>
- D. In addition, the Contractor shall provide archeological and cultural monitors per the AMP and the Draft Cultural Monitoring Plan (CMP) provided in the Reference Materials.
- E. The Contractor shall maintain 5 feet of separation between ground disturbances and burial sites identified in the Burial Treatment Plan. Where the Contractor proposes ground disturbances within 10 feet of identified burial sites, the Contractor shall submit details, sections, means, and methods to HART for review at least 30 days prior to construction activity. Submittal shall include sheet piling or other burial site protection acceptable to HART.
- F. Stipulation XII.B: The Contractor shall comply with this stipulation regarding the inadvertent discoveries of historical or archaeological finds, including burials, during construction operations.
- G. Stipulation XII.D: Any human remains found on lands owned or controlled by the Federal government will be addressed in accordance with the Native American Graves

Protection and Repatriation Act (NAGPRA), in coordination with the affected land management agency.

All work for the Project, including but not limited to staging areas, storage yards, and utility relocations, within the APE for historic architecture resources has regulatory clearance (unless specifically mentioned). Any areas outside of the APE for historic resources used for the work for the Project, including but not limited to staging areas, storage yards, and utility relocations, are subject to additional regulations and will likely require environmental clearance.

No permanent features of the Project (guideway, station, ancillary buildings, etc.) shall be located on the makai side of the Kamehameha Highway ROW boundary, which are areas within the Pearl Harbor National Landmark Boundary. See U.S Naval Base Pearl Harbor National Landmark Boundary in the Reference Materials.

The Contractor shall comply with the conditions in the Keehi Lagoon Beach Park De Minimis Letter. No work is intended to impact public access to the lighted tennis courts mauka of the guideway alignment between Stations 1223+50 and 1226+50. Should the Contractor's means and methods result in the Contractor obtaining a temporary construction easement that impacts access to these tennis courts, the Contractor will be required to make improvements to at least 4 tennis courts near the entrance to the park at Lagoon Drive. These improvements shall include the addition of lighting and resurfacing of the playing surface to conform to the commitments made in the Final Environmental Impact Report. No additional compensation will be provided for improving these tennis courts. This impact would need to be documented because of its 4(f) regulatory compliance. The Contractor shall provide graphic renderings and narrative descriptions that may be used to document such changes. See Concurrence on Determination of De Minimis Impact Under Section 4(F) for Ke'ehi Lagoon Beach Park that is provided in the Reference Materials.

3.15 AESTHETICS / VISUAL

Chapter 3, Section 3.15 of the CDC shall be supplemented with the addition of the following statements after the last paragraph:

The Contractor shall take care to create a structure that is aesthetically pleasing from all angles of public view. Detailed design drawings shall be submitted showing aesthetic treatment for the superstructure guideway, sound barriers and railings, guideway columns, and surface treatments of columns and pier caps for HART's review and comment during development of the design. The overall form of the guideway columns and pier caps should be consistent with the shapes depicted in the Prescriptive and Guidance Drawings.

Designated guideway columns shall receive aesthetic treatment in accordance with PSR 9.7.1 and the Prescriptive Drawings.

The design of the guideway elements shall be considered as integrated components to establish an overall aesthetic theme consistent with the design guidelines established by the Design Language Pattern Book. The Contractor shall use scale, shape and texture, and the effects of light and shadow to create a guideway design that minimizes the visual impact of the structure. Control joints shall be an integral part of the design. Surface treatment shall be designed to work with areas that will have anti-graffiti coatings so as to create an integrated design. Provide mock-ups of finishes prior to fabrication. The entire guideway structure shall

be free of excessive honeycombing. Patch holes and imperfections in accordance with the Guidance Technical Specifications.

The Programmatic Agreement has been provided as Attachment D to the GCDB. The Contractor shall comply with following stipulations listed below:

- A. Stipulation IV.A: The Contractor shall comply with the Honolulu High Capacity Transit Project (HHCTCP) Design Language Pattern Book.
- B. Stipulation IV.A: For the Pearl Harbor Naval Base Station (stations within the boundary or directly adjacent to an eligible or listed historic property), the Contractor shall comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR 68), and will make every reasonable effort to avoid adverse effects on historic properties.
- C. Stipulation IV.A: The Contractor shall adhere to the consultation and concurrence that has already occurred with the Consulting Parties on the Pearl Harbor Naval Base Station. The comments are available at the following links:
 - 1. HART Response to Comments FD Plan Review:
<http://honolulutransit.org/media/232369/PearlHarborNavalBaseStation-Final-Design-COMMENTS.pdf>
 - 2. October 2013 Update Response to Comments PE Plan Review:
<http://honolulutransit.org/media/213728/2013-11-12-MS-LD-PH-design-Mtg-App-F.pdf>
- D. If the Contractor deviates from the concurrence discussed above, the Contractor may need to develop a Treatment Plan for the Pearl Harbor Station.

Stipulation IV.C: If there are substantial changes from the Pearl Harbor Naval Base station, the Contractor shall submit preliminary design plans (through HART) to the Consulting Parties for their review.
- E. Stipulation IV.B: HART is required to conduct one additional neighborhood design meeting for all four of the Airport Stations. The Contractor shall work with HART and provide any necessary exhibits for the neighborhood design meeting.

3.16 RESERVED

3.17 NOISE AND VIBRATION

3.17.2 Criteria for Wayside Noise

Chapter 3, Section 3.17.2 of the CDC shall be supplemented with the addition of the following:

Wheel skirts are not anticipated. Sound barrier noise attenuation shall comply with FEIS Table 4-16, FTA Transit Project Noise Impact Criteria, Land Use Categories; and Figure 4-52, FTA Transit Noise Exposure Impact Criteria.

3.17.4 Ground-Borne Noise from Train Operations

Chapter 3, Section 3.17.4, of the CDC shall be supplemented with the addition of the following:

Contractor shall to prepare a design stage noise and vibration study for the Project System operations phase that includes obtaining and analyzing Project System design and operational characteristics for both noise and vibration inputs from the Core Systems Contractor. The Contractor shall provide any additional noise and vibration mitigation required for the fixed facilities design to meet the criteria in the Final EIS.

3.17.7 Construction Noise and Vibration

Chapter 3, Section 3.17.7, of the CDC shall be supplemented with the addition of the following Subsections 3.17.7.A and 3.17.7.B:

- A. The Contractor shall comply with all HART-obtained Noise Permit and Variance conditions, including but not limited to, standard construction equipment (light impact and heavy impact) and listed work hours. Should the Contractor's design or means and methods require permit or variance modifications, the Contractor shall be responsible for assisting HART in obtaining the modifications (and renewals) at no additional cost to HART or be entitled to an extension of time resulting from delays in permit or variance modification approval.
- B. The Contractor shall comply with Programmatic Agreement Stipulation X.A.
 - 1. During final design, the Contractor shall develop a Construction Mitigation Plan (CMP). The CMP shall include a Noise and Vibration Mitigation Plan. Per requirements to be included in the FTA ROD and FTA guidance entitled Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06 (2006) (FTA Guidance Manual), the Contractor shall perform quantitative assessments of both noise and vibration. Noise and vibration control plans will be updated every 6 months. The updated plans should predict the construction noise and vibration impacts at sensitive receptor locations based upon the proposed construction equipment and methods. Appropriate construction plan noise and vibration mitigation measures shall be employed as identified in FTA's Guidance Manual.
 - 2. Numeric limits and monitoring measures will be developed to minimize noise and vibration impacts. Vibration criteria included in Table 12-3, Construction Vibration Damage Criteria, of the FTA Guidance Manual will be applied. Note that most historic properties in the corridor are non-engineered timber or masonry; a criterion of 0.2 inches per second of peak particle velocity would be applicable to these structures. Noise and vibration mitigation strategies will be included in the Noise and Vibration Mitigation Plan.

END OF CHAPTER

4.0 TRACK ALIGNMENT AND VEHICLE CLEARANCES

4.1 GENERAL

Chapter 4, Section 4.1, of the CDC is hereby amended by adding the following:

The Contractor shall comply with the Operational objectives and requirements of CDC 2.3.

4.2 RAIL TRANSIT ALIGNMENT

4.2.1 General

Chapter 4, Section 4.2.1, of the CDC is hereby amended by deleting its first paragraph in its entirety and replacing it with the following:

In accordance with CDC 2.3.3.1.A, the track alignment shall be designed to accommodate a design speed up to a maximum of 55 miles per hour (mph). Physical constraints along various portions of the system, together with other design limitations, may not permit a design speed of 55 mph, and in such locations, the design speed may be reduced. However, the Contractor's design shall be coordinated with the speeds associated with the train control design. In no case shall the civil design speed be less than the ATO speeds as defined in Core Systems Interface Reference Drawings, Section ATC, Chapter W-ICDD-Civil Works-Track Alignment.

Chapter 4, Section 4.2.1, of the CDC shall be amended with the addition of Section 4.2.1.1 at the end of the Section:

4.2.1.1 Constraints

The Contractor is constrained to both the vertical and horizontal track alignment as found on the Airport Guideway RFP Drawings:

- Track Alignment Plan & Profile – Airport Guideway RFP Drawings, drawings TA001 through TA0028
- Track Alignment Data – Airport Guideway RFP Drawings, drawings TA0101 through TA0107

Chapter 4, Section 4.2, of the CDC is hereby amended by adding the following Subsection 4.2.5:

4.2.5 Pre-Approved Track Alignment

The track alignment, including horizontal and vertical geometry, superelevation and location of special trackwork as shown on the Airport Guideway RFP Drawings shall be considered approved by HART, including the pre-approved criteria deviations inherent in this Prescriptive design. Contractor shall verify the design of these elements and include said design in its signed and sealed Construction Drawings. See related PSR 1.7.1.D, Pre-Approved HART Design Deviations.

4.3 VEHICLE CLEARANCES

4.3.2 Clearance Envelope

Chapter 4, Section 4.3.2.A, of the CDC is hereby amended by adding the following Subsection 4.3.2.A.5:

5. The Contractor shall utilize the Vehicle Dynamic Envelope, including vehicle inswing/outswing and superelevation effects, as provided by the vehicle supplier in the Core Systems Interface Reference Drawings, Section Passenger Vehicle, Dynamic Envelope. Other Wayside Factors and Running Clearances, as described below, shall be added to the Vehicle Dynamic Envelope to obtain the Clearance Envelope.

END OF CHAPTER

5.0 TRACKWORK

5.1 GENERAL

5.1.3 Related System Interface

Chapter 5, Section 5.1.3, of the CDC shall be supplemented with the addition of the following:

The Contractor shall comply with the Operational objectives and requirements of CDC 2.3.

Chapter 5, Section 5.1.4, of the CDC shall be supplemented with the addition of the following:

5.1.4 HART-Furnished Materials

Certain materials to be incorporated into the Contractor’s work have been procured by HART under a separate contract and will be provided to the Contractor as HART-furnished materials in accordance with GCDB 7.27, HART-Furnished Products. The items provided by HART, the available quantity, and the locations where they will be made available to the Contractor for pickup are as follows:

Table 5.1.4 – Materials Provided by HART

Item	Available Qty	Location*
115# High Strength Running Rail, TNS	2,041	S
Restraining Rail, LF	1,940	S
Powered Switch Machines, EA	16	S
Direct Fixation Fasteners, EA	43,213	P
#10 Double Crossovers, EA	4	P
Contact Rail (39-foot segments), EA	1,417	S
Contact Rail Splice Joint Assembly, EA	1,533	P
Contact Rail Support Insulator Assembly (10-foot spacing), EA	5,658	P
Contact Rail Mid-Point Anchor Assembly, EA	116	P
Contact Rail End Approach (10'-9 11/16" long), EA	75	P
Contact Rail End Approach (6'-9 11/16" long), EA	35	P
Contact Rail Expansion Joint Assembly (795-foot spacing), EA	58	P
Contact Rail Coverboard (10-foot sections) (EA)	5,590	P
Contact Rail Coverboard expansion joints (EA)	58	P

*Location: "S" denotes Sause Storage; "P" denotes Pasha Storage

Sause Storage (91-550 Malakole Street, Kapolei, HA 96707)

1. These materials occupy an area approximately 3.5 acres and are not stored in containers, except for the switch machines.
2. The switch machines are stored in containers to shelter them from the elements.

3. The existing agreement includes a provision for the items to be loaded for the Contractor at the Sause Storage by Sause Brothers, but does not include transport.
4. The Contractor shall inventory, inspect, accept, and take possession of said materials within 90 days after NTP1.

Pasha Storage (1730 Kitty Hawk - NAS - Barbers Point, Kapolei, HI 96707)

1. These materials occupy an area approximately 4 acres of a laydown area. The layout provides ingress and egress for trucks on AC pavement.
2. The Pasha Storage area is protected with 8-foot-high, chain-link temporary perimeter fencing with two openings (ingress and egress) and four swinging chain-link gates at 10 feet wide each.
3. The Contractor shall be responsible to load, transport, and unload designated material for other contracts from the Pasha Yard.
4. The Contractor shall inventory, inspect, accept, and take possession of said materials within 90 days after NTP1.

If additional quantities of any of the above-tabulated components are required to completely construct the work, the Contractor shall be responsible for furnishing the additional material.

5.3 TRACK TYPES

5.3.1 Mainline Ballasted and Direct Fixation Track

Chapter 5, Section 5.3.1, of the CDC shall be amended by adding the following statement to the end of the first paragraph:

The Contractor shall not use Plinthless track construction. The Contractor shall coordinate plinth gaps with the Core Systems Contractor to allow Core Systems Contract (CSC) cabling such as cross bonds and Automatic Train Control cables to be routed as efficiently as possible.

5.7 RAIL

5.7.4 Rail Lubricators

Chapter 5, Section 5.7.4, of the CDC is hereby deleted in its entirety and replaced with the following:

Wayside rail lubricators shall be considered in the development of the design and details for the guideway. Locations of wayside rail lubricators are indicated in the Airport Guideway RFP Drawings, drawings TA0001 through TA0028. Anticipated loads associated with the wayside track lubricators are found in PSR 9.2.2. The Contractor's design shall account for the loads of the wayside rail lubricators and shall make provisions for electrical feed to the wayside rail lubricators. The electrical feed shall not be visible to the general public. The Contractor is not responsible for the procurement and installation of the wayside rail lubricators.

5.13 EMERGENCY GUARD RAIL

Chapter 5, Section 5.13, of the CDC shall be deleted in its entirety and replaced with:

Installation of emergency guard rail for the sole purpose of preventing derailment is not a requirement of the Project.

5.17 SPECIAL TRACKWORK**5.17.4 Switches**

Chapter 5, Section 5.17.4, of the CDC shall be supplemented with the addition of the following statement:

- F. Ansaldo STS M-3 type switch machine. See Core Systems Reference Drawings, Section Trackwork Chapter Direct Fixation Switch Machine for details.

5.18 TRACK CROSSINGS – PEDESTRIAN AND ROADWAY**5.18.1 Emergency Pedestrian Track Crossings – Mainline**

Chapter 5, Section 5.18.1, of the CDC, paragraph one, shall be replaced with the following:

The aerial guideway with direct fixation track shall include designated emergency walkways for pedestrians evacuating non-functioning vehicles or trains. When the walkways reach an area of special trackwork, it is required to transition from the center of the guideway to the edge of the guideway. The crossing walkways shall be configured to provide clearance from the direct fixation track installation, and any nearby plates, covers, equipment, or other material shall be bolted in place. The crossing panel surface shall be ¼-inch below the top of rail head. The gauge side flangeway shall be 2-½ inches wide.

Chapter 5, Section 5.18.1, of the CDC shall be amended with the addition of the following paragraph at the end of the section:

The minimum distance between crosswalks shall be 300 feet.

5.19 INTERFACING SYSTEMS TO TRACKWORK**5.19.2 Signaling and Train Control – Impact on Track**

Chapter 5, Section 5.19.2, paragraph 2 of the CDC shall be amended as follows:

Delete:

The location of the insulated joints must be coordinated to accommodate the train control requirements. If negative return and signal train control design is included in the rail system, impedance bonds will also be required at the insulated joint locations, which the track designer must accommodate in the track design.

Replace with:

The location of the insulated joints must be coordinated and interfaced with the Core System Contractor to accommodate the train control requirements.

Chapter 5, Section 5.19.2, paragraph 4 of the CDC shall be amended as follows:

Delete:

Insulated rail joints at limits of track circuits are to be opposite each other (staggered between 32 and 54 inches) to increase signal reliability and facilitate underground ducting and traction power crossbonding.

Replace with:

Insulated rail joints at limits of some track circuits are to be located near each other (staggered between 32 and 39 inches) to increase signal reliability and facilitate underground ducting and traction power crossbonding. The exception will be the Insulated rail joints at each end of the passenger station platforms, which will be directly opposite of each other. The Contractor shall coordinate the location of the Insulated rail joints at each end of the passenger station platforms as within a tolerance of +0" -1" to the centerline of platform with the Core Systems Contractor.

The following sections shall be added to Chapter 5 of the CDC:

5.21 PROTECTION OF ADJACENT GUIDEWAY TRACKWORK

- A. Track Installation. The Contractor shall not use the tracks to carry or transport materials or equipment for its construction. The Contractor shall be responsible to repair or replace any damage done by its work to track, third rail, duct banks and conduit pathways and conduits, and appurtenances installed by others.
- B. Baseline As-Builts. A baseline that will be utilized by HART to determine whether the damage resulted from the Contractor's work is the As-Built documentation provided by the adjacent guideway contractor for the guideway segment at, and adjacent to, the Contractor's construction work area.
- C. Quantification of Damage. The Contractor shall be responsible for repair and replacement of any damage to track, contact rail, and deck appurtenances to the extent that they have to be corrected in order to comply with specifications applied to the construction by other contractors.
- D. Safety. If train testing and commissioning commences during the course of the Contractor's work schedule, Contractor personnel working adjacent to the track shall be safety-certified in accordance with 49 CFR 214, Federal Railroad Administration (FRA).

END OF CHAPTER

6.0 CIVIL

6.2 ROADWAY

6.2.3 Basis of Geometric Design Report

Section 6.2.3 of the CDC shall be supplemented with the addition of the following statement following the first paragraph:

The Contractor shall coordinate with HDOT and prepare a Basis of Geometric Design Report for the roadway design of Kamehameha Highway in accordance with HDOT's design review requirements. Contractor shall obtain HDOT approval of the report. The Basis of Geometric Design Report shall describe, at a minimum, the following:

- Functional classification of roadway
- Area development (rural or urban)
- Design speed
- Design vehicle
- Design level of service
- Traffic assignment or Average Daily Traffic (ADT) volume
- Federal-Aid or local funding
- National Highway System route determination
- References (policies and guidelines)
- Major geometric design elements.
 - Cross slope
 - Lane width
 - Shoulder width
 - Bridge width
 - Horizontal clearance
 - Vertical clearance
 - Grades
 - Sight distance
 - Medians
 - Superelevation rates
 - Minimum roadway curve radii
 - Terrain (level, rolling, mountainous)
 - Clear zone

6.2.4 Roadway Geometrics

Section 6.2.4 of the CDC shall be supplemented with the addition of the following statement:

For HDOT urban arterial facilities, the minimum horizontal clearance between obstructions and curb face shall be 2 feet in accordance with Subsection 9-03.5 of the Statewide Uniform Design Manual for Streets and Highways. Between the edge of travel way and obstructions, the minimum clearance shall be 3 feet in accordance with Subsection 6.2.4.2 of the CDC. If required by HDOT, the Contractor shall provide written justification for the placement of all instances where less than 4 feet of horizontal clearance is provided between rigid objects and the curb face.

6.2.5 Pavement Design

Section 6.2.5 of the CDC shall be supplemented with the addition of the following statement following the first paragraph:

The Contractor shall be responsible for obtaining additional site investigations necessary to assess existing pavement structure composition, thickness and conditions. No additional time or compensation will be provided when existing pavement thickness or type of material varies from information shown on record drawings or geotechnical reports.

The Contractor shall prepare and obtain HDOT approval of a Pavement Justification Report in accordance with the design procedures specified in the HDOT's Pavement Design Manual. A Pavement Design Report has been developed (see Roadway Pavement from Halawa Drive to Dillingham Boulevard, and TPSS #28) and is provided to the Contractor as a Reference Material. This document has not been reviewed by HDOT. The pavement structural section along existing roadways that are to be widened shall be designed for a 50-year design period.

The Contractor shall coordinate and obtain the appropriate asphalt mix design approval from the respective State or City jurisdictional agency.

The following sections shall be added to Section 6.2 of the CDC:

6.2.11 Striping

All pavement striping within the project limits or disturbed by the Project shall be replaced.

6.2.12 Design and Posted Speeds

The design speeds and posted speeds for this Section varies as follows:

- Kamehameha Highway (SR 99) from Arizona Memorial Place to Center Drive
 - Design Speed: 45 mph
 - Posted Speed: 35 mph
- Nimitz Highway (SR 92) from Valkenburgh to Middle Street
 - Design Speed: 45 mph
 - Posted Speed: 35 mph

- Aolele Street
 - Design Speed: 35 mph
 - Posted Speed: 25 mph
- Lagoon Drive – from Aolele Street to Koapaka Street
 - Design Speed: 45 mph
 - Posted Speed: 35 mph
- Kamehameha Highway (SR 7401) – from Middle Street to E/O Kalihi Stream
 - Design Speed: 45 mph
 - Posted Speed: 35 mph
- Ualena Street
 - Design Speed: 30 mph
 - Posted Speed: 25 mph
- Waiwai Loop
 - Design Speed: 30 mph
 - Posted Speed: 25 mph

6.2.13 DCAB

Contractor shall ensure that all new design conforms to ADA requirements and shall obtain design approval from the HDOH Disability and Communication Access Board (DCAB).

Several curb ramps depicted in the RFP Drawings do not conform to ADA requirements. Contractor is encouraged to modify these curb ramps to meet ADA requirements. However, if unable to do so, Contractor shall develop, and obtain DCAB approvals for Technical Infeasibility Reports.

Curb ramp locations that do not currently meet ADA requirements include:

RP6010 – Curb Ramp #1, Kamehameha Highway at Plantation Drive

- RP6019 – Curb Ramp #1, Aolele St.
- RP6020 – Curb Ramp #3, Aolele St.
- RP6025 – Curb Ramp #14, Aolele St.

6.2.14 Pre-Approved Roadway Design Exceptions

See PSR 1.7.1.E, Pre-Approved HDOT Design Exception, regarding highway design speeds.

6.2.15 Open Comments

HART has received review comments from HDOT that have not been addressed in the RFP Drawings or with HDOT. HDOT's comments are provided in PSR Appendix C, Open HDOT

Comments. Contractor shall modify the design concepts depicted in the RFP Drawings as necessary to obtain HDOT approvals.

6.3 DRAINAGE

6.3.4 Surface Drainage

Section 6.3.4 of the CDC shall be supplemented with the addition of the following statement prior to the first paragraph:

Drainage calculations and reports shall be prepared and submitted to HART for review and acceptance. The Contractor shall provide sufficient information including but not limited to typical guideway deck sections, guideway deck drainage details and calculations to show compliance with the Compendium of Design Criteria. The Contractor shall identify and document the location of all critical points where the design flow depth on the guideway deck approaches within 1 inch of the minimum required freeboard. The guideway deck drainage design shall account for clogging of drainage inlets and incorporate elements, such as overflow devices at the critical points. Drainage reports have been prepared and are available for information only in Reference Materials.

6.3.7 Flood Control

Section 6.3.7 of the CDC shall be supplemented with the addition of the following statement following the first paragraph:

The Guidance Drawings depict several guideway piers to be constructed within Halawa Stream, Moanalua Stream, and Kalihi Stream. The Contractor shall design the improvements in accordance to the flood hazard requirements of the City and County of Honolulu Ordinance 14-9; as amended; and comply with conditions of the 404 Permit and the 401 Water Quality Certification. The flood hazard requirements include but are not limited to hydrologic and hydraulic analyses for the streams, the preparation of Flood Fringe District Certifications(s), Floodway District Certifications and Certifications of a "No-Rise" Determination for a Proposed Floodway Development; and obtaining Floodway Permits from the City and County of Honolulu Department of Planning and Permitting.

Floodplain mitigation reports have been prepared for Halawa Stream (see Halawa Stream Floodplain Mitigation Report), Moanalua Stream (see Moanalua Stream Floodplain Mitigation Report), and Kalihi Stream (see Kalihi Stream Floodplain Mitigation Report), and are provided to the Contractor as Reference Materials.

To reduce the potential of flood damage to electrical equipment located in the vicinity of the Lagoon Drive Station, the Contractor shall design and construct the finish floor elevations of the TCCR, the concrete pad supporting the ground mounted electrical transformer, and the concrete pad supporting System Site #28 to a minimum elevation as defined in PSR 1.6.6.5. This requirement supersedes the elevations depicted in the Station RFP Drawings.

The following sections shall be added to Section 6.3 of the CDC:

6.3.8 Abandoned Drainage Utilities

See PSR 1.12.6.

6.3.9 Reserved**6.5 THIRD-PARTY COORDINATION**

Chapter 6 of the CDC is hereby amended by adding the following Section 6.5:

6.5.1 Temporary U.S. Post Office Service Road

Prior to the construction of the foundations for piers 522 through 525, the Contractor shall construct a temporary USPS service road that allows direct, secured access from the USPS facility located on the Koko Head side of Aolele Street to the Airport tarmac. Design and construction of the service road is subject to the approval of both HDOT Airports Division and the USPS. The Contractor shall coordinate the security of this road with HDOT Airports Division, TSA, and the USPS. Construction of the service road must be coordinated with HDOT Airports Division's Mauka Concourse Modernization Project. A conceptual design is shown in the Airport Guideway RFP Drawings, drawings RP1026 through RP1027A. This design concept assumes that the current commuter terminal and its parking lot are not in service at time of construction; if otherwise, the Contractor will have to find an alternate solution subject to the approval of HDOT Airports Division, TSA, USPS, and HART.

6.5.2 Pai`ea Street and Aolele Street Intersection

The design of the Pai`ea Street and Aolele Street intersection assumes that, prior to construction, the intersection will be reconstructed as part of the HDOT Airports Division CONRAC expansion. Work within this area shall be coordinated with HDOT Airports Division. The Contractor shall repave and stipe the work areas within the intersection. If the Contractor damages completed CONRAC construction during subsequent construction activities, all facilities shall be restored to their as-constructed condition to the satisfaction of the HDOT Airports Division.

6.6 MODIFICATIONS TO THE RFP DRAWINGS

Chapter 6 of the CDC is hereby amended by adding the following Section 6.6:

The subsections of PSR 6.6 below modify the Guidance Drawings. The Contractor shall perform its own investigations and engineering to prepare the Final Design for these concepts. Also see PSR 1.6 for other modifications to the Guidance Drawings.

6.6.1 System Site #28 Modification

The Systems Site #28 area shall be reconfigured to accommodate a TPSS and a traction power backup generator. The public parking lot shall be eliminated and the parcel shall be paved and secured with fencing for future HART use (open area). The Contractor shall design and construct the System Site #28 facilities as indicated in PSR Appendix B.04.

6.6.2 Roadway Adjacent to Pier 535

The Contractor shall modify the conceptual design shown on the Airport Guideway Guidance Drawings and design and construct a roadway that maintains the existing roadway's minimum roadway width as indicated in PSR Appendix B.05.

6.6.3 Airport Parking Lot A

The Contractor shall assume that the parking lot A (located behind the lei stands) shall be reconfigured (repaved, curbed and striped). The design and construction of the parking lot shall accommodate the conceptual column placement, with only minor adjustments while maximizing the number of parking stalls. The design of the parking lot shall be subject to review and approval by both HDOT Airports Division and HART. Work shall be done to the satisfaction of the HDOT Airports Division.

6.6.4 Drainage at Pier 549

As one of the guideway shaft foundations constructed under the Airport Section Guideway Seven-Pier construction project, a portion of Pier 549 is existing. Pier 549 was constructed without proposed drain outfall pipe JSD1149 as depicted in the Airport Section Guideway Seven-Pier drawings provided in the Reference Materials (see drawings UP101 and UP101A). The Contractor shall design the guideway drainage system to meet all criteria without drain outfall pipe JSD1149.

6.6.5 Transition between Airport and City Center

The Contractor shall modify the conceptual designs shown in the Airport Guideway RFP Drawings and design and construct a temporary roadway transition to meet existing conditions as indicated in PSR Appendix B.06.

6.6.6 Transitions in the Work

The contractor is responsible for integrating the Work within its surroundings. All retaining walls, graded slopes, driveway tie-ins, sidewalk adjustments, relocation of private property such as signs and lights, relocation of fences, and other similar transition work is required and included in the Contract Price. Contractor is responsible for acquiring all access necessary to construct such transitions to the satisfaction of the affected property owner(s).

END OF CHAPTER

7.0 TRAFFIC

7.2 MAINTENANCE OF TRAFFIC

Chapter 7, Section 7.2, of the CDC is hereby amended by the addition of the following Subsections 7.2.1 through 7.2.4:

7.2.1 Transportation Management Plan

The Contractor shall prepare a Transportation Management Plan (TMP) in accordance with the requirements of this contract and HDOT's Transportation Management Plan Guidelines. The Contractor shall obtain HART and HDOT acceptance of the TMP.

A draft Transportation Management Plan, Airport Guideway is provided in the Reference Materials. Contractor may use information in the draft TMP but is required to obtain acceptance of the Contractor's final TMP.

7.2.2 Maintenance of Traffic Plans, Detour Plans, and Traffic Control Plans

The Contractor shall prepare MOT Plans, Detour Plans, and TCPs as part of the design review process and submit these plans to HART and the agencies having jurisdiction. These plans shall depict the maintenance of traffic concepts throughout the entire construction site. During construction, the Contractor shall prepare site-specific MOT Plans, site-specific Detour Plans, and site-specific TCPs that depict the detailed traffic control measures to be provided to obtain permits for closing traffic facilities. The site-specific plans shall be signed and sealed by a licensed engineer.

7.2.3 Maintenance of Traffic at the USPS Facility

The Contractor shall coordinate construction activities with the USPS, including those items listed in the letter to USPS, Reference Material "HART Response Letter to USPS Request for Changes and Additions, May 19, 2015," and PSR Appendix N.

7.2.4 Maintenance of Traffic at Honolulu International Airport

The Contractor shall coordinate construction activities with Honolulu International Airport, including those items listed below.

- A. Honolulu International Airport operates around the clock. Construction activities can not restrict access to the Inter-Island or Overseas Terminals.
- B. Access to the rental car facility (via the lei stand frontage roadway and Aolele Street) must remain operational at all times.
- C. No construction activities shall occur during the week of spring break for the University of Hawaii at Manoa and the week of spring break for schools run by the Hawaii Department of Education.
- D. No construction activities shall occur on July 4th.

- E. No construction activities shall occur during the week of Thanksgiving, from the Tuesday prior to Thanksgiving to the Monday after Thanksgiving.
- F. No construction activities shall occur between the dates of December 15th through January 15th.
- G. Construction times and durations within the Airport's CONRAC expansion project must be coordinated with HDOT Airports Division and the affected rental car companies.
- H. Employees of the Contractor and its subs will not be allowed to park on the Airport property, including in any of the HDOT Airports parking structures or parking lot.
- I. The Contractor will be charged rent for the use of any staging areas requested on Airport property.
- J. The Contractor shall apply and receive approval from HDOT Airports Division for water usage. Contractor will be charged for water usage.

7.3 TRAFFIC CONTROL DEVICES

Chapter 7, Section 7.3.4, of the CDC is hereby amended by adding the following Paragraphs (Q) and (R):

- Q. Traffic Signal Interconnect Termination. The Contractor shall install all traffic signal interconnect conduit and cabling within the Airport Guideway and Stations contract. The Contractor shall terminate the traffic signal interconnect conduits at a pullbox located in the future sidewalk area Koko Head of Station EB 1260+98. See PSR Appendix B.06, Airport Transition to City Center.
- R. A draft Traffic Signal Warrant Study for Lagoon Drive, Ualena Street, and Waiwai Loop is provided in the Reference Materials. The Contractor shall coordinate with HDOT and DTS, perform Work necessary to produce a similar study, and obtain HDOT and DTS approval of the Contractor's warrant study report.

7.3.5 City Fiber

Chapter 7, Section 7.3, of the CDC is hereby amended by adding the following Subsection 7.3.5:

Design, procure, and install raceways on the Guideway and conduit drops at stations for City fiber cables as indicated in PSR Appendix B.01.

7.5 WORK SEQUENCE AND SCHEDULE CONSTRAINTS

Chapter 7 of the CDC is hereby amended by adding the following Section 7.5:

The following sequences of work and/or work schedule constraints shall apply:

- 1. The order of Work shall conform to the Contractor's approved schedule and detailed work plans. The Contractor shall develop its schedule such that inconvenience to traffic, pedestrians, and adjacent businesses/landowners is minimized.

2. Install travel time system (including temporary and permanent LPR cameras and portable DMS) prior to any construction activity impacting existing traffic operations or within 60 days following NTP1, whichever occurs first.
3. The Contractor shall make probing of existing utilities the first order of work as rights-of-way/easements become available for use.
4. In any given area, roadway widening and traffic signal/permanent ITS installation shall be completed prior to construction of guideway elements within the roadway. Final asphalt paving lift may be delayed until after guideway construction, so long as a safe, acceptable roadway surface is provided in the interim.
5. In areas to receive asphalt concrete overlays or new pavement sections, all work involving pavement cuts, including installation of traffic signal conduits, loops and hand holes, or new pavement sections shall be completed prior to placing the final lift of asphalt concrete pavement.

END OF CHAPTER

8.0 UTILITIES

8.1 GENERAL

The following sections shall be added to Section 8.1 of the CDC:

8.1.3 Transition between Airport and City Center

8.1.3.1 Water Line Relocation

The Contractor shall modify the conceptual designs shown in the Airport Guideway RFP Drawings and design and construct a temporary waterline as indicated in PSR Appendix B.06.

8.1.4 Third-Party Agreements

Refer to PSR 1.6 for other third-party agreements and design review information and PSR 1.6.5 for utility agreements.

8.1.5 Utility Relocation Responsibility Matrix

- A. See PSR Appendix A for a listing of utility agencies and corresponding responsibilities relating to who is performing the Work:
- Relocation Design by Utility;
 - Relocation Design by Contractor;
 - Construction by Utility; and
 - Construction by Contractor.

Note: Several utilities relocations include split responsibility.

- B. The utility owners listed in PSR Appendix A may have facilities located within the construction zone of this Project that will require coordination and/or relocation.

8.2 UTILITIES

8.2.4 Water (BWS and Navy)

Chapter 8, Section 8.2.4, of the CDC is hereby amended by revising its title to “Water (BWS and Navy),” and adding the following two paragraphs at the end of the Section:

Water utility owners include BWS, Navy, and HDOT Airports Division. Utilities located within the HDOT Airports Division property are under the jurisdiction of HDOT Airports Division.

8.2.6 Electric Power (Hawaiian Electric Company)

Section 8.2.6 of the CDC shall be amended with the addition of the following statement:

Contractor is advised that HECO has begun its electrical design based on the facilities design concepts depicted in the RFP Drawings. Most HECO-related RFP Drawings are Reference

Drawings. As such, most HECO-related drawings are Reference Materials and, by definition, the Contractor is not constrained to the design concepts depicted in those Reference Drawings. Similarly, HART does not guarantee that those HECO-related Reference Drawings are complete, accurate, acceptable or constructible. Modifications by the Contractor may be required. However, the Contractor is advised that unnecessary revisions to HECO-related Reference Drawings may cost additional time due to HECO redesign and, depending on the extent of the revisions, may require approvals from utility authorities or additional environmental clearances.

The following section shall be added to Section 8.2.6 of the CDC:

8.2.6.3 HECO Thermal Concrete and FTB Design Mix

Preliminary geotechnical investigations were performed based on the electrical design concepts in the Airport Guideway RFP Drawings. See PSR Appendix D for locations where soil resistivity borings were performed. PSR Appendix D, "Fluidized Thermal Backfill," contains soil thermal survey information of the soil resistivity samples.

The preliminary HECO thermal concrete and fluidized-thermal-backfill (FTB) mixes shown in the Guidance Drawings for HECO's 46kV underground duct lines are draft and may serve as a starting point for the Contractor's design.

The Contractor shall coordinate with HECO the design of the thermal concrete and FTB mixes. Following HECO's receipt of the design mixes and the final duct line design plans and profiles, HECO will perform calculations to determine the amount of heat generated by the cables and whether the duct configuration, depth, and thermal properties of the surrounding soil, thermal concrete, and FTB will effectively dissipate the heat. Contractor is responsible for finalizing the adjusting the mix designs if necessary to obtain HECO's approval.

The Contractor shall be required to test samples of the thermal concrete and FTB mixes to ensure that they meet the design mix requirements both prior to and during construction of the duct lines.

8.2.6.4 HECO Service Reconnections

HECO service reconnections shown on the Airport Guideway RFP Drawings are based on available information at the time of the conceptual design. Property owners may have changed and/or made updates. It is the Contractor's responsibility to verify the conditions and design concepts depicted in the RFP Drawings and obtain the HECO Service Request approvals for the service reconnections. See Incidental Utility Work.

Contractor is alerted to the following development modification post conceptual design:

- TMK property 1-1-004:029 (2888 Ualena Street)

8.2.6.5 HECO Service Requests

HECO Service Requests for the Passenger Stations have been submitted and preliminary coordination has occurred. Related documents are provided as Reference Materials. It is the Contractor's responsibility to verify the design shown in the RFP Drawings, coordinate any related interfaces with the Core Systems Contractor, and coordinate with HECO to provide permanent power service connections to passenger stations and systems sites as described in the RFP Drawings.

8.2.6.6 Proximity of Drilled Shaft to Underground HECO Utilities

For any piers proposed to be constructed within 10 feet of underground 46kV or higher HECO facilities, Contractor shall obtain HECO's approval in accordance with the requirements of PSR 1.7.1.F and PSR Appendix G.

8.2.8 Miscellaneous Telecommunications

Section 8.2.8 of the CDC shall be supplemented with the addition of the following statement after the last paragraph:

Contractor shall prevent impact to the existing Navy communication facilities on the makai side of Kamehameha Highway at Pearl Harbor Naval Base Station, unless otherwise approved in writing by the Navy. Refer to PSR 1.7.1.B.2 Pearl Harbor Naval Base Station, Updates to the RFP Drawings, Architectural and Structural.

Honolulu International Airport Main Communication lines pass through the HIA Station site. The line is minimally labeled on As-Built Drawings, but airport officials have identified the line as the main communication ductbank for the airport. HIA Station configuration shall be modified as described in PSR Appendix J.05 to avoid this communication ductbank. Also see PSR 1.6.

8.2.10 Street Lights (DDC and HDOT-Hwy)

Section 8.2.10 of the CDC shall be supplemented with the addition of the following statement after the last paragraph:

The Contractor shall comply with Hawaii Night Sky Protection Act (Act 287, 2012), requiring shielding of outdoor lights and restricting light temperature. The Contractor shall also coordinate with HDOT Highways Division, City and County Department of Design and Construction (DDC), and joint-pole owners regarding programs to utilize energy efficient (LED) light fixtures including the Island-Wide LED Street Light Conversion Project. The Contractor is only required to relocate, replace, or modify street lighting affected by the Project. However, the Contractor shall coordinate specific fixture types with the appropriate entities.

The following sections shall be added to Chapter 8 of the CDC:

8.3 UPDATES TO THE RFP DRAWINGS

The subsections of PSR 8.3 below modify the Guidance Drawings. The Contractor shall perform its own investigations and engineering to prepare the Final Design of these concepts. Also see PSR 1.6 for other modifications to the Guidance Drawings.

8.3.1 Pier 630 – Middle Street Station

As compared to the proposed location depicted in the Guidance Drawings, Pier 630 shall be shifted approximately 24 feet in the Koko Head direction to avoid the need to relocate an existing 30-inch sewer line located on the First Hawaiian Bank property. The HART-Provided ROW limits have been revised to reflect this modification.

8.3.2 Coordination of Work with Airport Section Utilities Contractor

HART has procured a utility relocation contractor under the Airport Section Utilities contract. The Airport Section Utilities contractor is responsible for relocating some, but not all, utilities in the Airport Guideway and Stations project area. The scope of utility relocation to be performed by the Airport Section Utilities contractor is depicted in the Airport Section Utilities construction drawings in the Reference Materials (the AGS Contractor is not responsible for performing those utility relations). The AGS Contractor shall coordinate work with the Airport Section Utilities Construction Contractor that will be relocating utilities within the Work site.

8.3.3 Electrical Run to Service Pearl Harbor Naval Base Station

The Contractor shall modify the design concept depicted on the *Airport Guideway RFP Drawings* and design and construct components for electrical service connection to the Pearl Harbor Naval Base Station and System Site #25 as indicated in PSR Appendix B.07. There has been no review by HECO of this modification.

8.3.4 HECO Manhole #999

The Contractor shall modify the design concept depicted in the Airport Guideway RFP Drawing UP1537 and design and reconstruct the back wall and top slab of Manhole #999 as indicated in PSR Appendix B.08. There has been no review by HECO of this modification.

8.3.5 Waiwai Loop Service Reconnections

Service reconnections along Waiwai Loop shall be developed by the Contractor. Like other service reconnections, the service connections along Waiwai Loop are Incidental Utility Work. There has been no formal review by HECO of this modification.

8.3.6 TMK 1-1-016:013 (Jeans West) Photo Voltaic (PV) System – Transformer

The Contractor shall modify the conceptual design shown in the Airport Guideway RFP Drawing UP1544 to include electric service reconnection components for the PV System on TMK 1-1-016:013 (Jeans West). The Contractor shall coordinate with the property owner, HECO, and HART; and design and construct the reconnection components to replace the existing overhead pole-mounted PV transformer.

A fairly extensive PV system exists on top of the property's building. The existing pole-mounted PV transformer will need to be replaced due to undergrounding of the existing overhead electrical lines. The location of the new pad-mounted PV transformer has not been coordinated with the property owner.

A single dry-type transformer and new pedestal meter that has been proposed on the Koko Head side of the site in front of the existing building, it would require intrusion into a single parking stall stanchions would also be required. This dry-type transformer ties into the HECO transformer located on the Lagoon Station site and is needed because the building utilizes a different voltage than produced by standard HECO pad-mounted transformers.

The Contractor shall provide electrical service reconnections, including but not limited to separate PV and non-PV transformer(s), foundations, underground and aboveground conduits, meters, and connection. The Contractor shall coordinate and obtain property owner concurrence, obtain

HECO approvals, and provide all electrical components. The Contractor shall modify any other existing facilities as necessary to accommodate the Final Design. These service reconnections are Incidental Utility Work. There has been no review by HECO of this modification.

8.3.7 System Site #28 Modification

The Systems Site (#28) area shall be reconfigured to accommodate a TPSS and a traction power backup generator. The public parking lot shall be eliminated and the parcel shall be paved and secured with fencing for future HART use (open area). The Contractor shall design and construct the System Site #28 facilities as indicated in PSR Appendix B.04. The modifications to the conceptual design may impact the utility relocations along Waiwai Loop as shown on the Airport Guideway RFP Drawings. The Contractor shall be responsible for all associated utility work. There has been no review by HECO of this modification.

8.3.8 No outage for Navy Communication Facilities at Pearl Harbor Naval Base Station

See PSR 1.7.1.B.2 and PSR 8.2.8 regarding Navy communication facilities near Pearl Harbor Naval Base Station.

8.3.9 LED luminaires along Ualena Street and Waiwai Loop

The Airport Guideway RFP Drawings Street Lighting Plans depict conceptual locations for luminaires based on lighting calculations for HPS fixtures. However, based on more recent design information, the Contractor shall coordinate with the City and County of Honolulu and design and construct street lights as necessary within City and County of Honolulu streets utilizing LED fixtures. Also see PSR 8.2.10.

8.3.10 HECO Transformer at TMK:1-1-004:028 and TMK: 1-1-004:0027

Based on discussions with the landowners of TMK: 1-1-004:028 and TMK: 1-1-004:0027, the HECO transformer easement indicated in the utilities drawings (shown on TMK:1-1-004:028) shall be relocated to TMK: 1-1-004:0027, as indicated in the ROW drawings. The Contractor shall update the design accordingly.

8.4 ADDITIONAL CONSIDERATIONS

8.4.1 Chevron Fuel Line

The existing 4-inch Chevron fuel lines (abandoned), which run along Aolele Ditch (EB 1177+20 to EB 1185+00) within HDOT Airports Division ROW will be removed by the Airport Section Utilities Contractor. The AGS Contractor shall coordinate with Chevron and design and construct a relocated 4-inch fuel line. The Contractor shall prepare a parcel map showing a relocated fuel line easement that is signed and sealed by a licensed land surveyor.

8.4.2 Burial Treatment

See PSR 3.13.E.

8.4.3 Abandonment of Utilities

The Contractor shall be responsible for the removal of all abandoned utilities that conflict with Project improvements. The Contractor may be required to remove abandoned utilities beyond the extent that such utilities conflict with the Project improvements. The Contractor is alerted to the HDOT Departmental Pipeline Removal Policy for utilities in HDOT ROW. The Contractor and HART shall jointly pursue a conditional waiver to the Policy. The Contractor shall provide all supporting documentation necessary to obtain said waiver. For purposes of its Technical and Price Proposal, the Contractor shall anticipate approval conditions similar to those in letter titled HDOT Abandonment Letter (Sample) ("Request to Abandon Utilities" dated September 16, 2014) in the Reference Materials.

8.4.4 Utility Service Connections

- A. New Connections. The Contractor shall provide all utility service connections (e.g., electric, water, sewer) for passenger stations and systems sites to be constructed under the Contract. New utility service connections for the facilities provided under this contract are included in the Contract Price.
- B. Existing Connections. The Contractor shall replace or relocate all existing utility service connections affected by the Work under the Contract. New utility service connections shall be provided in accordance with current utility standards. Reconnection of all existing services, whether shown on the drawings or not, is included in the Contract Price as Incidental Utility Work.

END OF CHAPTER

9.0 STRUCTURAL

9.1 GENERAL

9.1.1 Introduction

Section 9.1.1 of the CDC shall be supplemented with the addition of the following:

The Contractor shall comply with the Operational objectives and requirements of CDC 2.3.

9.2 AERIAL GUIDEWAY STRUCTURES

9.2.1 General

Section 9.2.1 of the CDC shall be supplemented with the addition of the following statement after the last paragraph:

The Contractor is constrained to the following requirements:

- The guideway superstructure shall be a single or multi-cell segmental box girder, with inclined webs (with a slope no steeper than a 1 H to 4.58V).
- Typical guideway supporting columns shall utilize a round cross-section.
- Modification of proposed pier locations depicted on Guidance Drawings GP001 through GP028, Structural Plan & Profile drawings, shall require specific written approval from HART on a pier by pier basis. The Contractor is advised that modifications to proposed pier locations may require additional studies, coordination, and approvals as directed by HART.
- Pier placement within Halawa Stream is limited to a maximum of two piers with a maximum diameter no larger than that indicated in the Airport Guideway RFP Drawings. United States Coast Guard and United States Army Corps of Engineers approval is based on the current design as indicated in the Airport Guideway RFP Drawings.
- No pier shall be placed in Aolele Ditch. United States Coast Guard and United States Army Corps of Engineers approval is based on the current design as indicated in the Airport Guideway RFP Drawings.
- Pier placement within Moanalua Stream is limited to a maximum of three piers with a maximum diameter no larger than that indicated in the Airport Guideway RFP Drawings. United States Coast Guard and United States Army Corps of Engineers approval is based on the current design as indicated in the Airport Guideway RFP Drawings.
- Pier placement within Kalihi Stream is limited to a maximum of four piers as indicated in PSR 3.8 and the U.S. Army Corps of Engineers 404 Permit Application and the Hawaii Department of Health Water Quality Certification Application in the Reference Materials.

9.2.2 Dead Loads (DC, DW)

Section 9.2.2 of the CDC shall be amended by replacing the following statement:

Superimposed dead load (DW) shall include the weights of all appurtenances and utilities attached to the structure, including, but not necessarily limited to, the weights of the running rails, rail fasteners, concrete rail support (plinth) pads, emergency guardrails, contact rail, and coverboard with mountings and support pads, walkways, wireways, cable trays, cables, railings, and acoustical barriers.

Replace with:

Superimposed dead load (DW) shall include the weights of all appurtenances and utilities attached to the structure, including, but not necessarily limited to, the weights of the running rails, rail fasteners, concrete rail support (plinth) pads, emergency guardrails, contact rail, and coverboard with mountings and support pads, walkways, wireways, cable trays, cables, railings, and acoustical barriers; and provision for the future installation of an electrical utility conduit weighing 220 pounds (lbs) per foot to be externally attached to the underside of the guideway slab mauka-side, where the slab connects with the box girder web.

Chapter 9, Section 9.2.2, of the CDC shall be supplemented with the addition of the following statement after the last paragraph:

Wayside Rail Lubricators shall be included as DW in the amount equal to the actual lubricator equipment dead weight inclusive of a filled lubricator reservoir, but not less than the minimum design load of 900 lbs distributed over a 1.5-foot by 0.5-foot area adjacent to the outer edge of the guideway deck. Also see PSR 5.7.4.

9.2.3 Live Loads (LL, PL)

Chapter 9, Section 9.2.3, of the CDC is hereby amended by adding the following statement after the last paragraph:

The Contractor shall refer to Core Systems Interface Reference Drawings, Section Passenger Vehicle, Chapter Passenger Vehicle General Assembly, for detailed vehicle dimensions.

9.2.6 Dynamic Load Allowance (IMV, IMH)

Chapter 9, Section 9.2.6, of the CDC is hereby amended by adding the following subparagraph (D):

- D. The above levels of vertical and horizontal dynamic load allowance (impact force) are based on conventional designs of DF fastener assembly manufactured and installed to meet stringent American Railway and Maintenance of Way Association (AREMA) tolerances and transit industry best practices as in TRB Reports 71 and 155. Deviations from such designs and practices will result in higher dynamic forces which require analysis of a dynamic model that is representative of the DF fastener assembly in its most critical loading configuration, e.g., at maximum curve or some critical curve transition point, maximum superelevation, and at maximum design speed.

9.2.10 Water Load, Stream Pressure, Buoyancy, Scour (WA)

Section 9.2.10 of the CDC shall be supplemented with the addition of the following statements after the second paragraph:

Certain guideway piers, station piers, and other portions of structures located within stream flood plains may be subject to scour. The Contractor shall perform scour analyses to determine scour potential in accordance with applicable FHWA Hydraulic Engineering Circulars. The hydrologic, hydraulic, and scour calculations and scour report shall be prepared and submitted to HART for review and acceptance. A scour report titled "Final Scour Summary Report, Airport and City Center Guideway" has been prepared and is provided as Reference Material.

9.2.16 Rail Fracture (RF)

Section 9.2.16 of the CDC shall be supplemented with the addition of the following paragraph:

The Contractor shall independently confirm its design based on actual stiffener test stiffness and capacity values provided by the manufacturer of the DF fasteners. If values fall outside the above-prescribed limits, a finite element model of the rail/fastener assembly shall be analyzed. Such analysis shall demonstrate that the fasteners can provide the required resistance at rail fracture, and that the rail break gap will not exceed 2 inches.

9.2.22.2 Fatigue

Section 9.2.22.2 of the CDC shall be deleted in its entirety and replaced with the following:

The effect of stress-level changes caused by passage of rail trains over structures shall be considered using 3 million cycles of maximum stress over the life of the structure to estimate the number of repetitive maximum stress cycles. However, structural steel details considered by AASHTO to be fatigue-sensitive, and fracture-critical structural elements as defined by FHWA's publication Inspection of Fracture Critical Bridge Members, shall be designed and be additionally based on fatigue evaluations that consider the actual stress range and estimated number of cycles each structural detail or structural element is subjected to.

9.2.22.12 Visual Access for Inspection

Section 9.2.22 of the CDC shall be supplemented by adding the following subsection 9.2.22.12, Visual Access for Inspection:

Consideration shall be given in the structural design of the guideway structure to enable access for visual inspection inside the guideway box, and also visual inspection of critical details at the guideway bearing. For personnel safety, access to the inside of the box shall not be at guideway deck level unless otherwise approved in writing by HART on a case-by-case basis.

9.3 SURFACE STATIONS AND BUILDINGS

9.3.1. A Surface Stations and Building - Design

Section 9.3.1.A of the CDC, shall be supplemented by adding the following to the end of the section:

Structural bearing walls and Architectural non-bearing walls shall be constructed with concrete masonry unit (CMU) or concrete material only.

All slabs-on-grade shall be at least 4 inches thick with minimum #3 @16-inch o.c. each way at centerline of slab.

Welded reinforcement in Station structures as required in HART System Bonding Directive Drawings shall be Grade A706 unless otherwise approved by HART.

9.6 GEOTECHNICAL

9.6.2 Geotechnical Planning Report

Section 9.6.2.E of the CDC shall be deleted and replaced with the following:

The Design Work Plan shall address the Contractor's approach to preparing and submitting the required Geotechnical Planning Report (GPR), Geotechnical Investigation Work Plan (GIWP), Geotechnical Data Report (GDR), and Geotechnical Engineering Report (GER). Include sequencing of reports, methods for presenting any HART-provided data, and anticipated dates for each submittal.

9.6.3 Geotechnical Investigations

Section 9.6.3 of the CDC shall be deleted in its entirety and replaced with the following:

The project geotechnical engineer shall, prior to the start of any geotechnical investigations, including field and/or laboratory testing, submit a GIWP Report addressing how the planned geotechnical investigations meet the engineering and design approach that the project geotechnical engineer will follow to develop the necessary geotechnical information for the Project in accordance with the project design criteria. At the Contractor's option, the GPR and GIWP can be combined into one report.

Subsurface investigations for structures governed by AASHTO guidelines shall be conducted in accordance with AASHTO LRFD Section 10.4.2 (Subsurface Exploration) and FHWA Reference Manual NHI-01-031 (Subsurface Investigations-Geotechnical Site Characterization); minimum requirements for structures and improvements governed by Building Code shall be as recommended in FHWA Reference Manual Section 2.5. The frequency of investigations shall be not less than minimums set forth in AASHTO LRFD Table 10.4.2-1 and FHWA Reference Manual Tables 2-2 and 2-3, and further specified herein.

Investigations for aerial guideway foundations require a minimum of one boring for each pier or foundation as detailed below. Subsurface investigations for buildings and other structures not governed by AASHTO guidelines shall be conducted in accordance with the Building Code Section 1802. Geotechnical investigations completed for the Project, as well as other existing geotechnical information are made available for the project geotechnical engineer's use. These completed investigations are included in HART's Geotechnical Data Reports (GDR-HART).

- A. HART Data:** Geotechnical Data Reports completed by HART are available in PSR Appendix I.3 through Appendix I.12.
1. For guideway-related geotechnical data, HART-provided geotechnical investigation data for deep foundations may, at project geotechnical engineer's discretion, be adopted for use in meeting minimum design requirements for investigation locations provided that (a) the investigation satisfies the minimum

requirements set forth in AASHTO LRFD Table 10.4.2-1 and (b) HART data are located within 20 feet of the final deep foundation location (as measured from the center line of the foundation(s)) and the foundation derive less than 25% of its support from end bearing on or in rock, coralline, or coralline detritus formations. Where deep foundations derive 25% or of their support on or in rock, coralline, or coralline detritus formations, subsurface investigation holes shall be located within the footprint of each drilled shaft or within the footprint of the foundation of other types of deep foundations, whether completed by HART or new. Where multiple deep foundations support the structure or superstructure and these foundations are redundant as defined herein, investigation holes shall be located within the limits of the shaft group comprising that foundation.

2. For station related-geotechnical data, HART-Provided geotechnical investigations data within the general footprint of the station structures, including any ancillary structures, may at project geotechnical engineer's discretion be adopted directly for use in meeting investigations location minimum design requirements for investigation locations. Minimum depth requirements shall be accordance with minimum requirements for structures and improvements governed by Building Code as recommended in FHWA Reference Manual Section 2.5.

B. Contractor's Additional Data: For all guideway structures to be supported on deep foundations, at least one geotechnical boring completed in accordance with the criteria presented herein and with the Project-Specific Technical Specification 02 32 00 - Geotechnical Investigations shall be located within foundation plan limits. At aerial guideway bents where multiple drilled shafts are used to support the pier or column, geotechnical investigations shall be performed at each drilled shaft location where the drilled shafts derive 25% or more of their support on or in rock, coralline, or coralline detritus formations.

Geotechnical investigations for other structures to be supported on deep foundations, such as station structures, shall be within the footprint, and evenly distributed across the plan limits. The extent of the investigation shall satisfy the minimum set forth in FHWA Reference Manual Table 2-2 and Table 2-3.

9.6.3.1 Field Investigation and Testing

The following paragraphs shall be added to the end of Section 9.6.3.1 of the CDC:

The Verification Borings listed in the Guideway Technical Specifications Section 02 32 00 - Geotechnical Investigations are hereby superseded. At a minimum, the Contractor shall perform geotechnical investigations at the following locations:

- Pearl Harbor Station – System Site #25
- Pearl Harbor Station – Retaining wall
- Column Support – Pier 480
- Column Support – Pier 493
- Column Support – Pier 601

- Column Support – Pier 630 (see Section 9.10.3)
- Verification of subsurface condition at the Chevron Station site, TMK 1-1-016:014
- All load test shaft locations
- All locations required by the project geotechnical engineer

HART will not require the Contractor to perform additional borings to supplement the borings in the following Table 9.6.3.1, provided that the specific guideway foundations remain at the locations shown in the Airport Guideway RFP Drawings and the extent of investigation satisfies the minimum set forth in AASHTO LRFD Table 10.4.2-1. The Contractor’s project geotechnical engineer is responsible for assessing the adequacy of the information provided in the GDR-HART and for determining if supplemental geotechnical investigations are required at the locations in Table 9.6.3.1.

Table 9.6.3.1 – Boring Location Variances

Boring Number	Station (Approx.)
B-423	990+40.00
B-424L	991+80.00
B-427	995+83.00
B-428	997+06.00
B-433L	1003+89.00
B-435L	1006+69.00
B-479L	1063+47.00
B-479R	1063+47.00
B-482L	1067+20.00
B-483	1068+60.00
B-484	1070+00.00
B-485	1071+40.00
B-486	1072+80.00
B-487L	1074+03.00
B-488L	1075+26.00
B-489	1076+66.00
B-499R	1089+88.00
B-500	1091+28.00
B-501	1092+68.00
B-502	1094+08.00
B-507	1100+91.00
B-510	1104+94.00
B-511	1106+34.00
B-512	1107+74.00
B-522	1120+02.00
B-524	1122+30.00
B-536	1134+66.50
B-537	1135+64.50

Boring Number	Station (Approx.)
B-541	1139+64.00
B-547	1146+70.00
B-552R	1152+86.32
B-555	1157+08.00
B-558	1161+31.00
B-559	1162+59.25
B-560R	1163+99.25
B-561R	1165+20.13
B-573	1181+51.25
B-576	1185+86.25
B-581	1192+35.25
B-583	1194+65.25
B-584	1195+98.90
B-600	1215+22.70
B-616	1263+88.10
B-627	1250+77.91

The Load Test locations listed in Guideway Technical Specification Section 02 32 00 - Geotechnical Investigations shall be disregarded. The Contractor shall determine the number and locations of load tests and borings, based on the project geotechnical engineer’s understanding of the geotechnical conditions, the Contractor’s construction means and methods, and the minimum load test requirements stipulated in Section 9.6.5.1 of this Compendium of Design Criteria. Load test plans shall be subject to review and comment by HART and authorities having jurisdiction.

9.6.4 Geotechnical Reports

Delete the second paragraph of CDC Section 9.6.4 and replace with the following:

The project geotechnical engineer shall prepare and submit Geotechnical Data Report(s) (GDR-DB) to HART, documenting all geotechnical field investigations and all field and laboratory testing performed. The adopted HART data, together with the project geotechnical engineer’s investigation data, shall be documented in the Contractor’s GDR-DB, which shall be the basis/es for the engineering analyses and geotechnical designs.

Geotechnical investigations data from GDR-HART adopted by the project geotechnical engineer may be included in the GDR-DB or included by reference. For all adopted geotechnical investigation data, the GDR-DB shall contain:

- A. Explicitly noted dates, specific areas represented, and the report’s intended purpose.
- B. Boring Logs - by reference or included in appendix maintaining its unique identifier, e.g., boring number maintained even if unique project number also assigned.
- C. Field testing – include by reference but at minimum include in discussions and tabulations.

- D. Laboratory testing – include by reference but at minimum include in discussions and tabulations.

9.6.4.1 Interpretation, Analyses, and Recommendations

Delete the first paragraph of CDC Section 9.6.4.1 and replace with the following:

The project geotechnical engineer shall prepare and submit to HART a Geotechnical Engineering Report (GER-DB). At a minimum, a separate GER-DB shall be prepared for designs completed for guideway and each station. The GER-DB shall be based on the available subsurface information, including information from the GDR-HART adopted for the design. At a minimum, the GER-DB shall include a discussion of the interpreted subsurface and ground water conditions, including but not limited to: [see CDC for complete list]

Add new sections to CDC Section 9.6.4.1.C:

7. Estimated settlement, and
8. Evaluation of geological and seismic hazards, such as soil liquefaction and lateral spreading.

Delete CDC Section 9.6.4.1.G in its entirety and replace with the following:

- G. Discussion of how the engineering designs, design parameters, and analyses take into account construction means and methods. For drilled shaft foundation to be constructed in coralline or coralline detritus formations, provide discussion of construction details and potential concrete overpour ratios.

9.6.5.1 Deep Foundations

Amend CDC Section 9.6.5.1.A with the addition of the following:

Geotechnical capacity for the selected shaft size and length shall be based on design parameters reported in the GER-DB specific to the Site under consideration. Adjustment to reported engineering properties based on local experience or other field load tests shall be explicitly discussed in the GER-DB and justifications of their use documented.

Drilled shafts constructed in coralline or coralline detritus formations are typically subjected to high overpour ratios against theoretical shaft volumes. The project geotechnical engineer shall address this anticipated condition in the GER-DB and provide the anticipated concrete overpour ratio as described in Section 9.6.4.1.G above. Concrete overpour will not be accepted as a Differing Site Condition claim.

The following sections shall be added to Section 9.6 of the CDC:

9.6.7 Protection of Existing Facilities

The Contractor is responsible for protecting existing facilities from damage due to the Contractor's construction operations. General requirements are described in GCDB 7.3.1, Contractor's Duty to Locate and Protect Utility, and GCDB 7.30.6, Restoration and Precautions. No additional compensation will be made for protecting or restoring damaged facilities or for installing and monitoring geotechnical instrumentation.

- A. Deep Foundations Adjacent to Existing Facilities. Installation of temporary or permanent piling or drilled shafts has potential to cause damage or distress to existing facilities. The Contractor is responsible to determine and implement appropriate instrumentation and monitoring. The Contractor shall install instrumentation and conduct monitoring in accordance with Technical Specification 31 09 00, Geotechnical Instrumentation and Monitoring of Earthwork in at least the following situations:
1. Existing structure support elements are within 50 feet of the pile or drilled shaft
 2. Existing utility is within 50 feet of a driven pile
 3. Existing utility is within 50 feet of a drilled shaft with casing installed or removed by vibratory hammers or any other type of vibratory equipment
- B. Red Hill Fuel Tunnel. The Navy's Red Hill Fuel Tunnel crosses beneath Kamehameha Highway approximately midway between the proposed drilled shaft foundations for Piers 442 and 443. The Contractor shall institute the following measures to monitor the condition of the tunnel before and during construction:
1. Monitoring Requirements: The following requirements shall be met. Access to the tunnel for this documentation shall be coordinated with the Navy by the Contractor.
 - a. Prior to construction, the Contractor shall perform a pre-construction survey of the portion of the tunnel within 150 feet of the drilled shaft foundations. At a minimum, this survey shall include recording and measurement of existing cracks, spalls and any tunnel lining anomalies. The survey shall also include photo documentation of the overall condition of the tunnel lining.
 - b. During the construction process, the tunnel shall be inspected regularly on a daily basis to ascertain the impact of construction on the tunnel.
 - c. After construction completion, the Contractor shall conduct a survey similar that performed before construction to document changes, if any. Damage caused by the Contractor's work shall be repaired by the Contractor at no additional cost to HART.
 2. Extensometer Installation: Prior to initiating ground disturbing construction, a minimum of one borehole three-point Extensometer shall be installed and monitored in accordance with Technical Specification 31 09 00, Geotechnical Instrumentation and Monitoring of Earthwork. During the construction process, the tunnel shall be regularly inspected to ascertain the impact of construction on the tunnel lining.
 - a. The extensometer anchors shall be positioned at elevation +25, +15 and +5, respectively, as close to the tunnel wall surface as practically possible without damaging the tunnel. The final location of the extensometer shall be coordinated and approved by the Navy.
 - b. A baseline reading at each extensometer point location shall be acquired at least 1 week prior to any construction activity between eastbound track Station 1015+00 and 1018+00. Extensometer monitoring shall be continuous during any construction activity occurring between eastbound track station 1015+00 and 1018+00, with readings occurring hourly at a minimum. During

construction of the drilled shafts, piers, and guideway between eastbound track station 1015+00 and 1018+00, the readings shall be reported daily to HART.

- c. Any reading indicating cumulative movement in excess of 0.25-inch shall be reported immediately to HART and construction activity shall stop until directed by HART to resume. Readings shall be reported in inches of deflection (accurate to 0.001-inch) and shall be reported respective of depth and extensometer borehole number.
- d. Monitoring shall be ceased following construction with concurrence from HART.

9.7 STATIONS

The following sections shall be added to Section 9.7 of the CDC:

9.7.1 Guideway Column Aesthetics in the Vicinity of Stations

Certain guideway columns near stations shall receive a formliner relief pattern that is cast into the concrete column. See Guideway RFP Drawing FP700 for the minimum column locations to receive the formliner relief patterns. Columns shall be designed to accommodate the formliner and provide sufficient concrete cover for reinforcing. The design of the formliner and CADD drawings of the pattern will be provided by HART. One pattern will be provided per station; however, each station will have a different pattern. Formliners should be similar to formliners fabricated by Fitzgerald Formliners and used in other HART projects. Refer to Airport Guideway RFP Drawings FP700 and FP709 through FP713.

9.7.2 Honolulu International Airport (HIA) Station

The Contractor is advised that during the geotechnical investigation for the HIA Station, an underground obstruction was encountered (see borings ASG-202 and ASG-202a through ASG-202m in PSR Appendix I.10). At the locations investigated, the elevation of the top of the underground obstruction ranged from 2 to 7.2 feet below the ground line during the geotechnical investigation. Additional investigations were completed using Ground-Penetrating Radar (GPR) and potholing to further identify the underground obstruction at this location. Results of these investigations can be found in Exhibits 5 through 7 under PSR Appendix J.05.

The following sections shall be added to Section 9 of the CDC:

9.10 UPDATES TO THE RFP DRAWINGS

The subsections of this PSR 9.10 below modify the Guidance Drawings. The Contractor shall perform its own investigations and engineering to prepare the Final Design of these concepts. Also see PSR 1.6 for other modifications to the Guidance Drawings.

9.10.1 Pier 535

Per HART's coordination with HDOT, the Contractor shall modify the design concept depicted in the Airport Guideway Guidance Drawings for Pier 535 and design and construct a C-Pier as indicated in PSR Appendix B.05.

9.10.2 Pier 630 – Middle Street Station

As compared to the proposed location depicted in the Guidance Drawings, Pier 630 shall be shifted approximately 24 feet in the Koko Head direction. Also see PSR 8.3.1.

9.10.3 Pearl Harbor Naval Base Station Concourse

The Contractor shall modify the design concept depicted on the Pearl Harbor Naval Base Station Guidance Drawings and design and construct the makai side of the station such that there is no outage of an existing Navy communication line. See PSR 1.7.1.B.2, PSR 8.2.8, and PSR 9.10.3.

9.11 PRE-COORDINATION OF PIER LOCATIONS

The Contractor is advised of HART's prior coordination of the following pier locations with third parties:

- A. Piers 441 and 442 – Based on discussion with the Navy, the location of piers 441 and 442 are constrained by their proximity to a Navy easement.
- B. Piers 552 through 524 – Based on discussion with HDOT Airports Division, the location of these piers are constrained by HDOT Airport Division's Makua Concourse Project.
- C. Piers 525 through 531 – Based on discussion with the USPS, the location of these piers are constrained by the USPS operations.
- D. Piers 532 through 552 – Based on discussion with HDOT Airports Division, the location of these piers are constrained by HDOT Airport Division's Consolidated Rental Car Facility Project.
- E. Pier 566 – Based on discussion with HDOT Highways Division, the location of this pier is constrained by its proximity to an energy corridor easement.
- F. Piers 583 through 590 – Based on discussion with the property owners along Ualena Street, location of these piers are constrained by proximity to nearby properties.

9.12 RESERVED**9.13 GENERAL INFORMATION****9.13.1 Piers 546 through 552R**

The foundations of Piers 546 through 550, 551R, and 552R have been constructed as part of HART's Airport Guideway 7-Pier Construction contract. The Contractor shall design the guideway column and interface details to match and be integral with the existing foundations. For additional details, see the drawings for the Airport Section Guideway 7-Pier Construction provided in the Reference Materials.

9.13.2 The Cast-In-Place Guideway

The Contractor shall design the guideway in accordance with the requirements indicated in the Final EIS Appendix K that is available in Reference Materials - Permits and Third-party Agreements. The conceptual designs of spans 583 through 597 are shown in the Airport

Guideway RFP Drawings as cast-in-place box girders. Contractor is not constrained to cast-in-place construction but is advised of HDOT Airport Division runway glideslope height restrictions and 16-foot vertical clearance requirements for roadways and driveways.

Contractor shall maintain a minimum 16-foot vertical clearance at the driveways along Ualena Street and Waiwai Loop.

9.13.3 Wayside Rail Lubricators

See PSR 5.7.4 and PSR 9.2.2.

9.13.4 Ala Onaona Street

See PSR 1.6 and 1.7 for third-party restrictions associated with construction along Ala Onaona Street.

9.13.5 Transition Pier 422

Pier 422 has been designed and will be constructed by the KHG DB Contractor. The AGS Contractor shall design and construct the Ewa-most span of the Airport Guideway based on the designed capacities and configuration of Pier 422. Design information for Pier 422 was obtained through HART's interface process by the previous Airport Guideway designer. This information is provided in the Reference Materials, Pier 422 RFID Information. Any additional information required by Offerors will be provided by HART upon request. Additional information requested by the AGS Contractor shall be obtained through HART's interface process.

9.13.6 Temporary Terminus

- A. The Contractor is required to coordinate with the City Center Guideway and Stations Contractor to design and construct the interface between the Airport and City Center Sections to provide an integrated structure that will support the objectives of the completed Honolulu Rail Transit Project as defined in the Contract. In addition, for purposes of testing or interim operations, the Contractor shall design and construct the end of the Airport Section Guideway to function as a temporary terminus.
1. The Contractor shall coordinate with the Core Systems Contractor and HART to determine the temporary configuration of the terminus, including the locations of friction buffers.
 2. The Contractor shall design the Airport Section Guideway to accommodate a temporary friction buffer stop to be installed east of Middle Street Station. The structural design shall also accommodate the loads associated with the termination of the continuous welded rail. Coordinate design requirements with CDC 5.20.1.
 3. The Contractor shall relocate two existing friction buffers from the east end of the Kamehameha Highway Guideway to the east end of the Airport Section Guideway. Coordinate installation requirements with CDC 5.20.1.

9.13.7 Tarmac Clearance

- A. Column height and track elevation between Piers 552 through 524 shall allow for adequate vertical clearance associated with the HDOT Airports Division's future Makua terminal expansion. Clearance is established to allow clearance of an Airbus A330 plus 10 feet. At this location, the Contractor's design shall take appropriate measures to seal the zone between the bridge deck and the top of the barrier rail as to insure debris cannot fall down onto the future tarmac.
- B. Clearances to existing structures. Where guideway, straddle bent, or station elements are in close proximity to existing structures (less than 10 feet) and guideway access could be feasibly obtained by jumping, falling, climbing, or other means of unassisted entry, the Contractor shall implement measures to prevent guideway access.

END OF CHAPTER

10.0 ARCHITECTURE

10.3 STATIONS

10.3.2 Basic Design Goals

Chapter 11, Section 10.3.2, of the CDC is hereby amended by the addition of the following Subsections 10.3.2.E and 10.3.2.F:

- E. Coordinate the location of ceiling-, wall-, and floor-mounted fixtures, devices, and signage. Provide backboxes, mounting brackets, surfaces, or structural supports for Core Systems devices, including CCTV cameras, speakers, sensors, variable message signs, phones, and related devices. Coordinate the location of junction boxes, raceway and conduit for fare gates, ticket vending machines, light fixtures, alarms, and signage.

- F. The Contractor shall provide the following renderings at the interim and final design phases for each station:
 1. Site plan showing station and guideway;
 2. Aerial view of the station;
 3. Station Entrance view from grade;
 4. Views from the two sides of the station;
 5. Rendered Landscape Plan, indicating paving patterns;
 6. Rendered Landscape Plan of Traction Power Substation; and
 7. Rendered exterior view of Traction Power Substation, indicating landscaping.

Renderings shall be of high resolution and quality for public presentation. Renderings shall accurately portray architectural elements, materials, colors, landscaping and including entourage that reflects Hawaii.

10.3.5 Ancillary Space Program

Section 10.3.5, Table 10-2 of the CDC shall be supplemented with the addition of the following:

Activity/Space	Quantity	Approx. Size	Approx. Area	Operational/ Locational Needs	Design Criteria	Notes
Portable backup generator access	1	10'x 20'	200 SF	Adjacent to generator receptacle with a maximum cable distance of 100'	Drivable surface suitable for temporary use of trailer mounted generator	

10.3.6 Platform

Section 10.3.6 of the CDC shall be supplemented with the addition of the following statements:

- D. End of Platform Cabinets shall be provided at the ends of each platform in accordance with the Directive Drawings, Drawing No AD502. These cabinets provide locations for the installation of the Blue Light Station (BLS), AED, Platform Screen Gates/Local Control Panel (PSGs/LCP), and Emergency Telephone (ETEL). Coordinate device locations and conduit requirements with the Core Systems Contractor and adjacent access gate.
1. Curb cut at ends of platform shall be provided to accommodate Platform Screen Gate System (PSGS) overhang.

10.3.6.A Platform - General

Section 10.3.6.A.3 of the CDC shall be deleted in its entirety and replaced with the following:

The platform edge will be protected by a PSGS provided by the Core Systems Contractor. The system will be continuous along the edge of the platform with automatic gates located to correspond to the programmed stopping location of the train doors. The Contractor shall provide embedded attachment plates for the PSGS installation. Refer to Station Common drawings AS301 and AS302 and Core Systems Interface Reference Drawings, Section PSG for further details. The PSGs, PSG base plates, and the edge warning strips shall be interfaced and provided in accordance with the Contract. Refer to Chapters 12, Passenger Vehicles; Chapter 14, Train Control, and Chapter 23, Fire/Life Safety for further details regarding platform screen gates.

10.3.9 Weather Protection

Section 10.3.9.A of the CDC shall be supplemented with the addition of the following:

6. Weather Protection along Pedestrian Pathways
 - a. Overhead weather protection will be provided along a continuous pathway from the Fare Gate Entry Module to the platform. Stairs, escalators, and pedestrian pathways to the elevators will have weather protection.
 - b. The structural system supporting the overhead weather protection must be designed to facilitate the installation of Core Systems devices, lighting, conduit, signage, and guardrails, where required.
 - c. Roof drainage and downspouts should be integrated into the overhead weather protection design.

10.4 STATION ENTRANCES

Section 10.4 of the CDC shall be supplemented with the addition of the following:

H. Station Plaza Paving

1. HART has a cultural paving program that incorporates historical and cultural decorative patterns in the plaza paving concrete, using a combination of saw cuts, stain, and tile inlay. The design of the patterns and layout shall be as shown on Landscape Pavement Layout and Finishes drawings of each station.

10.5 VERTICAL CIRCULATION**10.5.1 Introduction**

Section 10.5.1 of the CDC shall be supplemented with the addition of the following:

- F. Elevator and escalator types and configurations are shown in the Airport Stations RFP Drawings. Refer to PSR Appendix S, Elevator & Escalator Type Schedule, for complete list of quantities, types, configurations, floor elevation stops, and rise. Also refer to PSR 1.7.3.B.3 regarding additional of two escalators at Pearl Harbor Naval Base Station.

10.5.6 Elevator

Section 10.5.6.A of the CDC shall be supplemented with the addition of the following:

9. Elevator hoistway shall be glazed on all sides to the maximum extent possible to allow security surveillance of the elevator cab interior.
10. Suspended elevator hoistways shall increase in size, from that shown on the Airport Stations RFP Drawings, to accommodate additional counterweight safety devices as per the elevator code. Confirm exact dimensions and the elevators to which this requirement applies with the E&E Contractor.
11. Elevator types will be roped hydraulic or machine room-less as provided by the E&E Contractor. All details and dimensions of the hoistway shall be interfaced and in accordance with the elevators to be provided by the E&E Contractor.

10.8 MATERIALS AND FINISHES**10.8.4 List of Finished Materials and Finishes**

Section 10.8.4 of the CDC shall be supplemented with the addition of the following:

A. Floor Finish Materials

1. Acceptable
 - a. Monolithic Materials
 - iii. Standard Broom Finish Concrete
 - iv. Concrete, integrally-colored or uncolored.

B. Wall Finish Materials

1. Acceptable
 - a. Monolithic Materials
 - ii. Formed-finished concrete
 - iii. Unfinished concrete, only if not exposed to view
- E. Canopy Materials (Replace with the following):
 1. Acceptable
 - a. Tensile Fabric per Technical Specifications
- F. Handrails (Replace with the following):
 1. The requirements for balustrades are not consistent across the various Guidance Materials provided with the RFP Documents (e.g., the RFP Drawings, HART Directive Drawings, Technical Specifications, and Standard Specifications). The balustrade requirements conflict in both material and form. For clarification, the Contractor shall provide stainless-steel balustrades per Guidance Technical Specification 05 73 00. The form of the balustrades shall be as depicted in HART's Directive Drawings.

10.9 ARTWORK

10.9.1 Introduction

In Section 10.9.1 of the CDC, the following statement shall be added to the end of the section:

HART has designated a location at each station for the integration of artwork into the architecture. The Contractor must coordinate with HART regarding the location, type, and structural features of the station required by the artwork installation. HART will contract the artist. The Contractor must coordinate the art installation with HART and the artist.

The following sections shall be added to Section 10.9 of the CDC:

10.9.4 Coordination with Artwork

- A. Artwork will be provided by HART under contracts with station artists.
- B. The Contractor shall coordinate with HART and the station artists and schedule for access to the site as required for installation and shall include the artist's schedule into the Station Construction Schedule.
- C. The Contractor shall prepare surfaces and substrates as indicated on the Contract Documents. Refer to Exhibits for the locations of artwork at each station.
- D. Artwork locations shall be free of construction debris, materials, equipment, etc. Area shall be broom clean.

- E. The Contractor shall facilitate the artwork installation and provide temporary electrical and water at no additional cost to HART.
- F. The Contractor shall provide barriers, install materials to protect the Work site during installation, and protect artwork after completion.

10.11 LIGHTING

In Section 10.11.3 of the CDC, the following statement shall be added to the end of the section:

- H. To the greatest extent possible, standardize light fixtures across the system to reduce inventory and maintenance requirements. See PSR Appendix L, Lighting Fixture Schedule, which should be regarded as Guidance.

10.12 SIGNAGE AND GRAPHICS

In Section 10.12.6 of the CDC, the following statement shall be added to the end of the section:

10.12.6 Signage System

- A. Signage shall be in accordance with the H RTP Signage & Wayfinding Systems Manual. Directional signage to streets or places of public interest in the vicinity of the station will be determined by the station location. Signage messages will be submitted by the Contractor and approved by HART. Signs displaying the station names and station location will be as established by HART. The content of and graphics for the Aesthetic Guideway Columns, the Interpretative Signage, and the Neighborhood Maps and Station Dedication Plaques will be provided by HART.

10.13 SANITATION AND MAINTENANCE**10.13.1 Introduction**

In Section 10.13.1 of the CDC, the following statement shall be added to the end of the section:

- D. The Contractor shall coordinate with the Core Systems Contractor to provide a list of spare parts and select consumables for inclusion in the Maintenance Management Information System. See GCDB 7.35.

10.14 STATION CONTROL**10.14.9 Access Control**

In Section 10.14.9 of the CDC, the following Subsection shall be added to the end of the section:

- D. The Contractor shall coordinate with the Core Systems Contractor to provide door hardware compatible with the CSC access control system.

- E. Door schedule and hardware. Refer to project-wide door schedule and hardware in PSR Appendix R for requirements.

10.15 CORE SYSTEMS DEVICES

Chapter 10 of the CDC is hereby amended by adding the following Section 10.15:

- A. The Contractor shall coordinate mounting details for all CSC-provided devices shown in Vol 4, Common Drawings AS100 through AS118 with the Core Systems Contractor. Mounting height for CCTV and PA shall be 12-foot preferred minimum, 11-foot absolute minimum.
- B. The Contractor shall coordinate mounting details for all CSC-provided devices shown in Vol 4, Common Drawings AS521 with the Core Systems Contractor. Mounting height for communications devices shall be 12-foot preferred minimum, 11-foot absolute minimum. Mounting provisions shall be provided for fire alarm systems in accordance with NFPA 72. Reference Core Systems Interface Reference Drawings, Section Fire Detection, in the Reference Materials.
- C. The Contractor shall coordinate mounting details, access, conduit sizing, and conduit entry for all CSC-provided equipment cabinets, including those shown in Vol 4, Common Drawings AS534 with the Core Systems Contractor.

END OF CHAPTER

11.0 LANDSCAPE ARCHITECTURE

11.1 GENERAL

Chapter 11, Section 11.1, of the CDC shall be amended with the following statement placed at the end of the Section:

HART highlights that the Temporary Planting and Irrigation Plans in the Airport Guideway RFP Drawings, drawings LA101 through LA155, are Reference Materials. The Contractor may avoid the installation of some temporary planting by coordinating these drawings with the Airport Median Landscape RFP Drawings or by other means.

11.1.3 Reference Data

Section 11.1.3 of the CDC shall be amended with the following addition:

- G. Codes, Regulations, and Standards
- H. Project-specific Landscape Documents
 - 1. Tree Disposition Plan Airport Guideway RFP Drawings, Volume 1 D, drawings LA001 to LA027
 - 2. Design guidelines applicable to landscaping within the State highway ROW are contained in the document titled HDOT Memorandum: Honolulu Rail Transit Project - Landscape Treatment Part 2, January 07, 2015, transmitted by the Hawaii Department of Transportation, Design Branch and dated January 7, 2015. These design guidelines are located in the Reference Materials.
 - 3. United States Department of Agriculture Restricted Plants List from the Hawaii Department of Transportation Airport Division that identifies plants that are prohibited from being planted on airport property.
 - 4. Revised Ordinances of Honolulu 14-6, Relating to the Use of Indigenous and Polynesian Introduced Plants in Public Landscaping, City and County of Honolulu

The following sections shall be added to Section 11.1 of the CDC:

11.1.4 Tree Condition Update

The Contractor is not responsible for removal, transport, or transplant of trees, even if such actions are identified in this PSR, in the RFP Drawings, or elsewhere in the Contract Documents. HART will coordinate with others to clear trees identified for removal or transplant to support the Contractor's schedule.

The Contractor is responsible for protection of all trees not identified for removal or transplant. The Contractor's certified arborist shall reassess the condition of all trees along the Project and provide HART with a recommended Action for review and concurrence if different than the Action identified within the Tree Disposition Plan.

Based on an early 2015 assessment of the trees within the Airport Section, the Tree Disposition Plan found on Airport Guideway RFP Drawings, drawings LA001 through LA028 is hereby updated as listed in the following Table 11.1.4.

Table 11.1.4 – Update to Tree Disposition Plan

Tree ID#	Species	Action
565	Coconut	Remove
567	Fan Palm	None - Tree has been removed or transplanted
568	Fan Palm	None - Tree has been removed or transplanted
569	Fan Palm	None - Tree has been removed or transplanted
570	Rainbow Shower	None - Tree has been removed or transplanted
572	Rainbow Shower	None - Tree has been removed or transplanted
573	Rainbow Shower	None - Tree has been removed or transplanted
574	Rainbow Shower	None - Tree has been removed or transplanted
575	Fan Palm	None - Tree has been removed or transplanted
576	Fan Palm	None - Tree has been removed or transplanted
577	Fan Palm	None - Tree has been removed or transplanted
578	Fan Palm	None - Tree has been removed or transplanted
579	Fan Palm	None - Tree has been removed or transplanted
580	Fan Palm	None - Tree has been removed or transplanted
581	Fan Palm	None - Tree has been removed or transplanted
583	Rainbow Shower	Tree has been removed by HART
584	Rainbow Shower	Tree has been removed by HART
585	Fan Palm	None - Tree has been removed or transplanted
586	Fan Palm	None - Tree has been removed or transplanted
588	Fan Palm	None - Tree has been removed or transplanted
725	Rainbow Shower	Remove
727	Rainbow Shower	Tree has been removed by HART
728	Rainbow Shower	Tree has been removed by HART
729	Rainbow Shower	Tree has been removed by HART
730	Rainbow Shower	Tree has been removed by HART
731	Rainbow Shower	Tree has been removed by HART
732	Rainbow Shower	Tree has been removed by HART
733	Rainbow Shower	Tree has been removed by HART
734	Rainbow Shower	Remove
735	Rainbow Shower	Remove
736	Rainbow Shower	Tree has been removed by HART
737	Rainbow Shower	Remove
741A	Rainbow Shower	Remove
742	Rainbow Shower	Remove
743	Rainbow Shower	Remove
744	Rainbow Shower	Remove
745	Rainbow Shower	Remove

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Tree ID#	Species	Action
745A	Rainbow Shower	Remove
746A	Rainbow Shower	Tree has been removed by HART
747	Rainbow Shower	Tree has been removed by HART
748	Rainbow Shower	Remove
749	Rainbow Shower	Remove
750	Rainbow Shower	Remove
751	Rainbow Shower	Tree has been removed by HART
752	Rainbow Shower	Remove
753	Rainbow Shower	Remove
754	Rainbow Shower	Remove
755	Rainbow Shower	Remove
756	Rainbow Shower	Remove
757	Rainbow Shower	Remove
759	Rainbow Shower	Remove
760	Rainbow Shower	Tree has been removed by HART
761	Rainbow Shower	Tree has been removed by HART
762	Rainbow Shower	Remove
763	Rainbow Shower	Remove
764	Rainbow Shower	Tree has been removed by HART
765	Rainbow Shower	Tree has been removed by HART
766	Rainbow Shower	Remove
766A	Rainbow Shower	Remove
767	Rainbow Shower	Remove
768	Rainbow Shower	Tree has been removed by HART
769	Rainbow Shower	Remove
769A	Rainbow Shower	Tree has been removed by HART
771	Rainbow Shower	Remove
774	Rainbow Shower	Tree has been removed by HART
775	Rainbow Shower	Remove
776	Rainbow Shower	Tree has been removed by HART
777	Rainbow Shower	Remove
777A	Rainbow Shower	Tree has been removed by HART
781	Weeping Banyan	Remove
782	Weeping Banyan	Remove
783	Weeping Banyan	Remove
784	Weeping Banyan	Remove
785	Weeping Banyan	Remove
786	Weeping Banyan	Remove
787	Weeping Banyan	Remove
788	Weeping Banyan	Remove
789	Weeping Banyan	None - Tree has been removed or transplanted
790	Weeping Banyan	Remove

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Tree ID#	Species	Action
791	Weeping Banyan	Remove
792	Weeping Banyan	Remove
816	Rainbow Shower	None - Tree has been removed or transplanted
816A	Rainbow Shower	None - Tree has been removed or transplanted
817	Rainbow Shower	None - Tree has been removed or transplanted
819	Rainbow Shower	Remove
820	Rainbow Shower	Tree has been removed by HART
822	Rainbow Shower	Tree has been removed by HART
823	Rainbow Shower	Tree has been removed by HART
824	Rainbow Shower	Tree has been removed by HART
825	Rainbow Shower	Remove
826	Rainbow Shower	Remove
827	Rainbow Shower	Remove
829	Rainbow Shower	Remove
830	Rainbow Shower	Remove
831	Rainbow Shower	Remove
832	Rainbow Shower	Remove
833	Rainbow Shower	Remove
834	Rainbow Shower	Tree has been removed by HART
835	Rainbow Shower	Remove
836	Rainbow Shower	Remove
837	Rainbow Shower	Remove
838	Rainbow Shower	Remove
839	Rainbow Shower	Remove
840	Rainbow Shower	Remove
841	Rainbow Shower	Remove
842	Rainbow Shower	Remove
843	Rainbow Shower	Remove
844	Rainbow Shower	Remove
845	Rainbow Shower	Remove
846	Rainbow Shower	Remove
847	Rainbow Shower	Remove
852	Rainbow Shower	Remove
853	Rainbow Shower	Remove
854	Rainbow Shower	Remove
855	Rainbow Shower	Tree has been removed by HART
856	Coconut Palm	Remove
857	Rainbow Shower	Tree has been removed by HART
858	Rainbow Shower	Tree has been removed by HART
859	Rainbow Shower	Tree has been removed by HART
860	Rainbow Shower	Tree has been removed by HART
861	Rainbow Shower	Remove

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Tree ID#	Species	Action
862	Monkeypod	Transplant
862A	Monkeypod	Transplant
863	Coconut	Remove
863A	Monkeypod	Remove
864	Rainbow Shower	Remove
865	Rainbow Shower	Remove
865A	Rainbow Shower	Remain
866	Monkeypod	Remove
867	Coconut	Remove
868	Monkeypod	Transplant
869	Coconut	Remove
870	Coconut	Transplant
871	Monkeypod	Remove
875	Rainbow Shower	Remove
877	Coconut	Remove
880	Autograph Tree	Remove
881	Lauhala	Remove
900	Areca Palm	Remove
901	Coconut	Remove
902	Areca Palm	Remove
903	Areca Palm	Remove
904	Areca Palm	Remove
905	Areca Palm	Remove
906	Areca Palm	Remove
907	Areca Palm	Remove
908	Areca Palm	Remove
909	Areca Palm	Remove
910	Areca Palm	Remove
911	Areca Palm	Remove
912	Areca Palm	Remove
913	Areca Palm	Remove
914	Areca Palm	Remove
915	Areca Palm	Remove
916	Areca Palm	Remove
917	Areca Palm	Remove
918	Areca Palm	Remove
922	Coconut	Remove
941	Royal Palm	Remove
943	Coconut	Remove
959	Phoenix Date Palm	Remove
960	Rainbow Shower	Remove
961	Rainbow Shower	Remove

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PROJECT SPECIFIC REQUIREMENTS

Tree ID#	Species	Action
1019	Macarthur Palm	Remove
1020	Macarthur Palm	Remove
1021	Macarthur Palm	Remove
1034	Coconut	Remove
1041	Coconut	Remove
1042	Coconut	Remove
1043	Coconut	Remove
1044	Coconut	Remove
1045	Coconut	Remove
1052	Coconut	Remove
1053	Coconut	Remove
1056	Coconut	Remove
1058	Manila Palm	Remove
1059	Manila Palm	Remove
1060	Queen Palm	Remove
1061	Queen Palm	Remove
1063	Manila Palm	Remove
1064	Queen Palm	Remove
1076	Fiddleleaf Fig	Remove
1077	Fiddleleaf Fig	Remove
1078	Fiddleleaf Fig	Remove
1081	Fiddleleaf Fig	Remove
1094	Rainbow Shower	None - Tree has been removed or transplanted
1094A	Rainbow Shower	None - Tree has been removed or transplanted
1104	Phoenix Palm	Remove
1105	Phoenix Palm	Remove
1106	Phoenix Palm	Remove
1107	Phoenix Palm	Remove
1108	Phoenix Palm	Remove
1109	Phoenix Palm	Remove
1142	Narra	None - Tree has been removed or transplanted
1143	Narra	None - Tree has been removed or transplanted
1144	Narra	None - Tree has been removed or transplanted
1145	Narra	None - Tree has been removed or transplanted
1146	Narra	None - Tree has been removed or transplanted
1147	Narra	None - Tree has been removed or transplanted
1148	Narra	None - Tree has been removed or transplanted
1149	Narra	None - Tree has been removed or transplanted
1150	Narra	None - Tree has been removed or transplanted
1151	Manila Palm	Remove
1152	Manila Palm	Remove
1153	Manila Palm	Remove

AIRPORT GUIDEWAY AND STATIONS DESIGN-BUILD CONTRACT**PROJECT SPECIFIC REQUIREMENTS****REV. 0, 09-01-15**

Tree ID#	Species	Action
1155	Manila Palm	Remove
1157	Coconut	Remove
1158	Norfolk Pine	Remove
1159	Coconut	Remove
1160	Coconut	Remove
1161	Coconut	Remove
1162	Coconut	Remove
1163	Coconut	Remove
1164	Monkeypod	Remove
1165	Coconut	Remove
1166	Manila Palm	Remove
1167	Manila Palm	Remove
1168	Manila Palm	Remove
1169	Manila Palm	Remove
1170	Manila Palm	Remove
1171	Manila Palm	Remove
1172	Manila Palm	Remove
1173	Monkeypod	Remove
1179	Paperbark	Tree has been removed by HART
1181	Paperbark	Tree has been removed by HART
1182	Paperbark	Tree has been removed by HART
1183	Rainbow Shower	Tree has been removed by HART
1184	Rainbow Shower	Remove
1185	Rainbow Shower	Remove
1186	Rainbow Shower	None - Tree has been removed or transplanted
1187	Rainbow Shower	None - Tree has been removed or transplanted
1188	Rainbow Shower	None - Tree has been removed or transplanted
1190	Chinese Banyan	Remove
1192	Coconut	Remove
1193	Rainbow Shower	Remove
2047	Coconut palm	Transplant
2048	Coconut palm	Transplant
2049	Coconut palm	Transplant
2050	Coconut palm	Transplant
2051	Coconut palm	Remain
2052	Coconut palm	Remain
2053	Coconut palm	Remain
2054	Royal Palm	Remove
2055	Royal Palm	Remove
2056	Loulu Palm	Transplant
2057	Loulu Palm	Transplant
2058	Loulu Palm	Transplant

Tree ID#	Species	Action
2059	Loulu Palm	Transplant
2060	Loulu Palm	Transplant
2061	Loulu Palm	Transplant
2062	Loulu Palm	Transplant
2063	Loulu Palm	Transplant
2064	Loulu Palm	Remain
2065	Coconut palm	Remove
2066	Coconut palm	Remove
2067	Blue Latan	Transplant
2068	Coconut palm	Remove
2069	Blue Latan	Remain
2070	Coconut palm	Remove
2071	Shower	Remove
2072	Shower	Transplant
2073	Coconut palm	Remove
2074	Coconut palm	Remove
2075	Coconut palm	Remove
2076	Phoenix Palm	Remove
2077	Kukui	Remove
2078	Coconut palm	Remove
2079	Coconut palm	Remove
2080	Kukui	Remove

Trees designated with an “A” suffix are not indicated on the Airport Guideway RFP Drawings. For the location of these trees, see Assessment of Trees Pearl Harbor Interchange EB 1077 to EB 1087 and Assessment of Trees Keehi Interchange EB 1239 to EB 1259 Arborist Report in the Reference Materials.

11.3 ZONES

11.3.5 Traction Power Substations

Section 11.3.5.C of the CDC shall be deleted and replaced as follows:

There shall be no plantings within the secured area. All vegetation shall be planted outside the security fences for TPSSs and Gap Breaker Substations (GBS), and in areas where roots will not adversely affect the underground electrical grounding system. Landscaping for TPSS and GBS shall comply with Crime Prevention through Environmental Design (CPTED) principles regarding line of sight. Trees shall not be planted where they could be used for ingress to secured areas.

11.3.6 Under Guideway

Section 11.3.6 of the CDC is hereby deleted in its entirety and replaced with the following:

- A. The use of living vines on guideway columns is prohibited.

The following sections shall be added to Section 11.3 of the CDC:

11.3.7 Median Under Guideway

- A. Design of final median landscaping shall be coordinated with the ROW owner.
- B. For the State highway ROW, the design should conform to the long-term maintenance requirements contained in HDOT Memorandum: Honolulu Rail Transit Project - Landscape Treatment Part 2, January 07, 2015.
- C. Design criteria for median under guideway
 - 1. The Contractor shall develop six tiers (or levels) of treatment:
 - a. Tier 1: Hardscape, which may consist of various hardened surfaces constructed from concrete, rock (not less than 12 inches in diameter minimum exposed width), and/or similar materials, but no vegetation.
 - b. Tier 2: Minimal Landscaping, which may consist of grasses (such as St. Augustine grass or Bermuda sod), and shrubs (such as beach naupaka), as coordinated with the ROW owner.
 - c. Tier 3: Basic Landscaping, which may consist of grasses (such as St. Augustine grass or Bermuda sod) and low, hardy native ground covers (such as 'akia or carex), as coordinated with the ROW owner.
 - d. Tier 4: Basic landscaping, which may consist of low, hardy native ground covers (such as 'akia or carex), as allowed by the ROW owner. In lieu of grasses (provided in Tier 3), Tier 4 includes an 18-inch-wide hardened strip for use by maintenance personnel.
 - e. Tier 5: Accent Landscaping to create an attractive focal point, which may consist of trees, groundcovers, and shrubs of predominantly native species, as coordinated with the ROW owner.
 - f. Tier 6: Restoration Landscaping, in which the Contractor is to photo-document existing conditions and restore landscaping by replacing plants as close as possible to pre-construction locations. If guidance for landscape treatment is provided by the HDOT Airports Division, stated preferences should be accommodated, as feasible. In the vicinity of the HIA Station, the Contractor is to use plant species and a design scheme for the median that matches station landscaping, as coordinated by the Contractor with HDOT Airports Division.
 - 2. Restoration shall consider erosion control with plants or fabric to stabilize and hold the soil of banks and slopes in place as required.
 - 3. Control outgrowth of grass maintenance strips in Tier 2 and Tier 3 by adding a landscape barrier in aluminum edging where there are no concrete curbs or wall to hold the grass in place.
 - 4. The Median Landscape RFP Drawings depict the following:

- a. Landscaping treatment by tier, and
 - b. Typical cross sections showing representative design for Tiers 1 through 5, including planting materials.
5. The irrigation system shall include equipment as specified in the Contract. Power systems, water sources, and communication protocols should be coordinated with the ROW owner.
 6. The planting scheme shall be approved by the entity responsible for maintenance and roadway traffic safety.
- D. Median landscaping should accommodate temporary and permanent BMPs for guideway drainage and stormwater management.
1. Stormwater will be collected on the guideway and conveyed to ground via integral downspouts.
 2. Contractor shall design and construct acceptable downspout discharge conveyance treatment, which could include rip rap, splash blocks, drain connections, bioswales, filters, or other site-specific solutions.
 3. Regardless of the specific treatments depicted in the RFP Drawings, downspout discharges shall be conveyed for permanent control of water runoff into storm sewers, catch basins, curbing, gutters, and culverts as a standard in the State of Hawaii, in accordance with the regulations of the jurisdictional areas, at no additional cost to HART.
- F. Design criteria for mitigation landscaping
1. Provide median landscaping in the vicinity of the Arizona Memorial.
 - a. An illustrative concept plan for accent landscaping (Tier 3) is included in the RFP Drawings.
 - b. HART will inform, solicit and comply to comments from consulting parties where feasible and consistent with Section 106 Programmatic Agreement (PA). The Contractor is to provide graphic renderings and narrative descriptions that may be used in potential presentations to consulting parties.
 2. Provide landscaping at Keehi Memorial Park.
 - a. An illustrative concept plan is included in the RFP Drawings.
 - b. HART will coordinate final design with the Keehi Memorial Organization. The Contractor is to provide graphic renderings and narrative descriptions that may be used in potential presentations to the organization.
 - c. Landscape design and installation shall include the driveway entry area to mitigate the visual impact of the guideway.

3. Provide landscaping in other traffic triangles and islands on cross streets, as approved by the ROW owner.
 - a. An illustrative concept plan is included in the Median Landscape RFP Drawings.
 - b. Examples include the intersections of Kamehameha Highway with Radford Drive and Makalapa Road.

11.3.8 Stations

In the Stations RFP Drawings, drawing LA102, Landscape Site Plan, disregard note: “See enlargement sht. LA401 for pavement layout” and instead refer to PSR Appendix U, Cultural Paving, for pavement layout.

11.5 PLANTING DESIGN

11.5.4.C Existing Trees/Urban Forest

Chapter 11, Section 11.5.4.C, of the CDC shall be amended as follows:

6. Relocation sites for trees salvaged from State or City and County ROW to be determined by HART. Trees salvaged from private properties will be offered first to the property owner, and, if not accepted, should be relocated to a suitable transplant site as determined by HART.
7. The Contractor shall provide a temporary holding area for displaced trees that cannot be replanted immediately. Trees with wrapped rootballs and placed in individual baskets or boxes may be stored in the holding area for a period not to exceed 3 months, during which the Contractor will be responsible for watering and maintaining the trees in a condition that allows for future transplant. The temporary holding area should be outfitted with proper BMPs.
8. The Tree Disposition Plan, Airport Guideway RFP Drawings LA001 through LA027, and as updated in Table 11.1.4 of this document, shall provide a baseline for actions on trees located in the guideway corridor.
9. The Contractor shall maintain a spreadsheet (tree matrix) as an ongoing record of tree dispositions.
10. Prior to changing the disposition of a tree, the Contractor is to consult its certified arborist and determine if the work can be performed in a different manner that will maintain or improve the tree’s disposition. The Contractor shall notify HART of any tree disposition that is different from the tree disposition plan upon discovery, and provide a letter from the certified arborist with recommendations. The Contractor will update the tree matrix for concurrence by HART.
11. The Contractor shall be responsible for disposing of repurposed wood.
12. All large canopy trees (dripline diameter greater than 30 feet) to be pruned shall be surveyed by a certified arborist or qualified biologist prior to construction to ensure that

no trees have white tern (a threatened species) chicks. If any are found, pruning will be delayed until chicks have fledged.

11.6 SPECIALTY LANDSCAPES

11.6.A Vertical Planting (Trellis or Green Walls)

Chapter 11, Section 11.6.A, of the CDC shall be amended as follows:

Delete:

Planting screens, hedges, vines on trellises, or green walls can assist in defining outdoor spaces, guide patrons toward walkways or entrances, assist in cooling microclimate areas, and be a graffiti deterrent at guideway piers and platforms.

Replace with:

Planting screens, hedges, vines on trellises, or green walls can assist in defining outdoor spaces, guiding patrons toward walkways or entrances, and cooling microclimate areas. Vines should not be planted directly on guideway piers or on trellises adjacent to guideway piers.

11.8 IRRIGATION DESIGN

11.8.3 Design Considerations

Section 11.8.3C of the CDC shall be amended as follows:

Delete:

Water-savings equipment (e.g., rain and wind sensors or a central control system) shall be specified to manage and monitor the irrigation system.

Replace with:

Water-savings equipment (e.g., rain and wind sensors or a central control system) shall be specified to manage and monitor the irrigation system via Wi-Fi communication.

Section 11.8.3.H of the CDC shall be amended as follows:

Delete:

System should have the ability to be controlled by a central computer either at the time of installation or at a future date with little additional expense or difficulty. The computer-controlled system should have the ability to manage and monitor all systems and to provide water audits accurately and efficiently. All controls that are in publicly accessible areas shall be encased in a vandal-resistant box secured with a lock.

Replace with:

The system should have the ability to be controlled via Wi-Fi communication by a central computer either at the time of installation or at a future date with little additional expense or difficulty. The computer-controlled system should have the ability to manage and

automatically adapt and monitor all system operation and irrigation run-times in response to conditions in the system and surrounding area (weather change, pipe breaks, etc.) as well as parameters defined by the operator, to provide water audits accurately and efficiently. All controls that are in publicly accessible areas shall be encased in a vandal-resistant box secured with a lock.

END OF CHAPTER

12.0 PASSENGER VEHICLES

12.1 GENERAL

12.1.1 Introduction

Section 12.1.1 of the CDC shall be amended with the following addition to be added after the last paragraph:

Detailed vehicle dimensions and dynamic envelope data are provided in the Core Systems Interface Reference Drawings, Section Passenger Vehicle. For any discrepancies between the data provided in CDC Chapter 12 and the data provided in the Core Systems Interface Reference Drawings, Section Passenger Vehicle, the data provided in the Core Systems Interface Reference Drawings shall take precedence.

END OF CHAPTER

13.0 TRACTION ELECTRIFICATION

13.6 TRACTION POWER FACILITIES

13.6.2 Utility Power Supply

Section 13.6.2 of the CDC shall be amended with the following addition to be added after the last paragraph:

- C. Provide a concrete pad (4 feet by 4 feet and 6 inches thick) with stairs on all three sides abutting the area of the TPSS where the HECO metering equipment is contained. The Contractor shall coordinate the design and installation with the Core Systems Contractor and HECO. The reinforcing in the pad shall be connected to the TPSS grounding system.
- D. Design and Installation of two (2) 5-inch conduits from a location within the TPSS foundation shall be coordinated with the Core Systems Contractor and laid to a position 5 feet outside the foundation, capped, and marked. Designate and show on the drawings a 9-foot by 9-foot area within the TPSS compound for a future Harmonic filter, extend the TPSS ground grid below this area, and leave three (3) 10-foot-long grounding pigtails in this area for connection to the future Harmonic filter and foundation reinforcing.

13.6.13 Substation Foundation

Section 13.6.13 of the CDC shall be amended with the following addition to be added after the last paragraph:

The Contractor shall coordinate with HECO and the Core Systems Contractor to design and install a 4-foot by 4-foot landing, walkway, and stairs for access to the TPSS utility metering cabinet.

The substation foundation shall be designed to accommodate the Core Systems-provided TPSS/GBS. See Core Systems Interface Reference Drawings, Section: Traction Electrification, Chapter TPSS Equipment Layout Inside the Prefabricated Enclosure. The Contractor shall interface with the Core Systems Contractor to ensure that the Contractor's design and installation plans are coordinated with the Core Systems Contractor. At a minimum, coordination shall include the load, footprint, foundation blockouts and conduit sleeves, ground grid, hold down anchors, access stairs, provisions (including embedded channel and cable pulling eyes) for conduit and/or tray in the cable vaults, and external work area pads with the CSC.

The following sections shall be added to Section 13.6 of the CDC:

13.6.15 Standby Generator and Transfer Switch Foundation

The design of the standby generator foundation, the Medium Voltage Auto-Transfer Switch (ATS), and the HECO metering access pad at the TPSS shall conform to established civil and structural engineering practices, ASTM International and American Concrete Institute (ACI) standards, local codes, and the CDC, including Chapter 9, Structural. The standby generator foundation and the transfer switch foundation shall be structurally capable of withstanding the live and dead loads of the generator and transfer switch enclosures occurring during installation, operation, and

maintenance of the generator. The reinforcing in the foundations must be connected to the ground grid for the metering access pad, generator, and ATS foundations.

The foundation design shall include adequate provisions for raceway interfaces and anchoring of the standby generator and transfer switch to the foundation.

The top level of the standby generator foundation and ATS foundation shall not be below the 100-year floodplain.

13.7 DC POWER DISTRIBUTION SYSTEM

13.7.1 Contact Rail System

The following Subsection shall be added to Section 13.7.1 of the CDC:

- R. The contractor shall provide cross sectional drawings showing trackwork and switch machine dimensions sufficient to allow the CSC to verify clearances for third rail and collector shoe.

END OF CHAPTER

14.0 TRAIN CONTROL

14.1 GENERAL

No change to CDC Chapter 14.0 – Train Control.

END OF CHAPTER

15.0 COMMUNICATION AND CONTROL

15.10 WIRELESS COMMUNICATIONS

15.10.2 System Design Criteria

Delete:

- C. MDS: Shall have the following characteristics:
 - 1. Antennas shall be mounted on station structures and along the guideway as required to provide continuous wireless coverage to all trains. Guideway mounted poles shall be less than 15 feet tall and the use of such poles shall be minimized to the extent possible.

Replace with:

- C. MDS: Shall have the following characteristics:
 - 1. Antennas shall be mounted on station structures and along the guideway as required to provide continuous wireless coverage to all trains. Guideway mounted poles shall be coordinated with the Core Systems Contractor and the use of such poles shall be minimized to the extent possible.

15.14 OTHER SYSTEMS DESIGN CRITERIA

15.14.3 Fare Collection

Section 15.14.3 of the CDC shall be amended as follows:

Delete:

- A. The SCADA shall monitor maintenance and intrusion detection alarms.
- B. The CTS shall provide a secure network connection from each TVM to centralized fare collection equipment located at the MSF.
- C. The CTS shall provide a secure network provision for connection to banking networks if required.
- D. CCTV shall work in conjunction with TVM alarm systems, activating real-time CCTV monitoring at the Operations Control Center (OCC, a.k.a. Rail Operations Center) when TVM alarm is activated.

Replace with:

- A. The SCADA shall provide control and monitor alarm/status indications for each TVM as well as each fare gate at the station.

- B. Each TVM, as well as each fare gate, shall be connected via a LAN at each station. This LAN will be separate from the SLAN described in this Chapter for connection of CCTV, ETELS, etc. and will connect to the Fare Vending Network Controller (FVNC) described in CDC Chapter 16 via a dedicated fiber network.

- C. CCTV shall work in conjunction with TVM alarm systems, activating real-time CCTV monitoring at the OCC when the TVM alarm is activated.

END OF CHAPTER

16.0 FARE VENDING

16.1 GENERAL

No change to CDC Chapter 16.0 – Fare Vending.

END OF CHAPTER

17.0 CORROSION CONTROL

17.1 GENERAL

No change to CDC Chapter 17.0 – Corrosion Control

END OF CHAPTER

18.0 MAINTENANCE & STORAGE FACILITIES (MSF)

18.1 GENERAL

No change to CDC Chapter 18.0 – Maintenance & Storage Facilities

END OF CHAPTER

19.0 FACILITIES MECHANICAL

19.3 SYSTEMS AND EQUIPMENT

19.3.1 Ventilation Systems – Supply and Exhaust

Section 19.3.1 of the CDC shall be amended with the following addition to be added after the last paragraph:

The Contractor shall provide an analysis to determine if the building ventilation should be interfaced with the Fire Alarm System in compliance with International Building Code Section 909.

19.10 ENERGY CONSERVATION AND MANAGEMENT SYSTEM

The following sections shall be added to Section 19.10 of the CDC:

19.10.1 TCCR and UPS Room HVAC Monitoring

The Contractor shall provide Dry-form “C” contacts for remote indication of the following conditions: TCCR High Air Temperature, TCCR Air Flow Malfunction, UPS room High Air Temperature, and UPS room Air Flow Malfunction. The contacts shall be centrally provided in or near the TCCR.

The following sections shall be added to Chapter 19 of the CDC:

19.11 SPARE PARTS

The Contractor shall coordinate with the Core Systems Contractor to provide a list of spare parts and select consumables for inclusion in the Maintenance Management Information System.

END OF CHAPTER

20.0 FACILITIES ELECTRICAL

20.4 FACILITY POWER SUPPLY

20.4.4 Essential Power Systems

20.4.4.2 Passenger Stations

In Section 20.4.4.2 of the CDC, the following statement shall be added to the end of the section:

Refer to the Core Systems Interface Reference Drawings, Section UPS, Chapter Single Line Diagram, for the wiring topology of the Core Systems provided TCC UPS. The Contractor shall interface with the Core Systems Contractor to provide raceways for connection of a portable generator to the Core Systems provided TCC UPS.

20.10 ELECTRONIC DISTRIBUTION REQUIREMENTS

20.10.2 Raceway

Amend Section 20.10.2 of the CDC, to add the following statement shall be added to the end of the section:

All conduits and raceways shall be concealed to the maximum extent possible. Where necessary to be exposed, conduits and raceways shall be consolidated, neatly composed, and routed as unobtrusively as possible.

20.10.5 Specific Requirements

20.10.5.5 Fare Vending, Collecting, Gates

In Section 20.10.5.5 of the CDC, the following statement shall be added to the end of the section:

The Contractor shall assume a connected load of 2 kilovolt ampere (kVA) for each TVM and 1 kVA for each fare gate entry (i.e., equipment pair). The final design for raceways and cabling for connecting the TVMs to fare gates and the TVMs and fare gates to the TCCR and electrical panels shall be coordinated with the Fare Systems Contractor.

20.12 COMMUNICATION AND SPECIAL SYSTEM SERVICES

In Section 20.12 of the CDC, the following statement shall be added to the end of the section:

- A. Fare Vending will not be provided by the Core Systems Contractor. Coordinate with the Fare Systems Contractor. A hardwire interface will exist between the CSC SCADA system (TCCR) with each TVM and fare gate (See also PSR 20.12.F).
- B. Encroachment Detections has been replaced by the Passenger Screen Gate Systems supplied by the Core Systems Contractor. The final design for raceways connecting the PSGs to the TCCR and UPS room shall be coordinated with the Core Systems Contractor.

- C. Refer to the Core Systems Interface Reference Drawings, Section Communications, Chapter Maintenance Storage Facility and 21 Stations – Common Drawings, for the typical device box and mounting requirements for the Core Systems devices.
- D. Refer to the Core Systems Interface Reference Drawings, Section Communications, Chapter UH West O’ahu Station Wiring Diagrams, for typical wiring requirements of the Core Systems communications devices. This item is intended to supplement the RFP Drawings with a more detailed, but indicative station wiring diagram.
- E. Refer to the Core Systems Interface Reference Drawings, Section Fire Detection, Chapter Fire Detection and Alarm System Typical Mechanical & Electrical Wiring Components Installation for the typical device box and mounting requirements for the Core Systems Fire Detection devices. Further, refer to the Core Systems Interface Reference Drawings, Section Fire Detection, Chapter Fire Detection & Alarm System Equipment Layout - Waipahu Station for an indicative station layout of fire alarm system equipment and cabling. These two items are intended to supplement the Airport Stations design concepts for raceways for Fire Alarm Systems as shown in the RFP Drawings. Please note that the while a raceway design for Fire Alarm Systems for the Honolulu International Airport Station is not shown in the Stations Guidance Drawings, the Contractor shall coordinate and finalize the raceway design for all stations. The Contractor shall provide conduit for a heat and smoke detector in each trash room and janitor room. Conduit for a flow switch is not required. Conduit for Fire Detection and Alarm Systems shall be 1 inch minimum.
- F. Refer to the Core Systems Interface Reference Drawings, Section SCADA, Chapter Honolulu International Airport Station SCADA Book Of Plans, for typical locations and wiring requirements for the Core Systems SCADA monitoring of station equipment. The Core Systems SCADA monitors equipment provided by the Core Systems, Fare Systems Contractor, and E&E Contractor, and by the Contractor. This item is intended to supplement the RFP Drawings with a more detailed SCADA design. The design is for the HIA Station, but is indicative for the other AGS stations.
- G. The Contractor shall coordinate with the Core Systems Contractor for adequate segregation of power and data conduits to avoid issues due to Electromagnetic Interference (EMI). Unless otherwise approved by HART, raceway segregation shall be provided in accordance with the guidelines set in Core Systems Interface Reference Drawings), Section Wiring, Chapter Cable Segregation Criteria.

20.12.1 TCCR to Guideway Communications and Train Control Cable Raceways

Chapter 20, Section 20.12, of the CDC is hereby amended by adding the following Subsection 20.12.1:

In addition to the equipment and devices located within the station noted in CDC Section 20.12, the Core Systems Contractor will install equipment and cabling along the guideway and between each facility (i.e., TPSS, TCCR). The Contractor shall finalize and coordinate the design of the raceways for the communications and train control cabling with the Core Systems Contractor.

Core Systems Communications cabling between stations is primarily fiber optic cable between the TPSS and TCCR and between TCCRs. Refer to the Core Systems Interface Reference Drawings, Section Communications, Chapter Communications System Fiber Optic

Communication Network Communications Transmission System Block Diagrams, for the typical wiring requirements for this Core Systems fiber optic backbone network. In addition to the Core Systems fiber optic backbone network, another fiber optic backbone network will be installed for use by the Fare Systems Contractor.

In general, Train Control cabling originates in the TCCR and is routed to Train Control equipment mounted along the guideway. Refer to the Core Systems Interface Reference Drawings, Section Automatic Train Control, Chapter Wayside Mainline Double Line Track Plan, for a schematic of the Train Control wiring requirements. Refer to the Core Systems Interface Reference Drawings, Section Automatic Train Control, for a Train Control wiring diagram from the Pearl Harbor and HIA Station TCCRs. The two wiring diagrams are indicative for the Lagoon Station.

20.12.2 TPSS Communications and DC Power Raceways

Chapter 20, Section 20.12, of the CDC is hereby amended by adding the following Subsection 20.12.2:

The conduit ductbanks for connections between the TPSS and guideway or TCCR are shown in the Airport Guideway RFP Drawings UP1501 through UP1555, and UP1601 through UP1645E. Refer to drawings UP1512 through UP1513, UP1531 through UP1532, UP1612 through UP1613, UP1631 through UP1632, and UP1645 through UP1646. The Contractor shall not reduce the quantity or size of these conduit ductbanks. The conduit routing and layout of intermediate manholes and pullboxes shall be in accordance with the requirements of HART Standard Specification (e.g., Section 34 20 51, Chapter 1.03, Section 26 05 23, and Section 26 05 33).

Traction Power Raceway: Ductbanks for negative and positive feeders shall be separated from each other until they enter the TES compound where they can be routed together in a vault and/or trench below the TPSS.

Conduit Stub-Ups into the TPSS and through sleeves in the guideway deck for traction power cables shall be coordinated with the Core Systems Contractor so that the length of cable required to be run on the track bed is minimized.

20.19 SPARE PARTS

Chapter 20 of the CDC is hereby amended by adding the following Section 20.19:

The Contractor shall coordinate with the Core Systems Contractor to provide a list of spare parts and select consumables for inclusion in the Maintenance Management Information System.

END OF CHAPTER

21.0 FIRE AND INTRUSION ALARM SYSTEMS

21.1 GENERAL

No change to CDC Chapter 21.0 – Fire and Intrusion Alarm Systems

END OF CHAPTER

22.0 ELEVATORS AND ESCALATORS

22.3 ELEVATORS

22.3.5 Communication Equipment

In Section 22.3.5 of the CDC, the following statement shall added to the end of the section:

The Contractor shall provide appropriate raceway from the Elevator interface point to the TCCR.

22.3.10 Machine Rooms and System Elements

In Section 22.3.10 of the CDC, the following statement shall added to the end of the section:

Elevator Machine Rooms (EMR) shall be located as near as possible to elevator hoistways. The maximum distance between EMR and elevator hoistway is as follows: Machine Room Less (MRL) type elevator to be 100 linear feet, maximum horizontal and vertical lengths. Roped Hydraulic type elevator to be 50 linear feet maximum.

The following subsections shall be added to Section 22.3 of the CDC:

22.3.13 Elevator Design Loads

A. General Machine Room Less (MRL) Traction Type Elevator Loads

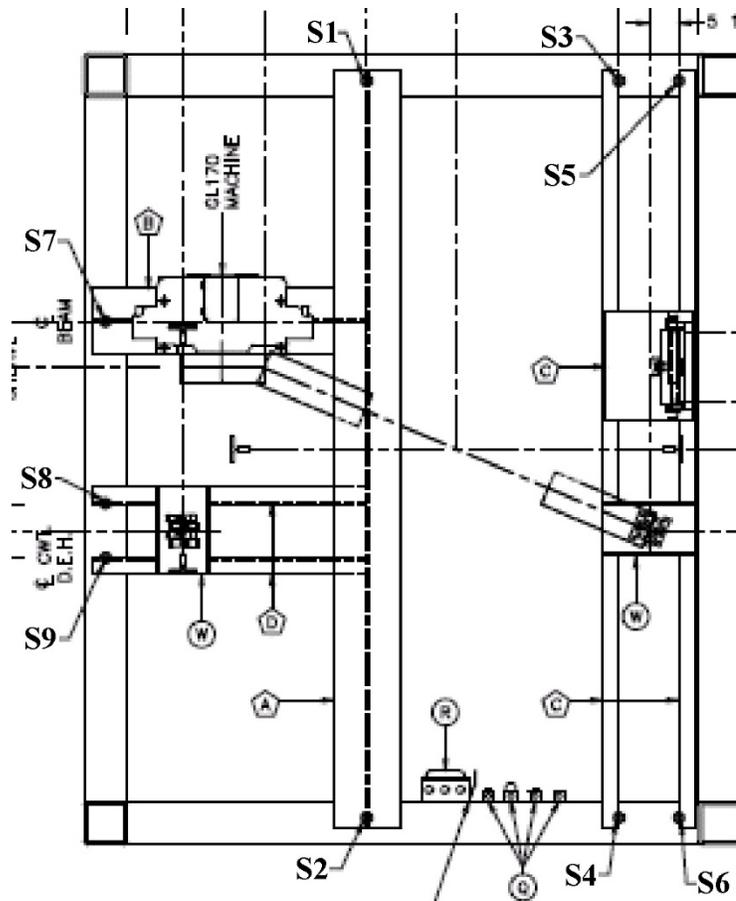
1. Dead Loads
 - a. Total Car Weight: 8,100 lbs.
 - b. Overbalance Weight: 2,250 lbs.
 - c. Total Counterweight: 10,350 lbs.
 - d. Hoist Ropes: 268 lbs.
 - e. 1/4 Traveling Cable Weight: 27 lbs.
 - f. Machine with Motor: 1,856 lbs.
2. Live Loads
 - a. Capacity: 4,500 lbs.
 - b. Load On Car Safeties: 12,627 lbs.
 - c. Overall System Load: 23,245 lbs.
 - d. Rail Reactions
 - i. Rail Reactions Are Live Loads



- ii. Normal Loading (Car) R1: 252 lbs.
- iii. Normal Loading (Car) R2: 272 lbs.
- iv. Normal Running (Car) R1: 252 lbs.
- v. Normal Running (Car) R2: 181 lbs.
- vi. Safety Applied Counterweight R1: 708 lbs.
- vii. Seismic (Car & Counterweight) R1: 3,558 lbs.

e. Overhead Reactions

- i. Overhead Reactions Are Live Loads



- ii. R1: 12,189 lbs.
- iii. S2: 7,557 lbs.

- iv. S3: 2,723 lbs.
- v. RS4: 4,426 lbs.
- vi. S5: 3,027 lbs.
- vii. S6: 4,611 lbs.
- viii. S7: 19,728 lbs.
- ix. S8: 3,879 lbs.
- x. S9: 3,879 lbs.

3. Impact Loads

- a. Car Buffers Reactions: 23,330 lbs. at each location – 2 locations per elevator
- b. Counterweight Buffers Reactions: 42,910,330 lbs. at each location – 2 locations per elevator
- c. Vertical Rail Reactions (Car): 12,903 lbs. at each location – 2 locations per elevator
- d. Vertical Rail Reactions (Counterweight): 12,903 lbs. at each location – 2 locations per elevator
- e. Forces shown have been doubled for impact.
- f. Car and counterweight buffer reactions do not occur simultaneously.
- g. Car and counterweight vertical rail reactions do not occur simultaneously.
- h. Buffer reactions and vertical rail reactions do not occur simultaneously.

4. Hoistway Plumbness For MRL Elevator

- a. The clear hoistway must be square and plumb to within 1/2 inch over 50 feet. Any out-of-plumb conditions must not encroach on the hoistway size envelope from top to bottom.

B General Hydraulic Elevator Loads

1. Dead Loads

- a. Total Car Weight: 6,151 lbs.

2. Live Loads

- a. Capacity: 4,500 lbs.
- b. Load On Car Safeties: 10,651 lbs.

- c. Overall System Load: 10,651 lbs.
- d. Rail Reactions Are Live Loads



- e. Normal Loading R_x : 267 lbs.
- f. Normal Loading R_y : 218 lbs.
- g. Seismic R_x : 3020 lbs.
- h. Seismic R_y : 1532 lbs.

3. Impact Loads

- a. Car Buffers Reactions: 28,418 lbs. at each location – 2 locations per elevator
- b. Vertical Rail Reactions: 21,702 lbs. at each location – 2 locations per elevator
- c. Jack Reactions: 25,442 lbs. at each location – 2 locations per elevator
- d. Forces shown have doubled for impact.
- e. Buffer reactions and vertical rail reactions do not occur simultaneously.
- f. Recommendation is to design the pit to accommodate the buffer and jack reactions simultaneously. Technically, the worst-case scenario would be the car striking the buffers before the safeties set. In this equation, subtract the Overall System Load from the Jack Reaction and then add that value to the Buffer Reaction.

i. Jack Reaction: 12,721 lbs. (Load has not been doubled for impact)

Overall System	
Load:	<u>- 10,651 lbs.</u>
Difference:	2,070 lbs.

ii. Car Buffer Reactions: 12,721 lbs. (Load has not been doubled for impact)

Difference From Above:	+ 2,070 lbs.
Reaction:	16,279 lbs. (Load has not been doubled for impact)
<u>x2 For Impact</u>	<u>x 2</u>
Total Reaction	32,558 lbs.

4. Hoistway Plumbness For A Hydraulic Elevator

- a. The clear hoistway must be square and plumb to within 1/2 inch over 50 feet. Any out-of-plumb conditions must not encroach on the hoistway size envelope from top to bottom.

22.3.14 Power Requirements**A. General MRL Traction Type Elevator**

1. Machine: GL170-35H
2. Speed (fpm): 200
3. Main Line Voltage: 480VAC / 3Ph / 60Hz
4. Duty Cycle (50% Typ):
5. Motor HP: 17.6 HP
6. Motor Hz: 23.77 Hz
7. HM RPM (Full Load): 102 RPM
8. Hoist Motor Voltage: 206 VAC
9. Hoist Motor FLA: 50.4 Amps
10. Brake Voltage (Picking): 198 VDC
11. Brake Voltage (Holding): 55 VDC
12. Brake Resistance: 14.9 Ohms
13. Machine Type: Gearless Traction
14. Drive Type: Inverter KEB Torqmax-Regenerative
15. Total ISO Xfmr KVA: 3 KVA
16. Total Control Xfmr KVA: 20 KVA
17. Total Control Resistor W: 700W
18. AC Inverter Drive W: 550 W
19. Controller Current Load
 - a. Full Load (Full Speed)
 - i. Pump Motor: 17.8 Amps
 - ii. Brake: 6.9 Amps
 - iii. Logic & Door Operator: 8 Amps

- iv. Total: 32.7 Amps
 - b. Full Load (Accelerating)
 - i. Pump Motor: 39.1 Amps
 - ii. Brake: 6.9 Amps
 - iii. Logic & Door Operator: 8 Amps
 - iv. Total: 54 Amps
- B. General Hydraulic Type Elevator
 - 1. Speed: 150
 - 2. Main Line Voltage: 480 VAC / 3 Ph / 60 Hz
 - 3. Duty Cycle (50% Typ): 50%
 - 4. Motor HP: 75 HP
 - 5. Pump Motor Voltage: 480 VAC
 - 6. Pump Motor FLA: 96 Amps
 - 7. Motor Type: Y-D (Wye-Delta)
 - 8. Starter Type: Solid State
 - 9. Total Control Xfmr KVA: 2.0 KVA
 - 10. Controller Current Load
 - a. Full Load (Full Speed)
 - i. Pump Motor: 96 Amps
 - ii. Logic & Door Operator: 10 Amps
 - iii. Total: 106 Amps
 - b. Full Load (Accelerating)
 - i. Pump Motor: 288 Amps
 - ii. Logic & Door Operator: 10 Amps
 - iii. Total: 298 Amps
- C. Additional Power Requirements

1. Auxiliary Feeder: One supply per car controller for car lighting and fan per NEC 620-22. The disconnect must be lockable as required per NEC 620-53
 - a. Power Requirements For Auxiliary Feeder: 120 Volts / 1 Phase / 60 Hertz
 - b. Typical Circuit Size: 15 Amps
2. Battery Lowering Provisions: Auxiliary contacts are required in the main line disconnect for elevators with battery lowering. These contacts will be supplied by the electrical contractor per NEC 620-91.c.
3. Add additional circuit breaker type OCPD for the A/C system, in addition to the main line disconnect and the lighting/fan disconnect.

22.4 ESCALATORS**22.4.12 Operating Devices**

In Subsection 22.4.12 of the CDC, the following statement shall added to the end of the Subsection:

Dry-form "C" contacts will be provided for remote indication of the following conditions: Escalator Emergency Stop, Escalator Stop, and Escalator Malfunction. The Contractor shall provide an appropriate raceway from the Escalator interface point to the TCCR.

The following sections shall be added to Section 22.4 of the CDC:

22.4.19 Power Data Ratings

1. Capacity: 8,100 per/hr
2. Speed: 0.50 m/s (100 FPM)
3. Main Power Supply: 50A slow fuse protection (by others)
4. 3-phase AC: 3 x 480V, 60 Hz
5. Lighting & Receptacles: 16A CB Protection (by others)
6. Motor Power Rating: 18.5 kW (25 HP)
7. Rated Motor Current: 32.5 A
8. Starting Current: 67 A

The following sections shall be added to Chapter 22 of the CDC:

22.7 SPECIAL COORDINATION PROCEDURES

- A. The Contractor shall provide the E&E Contractor partial access on the dates provided in SP-7.1.1 of the Special Provisions.

- B. The E&E Contractor's installation work will be performed during normal working hours of normal working days after hoistways and machine/control rooms have been prepared by the Contractor in accordance with the requirements set forth in the subsections below. All work items herein shall be provided at no additional cost to HART or the E&E Contractor, and in accordance with all governing codes.
- C. All preparatory work as described in the subsections below for elevator and escalator installation shall be performed per the latest applicable revision of the national (ASME A17.1 or CSA B44) and/or local codes.
- D. The Contractor shall coordinate with the E&E Contractor to clarify the sequence of construction for each elevator and each escalator to ensure that required preparatory work is completed in advance of the E&E Contractor's installation date, and that any elements of the Work relating to closing in elevators and escalators is deferred until acceptably coordinated and agreed with the E&E Contractor.
- E. Where machine rooms are remote from the hoistway, electrical duct runs and piping serving the elevators and escalators will be underground or embedded in the concrete slab. The Contractor shall provide notification to the E&E Contractor at least 2 weeks in advance of pouring concrete in the floor area between any hoistway and its corresponding machine room, and provide access to the E&E Contractor to supply and install ducting and piping prior to the Contractor pouring concrete.
- F. The Contractor shall provide availability of a crane and operator to place the elevator/escalator machine, controller, and machine supports (where applicable) into the machine/control room or hoistway overhead, and to place the escalators into the wellways, prior to enclosing these areas. The Contractor shall coordinate this work with the E&E Contractor. The crane shall be of adequate capacity to hoist a minimum load of 30 tons and shall have a vertical lift capability to position escalator trusses and elevator hoistway equipment into place.
- G. The Contractor shall provide an acceptable material unloading area within 100 feet of hoistway (for elevators) and within 300 feet of wellway (for escalators) with 'rollable' access (planked or paved). Unloading area shall be accessible to a 43-foot semi-trailer to allow for unloading of the E&E Contractor's equipment during normal working hours.
- H. The work areas to be used by the E&E Contractor, including wellways, hoistways, machine rooms, pits, storage areas, and assembly areas, shall be kept clear of construction debris resulting from other than the E&E Contractor at all times.
- I. The Contractor shall coordinate with the E&E Contractor regarding requirements for the E&E Contractor's partial access. At a minimum, the Contractor shall provide the following in compliance with the Contract Documents prior to the E&E Contractor's partial access dates shown in SP-7.1.1 and shall provide notice to the E&E Contractor that the station is ready for elevator and escalator installation:
1. Hoistways or wellways, including any supports for elevator or escalator equipment, shall be completed in accordance with the Contract Documents and enclosed, except as required for installation access.

2. Hoistways or wellways shall be plumb from top to bottom within a variation of 1 inch per 100 feet, and provided with sufficient clearance at the top and bottom for proper installation of machinery. Inside edge of door sill supports shall be parallel, level, and plumb from the center line of the hoistway, with allowable variation of ¼ inch.
 3. Machine rooms shall be completed in accordance with the Contract Documents, including cooling system, concrete floors, and foundations.
 4. All pits shall be completed in accordance with the Contract Documents, including drains, sumps, and waterproofing. Provide any additional measures required to ensure effective prevention of pit exposure to stormwater or ground water for the duration of the Work.
 5. Concrete surfaces of hoistways, wellways, pits, and machine rooms shall be fully dry and cured.
 6. Power shall be provided to the elevator and/or escalator controller and associated lighting circuits, including necessary disconnect switches, switches, conduit, wiring, and junction boxes, etc., in accordance with the Contract Documents. Where permanent power is not available, temporary electric power shall be provided, with the same characteristics as the permanent supply, for construction, testing, and adjusting. Permanent power is required prior to any testing of elevator or escalator installations.
- J. The Contractor shall coordinate with the E&E Contractor regarding the requirements for preparatory work for elevators. At a minimum, the Contractor shall provide the following preparatory work for elevators:
1. Pit floor shall be dry, level, flat, and free of surface imperfections and debris.
 2. Provide a dry and enclosed storage area of 15 feet by 30 feet for elevator materials and tools, adjacent to the lowest entrance at each hoistway. If this space cannot be provided, the Contractor shall provide an alternate lay down area acceptable to the E&E Contractor. The Contractor shall provide power for construction adjacent to hoistways and machine/control rooms (110/220-V, single phase, for welders and hoists) and sufficient 480-V 3-phase power to run elevator(s) at the same time.
 3. Provide a temporary work platform, as approved by the E&E Contractor, for all elevators at the top floor served by each elevator. The platform shall comply with applicable codes and regulations and shall be securely fastened to the structure. Construction, maintenance, and removal of this platform shall be provided by the Contractor.
 4. Provide 75 degree bevel guards on all projections, recesses or setbacks over 4 inches, except on side used for loading/unloading within all elevator shafts.
 5. Provide venting of hoistways in accordance with the Contract Documents.

6. Provide construction barricades outside elevator hoistways in accordance with OSHA requirements. Barricades shall be freestanding and removable, located at each hoistway opening at each floor.
7. Provide drains and sumps in elevator pits in accordance with the Contract Documents. The cover shall be secured and level with the pit floor (Rules 2.2.2.4 and 2.2.2.6 in cars following ANSI 2000 or greater or Rules 106.1b(3)&(4) less than ANSI 2000) and shall be located to clear elevator equipment.
8. Access to the machine room shall be secured (Rule 2.7.3 in cars following ANSI 2000 or greater or Rule 101.3 for less than ANSI 2000). Door shall be self-closing, self-locking, and operable from inside without a key.
9. Provide a ground fault interrupter (GFI) convenience outlet and telephone outlet for each elevator in the machine/control room, in accordance with the Contract Documents.
10. Provide lighting, power, and cooling of elevator machine room (Rule 2.7.5 in cars following ANSI 2000 or greater and less than ANSI 2007 and Rule 2.7.9 for ANSI 2007 or greater or Rule 101.5 for less than ANSI 2000), in accordance with the Contract Documents. Machine room temperature shall be maintained between 55 degrees Fahrenheit (°F) and 90°F. Humidity levels shall be maintained to prevent condensation on equipment or surfaces.
11. Provide lighting and ground fault circuit interrupter (GFCI) per hoistway code requirements as shown on the Contract Documents. For elevator MRL-type elevators, the “machine room” and “control room” as shown are two separate spaces and require a “GFI” outlet and for lighting (19 footcandles) per code in each space.
12. Provide hoisting beams, trap doors and other means of access to machinery space, in accordance with the Contract Documents (Rules 2.7.3.4 and 2.9.3.3 in cars following ANSI 2000 or greater or Rules 101.3d and 105.3c for less than ANSI 2000). Hoisting beams in each shaft shall be located and load rated in accordance with the Contract Documents. Lifting points or beams shall be visibly marked with the safe working load.
13. Provide Class “ABC” fire extinguishers in electrical machinery and control space in accordance with the Contract Documents. Extinguishers shall be located convenient to access door (Rule 8.6.1.6.5 in cars following ANSI 2000 or greater or Rule 1206.1h for less than ANSI 2000).
14. All elevator glass and secondary steel framing shall be left open at ground level entrances for the E&E Contractor to install elevator cab assemblies. Coordinate with E&E Contractor for installation of elevator door frame.
15. At the Elevator Roof level, all roof structure and finishes shall not be installed until the elevator cab assembly is complete. Provide an effective prevention of hoistway exposure to stormwater by means of removable barriers at the roof level.

- K. The Contractor shall coordinate with the E&E Contractor regarding work to be performed prior to placing the elevators into automatic operation. At a minimum, the Contractor shall have completed the following work before elevators are placed into automatic operation, prior to code-required inspections by the authority having jurisdiction:
1. The machine room shall be completed in accordance with the Contract Documents, and in compliance with code, including stairways or steps and guardrails, and lockable fire-rated door (self-closing and self-locking with label to be provided) (Rules 2.7.3 & 2.11.14 in cars following ANSI 2000 or greater or Rules 101.3 & 110.14 for less than ANSI 2000).
 2. All penetrations through 2-hour- (or greater) rated walls shall be sealed in accordance with the Contract Documents.
 3. Cab light circuits and all receptacles installed in machine rooms, and ground fault circuit interrupter protection shall be installed in pits (NEC 620 or CSA 38).
 4. The conduit runs from elevators to remote status panel and monitoring systems shall be in accordance with the Contract Documents.
 5. The conduit for the fire alarm system to each elevator control in the machine room shall be in accordance with the Contract Documents.
- L. The Contractor shall coordinate with the E&E Contractor regarding preparatory work for escalators. At a minimum, the Contractor shall provide the following preparatory work for escalators:
1. The wellway framed openings shall be complete in the floors, including necessary supports for the truss, in accordance with the Contract Documents. Any indicated enclosures, wellway railings, baffles, and barricades around the wellway shall be in place prior to escalator installation, so that the E&E Contractor can hoist trusses into place. Roof structures shall not be used for hoisting escalators into place. Confirm and coordinate with E&E Contractor for locations of intermediate or other supports as shown on Contract Documents. Locate and install supports required for escalator truss attachments prior to installation of the intermediate supports.
 2. Provide a staging area for the exclusive use of the E&E Contractor, with a minimum area of 15 feet by 50 feet (per escalator), located at the bottom or most accessible landing within crane picking distance of each escalator wellway.
 3. Coordinate with the Core Systems Contractor for their installation of a RJ11C-one pair telephone line to phone jack in either the top or bottom landing.
- M. The Contractor shall coordinate with the E&E Contractor regarding the work to be provided by the Contractor during the E&E Contractor's performance of its work. At a minimum, the Contractor shall perform the following Work during the E&E Contractor's performance of its work:

1. Provide all cutting, patching, and chasing of walls, beams, masonry, finish work, and painting, together with all repairs made necessary by such work.
 2. Provide protection to hoistway or wellway during the time the equipment is being installed.
 3. Provide blockout/cutout through steel or masonry as required, to accommodate hall button boxes, signal fixtures, hoistway access switches, fire service fixtures, hydraulic piping, electrical conduit, and hatch duct. Provide any repairs such as grouting, patching, painting, or fire-proofing. Coordinate blockout/cutout with the E&E Contractor's field supervisor.
- N. The Contractor shall at a minimum perform the following Work following the completion of the E&E Contractor's work:
1. Completed elevators and escalators shall be barricaded, protected, and secured by the Contractor for the duration of the Work.
 2. Provide any repairs such as grouting, patching, painting, or fire-proofing around entrance frames and finished floor and grout to sill line after installation of entrance.

END OF CHAPTER

23.0 FIRE/LIFE SAFETY

23.1 GENERAL

No change to CDC Chapter 23.0 – Fire/Life Safety

END OF CHAPTER

24.0 SYSTEMS ASSURANCE

24.1 GENERAL

No change to CDC Chapter 24.0 – Systems Assurance

END OF CHAPTER

25.0 SYSTEM SAFETY AND SECURITY

25.1 GENERAL

No change to CDC Chapter 25.0 – System Safety and Security.

END OF CHAPTER

26.0 SUSTAINABILITY

26.1 GENERAL

No change to CDC Chapter 26.0 – Sustainability

END OF CHAPTER